Oxford Humanities

Operation & Maintenance Manual

ORCHESTRA LIFTS & STAGE RISERS

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J&C Joel

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1. Document Control

1.1. Identification

Client: Laing O'Rourke

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1.2. Document History

Rev	Date	Description	Author	Checked
A	14/08/2025	First Issue	DT	JC
B	23/12/2025	Updated as per consultant comments	JC	SS

1.3. Contact Details

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1.4. Warranty

Limited warranty is valid for twelve (12) months from the date of practical completion and handover to the client or clients representative (whichever occurs first.)

1. The warranty shall be limited to the free supply of replacement materials and workmanship for the faulty materials or workmanship and shall not cover other damage or defects how so ever caused.
2. It shall be the client's responsibility to notify J&C Joel Ltd for any defects in the machinery and the warranty shall be void if repairs or other works were carried out by third parties.
3. This warranty shall only apply to the areas where J&C Joel Ltd have been applied and completed the works.
4. The supply of replacement materials and workmanship under this warranty shall in no event exceed the quantity specified and supplied and shall only be applied to proven defective areas by checking and tests conducted under the control of the owner, the consultant or its representative and J&C Joel Ltd or its representatives.
5. This warrantee shall be interpreted according to the laws of the United Kingdom.

1.5. Copyright

This document contains material that is proprietary to J&C Joel Ltd. This information is provided on the understanding that it is used solely for the purpose of information, installing and maintaining the equipment described, and that it will not be revealed to third parties or otherwise disposed of without the prior written consent of J&C Joel Ltd.

Copyright for all design, software, electronic circuits, drawings and the text of this manual remains with J&C Joel Ltd. This publication or parts thereof may not be reproduced in any form, by any method, for any purpose. Further copies may be obtained from J&C Joel Ltd. on request.

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2. How to use this manual

Read the instructions carefully before use and follow them accordingly. Keep this document safe for future reference. Non- observance of these instructions may lead to hazardous situations and / or malfunctions or to failure of the equipment, resulting in damage or injury.

The user is advised not to operate or undertake any work on the systems without first reading and understanding the contents of this manual.

All maintenance should be carried out strictly in accordance with the instructions contained in this and the manufacturer's reference manuals as may be attached and undertaken by suitably trained and qualified personnel.

This manual describes the J&C Joel Orchestra Lifts and associated Items as installed within the Stephen Schwarzman Centre for the Humanities at Oxford University. It sets out the different Orchestra Lifts and associated Items within the building, outlines maintenance procedures, and gives a technical description of the various components. Servicing of main fault conditions is not covered; in such cases, please contact J&C Joel immediately.

This document is intended to provide the user with sufficient information to allow regular routine maintenance of the equipment described. It is intended to clearly instruct the user in the follow areas:

- System philosophy and overview
- Description of systems
- Maintenance of systems
- Equipment lists
- Other Supplier's documentation

If in doubt about anything contained in this manual, please contact the Projects Department at J&C Joel Ltd. T: +44 (0)1422 833835 – E: Projects@jcjoel.com

3. Health and Safety

The machinery is designed for use in theatres and venues of public entertainment and must be operated strictly according to its intended purpose. Compliance with all relevant local laws, regulations, and machinery directives regarding operation and accident prevention is mandatory. Regular inspections and maintenance are essential for ensuring the equipment's proper functioning. Only fully trained and competent personnel should conduct operations, inspections, and maintenance activities.

Personnel are required to possess comprehensive knowledge of the equipment, including adherence to operating and maintenance guidelines. The client's staff bear the responsibility for ensuring safe operation in accordance with the client's safety manual and must promptly address any defects or damages. Minor issues may be rectified by the client's operating company; otherwise, please contact J&C Joel Ltd to ensure proper safety measures are taken.

In situations where the condition of the equipment is uncertain, operations should be conducted exclusively under the supervision of a qualified expert. Ensure that all loads are removed or securely fastened prior to inspecting or maintaining movable installations.

The maintenance supervisor is accountable for complying with all relevant health and safety regulations and must ensure that maintenance switches are deactivated when servicing drive units.

Authorized personnel are required to inspect, maintain, and lubricate parts regularly. Safety devices, such as protective covers, should be properly installed. Equipment and installations should be used only for their intended purposes, following all operating instructions and technical specifications.

The client's technical supervisor is required to verify that all operators or technicians engaged in work on live equipment up to 400 VAC possess the necessary training and qualifications.

The electrical equipment must be connected to an appropriate power supply that meets the required technical specifications and tolerances. The client is responsible for ensuring proper equipotential bonding.

- Nominal Voltage = 230 V AC (in accordance with EN 60204-1).
- Nominal frequency: = 50 Hz, (in accordance with EN 60204-1).
- Control voltage: 24 V DC

The client's supervisor is responsible for ensuring that a current copy of the company's local health and safety regulations is always accessible within the venue. The supervisor must ensure that all personnel who are required to work on the equipment and systems referenced in this manual are fully acquainted with the health and safety regulations and are provided with the necessary personal protective equipment prior to commencing any work on the equipment. Additionally, they must have the appropriate tools and equipment as listed herein and thoroughly understand the requirements of BSEN 17206:2020 Entertainment Technology Machinery for Stages and Other Production Areas, Safety Requirements and Inspections and Use.

3.1. Disposal instructions

At the end of the service life of the equipment, normally between 15 and 20 years, any parts or items that may be upgraded or replaced must be removed and disposed of in accordance with laws and regulations in force at the time. Generally, the equipment comprises of non-hazardous steel fabrications and machinery, electrical installation materials and accessories, and electronic assemblies. Some PLC components contain batteries which must also be disposed of correctly. Gearboxes have small amounts of lubricating oil inside which should be disposed of using a properly licensed facility.

3.2. Electrical Maintenance Safety



CAUTION



Many racks feature multiple power supplies, including mains supplies, clean supply, and auto-transformer supply, among others. Each supply has a warning indicator located on the front panel. Additionally, within the equipment and contactor racks, there are exposed live terminals that must be handled with caution. **Ensure that all supplies are isolated and locked off before attempting to carry out any work.**

After isolating all supplies, it is imperative to display a warning notice at the isolation point. This notice must indicate that maintenance is being performed on the downstream equipment and that re-energizing is strictly prohibited.

In situations where it is unavoidable to work on live equipment, it is imperative that the individual performing the task is appropriately trained and that the work adheres to the regulations set forth by the "Health and Safety at Work Act".

Microprocessor systems are inherently complex, requiring specialized knowledge for detailed fault diagnosis. It is essential that individuals servicing this equipment have attained sufficient expertise before undertaking such tasks. Consequently, this manual does not provide tutorials on electronic circuits and microprocessor systems; it assumes that the reader is fully competent in this area.

4. General

The Two stage extension lifts (large & small) Orchestra Lifts, as depicted in the as-built drawings, to allow the stage and orchestra pit size to be finely adjusted to suit performance requirements. These lifts give the ability to create various performance formats and have been strategically positioned by the Theatre Consultant, Charcoal Blue, during the design phase.

These Orchestra Lift systems are used to create the following performance formats:

- Standard stalls seating with the small stage extension pit lift at stage level and the large stage extension pit lift at stalls level
- Small band pit with the small stage extension pit lift at stage level and the large stage extension pit lift at orchestra pit level
- Large band pit with the small stage extension pit lift at orchestra pit level and the large stage extension pit lift at orchestra pit level
- Extended platform with the small stage extension pit lift at stage level and the large stage extension pit lift at stage level

A demountable fascia system is provided for the downstage edge of the small stage extension lift to cover the void between the fixed lift fascia and the large orchestra pit lift finished floor level when the small stage lift is at stage height and the large orchestra pit lift is at orchestra pit level. This comprises of a system of removable panels with timber infills which slot into sockets within the lift surface.

Safety guardrails are installed around the large orchestra pit lift to protect the live pit edge when in the small / large orchestra pit formats.

LED work lighting is provided on the underside of the lift platforms. These are operated through the StageLX panel.

Two hatches are included in the large orchestra lift to allow service access to the machinery in the pit below. These are interlocked with the lift control system so that remote control of the lifts is not possible when the hatches are opened or removed. Safety edge astragals are fitted along the bottom edge of a lift fascia where a shear hazard is created.

Five stage riser lifts create three curved orchestra risers, to allow a variety of orchestra riser formats to be created. The two furthest upstage orchestra risers comprise two lifts to allow the smaller stage right lifts of each riser to be lowered independently to create a level passage for pianos to be brought from the piano store onto stage with minimal disruption to stage set-up, as well as allowing for the creation of a larger raised area for the piano during a performance.

A package of pit access tread units (refer to 4334-09-OM-0001 for more information) and demountable rostra (refer to 10335 Concert Hall O&M v1 for more information) are supplied to provide access to the orchestra pit and stage, and to complete the large stage extension, to be used as and when required.

The Orchestra Pit Lift Systems are intended for use as part of a change over system only and are not designed to be suitable for use during a show or for a live performance.

The orchestra pit guardrails (refer to 4334-11-OM-0001 for more information) are removable steel columns that fit into pre-existing, permanent sockets that are fitted into the concrete below the concert hall finished floor around the orchestra pit lifts. They are designed to prevent falls by persons into the pit area when the orchestra lift is lowered below the level of the stage floor or stalls. When removed, handrails are stored on a movable trolley for ease of handling.

Only authorized stage technicians are permitted within the hazard zone of the machinery during its setup for a performance or for maintenance.

The control system operator should be able to observe all machines throughout their entire range of motion during operation.

The machinery should be operated according to its intended purpose and maintained in optimal technical condition. Adherence to regulations and BS EN 17206:2020 standards is critical for ensuring the operational safety of the equipment.

If a fault or issue is identified with the machine, it must not be used further until it has undergone a complete inspection by senior qualified personnel. It is strongly advised by J&C Joel that the lifts are not operated until the issues are resolved, however at the discretion of senior members of the venue's operating team, issues can be "made safe", allowing operation.

4.1. Misuse

Any use that does not comply with the "intended use" or exceeds its scope shall be considered inappropriate use.

Each of the Orchestra Pit Lift Systems is specifically engineered to support the loads indicated on the performance parameters of the Orchestra Pit Lift Systems. It is imperative that these stated load limits are not exceeded. For comprehensive details regarding permissible, please consult the as-built drawings.

The manufacturer shall not be held responsible for damages resulting from improper use. Such misuse may lead to unsafe conditions and/or material damage, thereby invalidating the warranty.

4.2. Modification and Changes

Modifying or changing the equipment and electrical installations can create hazardous situations and material damage. Such actions will also invalidate the warranty and any CE marking.

4.3. Spare Parts

Using parts from other manufacturers may present risks. It is recommended to use parts approved and recommended by the original manufacturers J&C Joel Limited and Serapid. The manufacturer does not assume liability for any damage caused by unapproved parts, which can create hazards and invalidate the warranty and CE marking.

4.4. Equipment Risks

When using the equipment risks and injuries may arise to:

- The life and limbs of the operator or third parties
- For the equipment itself,
- Other property.

The safe handling and efficient operation of this equipment depend on thorough knowledge of the safety and user instructions detailed in this manual. Ensure that this manual is always kept with the equipment so that it remains readily accessible to both operators and maintenance personnel.

Additionally, adhere to the general and local safety and accident prevention regulations, specifically BS EN 17206:2020.

4.5. Residual Risks

The equipment and electrical installations have been manufactured and installed in compliance with the latest certified safety regulations and standards.

 **WARNING** 

Operating theatre equipment entails inherent risks and hazards for all participants; therefore, it is imperative to conduct a comprehensive risk assessment for each phase of the intended operation. This process should identify all risks and hazards that need to be mitigated through appropriate countermeasures to achieve an acceptable level of safety. Furthermore, the sequence of events should be reviewed with all involved personnel to ensure preparedness.

The responsibility for managing risks and hazards that occur during normal operation of the equipment rests with the client's operating company. They must consistently comply with all health and safety regulations.

4.6. Operational Crew

The Client's operating crew must ensure that only authorized personnel operate the equipment who:

1. Are familiar with the basic regulations on work safety and accident prevention.
2. Are trained in the operation of the equipment.
3. Have read and understood these operating and maintenance instructions.
4. Are 18 years old and over.
5. Are physically and mentally suitable.
6. Have been trained and instructed about the relevant work.
7. Conduct all the required work in a safety-conscious and reliable way.

The requirements of BS EN 17206:2020 together with the EC Directive 2007/30/EC on the use of work equipment are to be always fully complied with.

4.7. Care

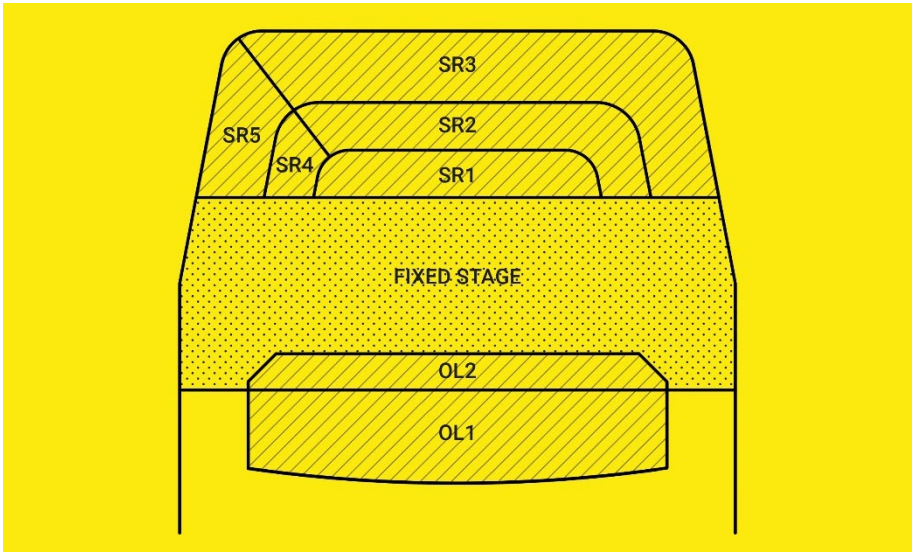
1. It is recommended to wear PPE protective working gloves when handling or transporting items or equipment.
2. The use of a bump cap or hard hat should be considered when working beneath the lifts.
3. Use extra caution when moving or installing handrails in low-light conditions, such as during theatre set-ups with blue light only.
4. Take care when lifting and lowering heavy equipment. Pay particular attention to the risk of entrapment when lowering items to the floor level,
5. Prior to initial use by new personnel, training should be provided to ensure users are comfortable and confident in operating the equipment.

5. Orchestra Lifts & Stage Risers

5.1. Orchestra Pit Lift Systems

The Oxford Concert Hall features a distinctive design that affords remarkable flexibility, with a stage floor capable of being reconfigured into various levels and layouts to accommodate diverse production requirements. Equipped with comprehensive operating systems—including orchestra lifts, riser lifts, versatile rostra units, and various removable fascia's—the venue enables seamless adjustments that can be tailored to suit each performance. Additionally, the Concert Hall is fitted with variable acoustic banners, and sophisticated variable lighting systems, and an adaptable air conditioning system, all designed to enhance the overall audience experience.





Two (2) stage extension lifts (1-large & 1-small) Orchestra Pit Lifts have motorised moving for the dual purpose of providing a static performance surface or for moving goods have been installed

in the forestage area of the Oxford Humanities Concert Hall. The platforms are fabricated steel structures with a finished wood surface provided by others. The primary motive mechanism is provided by Serapid Rigid Chain columns, mechanically linked to each other using a series of interlinked drive shafts, and electro/mechanical motor gearbox, with dual brakes. Refer to the attached SERAPID Rigid Chain Technology Instruction Manual Lifting System in Appendix 1.



The control for the lifts is provided via a touchscreen pendant controller on a trailing lead that plugs into a control panel located at stage left corridor as indicated on the as-built drawings. The control pendant is used to recall pre-programmed position dead's corresponding to the various required staging formats. The control system manages all interlocking; safety and emergency stop features associated with the lift control system (see manual 4334-99-OM-0001 for more information).

A centralised emergency stop (E-stop) system is provided that will bring all overhead and stage level equipment, except for the acoustic banners, to a safe stand-still in the event of an

emergency or fault. E-stop buttons are located at positions shown on the as built drawings at stage level, top hat level and in the roof void as well as on the handheld controller.

Orchestra Lift Parameters:

- Static load 5kN/m2
- Total travel 1800mm
- Speed 50mm/s.
- Static floor loading 3kN (over a square with 300mm sides)
- Fascia horizontal load 1.5kN/m
- No. of pre-sets, 3 - levels, Orchestra Pit, Stalls, Stage.

5.2. Orchestra Pit Guardrails

The orchestra pit guardrails are removable steel vertical posts that fit into pre-existing, permanent sockets that are fitted into the outer edge concrete of the concert hall floor around the orchestra pit. They are designed to prevent persons falling into the pit when the orchestra lift is lowered below stage level. When removed, the guardrails are stored on a custom-built mobile trolley for ease of handling. For more information, please view the guard rail manual; 4334-11-OM-0001.

Large orchestra lift in its lowest position with the handrails and pit access steps fitted.



5.3. Orchestra Pit Access Steps

The pit access steps are supplied to allow for easy access from stage level into the pit. The steps consist of a rolling metal and timber structure that is pitched at 180mm rise with 250mm step. There is a separate moving trolley has been supplied for storage of the demountable handrails. The handrails are demountable to allow the unit to pass through a standard doorway. For more information, please view the pit access treads manual; 4334-09-OM-0001.

5.4. Orchestra Stage Riser Lift System

Five stage riser lifts creating three curved orchestra risers are installed to allow a variety of orchestra riser formats to be created. The two furthest upstage orchestra risers comprise two lifts to allow the smaller stage right lifts of each riser to be lowered independently to create a level passage for pianos to be brought from the piano store onto stage with minimal disruption to stage set-up, as well as allowing for the creation of a larger raised area for the piano during a performance.

The primary motive mechanism is provided by Serapid Rigid Chain columns, mechanically linked to each other using a series of interlinked drive shafts, and electro/mechanical motor gearbox, with dual brakes. Refer to the attached SERAPID Rigid Chain Technology Instruction Manual Lifting System in Appendix 1.

Please be aware that due to the different gearing ratios of adjacent risers, there is a slight speed difference when risers are moving simultaneously. It is important to ensure that no materials straddle multiple risers when they are to be moved.



Around the rear of the stage, there are three doors that lead into the Risers. For safety, these doors cannot be opened when the lifts are not at the height of the fixed stage. A magnetic locking system is in place on all three doors. Additionally, when one of the access hatches is open, none of the risers will run as they are all within one zone.

5.5. Operation

For operating the, Orchestra Pit Lift Systems, refer to the control operation manual; 4334-99-OM-0001. This includes more detailed instructions for operation, maintenance, and service.

Please note that if the lift MCC is powered off, this will remove the magnetic locking system on the doors. If the stage risers are not at stage level, this will lead to hazards from the doors. The stage right door has two leaves, but only one leaf contains a magnetic lock. If the magnetically locked door is closed, the other leaf cannot open. If the other leaf is opened but the first is then shut, the system will read the doors as being locked, leading to shear edges and other hazards. This must be checked by the operating crew before operation of the lift.

5.5.1. Start-up

To move any of the Orchestra Lifts or the Riser Lifts, the following devices must be powered on.

- Power Distribution Cabinets
- Stage Level MCC
- Touchscreen control pendant

Additionally, the following devices should be checked:

- E-stop system – all E-stops released, and E-stop system reset if necessary.
- Daily & Weekly checks as required.



5.5.2. Shutdown

System shutdown should be carried out in the following order:

- An e-stop should be struck.
- The AVW Control Console should be shut down.
- The MCCs can then be turned off using the isolator switches as required.

5.5.3. Control Points

There is one control point for the stage level system in the concert hall, this is located outside the stage left door. For the e-stops to function the dummy plug must remain plugged in when the plug in point is not in use. If not, the system will recognise an e-stop and not allow movement of any system within the concert hall.



5.5.4. E-Stops

The concert hall has six e-stops within the venue; two in the loft space, two on the technical gantry, and one above the plug in points at stage level. There are also three distributed between the MCC panels, and one on the global e-stop cabinet. There is an additional e-stop on the control pendant. Each e-stop has been given a location reference which when triggered can be identified on the e-stop trace page of the control.

All personnel working on the stage, technical gantry and loft should be introduced to the e-stop locations and system during induction/familiarisation with the venue.

5.5.5. Control Console Problem solving

If the AVW control console does not operate as expected, problem solving should be attempted starting from physical connections, as this is the most likely area to have problems. There are no user-serviceable components within the AVW Control Console therefore to avoid invalidating the warranty please contact J&C Joel Ltd for assistance.

Confirm the following:

- The connection cable must be properly connected.
- Power is reaching the AVW Motion Control Console, which can be confirmed with the power indicator lights on the control console.
- If the control point is not powered up, check the 24V power supply source.
- Whether any e-stops are triggered.
- Whether the global e-stop panel is switched on.
- Whether the dummy plugs are connected into the plug in points
- Check all isolators are on for the machinery that is intended to run.

If these measures do not help rectify the problem, contact J&C Joel Ltd support for further assistance.

5.5.6. First line fault diagnosis

The Control System is a complex system and more harm than good can be done by incorrect investigation into possible problems. Comprehensive training will be provided in the control O&M

manual (4334-99-OM-0001) to enable rapid diagnosis of most common system faults. In the event of any unfamiliar errors or problems, contact J&C Joel Ltd support for further assistance.

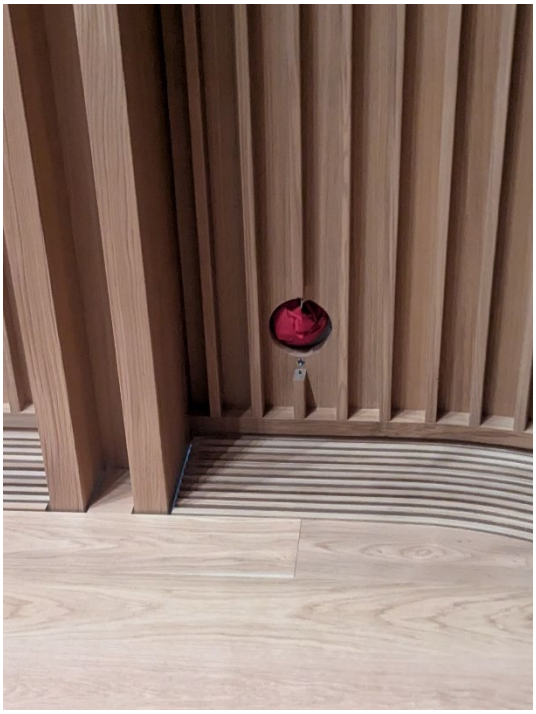
5.5.7. No load sensors

Each lift is fitted with no-load sensors on each serapid chain. In the event that the lift snags on something when moving downwards, the no-load will trigger, stopping the motion of the lift. This will show as a red warning sign on the control console. The control will enable the user to move upwards away from the snag. If the lift snags on anything, this must be investigated by competent professionals. Please follow all health and safety advice within this manual when doing so, and conduct a thorough risk assessment for the specific case.

5.5.8. Temporary Cables

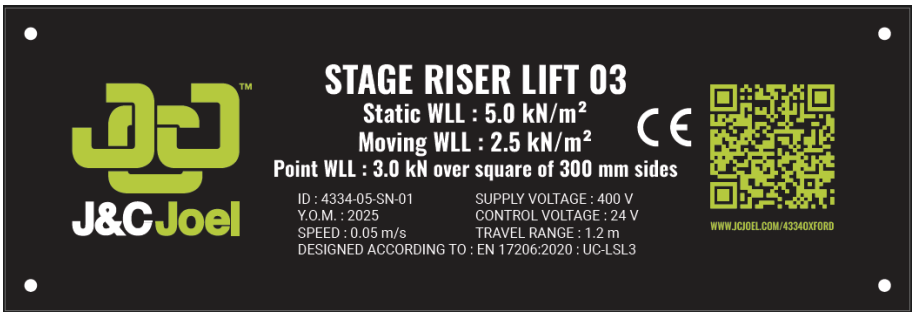
At multiple points across the stage there are wooden wall plugs that function as temporary cable pass throughs, providing access from off stage to on stage. Some are installed on walls adjacent to the stage riser lifts, the typical gap between the stage risers and the wall is between 5-8mm. Meaning that if the plug is not completely flush in the socket, it will clash with the riser when in operation, likely leading to damage. J&C Joel strongly advise that all plugs are completely removed prior to moving the lifts.



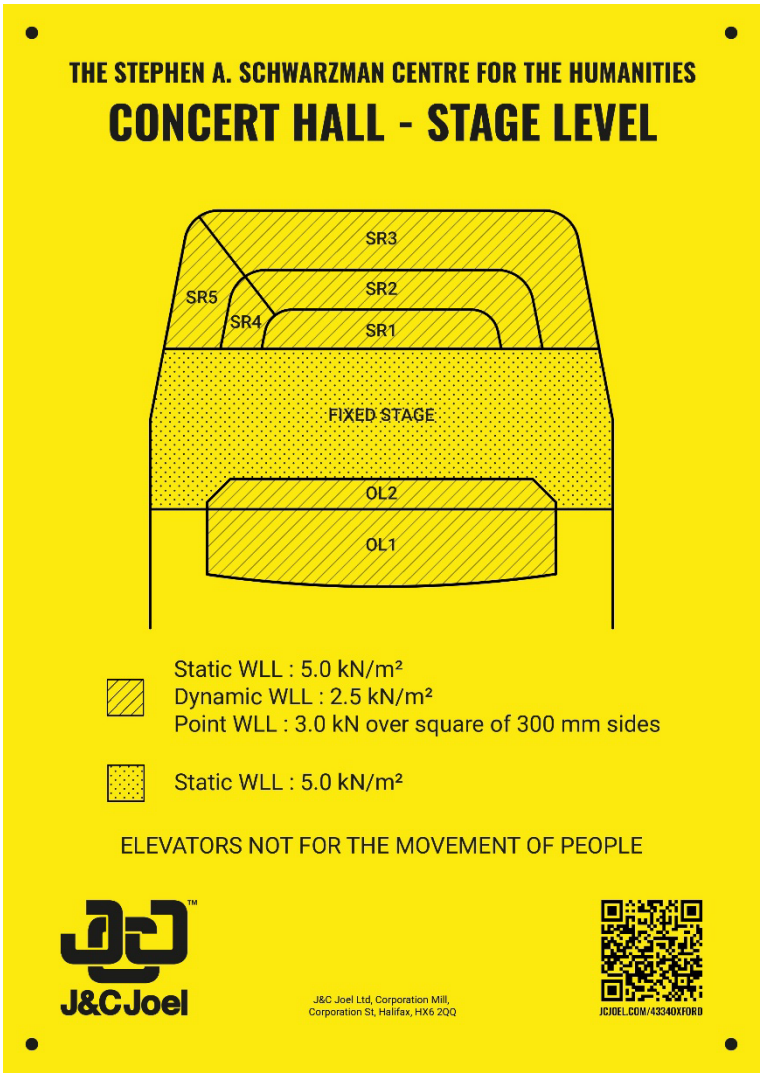


5.6. Signage

Each lift has a local machinery label fitted on the access hatch;



The general floor loading signage is located above the control ports on stage left;



5.7. List of Drawings

DRAWING NO.	TITLE
UOONHB-JCJ-CH-B1-DR-OT-050002	Concert Hall – Large Orchestra Lift Proposal – Floor & Structure Plans
UOONHB-JCJ-CH-B1-DR-OT-050003	Concert Hall – Large Orchestra Lift Proposal – Sections & Pit Plan
UOONHB-JCJ-CH-B1-DR-OT-050004	Concert Hall – Small Orchestra Lift Proposal – Floor & Structure Plans
UOONHB-JCJ-CH-B1-DR-OT-050005	Concert Hall – Small Orchestra Lift Proposal – Sections & Pit Plan
UOONHB-JCJ-CH-B1-DR-OT-050006	Concert Hall - Large Orchestra Lift Proposal Infill Fascia Panels
UOONHB-JCJ-CH-B1-DR-OT-050009	Concert Hall - Orchestra Lifts - Proposal - Maintenance Hatch Assembly
UOONHB-JCJ-CH-B1-DR-OT-050025	Concert Hall - Orchestra Lifts & Stage Risers - Overall Plan
UOONHB-JCJ-CH-B1-DR-OT-050026	Concert Hall - Orchestra Pit & Stage Riser - Applied Loadings
UOONHB-JCJ-CH-B1-DR-OT-050027	Concert Hall - Large Orchestra Lift - Demountable Tread Unit - Proposal
UOONHB-JCJ-CH-B1-DR-OT-050047	Concert Hall - Orchestra Lifts - Seating Coordination
UOONHB-JCJ-CH-B1-DR-OT-080001	Concert Hall - Riser 1 - Proposal - Floor & Structure Plans
UOONHB-JCJ-CH-B1-DR-OT-080002	Concert Hall - Riser 1 - Proposal - Sections & Pit Plan
UOONHB-JCJ-CH-B1-DR-OT-080003	Concert Hall - Riser 2 - Proposal - Floor & Structure Plans
UOONHB-JCJ-CH-B1-DR-OT-080004	Concert Hall - Riser 2 - Proposal - Sections & Pit Plan
UOONHB-JCJ-CH-B1-DR-OT-080005	Concert Hall - Riser 3 - Proposal - Floor & Structure Plans
UOONHB-JCJ-CH-B1-DR-OT-080006	Concert Hall - Riser 3 - Proposal - Floor & Structure Plans
UOONHB-JCJ-CH-B1-DR-OT-080007	Concert Hall - Riser 3 - Proposal - Pit Plan
UOONHB-JCJ-CH-B1-DR-OT-080008	Concert Hall - Riser 4 - Proposal - Floor & Structure Plans
UOONHB-JCJ-CH-B1-DR-OT-080009	Concert Hall - Riser 4 - Proposal - Floor & Structure Plans
UOONHB-JCJ-CH-B1-DR-OT-080010	Concert Hall - Riser 5 - Proposal Plans
UOONHB-JCJ-CH-B1-DR-OT-080011	Concert Hall - Riser 5 - Proposal - Floor & Structure Plans
UOONHB-JCJ-CH-ZZ-DR-OT-990103	Concert Hall - Control Layout - Stage Level
UOONHB-JCJ-CH-ZZ-DR-OT-990131	Concert Hall - Stage Level Control System - Line Diagram
UOONHB-JCJ-CH-ZZ-DR-OT-990132	Concert Hall - Stage Level Control System - Power Diagram
UOONHB-JCJ-CH-ZZ-DR-OT-990133	Concert Hall - Stage Level Control System - Control Diagram
UOONHB-JCJ-CH-ZZ-DR-OT-990134	Concert Hall - Stage Level Control System - General Arrangement
UOONHB-JCJ-CH-ZZ-DR-OT-990141	Concert Hall - E-Stop - Electrical Schematic
UOONHB-JCJ-CH-ZZ-DR-OT-990142	Concert Hall - E-Stop - General Arrangement

5.8. List of Lifts

LIFT No.	TRAVEL (mm)	SPEED (m/s)
ORCHESTRA LIFT 01 (LARGE)	1800	0.05
ORCHESTRA LIFT 02 (SMALL)	1800	0.05
STAGE RISER 01	400	0.05
STAGE RISER 02	800	0.05
STAGE RISER 03	1200	0.05
STAGE RISER 04	800	0.05
STAGE RISER 05	1200	0.05

Each lift is designed to lift the dynamic load specified above, and support the static load above when stationary. Do not exceed these stated loads. Ensure that any loads carried are distributed as detailed below;

- 5.0kN/m2 Static Load
- 2.5kN/m2 Dynamic Load
- 3.0kN point load over a square with 300mm sides

The lifts are not designed for the transportation of people.

Common features to all lifts;

- All manufactured in 2025.
- All use a supply voltage of 400V AC and a control voltage of 24 V.
- All travel at a speed indicated under item 6.5 above.

- All designed in accordance with EN 17206:2020 for UC-LSL4.
- All lifts are scissor guided.

6. Maintenance

Before undertaking any maintenance on the Orchestra Pit Lift Systems, it is imperative to thoroughly review and comprehend the sections on Safety and Intended Use as outlined in this manual.

It is advisable that all stage equipment undergo regular inspection and maintenance to ensure longevity and uninterrupted operation. The frequency of maintenance should be determined based on factors such as temperature, humidity, time, and both the frequency and intensity of use. Adjustments to the recommended maintenance schedule may be necessary due to localized conditions.

Once established, this maintenance schedule should be diligently followed and records maintained for future reference. These records will provide valuable information regarding service duration and any changes that might indicate the need for replacement parts.

In addition to "In House Inspection and Maintenance," it is highly recommended to conduct periodic safety inspections by a professional theatre rigging firm or J&C Joel Limited the designer and supplier of the complete stage equipment for the project.

6.1. General Maintenance Notes

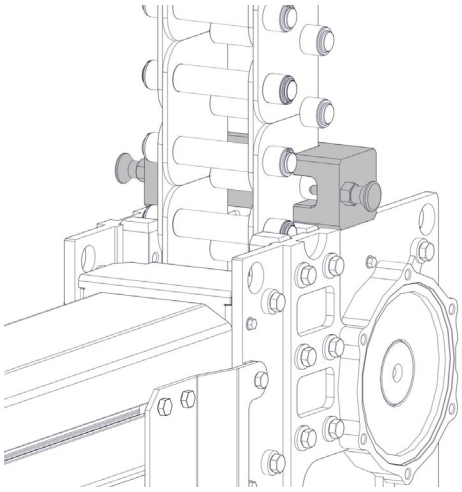
To remove the hatches, remove the installed 2no. cap head screws from the hatch. Screw in the provided lifting handles, and with two people, lift the hatch to the side. Note that Riser 4 and the Small Orchestra Lift do not have hatches, access is given by adjacent lifts.

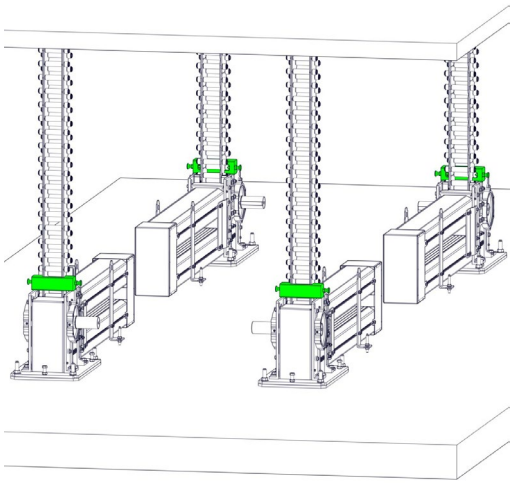
To gain access into the pit, a ladder(s) is required. Ensure that there is sufficient edge protection on the timber floor. For the large orchestra lift, two landing platforms have been provided under the hatches.

Before working on any lifts, ensure that the lift(s) being worked on are isolated.

Ensure that the workers are aware of the locations of the wire driven encoders, and take extra caution to not touch the sensitive wires or electromechanical parts.

Before work starts on any lift, ensure that the Serapid maintenance blocks are fitted to the Serapid chains. For comprehensive instructions on how to fit these, please refer to Appendix 10.





6.2. Training of Personnel

All personnel assigned to maintenance or cleaning duties must have completed appropriate training on the designated equipment to ensure safe and effective work practices. Furthermore, staff are expected to be thoroughly familiar with and comply with all applicable local safety procedures.

Before maintenance is carried out the below must be followed.

1. Power to the equipment must be turned off at the relevant isolator switch and the switch locked in the off position.
2. Only suitably qualified personnel must carry out all maintenance.
3. When maintenance work is being carried out, no unauthorized personnel should be present in the immediate vicinity.
4. Suitable personal protective equipment must be worn by all persons carrying out the work and within the vicinity, see below PPE requirements.
5. Loose clothing should not be worn when servicing the equipment.
6. All safety guards and covers that are to be removed for maintenance must be replaced prior to power being turned back on.
7. All local regulations relating to safe working practices are to be adhered to while carrying out any inspection, installation or maintenance work.
8. All maintenance must be carried out strictly in accordance with either the manufacturer's reference or this manual.

Steps to be followed for maintenance procedure

1. First arrange with the theatre safety officer to set up a close period work schedule for the Concert Hall for all persons and visitors except the theatre technical staff who will be required to carry out the work on the Orchestra Lift systems for the period necessary for the work to be completed. Post relevant notification on all Concert Hall access doors as required by the theatre safety policy.
2. It is necessary to arrange with the Orchestra Lift Control System Operator to be in attendance during the full period necessary for the work to be completed, during which time he or she will be required to power up the control system to move the required orchestra lift or riser lift, as to the requirements of the theatre safety policy. And after the work has been completed and signed off as safe to use by the Theatre Safety Officer, he or she will be responsible to return the orchestra lifts and riser lifts to the required theatre safety policy physical positions, and then power down the orchestra lifts Control System, lock off the system, and finally deliver the control system keys into the care of the Theatre Key holder.
3. Obtain from the Stage Manager, the schedule of work to be carried out and assemble the required crew of theatre stagehands and safety officer.
4. Bring into the Concert Hall auditorium from the technical storage area, all necessary cleaning items and PPE that will be required together with the maintenance toolbox with tools listed elsewhere in this document, and a supply of cleaning cloths and WD40.
5. Carry out a full general cleaning of the concert hall, and checks paying special attention to all fixing down bolts and clamps for all removable theatre seats for security.

6. 2 teams of technical staff are required to carry out the following steps, team 1 will be on the auditorium floor level, and team 2 will be in the Concert Hall under lift area. Both teams will inspect all lift equipment is in a safe condition to be operated, then advise the Team 1 leader it is safe to proceed.
7. Team 1 in the Auditorium floor level, a minimum of 4 stagehands, and the Orchestra Lift System Control operator are required for the duration of the works. After team 1 was advised it is safe to operate the Lifts Control System, the required Orchestra Lift or Riser Lift can be operated and all check items in the ML01 Check Sheet caried out and the relevant tick boxes completed and signed.
8. Refer to the attached SERAPID Rigid Chain Technology Instruction Lifting System Manual, for details and familiarisation of the Serapid drive systems technical details, operation and especially Part 6 Maintenance, starting on Page 35, regarding care and lubrication of the Serapid provided items, for longevity of the drive systems.
9. Refer to the attached NIVOflex Multi Steeldeck, & StageBase platforms Operation & Maintenance Manual for Schwarzman Centre, Oxford – Concert Hall for J&C Joel, for details and familiarisation of the Steeldeck components, especially Part 7 Maintenance, on Page 16, regarding care and cleanliness of the NIVOflex equipment.
10. Repeat items 3 to 9 until both Orchestra Lifts and all Riser Lifts Serapid drives and NIVOflex Steeldeck items have been completed and all ML01 Check Sheets requirements have been caried out and the relevant tick boxes completed.
11. Finally carry out a general clean-up of all items that have had maintenance checks carried out and then remove from the Concert Hall auditorium back to the technical storage area, all cleaning items and PPE items, together with the maintenance toolbox to the dedicated storage area as instructed by the stage manager.

6.3. Tools Required

In addition to a standard set of mechanical tools the following specific tools are required for installation and maintenance of the Orchestra Lifts and :

- 8mm – 20mm spanners and sockets
- 2mm – 10mm allen keys
- Internal circlip pliers
- External circlip pliers
- Soft-faced mallet
- Flat screwdriver set
- Needle nosed pliers
- Torque Wrench

Fastener Torques

All fasteners should be tightened to the appropriate torque as listed in the following table:

Fastener Size	Tightening Torque Gr8.8 (Nm)
M4	3.1
M5	6.1
M6	10.4
M8	25

M10	51
M12	87
M16	215
M20	430

6.4. Personal Protective Equipment

PPE is to be worn by all personnel engaged in maintenance/cleaning tasks:

- Safety footwear.
- Protective helmet/hard hat, as applicable.
- High visibility vest. (ORANGE/YELLOW).
- Protective gloves (as required, rigger-type to protect from cuts/abrasions).
- Eye protection (goggles/safety spectacles).
- Proprietary pre-work barrier cream.

Additional PPE may be required for specialised tasks, such as:

- Dust masks, as required by the working conditions.
- Ear defenders in noisy environments.
- Safety harnesses (required where work is carried out at height).
- Back support belt for any tasks involving more than light manual lifting.

6.5. Preparation

First clean the immediate area then the lifts should be wiped clean of any dust accumulation.

6.6. Check Sheets

The check sheets are designed for the Maintenance Manager to maintain an accurate record of the service history and condition of the lift systems described above. These reports and check sheets should be stored with the operation and maintenance manuals for review if required by J&C Joels engineers during any scheduled service visit. The check sheets are located at the end of this O&M Manual for copying and use during the servicing and maintenance visits.

6.7. Inspection Requirements

The Maintenance Manager should check off each item on the Inspection sheets as soon as the lifts have been inspected, checked and passed. The boxes shall all have been checked off as “Pass, or Fail, if any of the items are checked as “Fail”, the Maintenance Manager should compile a full report sheet with full details of the malfunction and arrange for service of the faults by J&C Joel Limited. Once these faults have all been corrected the “Rectified” box should be checked off and the document signed and dated by the Inspector and Maintenance Manager and the original copies of the inspection check sheets are to be filed with the O&M Manual for future review and use as may be required.

The section “Inspection Notes” of the document is intended for recording any observations, or individual component characteristics that may not have been included in the inspection check sheets.

6.8. Inspection Intervals

Each machine should be inspected on a 6 monthly basis or sooner if any operational problems may occur. Blank Check Sheets and Maintenance Log Check sheets are provided in the next section of this O&M Manual for the maintenance manager to produce copies for use during the Maintenance inspection

7. Maintenance Sheets

7.1. ML02 Inspection sheet

Orchestra Lift Large

Inspection Notes:

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_____

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Inspector:

Name: _____ Signature: _____ Date: _____

Maintenance Manager:

Name: _____ Signature: _____ Date: _____

Maintenance Inspection

The Maintenance Manager or Inspection Engineer should check off each item on the **ML01 Inspection Sheet** as "Pass, Fail, or N/A" (not applicable to this item).

If any of the items are checked as "Fail", the Maintenance Manager or Inspection Engineer must compile a separate Snagging Sheet and arrange for immediate rectification of the faults. Once these have all been corrected the relevant "Rectified" box on the ML01 document must be checked off and this page ML02 must be signed and dated by the Inspector or Maintenance Manager.

The section "**Inspection Notes**" above is intended for recording any snag that is found during the inspection that may have not been included in the tick sheets for the item of equipment, these snags must be included on the Snagging Sheet.

As soon as this document has been signed, the relevant section of the Maintenance Inspection Report must be checked off, initialled and dated.

7.2. ML01 Check Sheet

Orchestra Lift Large

		Pass	Fail	Rectified	N/A
1	**Appearance**				
1.1	Check equipment is neat and tidy	☐	☐	☐	☐
1.2	Check all equipment and magazines care clean	☐	☐	☐	☐
2	**General**				
2.1	Check all equipment for signs of any damage	☐	☐	☐	☐
2.2	Check surrounding woodwork and fascias for signs of damage	☐	☐	☐	☐
3	**Mechanical**				
3.1	Check all rigid push chains for signs of wear or damage	☐	☐	☐	☐
3.2	Check all planetary gearboxes for operation and security	☐	☐	☐	☐
3.3	Check all bevel gear boxes for operation and security	☐	☐	☐	☐
3.4	Check all cardan driveshafts for operation and security	☐	☐	☐	☐
3.5	Check all couplings for operation and security	☐	☐	☐	☐
3.6	Check all bolts fixing components to steelwork are secure	☐	☐	☐	☐
3.7	Check all brakes for operation and security	☐	☐	☐	☐
3.8	Check all brakes for signs of wear	☐	☐	☐	☐
3.9	Check all brakes for any abnormal operating noise	☐	☐	☐	☐
3.10	Check gearbox oil seals for signs of wear (replace if necessary)	☐	☐	☐	☐
3.11	Check for signs of oil leaks (rectify if leaks are evident)	☐	☐	☐	☐
3.12	Check gearbox oil level (top up if necessary)	☐	☐	☐	☐
3.13	Check the travel distance of the system is correct	☐	☐	☐	☐
3.14	Check the Serapid O&M Manual for any ordinary malfunctions	☐	☐	☐	☐
3.15	Check all pit floor fixings of the drive system for security	☐	☐	☐	☐
3.16	Clean the complete drive system assembly	☐	☐	☐	☐
4	**Electrical**				
4.1	Check all electric motor(s) electrical connections for security	☐	☐	☐	☐
4.2	Check electric motor(s) air intake vents are not obstructed	☐	☐	☐	☐
4.3	Check the electric motor(s) runs smoothly	☐	☐	☐	☐
4.4	Check the motor(s) runs with no abnormal rise in temperature	☐	☐	☐	☐
4.5	Clean the motor(s) assembly	☐	☐	☐	☐
4.6	Check all limit box connections for security	☐	☐	☐	☐
4.7	Run the lift full travel to check the operation is correct	☐	☐	☐	☐
4.8	Clean limit switch box and replace cover	☐	☐	☐	☐
4.9	Check all cables to control and MCC are undamaged	☐	☐	☐	☐
4.10	Check all cables are fixed away from snag risks	☐	☐	☐	☐
4.11	Check the isolators operate freely	☐	☐	☐	☐
4.12	Check all encoders are working correctly and clean	☐	☐	☐	☐

Orchestra a Lift Large - Continued

		Pass	Fail	Rectified	N/A
4.13	Check all lids or covers are fitted and all screws are present	☐	☐	☐	☐
5.1	Check all floor gaps around the lifts and all movable items are free of any foreign objects that may impede movement,	☐	☐	☐	☐
5.2	Check that each removable floor access panel is operable	☐	☐	☐	☐
5.3	Clean and vacuum all stage floor gaps	☐	☐	☐	☐
6.	**Stage Floor platforms and removable fascia's**				
6.1	Inspect all in use removable stage platforms and fasciae for any sign of damage or misuse	☐	☐	☐	☐
6.2	Check that all in use removable stage platforms and fasciae are easy to remove and replace correctly	☐	☐	☐	☐
6.3	Check that all in use removable stage platforms and fasciae fixings are all in use undamaged and operable	☐	☐	☐	☐
6.4	Clean and vacuum all stage floor gaps	☐	☐	☐	☐
6.5	Check the NIVOflex O&M Manual for Operation and Maintenance details and care instructions	☐	☐	☐	☐
7.	**Winch Cabinets**				
7.1	Check all MCC Cabinets are undamaged	☐	☐	☐	☐
7.2	Check all wiring inside the MCC cabinets is secure	☐	☐	☐	☐
7.3	Check the isolators operate freely	☐	☐	☐	☐
8.1	Clean and vacuum all MCC Cabinets	☐	☐	☐	☐
9.	**E-Stop Test**				
9.1	Carry out a full test of each E-Stop station	☐	☐	☐	☐

7.3. ML02 Inspection sheet

Orchestra Lift Small

Inspection Notes:

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Inspector:

Name: _____ Signature: _____ Date: _____

Maintenance Manager:

Name: _____ Signature: _____ Date: _____

Maintenance Inspection

The Maintenance Manager or Inspection Engineer should check off each item on the **ML01 Inspection Sheet** as "Pass, Fail, or N/A" (not applicable to this item).

If any of the items are checked as "Fail", the Maintenance Manager or Inspection Engineer must compile a separate Snagging Sheet and arrange for immediate rectification of the faults. Once these have all been corrected the relevant "Rectified" box on the ML01 document must be checked off and this page ML02 must be signed and dated by the Inspector or Maintenance Manager.

The section "**Inspection Notes**" above is intended for recording any snag that is found during the inspection that may have not been included in the tick sheets for the item of equipment, these snags must be included on the Snagging Sheet.

As soon as this document has been signed, the relevant section of the Maintenance Inspection Report must be checked off, initialled and dated.

7.4. ML01 Check Sheet

Orchestra Lift Small

		Pass	Fail	Rectified	N/A
1	**Appearance**				
1.1	Check equipment is neat and tidy	☐	☐	☐	☐
1.2	Check all equipment and magazines care clean	☐	☐	☐	☐
2	**General**				
2.1	Check all equipment for signs of any damage	☐	☐	☐	☐
2.2	Check surrounding woodwork and fascias for signs of damage	☐	☐	☐	☐
3	**Mechanical**				
3.1	Check all rigid push chains for signs of wear or damage	☐	☐	☐	☐
3.2	Check all planetary gearboxes for operation and security	☐	☐	☐	☐
3.3	Check all bevel gear boxes for operation and security	☐	☐	☐	☐
3.4	Check all cardan driveshafts for operation and security	☐	☐	☐	☐
3.5	Check all couplings for operation and security	☐	☐	☐	☐
3.6	Check all bolts fixing components to steelwork are secure	☐	☐	☐	☐
3.7	Check all brakes for operation and security	☐	☐	☐	☐
3.8	Check all brakes for signs of wear	☐	☐	☐	☐
3.9	Check all brakes for any abnormal operating noise	☐	☐	☐	☐
3.10	Check gearbox oil seals for signs of wear (replace if necessary)	☐	☐	☐	☐
3.11	Check for signs of oil leaks (rectify if leaks are evident)	☐	☐	☐	☐
3.12	Check gearbox oil level (top up if necessary)	☐	☐	☐	☐
3.13	Check the travel distance of the system is correct	☐	☐	☐	☐
3.14	Check the Serapid O&M Manual for any ordinary malfunctions	☐	☐	☐	☐
3.15	Check all pit floor fixings of the drive system for security	☐	☐	☐	☐
3.16	Clean the complete drive system assembly	☐	☐	☐	☐
4	**Electrical**				
4.1	Check all electric motor(s) electrical connections for security	☐	☐	☐	☐
4.2	Check electric motor(s) air intake vents are not obstructed	☐	☐	☐	☐
4.3	Check the electric motor(s) runs smoothly	☐	☐	☐	☐
4.4	Check the motor(s) runs with no abnormal rise in temperature	☐	☐	☐	☐
4.5	Clean the motor(s) assembly	☐	☐	☐	☐
4.6	Check all limit box connections for security	☐	☐	☐	☐
4.7	Run the lift full travel to check the operation is correct	☐	☐	☐	☐
4.8	Clean limit switch box and replace cover	☐	☐	☐	☐
4.9	Check all cables to control and MCC are undamaged	☐	☐	☐	☐
4.10	Check all cables are fixed away from snag risks	☐	☐	☐	☐
4.11	Check the isolators operate freely	☐	☐	☐	☐
4.12	Check all encoders are working correctly and clean	☐	☐	☐	☐

Orchestra Lift Small - Continued

		Pass	Fail	Rectified	N/A
4.13	Check all lids or covers are fitted and all screws are present	☐	☐	☐	☐
5.1	Check all floor gaps around the lifts and all movable items are free of any foreign objects that may impede movement,	☐	☐	☐	☐
5.2	Check that each removable floor access panel is operable	☐	☐	☐	☐
5.3	Clean and vacuum all stage floor gaps	☐	☐	☐	☐
6.	**Stage Floor platforms and removable fascia's**				
6.1	Inspect all in use removable stage platforms and fasciae for any sign of damage or misuse	☐	☐	☐	☐
6.2	Check that all in use removable stage platforms and fasciae are easy to remove and replace correctly	☐	☐	☐	☐
6.3	Check that all in use removable stage platforms and fasciae fixings are all in use undamaged and operable	☐	☐	☐	☐
6.4	Clean and vacuum all stage floor gaps	☐	☐	☐	☐
6.5	Check the NIVOflex O&M Manual for Operation and Maintenance details and care instructions	☐	☐	☐	☐
7.	**Winch Cabinets**				
7.1	Check all MCC Cabinets are undamaged	☐	☐	☐	☐
7.2	Check all wiring inside the MCC cabinets is secure	☐	☐	☐	☐
7.3	Check the isolators operate freely	☐	☐	☐	☐
8.1	Clean and vacuum all MCC Cabinets	☐	☐	☐	☐
9.	**E-Stop Test**				
9.1	Carry out a full test of each E-Stop station	☐	☐	☐	☐

7.5. ML02 Inspection sheet

Stage Riser 01

Inspection Notes:

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Inspector:

Name: _____ Signature: _____ Date: _____

Maintenance Manager:

Name: _____ Signature: _____ Date: _____

Maintenance Inspection

The Maintenance Manager or Inspection Engineer should check off each item on the **ML01 Inspection Sheet** as "Pass, Fail, or N/A" (not applicable to this item).

If any of the items are checked as "Fail", the Maintenance Manager or Inspection Engineer must compile a separate Snagging Sheet and arrange for immediate rectification of the faults. Once these have all been corrected the relevant "Rectified" box on the ML01 document must be checked off and this page ML02 must be signed and dated by the Inspector or Maintenance Manager.

The section "**Inspection Notes**" above is intended for recording any snag that is found during the inspection that may have not been included in the tick sheets for the item of equipment, these snags must be included on the Snagging Sheet.

As soon as this document has been signed, the relevant section of the Maintenance Inspection Report must be checked off, initialled and dated.

7.6. ML01 Check Sheet

Stage Riser 01

		Pass	Fail	Rectified	N/A
1	**Appearance**				
1.1	Check equipment is neat and tidy	☐	☐	☐	☐
1.2	Check all equipment and magazines care clean	☐	☐	☐	☐
2	**General**				
2.1	Check all equipment for signs of any damage	☐	☐	☐	☐
2.2	Check surrounding woodwork and fascias for signs of damage	☐	☐	☐	☐
3	**Mechanical**				
3.1	Check all rigid push chains for signs of wear or damage	☐	☐	☐	☐
3.2	Check all planetary gearboxes for operation and security	☐	☐	☐	☐
3.3	Check all bevel gear boxes for operation and security	☐	☐	☐	☐
3.4	Check all cardan driveshafts for operation and security	☐	☐	☐	☐
3.5	Check all couplings for operation and security	☐	☐	☐	☐
3.6	Check all bolts fixing components to steelwork are secure	☐	☐	☐	☐
3.7	Check all brakes for operation and security	☐	☐	☐	☐
3.8	Check all brakes for signs of wear	☐	☐	☐	☐
3.9	Check all brakes for any abnormal operating noise	☐	☐	☐	☐
3.10	Check gearbox oil seals for signs of wear (replace if necessary)	☐	☐	☐	☐
3.11	Check for signs of oil leaks (rectify if leaks are evident)	☐	☐	☐	☐
3.12	Check gearbox oil level (top up if necessary)	☐	☐	☐	☐
3.13	Check the travel distance of the system is correct	☐	☐	☐	☐
3.14	Check the Serapid O&M Manual for any ordinary malfunctions	☐	☐	☐	☐
3.15	Check all pit floor fixings of the drive system for security	☐	☐	☐	☐
3.16	Clean the complete drive system assembly	☐	☐	☐	☐
4	**Electrical**				
4.1	Check all electric motor(s) electrical connections for security	☐	☐	☐	☐
4.2	Check electric motor(s) air intake vents are not obstructed	☐	☐	☐	☐
4.3	Check the electric motor(s) runs smoothly	☐	☐	☐	☐
4.4	Check the motor(s) runs with no abnormal rise in temperature	☐	☐	☐	☐
4.5	Clean the motor(s) assembly	☐	☐	☐	☐
4.6	Check all limit box connections for security	☐	☐	☐	☐
4.7	Run the lift full travel to check the operation is correct	☐	☐	☐	☐
4.8	Clean limit switch box and replace cover	☐	☐	☐	☐
4.9	Check all cables to control and MCC are undamaged	☐	☐	☐	☐
4.10	Check all cables are fixed away from snag risks	☐	☐	☐	☐
4.11	Check the isolators operate freely	☐	☐	☐	☐
4.12	Check all encoders are working correctly and clean	☐	☐	☐	☐

Stage Riser 01 - Continued

		Pass	Fail	Rectified	N/A
4.13	Check all lids or covers are fitted and all screws are present	☐	☐	☐	☐
5.1	Check all floor gaps around the lifts and all movable items are free of any foreign objects that may impede movement,	☐	☐	☐	☐
5.2	Check that each removable floor access panel is operable	☐	☐	☐	☐
5.3	Clean and vacuum all stage floor gaps	☐	☐	☐	☐
6.	**Stage Floor platforms and removable fascia's**				
6.1	Inspect all in use removable stage platforms and fasciae for any sign of damage or misuse	☐	☐	☐	☐
6.2	Check that all in use removable stage platforms and fasciae are easy to remove and replace correctly	☐	☐	☐	☐
6.3	Check that all in use removable stage platforms and fasciae fixings are all in use undamaged and operable	☐	☐	☐	☐
6.4	Clean and vacuum all stage floor gaps	☐	☐	☐	☐
6.5	Check the NIVOflex O&M Manual for Operation and Maintenance details and care instructions	☐	☐	☐	☐
7.	**Winch Cabinets**				
7.1	Check all MCC Cabinets are undamaged	☐	☐	☐	☐
7.2	Check all wiring inside the MCC cabinets is secure	☐	☐	☐	☐
7.3	Check the isolators operate freely	☐	☐	☐	☐
8.1	Clean and vacuum all MCC Cabinets	☐	☐	☐	☐
9.	**E-Stop Test**				
9.1	Carry out a full test of each E-Stop station	☐	☐	☐	☐

7.7. ML02 Inspection sheet

Stage Riser 02

Inspection Notes:

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Inspector:

Name: _____ Signature: _____ Date: _____

Maintenance Manager:

Name: _____ Signature: _____ Date: _____

Maintenance Inspection

The Maintenance Manager or Inspection Engineer should check off each item on the **ML01 Inspection Sheet** as "Pass, Fail, or N/A" (not applicable to this item).

If any of the items are checked as "Fail", the Maintenance Manager or Inspection Engineer must compile a separate Snagging Sheet and arrange for immediate rectification of the faults. Once these have all been corrected the relevant "Rectified" box on the ML01 document must be checked off and this page ML02 must be signed and dated by the Inspector or Maintenance Manager.

The section "**Inspection Notes**" above is intended for recording any snag that is found during the inspection that may have not been included in the tick sheets for the item of equipment, these snags must be included on the Snagging Sheet.

As soon as this document has been signed, the relevant section of the Maintenance Inspection Report must be checked off, initialled and dated.

7.8. ML01 Check Sheet

Stage Riser 02

		Pass	Fail	Rectified	N/A
1	**Appearance**				
1.1	Check equipment is neat and tidy	☐	☐	☐	☐
1.2	Check all equipment and magazines care clean	☐	☐	☐	☐
2	**General**				
2.1	Check all equipment for signs of any damage	☐	☐	☐	☐
2.2	Check surrounding woodwork and fascias for signs of damage	☐	☐	☐	☐
3	**Mechanical**				
3.1	Check all rigid push chains for signs of wear or damage	☐	☐	☐	☐
3.2	Check all planetary gearboxes for operation and security	☐	☐	☐	☐
3.3	Check all bevel gear boxes for operation and security	☐	☐	☐	☐
3.4	Check all cardan driveshafts for operation and security	☐	☐	☐	☐
3.5	Check all couplings for operation and security	☐	☐	☐	☐
3.6	Check all bolts fixing components to steelwork are secure	☐	☐	☐	☐
3.7	Check all brakes for operation and security	☐	☐	☐	☐
3.8	Check all brakes for signs of wear	☐	☐	☐	☐
3.9	Check all brakes for any abnormal operating noise	☐	☐	☐	☐
3.10	Check gearbox oil seals for signs of wear (replace if necessary)	☐	☐	☐	☐
3.11	Check for signs of oil leaks (rectify if leaks are evident)	☐	☐	☐	☐
3.12	Check gearbox oil level (top up if necessary)	☐	☐	☐	☐
3.13	Check the travel distance of the system is correct	☐	☐	☐	☐
3.14	Check the Serapid O&M Manual for any ordinary malfunctions	☐	☐	☐	☐
3.15	Check all pit floor fixings of the drive system for security	☐	☐	☐	☐
3.16	Clean the complete drive system assembly	☐	☐	☐	☐
4	**Electrical**				
4.1	Check all electric motor(s) electrical connections for security	☐	☐	☐	☐
4.2	Check electric motor(s) air intake vents are not obstructed	☐	☐	☐	☐
4.3	Check the electric motor(s) runs smoothly	☐	☐	☐	☐
4.4	Check the motor(s) runs with no abnormal rise in temperature	☐	☐	☐	☐
4.5	Clean the motor(s) assembly	☐	☐	☐	☐
4.6	Check all limit box connections for security	☐	☐	☐	☐
4.7	Run the lift full travel to check the operation is correct	☐	☐	☐	☐
4.8	Clean limit switch box and replace cover	☐	☐	☐	☐
4.9	Check all cables to control and MCC are undamaged	☐	☐	☐	☐
4.10	Check all cables are fixed away from snag risks	☐	☐	☐	☐
4.11	Check the isolators operate freely	☐	☐	☐	☐
4.12	Check all encoders are working correctly and clean	☐	☐	☐	☐

Stage Riser 02 - Continued

		Pass	Fail	Rectified	N/A
4.13	Check all lids or covers are fitted and all screws are present	☐	☐	☐	☐
5.1	Check all floor gaps around the lifts and all movable items are free of any foreign objects that may impede movement,	☐	☐	☐	☐
5.2	Check that each removable floor access panel is operable	☐	☐	☐	☐
5.3	Clean and vacuum all stage floor gaps	☐	☐	☐	☐
6.	**Stage Floor platforms and removable fascia's**				
6.1	Inspect all in use removable stage platforms and fasciae for any sign of damage or misuse	☐	☐	☐	☐
6.2	Check that all in use removable stage platforms and fasciae are easy to remove and replace correctly	☐	☐	☐	☐
6.3	Check that all in use removable stage platforms and fasciae fixings are all in use undamaged and operable	☐	☐	☐	☐
6.4	Clean and vacuum all stage floor gaps	☐	☐	☐	☐
6.5	Check the NIVOflex O&M Manual for Operation and Maintenance details and care instructions	☐	☐	☐	☐
7.	**Winch Cabinets**				
7.1	Check all MCC Cabinets are undamaged	☐	☐	☐	☐
7.2	Check all wiring inside the MCC cabinets is secure	☐	☐	☐	☐
7.3	Check the isolators operate freely	☐	☐	☐	☐
8.1	Clean and vacuum all MCC Cabinets	☐	☐	☐	☐
9.	**E-Stop Test**				
9.1	Carry out a full test of each E-Stop station	☐	☐	☐	☐

7.9. ML02 Inspection sheet

Stage Riser 03

Inspection Notes:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Inspector:

Name: _____ Signature: _____ Date: _____

Maintenance Manager:

Name: _____ Signature: _____ Date: _____

Maintenance Inspection

The Maintenance Manager or Inspection Engineer should check off each item on the **ML01 Inspection Sheet** as "Pass, Fail, or N/A" (not applicable to this item).

If any of the items are checked as "Fail", the Maintenance Manager or Inspection Engineer must compile a separate Snagging Sheet and arrange for immediate rectification of the faults. Once these have all been corrected the relevant "Rectified" box on the ML01 document must be checked off and this page ML02 must be signed and dated by the Inspector or Maintenance Manager.

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As soon as this document has been signed, the relevant section of the Maintenance Inspection Report must be checked off, initialled and dated.

7.10. ML01 Check Sheet

Stage Riser 03

		Pass	Fail	Rectified	N/A
1	**Appearance**				
1.1	Check equipment is neat and tidy	☐	☐	☐	☐
1.2	Check all equipment and magazines care clean	☐	☐	☐	☐
2	**General**				
2.1	Check all equipment for signs of any damage	☐	☐	☐	☐
2.2	Check surrounding woodwork and fascias for signs of damage	☐	☐	☐	☐
3	**Mechanical**				
3.1	Check all rigid push chains for signs of wear or damage	☐	☐	☐	☐
3.2	Check all planetary gearboxes for operation and security	☐	☐	☐	☐
3.3	Check all bevel gear boxes for operation and security	☐	☐	☐	☐
3.4	Check all cardan driveshafts for operation and security	☐	☐	☐	☐
3.5	Check all couplings for operation and security	☐	☐	☐	☐
3.6	Check all bolts fixing components to steelwork are secure	☐	☐	☐	☐
3.7	Check all brakes for operation and security	☐	☐	☐	☐
3.8	Check all brakes for signs of wear	☐	☐	☐	☐
3.9	Check all brakes for any abnormal operating noise	☐	☐	☐	☐
3.10	Check gearbox oil seals for signs of wear (replace if necessary)	☐	☐	☐	☐
3.11	Check for signs of oil leaks (rectify if leaks are evident)	☐	☐	☐	☐
3.12	Check gearbox oil level (top up if necessary)	☐	☐	☐	☐
3.13	Check the travel distance of the system is correct	☐	☐	☐	☐
3.14	Check the Serapid O&M Manual for any ordinary malfunctions	☐	☐	☐	☐
3.15	Check all pit floor fixings of the drive system for security	☐	☐	☐	☐
3.16	Clean the complete drive system assembly	☐	☐	☐	☐
4	**Electrical**				
4.1	Check all electric motor(s) electrical connections for security	☐	☐	☐	☐
4.2	Check electric motor(s) air intake vents are not obstructed	☐	☐	☐	☐
4.3	Check the electric motor(s) runs smoothly	☐	☐	☐	☐
4.4	Check the motor(s) runs with no abnormal rise in temperature	☐	☐	☐	☐
4.5	Clean the motor(s) assembly	☐	☐	☐	☐
4.6	Check all limit box connections for security	☐	☐	☐	☐
4.7	Run the lift full travel to check the operation is correct	☐	☐	☐	☐
4.8	Clean limit switch box and replace cover	☐	☐	☐	☐
4.9	Check all cables to control and MCC are undamaged	☐	☐	☐	☐
4.10	Check all cables are fixed away from snag risks	☐	☐	☐	☐
4.11	Check the isolators operate freely	☐	☐	☐	☐
4.12	Check all encoders are working correctly and clean	☐	☐	☐	☐

Stage Riser 03 - Continued

		Pass	Fail	Rectified	N/A
4.13	Check all lids or covers are fitted and all screws are present	☐	☐	☐	☐
5.1	Check all floor gaps around the lifts and all movable items are free of any foreign objects that may impede movement,	☐	☐	☐	☐
5.2	Check that each removable floor access panel is operable	☐	☐	☐	☐
5.3	Clean and vacuum all stage floor gaps	☐	☐	☐	☐
6.	**Stage Floor platforms and removable fascia's**				
6.1	Inspect all in use removable stage platforms and fasciae for any sign of damage or misuse	☐	☐	☐	☐
6.2	Check that all in use removable stage platforms and fasciae are easy to remove and replace correctly	☐	☐	☐	☐
6.3	Check that all in use removable stage platforms and fasciae fixings are all in use undamaged and operable	☐	☐	☐	☐
6.4	Clean and vacuum all stage floor gaps	☐	☐	☐	☐
6.5	Check the NIVOflex O&M Manual for Operation and Maintenance details and care instructions	☐	☐	☐	☐
7.	**Winch Cabinets**				
7.1	Check all MCC Cabinets are undamaged	☐	☐	☐	☐
7.2	Check all wiring inside the MCC cabinets is secure	☐	☐	☐	☐
7.3	Check the isolators operate freely	☐	☐	☐	☐
8.1	Clean and vacuum all MCC Cabinets	☐	☐	☐	☐
9.	**E-Stop Test**				
9.1	Carry out a full test of each E-Stop station	☐	☐	☐	☐

7.11. ML02 Inspection sheet

Stage Riser 04

Inspection Notes:

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_____

_____

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_____

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_____

Inspector:

Name: _____ Signature: _____ Date: _____

Maintenance Manager:

Name: _____ Signature: _____ Date: _____

Maintenance Inspection

The Maintenance Manager or Inspection Engineer should check off each item on the **ML01 Inspection Sheet** as "Pass, Fail, or N/A" (not applicable to this item).

If any of the items are checked as "Fail", the Maintenance Manager or Inspection Engineer must compile a separate Snagging Sheet and arrange for immediate rectification of the faults. Once these have all been corrected the relevant "Rectified" box on the ML01 document must be checked off and this page ML02 must be signed and dated by the Inspector or Maintenance Manager.

The section "**Inspection Notes**" above is intended for recording any snag that is found during the inspection that may have not been included in the tick sheets for the item of equipment, these snags must be included on the Snagging Sheet.

As soon as this document has been signed, the relevant section of the Maintenance Inspection Report must be checked off, initialled and dated.

7.12. ML01 Check Sheet

Stage Riser 04

	9	Pass	Fail	Rectified	N/A
1	**Appearance**				
1.1	Check equipment is neat and tidy	☐	☐	☐	☐
1.2	Check all equipment and magazines care clean	☐	☐	☐	☐
2	**General**				
2.1	Check all equipment for signs of any damage	☐	☐	☐	☐
2.2	Check surrounding woodwork and fascias for signs of damage	☐	☐	☐	☐
3	**Mechanical**				
3.1	Check all rigid push chains for signs of wear or damage	☐	☐	☐	☐
3.2	Check all planetary gearboxes for operation and security	☐	☐	☐	☐
3.3	Check all bevel gear boxes for operation and security	☐	☐	☐	☐
3.4	Check all cardan driveshafts for operation and security	☐	☐	☐	☐
3.5	Check all couplings for operation and security	☐	☐	☐	☐
3.6	Check all bolts fixing components to steelwork are secure	☐	☐	☐	☐
3.7	Check all brakes for operation and security	☐	☐	☐	☐
3.8	Check all brakes for signs of wear	☐	☐	☐	☐
3.9	Check all brakes for any abnormal operating noise	☐	☐	☐	☐
3.10	Check gearbox oil seals for signs of wear (replace if necessary)	☐	☐	☐	☐
3.11	Check for signs of oil leaks (rectify if leaks are evident)	☐	☐	☐	☐
3.12	Check gearbox oil level (top up if necessary)	☐	☐	☐	☐
3.13	Check the travel distance of the system is correct	☐	☐	☐	☐
3.14	Check the Serapid O&M Manual for any ordinary malfunctions	☐	☐	☐	☐
3.15	Check all pit floor fixings of the drive system for security	☐	☐	☐	☐
3.16	Clean the complete drive system assembly	☐	☐	☐	☐
4	**Electrical**				
4.1	Check all electric motor(s) electrical connections for security	☐	☐	☐	☐
4.2	Check electric motor(s) air intake vents are not obstructed	☐	☐	☐	☐
4.3	Check the electric motor(s) runs smoothly	☐	☐	☐	☐
4.4	Check the motor(s) runs with no abnormal rise in temperature	☐	☐	☐	☐
4.5	Clean the motor(s) assembly	☐	☐	☐	☐
4.6	Check all limit box connections for security	☐	☐	☐	☐
4.7	Run the lift full travel to check the operation is correct	☐	☐	☐	☐
4.8	Clean limit switch box and replace cover	☐	☐	☐	☐
4.9	Check all cables to control and MCC are undamaged	☐	☐	☐	☐
4.10	Check all cables are fixed away from snag risks	☐	☐	☐	☐
4.11	Check the isolators operate freely	☐	☐	☐	☐
4.12	Check all encoders are working correctly and clean	☐	☐	☐	☐

Stage Riser 04 - Continued

		Pass	Fail	Rectified	N/A
4.13	Check all lids or covers are fitted and all screws are present	☐	☐	☐	☐
5.1	Check all floor gaps around the lifts and all movable items are free of any foreign objects that may impede movement,	☐	☐	☐	☐
5.2	Check that each removable floor access panel is operable	☐	☐	☐	☐
5.3	Clean and vacuum all stage floor gaps	☐	☐	☐	☐
6.	**Stage Floor platforms and removable fascia's**				
6.1	Inspect all in use removable stage platforms and fasciae for any sign of damage or misuse	☐	☐	☐	☐
6.2	Check that all in use removable stage platforms and fasciae are easy to remove and replace correctly	☐	☐	☐	☐
6.3	Check that all in use removable stage platforms and fasciae fixings are all in use undamaged and operable	☐	☐	☐	☐
6.4	Clean and vacuum all stage floor gaps	☐	☐	☐	☐
6.5	Check the NIVOflex O&M Manual for Operation and Maintenance details and care instructions	☐	☐	☐	☐
7.	**Winch Cabinets**				
7.1	Check all MCC Cabinets are undamaged	☐	☐	☐	☐
7.2	Check all wiring inside the MCC cabinets is secure	☐	☐	☐	☐
7.3	Check the isolators operate freely	☐	☐	☐	☐
8.1	Clean and vacuum all MCC Cabinets	☐	☐	☐	☐
9.	**E-Stop Test**				
9.1	Carry out a full test of each E-Stop station	☐	☐	☐	☐

Maintenance Log Check Sheets

7.13. ML02 Inspection sheet

Stage Riser 05

Inspection Notes:

_____

_____

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_____

Inspector:

Name: _____ Signature: _____ Date: _____

Maintenance Manager:

Name: _____ Signature: _____ Date: _____

Maintenance Inspection

The Maintenance Manager or Inspection Engineer should check off each item on the **ML01 Inspection Sheet** as "Pass, Fail, or N/A" (not applicable to this item).

If any of the items are checked as "Fail", the Maintenance Manager or Inspection Engineer must compile a separate Snagging Sheet and arrange for immediate rectification of the faults. Once these have all been corrected the relevant "Rectified" box on the ML01 document must be checked off and this page ML02 must be signed and dated by the Inspector or Maintenance Manager.

The section "**Inspection Notes**" above is intended for recording any snag that is found during the inspection that may have not been included in the tick sheets for the item of equipment, these snags must be included on the Snagging Sheet.

As soon as this document has been signed, the relevant section of the Maintenance Inspection Report must be checked off, initialled and dated.

7.14. ML01 Check Sheet

Stage Riser 05

		Pass	Fail	Rectified	N/A
1	**Appearance**				
1.1	Check equipment is neat and tidy	☐	☐	☐	☐
1.2	Check all equipment and magazines care clean	☐	☐	☐	☐
2	**General**				
2.1	Check all equipment for signs of any damage	☐	☐	☐	☐
2.2	Check surrounding woodwork and fascias for signs of damage	☐	☐	☐	☐
3	**Mechanical**				
3.1	Check all rigid push chains for signs of wear or damage	☐	☐	☐	☐
3.2	Check all planetary gearboxes for operation and security	☐	☐	☐	☐
3.3	Check all bevel gear boxes for operation and security	☐	☐	☐	☐
3.4	Check all cardan driveshafts for operation and security	☐	☐	☐	☐
3.5	Check all couplings for operation and security	☐	☐	☐	☐
3.6	Check all bolts fixing components to steelwork are secure	☐	☐	☐	☐
3.7	Check all brakes for operation and security	☐	☐	☐	☐
3.8	Check all brakes for signs of wear	☐	☐	☐	☐
3.9	Check all brakes for any abnormal operating noise	☐	☐	☐	☐
3.10	Check gearbox oil seals for signs of wear (replace if necessary)	☐	☐	☐	☐
3.11	Check for signs of oil leaks (rectify if leaks are evident)	☐	☐	☐	☐
3.12	Check gearbox oil level (top up if necessary)	☐	☐	☐	☐
3.13	Check the travel distance of the system is correct	☐	☐	☐	☐
3.14	Check the Serapid O&M Manual for any ordinary malfunctions	☐	☐	☐	☐
3.15	Check all pit floor fixings of the drive system for security	☐	☐	☐	☐
3.16	Clean the complete drive system assembly	☐	☐	☐	☐
4	**Electrical**				
4.1	Check all electric motor(s) electrical connections for security	☐	☐	☐	☐
4.2	Check electric motor(s) air intake vents are not obstructed	☐	☐	☐	☐
4.3	Check the electric motor(s) runs smoothly	☐	☐	☐	☐
4.4	Check the motor(s) runs with no abnormal rise in temperature	☐	☐	☐	☐
4.5	Clean the motor(s) assembly	☐	☐	☐	☐
4.6	Check all limit box connections for security	☐	☐	☐	☐
4.7	Run the lift full travel to check the operation is correct	☐	☐	☐	☐
4.8	Clean limit switch box and replace cover	☐	☐	☐	☐
4.9	Check all cables to control and MCC are undamaged	☐	☐	☐	☐
4.10	Check all cables are fixed away from snag risks	☐	☐	☐	☐
4.11	Check the isolators operate freely	☐	☐	☐	☐
4.12	Check all encoders are working correctly and clean	☐	☐	☐	☐

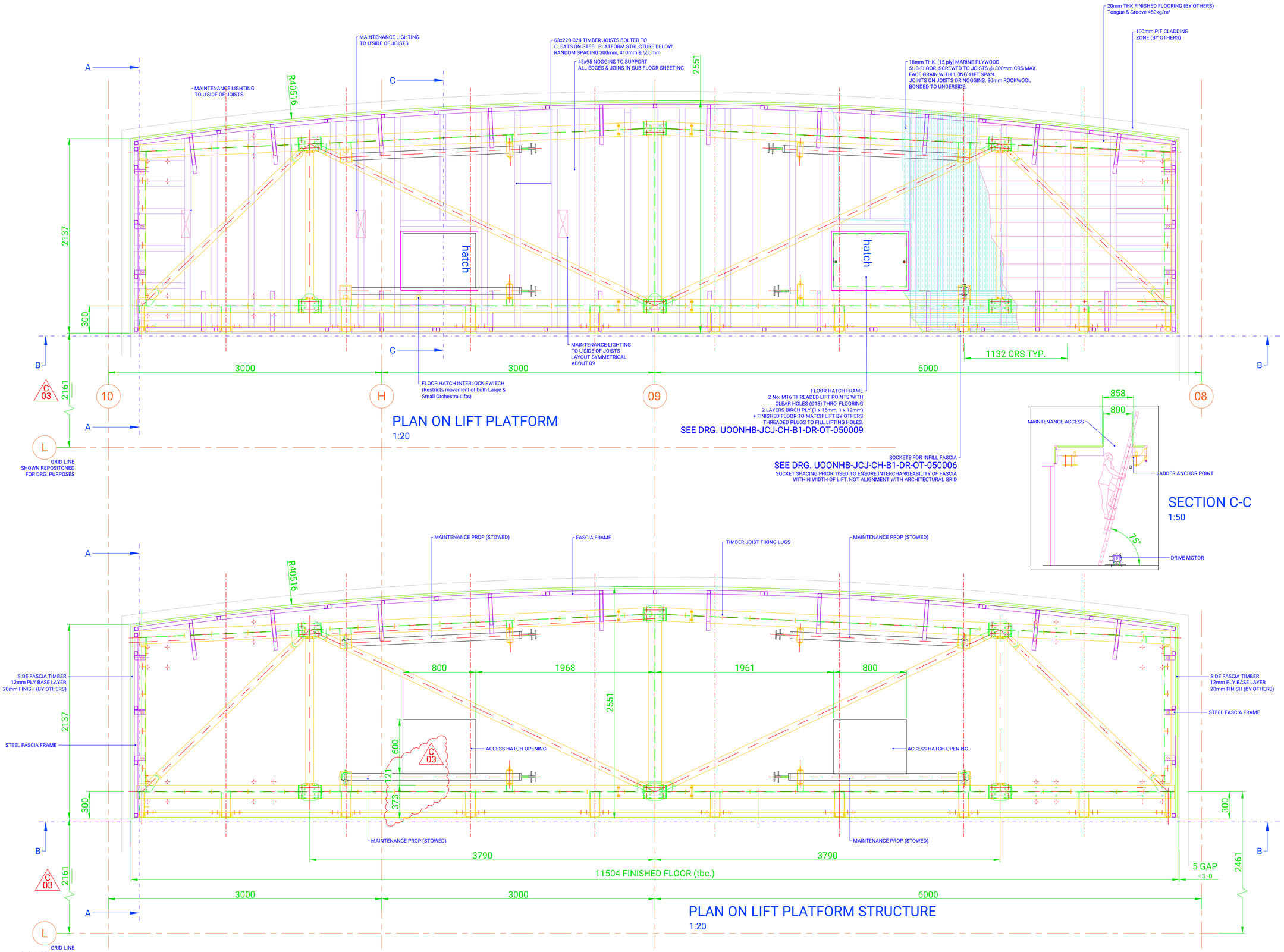
Stage Riser 05 - Continued

		Pass	Fail	Rectified	N/A
4.13	Check all lids or covers are fitted and all screws are present	☐	☐	☐	☐
5.1	Check all floor gaps around the lifts and all movable items are free of any foreign objects that may impede movement,	☐	☐	☐	☐
5.2	Check that each removable floor access panel is operable	☐	☐	☐	☐
5.3	Clean and vacuum all stage floor gaps	☐	☐	☐	☐
6.	**Stage Floor platforms and removable fascia's**				
6.1	Inspect all in use removable stage platforms and fasciae for any sign of damage or misuse	☐	☐	☐	☐
6.2	Check that all in use removable stage platforms and fasciae are easy to remove and replace correctly	☐	☐	☐	☐
6.3	Check that all in use removable stage platforms and fasciae fixings are all in use undamaged and operable	☐	☐	☐	☐
6.4	Clean and vacuum all stage floor gaps	☐	☐	☐	☐
6.5	Check the NIVOflex O&M Manual for Operation and Maintenance details and care instructions	☐	☐	☐	☐
7.	**Winch Cabinets**				
7.1	Check all MCC Cabinets are undamaged	☐	☐	☐	☐
7.2	Check all wiring inside the MCC cabinets is secure	☐	☐	☐	☐
7.3	Check the isolators operate freely	☐	☐	☐	☐
8.1	Clean and vacuum all MCC Cabinets	☐	☐	☐	☐
9.	**E-Stop Test**				
9.1	Carry out a full test of each E-Stop station	☐	☐	☐	☐

8. Referenced Drawings

Drawings are shown overleaf.

LARGE ORCHESTRA LIFT PROPOSAL



PLAN ON LIFT PLATFORM
1:20

SECTION C-C
1:50

PLAN ON LIFT PLATFORM STRUCTURE
1:20

Scale 1:20

SEE DRG. UOONHB-JCJ-CH-B1-DR-OT-050003 FOR SECTIONS & DRIVE PLAN

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REVISIONS

REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	25/10/2023
P02	SC	UPDATED TO CLIENT COMMENTS	07/12/2023
P03.1	SC	INTERNAL ISSUE	22/01/2024
C01	SC	CONSTRUCTION ISSUE	26/03/2024
C02	SC	MAINTENANCE ACCESS MODS.	18/04/2024
C03	SC	MAINTENANCE ACCESS & SETTING OUT MODS	24/05/2024
C04	SH	For Record	14/08/2025
-	-	-	-

Notes:

Lift Area;	28m²
Platform Self Weight;	4500kg
Static Load (@ 500kg/m²);	14000kg
Dynamic Load (@250kg/m²);	7000kg
Test Static Load	17500kg
Test Dyn. Load	7700kg

Point loading 300kg over sq. of 300mm sides

Platform design loads;
Dead (self) + Payload + dyn. (x 1.2) x 2

Horizontal Loads 5% of design loads.

Structural Deflection Limit L/750

Drive Shafts & maintenance props finished Yellow (RAL1026)
all other parts Black (RAL9005) typically semi-gloss finish.

Overload detection by current sensing, no load detection by 'Floating-plate' assembly.

Normal Travel limits from wire-line encoder. Overtravel via direct struck limits on stage left scissors.

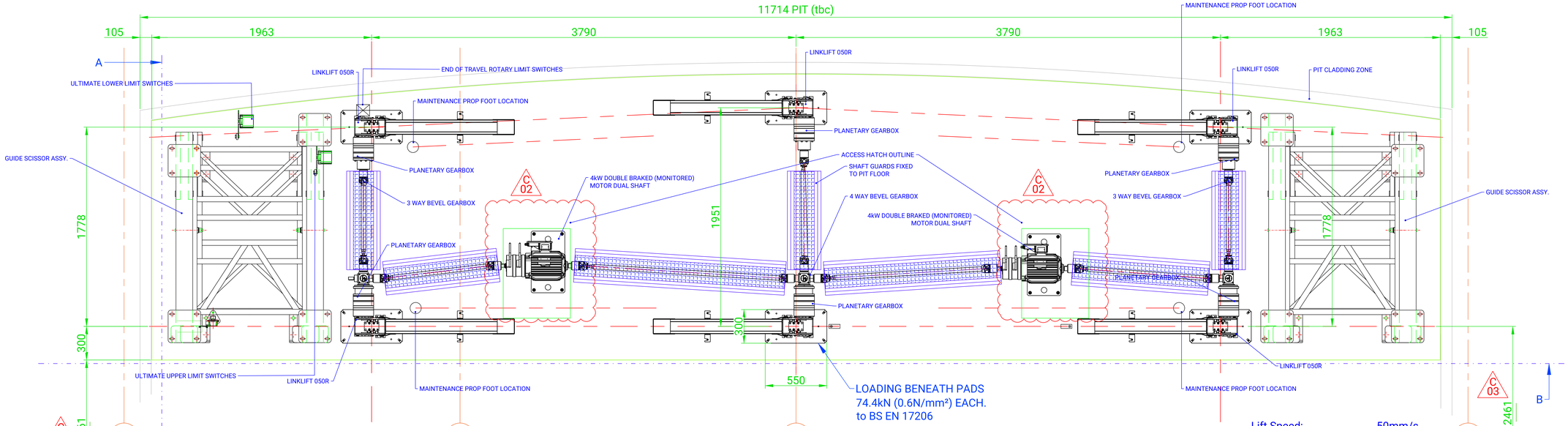
Status:
A - ☐ B - ☐ C - ☐

All dimensions in mm unless otherwise stated. Do not scale.

DRAWN:	SH	DATE:	14/08/2025
CHECKED:	JC	DATE:	14/08/2025
APPROVED:	OS	DATE:	14/08/2025
SCALE:	ON SHEET	PAPER SIZE:	A1

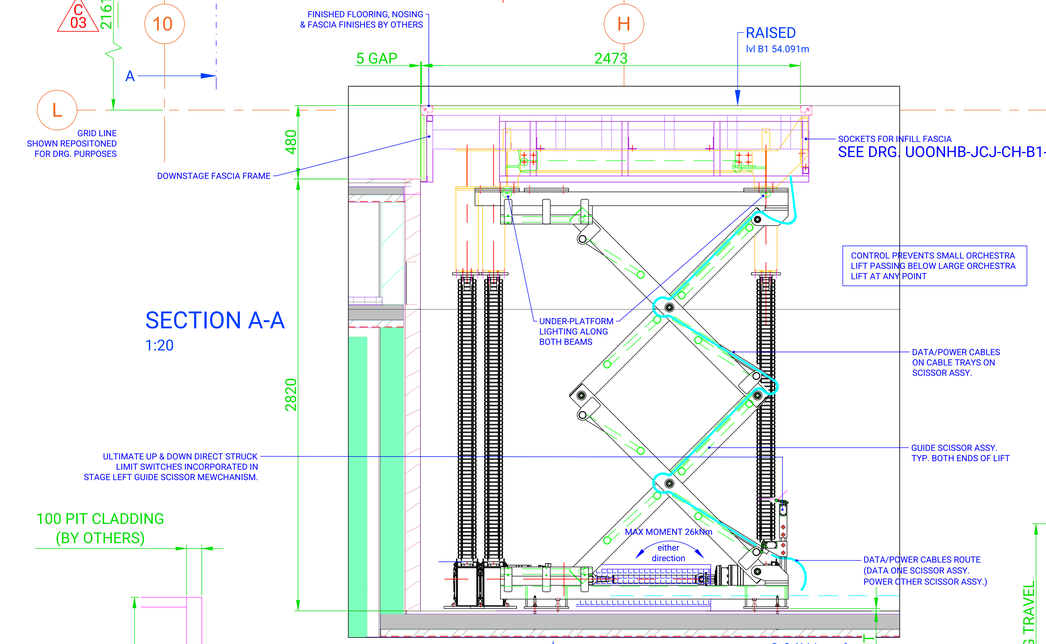
J&C Joel
Inspiration in every performance

PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-GA-05-0002
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-050002
TITLE	CONCERT HALL LARGE ORCHESTRA LIFT PROPOSAL FLOOR & STRUCTURE PLANS
PURPOSE	A5 - Accepted as Suitable for Record
	REV C04

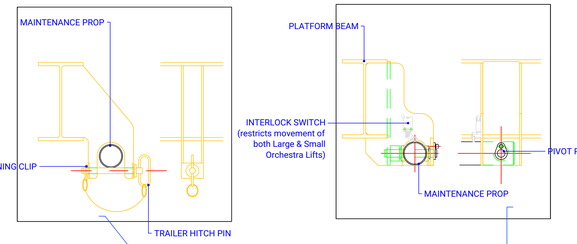


PLAN ON PIT FLOOR - DRIVE LAYOUT
1:20

Lift Speed;	50mm/s
Normal Travel;	1.8m
Overtravel each end;	50mm
Motor Speed;	950rpm
Cardan Shaft speed;	950rpm



SECTION A-A
1:20



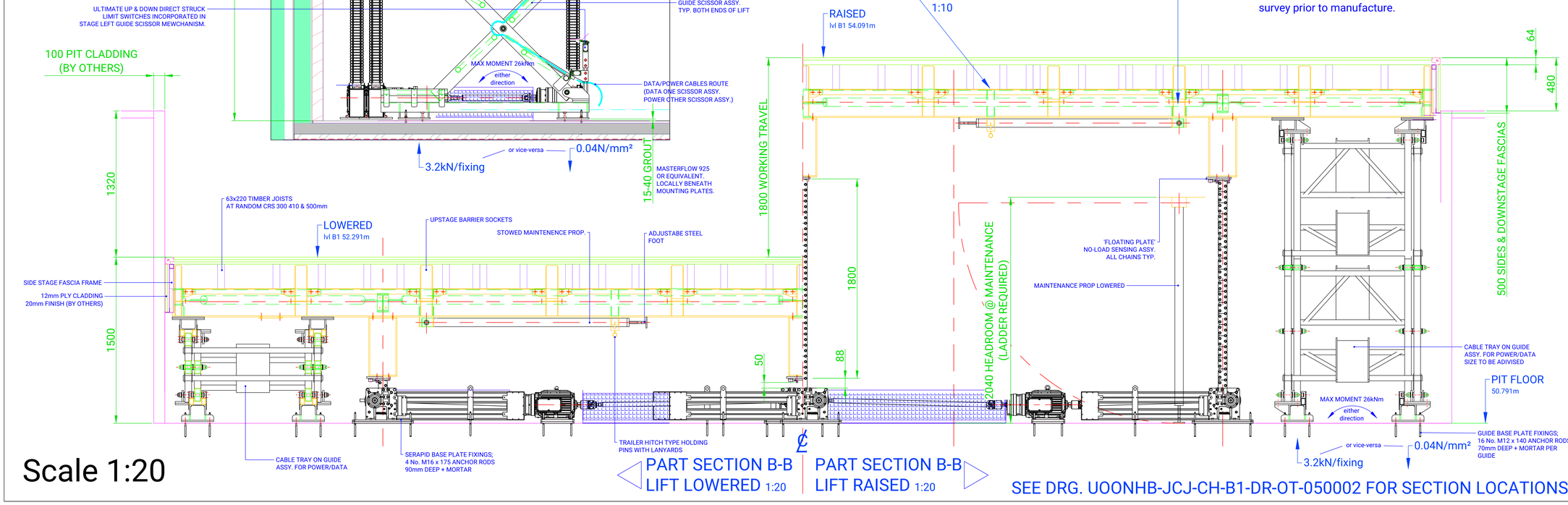
MAINTENANCE PROP DETAILS
1:10

PRE-SET LEVELS (top of lift floor)

Platform;	B1	54.091m
Stalls/Maintenance;	B1-600	53.491m
Band Pit;	B1-1800	52.291m

Level Controls from wire driven encoder.
Tol ±1mm
(maintenance level gives 2.1m clear below main beams)

Levels to be confirmed post-installation.
All dimensions to be confirmed with a site survey prior to manufacture.



PART SECTION B-B LIFT LOWERED 1:20
PART SECTION B-B LIFT RAISED 1:20

SEE DRG. UOONHB-JCJ-CH-B1-DR-OT-050002 FOR SECTION LOCATIONS

Scale 1:20

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REVISIONS

REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	25/10/2023
P02	SC	UPDATED TO CLIENT COMMENTS	07/12/2023
P03	SC	ACCESS HATCHES MOVED	22/01/2024
C01.1	SC	INTERNAL ISSUE	26/03/2024
C02	SC	MAINTENANCE ACCESS MODS	18/04/2024
C03	SC	MAINTENANCE ACCESS & SETTING OUT MODS	28/05/2024
C04	SH	For Record	14/08/2025
-	-	-	-

Notes:

Lift Area;	28m²
Platform Self Weight;	4500kg
Static Load (@ 500kg/m²);	14000kg
Dynamic Load (@250kg/m²);	7000kg
Test Static Load	17500kg
Test Dyn. Load	7700kg

Point loading 300kg over sq. of 300mm sides

Platform design loads;
Dead (self) + Payload + dyn. (x 1.2) x 2

Horizontal Loads 5% of design loads.

Structural Deflection Limit L/750

Drive Shafts & maintenance props finished Yellow (RAL1026)
all other parts Black (RAL9005) typically semi-gloss finish.

Overload detection by current sensing, no load detection by 'Floating-plate' assembly.

Normal Travel limits from wire-line encoder. Overtravel via direct struck limits on stage left scissors.

Status:
A - ☐ B - ☐ C - ☐

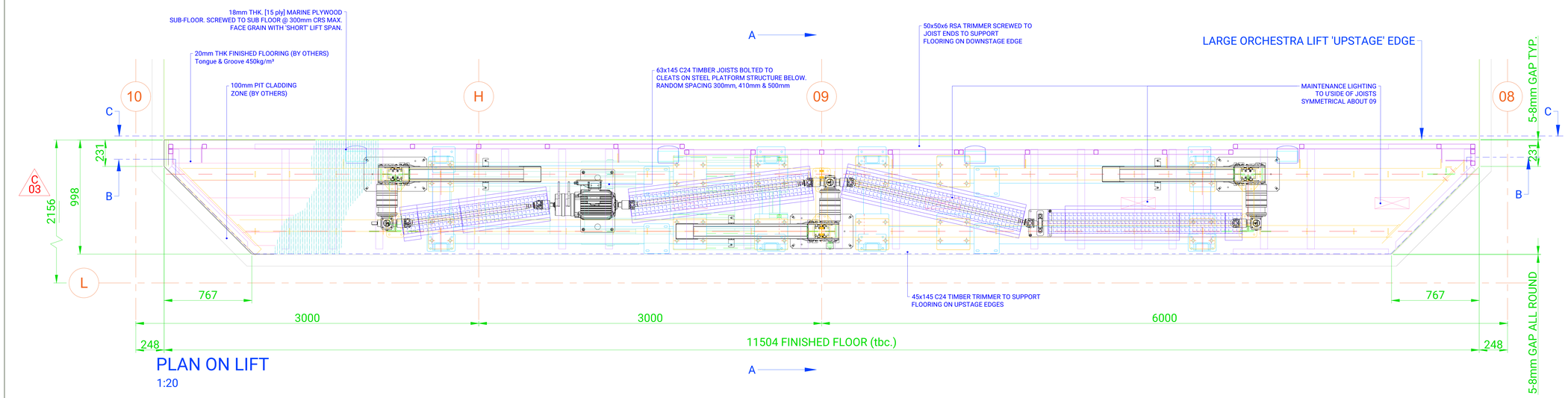
All dimensions in mm unless otherwise stated. Do not scale.

DRAWN:	SH	DATE:	14/08/2025
CHECKED:	JC	DATE:	14/08/2025
APPROVED:	OS	DATE:	14/08/2025
SCALE:	ON SHEET	PAPER SIZE:	A1

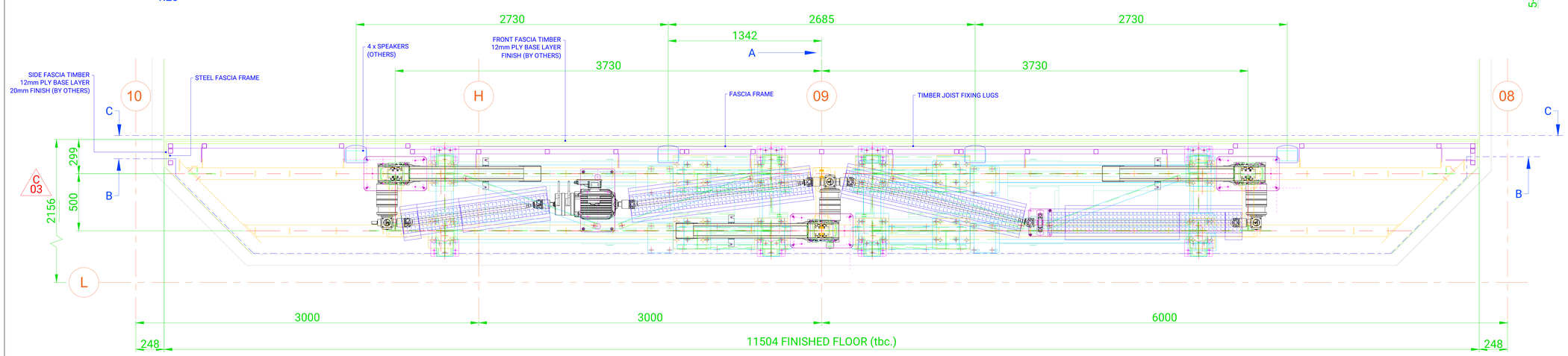
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Inspiration in every performance

PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-GA-05-0003
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-050003
TITLE	CONCERT HALL LARGE ORCHESTRA LIFT PROPOSAL SECTIONS & PIT PLAN
PURPOSE	A5 - Accepted as Suitable for Record
	REV C04

SMALL ORCHESTRA LIFT PROPOSAL

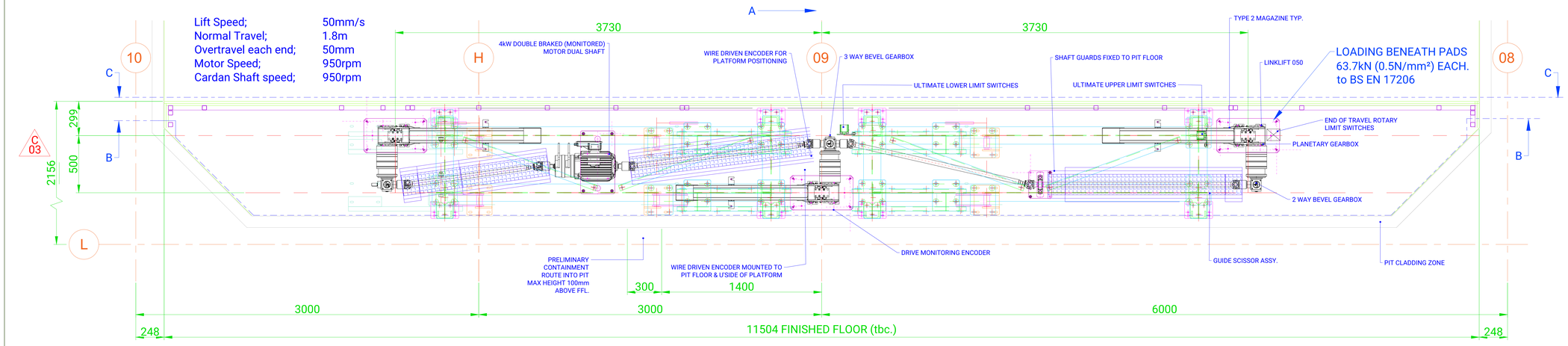


PLAN ON LIFT
1:20



PLAN ON LIFT PLATFORM STRUCTURE
1:20

Lift Speed;	50mm/s
Normal Travel;	1.8m
Overtravel each end;	50mm
Motor Speed;	950rpm
Cardan Shaft speed;	950rpm



PLAN ON GUIDE BASES & DRIVE TRAIN
1:20

Scale 1:20

SEE DRG. UOONHB-JCJ-CH-B1-DR-OT-050005 FOR SECTIONS

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REVISIONS

REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	25/10/2023
P02	SC	DRIVE LAYOUT UPDATED	08/12/2023
P03.1	SC	INTERNAL ISSUE	22/01/2024
C01	SC	CONSTRUCTION ISSUE	26/03/2024
C02	SC	SPEAKER DIMENSIONS ADDED	01/05/2024
C03	SC	2156 WAS 2168	28/05/2024
C04	SH	For Record	14/08/2025
-	-	-	-

Notes:

Lift Area;	11m²
Platform Self Weight;	2500kg
Static Load (@ 500kg/m²);	5500kg
Dynamic Load (@250kg/m²);	2750kg
Test Static Load	6875kg
Test Dyn. Load	3025kg

Platform design loads;
Dead (self) + Payload + dyn. (x 1.2) x 2

Point loading 300kg over sq. of 300mm sides

Horizontal Loads 5% of design loads.

Structural Deflection Limit L/750

Drive Shafts finished Yellow (RAL1026) all other parts Black (RAL9005) typically semi-gloss finish.

Overload detection by current sensing, no load detection by 'Floating-plate' assembly.

Normal Travel limits from wire-line encoder. Overtravel via direct struck limits on stage right scissors.

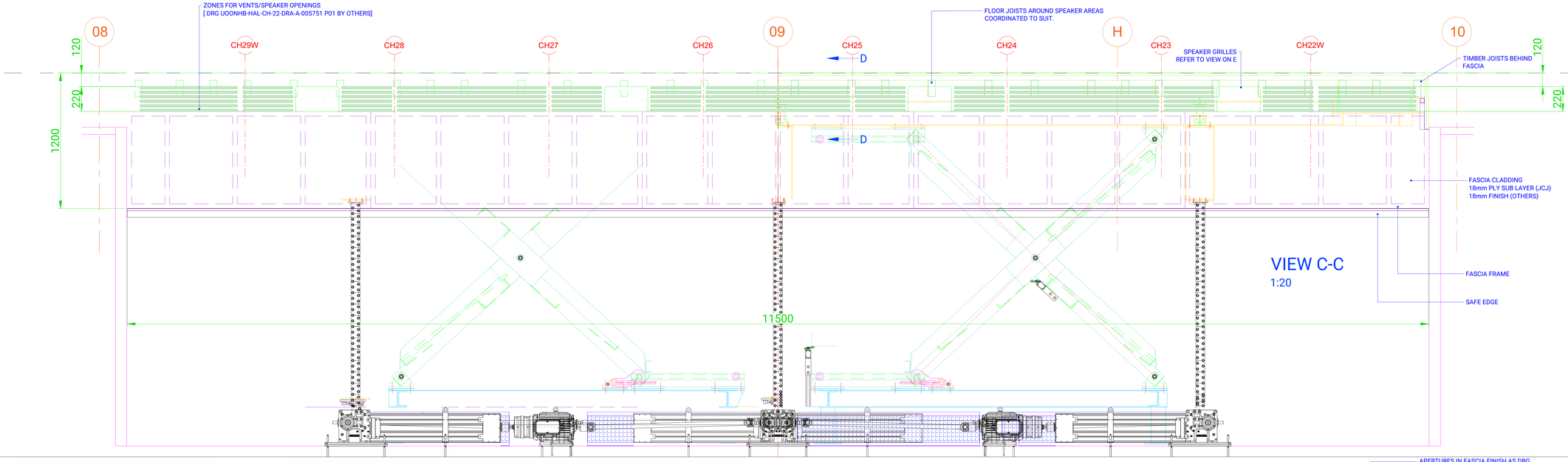
Status:
A - ☐ B - ☐ C - ☐

All dimensions in mm unless otherwise stated. Do not scale.

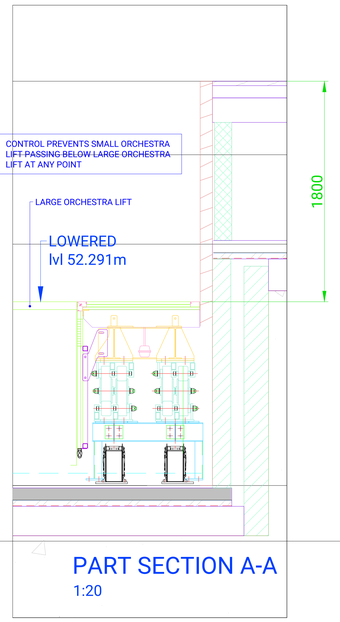
DRAWN:	SH	DATE:	14/08/2025
CHECKED:	JC	DATE:	14/08/2025
APPROVED:	OS	DATE:	14/08/2025
SCALE:	ON SHEET	PAPER SIZE:	A1

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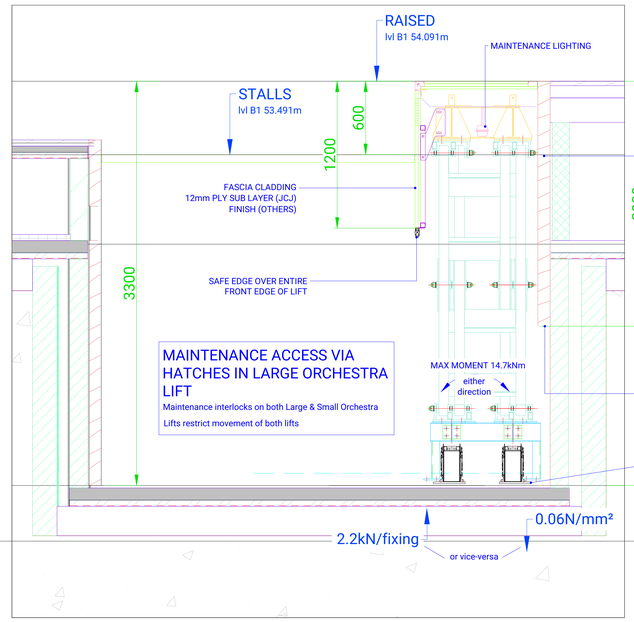
PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-GA-05-0004
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-050004
TITLE	CONCERT HALL SMALL ORCHESTRA LIFT PROPOSAL FLOOR & STRUCTURE PLANS
PURPOSE	A5 - Accepted as Suitable for Record
	REV C04



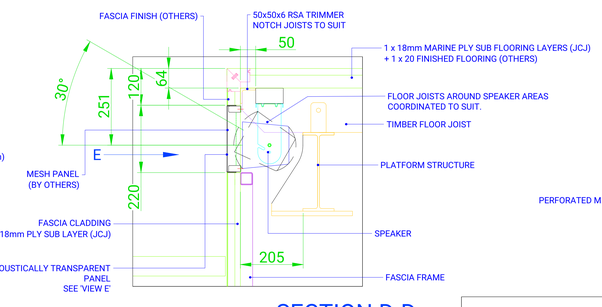
VIEW C-C
1:20



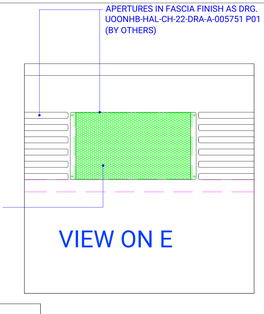
PART SECTION A-A
1:20



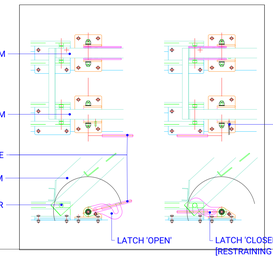
SECTION A-A
1:20



SECTION D-D
1:10



VIEW ON E



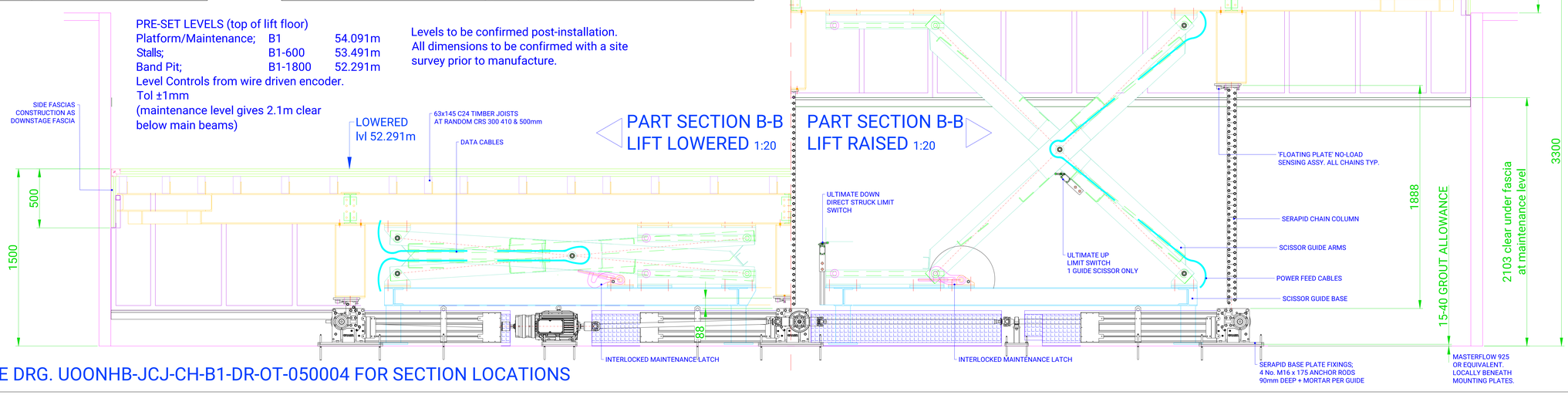
MAINTENANCE LATCH DETAIL 1:25

PRE-SET LEVELS (top of lift floor)

Platform/Maintenance;	B1	54.091m
Stalls;	B1-600	53.491m
Band Pit;	B1-1800	52.291m

Level Controls from wire driven encoder.
Tol ±1mm
(maintenance level gives 2.1m clear below main beams)

Levels to be confirmed post-installation.
All dimensions to be confirmed with a site survey prior to manufacture.



PART SECTION B-B
LIFT LOWERED 1:20

PART SECTION B-B
LIFT RAISED 1:20

SEE DRG. UOONHB-JCJ-CH-B1-DR-OT-050004 FOR SECTION LOCATIONS

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REVISIONS

REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	25/10/2023
P02	SC	DRIVE LAYOUT UPDATED	08/12/2023
P03	SC	MAINT. LIGHTS ADDED	22/01/2024
C01.1	SC	INTERNAL ISSUE	24/03/2024
C02	SC	SPEAKER APERTURE MODIFIED TO ARCH. COMMENT	01/05/2024
C03	SC	SPEAKER APERTURES & COVERS BY OTHERS	28/05/2024
C04	SH	For Record	14/08/2025
-	-	-	-

Notes:

Lift Area;	11m²
Platform Self Weight;	2500kg
Static Load (@ 500kg/m²);	5500kg
Dynamic Load (@250kg/m²);	2750kg
Test Static Load	6875kg
Test Dyn. Load	3025kg

Platform design loads;
Dead (self) + Payload + dyn. (x 1.2) x 2

Point loading 300kg over sq. of 300mm sides

Horizontal Loads 5% of design loads.

Structural Deflection Limit L/750

Drive Shafts finished Yellow (RAL1026) all other parts Black (RAL9005) typically semi-gloss finish.

Overload detection by current sensing, no load detection by 'Floating-plate' assembly.

Normal Travel limits from wire-line encoder. Overtravel via direct struck limits on stage right scissors.

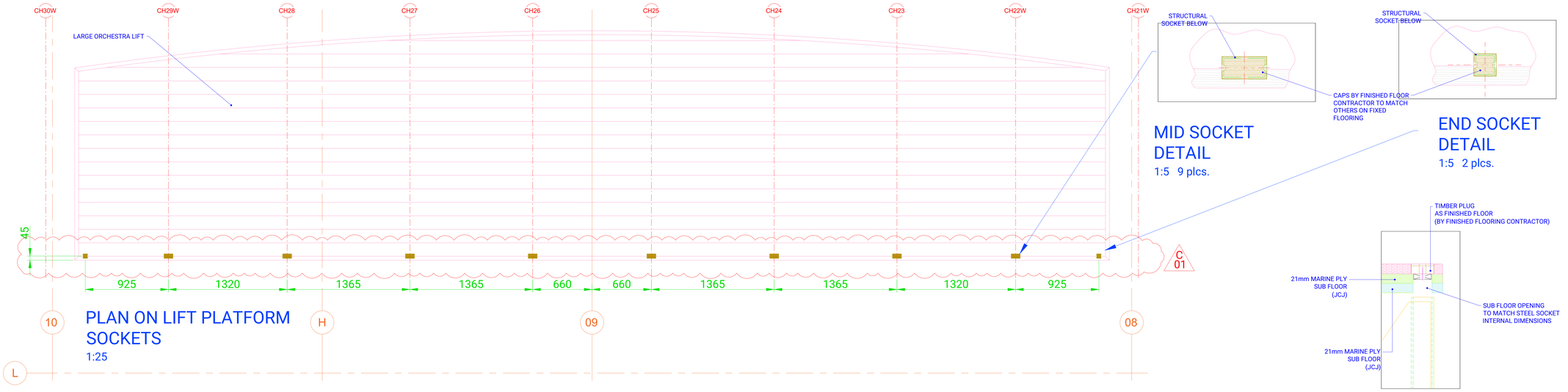
Status:
A - ☐ B - ☐ C - ☐

All dimensions in mm unless otherwise stated. Do not scale.

DRAWN:	SH	DATE:	14/08/2025
CHECKED:	JC	DATE:	14/08/2025
APPROVED:	OS	DATE:	14/08/2025
SCALE:	ON SHEET	PAPER SIZE:	A1

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PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-GA-05-0005
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-050005
TITLE	CONCERT HALL SMALL ORCHESTRA LIFT PROPOSAL SECTIONS & PIT PLAN
PURPOSE	A5 - Accepted as Suitable for Record
	REV C04



PLAN ON LIFT PLATFORM SOCKETS

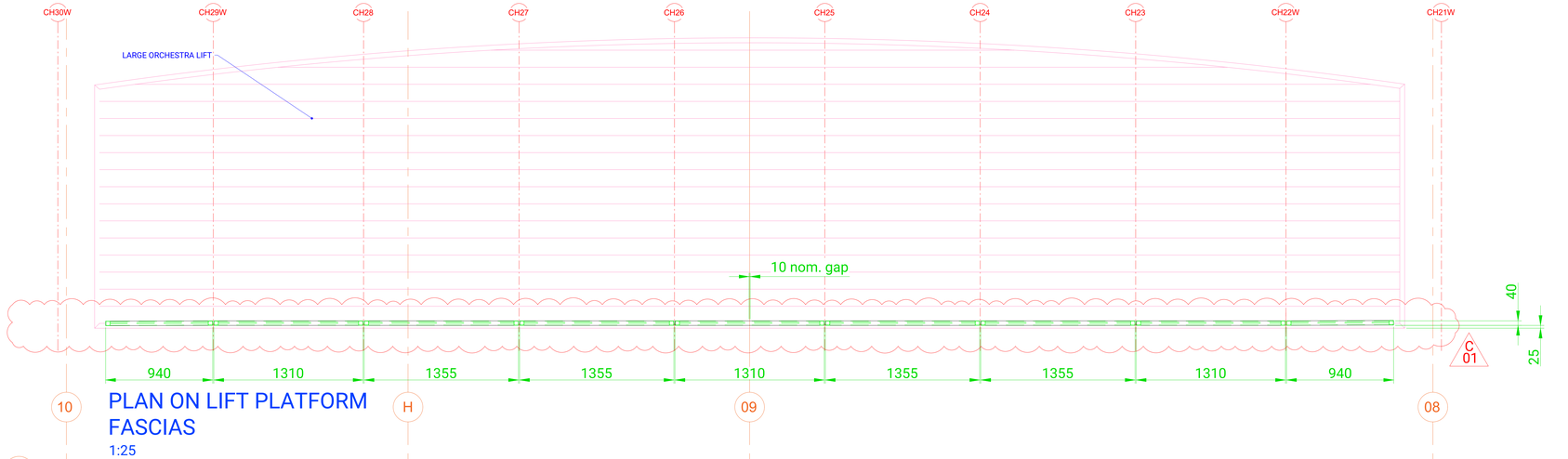
1:25

MID SOCKET DETAIL

1:5 9 plcs.

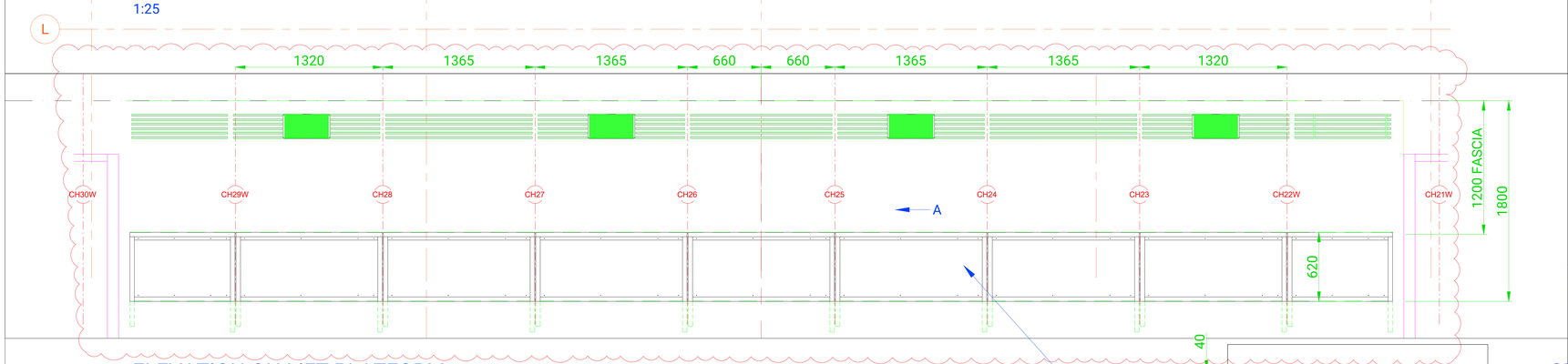
END SOCKET DETAIL

1:5 2 plcs.



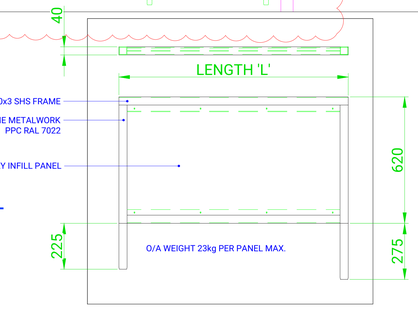
PLAN ON LIFT PLATFORM FASCIAS

1:25



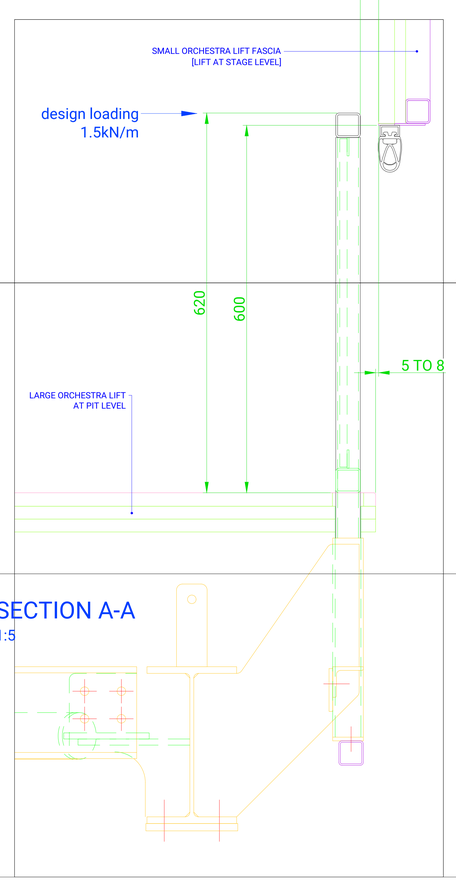
ELEVATION ON LIFT PLATFORM FASCIAS

1:25



PANEL DETAIL

1:15 10 PLCS.
2 off L = 940mm
3 off L = 1310mm
4 off L = 1355mm



SECTION A-A

1:5

SEE DRG. UOONHB-JCJ-CH-B1-DR-OT-050002 & 050003 FOR LARGE ORCHESTRA LIFT
SEE DRG. UOONHB-JCJ-CH-B1-DR-OT-050004 & 050005 FOR SMALL ORCHESTRA LIFT

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REVISIONS

REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	30/11/2023
P02	SC	SMALL ORCH. LIFT SAFE EDGE ADDED	18/12/2023
P03	SC-	GRID ADDED TO ARCHITECT REQUEST	12/02/2024
C01	SC	FASCIA PANELS ALIGNED WITH GRID	01/05/2024
C02	JC	SHS FRAME PPC RAL 7044 NOTE ADDED	20/08/2024
C03	JC	SHS FRAME PPC RAL 7022 NOTE ADDED	02/09/2024
C04	SH	For Record	14/08/2025

Notes:

Status:
A - ☐ B - ☐ C - ☐

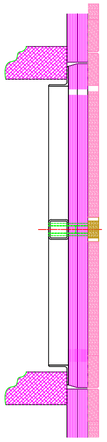
All dimensions in mm unless otherwise stated. Do not scale.

DRAWN:	SH	DATE:	14/08/2025
CHECKED:	JC	DATE:	14/08/2025
APPROVED:	OS	DATE:	14/08/2025
SCALE:	ON SHEET	PAPER SIZE:	A1

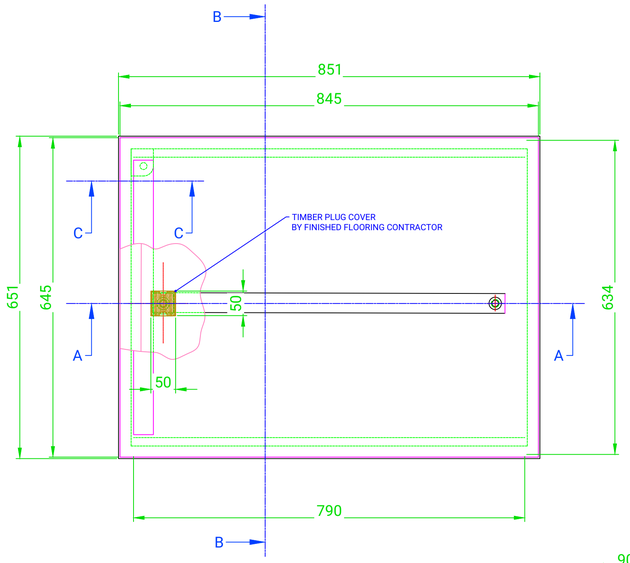
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PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-GA-05-0006
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-050006
TITLE	CONCERT HALL LARGE ORCHESTRA LIFT PROPOSAL INFILL FASCIA PANELS
PURPOSE	A5 - Accepted as Suitable for Record
	REV C04

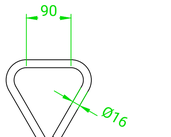


B-B
1:5

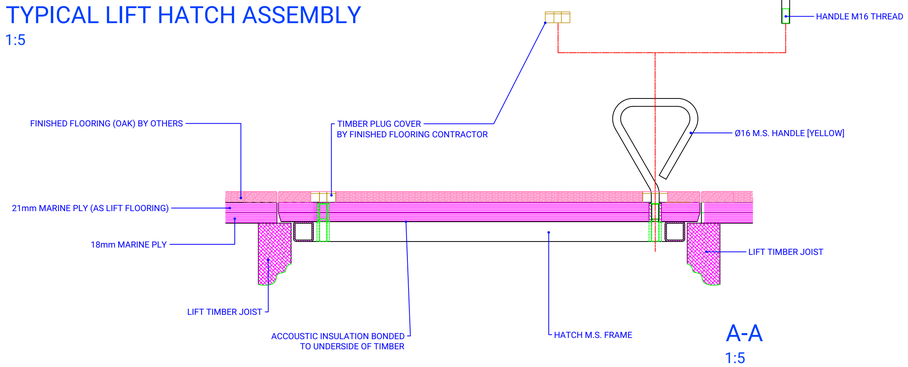


HATCH WEIGHT:
Timber 20kg
Frame 8kg

Total 28kg

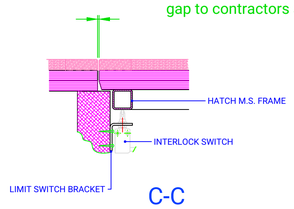


TYPICAL LIFT HATCH ASSEMBLY
1:5



A-A
1:5

2-3 mm GAP (Ply layers. Finished floor
gap to contractors spec.)



C-C
1:5

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REVISIONS

REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	25/10/2023
C01	SC	CONSTRUCTION ISSUE	12/02/2024
C02	SC	UPDATED TO CLIENT COMMENTS	28/05/2024
C03	SH	For Record	28/04/2025
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-	-	-	-
-	-	-	-

Notes:

Status:
A - ☐ B - ☐ C - ☐

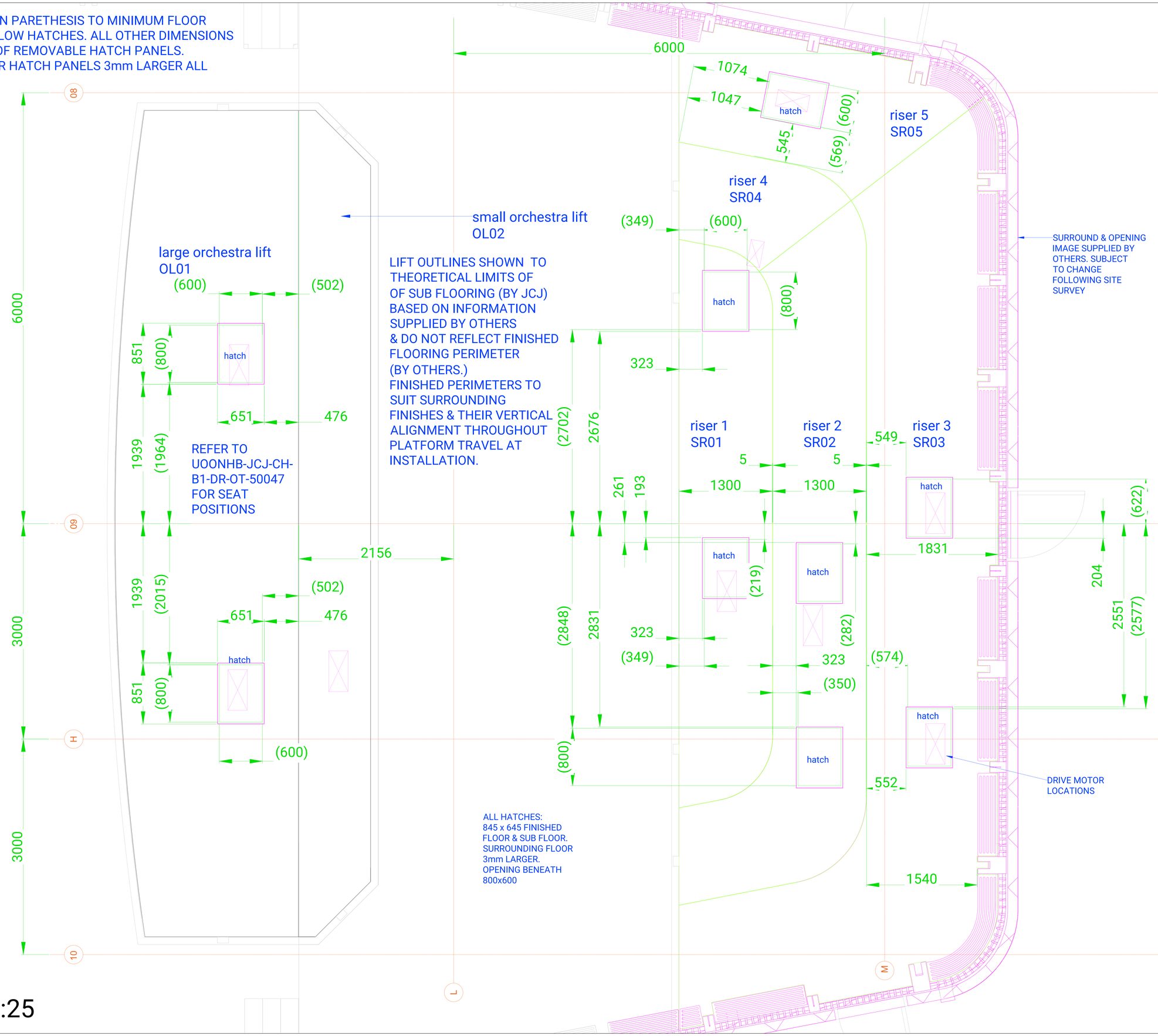
All dimensions in mm unless otherwise stated. Do not scale.

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CHECKED:	JC	DATE:	28/04/2025
APPROVED:	OS	DATE:	28/04/2025
SCALE:	ON SHEET	PAPER SIZE:	A1

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PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-GA-05-0009
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-050009
TITLE	CONCERT HALL ORCHESTRA LIFTS PROPOSAL MAINTENANCE HATCH ASSY.
PURPOSE	A5 - Accepted as Suitable for Record
	REV C03

DIMENSIONS IN PARETHESIS TO MINIMUM FLOOR OPENINGS BELOW HATCHES. ALL OTHER DIMENSIONS TO EXTENTS OF REMOVABLE HATCH PANELS. OPENINGS FOR HATCH PANELS 3mm LARGER ALL ROUND.



Scale 1:25

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REVISIONS			
REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	12/02/2024
P02	SC	RISER 5 HATCH ADDED	26/03/2024
P03	SC	ORCHESTRA LIFT ACCESS MODS	19/04/2024
C01	SC	MOTORS ADDED	01/05/2024
C02	SC	LGE ORCH LIFT HATCHES MOVED TO MAX. UPSTAGE POSN. FOR SEATING	28/05/2024
C03	JC	OL1 HATCH POSN. UPDATED & MOTOR POSN. ADDED	12/09/2024
C04	SH	For Record	14/08/2025

Notes:

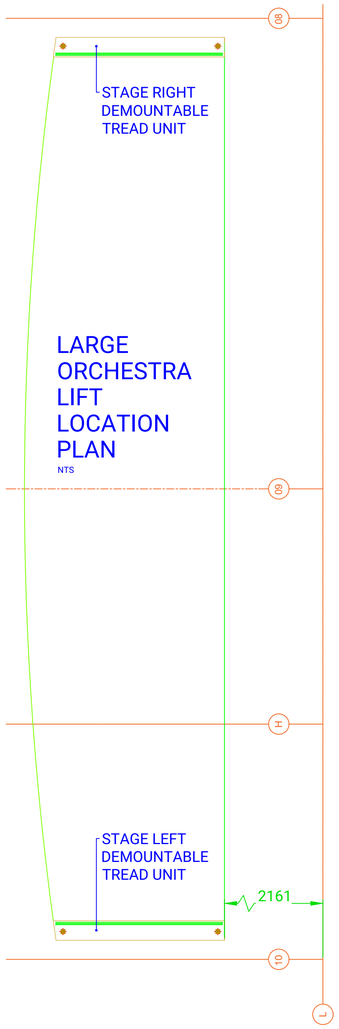
Status:
A - ☐ B - ☐ C - ☐

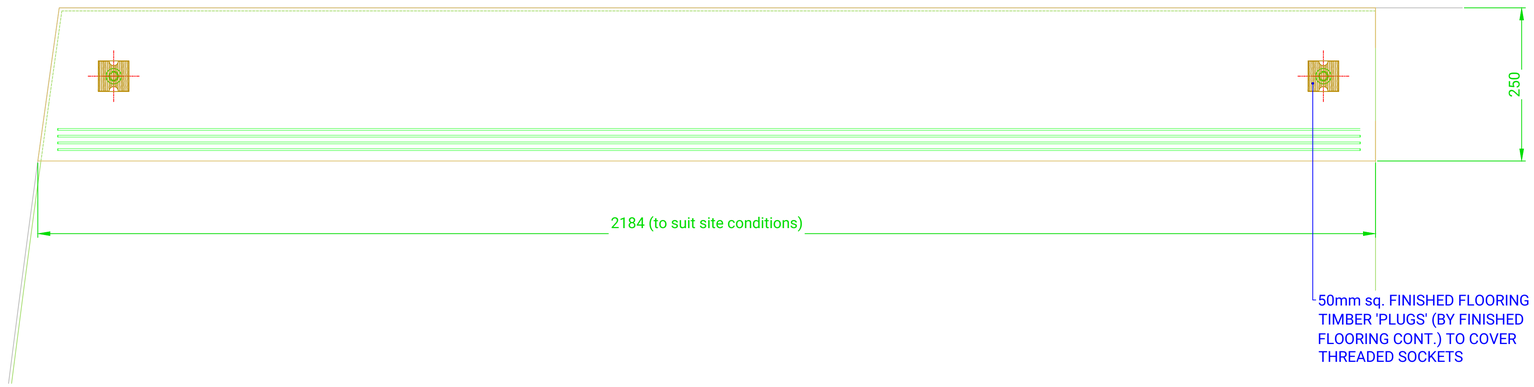
All dimensions in mm unless otherwise stated. Do not scale.

DRAWN:	SH	DATE:	14/08/2025
CHECKED:	JC	DATE:	14/08/2025
APPROVED:	OS	DATE:	14/08/2025
SCALE:	ON SHEET	PAPER SIZE:	A1

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PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-GA-05-0025
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-50025
TITLE	ORCHESTRA LIFTS & STAGE RISERS OVERALL PLAN
PURPOSE	A5 - Accepted as Suitable for Record
	REV C04

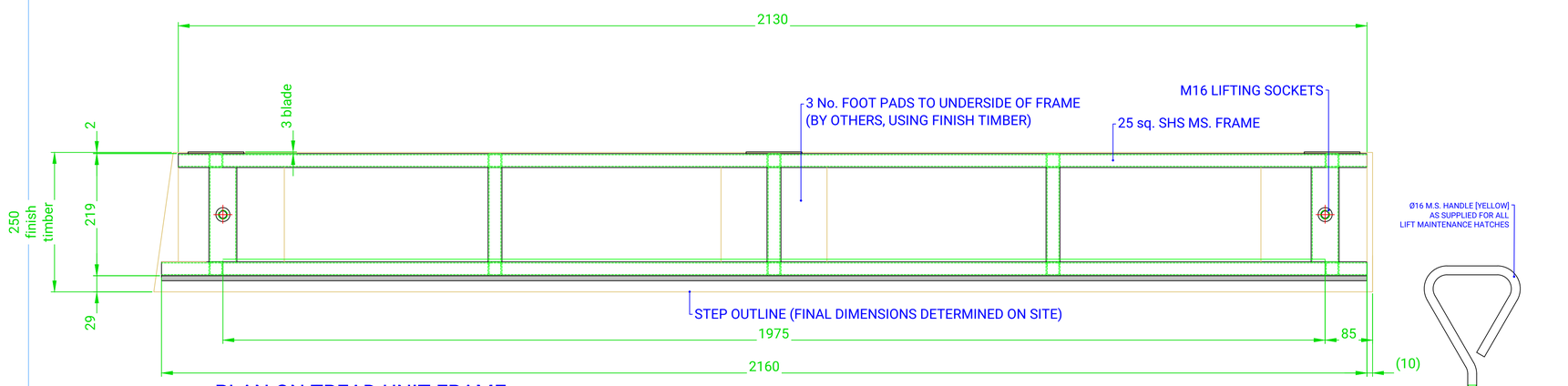




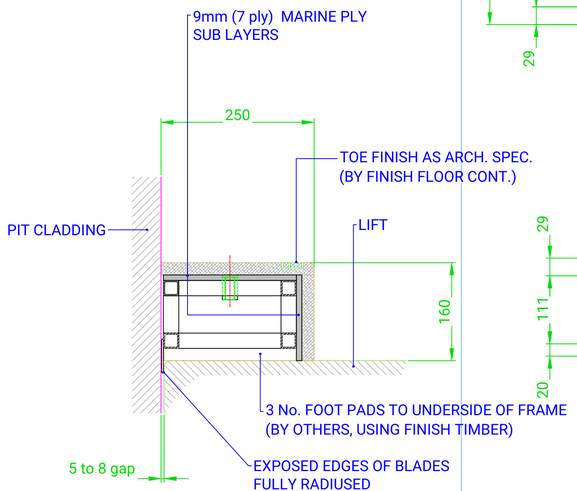
STAGE RIGHT DEMOUNTABLE TREAD UNIT PLAN
(STAGE LEFT - OPPOSITE HAND)

METALWORK FINISHED; POWDERCOAT RAL 7044

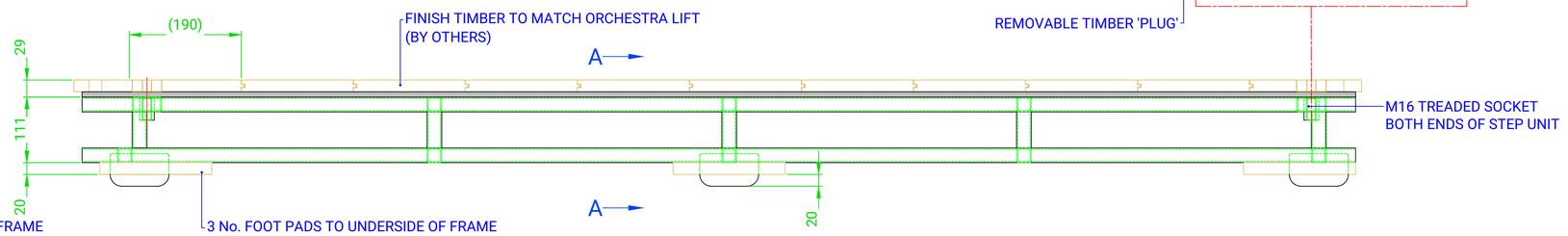
ESTIMATED WEIGHT;	
FRAME	16kg
SUB TIMBER	6kg
FINISH TIMBER	14kg
TOTAL	36kg
(2 PERSON LIFT)	



PLAN ON TREAD UNIT FRAME



SECTION A-A



TREAD UNIT FRAME FRONT ELEVATION

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REVISIONS

REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	27/03/2024
C01.1	SC	INTERNAL ISSUE	01/05/2024
C02	SC	LIFTING MODIFIED TO THREADED SOCKETS	28/05/2024
C03	SH	For Record	28/04/2025
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

Notes:

CALCULATIONS BASED ON:

The greater of ;
5kN/m² or 2kN point load
(100kg person, one foot (Ø70 area) at 2x dynamic)

Finish timber, Oak, σ 9.7N/mm², ν 0.3,
(finish timber alone sufficient for loads 9mm sub layer applied for back fixing of finished timber only.)

Status:
A - ☐ B - ☐ C - ☐

All dimensions in mm unless otherwise stated. Do not scale.

DRAWN:	SH	DATE:	28/04/2025
CHECKED:	JC	DATE:	28/04/2025
APPROVED:	OS	DATE:	28/04/2025
SCALE:	ON SHEET	PAPER SIZE:	A1

J&C Joel
Inspiration in every performance

PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-GA-05-0027
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-050027
TITLE	CONCERT HALL LARGE ORCHESTRA LIFT DEMOUNTABLE TREAD UNIT PROPOSAL
PURPOSE	A5 - Accepted as Suitable for Record
	REV C03

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REVISIONS

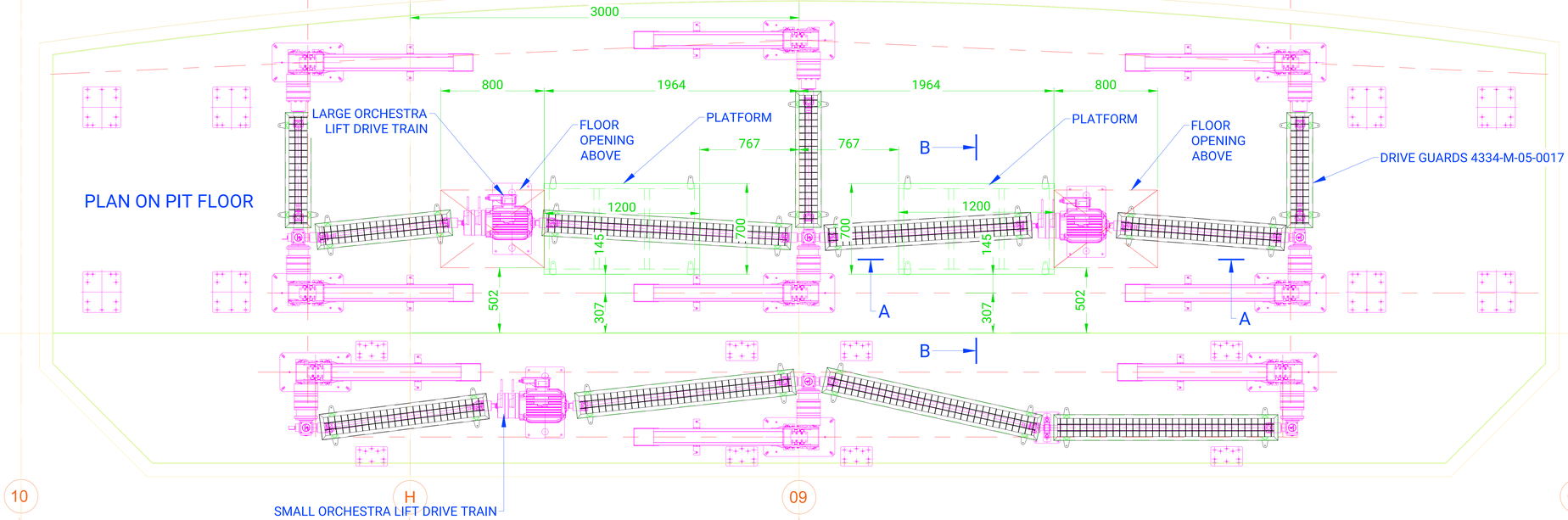
REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	28/05/2024
C01	SC	FOR CONSTRUCTION	07/08/2024
C02	JC	RACE SEATING LAYOUT UPDATED	12/09/2024
C03	SH	For Record	14/08/2025

Notes:

Seating layout taken from;
UOONHB-RAC-CH-B1-DR-OT-000003_P01

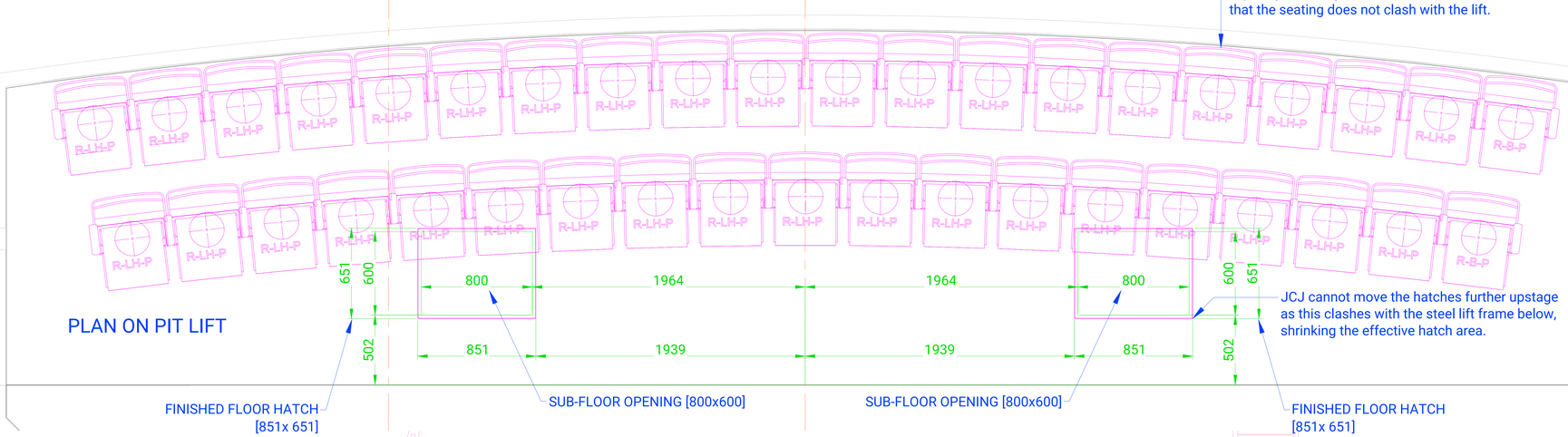
Explicitly stated by RACE on the above drawing that the seating does not clash with the lift.

PLAN ON PIT FLOOR

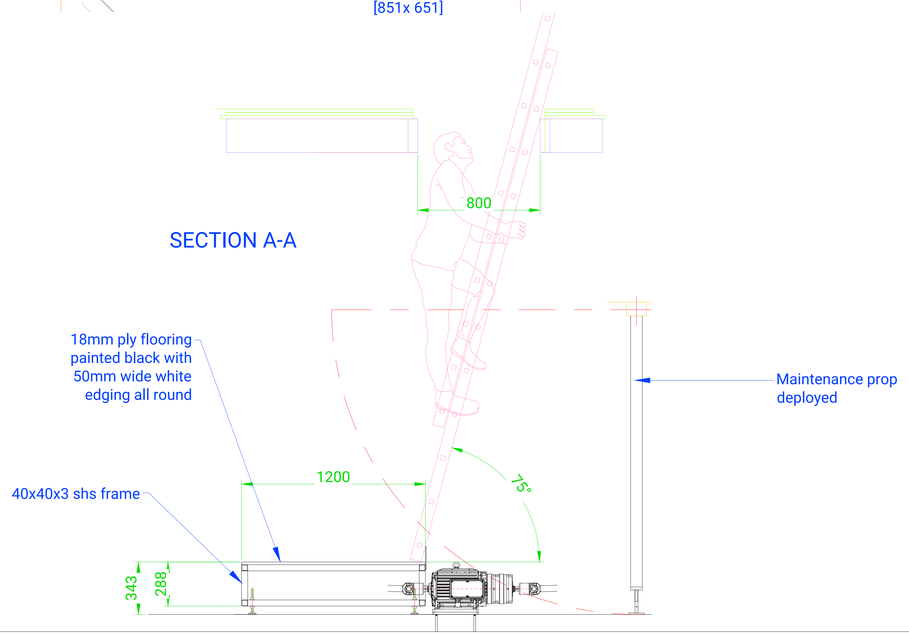


Explicitly stated by RACE on UOONHB-RAC-CH-B1-DR-OT-000003 that the seating does not clash with the lift.

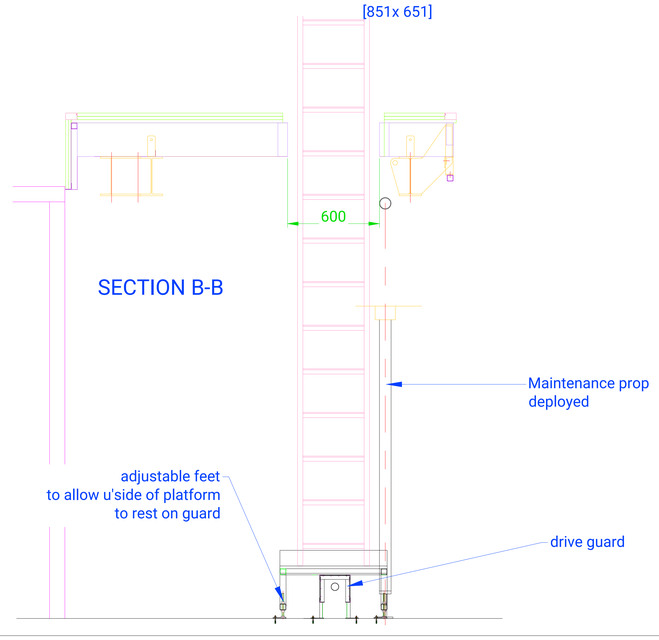
PLAN ON PIT LIFT



SECTION A-A



SECTION B-B



Status:
A - ☐ B - ☐ C - ☐

All dimensions in mm unless otherwise stated. Do not scale.

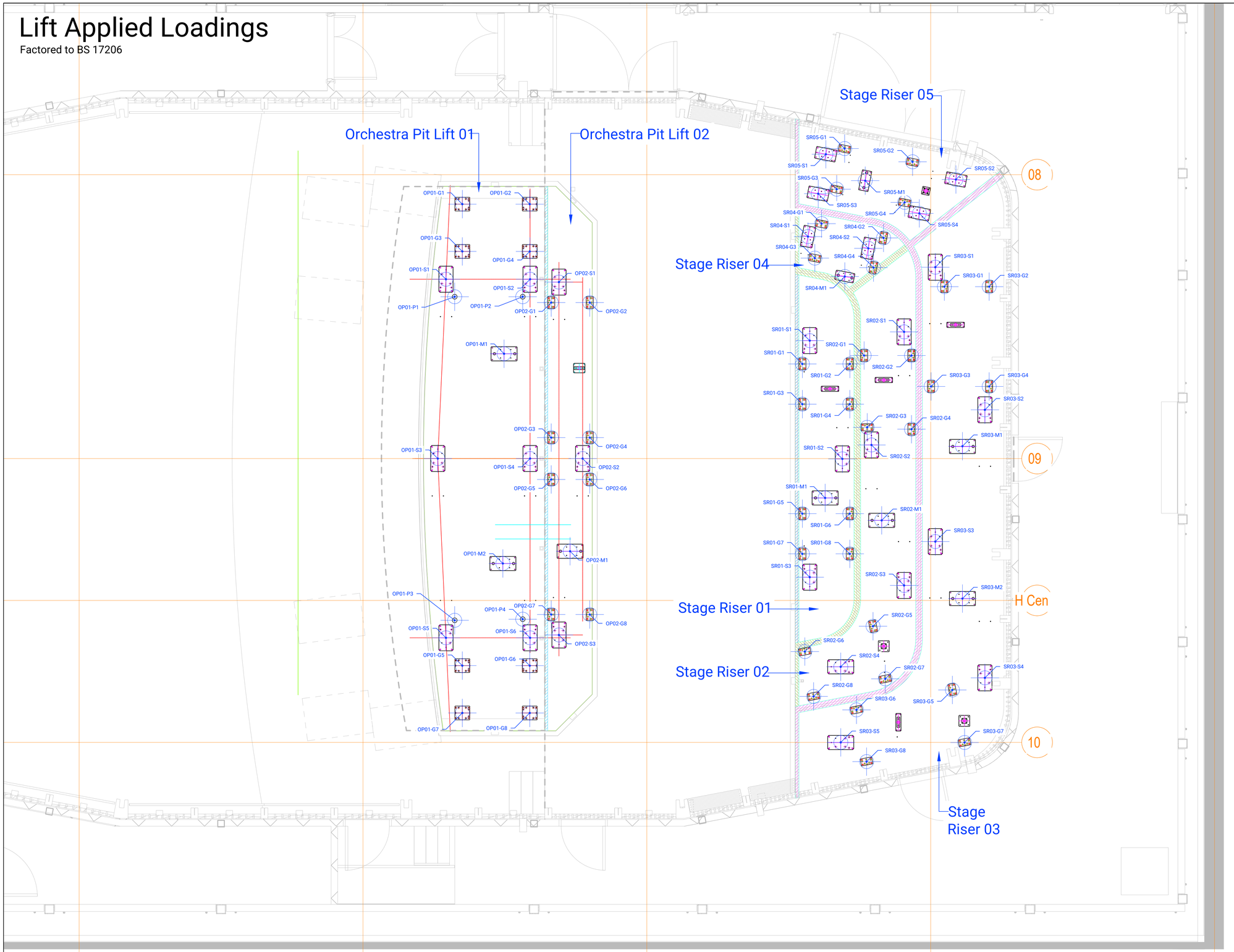
DRAWN:	SH	DATE:	14/08/2025
CHECKED:	JC	DATE:	14/08/2025
APPROVED:	OS	DATE:	14/08/2025
SCALE:	ON SHEET	PAPER SIZE:	A1

J&C Joel
Inspiration in every performance

PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-GA-05-0047
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-50047
TITLE	CONCERT HALL ORCHESTRA LIFTS SEATING COORDINATION
PURPOSE	A5 - Accepted as Suitable for Record
	REV C03

Lift Applied Loadings

Factored to BS 17206



Scale 1:40

Lift Applied Loadings

1.2 'acceleration' factor only

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REVISIONS

REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	09/02/2024
C01	SC	LOADING MODS	14/02/2024
C02	SH	For Record	28/04/2025

Notes:

For floor loadings see calculations
UOONHB-JCJ-CH-B1-CA-OT-050001-7

Status:
A - ☐ B - ☐ C - ☐

All dimensions in mm unless otherwise stated. Do not scale.

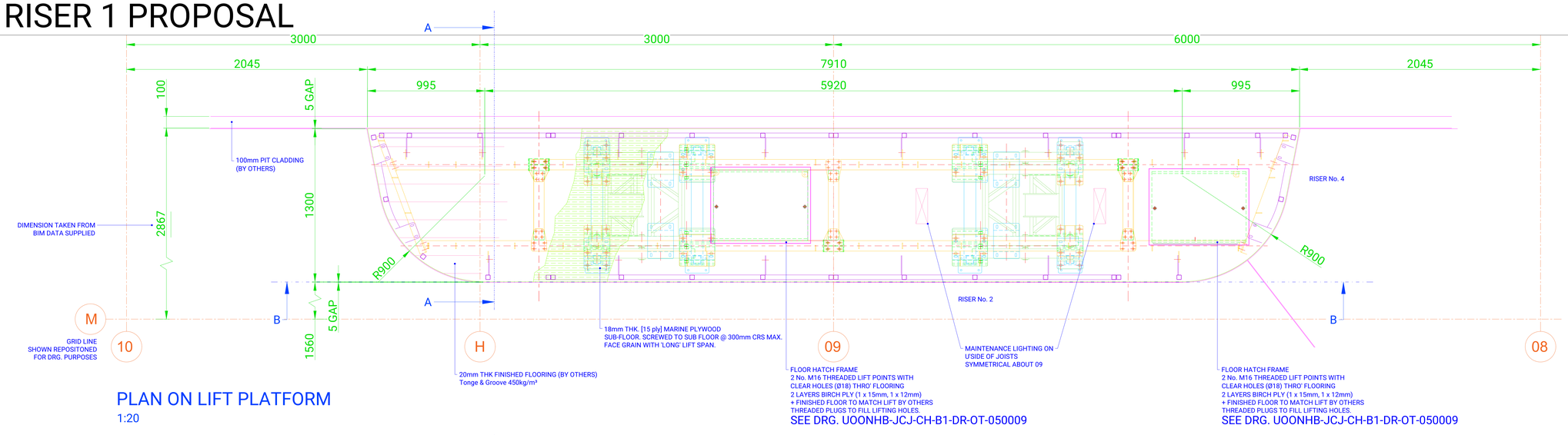
DRAWN:	SH	DATE:	28/04/2025
CHECKED:	JC	DATE:	28/04/2025
APPROVED:	OS	DATE:	28/04/2025
SCALE:	ON SHEET	PAPER SIZE:	A1

J&C Joel

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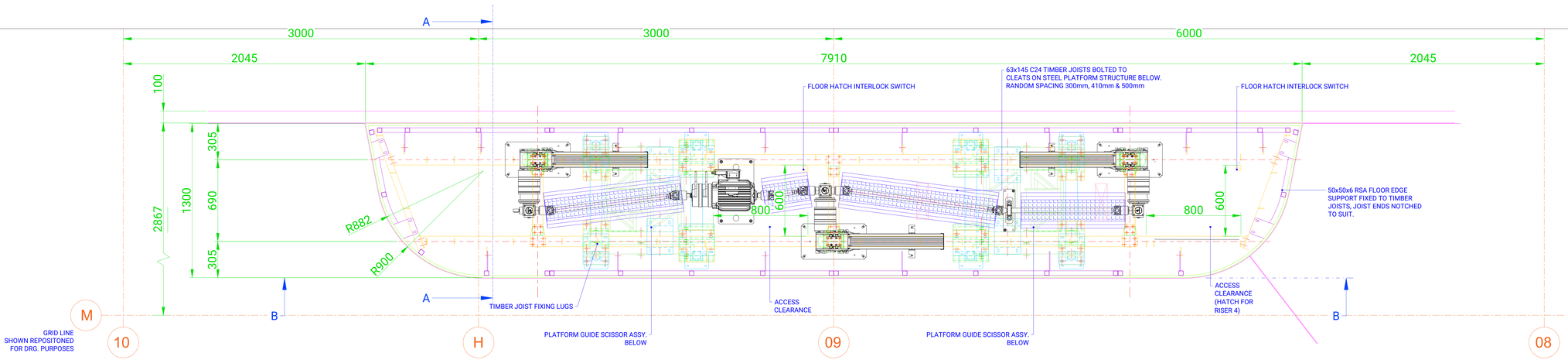
PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-GA-05-0026
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-050026
TITLE	Concert Hall Orchestra Pit & Stage Riser Applied Loadings
PURPOSE	A5 - Accepted as Suitable for Record
	REV C02

RISER 1 PROPOSAL



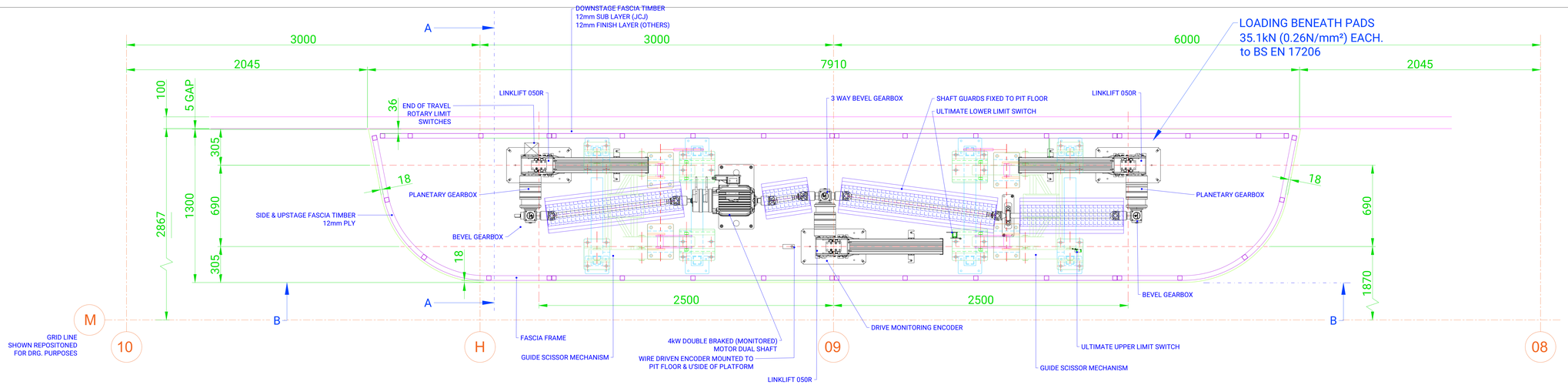
PLAN ON LIFT PLATFORM

1:20



PLAN ON LIFT PLATFORM STRUCTURE

1:20



PLAN ON LIFT DRIVE & GUIDES

1:20

Scale 1:20

SEE DRG. UOONHB-JCJ-CH-B1-DR-OT-080002 FOR SECTIONS

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REVISIONS

REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	25/10/2023
P02	SC	MOTOR & HATCH REPOSITIONED, HATCH ADDED	08/11/2023
C01	SC	CONSTRUCTION	26/03/2024
C02	JC	CONSTRUCTION	27/05/2024
C03	SH	For Record	14/08/2025

Notes:

Lift Area;	9.6m²
Platform Self Weight;	1800kg
Static Load (@ 500kg/m²);	4810kg
Dynamic Load (@250kg/m²);	2405kg
Test Static Load	6013kg
Test Dyn. Load	2646kg

Point Loading 300kg over sq. of 300mm sides

Platform design loads;
Dead (self) + Payload + dyn. (x 1.2) x 2

Horizontal Loads 5% of design loads.

Structural Deflection Limit L/750

Drive Shafts finished Yellow (RAL1026)
all other parts Black (RAL9005) typically
semi-gloss finish.

Overload detection by current sensing,
no load detection by 'Floating-plate' assembly.

Normal Travel limits from wire-line encoder.
Overtravel via direct struck limits on
stage right scissors.

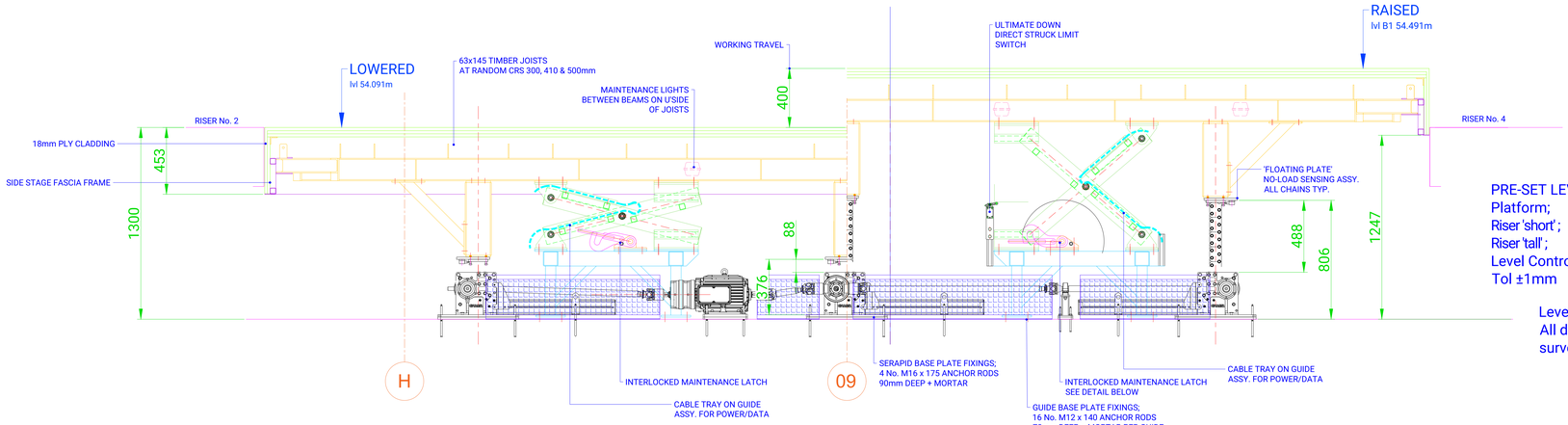
Status:
A - ☐ B - ☐ C - ☐

All dimensions in mm unless otherwise stated. Do not scale.

DRAWN:	SH	DATE:	14/08/2025
CHECKED:	JC	DATE:	14/08/2025
APPROVED:	OS	DATE:	14/08/2025
SCALE:	ON SHEET	PAPER SIZE:	A1

J&C Joel
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PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-GA-08-0001
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-080001
TITLE	CONCERT HALL RISER 1 PROPOSAL FLOOR & STRUCTURE PLANS
PURPOSE	A5 - Accepted as Suitable for Record
	REV C03



PART SECTION B-B
LIFT LOWERED 1:20

PART SECTION B-B
LIFT RAISED 1:20

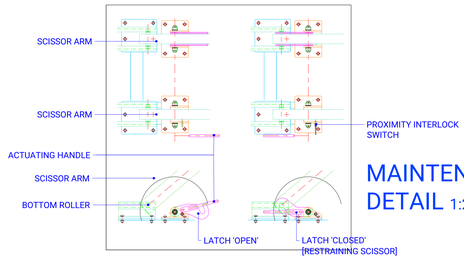
PRE-SET LEVELS (top of riser floor)

Platform;	B1	54.091m
Riser 'short';	B1+200mm	54.291m
Riser 'tall';	B1+400mm	54.491m

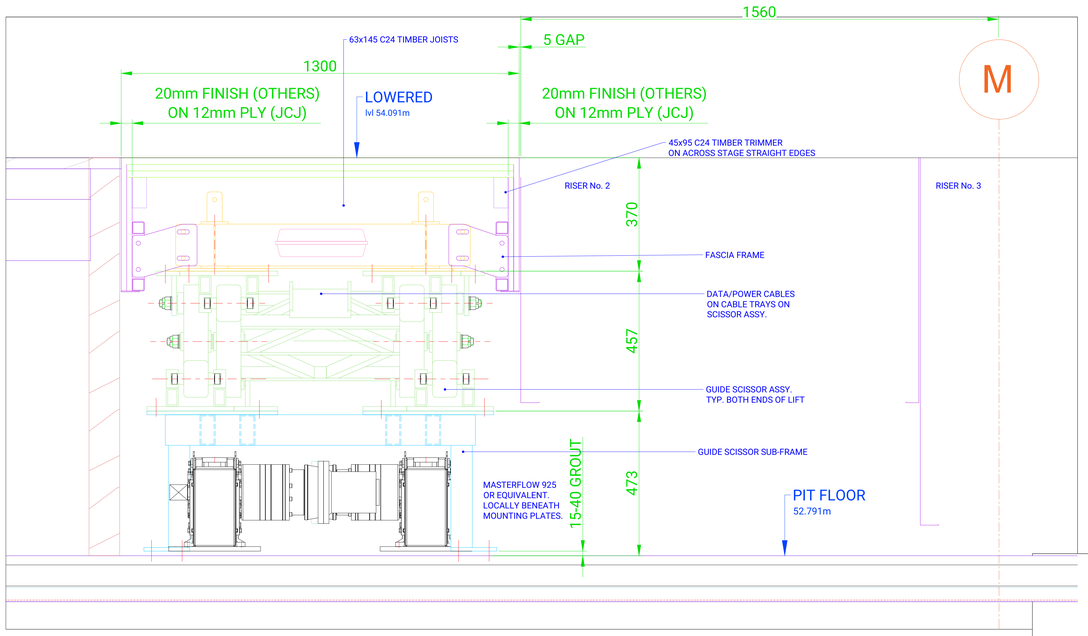
Level Controls from wire driven encoder.
Tol ±1mm

Levels to be confirmed post-installation.
All dimensions to be confirmed with a site survey prior to manufacture.

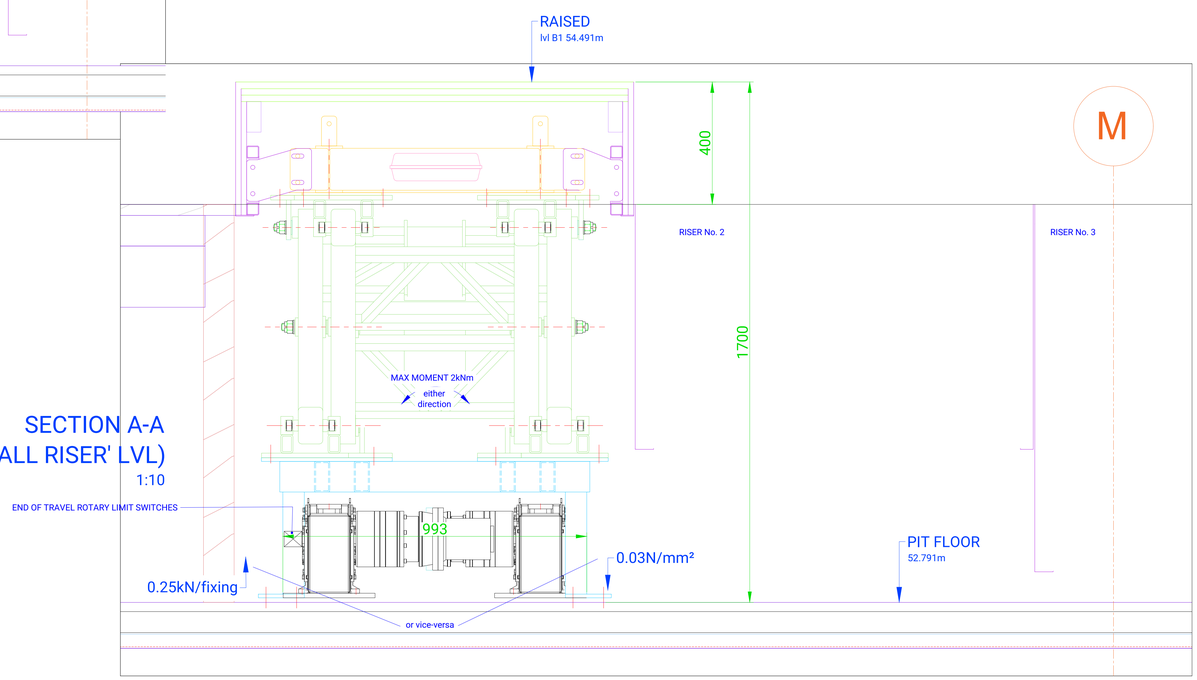
Lift Speed;	50mm/s
Normal Travel;	400m
Overtravel each end;	50mm
Motor Speed;	950rpm
Cardan Shaft speed;	950rpm



MAINTENANCE LATCH
DETAIL 1:25



SECTION A-A (RISER @ PLATFORM LVL)
1:10



SECTION A-A
(RISER @ 'TALL RISER' LVL)
1:10

SEE DRG. UOONHB-JCJ-CH-B1-DR-OT-080001 FOR SECTION LOCATIONS

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REVISIONS

REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	25/10/2023
P02	SC	MOTOR REPOSITIONED	08/11/2023
C01	SC	CONSTRUCTION	26/03/2024
C02	JC	CONSTRUCTION	27/05/2024
C03	SH	For Record	14/08/2025

Notes:

Lift Area;	9.6m²
Platform Self Weight;	1800kg
Static Load (@ 500kg/m²);	4810kg
Dynamic Load (@250kg/m²);	2405kg
Test Static Load	6013kg
Test Dyn. Load	2646kg

Point loading 300kg over sq. of 300mm sides

Platform design loads;
Dead (self) + Payload + dyn. (x 1.2) x 2

Horizontal Loads 5% of design loads.

Structural Deflection Limit L/750

Drive Shafts finished Yellow (RAL1026)
all other parts Black (RAL9005) typically semi-gloss finish.

Overload detection by current sensing, no load detection by 'Floating-plate' assembly.

Normal Travel limits from wire-line encoder. Overtravel via direct struck limits on stage right scissors.

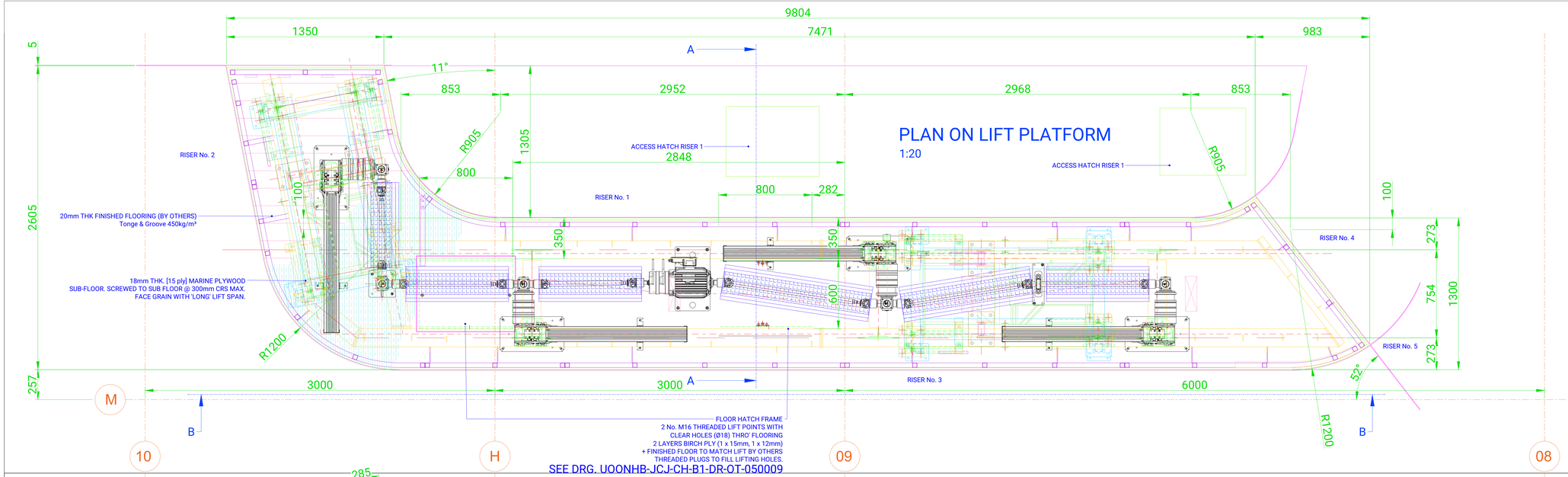
Status:
A - ☐ B - ☐ C - ☐

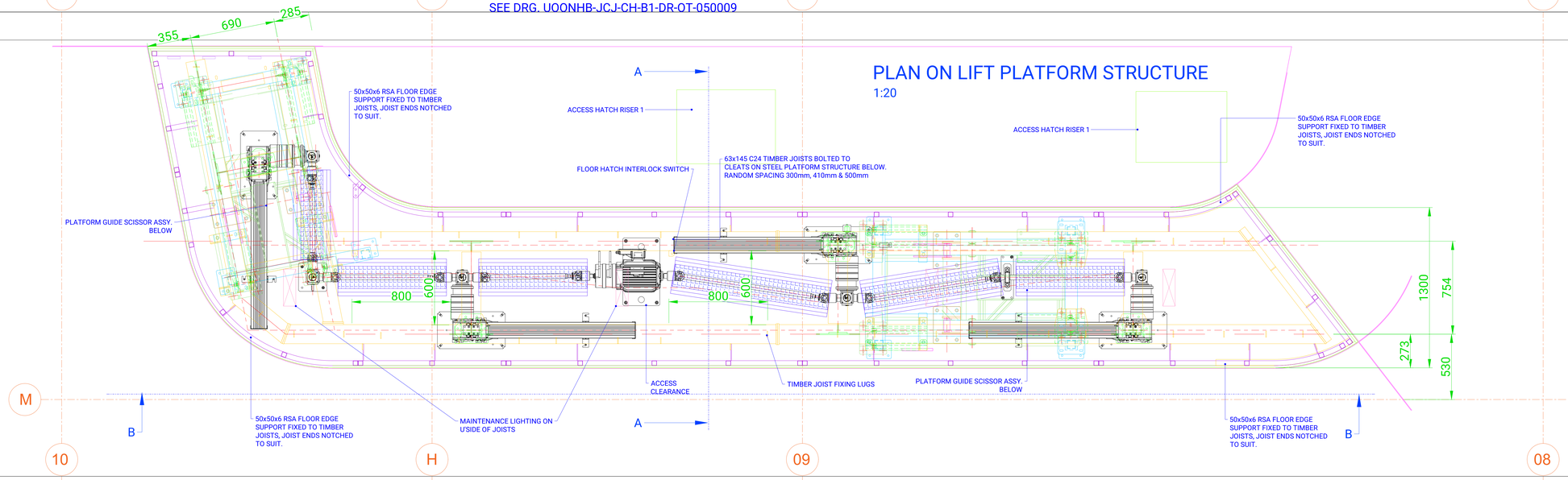
All dimensions in mm unless otherwise stated. Do not scale.

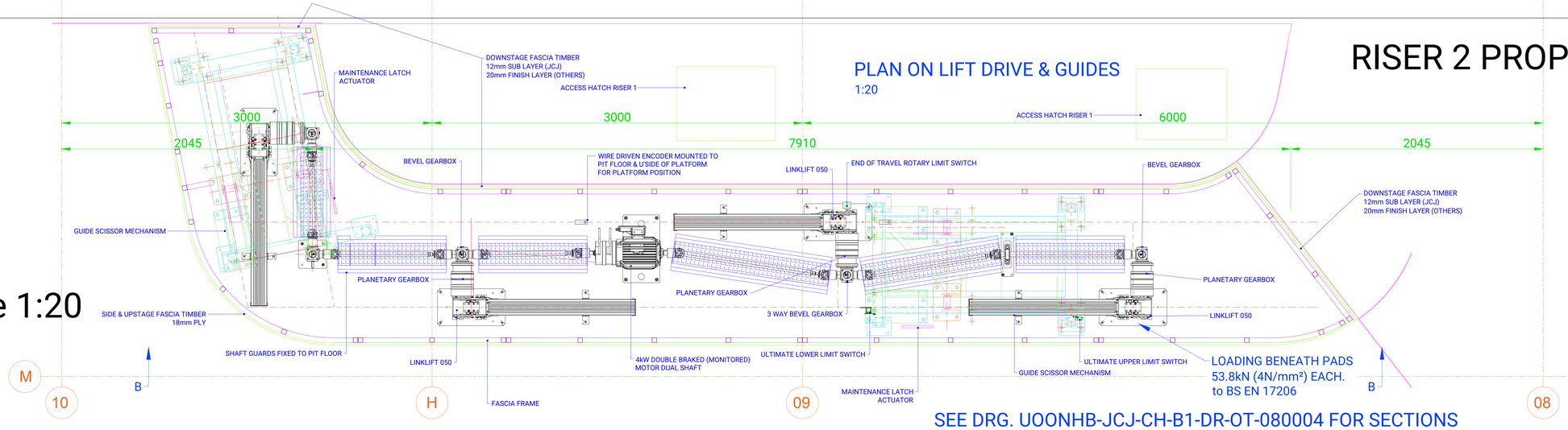
DRAWN:	SH	DATE:	14/08/2025
CHECKED:	JC	DATE:	14/08/2025
APPROVED:	OS	DATE:	14/08/2025
SCALE:	ON SHEET	PAPER SIZE:	A1

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PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-GA-08-0002
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-080002
TITLE	CONCERT HALL RISER 1 PROPOSAL SECTIONS & PIT PLAN
PURPOSE	A5 - Accepted as Suitable for Record
	REV C03







Scale 1:20

SEE DRG. UOONHB-JCJ-CH-B1-DR-OT-080004 FOR SECTIONS

RISER 2 PROPOSAL

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REVISIONS

REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	26/10/2023
P02	SC	UPDATE TO CLIENT COMMENTS	08/12/2023
C01	SC	CONSTRUCTION	26/03/2024
C02	SC	CONSTRUCTION	28/05/2024
C03	SC	CONSTRUCTION	30/05/2024
C04	SH	For Record	14/08/2025

Notes:

Lift Area;	13.5m²
Platform Self Weight;	2400kg
Static Load (@ 500kg/m²);	6750kg
Dynamic Load (@250kg/m²);	3375kg
Test Static Load	8438kg
Test Dyn. Load	3715kg

Point Load 300kg over sq. of 300mm sides

Platform design loads;
Dead (self) + Payload + dyn. (x 1.2) x 2

Horizontal Loads 5% of design loads.

Structural Deflection Limit L/750

Drive Shafts finished Yellow (RAL1026) all other parts Black (RAL9005) typically semi-gloss finish.

Overload detection by current sensing, no load detection by 'Floating-plate' assembly.

Normal Travel limits from wire-line encoder. Overtravel via direct struck limits on stage right scissors.

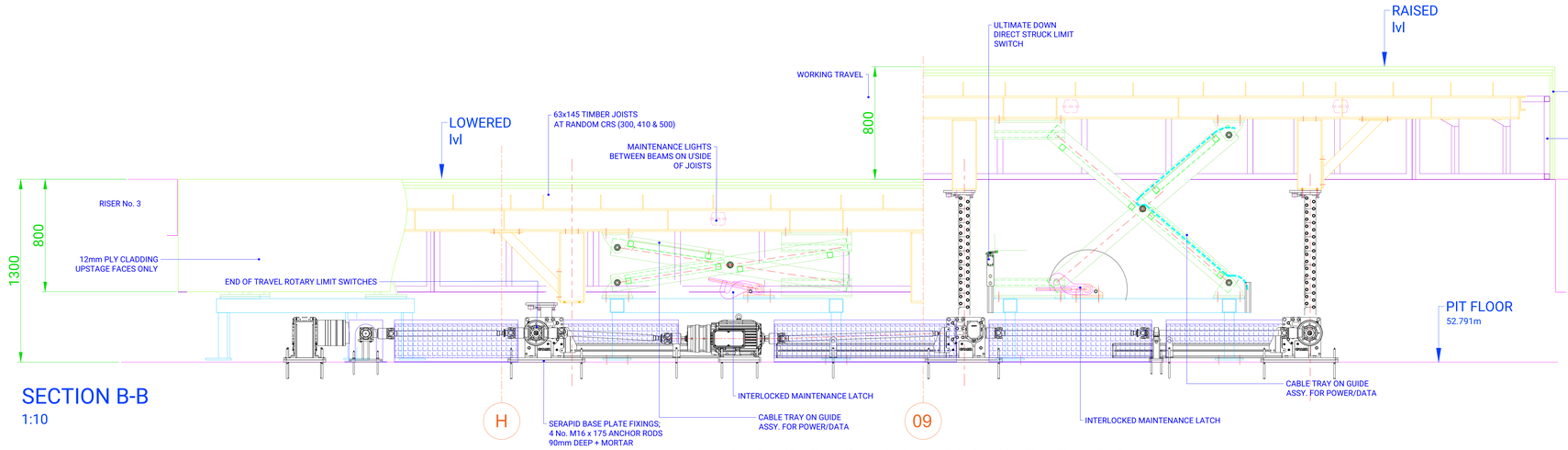
Status:
A - ☐ B - ☐ C - ☐

All dimensions in mm unless otherwise stated. Do not scale.

DRAWN:	SH	DATE:	14/08/2025
CHECKED:	JC	DATE:	14/08/2025
APPROVED:	OS	DATE:	14/08/2025
SCALE:	ON SHEET	PAPER SIZE:	A1

J&C Joel
Inspiration in every performance

PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-GA-08-0003
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-080003
TITLE	CONCERT HALL RISER 2 PROPOSAL FLOOR & STRUCTURE PLANS
PURPOSE	A5 - Accepted as Suitable for Record
	REV C04



SECTION B-B
1:10

PART SECTION B-B LIFT LOWERED 1:20

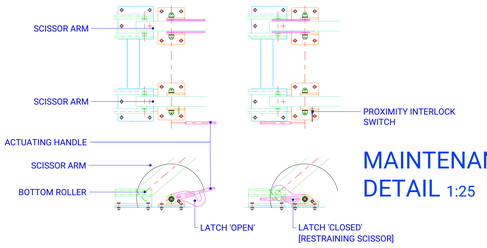
PART SECTION B-B LIFT RAISED 1:20

PRE-SET LEVELS (top of riser floor)

Platform;	B1	54.091m
Riser 'short';	B1+400mm	54.491m
Riser 'tall';	B1+800mm	54.891m

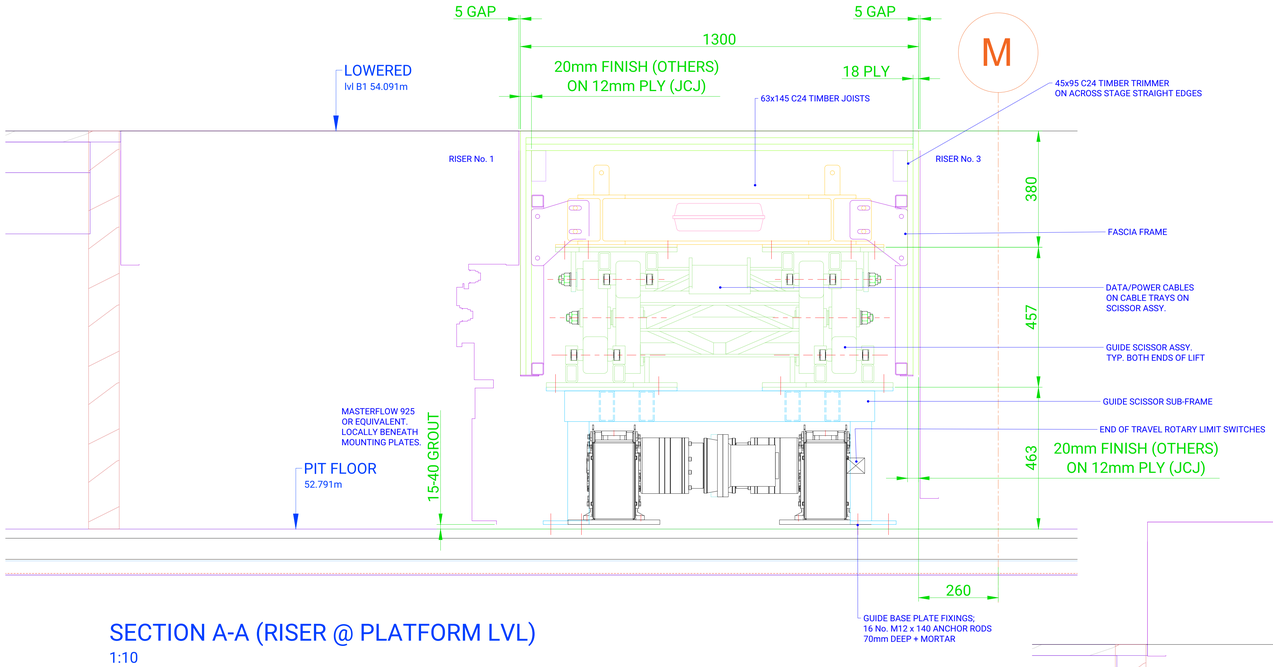
Level Controls from wire driven encoder.
Tol ±1mm

Levels to be confirmed post-installation.
All dimensions to be confirmed with a site survey prior to manufacture.

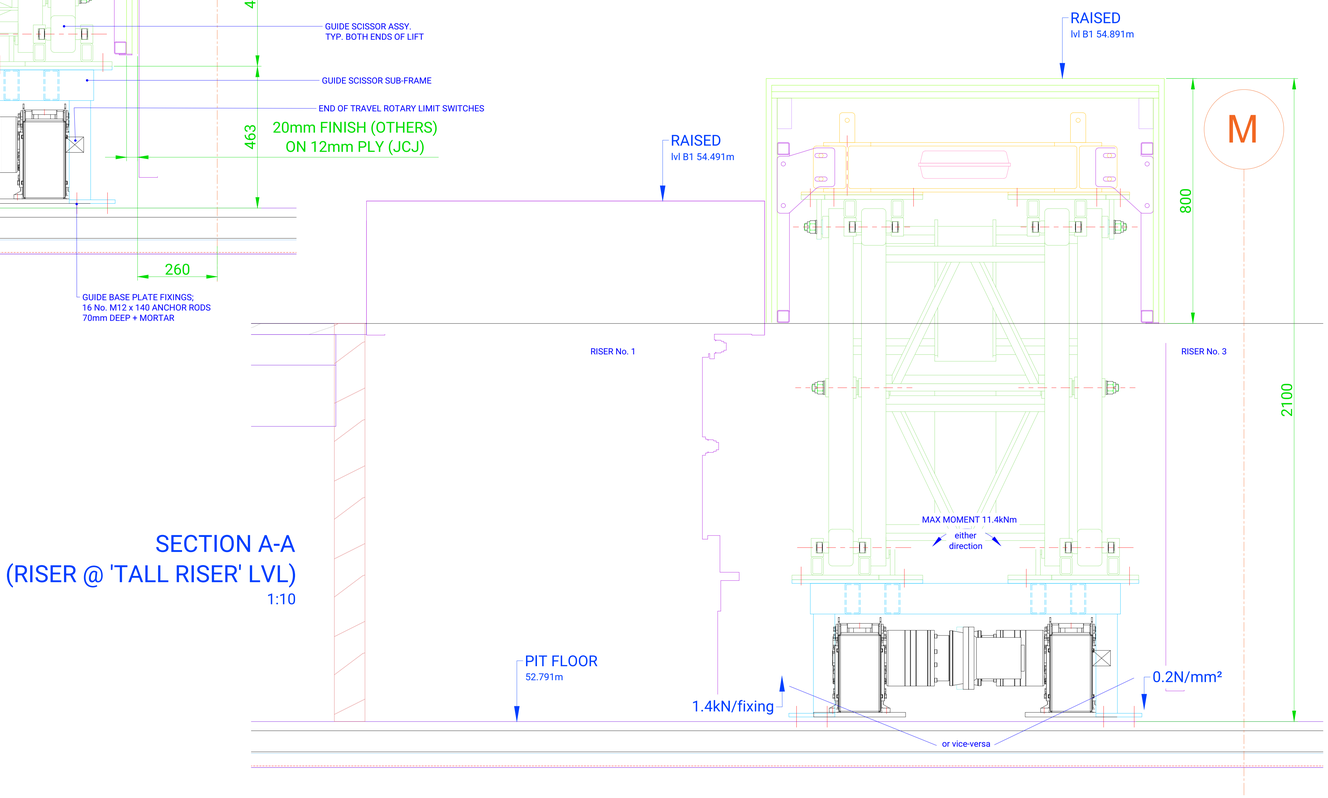


MAINTENANCE LATCH DETAIL 1:25

Lift Speed;	50mm/s
Normal Travel;	0.8m
Overtravel each end;	50mm
Motor Speed;	950rpm
Cardan Shaft speed;	950rpm



SECTION A-A (RISER @ PLATFORM LVL)
1:10



SECTION A-A (RISER @ 'TALL RISER' LVL)
1:10

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REVISIONS

REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	26/10/2023
P02	SC	UPDATED TO CLIENT COMMENTS	08/12/2023
C01	SC	CONSTRUCTION	26/03/2024
C02	JC	CONSTRUCTION	27/05/2024
C03	SH	For Record	14/08/2025

Notes:

Lift Area;	13.5m²
Platform Self Weight;	2400kg
Static Load (@ 500kg/m²);	6750kg
Dynamic Load (@250kg/m²);	3375kg
Test Static Load	8438kg
Test Dyn. Load	3715kg

Point Load 300kg over sq. of 300mm sides

Platform design loads;
Dead (self) + Payload + dyn. (x 1.2) x 2

Horizontal Loads 5% of design loads.

Structural Deflection Limit L/750

Drive Shafts finished Yellow (RAL1026) all other parts Black (RAL9005) typically semi-gloss finish.

Overload detection by current sensing, no load detection by 'Floating-plate' assembly.

Normal Travel limits from wire-line encoder. Overtravel via direct struck limits on stage right scissors.

Status:
A - ☐ B - ☐ C - ☐

All dimensions in mm unless otherwise stated. Do not scale.

DRAWN:	SH	DATE:	14/08/2025
CHECKED:	JC	DATE:	14/08/2025
APPROVED:	OS	DATE:	14/08/2025
SCALE:	ON SHEET	PAPER SIZE:	A1

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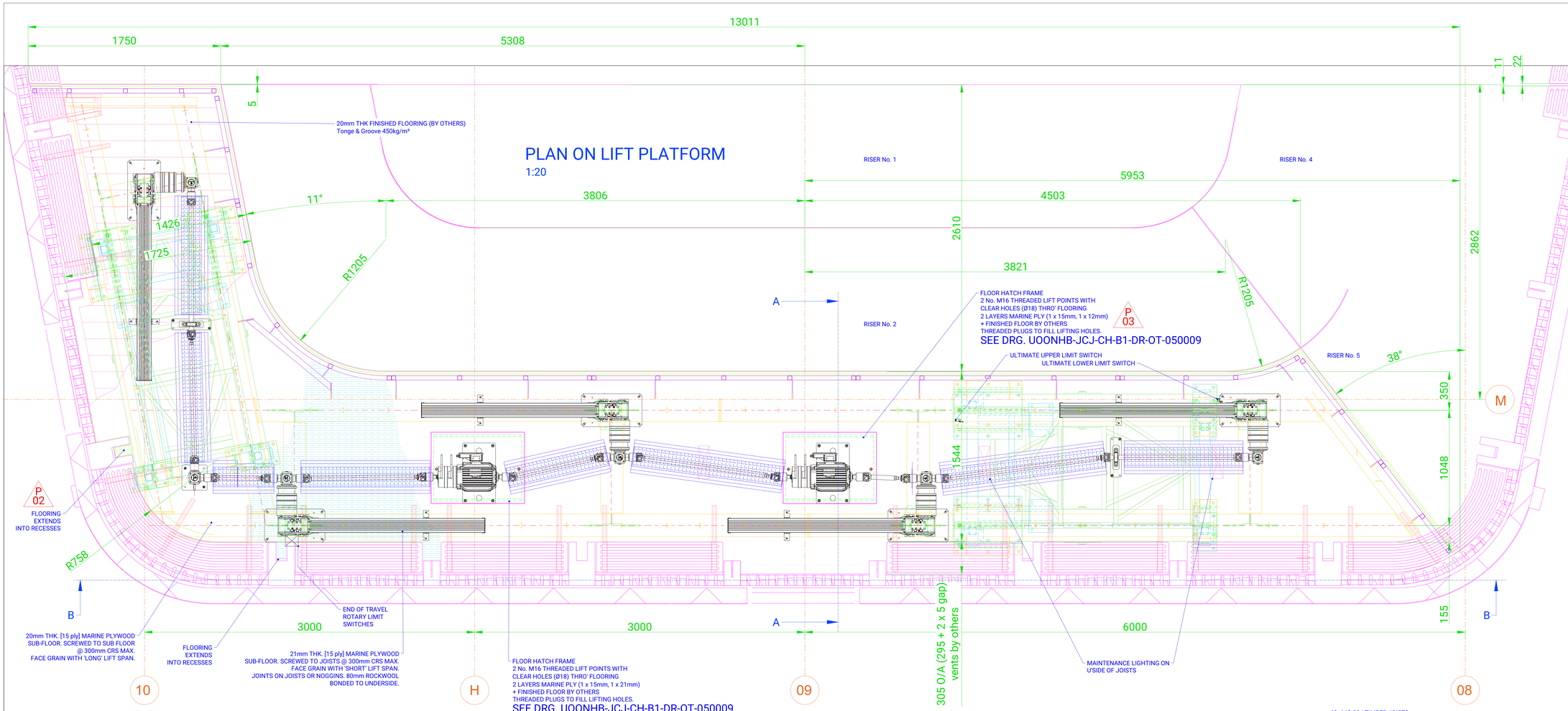
PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-GA-08-0004
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-080004
TITLE	CONCERT HALL RISER 2 PROPOSAL SECTIONS
PURPOSE	A5 - Accepted as Suitable for Record
	REV C03

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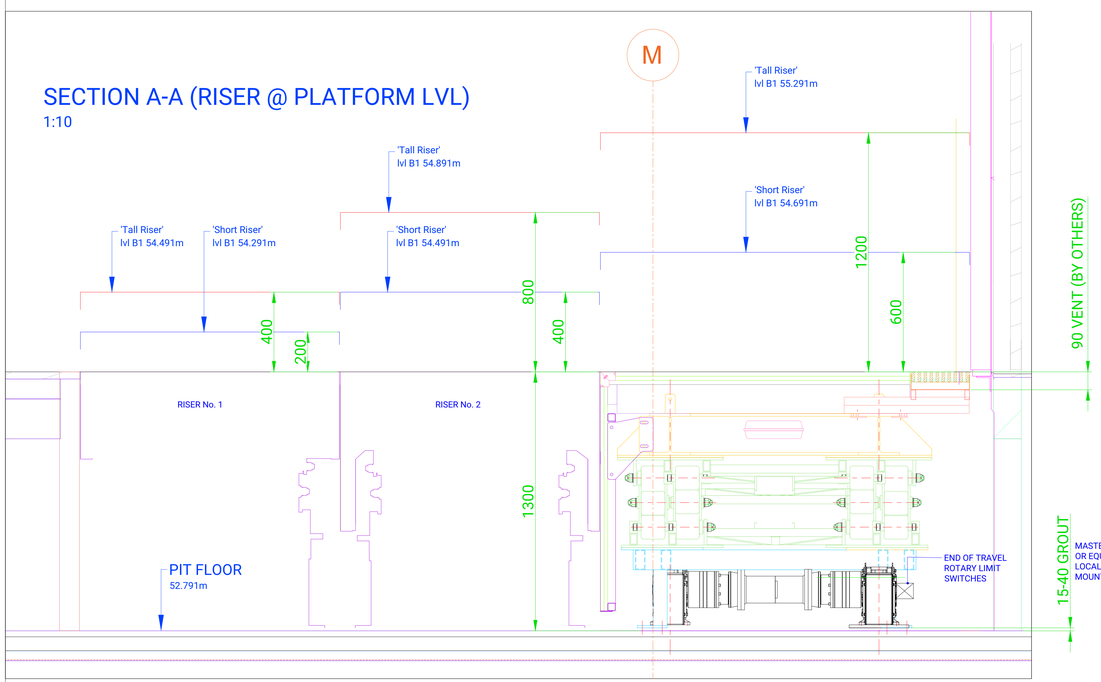
REVISIONS

REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	14/11/2023
P02	SC	UPDATED TO CLIENT COMMENTS	08/12/2023
P03	SC	ACCESS HATCH RELOCATED FOR 2nd MOTOR	09/01/2024
C01	SC	CONSTRUCTION	26/03/2024
C02	JC	CONSTRUCTION	27/05/2024
C03	SH	For Record	14/08/2025

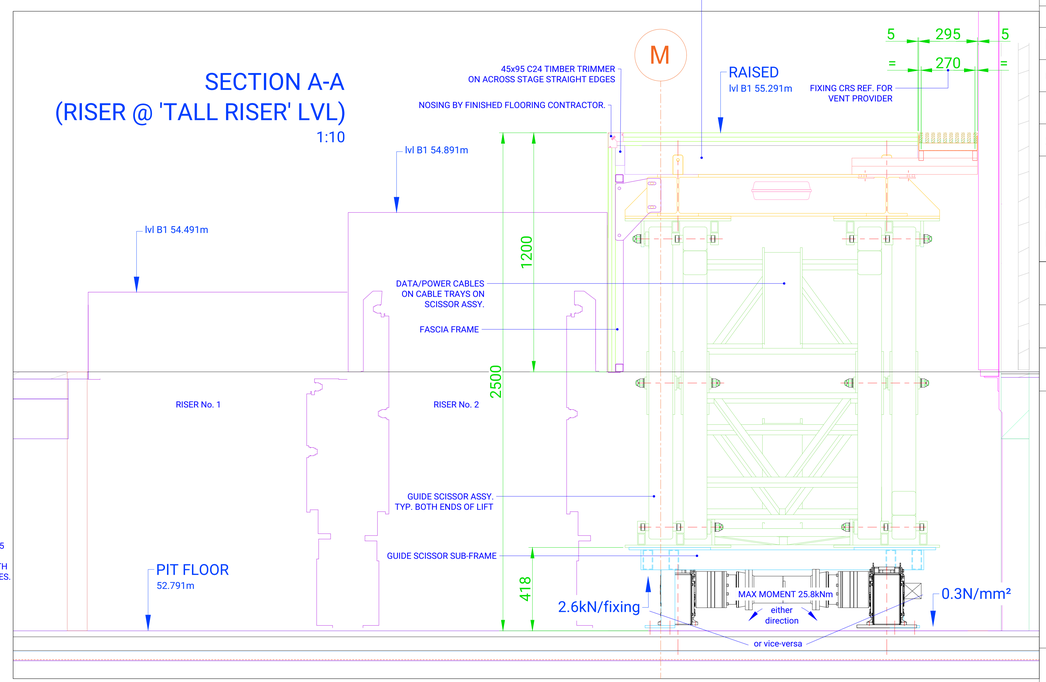
PLAN ON LIFT PLATFORM
1:20



SECTION A-A (RISER @ PLATFORM LVL)
1:10



SECTION A-A (RISER @ 'TALL RISER' LVL)
1:10



SEE DRG. UOONHB-JCJ-CH-B1-DR-OT-080006 & 080007 FOR SECTION B-B & PLATFORM STRUCTURE PLAN

Notes:

Lift Area;	26m²
Platform Self Weight;	4200kg
Static Load (@ 500kg/m²);	13000kg
Dynamic Load (@250kg/m²);	6500kg
Test Static Load	16250kg
Test Dyn. Load	7150kg

Platform design loads;
Dead (self) + Payload + dyn. (x 1.2) x 2

Horizontal Loads 5% of design loads.

Structural Deflection Limit L/750

Drive Shafts finished Yellow (RAL1026) all other parts Black (RAL9005) typically semi-gloss finish.

Overload detection by current sensing, no load detection by 'Floating-plate' assembly.

Normal Travel limits from wire-line encoder. Overtravel via direct struck limits on stage right scissors.

Status:
A - ☐ B - ☐ C - ☐

All dimensions in mm unless otherwise stated. Do not scale.

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CHECKED:	JC	DATE:	14/08/2025
APPROVED:	OS	DATE:	14/08/2025
SCALE:	ON SHEET	PAPER SIZE:	A1

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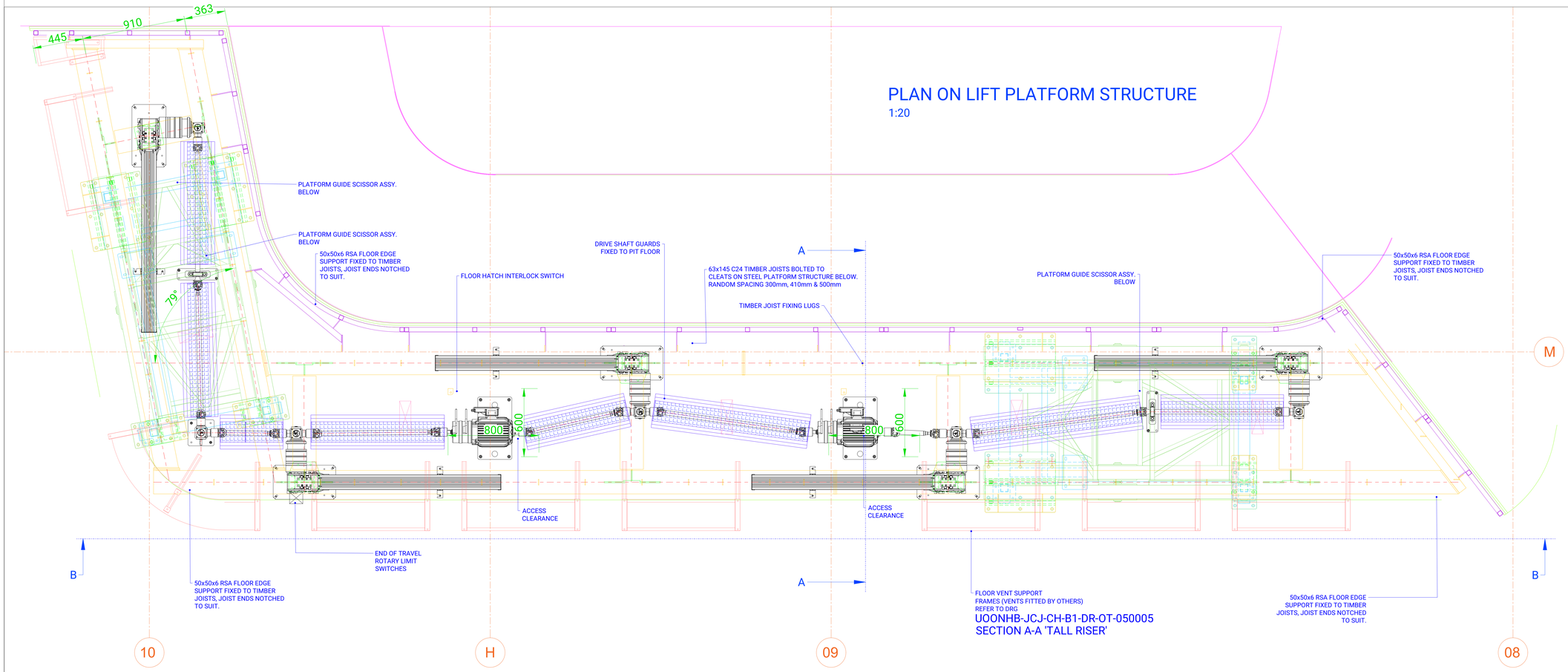
PROJECT	4334 - Oxford Humanities
JCJ NO.	-
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-080005
TITLE	CONCERT HALL RISER 3 PROPOSAL FLOOR & STRUCTURE PLANS
PURPOSE	A5 - Accepted as Suitable for Record
	REV C03

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REVISIONS

REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	14/11/2023
P02	SC	UPDATED TO CLIENT COMMENTS	11/12/2023
P03	SC	ACCESS HATCH RELOCATED FOR 2nd MOTOR	09/01/2024
C01	SC	CONSTRUCTION	26/03/2024
C02	JC	CONSTRUCTION	27/05/2024
C03	SH	For Record	14/08/2025

PLAN ON LIFT PLATFORM STRUCTURE
1:20



Notes:

Lift Area;	26m²
Platform Self Weight;	4200kg
Static Load (@ 500kg/m²);	13000kg
Dynamic Load (@250kg/m²);	6500kg
Test Static Load	16250kg
Test Dyn. Load	7150kg

Point Load 300kg over sq. of 300mm sides

Platform design loads;
Dead (self) + Payload + dyn. (x 1.2) x 2

Horizontal Loads 5% of design loads.

Structural Deflection Limit L/750

Drive Shafts finished Yellow (RAL1026) all other parts Black (RAL9005) typically semi-gloss finish.

Overload detection by current sensing, no load detection by 'Floating-plate' assembly.

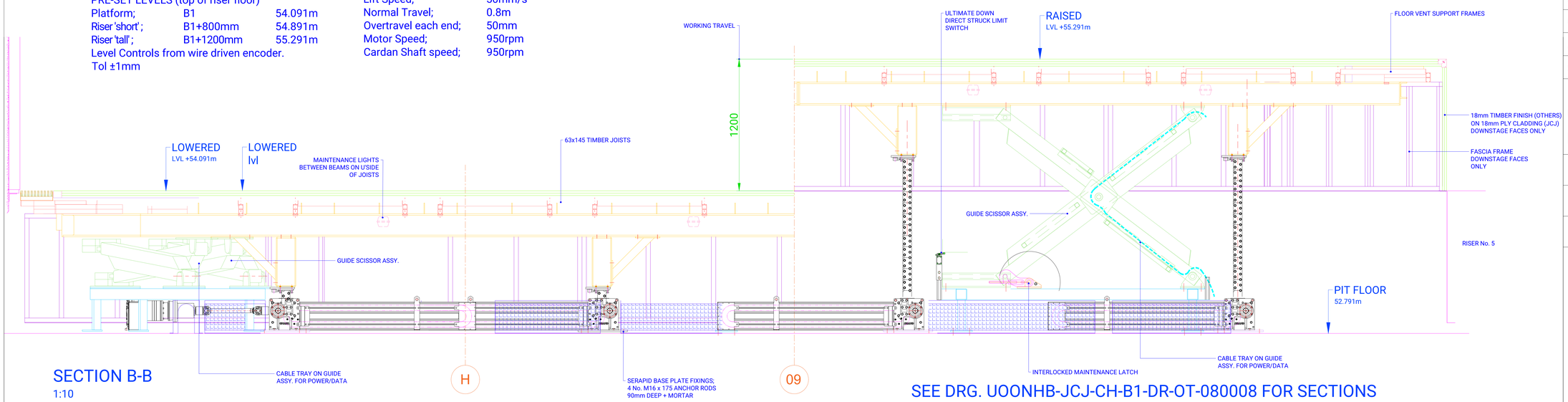
Normal Travel limits from wire-line encoder. Overtravel via direct struck limits on stage right scissors.

PRE-SET LEVELS (top of riser floor)

Platform;	B1	54.091m
Riser 'short';	B1+800mm	54.891m
Riser 'tall';	B1+1200mm	55.291m

Level Controls from wire driven encoder.
Tol ±1mm

Lift Speed;	50mm/s
Normal Travel;	0.8m
Overtravel each end;	50mm
Motor Speed;	950rpm
Cardan Shaft speed;	950rpm



SECTION B-B
1:10

SEE DRG. UOONHB-JCJ-CH-B1-DR-OT-080008 FOR SECTIONS

PART SECTION B-B LIFT LOWERED 1:20

PART SECTION B-B LIFT RAISED 1:20

SEE DRG. UOONHB-JCJ-CH-B1-DR-OT-080005 FOR SECTION A-A & PLATFORM PLAN

SEE DRG. UOONHB-JCJ-CH-B1-DR-OT-080007 FOR DRIVE PLAN

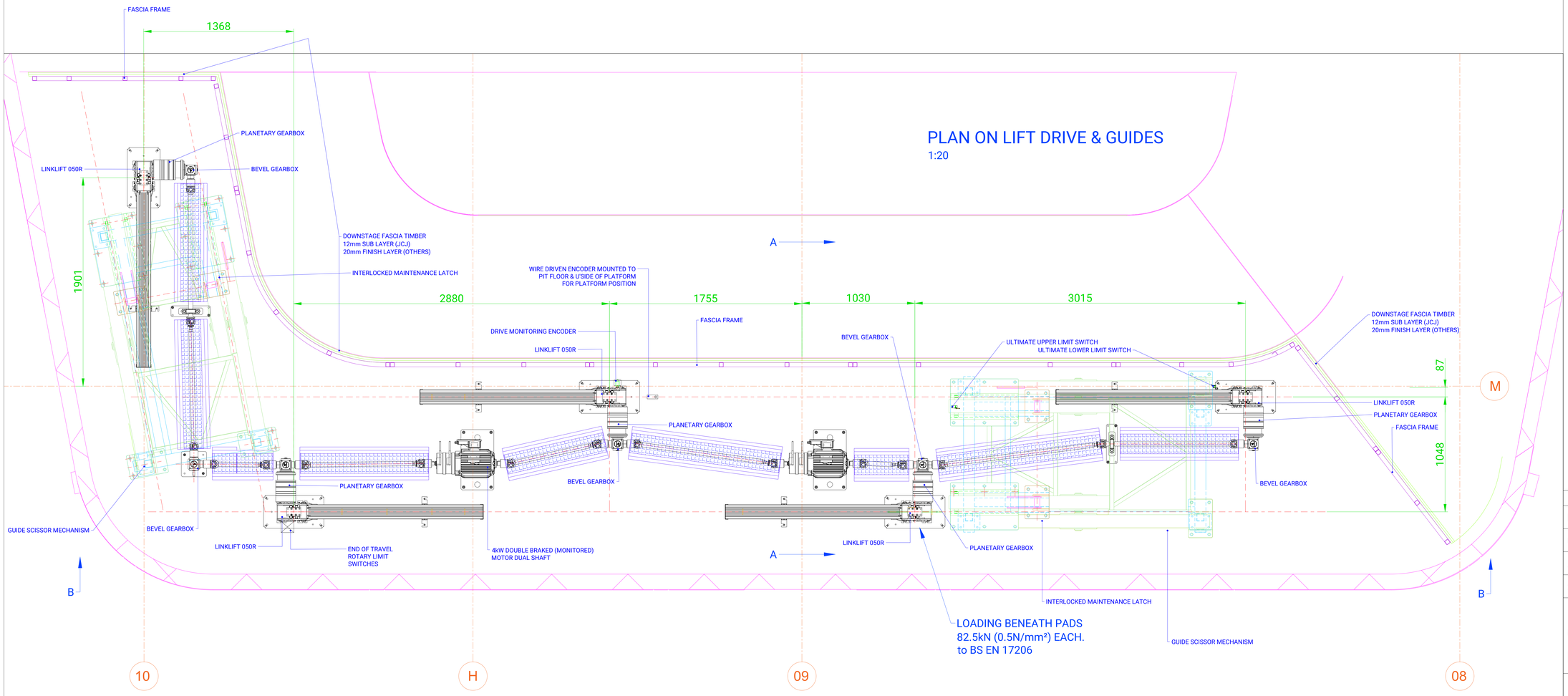
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All dimensions in mm unless otherwise stated. Do not scale.

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CHECKED:	JC	DATE:	14/08/2025
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PROJECT	4334 - Oxford Humanities
JCJ NO.	-
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-080006
TITLE	CONCERT HALL RISER 3 PROPOSAL FLOOR & STRUCTURE PLANS
PURPOSE	A5 - Accepted as Suitable for Record
	REV C03



PLAN ON LIFT DRIVE & GUIDES

1:20

SEE DRG. UOONHB-JCJ-CH-B1-DR-OT-080005 FOR SECTION A-A & PLATFORM STRUCTURE PLAN

SEE DRG. UOONHB-JCJ-CH-B1-DR-OT-080006 FOR SECTION B-B & DRIVE PLAN

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REVISIONS

REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	14/11/2023
P02	SC	UPDATED TO CLIENT COMMENTS	11/12/2023
P03	SC	2nd MOTOR ADDED	09/01/2024
C01	SC	CONSTRUCTION	26/03/2024
C02	JC	CONSTRUCTION	27/05/2024
C03	SH	For Record	14/08/2025

Notes:

Lift Area;	26m²
Platform Self Weight;	4200kg
Static Load (@ 500kg/m²);	13000kg
Dynamic Load (@250kg/m²);	6500kg
Test Static Load	16250kg
Test Dyn. Load	7150kg

Point Load 300kg over sq. of 300mm sides

Platform design loads;
Dead (self) + Payload + dyn. (x 1.2) x 2

Horizontal Loads 5% of design loads.

Structural Deflection Limit L/750

Drive Shafts finished Yellow (RAL1026)
all other parts Black (RAL9005) typically
semi-gloss finish.

Overload detection by current sensing,
no load detection by 'Floating-plate'
assembly.

Normal Travel limits from wire-line encoder.
Overtravel via direct struck limits on
stage right scissors.

Status:
A - ☐ B - ☐ C - ☐

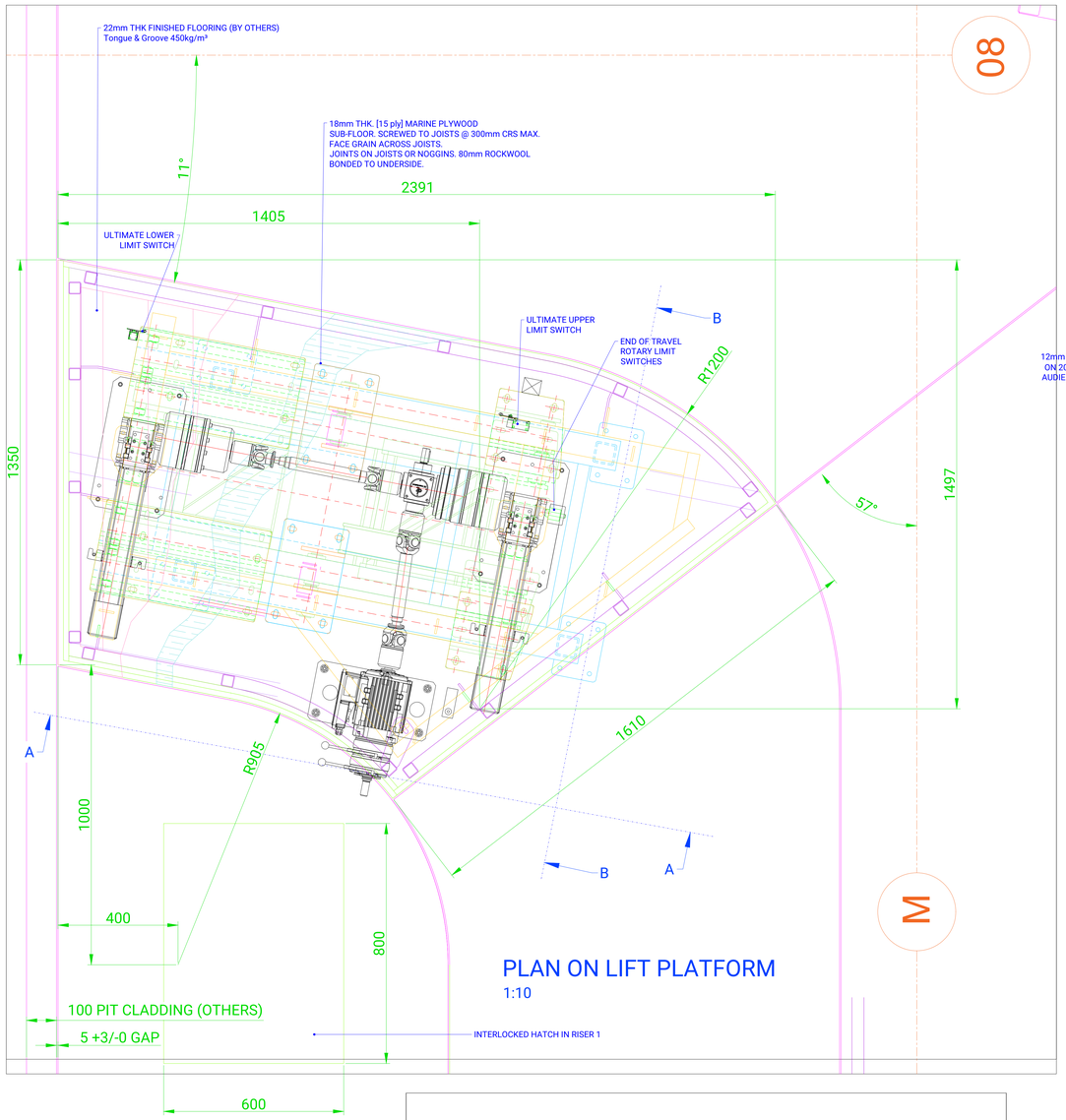
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CHECKED:	JC	DATE:	14/08/2025
APPROVED:	OS	DATE:	14/08/2025
SCALE:	ON SHEET	PAPER SIZE:	A1

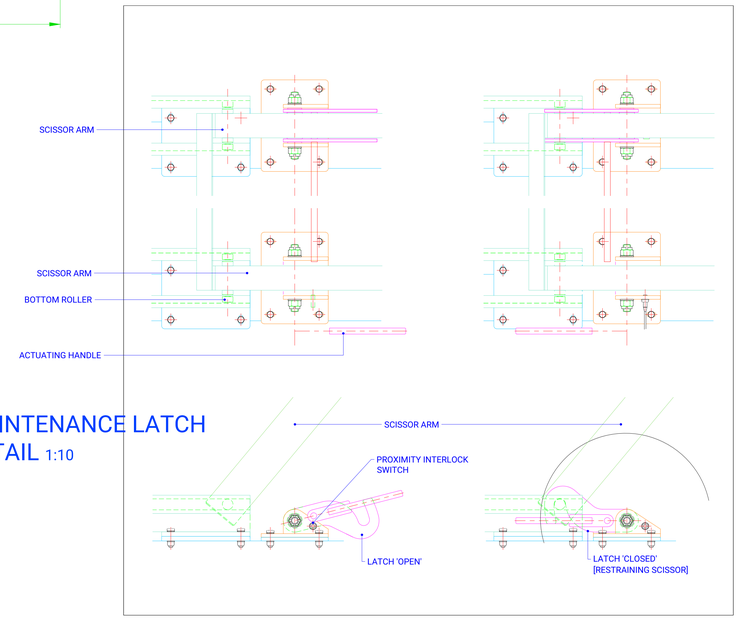
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PROJECT	4334 - Oxford Humanities
JCJ NO.	-
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-080007
TITLE	CONCERT HALL RISER 3 PROPOSAL PIT PLAN
PURPOSE	A5 - Accepted as Suitable for Record
	REV C03

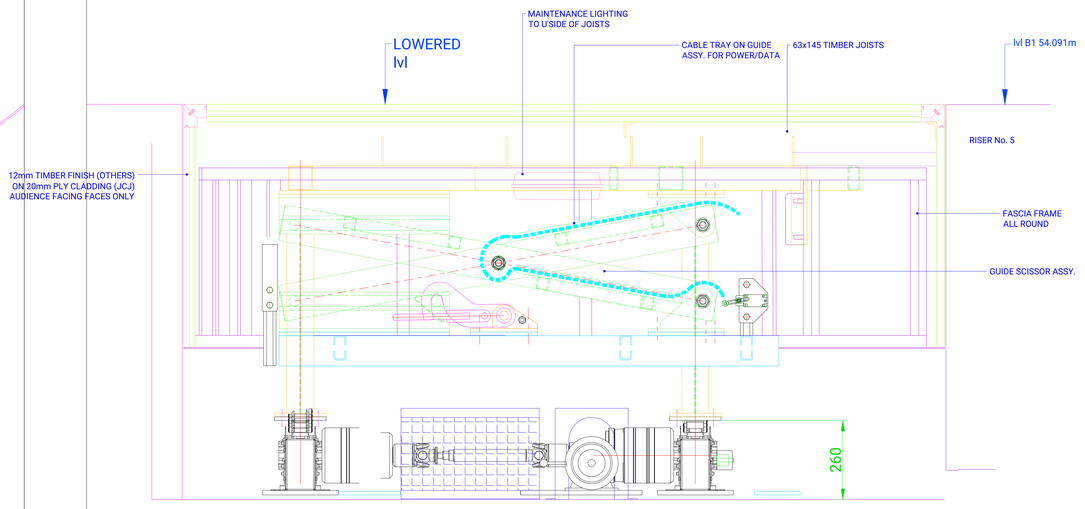


PLAN ON LIFT PLATFORM
1:10

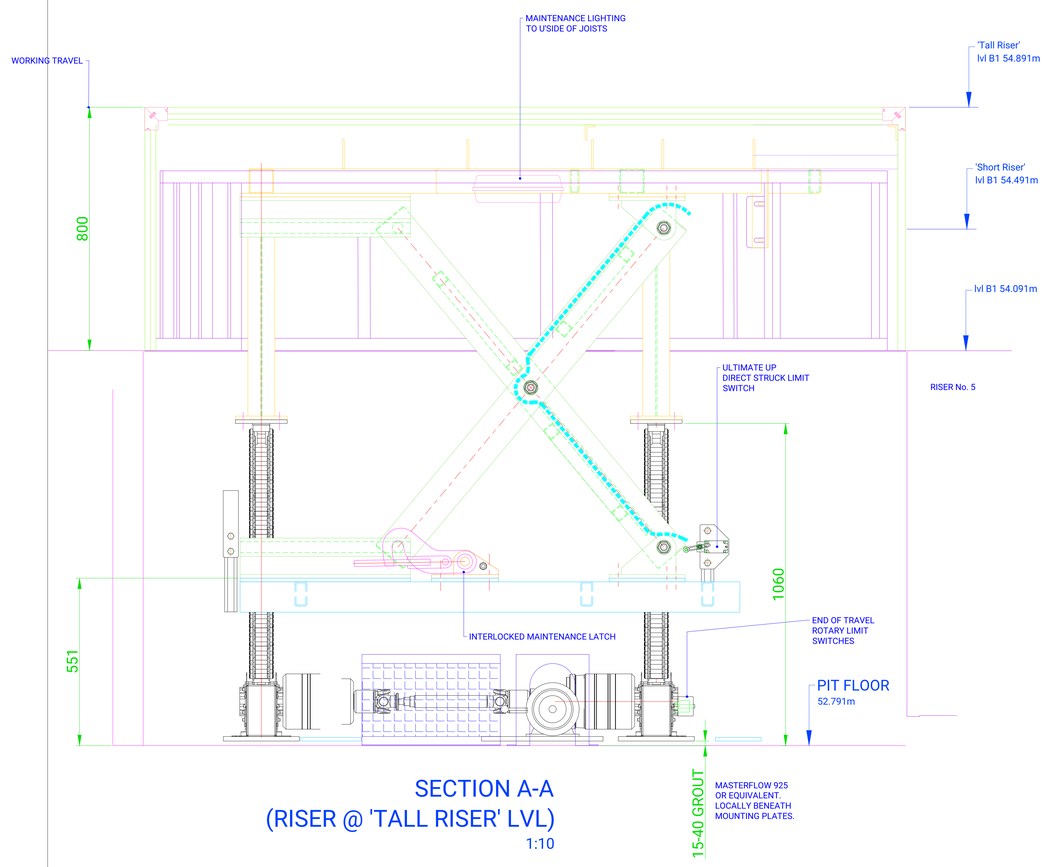


MAINTENANCE LATCH DETAIL 1:10

SEE DRG. UOONHB-JCJ-CH-B1-DR-OT-080009 FOR SECTION B-B, PLATFORM STRUCTURE & DRIVE PLANS



SECTION A-A (RISER @ PLATFORM LVL)
1:10



SECTION A-A (RISER @ 'TALL RISER' LVL)
1:10

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REVISIONS			
REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	30/11/2023
P02	SC	MODIFIED TO CLIENT COMMENTS	19/12/2023
C01	SC	CONSTRUCTION	26/03/2024
C02	JC	CONSTRUCTION	27/05/2024
C03	SH	For Record	14/08/2025

Notes:

Lift Area;	2.7m²
Platform Self Weight;	700kg
Static Load (@ 500kg/m²);	1350kg
Dynamic Load (@250kg/m²);	675kg
Test Static Load	1563kg
Test Dyn. Load	743kg

Platform design loads;
Dead (self) + Payload + dyn. (x 1.2) x 2

Point loading 300kg over sq. of 300mm sides

Horizontal Loads 5% of design loads.

Structural Deflection Limit L/750

Drive Shafts finished Yellow (RAL1026) all other parts Black (RAL9005) typically semi-gloss finish.

Overload detection by current sensing, no load detection by 'Floating-plate' assembly.

Normal Travel limits from wire-line encoder. Overtravel via direct struck limits on stage right scissors.

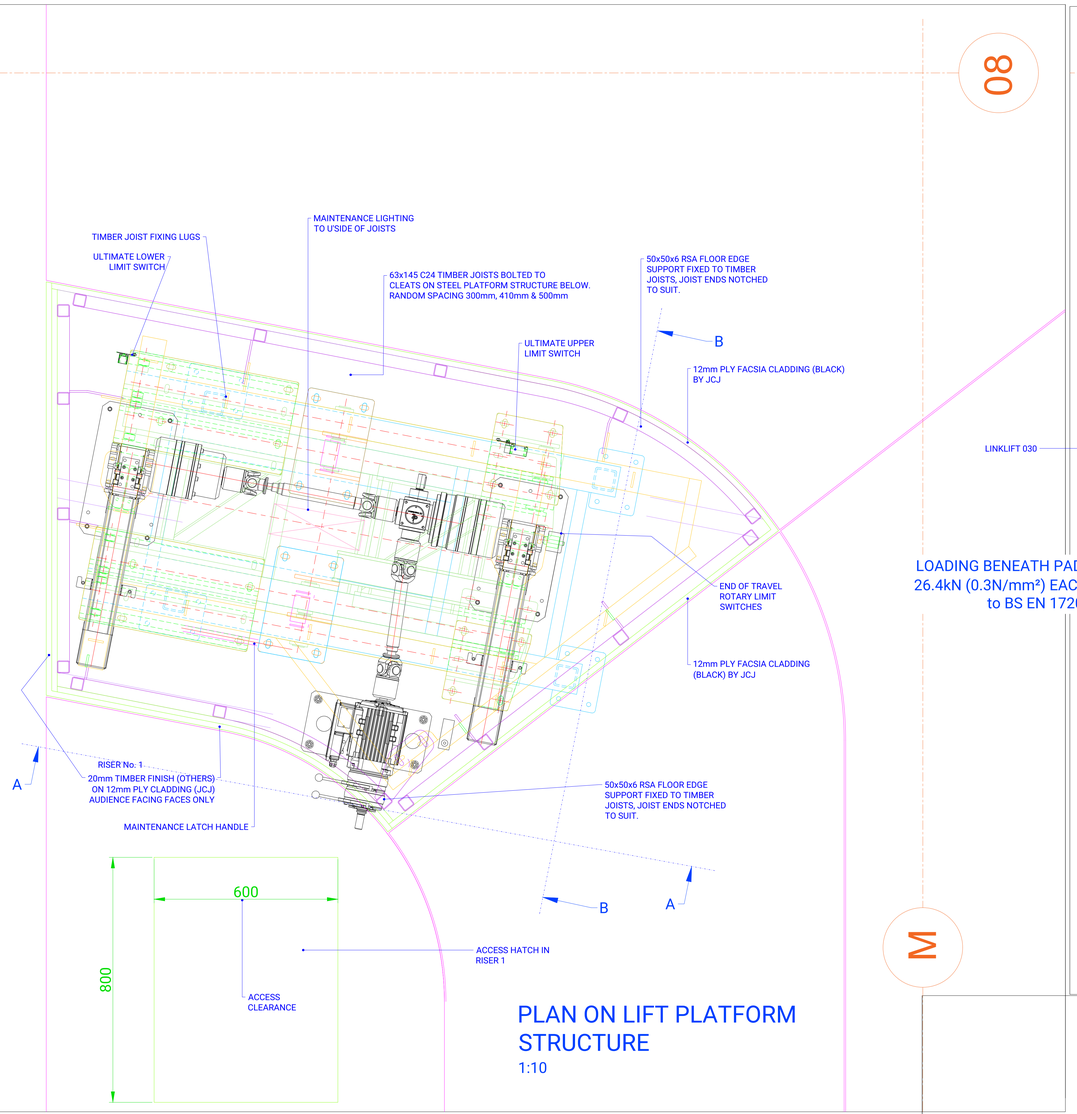
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All dimensions in mm unless otherwise stated. Do not scale.

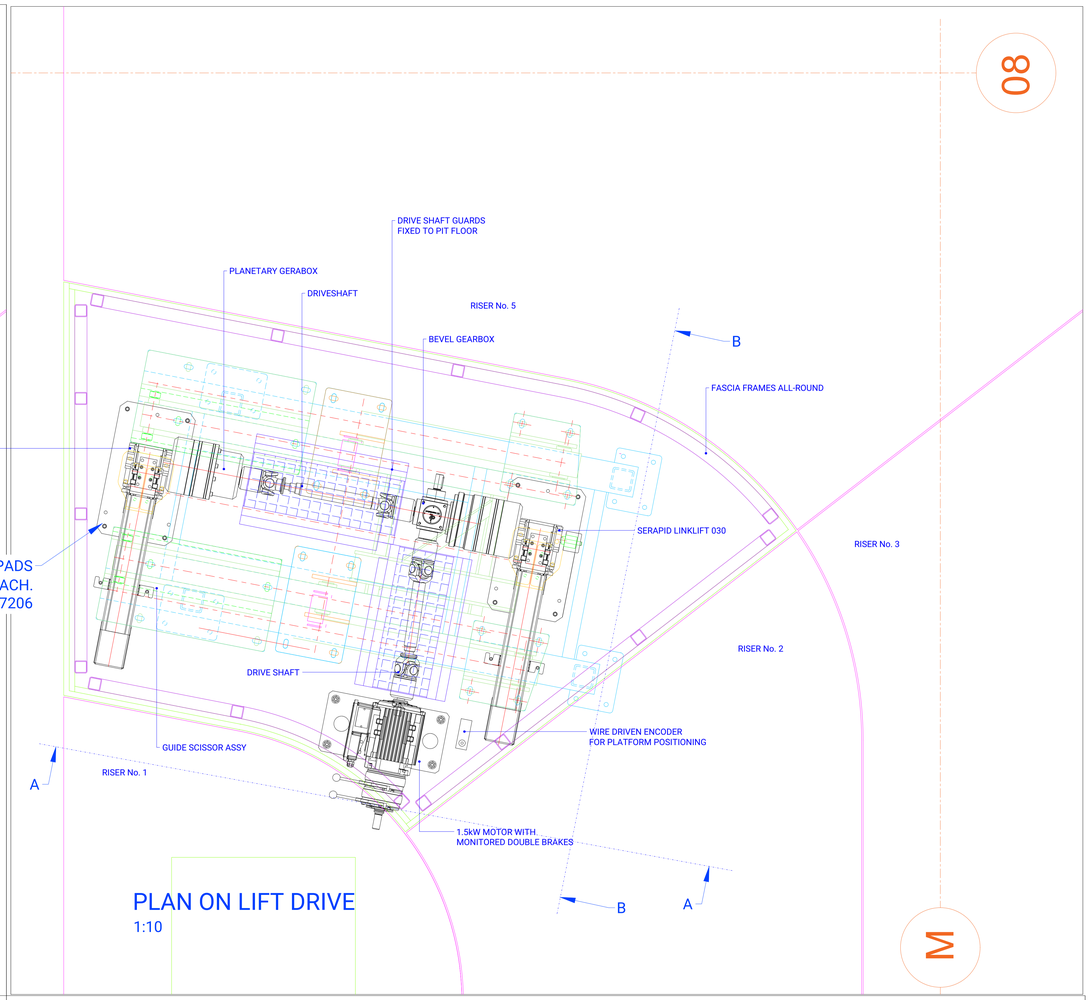
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PROJECT	4334 - Oxford Humanities
JCJ NO.	434-GA-08-0008
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-080008
TITLE	CONCERT HALL RISER 4 PROPOSAL FLOOR & STRUCTURE PLANS
PURPOSE	A5 - Accepted as Suitable for Record
	REV C03



PLAN ON LIFT PLATFORM STRUCTURE
1:10



PLAN ON LIFT DRIVE
1:10

PRE-SET LEVELS (top of riser floor)

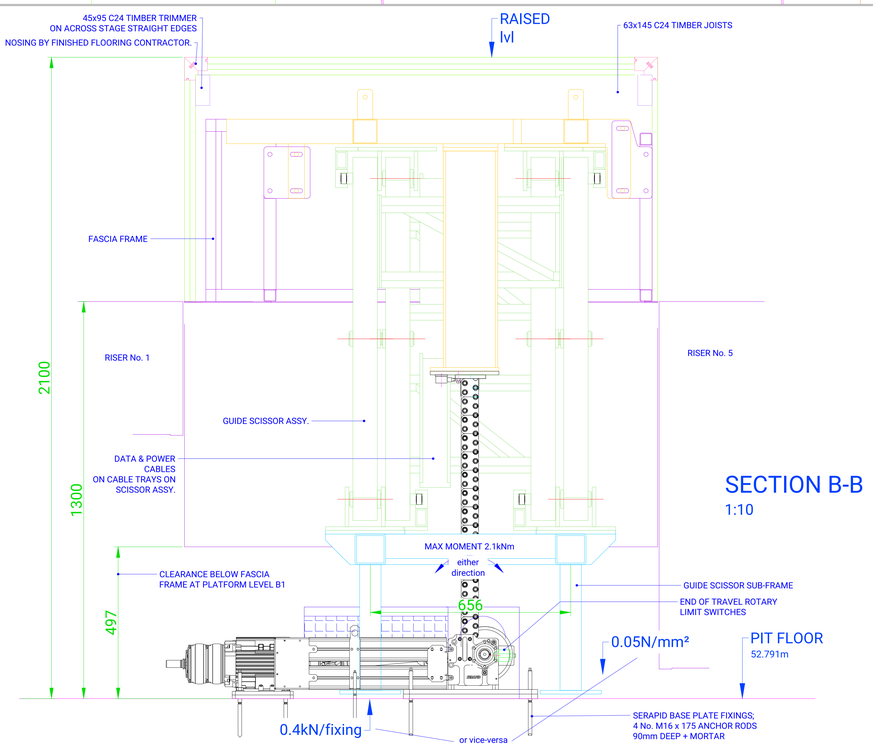
Platform;	B1	54.091m
Riser 'short' ;	B1+400mm	54.491m
Riser 'tall' ;	B1+800mm	54.891m

Level Controls from wire driven encoder.
Tol ±1mm

Lift Speed;	50mm/s
Normal Travel;	0.8m
Overtravel each end;	50mm
Motor Speed;	950rpm
Cardan Shaft speed;	950rpm

Levels to be confirmed post-installation.
All dimensions to be confirmed with a site survey prior to manufacture.

SEE DRG. UOONHB-JCJ-CH-B1-DR-OT-080008 FOR SECTION A-A & PLATFORM PLAN



SECTION B-B
1:10

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REVISIONS

REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	30/11/2023
P02	SC	MODIFIED TO CLIENT COMMENTS	19/12/2023
C01	SC	CONSTRUCTION	26/03/2024
C02	JC	CONSTRUCTION	27/05/2024
C03	SH	For Record	14/08/2025

Notes:

Lift Area;	2.7m²
Platform Self Weight;	700kg
Static Load (@ 500kg/m²);	1350kg
Dynamic Load (@250kg/m²);	675kg
Test Static Load	1563kg
Test Dyn. Load	743kg

Platform design loads;
Dead (self) + Payload + dyn. (x 1.2) x 2

Point loading 300kg over sq. of 300mm sides

Horizontal Loads 5% of design loads.

Structural Deflection Limit L/750

Drive Shafts finished Yellow (RAL1026) all other parts Black (RAL9005) typically semi-gloss finish.

Overload detection by current sensing, no load detection by 'Floating-plate' assembly.

Normal Travel limits from wire-line encoder. Overtravel via direct struck limits on stage right scissors.

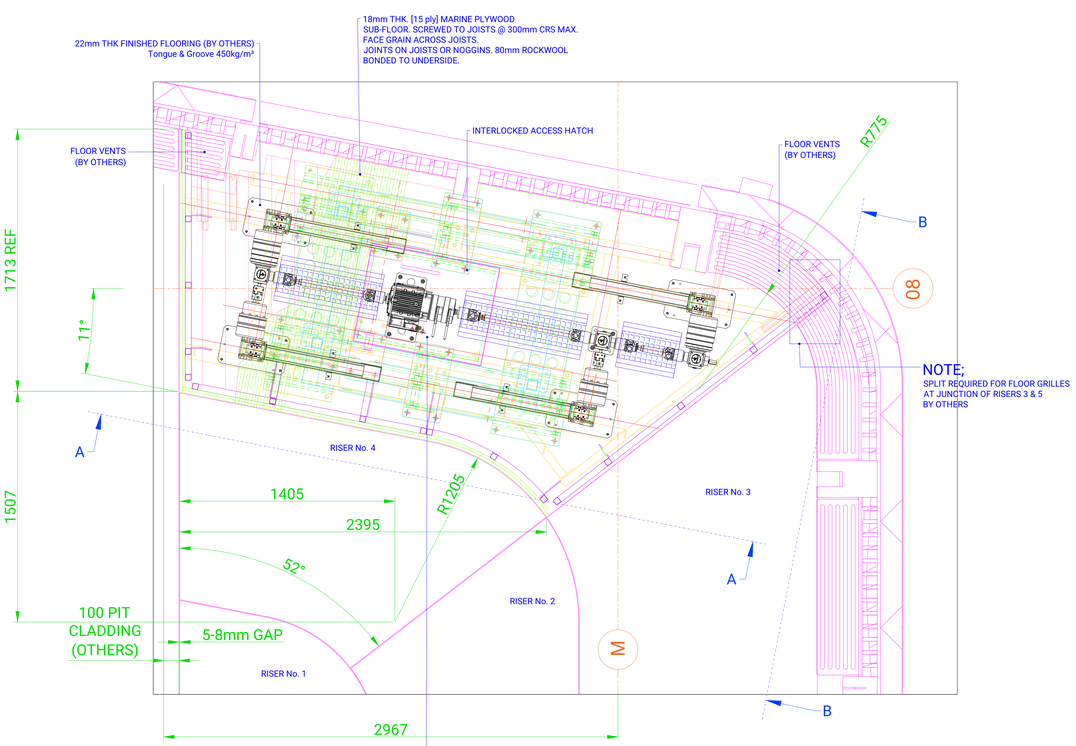
Status:
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All dimensions in mm unless otherwise stated. Do not scale.

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CHECKED:	JC	DATE:	14/08/2025
APPROVED:	OS	DATE:	14/08/2025
SCALE:	ON SHEET	PAPER SIZE:	A1

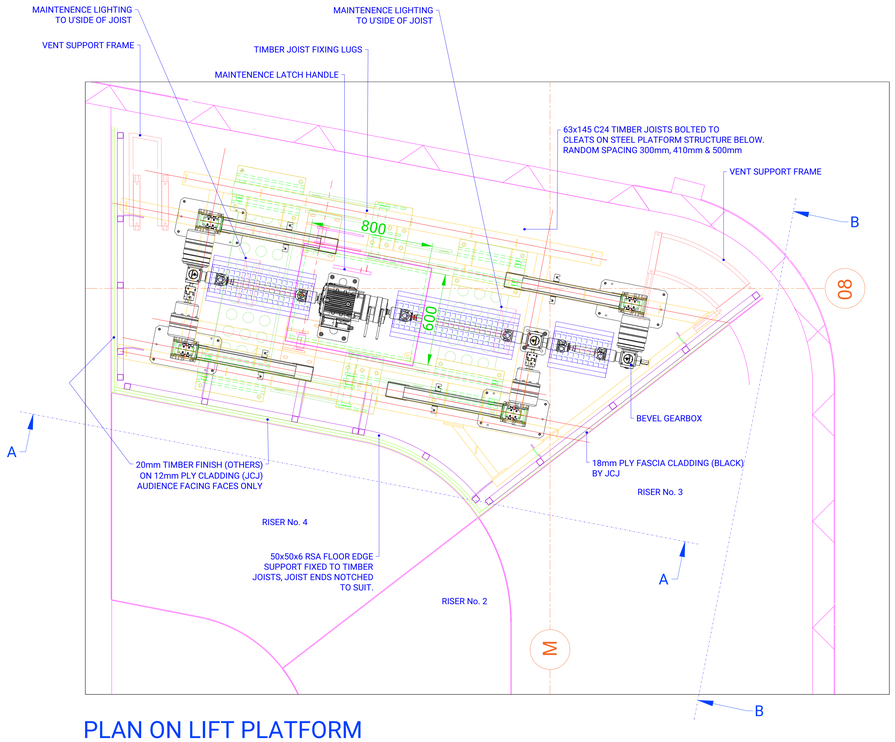
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PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-GA-08-0009
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-080009
TITLE	CONCERT HALL RISER 4 PROPOSAL FLOOR & STRUCTURE PLANS
PURPOSE	A5 - Accepted as Suitable for Record
	REV C03



SEE DRG. UOONHB-JCJ-CH-B1-DR-OT-050009

PLAN ON LIFT PLATFORM
1:20



PLAN ON LIFT PLATFORM STRUCTURE
1:20

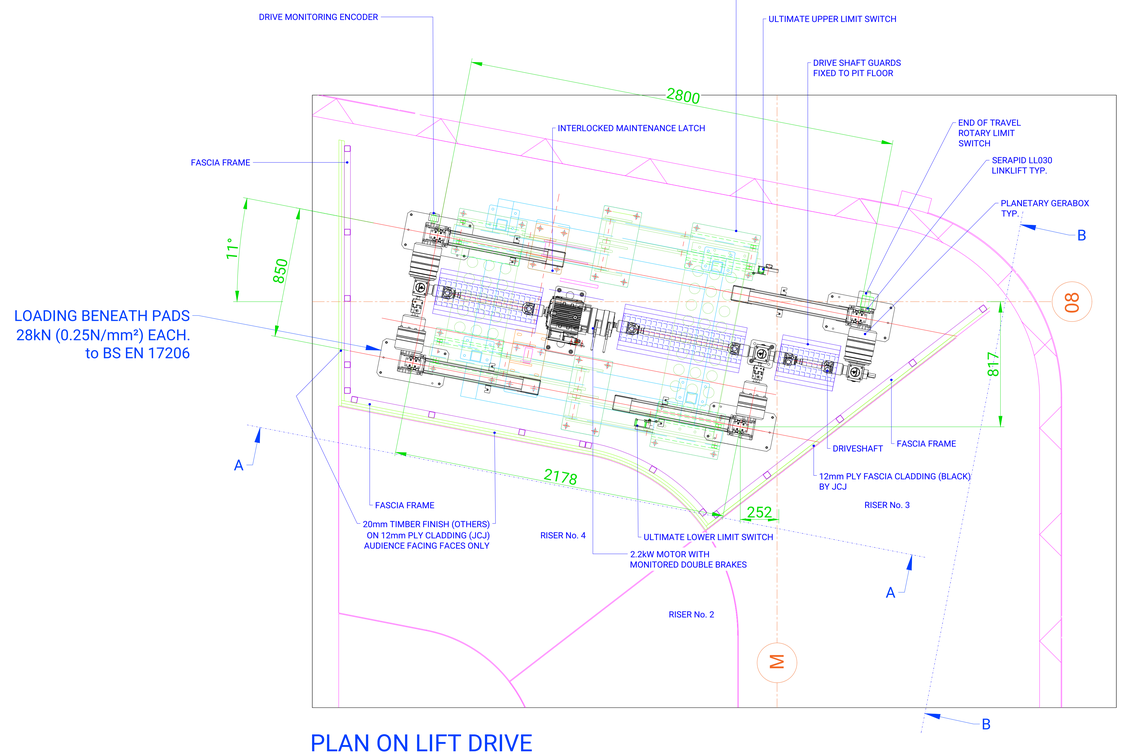
Levels to be confirmed post-installation.
All dimensions to be confirmed with a site survey prior to manufacture.

PRE-SET LEVELS (top of riser floor)

Platform;	B1	54.091m
Riser 'short';	B1+600mm	54.691m
Riser 'tall';	B1+1200mm	55.291m

Level Controls from wire driven encoder.
Tol ±1mm

Lift Speed;	50mm/s
Normal Travel;	1.2m
Overtravel each end;	50mm
Motor Speed;	950rpm
Cardan Shaft speed;	950rpm



PLAN ON LIFT DRIVE
1:20

SEE DRG. UOONHB-JCJ-CH-B1-DR-OT-080011 FOR SECTIONS A-A & B-B

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REVISIONS

REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	11/12/2023
P02	SC	UPDATE TO CLIENT COMMENTS	19/12/2023
C01	SC	CONSTRUCTION	26/03/2024
C02	JC	CONSTRUCTION	27/05/2024
C03	SH	For Record	14/08/2025

Notes:

Lift Area;	6.3m²
Platform Self Weight;	1200kg
Static Load (@ 500kg/m²);	3150kg
Dynamic Load (@250kg/m²);	1575kg
Test Static Load	3938kg
Test Dyn. Load	1733kg

Point Loading 300kg over sq. of 300mm sides

Platform design loads;
Dead (self) + Payload + dyn. (x 1.2) x 2

Horizontal Loads 5% of design loads.

Structural Deflection Limit L/750

Drive Shafts finished Yellow (RAL1026)
all other parts Black (RAL9005) typically
semi-gloss finish.

Overload detection by current sensing,
no load detection by 'Floating-plate' assembly.

Normal Travel limits from wire-line encoder.
Overtravel via direct struck limits on
stage right scissors.

Status:
A - ☐ B - ☐ C - ☐

All dimensions in mm unless otherwise stated. Do not scale.

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CHECKED:	JC	DATE:	14/08/2025
APPROVED:	OS	DATE:	14/08/2025
SCALE:	ON SHEET	PAPER SIZE:	A1

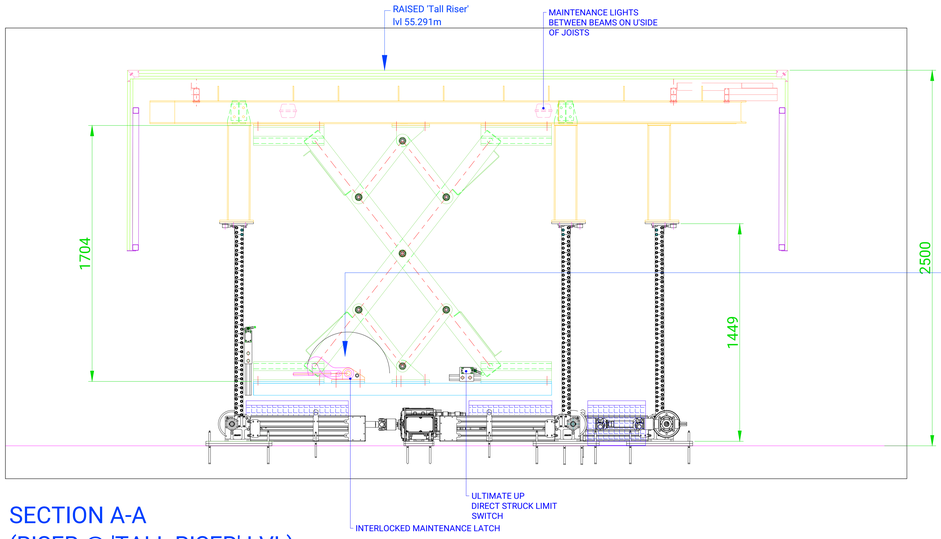
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PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-GA-08-0010
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-080010
TITLE	CONCERT HALL RISER 5 PROPOSAL PLANS
PURPOSE	A5 - Accepted as Suitable for Record
	REV C03

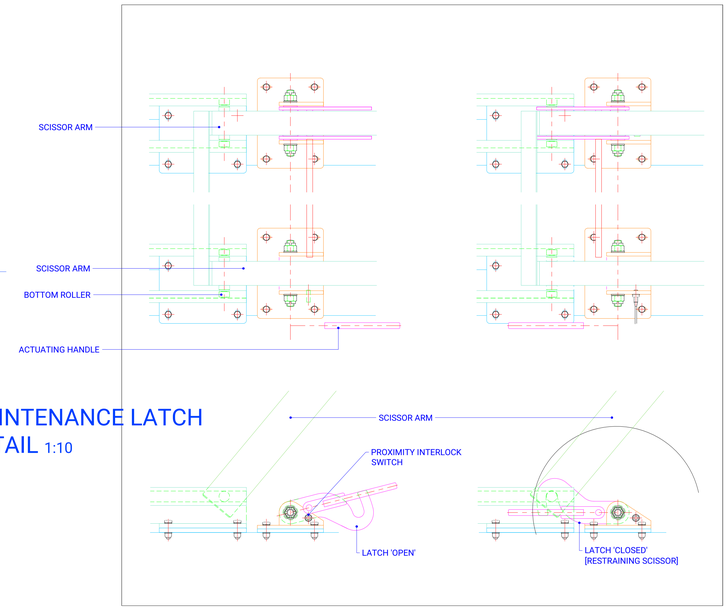
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REVISIONS

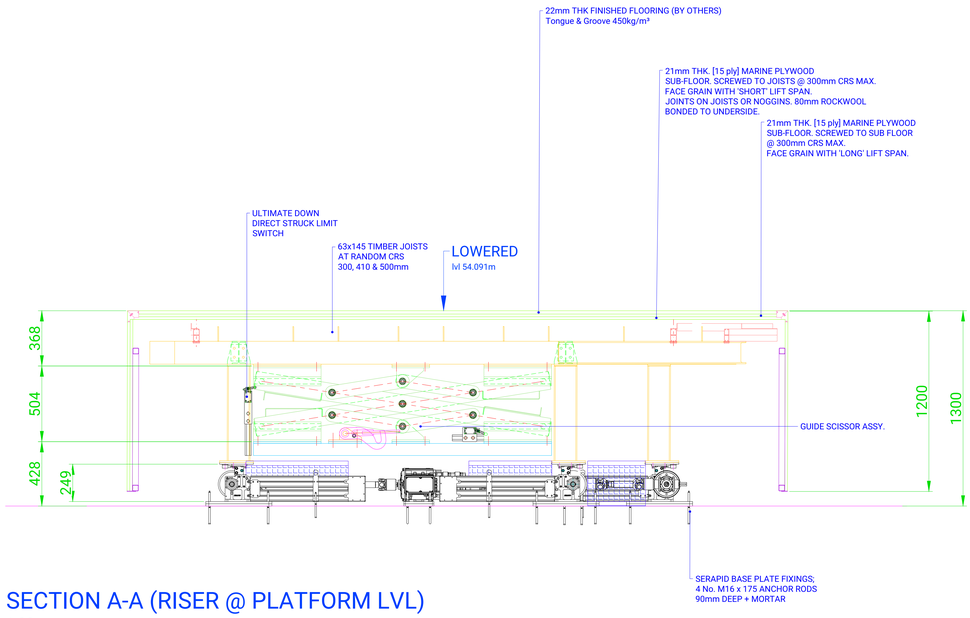
REV.	BY	DESCRIPTION	DATE
P01	SC	FIRST ISSUE	30/11/2023
P02	SC	UPDATED TO CLIENT COMMENTS	19/12/2023
C01	SC	CONSTRUCTION	26/03/2024
C02	JC	CONSTRUCTION	27/05/2024
C03	SH	For Record	14/08/2025



SECTION A-A
(RISER @ 'TALL RISER' LVL)
1:20

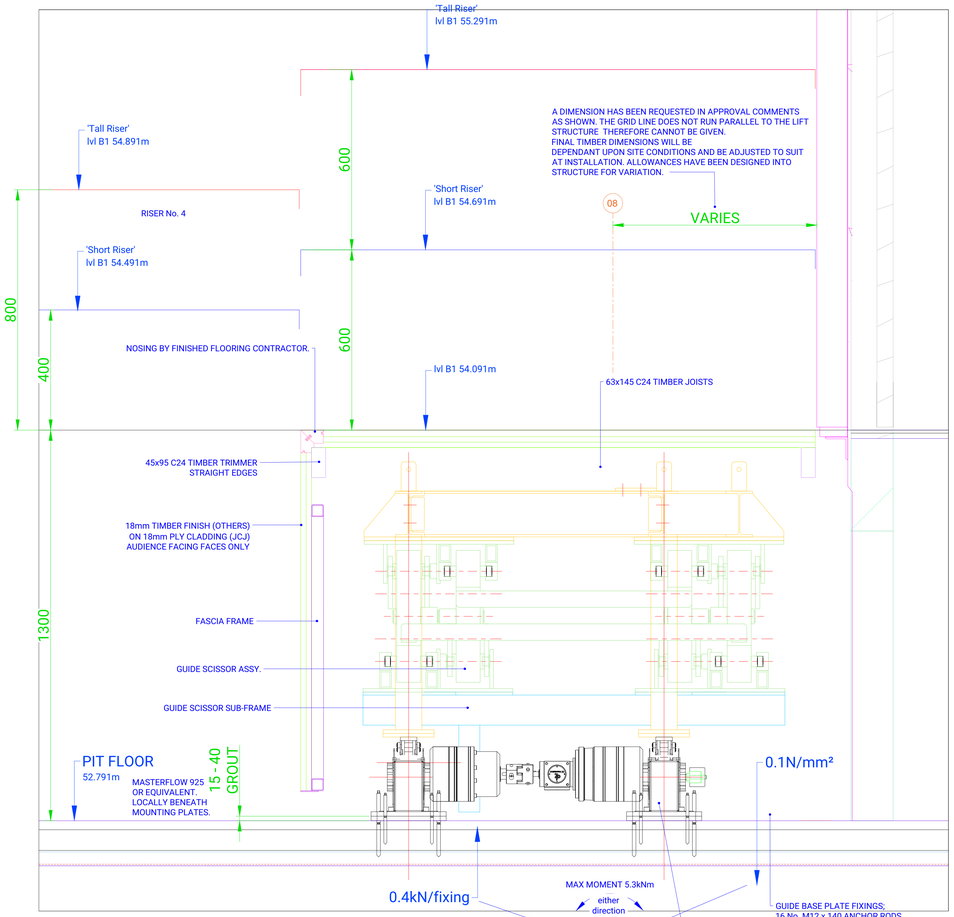


MAINTENANCE LATCH DETAIL 1:10



SECTION A-A (RISER @ PLATFORM LVL)
1:20

SEE DRG. UOONHB-JCJ-B1-DR-OT-080010 FOR PLANS



SECTION B-B
1:10

Notes:

Lift Area;	6.3m²
Platform Self Weight;	1200kg
Static Load (@ 500kg/m²);	3150kg
Dynamic Load (@250kg/m²);	1575kg
Test Static Load	3938kg
Test Dyn. Load	1733kg

Point Loading 300kg over sq. of 300mm sides

Platform design loads;
Dead (self) + Payload + dyn. (x 1.2) x 2

Horizontal Loads 5% of design loads.

Structural Deflection Limit L/750

Drive Shafts finished Yellow (RAL1026)
all other parts Black (RAL9005) typically
semi-gloss finish.

Overload detection by current sensing,
no load detection by 'Floating-plate' assembly.

Normal Travel limits from wire-line encoder.
Overtravel via direct struck limits on
stage right scissors.

Status:
A - ☐ B - ☐ C - ☐

All dimensions in mm unless otherwise stated. Do not scale.

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CHECKED:	JC	DATE:	14/08/2025
APPROVED:	OS	DATE:	14/08/2025
SCALE:	ON SHEET	PAPER SIZE:	A1

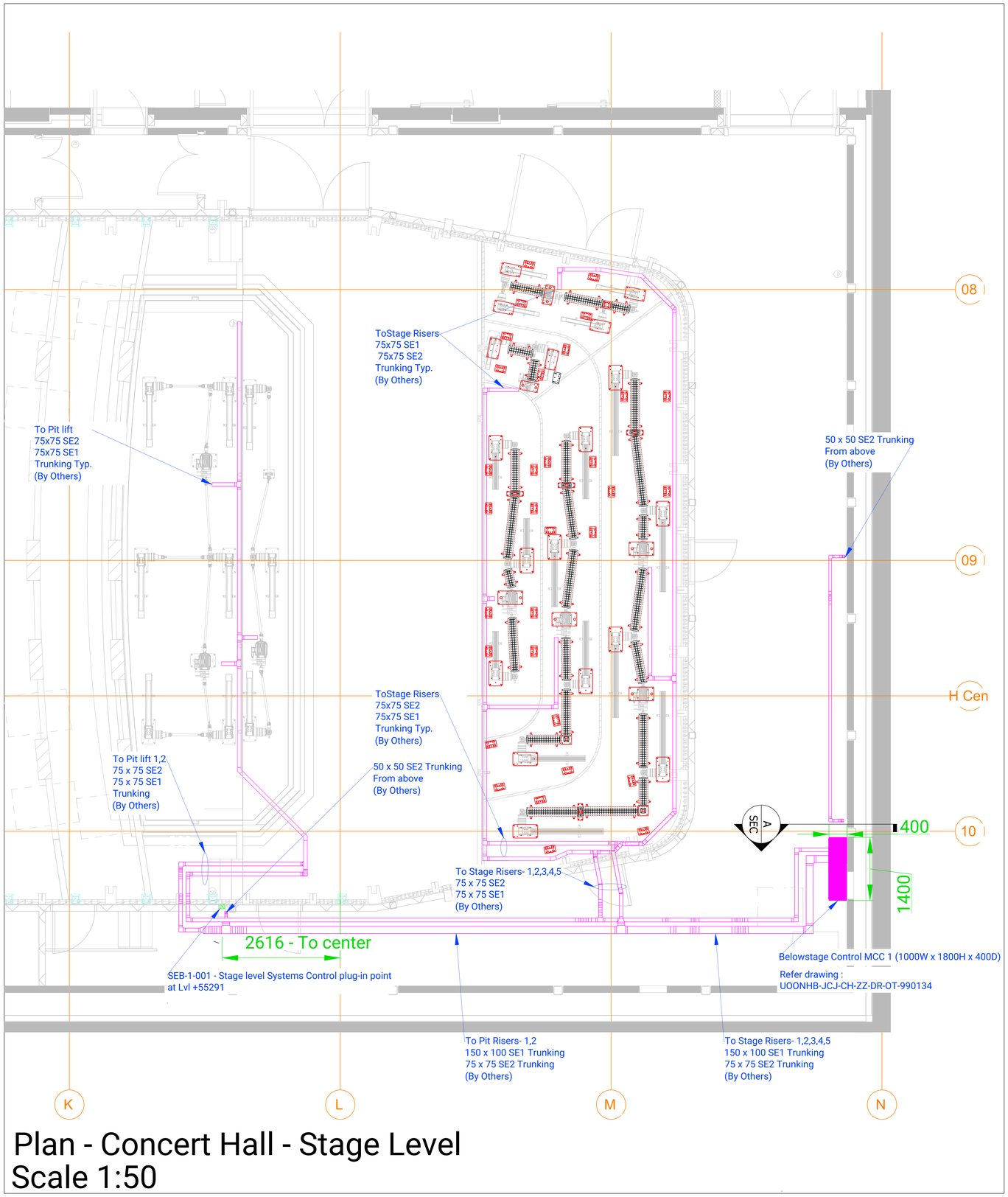
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PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-GA-08-0011
DRG NO.	UOONHB-JCJ-CH-B1-DR-OT-080011
TITLE	CONCERT HALL RISER 5 PROPOSAL SECTIONS
PURPOSE	A5 - Accepted as Suitable for Record
	REV C03

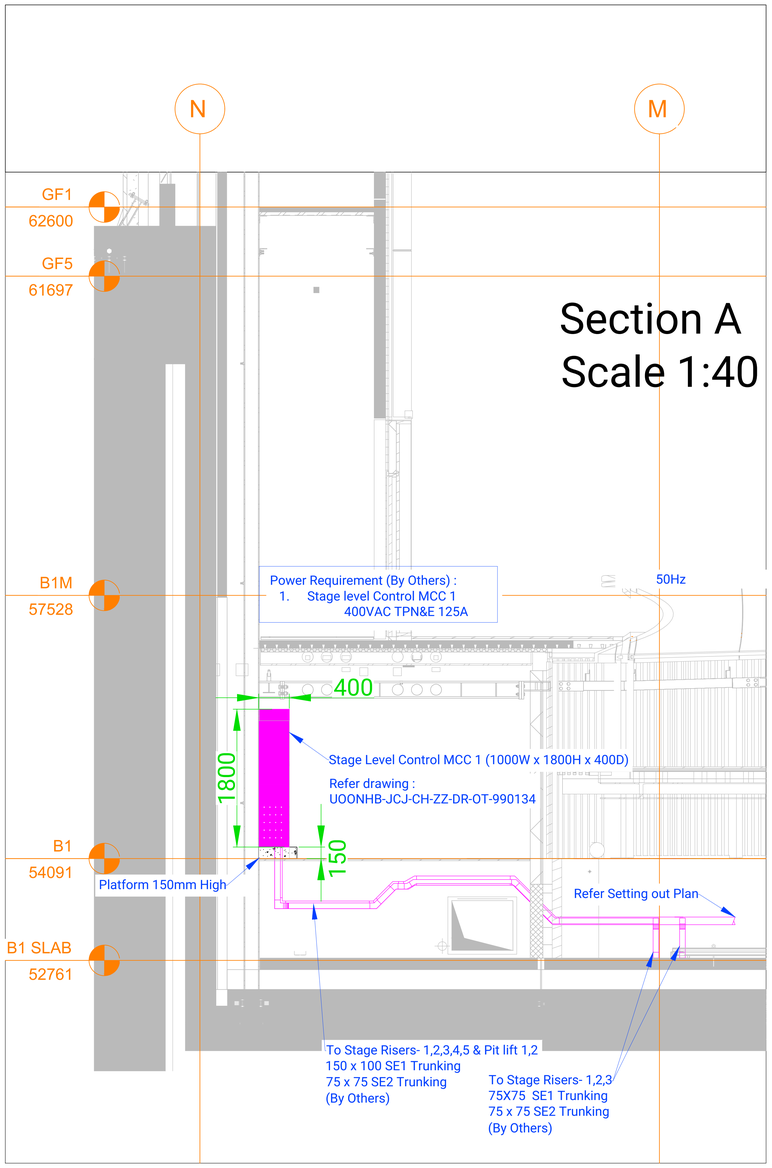
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REVISIONS

REV.	BY	DESCRIPTION	DATE
P01	SH	FIRST ISSUE	31/07/2024
C01	SH	CONSTRUCTION ISSUE	15/04/2025
C02	SH	FOR RECORD	28/04/2025



Plan - Concert Hall - Stage Level
Scale 1:50



Section A
Scale 1:40

Notes:
1. Stage Engineering Equipment schedule listed in the material submission.
2. Should be read in conjunction with the following drawings:
   a. UOONHB-JCJ-CH-B1-DR-OT-050001 ~ 006
   b. UOONHB-JCJ-CH-B1-DR-OT-050025 ~ 026
   c. UOONHB-JCJ-CH-ZZ-DR-OT-080001 ~ 011
   d. UOONHB-JCJ-CH-ZZ-DR-OT-990131 ~ 134
   e. UOONHB-JCJ-CH-ZZ-DR-OT-990141 ~ 142
4. Primary containment SE1 & SE2 to be provided by others

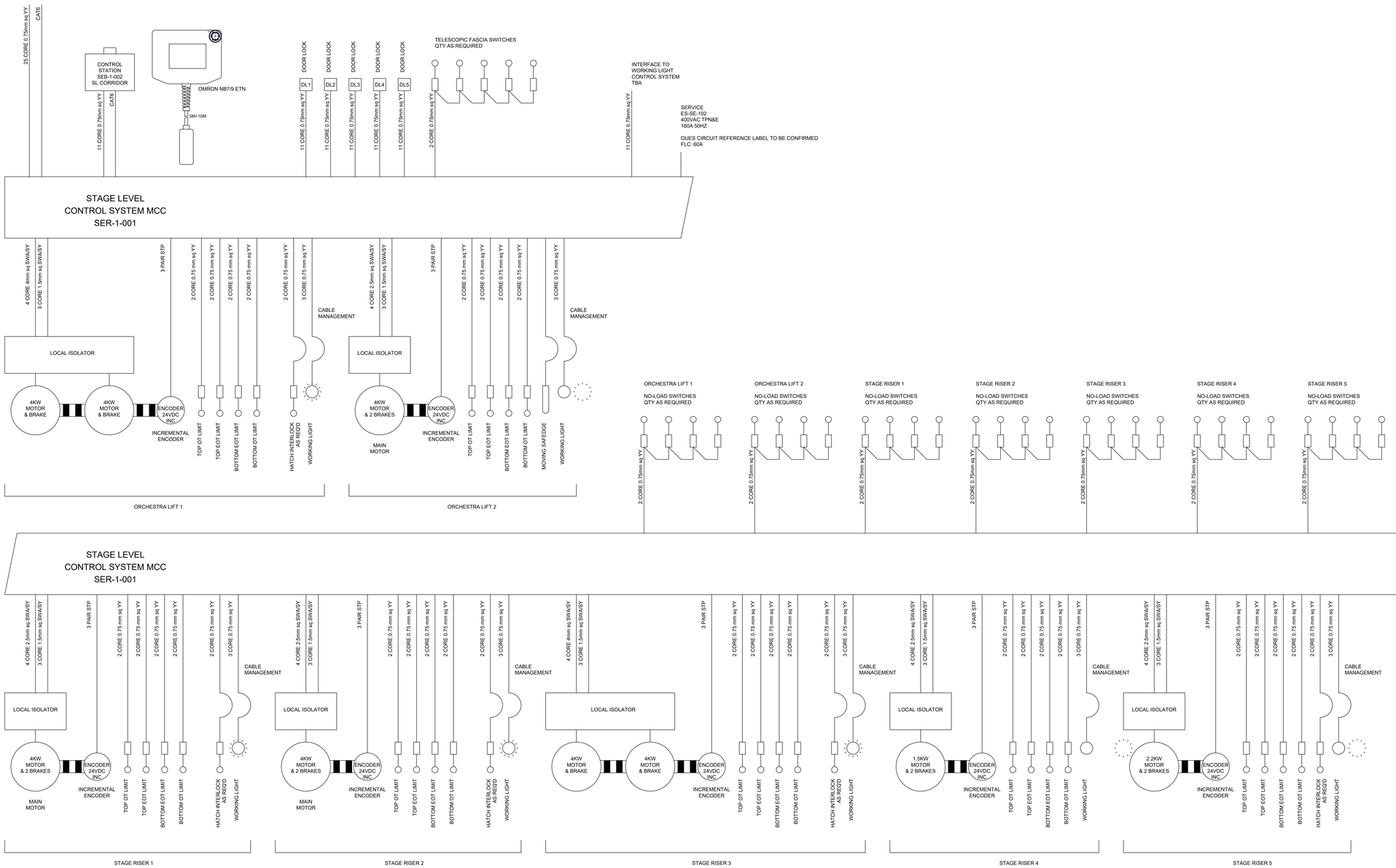
Status:
A - ☐ B - ☐ C - ☐

All dimensions in mm unless otherwise stated. Do not scale.

DRAWN:	SH	DATE:	28/04/2025
CHECKED:	JC	DATE:	28/04/2025
APPROVED:	OS	DATE:	28/04/2025
SCALE:	1 : 50	PAPER SIZE:	A1

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PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-GA-99-0103
CLIENT NO.	UOONHB-JCJ-CH-ZZ-DR-OT-990103
TITLE	Concert Hall Control Layout Stage Level
PURPOSE	A5 - Accepted as Suitable for Record
	REV C02



Scale N.T.S.

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P01	PT	FIRST ISSUE	03/01/2024
P02	PT	Response to Consultant's Comments	28/03/2024
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C02	SH	FOR RECORD	28/04/2025

Notes:

Status:
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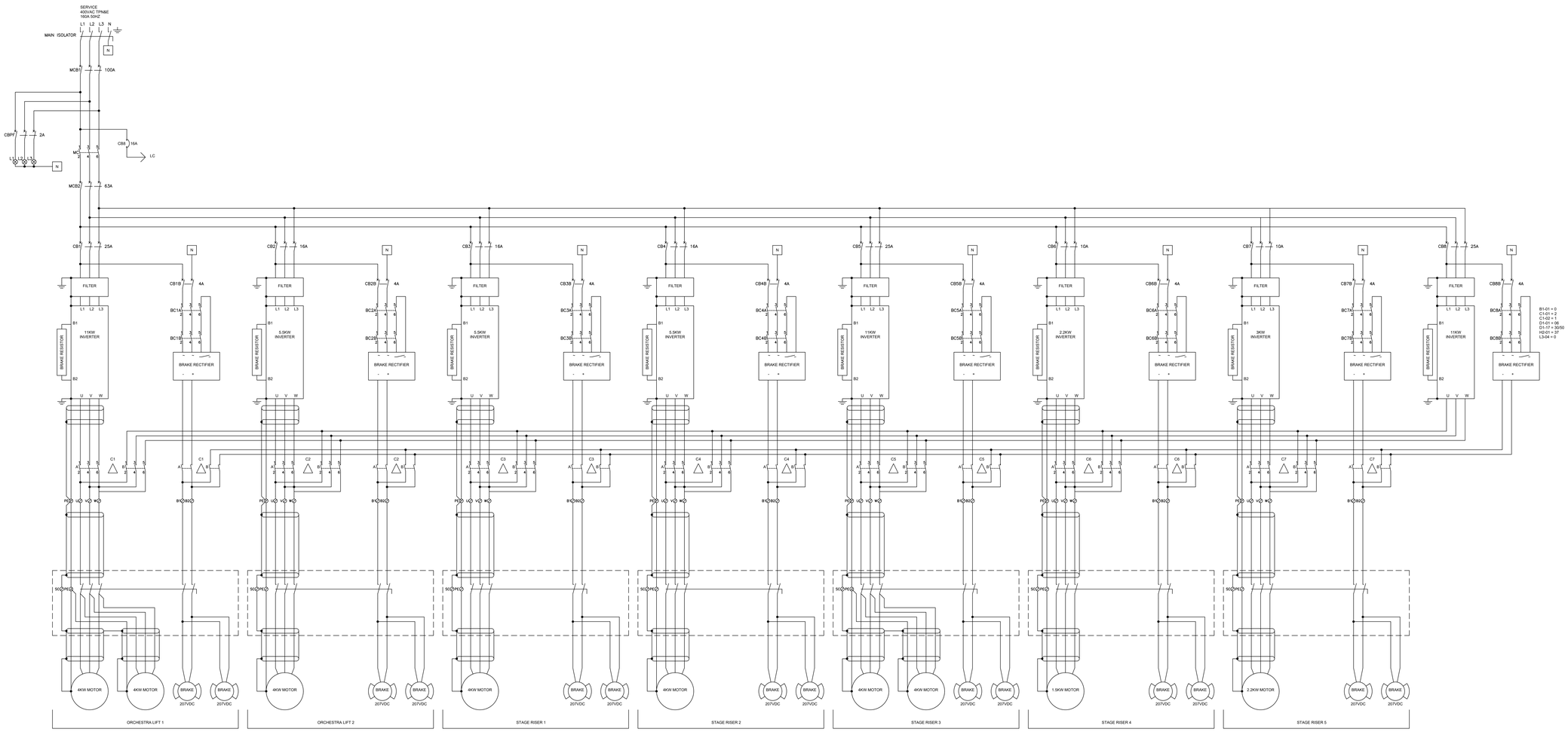
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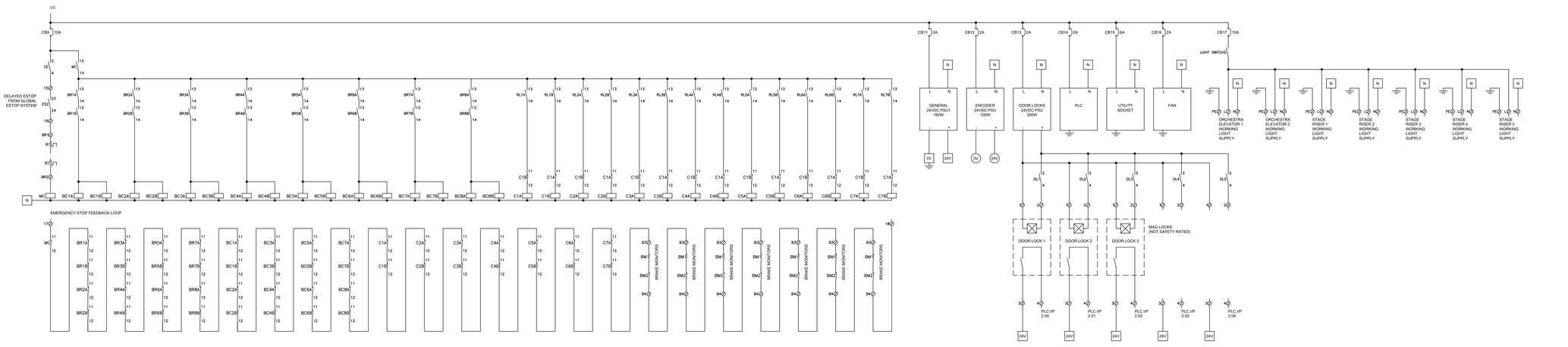
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PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-DE-99-0131
CLIENT NO.	UOONHB-JCJ-CH-ZZ-DR-OT-990131
TITLE	Concert Hall Stage Level Control System Line Diagram
PURPOSE	A5 - Accepted as Suitable for Record
	REV C02

Note: OUES Circuit Reference
10/016/103/1L123N





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C03	SH	FOR RECORD	28/04/2025

Notes:

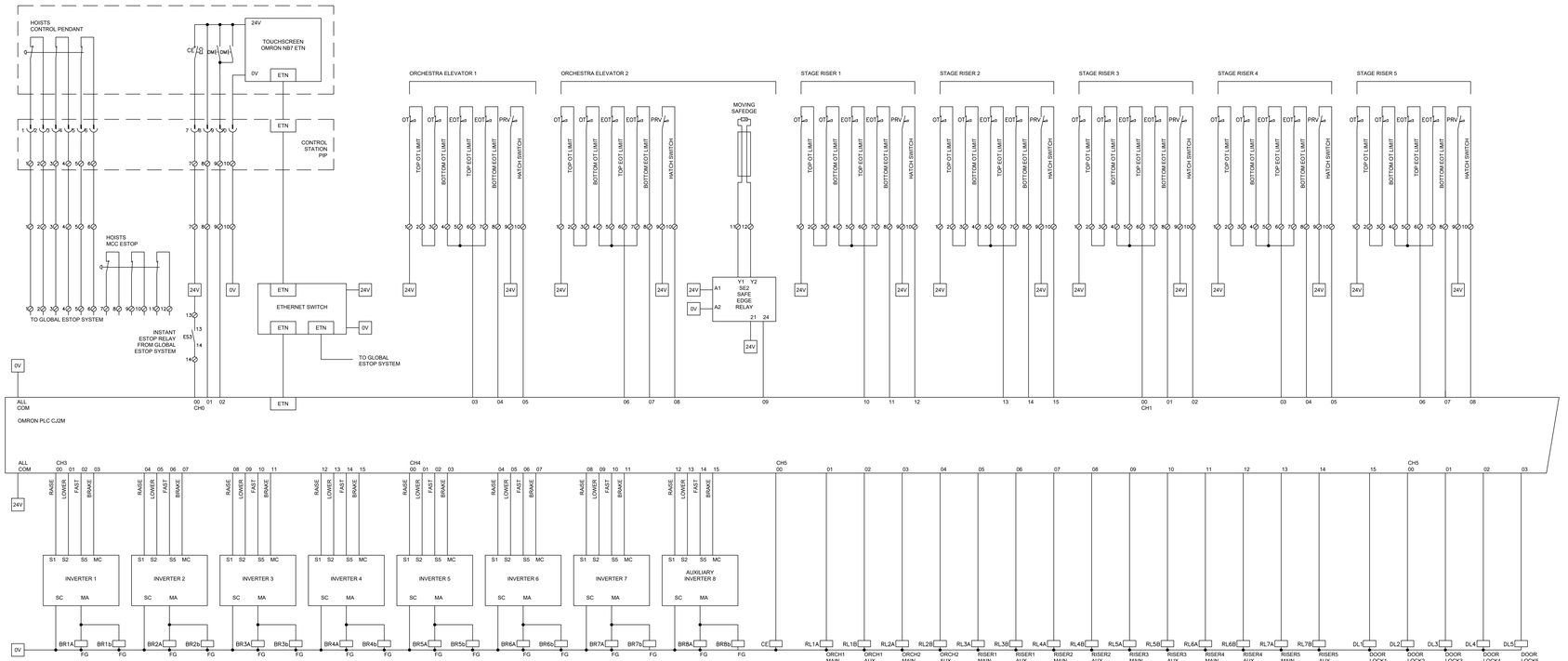
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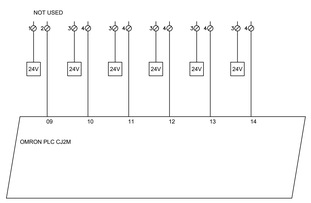
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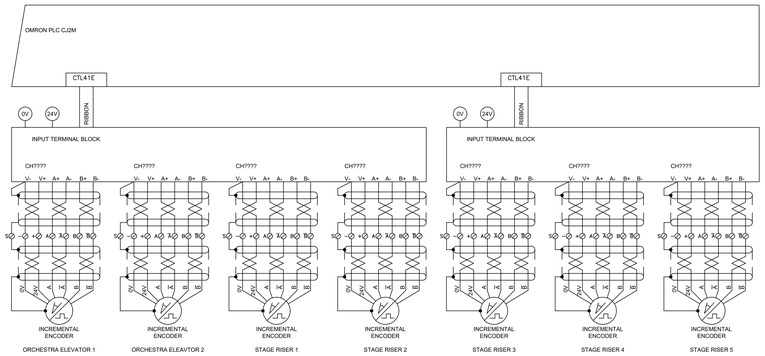
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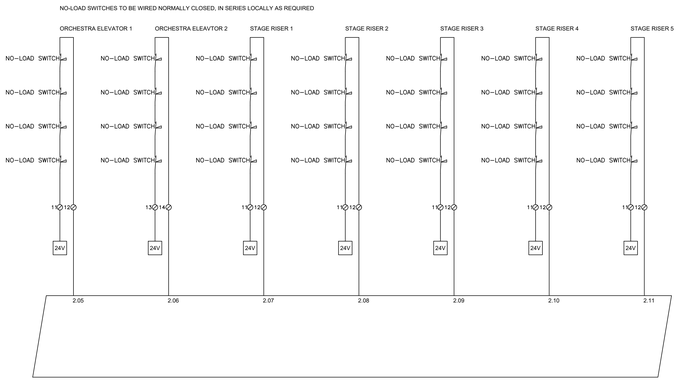
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PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-DE-99-0132
CLIENT NO.	UOONHB-JCJ-CH-ZZ-DR-OT-990132
TITLE	Concert Hall Stage Level Control System Power Diagram
PURPOSE	A5 - Accepted as Suitable for Record
	REV C03









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C02	SH	FOR RECORD	28/04/2025

Notes:

Status:

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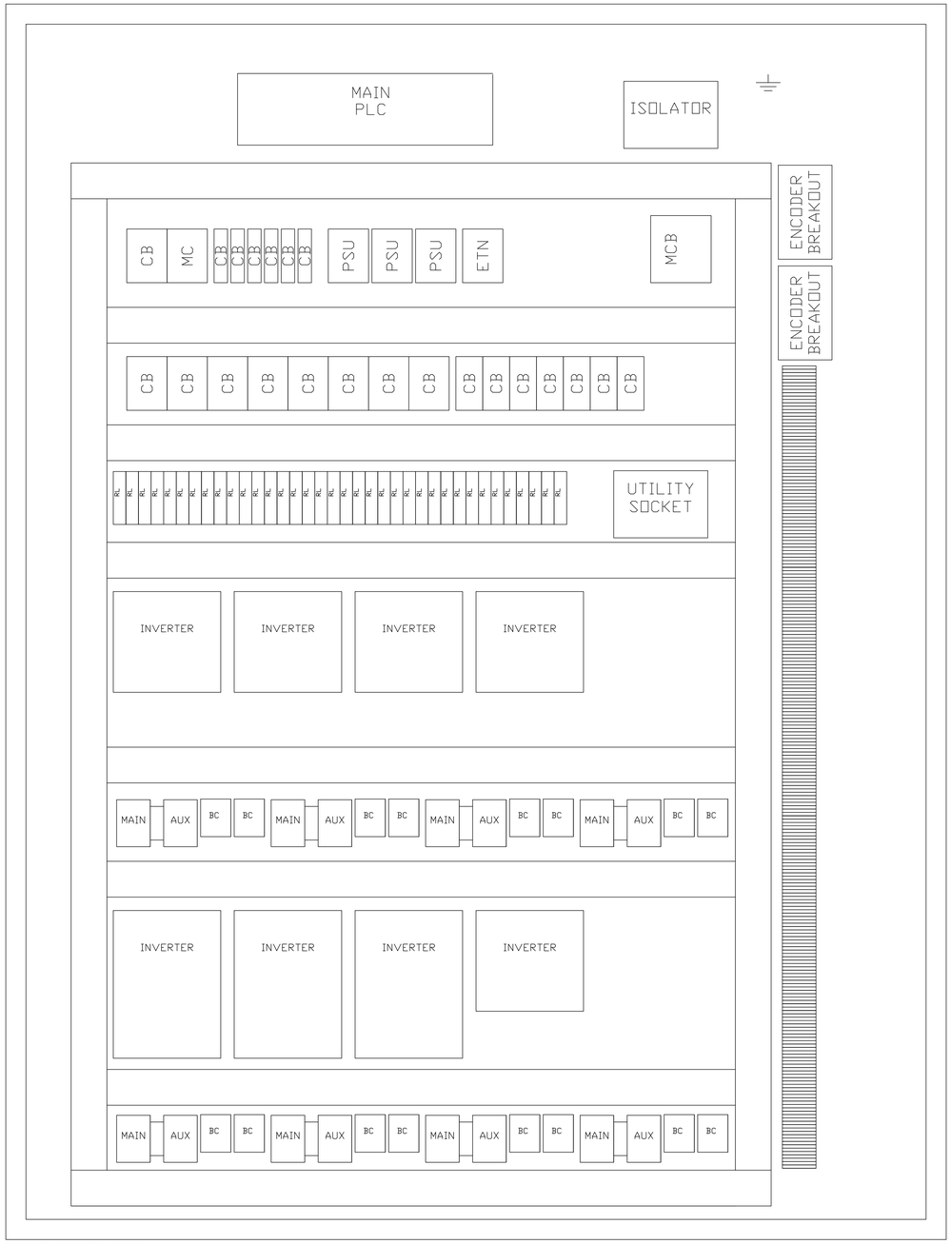
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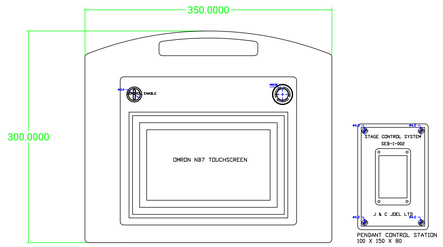
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PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-DE-99-0133
CLIENT NO.	UOONHB-JCJ-CH-ZZ-DR-OT-990133
TITLE	Concert Hall Stage Level Control System Control Schematic Diagram
PURPOSE	A5 - Accepted as Suitable for Record
	REV C02

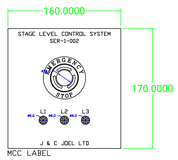


STAGE LEVEL MCC
IN□ 1800 X 1200 X 400



TOUCHSCREEN QTY 1

PENDANT CONTROL STATION
100 X 150 X 80



MCC LABEL

BRAKE RESISTOR MOUNTING TBD

See drawing UOONHB-JCJ-CH-ZZ-DR-OT-990103 for Setting Out

Colour Light Grey,No custom colour allowed for ,on any item

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P01	PT	FIRST ISSUE	03/01/2024
C01	PT	Response to Consultant's Comments & For Construction	28/03/2024
C02	JC	MCC SIZE CHANGE TO 1200	25/04/2024
C03	JC	OUES REFERENCE	03/06/2024
C04	JC	REVISED	06/08/2024
C05	SH	For Record	28/04/2025

Notes:

OUES Reference to be added on MCC door; 10/016/103/1L123N

Location of MCCs & E-Stops; UOONHB-JCJ-CH-ZZ-DR-OT-990102

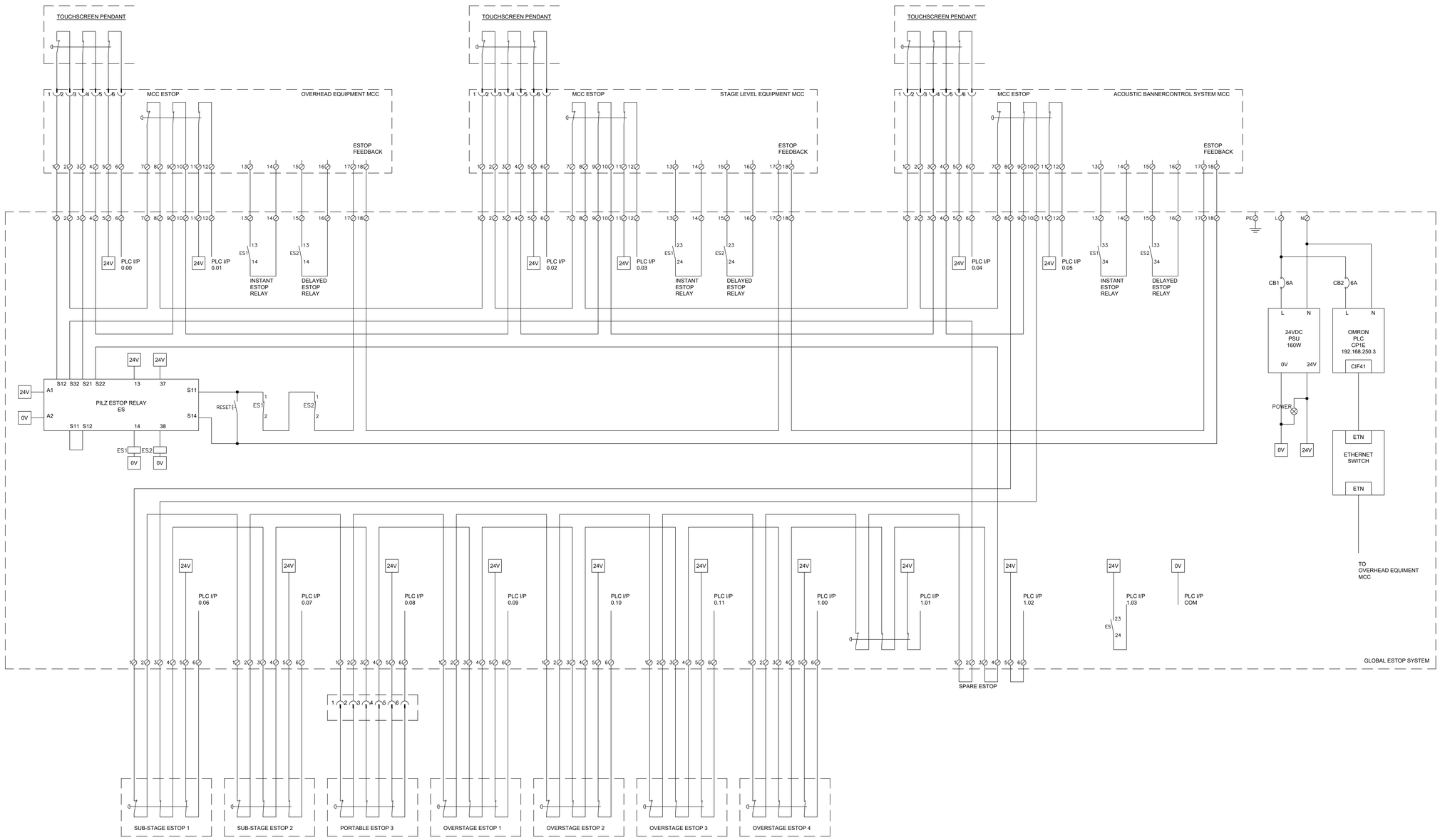
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PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-DE-99-0134
CLIENT NO.	UOONHB-JCJ-CH-ZZ-DR-OT-990134
TITLE	Concert Hall Stage Level Control System General Arrangement
PURPOSE	A5 - Accepted as Suitable for Record
	REV C05



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C02	SH	FOR RECORD	28/04/2025

Notes:

Status:

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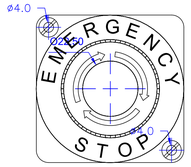
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SCALE:	N.T.S	PAPER SIZE:	A1

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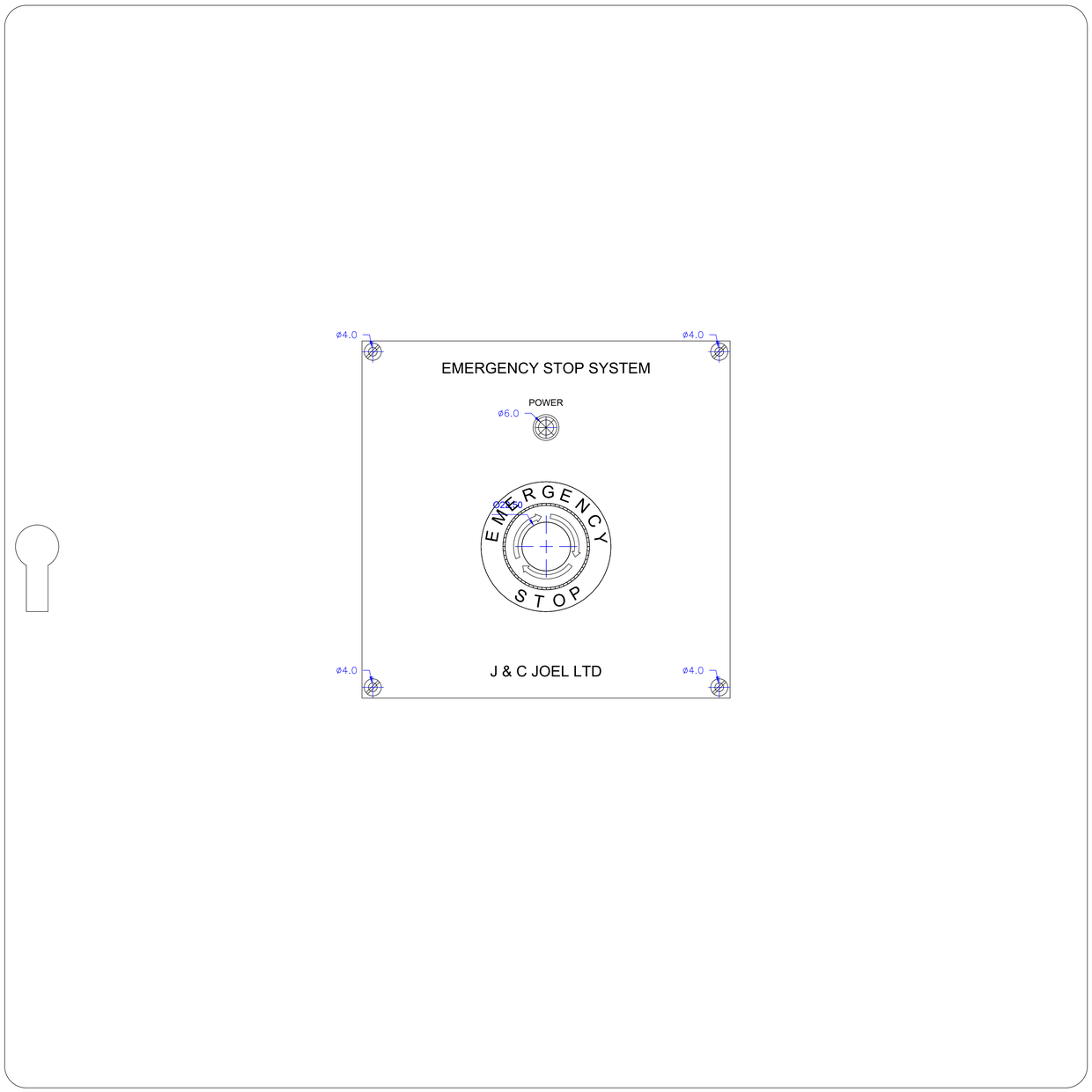
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PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-DE-99-0141
CLIENT NO.	UOONHB-JCJ-CH-ZZ-DR-OT-990141
TITLE	Concert Hall E-Stop - Electrical Schematic Diagram
PURPOSE	A5 - Accepted as Suitable for Record
	REV C02



SEB-1-010
SEB-1-011
SEB-1-004
SEB-1-100
SEB-1-101
SEB-1-200
SEB-1-201

ESTOP STATIONS
QTY 7



See drawing

UOONHB-JCJ-CH-ZZ-DR-OT-990101
UOONHB-JCJ-CH-ZZ-DR-OT-990102
UOONHB-JCJ-CH-ZZ-DR-OT-990103

for Setting Out .

Colour Light Grey,No custom colour allowed for
,on any item

EMERGENCY STOP SYSTEM
500 X 500 X 200

Scale N.T.S.

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C01	JC	FOR CONSTRUCTION	03/06/2024
C02	SH	FOR CONSTRUCTION	06/08/2024
C03	SH	FOR RECORD	28/04/2025

Notes:

Locations shown on;
UOONHB-JCJ-BB-ZZ-DR-OT-990301
UOONHB-JCJ-CH-ZZ-DR-OT-990101
UOONHB-JCJ-CH-ZZ-DR-OT-990102
UOONHB-JCJ-CH-ZZ-DR-OT-990103
UOONHB-JCJ-T2-ZZ-DR-OT-990201

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APPROVED:	OS	DATE:	28/04/2025
SCALE:	N.T.S	PAPER SIZE:	A1

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PROJECT	4334 - Oxford Humanities
JCJ NO.	4334-DE-99-0142
CLIENT NO.	UOONHB-JCJ-CH-ZZ-DR-OT-990142
TITLE	Concert Hall E-Stop General Arrangement
PURPOSE	A5 - Accepted as Suitable for Record
	REV C03

9. Appendix 1 – Serapid Manual

SERAPID
RIGID CHAIN TECHNOLOGY

NOTICE D'INSTRUCTIONS | INSTRUCTION MANUAL

Systèmes d'élévation | Lifting system



Client | Customer: **J&C Joel Ltd.**
Projet | Project: **University of Oxford**
Référence | Reference: **THE-20766-M001-0/A**
Date: **Avril 2024 / April 2024**

Original Instructions

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76370 Martin-Eglise
Tél. : 02 32 06 35 60 / Fax : 02 32 06 35 61
info-fr@serapid.com **/** www.serapid.com

Généralité / *General*

1.1 Consignes générales /*General instructions*

Avant toute utilisation des élévateurs SERAPID, nous vous recommandons de lire attentivement et complètement cette notice d'instruction.
Vous y trouverez tous les renseignements nécessaires à une bonne utilisation de cette machine.
Pour l'installation et ensuite pour l'utilisation, vous devez impérativement respecter les indications données dans les différents paragraphes concernés.
Le non-respect de ces conditions peut entraîner des anomalies de fonctionnement ou des détériorations matérielles prématurées et risque d'amener la perte de garantie.
Ces élévateurs ont été fabriqués et contrôlés, soigneusement selon les normes en vigueur chez SERAPID.
A la réception du matériel, vérifier qu'il n'a pas été endommagé durant le transport, si cela était le cas, faire immédiatement les réserves d'usage auprès du transporteur.

Before installation and operation of the material, we recommend that you read carefully and follow completely the following instructions.
You will find all the necessary information on setting up the material in the following pages.
For installation and subsequent operation, it is imperative that you follow the instructions given in the various sections.
Failure to follow the conditions can lead to malfunction and premature deterioration of the material and the risk of invalidating the warranty.
The material has been manufactured and assembled to the standard Q.A. levels stipulated for standard production items by SERAPID in their Q.A. manuals.
On reception of the material, verify that the consignment has not been damaged in transit. If damage has occured, both the transporter and SERAPID should be notified immediately, and the delivery note signed accordingly.

1.2 Dispositif de sécurité / *Safety devices*

Seule la personne autorisée doit se trouver dans la zone d'évolution.
La zone d'évolution sera protégée par **vos soins** par un barrage immatériel.
Les élévateurs ne pourront pas fonctionner si ce système de protection de zone est activé.

Only authorised personnel are permitted inside the operating zone.
This area should be protected, by the client, by means of an electronic security system.
The lifting system should not be able to function if the zone is penetrated.

1.3 Interdiction / *Prohibited actions*

IL EST FORMELLEMENT INTERDIT :
- D'utiliser les élévateurs lorsque du personnel se trouve dans la zone protégée.
- D'utiliser les élévateurs sans y être habilité et sans avoir reçu la formation.
- De modifier les réglages d'usine ou les réglages établis sur site en présence d'un représentant de la société SERAPID.
- D'implanter les élévateurs dans une atmosphère explosive.

IT IS STRICTLY FORBIDDEN:
- To operate the system when unauthorised persons are in the secure zone.
- To use the system without the necessary experience or without having prior training.
- To modify the settings of the control system pre-set by SERAPID or by the SERAPID technician during commissioning.
- To locate the system in a volatile atmosphere.

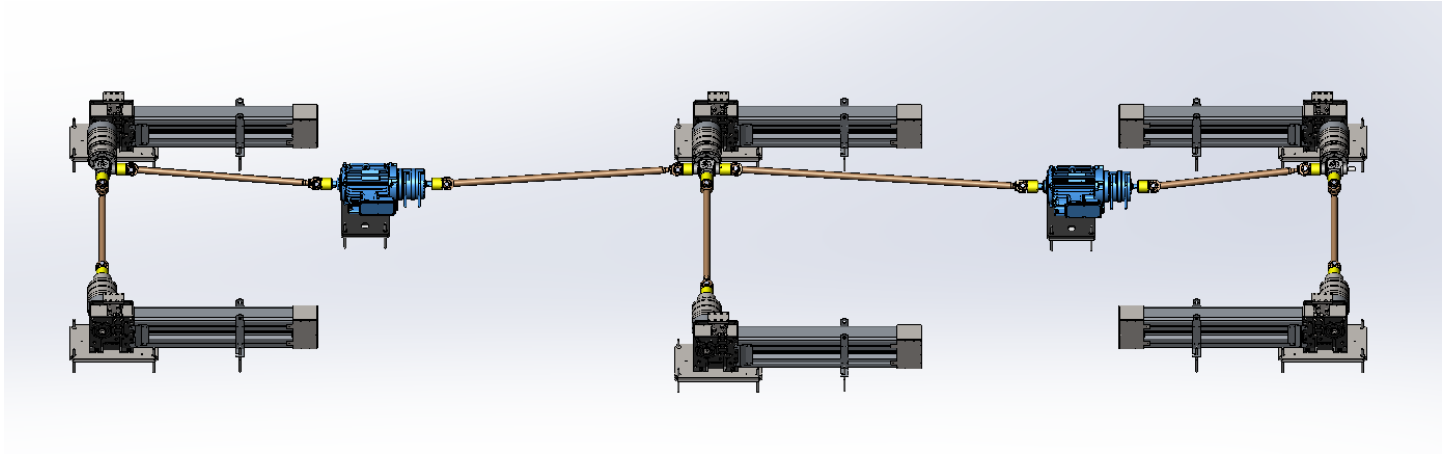
1.4 Obligation / *Essential actions*

OBLIGATION DE :
Se conformer aux prescriptions d'utilisation fixées par le constructeur.
Signaler toutes les anomalies de fonctionnement.
Eteignez toutes les commandes après utilisation.

You are obliged to:
Conform to the user instructions supplied by the manufacturer
Notify any abnormalities during operation
Switch off all controls after operations

SERAPID France
4 rue des frères Robbe
76370 Martin-Eglise
Tél. : 02 32 06 35 60 / Fax : 02 32 06 35 61
info-fr@serapid.com / www.serapid.com

2 Descriptif technique / *Technical description*



ORCHESTRA LIFT (LARGE) - THE-20766-1000-0

2.1 Caractéristiques du dispositif d'élévation pour la plateforme **ORCHESTRA LIFT (LARGE)** / *Characteristics of the device of rise for the platform **ORCHESTRA LIFT (LARGE)***

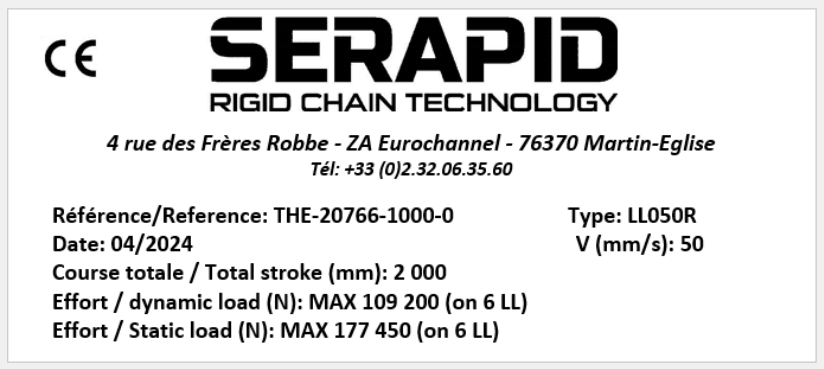
Surface de la plateforme / Platform surface :	**27.3 m²**
Masse morte / Dead weight :	**150 daN/m²**
Charge utile Statique / Static payload :	**500 daN/m²**
Charge utile Dynamique / Dynamic payload :	**250 daN/m²**
Effort de poussée statique max. / *Static load* :	**177 450 N (sur/on 6 LinkLift)** **MAX 29 575 N / LinkLift**
Effort de poussée dynamique max. / *Dynamic load* :	**109 200 N (sur/on 6 LinkLift)** **MAX 18 200 N / LinkLift**
Ces charges doivent être réparties équitablement sur l'ensemble des LinkLift. ***These loads must be distributed equally over all LinkLifts.***	
Type de chaînes / *Type of chains* :	**LinkLift 050R (LL2)**
Vitesse de translation des chaînes / *Transfer speed of chains* :	**50 mm/s avec variateur de fréquence / with frequency drive**
Course totale des chaînes / Total stroke of chains (Ct = Cr 1 + Cu + Cr 2 + Cm):	**Ct = 2 000 mm**
Course de réglage supérieure / Over travel ; Cr 1 :	**Cr 1 = 50 mm**
Course utile / Working stroke; Cu:	**Cu = 1 800 mm**
Course de réglage inférieure / Under travel ; Cr 2 :	**Cr 2 = 50 mm**
Course morte / Dead stroke; Cm:	**Cm = 100 mm**

2.2 Description générale du dispositif d'élévation pour la plateforme **ORCHESTRA LIFT (LARGE)** / *General description of the device of rise for the platform **ORCHESTRA LIFT (LARGE)***

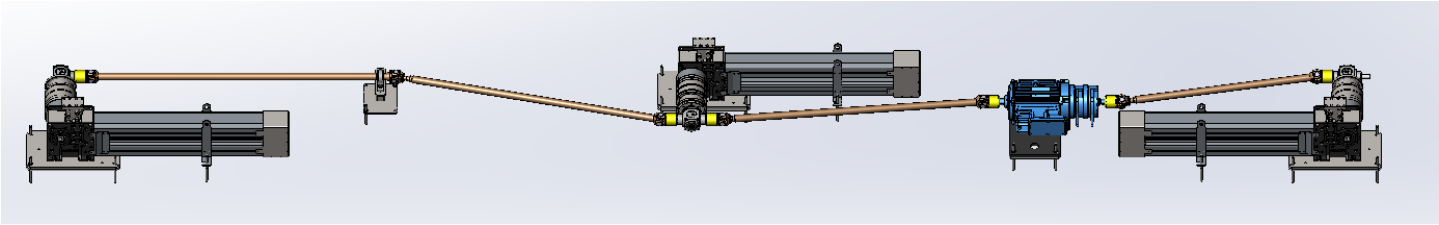
Les dispositifs d'élévations pour les plateformes sont essentiellement constitués … / *The lifting system for the platform consists in ...* :

06	Chaînes LL050R / *LL050R chains*
06	Carters d'entraînements comprenant une gaine magasin pour chaîne LL050R / *LL050R Drive housings with chain magazine*
02	Moteurs électrique 230V/400V – 50 Hz, double frein / *Electrical motors 230V/400V - 50Hz, double brake*
06	Réducteurs planétaires / *Planetary gearboxes*
03	Renvois d'angle / *Bevel gearboxes*
07	Cardans / *Drive shafts*

2.3 Plaque signalétique de la plateforme **ORCHESTRA LIFT (LARGE)** / *Maker's plate platform* ***ORCHESTRA LIFT (LARGE)***



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ORCHESTRA LIFT (SMALL) - THE-20766-2000-0

2.4 Caractéristiques du dispositif d'élévation pour la plateforme **ORCHESTRA LIFT (SMALL)** / *Characteristics of the device of rise for the platform* ***ORCHESTRA LIFT (SMALL)***

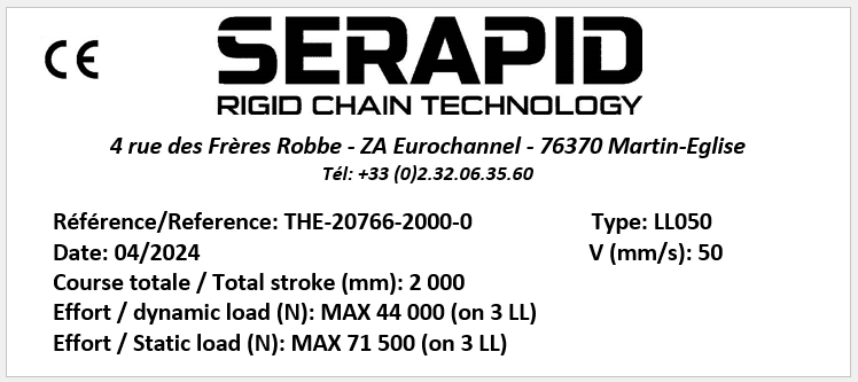
Surface de la plateforme / Platform surface :	**11.00 m²**
Masse morte / Dead weight :	**150 daN/m²**
Charge utile Statique / Static payload :	**500 daN/m²**
Charge utile Dynamique / Dynamic payload :	**250 daN/m²**
Effort de poussée statique max. / *Static load* :	**71 500 N (sur/on 3 LinkLift)** **MAX 23 833 N / LinkLift**
Effort de poussée dynamique max. / *Dynamic load* :	**44 000 N (sur/on 3 LinkLift)** **MAX 14 667 N / LinkLift**
Ces charges doivent être réparties équitablement sur l'ensemble des LinkLift. ***These loads must be distributed equally over all LinkLifts.***	
Type de chaînes / *Type of chains* :	**LinkLift 050 (LL2)**
Vitesse de translation des chaînes / *Transfer speed of chains* :	**50 mm/s variateur de fréquence / with frequency drive**
Course totale des chaînes / Total stroke of chains (Ct = Cr 1 + Cu + Cr 2 + Cm):	**Ct = 2 000 mm**
Course de réglage supérieure / Over travel ; Cr 1 :	**Cr 1 = 50 mm**
Course utile / Working stroke; Cu:	**Cu = 1 800 mm**
Course de réglage inférieure / Under travel ; Cr 2 :	**Cr 2 = 50 mm**
Course morte / Dead stroke; Cm:	**Cm = 100 mm**

2.5 Description générale du dispositif d'élévation pour la plateforme **ORCHESTRA LIFT (SMALL)**/ *General description of the device of rise for the platform* ***ORCHESTRA LIFT (SMALL)***

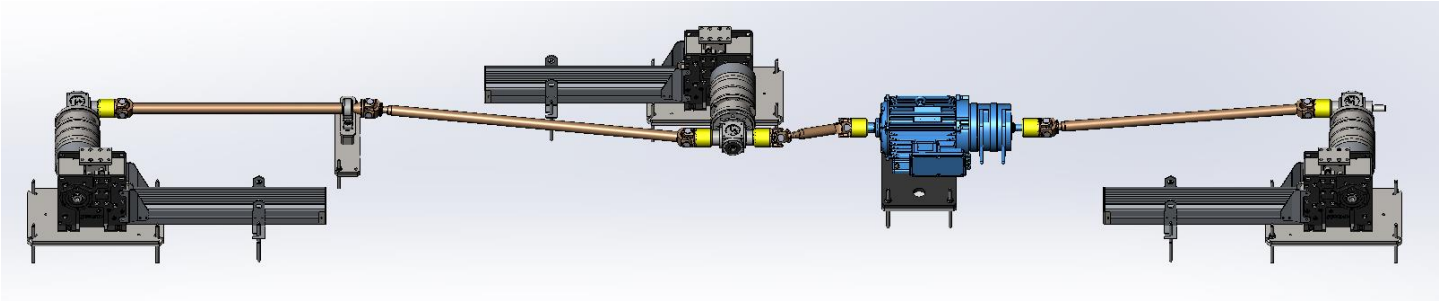
Les dispositifs d'élévations pour les plateformes sont essentiellement constitués … / *The lifting system for the platform consists in ...* :

03	Chaînes LL050 / *LL050 chains*
03	Carters d'entraînements comprenant une gaine magasin pour chaîne LL050 / *LL050 Drive housings with chain magazine*
01	Moteur électrique 230V/400V – 50 Hz, double frein / E*lectrical motor 230V/400V - 50Hz, double brake*
03	Réducteurs planétaires / *Planetary gearboxes*
03	Renvois d'angle / *Bevel gearboxes*
04	Cardans / *Drive shafts*

2.6 Plaque signalétique de la plateforme **ORCHESTRA LIFT (SMALL)** / *Maker's plate platform* ***ORCHESTRA LIFT (SMALL)***



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STAGE RISER 01 - THE-20766-3000-0

2.7 Caractéristiques du dispositif d'élévation pour la plateforme **STAGE RISER 01** / *Characteristics of the device of rise for the platform* ***STAGE RISER 01***

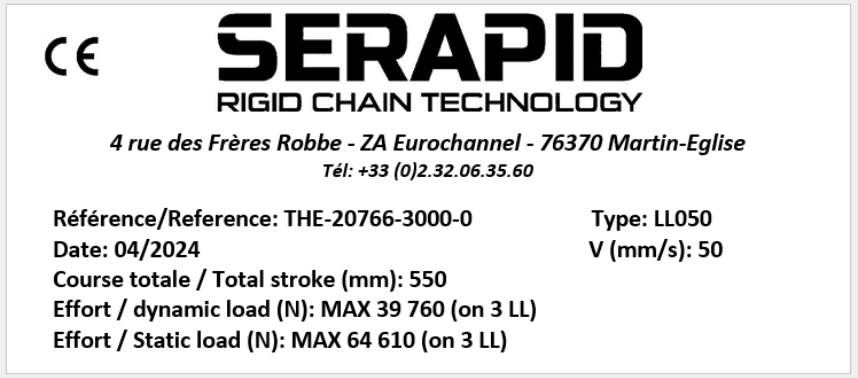
Surface de la plateforme / Platform surface :	**9.94 m²**
Masse morte / Dead weight :	**150 daN/m²**
Charge utile Statique / Static payload :	**500 daN/m²**
Charge utile Dynamique / Dynamic payload :	**250 daN/m²**
Effort de poussée statique max. / *Static load* :	**64 610 N (sur/on 3 LinkLift)** **MAX 21 537 N / LinkLift**
Effort de poussée dynamique max. / *Dynamic load* :	**39 760 N (sur/on 3 LinkLift)** **MAX 13 253 N / LinkLift**
Ces charges doivent être réparties équitablement sur l'ensemble des LinkLift. ***These loads must be distributed equally over all LinkLifts.***	
Type de chaînes / *Type of chains* :	**LinkLift 050 (LL2)**
Vitesse de translation des chaînes / *Transfer speed of chains* :	**50 mm/s variateur de fréquence / with frequency drive**
Course totale des chaînes / Total stroke of chains (Ct = Cr 1 + Cu + Cr 2 + Cm):	**Ct = 550 mm**
Course de réglage supérieure / Over travel ; Cr 1 :	**Cr 1 = 50 mm**
Course utile / Working stroke; Cu:	**Cu = 400 mm**
Course de réglage inférieure / Under travel ; Cr 2 :	**Cr 2 = 50 mm**
Course morte / Dead stroke; Cm:	**Cm = 50 mm**

2.8 Description générale du dispositif d'élévation pour la plateforme **STAGE RISER 01**/ *General description of the device of rise for the platform* ***STAGE RISER 01***

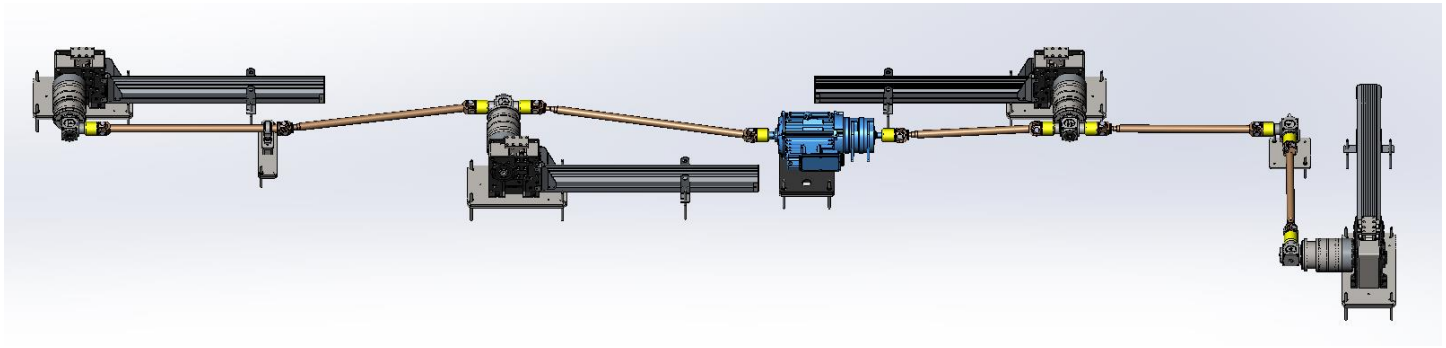
Les dispositifs d'élévations pour les plateformes sont essentiellement constitués … / *The lifting system for the platform consists in ...* :

03	Chaînes LL050 / *LL050 chains*
03	Carters d'entraînements comprenant une gaine magasin pour chaîne LL050 / *LL050 Drive housings with chain magazine*
01	Moteur électrique 230V/400V – 50 Hz, double frein / *Electrical motor 230V/400V - 50Hz, double brake*
03	Réducteurs planétaires / *Planetary gearboxes*
03	Renvois d'angle / *Bevel gearboxes*
04	Cardans / *Drive shafts*

2.9 Plaque signalétique de la plateforme **STAGE RISER 01**/ *Maker's plate platform* ***STAGE RISER 01***



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STAGE RISER 02 - THE-20766-4000-0

2.10 Caractéristiques du dispositif d'élévation pour la plateforme **STAGE RISER 02** / *Characteristics of the device of rise for the platform* ***STAGE RISER 02***

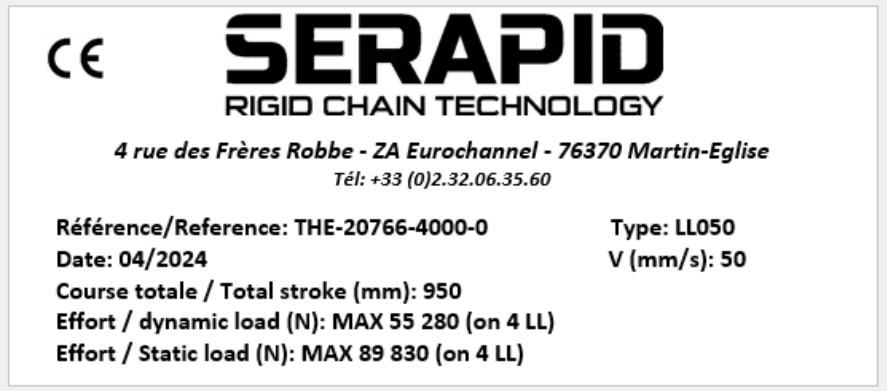
Surface de la plateforme / Platform surface :	**13.82 m²**
Masse morte / Dead weight :	**150 daN/m²**
Charge utile Statique / Static payload :	**500 daN/m²**
Charge utile Dynamique / Dynamic payload :	**250 daN/m²**
Effort de poussée statique max. / *Static load* :	**89 830 N (sur/on 4 LinkLift)** **MAX 22 458 N / LinkLift**
Effort de poussée dynamique max. / *Dynamic load* :	**55 280 N (sur/on 4 LinkLift)** **MAX 13 820 N / LinkLift**
Ces charges doivent être réparties équitablement sur l'ensemble des LinkLift. ***These loads must be distributed equally over all LinkLifts.***	
Type de chaînes / *Type of chains* :	**LinkLift 050 (LL2)**
Vitesse de translation des chaînes / *Transfer speed of chains* :	**50 mm/s variateur de fréquence / with frequency drive**
Course totale des chaînes / Total stroke of chains (Ct = Cr 1 + Cu + Cr 2 + Cm):	**Ct = 950 mm**
Course de réglage supérieure / Over travel ; Cr 1 :	**Cr 1 = 50 mm**
Course utile / Working stroke; Cu:	**Cu = 800 mm**
Course de réglage inférieure / Under travel ; Cr 2 :	**Cr 2 = 50 mm**
Course morte / Dead stroke; Cm:	**Cm = 50 mm**

2.11 Description générale du dispositif d'élévation pour la plateforme **STAGE RISER 02** / *General description of the device of rise for the platform* ***STAGE RISER 02***

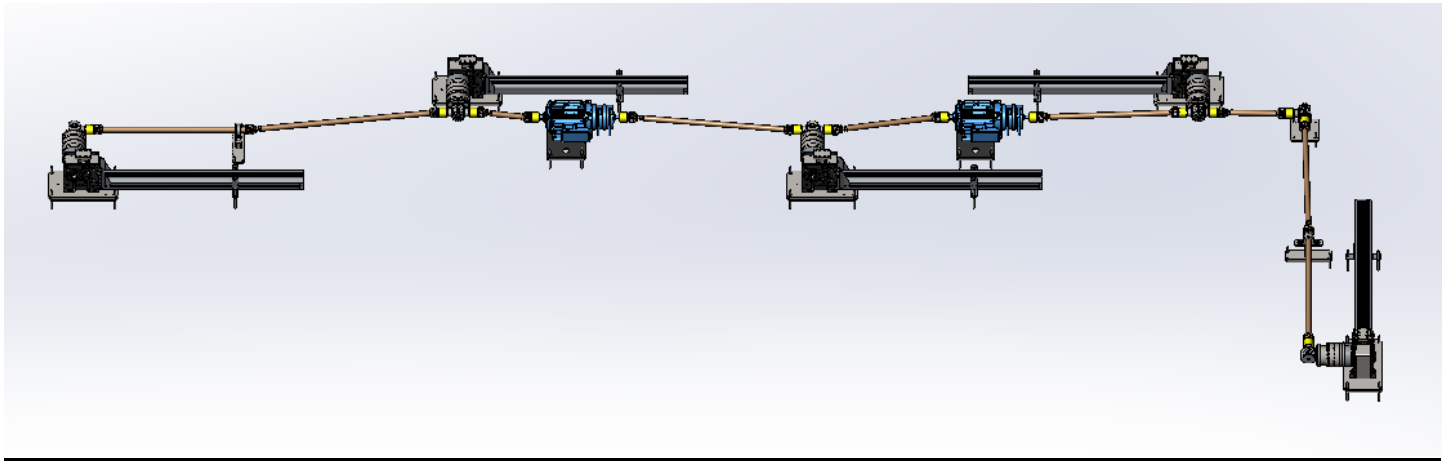
Les dispositifs d'élévations pour les plateformes sont essentiellement constitués … / *The lifting system for the platform consists in ...* :

04	Chaînes LL050 / *LL050 chains*
04	Carters d'entraînements comprenant une gaine magasin pour chaîne LL050 / *LL050 Drive housings with chain magazine*
01	Moteur électrique 230V/400V – 50 Hz, double frein / *Electrical motor 230V/400V - 50Hz, double brake*
04	Réducteurs planétaires / *Planetary gearboxes*
05	Renvois d'angle / *Bevel gearboxes*
06	Cardans / *Drive shafts*

2.12 Plaque signalétique de la plateforme **STAGE RISER 02** / *Maker's plate platform* ***STAGE RISER 02***



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STAGE RISER 03 - THE-20766-5000-0

2.13 Caractéristiques du dispositif d'élévation pour la plateforme **STAGE RISER 03** / *Characteristics of the device of rise for the platform* ***STAGE RISER 03***

Surface de la plateforme / Platform surface :	**26.54 m²**
Masse morte / Dead weight :	**150 daN/m²**
Charge utile Statique / Static payload :	**500 daN/m²**
Charge utile Dynamique / Dynamic payload :	**250 daN/m²**
Effort de poussée statique max. / *Static load* :	**172 510 N (sur/on 5 LinkLift)** **MAX 34 502 N / LinkLift**
Effort de poussée dynamique max. / *Dynamic load* :	**106 160 N (sur/on 5 LinkLift)** **MAX 21 232 N / LinkLift**
Ces charges doivent être réparties équitablement sur l'ensemble des LinkLift. ***These loads must be distributed equally over all LinkLifts.***	
Type de chaînes / *Type of chains* :	**LinkLift 050R (LL2)**
Vitesse de translation des chaînes / *Transfer speed of chains* :	**50 mm/s variateur de fréquence / with frequency drive**
Course totale des chaînes / Total stroke of chains (Ct = Cr 1 + Cu + Cr 2 + Cm):	**Ct = 1 350 mm**
Course de réglage supérieure / Over travel ; Cr 1 :	**Cr 1 = 50 mm**
Course utile / Working stroke; Cu:	**Cu = 1 200 mm**
Course de réglage inférieure / Under travel ; Cr 2 :	**Cr 2 = 50 mm**
Course morte / Dead stroke; Cm:	**Cm = 50 mm**

2.14 Description générale du dispositif d'élévation pour la plateforme **STAGE RISER 03**/ *General description of the device of rise for the platform* ***STAGE RISER 03***

Les dispositifs d'élévations pour les plateformes sont essentiellement constitués … / *The lifting system for the platform consists in ...* :

05	Chaînes LL050R / *LL050R chains*
05	Carters d'entraînements comprenant une gaine magasin pour chaîne LL050R / *LL050R Drive housings with chain magazine*
02	Moteurs électrique 230V/400V – 50 Hz, double frein / *Electrical motors 230V/400V - 50Hz, double brake*
05	Réducteurs planétaires / *Planetary gearboxes*
06	Renvois d'angle / *Bevel gearboxes*
09	Cardans / *Drive shafts*

2.15 Plaque signalétique de la plateforme **STAGE RISER 03**/ *Maker's plate platform* ***STAGE RISER 03***

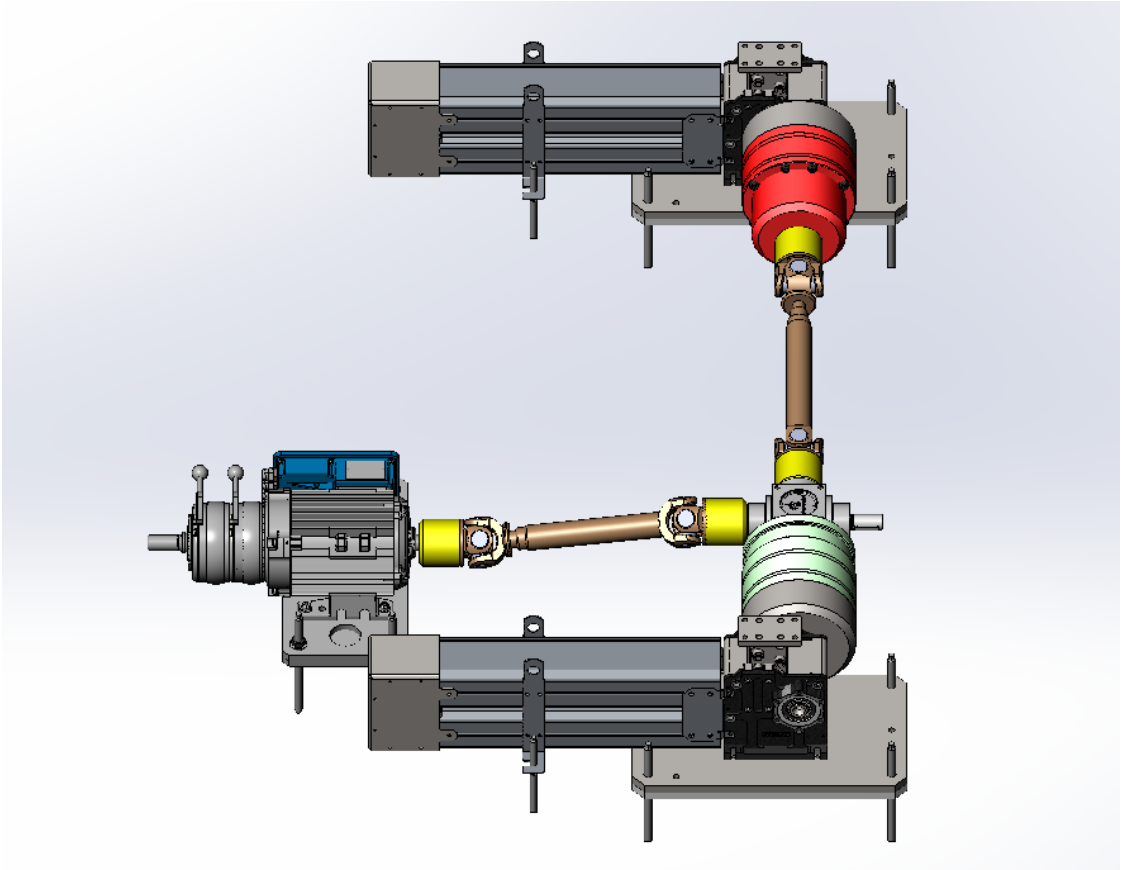
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Référence/Reference: THE-20766-5000-0 **Type: LL050R**
Date: 04/2024 **V (mm/s): 50**
Course totale / Total stroke (mm): 1 350
Effort / dynamic load (N): MAX 106 160 (on 5 LL)
Effort / Static load (N): MAX 172 510 (on 5 LL)

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STAGE RISER 04 - THE-20766-6000-0

2.16 Caractéristiques du dispositif d'élévation pour la plateforme **STAGE RISER 04** / *Characteristics of the device of rise for the platform* ***STAGE RISER 04***

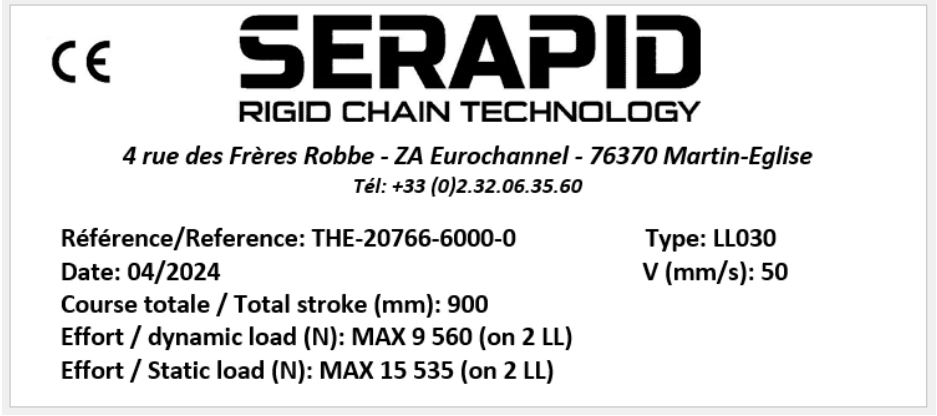
Surface de la plateforme / Platform surface :	**2.39 m²**
Masse morte / Dead weight :	**150 daN/m²**
Charge utile Statique / Static payload :	**500 daN/m²**
Charge utile Dynamique / Dynamic payload :	**250 daN/m²**
Effort de poussée statique max. / *Static load* :	**15 535 N (sur/on 2 LinkLift)** **MAX 7 768 N / LinkLift**
Effort de poussée dynamique max. / *Dynamic load* :	**9 560 N (sur/on 2 LinkLift)** **MAX 4 780 N / LinkLift**
Ces charges doivent être réparties équitablement sur l'ensemble des LinkLift. ***These loads must be distributed equally over all LinkLifts.***	
Type de chaînes / *Type of chains* :	**LinkLift 030 (LL1)**
Vitesse de translation des chaînes / *Transfer speed of chains* :	**50 mm/s variateur de fréquence / with frequency drive**
Course totale des chaînes / Total stroke of chains (Ct = Cr 1 + Cu + Cr 2 + Cm):	**Ct = 900 mm**
Course de réglage supérieure / Over travel ; Cr 1 :	**Cr 1 = 30 mm**
Course utile / Working stroke; Cu:	**Cu = 800 mm**
Course de réglage inférieure / Under travel ; Cr 2 :	**Cr 2 = 30 mm**
Course morte / Dead stroke; Cm:	**Cm = 40 mm**

2.17 Description générale du dispositif d'élévation pour la plateforme **STAGE RISER 04** / *General description of the device of rise for the platform* ***STAGE RISER 04***

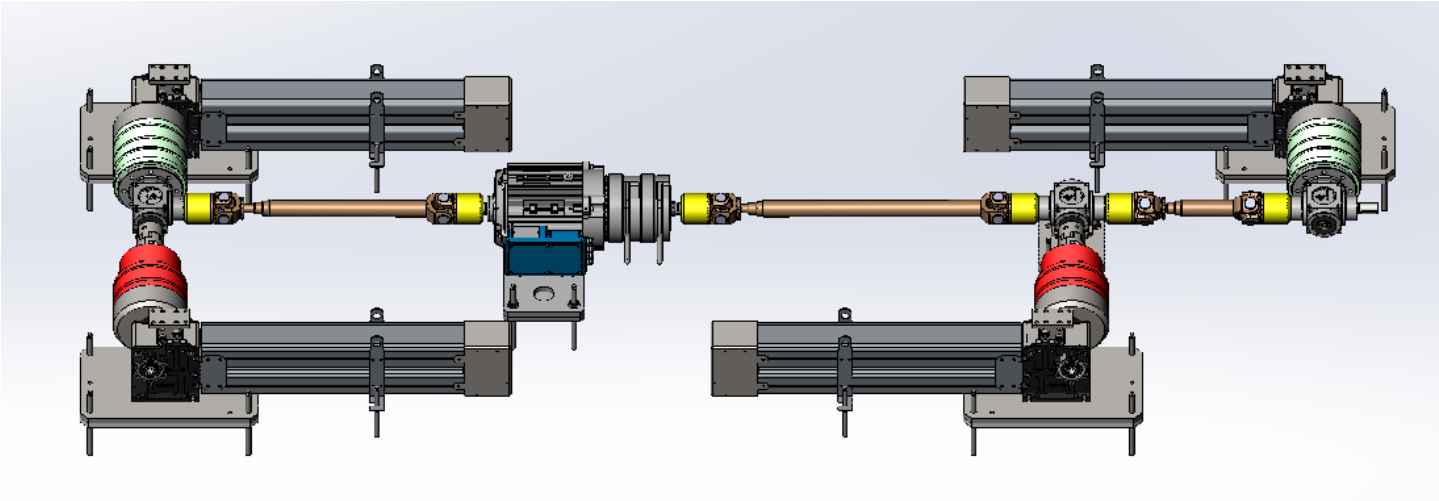
Les dispositifs d'élévations pour les plateformes sont essentiellement constitués … / *The lifting system for the platform consists in ...* :

02	Chaînes LL030 / *LL030 chains*
02	Carters d'entraînements comprenant une gaine magasin pour chaîne LL030 / *LL030 Drive housings with chain magazine*
01	Moteur électrique 230V/400V – 50 Hz, double frein / *Electrical motor 230V/400V - 50Hz, double brake*
02	Réducteurs planétaires / *Planetary gearboxes*
01	Renvoi d'angle / *Bevel gearbox*
02	Cardans / *Drive shafts*

2.18 Plaque signalétique de la plateforme **STAGE RISER 04** / *Maker's plate platform* ***STAGE RISER 04***



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STAGE RISER 05 - THE-20766-7000-0

2.19 Caractéristiques du dispositif d'élévation pour la plateforme **STAGE RISER 05** / *Characteristics of the device of rise for the platform* ***STAGE RISER 05***

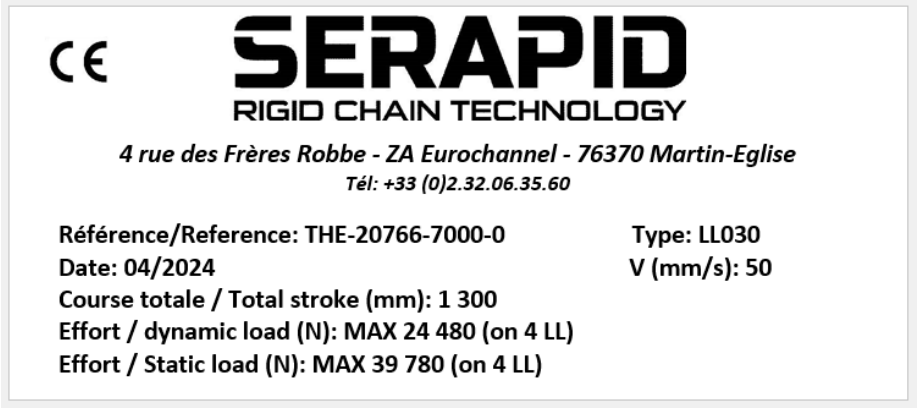
Surface de la plateforme / Platform surface :	**6.12 m²**
Masse morte / Dead weight :	**150 daN/m²**
Charge utile Statique / Static payload :	**500 daN/m²**
Charge utile Dynamique / Dynamic payload :	**250 daN/m²**
Effort de poussée statique max. / *Static load* :	**39 780 N (sur/on 4 LinkLift)** **MAX 9 945 N / LinkLift**
Effort de poussée dynamique max. / *Dynamic load* :	**24 480 N (sur/on 4 LinkLift)** **MAX 6 120 N / LinkLift**
Ces charges doivent être réparties équitablement sur l'ensemble des LinkLift. ***These loads must be distributed equally over all LinkLifts.***	
Type de chaînes / *Type of chains* :	**LinkLift 030 (LL1)**
Vitesse de translation des chaînes / *Transfer speed of chains* :	**50 mm/s variateur de fréquence / with frequency drive**
Course totale des chaînes / Total stroke of chains (Ct = Cr 1 + Cu + Cr 2 + Cm):	**Ct = 1 300 mm**
Course de réglage supérieure / Over travel ; Cr 1 :	**Cr 1 = 30 mm**
Course utile / Working stroke; Cu:	**Cu = 1 200 mm**
Course de réglage inférieure / Under travel ; Cr 2 :	**Cr 2 = 30 mm**
Course morte / Dead stroke; Cm:	**Cm = 40 mm**

2.20 Description générale du dispositif d'élévation pour la plateforme **STAGE RISER 05**/ *General description of the device of rise for the platform* ***STAGE RISER 05***

Les dispositifs d'élévations pour les plateformes sont essentiellement constitués … / *The lifting system for the platform consists in ...* :

04	Chaînes LL030 / *LL030 chains*
04	Carters d'entraînements comprenant une gaine magasin pour chaîne LL030 / *LL030 Drive housings with chain magazine*
01	Moteur électrique 230/400V – 50 Hz, double frein / *Electrical motor 230/400V - 50Hz, double brake*
04	Réducteurs planétaires / *Planetary gearboxes*
03	Renvois d'angle / *Bevel gearboxes*
03	Cardans / *Drive shafts*
02	Accouplements / Couplings

2.21 Plaque signalétique de la plateforme **STAGE RISER 05**/ *Maker's plate platform* ***STAGE RISER 05***



3 Sécurité / Safety

3.1 Pictogramme de sécurité / Safety signs

3.1.1 Obligations / Mandatory signs

Symbole	Signification	Signification
	Obligation générale	General mandatory sign
	Port des gants obligatoire	Safety gloves must be worn
	Port des chaussures de sécurité obligatoire	Safety boot must be worn
	Port du casque obligatoire	Safety helmet must be worn

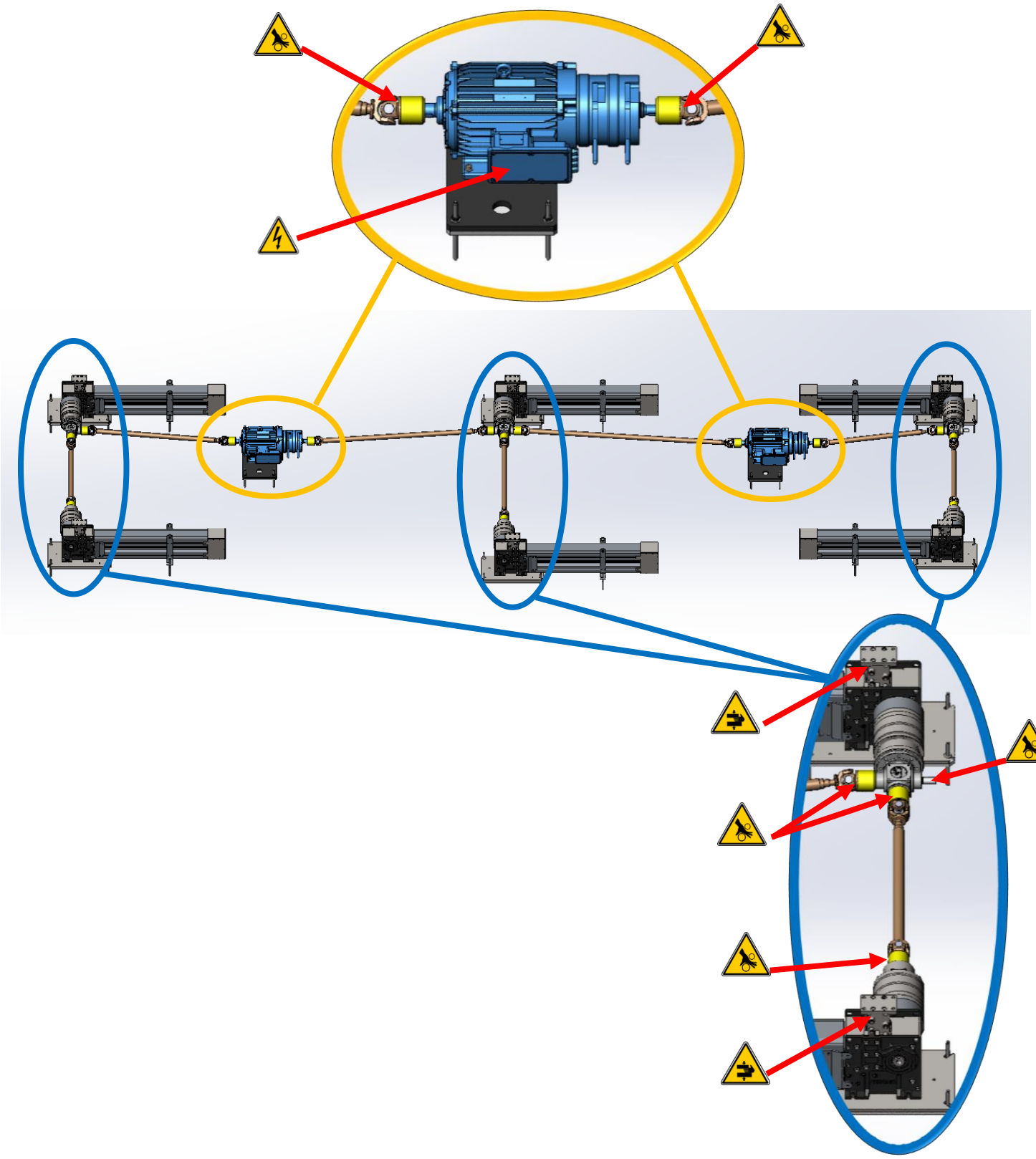
3.1.2 Interdictions / Prohibitory signs

Symbole	Signification	Signification
	Interdiction générale	General prohibition sign
	Interdiction de monter sur les bras du chariot	Climbing on the forks is strictly prohibited
	Interdiction d'utilisation de flamme	Open flames prohibited
	Interdiction de fumer	No smoking
	Zone interdite aux piétons	Area prohibited to pedestrians

3.1.3 Avertissements / Warning signs

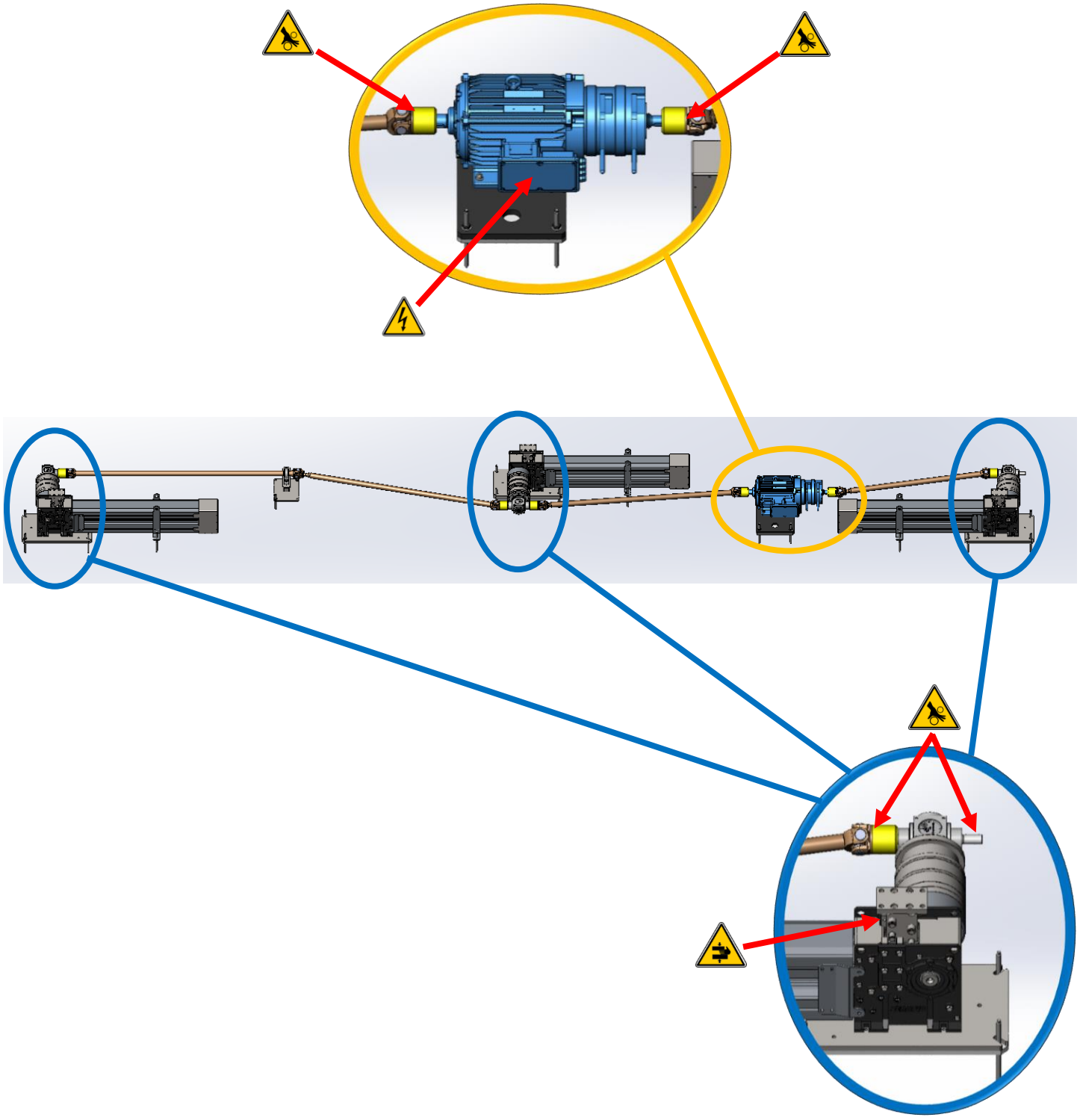
Symbole	Signification	Symbole	Signification
	Danger général / *General danger*		Danger d'écrasement / *Danger of crushing*
	Présence de tension électrique / *Electrical hazard*		Danger, transmission à chaîne / *Danger, chain drive*
	Danger, charge suspendue / *Danger, Overhead load*		Roulements, danger d'entraînement des mains / *Danger, keep hands away from the bearings*
	Danger, vis sans fin / *Danger, endless screw*		Danger, ruban transporteur / *Danger, conveyor belt*
	Roues dentelées, danger d'entraînement des mains / *Danger, keep hands away from the toothed wheels*		Danger, élévateur en mouvement / *Danger, lift moving*

3.2 Cartographie des dangers / Hazard mapping



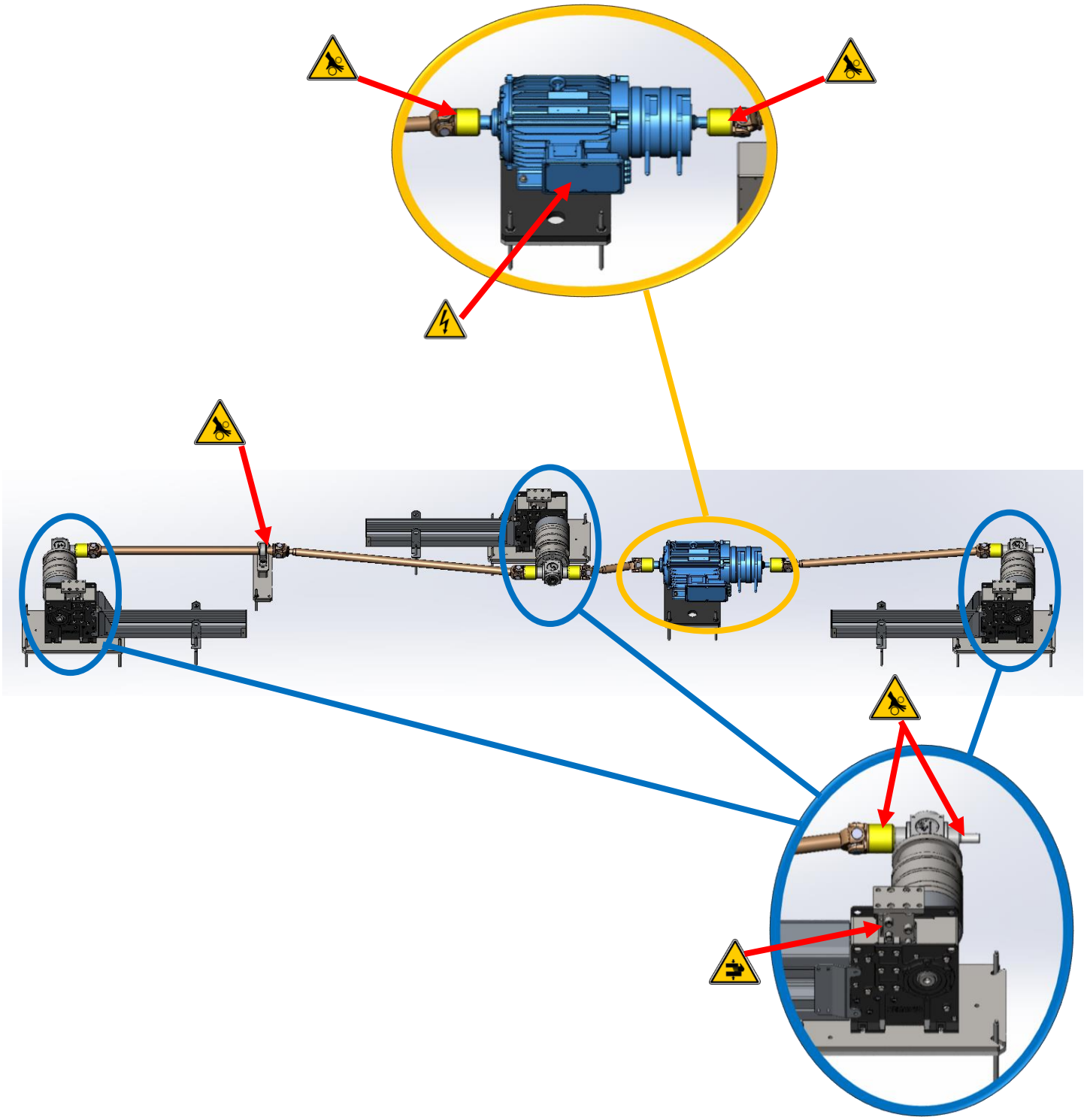
ORCHESTRA LIFT (LARGE) - THE-20766-1000-0

SERAPID France
4 rue des frères Robbe
76370 Martin-Eglise
Tél. : 02 32 06 35 60 / Fax : 02 32 06 35 61
info-fr@serapid.com / www.serapid.com



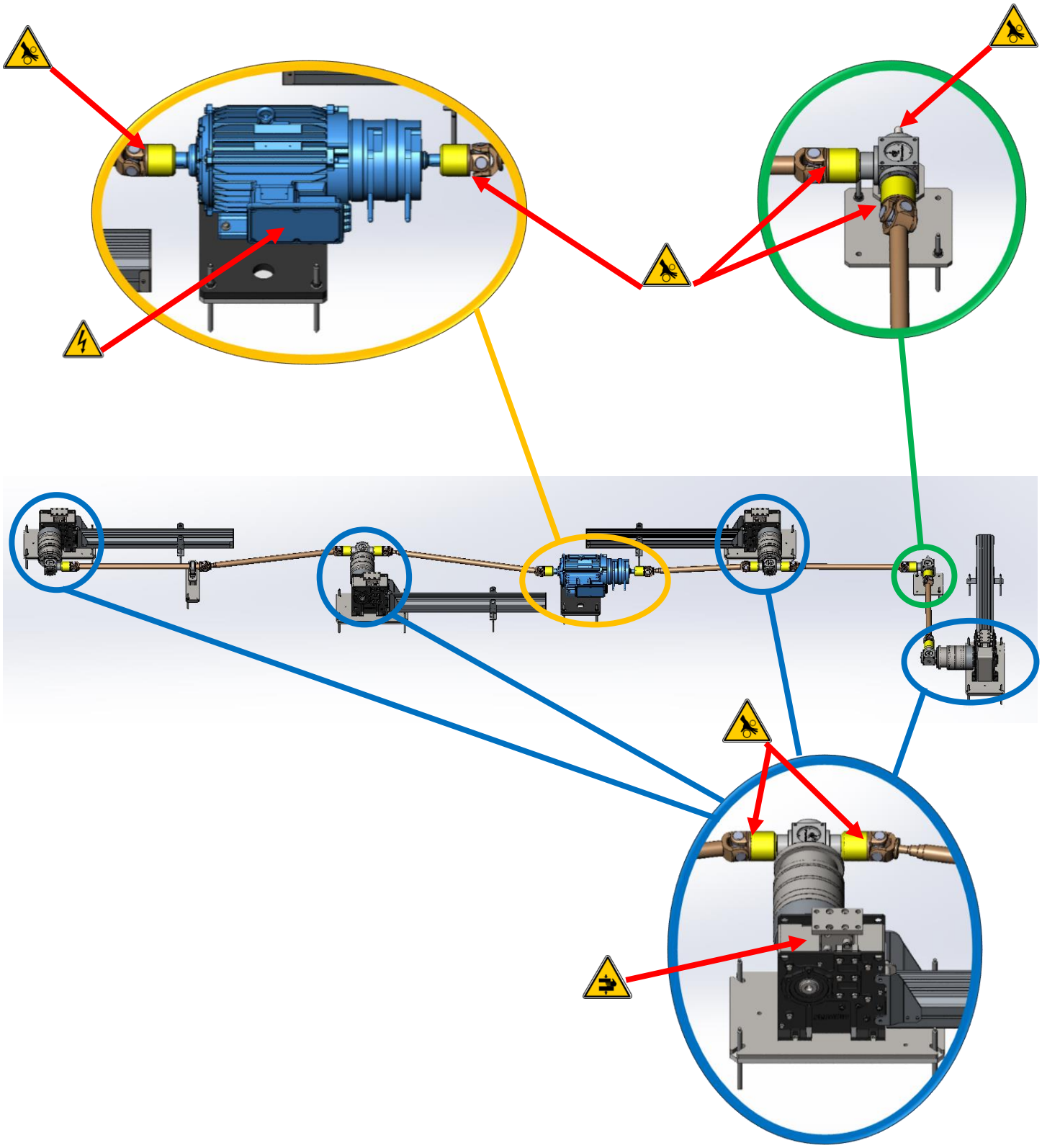
ORCHESTRA LIFT (SMALL) - THE-20766-2000-0

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4 rue des frères Robbe
76370 Martin-Eglise
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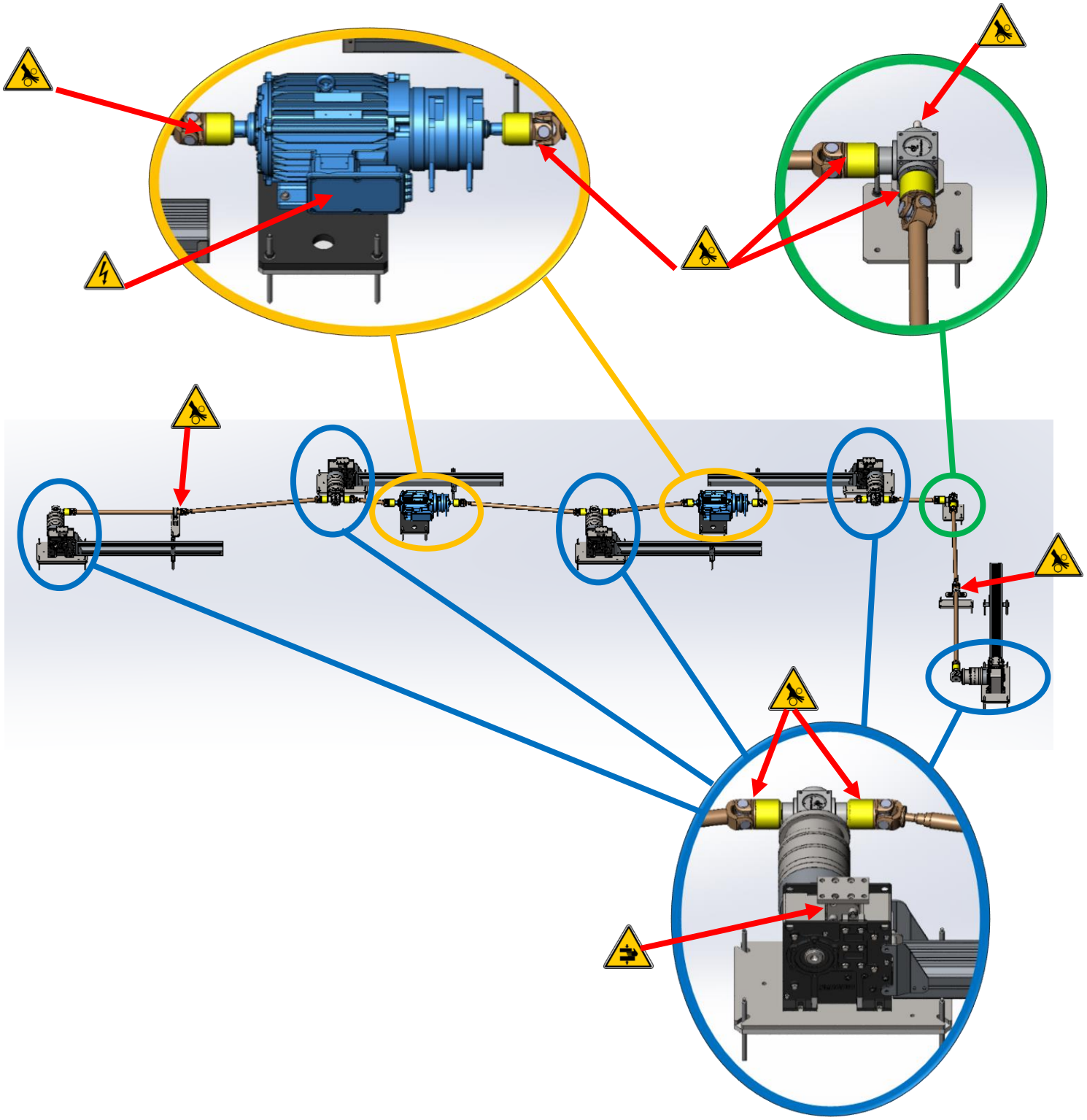
STAGE RISER 01 - THE-20766-3000-0

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4 rue des frères Robbe
76370 Martin-Eglise
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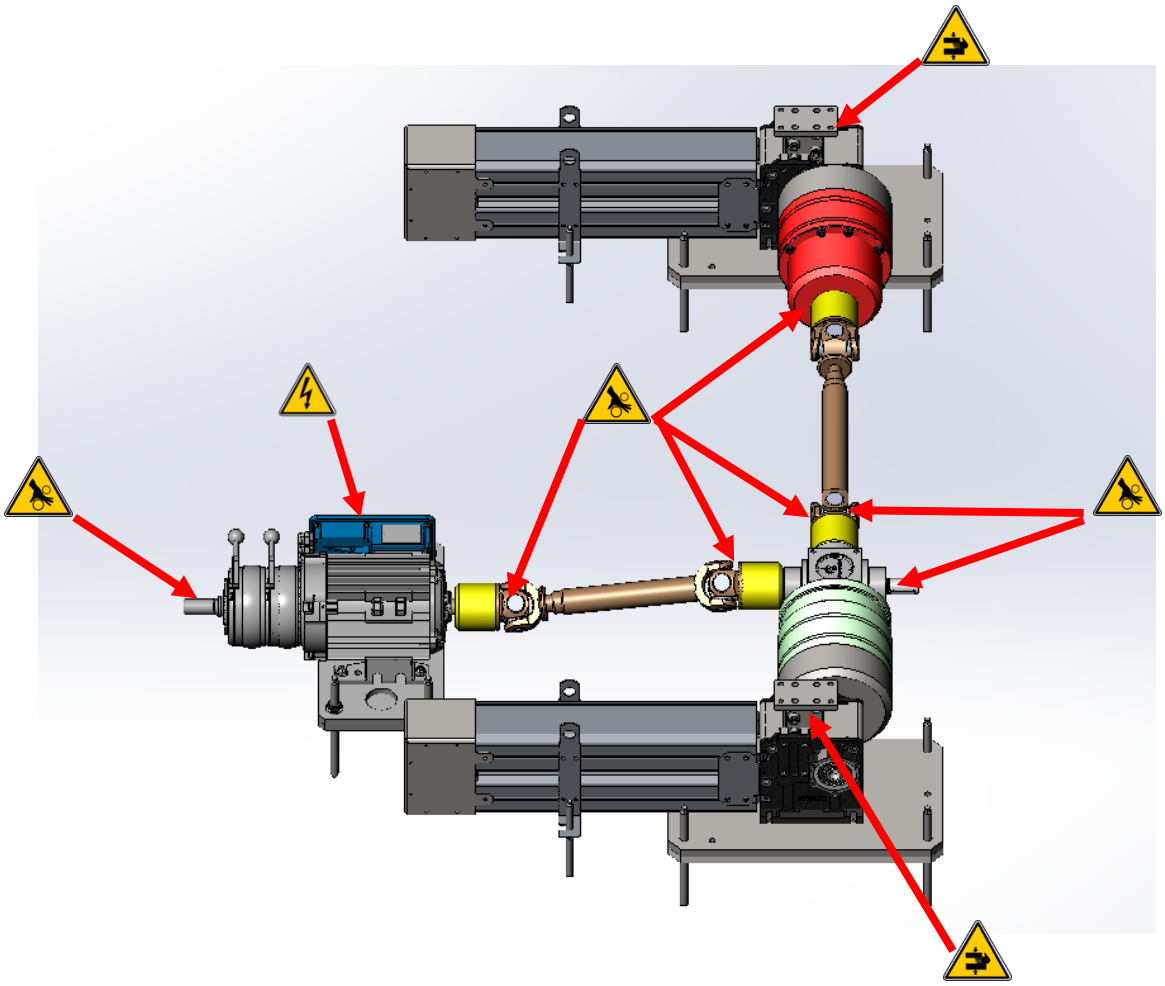
STAGE RISER 02 - THE-20766-4000-0

SERAPID France
4 rue des frères Robbe
76370 Martin-Eglise
Tél. : 02 32 06 35 60 / Fax : 02 32 06 35 61
info-fr@serapid.com / www.serapid.com



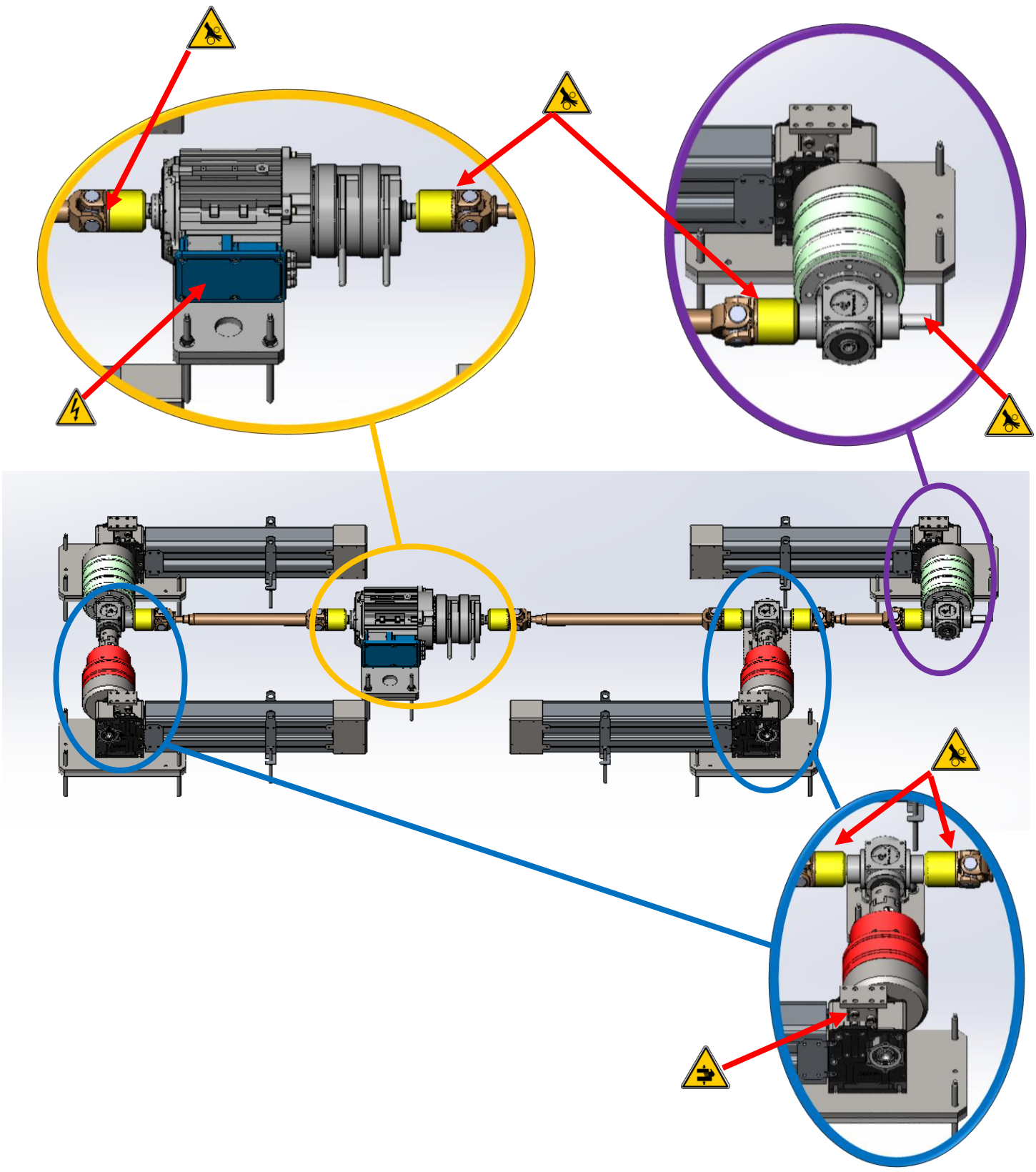
STAGE RISER 03 - THE-20766-5000-0

SERAPID France
4 rue des frères Robbe
76370 Martin-Eglise
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STAGE RISER 04 - THE-20766-6000-0

SERAPID France
4 rue des frères Robbe
76370 Martin-Eglise
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info-fr@serapid.com / www.serapid.com



STAGE RISER 05 - THE-20766-7000-0

4 Installation, mise en service / *Installation, commissoning*

4.1 Déchargement - Transport / *Unloading - Transport*

Avant déchargement, vérifier que le matériel n'a pas été endommagé durant le transport.
Si cela était le cas, faire immédiatement les réserves d'usage auprès du transporteur. Le matériel devra être déchargé, par chariot élévateur.

Before unloading the material, check that no damage has occurred during transport.
If it was, a claim must be lodged immediately with the carrier. The material should be off loaded by a suitable crane system.

4.2 Installation du matériel / *Installing the equipment*

Une adaptation est à prévoir par vos soins sur votre équipement suivant plans … / *For the fitting of the tool support consoles see drawings …* :

ORCHESTRA LIFT (LARGE)	**THE-20766-1000-0** (annexe / *appendix* A)
Orchestra lift (small)	**THE-20766-2000-0** (annexe / *appendix* A)
Stage riser 01	**THE-20766-3000-0** (annexe / *appendix* A)
Stage riser 02	**THE-20766-4000-0** (annexe / *appendix* A)
Stage riser 03	**THE-20766-5000-0** (annexe / *appendix* A)
Stage riser 04	**THE-20766-6000-0** (annexe / *appendix* A)
Stage riser 05	**THE-20766-7000-0** (annexe / *appendix* A)

Notice d'installation pour système LinkLift standard avec motorisation (annexe B) / *Installation notice for standard LinkLift system with motorization (appendix B)*.

4.3 Branchement des freins du moteur / Connecting the motor brakes

2 Moteur / 2 Motors

Attention ! Les freins d'un même moteur doivent être alimentés indépendamment mais un frein de chaque moteur doit être alimenté en même temps et de la façon suivante : 1x en dynamique (rapide) et 1x en statique (lent) par moteur, programmer un décalage de quelques dixièmes de secondes entre les freins dynamiques et les freins statiques.

The brakes of the same motor must be powered independently but one brake of each motor must be powered at the same time and in the following way : 1x dynamic (fast) and 1x static (slow) per motor, program a gap of a few tenths of a second between the dynamic and static brakes.

1 Moteur / 1 Motor

Attention ! Les freins du moteur doivent être alimentés indépendamment et de la façon suivante : 1x en dynamique (rapide) et 1x en statique (lent), programmer un décalage de quelques dixièmes de secondes entre le frein dynamique et le frein statique.

Attention ! The motor brakes must be supplied independently in the following way: 1x dynamic (fast) and 1x static (slow), program a gap of a few tenths of a second between the dynamic and static brake.

5 Notice de fonctionnement / *Note of functioning*

Pour le fonctionnement de ces élévateurs nous ne connaissons pas les différentes phases du cycle du client pour le décrire.
Il est cependant à noter que pour une vitesse d'utilisation supérieure à 50mm/s il est obligatoire de contrôler le mouvement en alimentant le moteur l'aide d'un variateur, afin de garantir des accélérations et décélérations progressives.
Le frein du moteur et les freins de sécurité sont à manque de courant, ce qui signifie qu'il faut les alimenter afin de libérer la transmission. Ceci assure la sécurité en cas de défaut de commande ou d'alimentation.

As we are not aware of the different phases of the working cycle we cannot comment on this section.
Nevertheless, it must be noted that for working speed equal to 50mm/s or over, it is obligatory to control the movement by driving the motor with a frequency drive, to obtain smooth accelerations and decelerations.
Brake on motor and safety brakes are normally closed, which means they must be powered to release the drive train. This ensures safety in case of control malfunction or power supply failure.

6 Entretien / *Maintenance*

AVANT PROPOS :
Toutes les opérations d'entretien doivent être réalisées par du personnel qualifié suivant la nature des travaux à effectuer.
Avant de procéder à une intervention d'entretien sur l'élévateur, il est impératif de le mettre hors tension afin d'empêcher toute remise en marche intempestive.

FOREWORD MAINTENANCE
All maintenance operations must be carried out by qualified personnel, according to the specialities involved.
Before beginning any work on the lifting system, disconnect from the main power supply.

6.1 Opérations de maintenance / *Maintenance operations*

	Opération mensuelle	**Opération trimestrielle**	**Opération anuelle**
Réducteur	Contrôler l'inexistence de bruits anormaux. (Voir annexes E et F)	Vérifier les niveaux d'huile, faire l'appoint si nécessaire. (Voir annexes E)	Vidange et remplissage d'huile. (Voir annexes E)
Moteur électrique	- Contrôler l'inexistence de bruits anormaux. - Souffler si nécessaire. (Voir annexe C)		
Cardan		- Contrôler l'état des cardans et des palier de cardans. - Graisser si nécessaire. (Voir annexe D)	
Chaîne			- Contrôler l'usure générale de la chaîne. - Graisser si nécessaire (usure / corrosion). (Voir annexe B)
Carter d'entrainement			- Contrôler le matage des plats de réaction et des pignons. (Voir annexe B)

	Monthly operation	***Three-monthly operation***	***Annual operation***
Reduction unit and bevel gear	*Check for any anormal noises.* *(See appendices E and F)*	*Check oil levels and top up as required.* *(See appendices E)*	*Drain and refill with oil.* *(See appendices E)*
Electrical motor	*- Check for any anormal noises.* *- Blow if necessary.* *(See appendix C)*		
Drive shaft		*- Check the condition of the drive shafts and pillow bearing shafts.* *- Grease as required.* *(See appendix D)*	
Chain			*- Check the general wear of the chain links and rollers* *- Grease if necessary (wearing / corrosion)* *(See appendix B)*
Drive housing			*Check for dull appearance on the reaction plates and the sprockets.* *(See appendix B)*

6.2 Nettoyage / *Cleaning*

L'élévateur devra être nettoyé à l'aide de chiffons et produit dégraissant. En aucun cas il ne devra être lavé au jet ou au nettoyeur haute pression.
Concernant l'entretien des matériels de commerce tels que moteur, réducteur, centrale hydraulique, cardans, etc., se référer aux différentes annexes de cette notice d'instruction.

The lifting system should be cleaned with a clean cloth and degreasing agent. Under no circumstances should the system be cleaned using a high-pressure hose or jet system.
As regards the bought-in components such as the motor, gearboxes, hydraulic pump, cardan shafts, etc, please refer to appendix in this instruction manual. (Where applicable)

6.3 Huile / *Oil*

Toute remise à niveau d'huile doit être effectuée avec de l'huile de grade de viscosité identique à celle déjà présente dans le réservoir du composant.
Le remplissage initial des composants est décrit dans le tableau ci-dessous :
Pour les quantités, se référer à l'annexe relative à chaque composant

Any top-up of oil level shall be made with same viscosity grade as the oil already present inside the component. Initial filling is described in following table:
For quantities refer to appendix related to each gearbox

Composant / *Item*	**Type d'huile / *Oil type***	**Viscosité / *Viscosity***	**Désignation huile / *Oil designation***
Réducteur planétaire / *Planetary gear box*	Synthétique / Synthetic	MDR 150	SOGELUB MDR 150 Ou équivalent / *Or equivalent*
Renvoi d'angle / *Bevel gear*	Graissé à vie / *Lubricated for life*		

6.4 Liste des pièces de rechange pour la plateforme **ORCHESTRA LIFT (LARGE)** / *List of spare parts platform* ***ORCHESTRA LIFT (LARGE)*.**

		Numéro de Projet SERAPID France / *SERAPID France Project Number*:	**THE-20766-1000-0**
Qté / *Qty*	Désignation / *Description*	Référence / *Reference*	Fournisseur / *Supplier*
02	Moteurs / *Motors*	Voir nomenclature - Annexes A et C / *Refer to parts list - Appendices A and C*	CANTONI
06	Chaînes LL050R / *LL050R Chains*	Voir nomenclature - Annexes A et B / *Refer to parts list - Appendices A and B*	SERAPID
24	Plats guide & réaction courts / *Short guide & reaction plates*	SER-00050-9067-3	SERAPID
12	Pignons d'entraînement extérieur/ *Outter drive sprockets*	SER-00050-9111-3	SERAPID
12	Pignons d'entraînement interieur/ *Inner drive sprockets*	SER-00050-9112-3	SERAPID
06	Réducteurs planétaires / *Planetary gearboxes*	Voir nomenclature - Annexes A et E / *Refer to parts list - Appendices A and E*	REGGIANA
03	Renvois d'angle / *Bevel gearboxes*	Voir nomenclature - Annexes A et F / *Refer to parts list - Appendices A and F*	DZ Trasmissioni
07	Cardans / *Drive shafts*	Voir nomenclature - Annexes A et D / *Refer to parts list - Appendices A and D*	SASS

6.5 Liste des pièces de rechange pour la plateforme **ORCHESTRA LIFT (SMALL) /** *List of spare parts platform* ***ORCHESTRA LIFT (SMALL).***

		Numéro de Projet SERAPID France / *SERAPID France Project Number*:	**THE-20766-2000-0**
Qté / *Qty*	Désignation / *Description*	Référence / *Reference*	Fournisseur / *Supplier*
01	Moteur / *Motor*	Voir nomenclature - Annexes A et C / *Refer to parts list - Appendices A and C*	CANTONI
03	Chaînes LL050 / *LL050 Chains*	Voir nomenclature - Annexes A et B / *Refer to parts list - Appendices A and B*	SERAPID
12	Plats guide & réaction courts / *Short guide & reaction plates*	SER-00050-9067-3	SERAPID
06	Pignons d'entraînement / *Drive sprockets*	SER-00050-9066-2	SERAPID
03	Réducteurs planétaires / *Planetary gearboxes*	Voir nomenclature - Annexes A et E / *Refer to parts list - Appendices A and E*	REGGIANA
03	Renvois d'angle / *Bevel gearboxes*	Voir nomenclature - Annexes A et F / *Refer to parts list - Appendices A and F*	DZ Trasmissioni
04	Cardans / *Drive shafts*	Voir nomenclature - Annexes A et D / *Refer to parts list - Appendices A and D*	SASS

6.6 Liste des pièces de rechange pour la plateforme **STAGE RISER 01 /** *List of spare parts platform* ***STAGE RISER 01***

		Numéro de Projet SERAPID France / ***SERAPID France Project Number*****:**	**THE-20766-3000-0**
Qté / *Qty*	Désignation / *Description*	Référence / *Reference*	Fournisseur / *Supplier*
01	Moteur / *Motor*	Voir nomenclature - Annexes A et C / *Refer to parts list - Appendices A and C*	CANTONI
03	Chaînes LL050 / *LL050 Chains*	Voir nomenclature - Annexes A et B / *Refer to parts list - Appendices A and B*	SERAPID
12	Plats guide & réaction courts / *Short guide & reaction plates*	SER-00050-9067-3	SERAPID
06	Pignons d'entraînement / *Drive sprockets*	SER-00050-9066-2	SERAPID
03	Réducteurs planétaires / *Planetary gearboxes*	Voir nomenclature - Annexes A et E / *Refer to parts list - Appendices A and E*	REGGIANA
03	Renvois d'angle / *Bevel gearboxes*	Voir nomenclature - Annexes A et F / *Refer to parts list - Appendices A and F*	DZ Trasmissioni
04	Cardans / *Drive shafts*	Voir nomenclature - Annexes A et D / *Refer to parts list - Appendices A and D*	SASS

6.7 Liste des pièces de rechange pour la plateforme **STAGE RISER 02 /** *List of spare parts platform* ***STAGE RISER 02***

		Numéro de Projet SERAPID France / ***SERAPID France Project Number*:**	**THE-20766-4000-0**
Qté / *Qty*	Désignation / *Description*	Référence / *Reference*	Fournisseur / *Supplier*
01	Moteur / *Motor*	Voir nomenclature - Annexes A et C / *Refer to parts list - Appendices A and C*	CANTONI
04	Chaînes LL050 / *LL050 Chains*	Voir nomenclature - Annexes A et B / *Refer to parts list - Appendices A and B*	SERAPID
16	Plats guide & réaction courts / *Short guide & reaction plates*	SER-00050-9067-3	SERAPID
08	Pignons d'entraînement / *Drive sprockets*	SER-00050-9066-2	SERAPID
04	Réducteurs planétaires / *Planetary gearboxes*	Voir nomenclature - Annexes A et E / *Refer to parts list - Appendices A and E*	REGGIANA
05	Renvois d'angle / *Bevel gearboxes*	Voir nomenclature - Annexes A et F / *Refer to parts list - Appendices A and F*	DZ Trasmissioni
06	Cardans / *Drive shafts*	Voir nomenclature - Annexes A et D / *Refer to parts list - Appendices A and D*	SASS

6.8 Liste des pièces de rechange pour la plateforme **STAGE RISER 03 /** *List of spare parts platform* ***STAGE RISER 03***

		Numéro de Projet SERAPID France / ***SERAPID France Project Number*:**	**THE-20766-5000-0**
Qté / *Qty*	Désignation / *Description*	Référence / *Reference*	Fournisseur / *Supplier*
02	Moteurs / *Motors*	Voir nomenclature - Annexes A et C / *Refer to parts list - Appendices A and C*	CANTONI
05	Chaînes LL050R / *LL050R Chains*	Voir nomenclature - Annexes A et B / *Refer to parts list - Appendices A and B*	SERAPID
20	Plats guide & réaction courts / *Short guide & reaction plates*	SER-00050-9067-3	SERAPID
10	Pignons d'entraînement extérieur / *Outter drive sprockets*	SER-00050-9111-3	SERAPID
10	Pignons d'entraînement intérieur / *Inner drive sprockets*	SER-00050-9112-3	SERAPID
05	Réducteurs planétaires / *Planetary gearboxes*	Voir nomenclature - Annexes A et E / *Refer to parts list - Appendices A and E*	REGGIANA
06	Renvois d'angle / *Bevel gearboxes*	Voir nomenclature - Annexes A et F / *Refer to parts list - Appendices A and F*	DZ Trasmissioni
09	Cardans / *Drive shafts*	Voir nomenclature - Annexes A et D / *Refer to parts list - Appendices A and D*	SASS

6.9 Liste des pièces de rechange pour la plateforme **STAGE RISER 04 /** *List of spare parts platform* ***STAGE RISER 04***

		Numéro de Projet SERAPID France / ***SERAPID France Project Number*:**	**THE-20766-6000-0**
Qté / *Qty*	Désignation / *Description*	Référence / *Reference*	Fournisseur / *Supplier*
01	Moteur / *Motor*	Voir nomenclature - Annexes A et C / *Refer to parts list - Appendices A and C*	CANTONI
02	Chaînes LL030 / *LL030 Chains*	Voir nomenclature - Annexes A et B / *Refer to parts list - Appendices A and B*	SERAPID
08	Plats guide & réaction courts / *Short guide & reaction plates*	SER-00030-9177-1	SERAPID
04	Pignons d'entraînement / *Drive sprockets*	SER-00030-9176-1	SERAPID
02	Réducteurs planétaires / *Planetary gearboxes*	Voir nomenclature - Annexes A et E / *Refer to parts list - Appendices A and E*	REGGIANA
01	Renvoi d'angle / *Bevel gearbox*	Voir nomenclature - Annexes A et F / *Refer to parts list - Appendices A and F*	DZ Trasmissioni
02	Cardans / *Drive shafts*	Voir nomenclature - Annexes A et D / *Refer to parts list - Appendices A and D*	SASS

6.10 Liste des pièces de rechange pour la plateforme **STAGE RISER 05** / *List of spare parts platform* ***STAGE RISER 05***

		Numéro de Projet SERAPID France / *SERAPID France Project Number*:	**THE-20766-7000-0**
Qté / *Qty*	Désignation / *Description*	Référence / *Reference*	Fournisseur / *Supplier*
01	Moteur / *Motor*	Voir nomenclature - Annexes A et C / *Refer to parts list - Appendices A and C*	CANTONI
04	Chaînes LL030 / *LL030 Chains*	Voir nomenclature - Annexes A et B / *Refer to parts list - Appendices A and B*	SERAPID
16	Plats guide & réaction courts / *Short guide & reaction plates*	SER-00030-9177-1	SERAPID
08	Pignons d'entraînement / *Drive sprockets*	SER-00030-9176-1	SERAPID
04	Réducteurs planétaires / *Planetary gearboxes*	Voir nomenclature - Annexes A et E / *Refer to parts list - Appendices A and E*	REGGIANA
03	Renvois d'angle / *Bevel gearboxes*	Voir nomenclature - Annexes A et F / *Refer to parts list - Appendices A and F*	DZ Trasmissioni
03	Cardans / *Drive shafts*	Voir nomenclature - Annexes A et D / *Refer to parts list - Appendices A and D*	SASS
02	Accouplements / Couplings	Voir nomenclature - Annexes A et G / *Refer to parts list - Appendices A and G*	KTR

6.11 Analyse des défauts / *Defaults*

6.11.1 Incidents de fonctionnement normaux / *Ordinary malfunctions*

Incident constaté	Cause possible	Remède
Le dispositif ne fonctionne pas	La zone de sécurité est activée	Désactiver la zone de sécurité
Aucun mouvement ne fonctionne	Le dispositif n'est pas en service	Mettre le dispositif en service

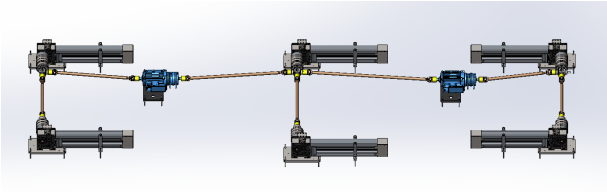
Problem	Possible cause	Remedy
Pushing system fail	Prohibited area is activated	Desactivate safety zone
No movement of pushing system	Pushing system is out of order	Check power supply and connections

6.11.2 Incidents de fonctionnement « anormaux » / *Anormal malfunctions*

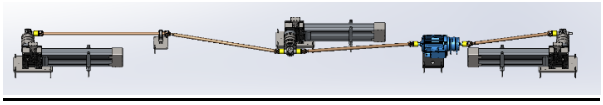
Incident constaté	Cause possible	Remède
Les chaînes ne sortent pas	Moteur hors service Moteur débranché	Changer le moteur Vérifier le câblage

Problem	Possible cause	Remedy
Chains don't move	Motor out of order Motor disconnected	Change motor Check connections

7 Annexe A – PLAN ET NOMENCLATURE / *Appendix A – DRAWING AND PARTS LIST*



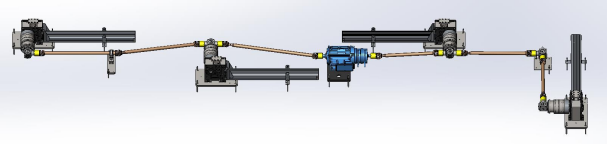
ORCHESTRA LIFT (LARGE) - THE-20766-1000-0



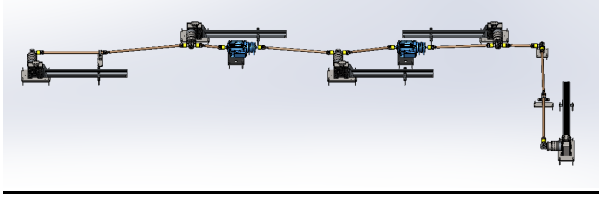
ORCHESTRA LIFT (SMALL) - THE-20766-2000-0



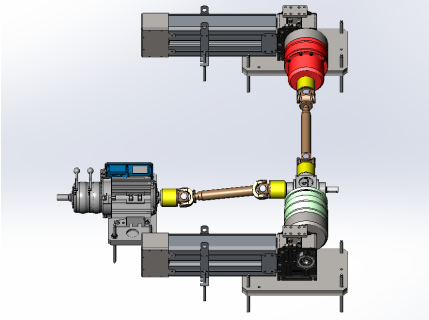
STAGE RISER 01 - THE-20766-3000-0



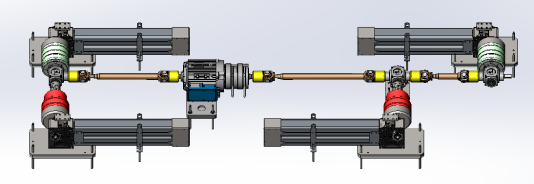
STAGE RISER 02 - THE-20766-4000-0



STAGE RISER 03 - THE-20766-5000-0



STAGE RISER 04 - THE-20766-6000-0



STAGE RISER 05 - THE-20766-7000-0

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8 Annexe B – CHAINE POUSSEUSE / *Appendix B – RIGID PUSHING CHAIN*

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info-fr@serapid.com **/** www.serapid.com

9 Annexe C – MOTEUR / *Appendix C – MOTOR*

Site Internet du fournisseur / *Supplier's Web site* : http://www.jet-moteurselectriques.com/

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4 rue des frères Robbe
76370 Martin-Eglise
Tél. : 02 32 06 35 60 / Fax : 02 32 06 35 61
info-fr@serapid.com **/** www.serapid.com

10 Annexe D – CARDAN / *Appendix D – DRIVE SHAFT*

Site Internet du fournisseur / *Supplier's Web site* : https://www.w-sass.de/home.html

11 Annexe E – REDUCTEUR PLANETAIRE / *Appendix E – PLANETARY GEAR BOX*

Site Internet du fournisseur / *Supplier's Web site* : https://www.reggianariduttori.com/

12 Annexe F – RENVOI D'ANGLE / *Appendix F – BEVEL GEAR BOX*

Site Internet du fournisseur / *Supplier's Web site* : https://www.dztrasmissioni.it/en

SERAPID France
4 rue des frères Robbe
76370 Martin-Eglise
Tél. : 02 32 06 35 60 / Fax : 02 32 06 35 61
info-fr@serapid.com **/** www.serapid.com

13 Annexe G – ACCOUPLEMENT / *Appendix G – COUPLING*

Site Internet du fournisseur / *Supplier's Web site* : https://www.ktr.com/uk/en/

SERAPID France
4 rue des frères Robbe
76370 Martin-Eglise
Tél. : 02 32 06 35 60 / Fax : 02 32 06 35 61
info-fr@serapid.com **/** www.serapid.com

14 Annexe H – CERTIFICAT D'INCORPORATION / *Appendix G – CERTIFICATE OF INCORPORATION*

« Ce document n'est pas contractuel, le document officiel sera fourni avec le bon de livraison de notre produit. / This document is not contractual; the official document will be provided with the delivery note of our product. »

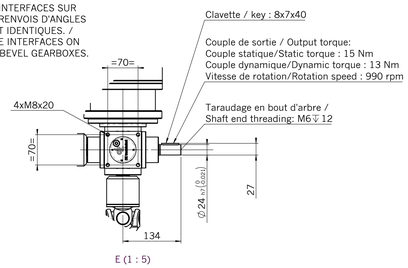
10. Appendix 2 – Serapid Drawings

Prefixe ERP	ARTICLE / PART NUMBER	DESCRIPTION FRANCAISE	ENGLISH DESCRIPTION	INFORMATION	FOURNISSEUR / SUPPLIER	ARTICLE / PART NUMBER	QTE / QTY
THE-	20766-1010-1	Réducteur planétaire	Bevel gearbox	RR 210 T FS 1/103.69 (80C) i=1/103.69 ; Breaking torque = 6380 Nm ; Efficiency=0.94 ; Inertia=0.9 gxm² ; color=Supplier's standard	REGGIANA (RR France)	20766-1010-1	3
THE-	20766-1010-2	Réducteur planétaire	Bevel gearbox	RR 210 T FS 1/103.69 (STD) i=1/103.69 ; Breaking torque = 6380 Nm ; Efficiency=0.94 ; Inertia=0.9 gxm² ; color=Supplier's standard	REGGIANA (RR France)	20766-1010-2	3
THE-	20766-1011-0	Ensemble de vis pour réducteur planétaire	Kit of screws for planetary gearbox	08x vis CH-c M8x170 et 08x rondelle plate ø8.4 x ø18 x1.5 / 08x CH-c screws M8x170 et 08x washers ø8.4 x ø18 x1.5	SERAPID France	20766-1011-0	3
THE-	20766-1020-1	Renvoi d'angle	Bevel gearbox	QB 9 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on left side (FLB) + double shaft exit Ø16 (MK2) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour : Supplier's standard.	DZ Trasmissioni (RR France)	20766-1020-1	1
THE-	20766-1020-2	Renvoi d'angle	Bevel gearbox	QB 9 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on left side (FLB) + double shaft exit Ø16 (MK2) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour : Supplier's standard.	DZ Trasmissioni (RR France)	20766-1020-2	1
THE-	20766-1020-3	Renvoi d'angle	Bevel gearbox	QB 4 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on right side (FLC) + double shaft exit Ø16 (MK2) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour : Supplier's standard.	DZ Trasmissioni (RR France)	20766-1020-3	1
THE-	20766-1030-0	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/mn. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-1030-0	2
THE-	20766-1030-1	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/mn. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-1030-1	1
THE-	20766-1030-2	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/mn. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-1030-2	1
THE-	20766-1030-3	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/mn. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-1030-3	1
THE-	20766-1030-4	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/mn. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-1030-4	1
THE-	20766-1030-5	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/mn. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-1030-5	1
THE-	20766-1100-0	Sous-ensemble LL050R - Sortie d'arbre A	LL050R subassembly - Shaft exit A	Rayon primitif ... / Primitive radius ... : 47.75mm. ; Rendement ... / Efficiency at worst ... : 0.80 ; Détails sur ce plan / Details on this drawing	SERAPID France	20766-1100-0	3
THE-	20766-1200-0	Sous-ensemble LL050R - Sortie d'arbre B	LL050R subassembly - Shaft exit B	Rayon primitif ... / Primitive radius ... : 47.75mm. ; Rendement ... / Efficiency at worst ... : 0.80 ; Détails sur ce plan / Details on this drawing	SERAPID France	20766-1200-0	3
SER-	L2050-CB02-0	Ensemble contre-bride + vis (RR210 - LL050/LL050R)	Adapter flange assembly (RR210 - LL050/LL050R)	RR210 - LL050/LL050R (Standard fourniseur / Supplier's standard), Couleur / Color : RAL 9005	SERAPID France	L2050-CB02-0	6
SER-	ZE000-1106-2	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø16 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1106-2	3
SER-	ZE000-1112-2	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø24 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1112-2	4
SER-	ZE000-1115-4	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø28 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1115-4	2
SER-	ZE000-1119-5	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø35 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1119-5	3
SER-	ZE000-1121-5	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø38 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1121-5	2
SER-	ZMJ03-R040-6	Moteur 4,0 kW, 6 pôles, double frein	Motor 4.0 kW, 6 poles, double brake	Sg 132M-6A-2HSY (cast iron casing) ; 4 kW ; 6 poles ; 230/400V ; 950rpm ; 50Hz ; Double brake : 2x80 Nm (Rectifier B2-2P : 230 VAC/ 207 VDC) ; Shaft exit / 2nd Shaft exit : Ø38g6x80(M12) / Ø28g6x80(M10) ; Classe isolation / Thermal protection : F IP55, 3 sondes PTC + 3 sondes TKO ; Inductive Microswith : IKZ ; Duty S2 10 minutes ; Colour : RAL 5010 (Supplier's Std).	CANTONI (JET)	ZMJ03-R040-6	2

NOTA :
Toutes les platines ne sont pas fournies par SERAPID France, et non referencees dans cette nomenclature. Se referer aux notes ci-dessous. / All base plates are not supplied by SERAPID France, and not notified in this parts list. Refer to below notes.

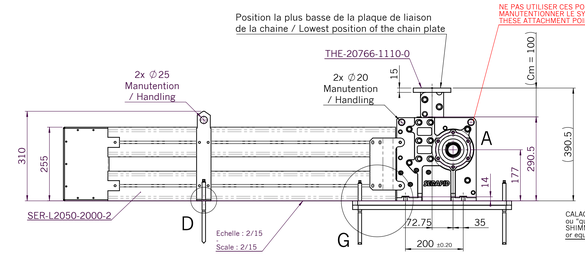
SER-ZA001-R055-0 :
PLATINES MOTEUR, DETAILS SUR LE PLAN SER-ZA001-R055-0, ELEMENTS NON FOURNIS PAR SERAPID France.
/ MOTOR PLATES, DETAILS ON THE DRAWING SER-ZA001-R055-0, ITEMS NOT SUPPLIED BY SERAPID France.

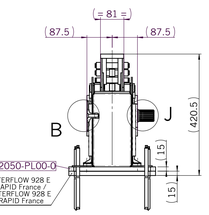
SER-L2050-PL00-0 :
PLATINE CARTER LINKLIFT, DETAILS SUR LE PLAN SER-L2050-PL00-0, ELEMENT NON FOURNI PAR SERAPID France. / DRIVE HOUSING PLATE, DETAILS ON THE DRAWING SER-L2050-PL00-0, ITEM NOT SUPPLIED BY SERAPID France.

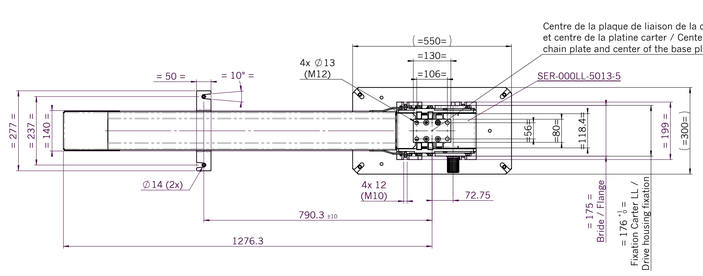


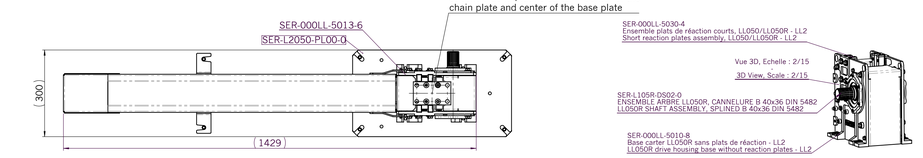
E (1 : 5)

Prefixe ERP	ARTICLE / PART NUMBER	DESCRIPTION FRANCAISE	ENGLISH DESCRIPTION	INFORMATION	FOURNISSEUR / SUPPLIER	ARTICLE / PART NUMBER	THE-20766-1100-0 Exit A - QTE / QTY	THE-20766-1200-0 Exit B - QTE / QTY
THE-	20766-1110-0	Sous-ensemble Chaine LL050R	LL050R Chain subassembly	Montage suivant plan : SER-00050-1181-0. Quantité de Maillons STD suivant la nomenclature de cette Affaire.	SERAPID France	20766-1110-0	1	1
SER-	L2050-2000-2	Magasin LL050 2 brins H / Course Totale = 2000	2 H strands magazine LL050 / Total Stroke = 2000	Standard STI SERAPID Group. LL2, LinkLift de 2ème generation / LinkLift of 2nd generation.	GAULT INDUSTRIES	L2050-2000-2	1	1
SER-000	LL-5013-5	Sous-ensemble LL050R, Plats de réaction courts, Sortie A	LL050R sub-assembly, Short reaction plates, Exit A	Nomenclature sur ce plan (vue 3D) / Parts list on this drawing (3D view). Primitive radius = 47.75mm; Efficienty at worst = 0.8	SERAPID France	LL-5013-5	1	-
SER-000	LL-5013-6	Sous-ensemble LL050R, Plats de réaction courts, Sortie B	LL050R sub-assembly, Short reaction plates, Exit B	Nomenclature sur ce plan (vue 3D) / Parts list on this drawing (3D view). Primitive radius = 47.75mm; Efficienty at worst = 0.8	SERAPID France	LL-5013-6	-	1

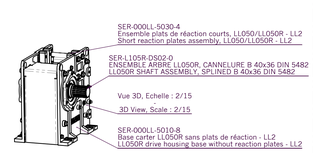




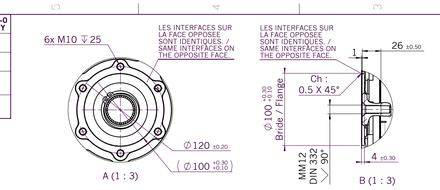


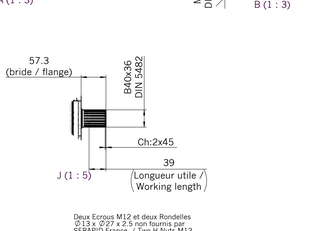


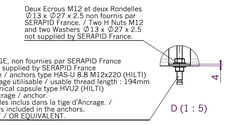
SER-000LL-5013-5
Sous-ensemble LL050R, Plats de réaction courts, Sortie A
LL050R sub-assembly, Short reaction plates, Exit A

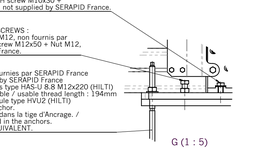


SER-000LL-5013-6
Sous-ensemble LL050R, Plats de réaction courts, Sortie B
LL050R sub-assembly, Short reaction plates, Exit B









Document necessaire au montage de ce systeme. ***Documents required for assembling this system.***

Plan d'ensemble / General Assembly : THE-20766-1000-0

Manuel d'instructions / Instruction manual : THE-20766-M001-0

TRES IMPORTANT / *VERY IMPORTANT*

CONSIGNES DE SECURITE / *SAFETY INSTRUCTIONS*

Tous les composants mécaniques doivent être impérativement mis de niveau et correctement positionnés suivant les indications et cotations de ce plan.
Le non respect de ces consignes risque d'entrainer une détérioration des différents organes mécanique de cette transmission et une annulation de la garantie SERAPID France.

All the mechanical components must be installed straightly and positionned following the dimensions and indications shown on this drawing.
Not respecting these instructions could lead to a deterioration of the differents parts of the transmission and could cancel SERAPID waranty.

IMPERATIF :
La charge totale doit être uniformément répartie sur chacun des LinkLifts.
IMPERATIVE :
The total load must be distributed uniformly on each LinkLift.

LINKLIFT 30 et/*and* LINKLIFT 50

FIXATION PLATINES / *PLATE FIXING :*
Non fourni par SERAPID France / Not supplied by SERAPID France

-A-Platine linklift, se référer au détail / *Linklift plate (see detail linklift plate)*
-1-Mise à niveau par / *Height setting by :*
3 vis verins / *screw jack* HM12x50 + 3 écrous / *nuts* M12
-2-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
4 tiges d'ancrage / *anchors*
4 capsules chimiques / *chemical capsules*

-B-Platine renvoi d'angle, se référer au détail (si besoin) / *Geared box plate, see detail geared plate (if needed)*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
4 tiges d'ancrage / *anchors*
4 capsules chimiques / *chemical capsules*

-C-Platine moteur, se référer au détail / *Motor plate, see detail motor plate*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
4 tiges d'ancrage / *anchors*
4 capsules chimiques / *chemical capsules*

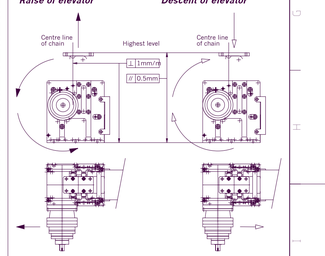
-D-Magasin linklift / *Linklift magazin*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
2 tiges d'ancrage / *anchors*
2 capsules chimiques / *chemical capsules*

-E-Support Cardan, se référer au détail (si besoin) / *Cardan Plate, see detail cardan plate (if needed)*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
2 tiges d'ancrage / *anchors*
2 capsules chimiques / *chemical capsules*

Après mise en position et ancrage, toutes les platines doivent être calées à l'aide d'une resine de calage.

After position setting and anchorage, all the plates must be shimmed with a resin.

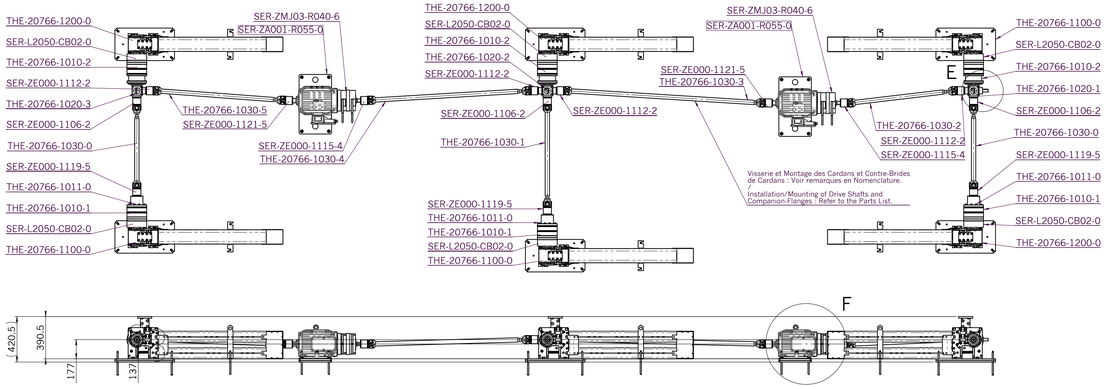
Montée de la plateforme / ***Raise of elevator***
Descente de la plateforme / ***Descent of elevator***

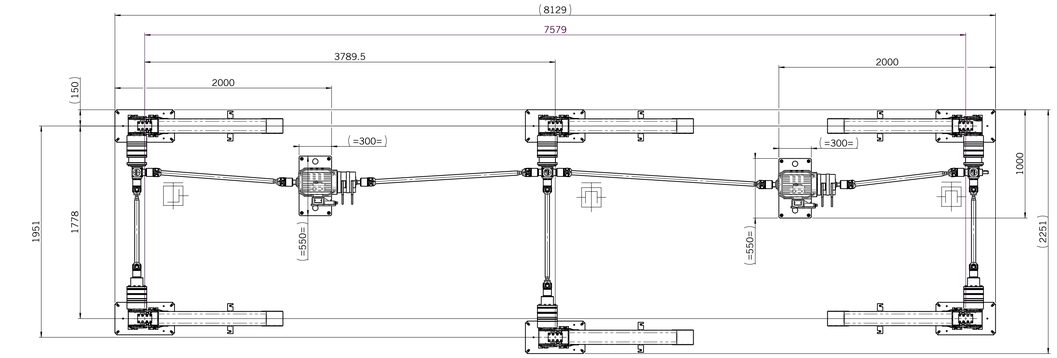


Parallelism between the floor and the highest level 0.5mm max.
Perpendicular position between the ground and the centre line of the chain 1mm/m.

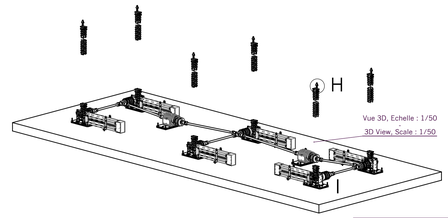
TRANSPORT ET STOCKAGE :
Les composants des systèmes d'élévation LINKLIFT ont une protection contre la corrosion par une peinture industrielle, vernis de protection ou huilage suivant les pièces. Dès réception, les caisses doivent être ouvertes pour vérifier l'état des composants après le transport (particulièrement si il est maritime) et les stocker à l'abri et au sec jusqu'à l'installation.

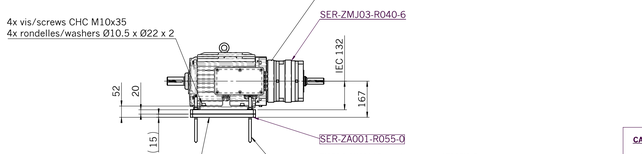
TRANSPORT AND STORAGE :
The components for the LINKLIFT systems have a protection against corrosion by an industrial painting, a protecting varnish or oiling according to the parts. When receiving the woodden boxes, same must imperatively be opened, in order to check the components specially after transport and mainly by sea. The storage has to be made in a dry aera.

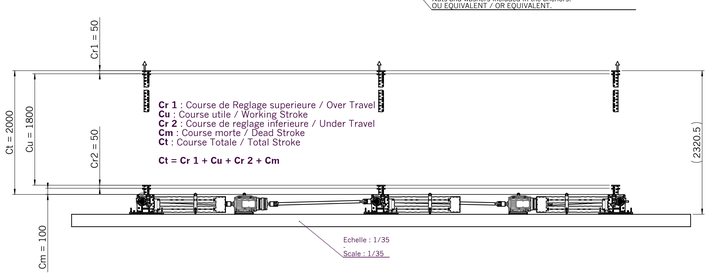








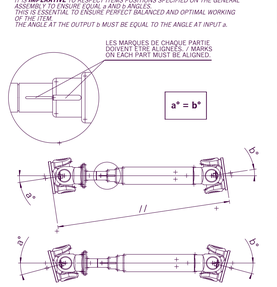




CARDAN / CARDAN SHAFT

IL EST **IMPERATIF** DE RESPECTER LES POSITIONS DES MATERIELS SPECIFIES SUR LE PLAN D'ENSEMBLE AFIN DE GARANTIR L'EGALITE DES ANGLES a ET b. CETTE EGALITE ETANT INDISPENSABLE POUR GARANTIR LE PARFAIT EQUILIBRAGE DU CARDAN ET UN FONCTIONNEMENT OPTIMAL DU MATERIEL.
L'ANGLE EN SORTIE b DOIT ETRE EGAL A L'ANGLE EN ENTREE a.

*IT IS **IMPERATIVE** TO RESPECT ITEMS POSITIONS SPECIFIED ON THE GENERAL ASSEMBLY TO ENSURE EQUAL a AND b ANGLES.*
THIS IS ESSENTIAL TO ENSURE PERFECT BALANCED AND OPTIMAL WORKING OF THE ITEM.
THE ANGLE AT THE OUTPUT b MUST BE EQUAL TO THE ANGLE AT INPUT a.



CARACTERISTIQUE TECHNIQUE / TECHNICAL DATA: Incorporation

Surface de la plateforme / Platform surface	m2 : 27.3
Masse de la plateforme / Mass of the platform	daN/m2 : 150
Charge utile Statique / Static payload	daN/m2 : 500
Charge utile Dynamique / Dynamic payload	daN/m2 : 250
Force statique / static load	N : 177 450 (on 6 LinkLift) MAX 29 575 N on 1 LinkLift
Force dynamique / dynamic load	N : 109 200 (on 6 LinkLift) MAX 18 200 N on 1 LinkLift

Ces charges sont considérées réparties équitablement sur l'ensemble des LinkLift.
These loads are considered distributed equally over all LinkLift.

Vitesse d'élévation / speed elevation	mm/s : 50 (with frequency drive)
Course / stroke	mm : Voir sur le plan / Refer to the drawing
Type de chaîne / type of chain	: LL050R (LL2)
Fréquence d'utilisation / frequency of use	: /
Teinte de finition / colors	: Apprêt phosphatique noir mat et standard fournisseurs / Black phosphatation and suppliers standards

Projet / Project : University of Oxford
Plateforme / Stage : Orchestra Lift (large)

Description	Changement des positions LinkLift et platine moteur, suppression du Stromag suivant demande client / Change of Linklift and baseplate motor position, removal of limit switch following customer request.				
Rev. B	Modifié par / Modified by	gosset.a	Vérifié par / Checked by	VERDIER S.	Approuvé par / Approved by	NOYON L.
	Date de modif.	20/12/2023	Date	20/12/2023	Date	20/12/2023
	Dessiné par / Designed by	gosset.a	Vérifié par / Checked by	VERDIER S.	Approuvé par / Approved by	NOYON L.
	Date de création	20/09/2023	Date :	20/09/2023	Date :	03/01/2024

http://www.serapid.com
info-fr@serapid.com
SERAPID RIGID CHAIN TECHNOLOGY
Tél: 02 35 93 82 82
Fax: 02 35 94 10 93
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Matière / Material : EXPLOSE / DIN / ASI : | Masse / Weight (Kg): | Traitement / Treatment :
Volume / Volume (cm³) :

Titre / Title :
Ensemble 6x LinkLift 050R avec motorisation
6x LinkLift 050R with drive system assembly

Code archivage / Code archive	Préfixe ERP/ ERP Prefix	N° de Plan / Drawing's number :	Indice 3D:	Tol. Gén. :	Rugosité :
CD2	THE-	20766-1000-0		Voir nota	
			Echelle / Scale : 1:20	Feuille / Size : A0 1/1	

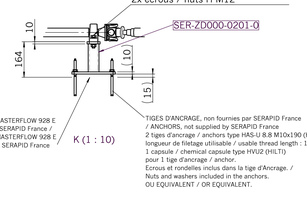
Prefixe ERP	ARTICLE / PART NUMBER	DESCRIPTION FRANCAISE	ENGLISH DESCRIPTION	INFORMATION	FOURNISSEUR / SUPPLIER	ARTICLE / PART NUMBER	QTE / QTY
THE-	20766-2010-1	Réducteur planétaire	Bevel gearbox	RR 210 T FS 1/103.69 (STD) i=1/103.69 ; Breaking torque = 6380 Nm ; Efficiency=0.94 ; Inertia= 0.9 gxm² ; color=Supplier's standard	REGGIANA (RR France)	20766-2010-1	3
THE-	20766-2020-1	Renvoi d'angle	Bevel gearbox	QB 4 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on left side (FLB) + simple shaft exit Ø16 (MKB) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour : Supplier's standard.	DZ Trasmissioni (RR France)	20766-2020-1	1
THE-	20766-2020-2	Renvoi d'angle	Bevel gearbox	QB 9 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on right side (FLB) + simple shaft exit Ø16 (MKB) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour : Supplier's standard.	DZ Trasmissioni (RR France)	20766-2020-2	1
THE-	20766-2020-3	Renvoi d'angle	Bevel gearbox	QB 9 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on right side (FLC) + simple shaft exit Ø16 (MKC) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour : Supplier's standard.	DZ Trasmissioni (RR France)	20766-2020-3	1
THE-	20766-2030-0	CARDAN SIMPLE PALIER	INTERMEDIATE CARDAN SHAFT	Vitesse de rotation : 990 tr/min - Rotation speed : 990 rpm - RAL 1003 - 6 vis/screws M6 DIN 960-10.9 et/and 6 écrous/nuts M6 DIN 980-10 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	20766-2030-0	1
THE-	20766-2030-1	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/min, Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-2030-1	1
THE-	20766-2030-2	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/min. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-2030-2	1
THE-	20766-2030-3	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/min. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-2030-3	1
THE-	20766-2100-0	Sous-ensemble LL050 - Sortie d'arbre A	LL050 subassembly - Shaft exit A	Rayon primitif ... / Primitive radius ... : 47.75mm. ; Rendement ... / Efficiency at worst ... : 0.80 ; Détails sur ce plan / Details on this drawing	SERAPID France	20766-2100-0	1
THE-	20766-2200-0	Sous-ensemble LL050 - Sortie d'arbre B	LL050 subassembly - Shaft exit B	Rayon primitif ... / Primitive radius ... : 47.75mm. ; Rendement ... / Efficiency at worst ... : 0.80 ; Détails sur ce plan / Details on this drawing	SERAPID France	20766-2200-0	2
SER-	L2050-CB02-0	Ensemble contre-bride + vis (RR210 - LL050/LL050R)	Adapter flange assembly (RR210 - LL050/LL050R)	RR210 - LL050/LL050R (Standard fournisseur / Supplier's standard), Couleur / Color : RAL 9005	SERAPID France	L2050-CB02-0	3
SER-	ZE000-1112-2	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø24 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1112-2	4
SER-	ZE000-1115-4	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø28 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1115-4	1
SER-	ZE000-1121-5	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø38 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1121-5	1
SER-	ZMJ03-R040-6	Moteur 4.0 kW, 6 pôles, double frein	Motor 4.0 kW, 6 poles, double brake	Sg 132M-6A-2HSY (cast iron casing) ; 4 kW ; 6 poles ; 230/400V ; 950rpm ; 50Hz ; Double brake : 2x80 Nm (Rectifier B2-2P : 230 VAC/ 207 VDC) ; Shaft exit / 2nd Shaft exit : Ø38g6x80(M12) / Ø28g6x80(M10) ; Classe isolation / Thermal protection : F IP55, 3 sondes PTC + 3 sondes TKO ; Inductive Microswith : IKZ ; Duty S2 10 minutes ; Colour : RAL 5010 (Supplier's Std).	CANTONI (JET)	ZMJ03-R040-6	1

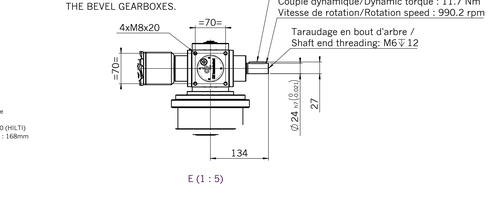
NOTA :
Toutes les platines ne sont pas fournies par SERAPID France, et non referencees dans cette nomenclature. Se referer aux notes ci-dessous. / All base plates are not supplied by SERAPID France, and not notified in this parts list. Refer to below notes.

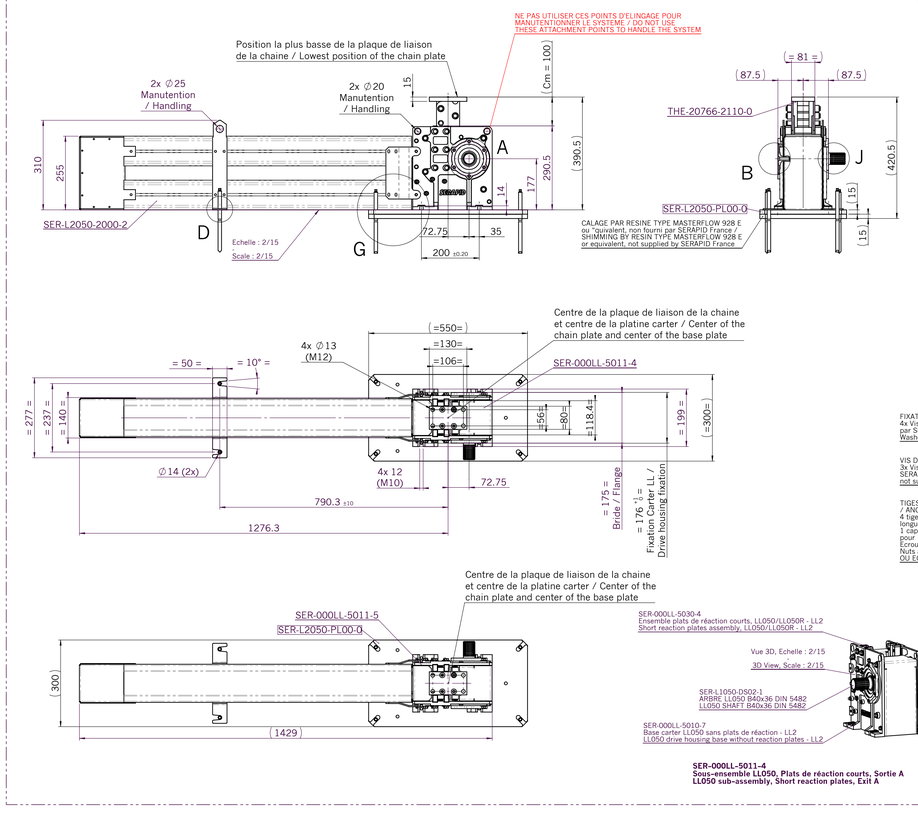
SER-ZA001-R055-0 :
PLATINES MOTEUR, DETAILS SUR LE PLAN SER-ZA001-R055-0, ELEMENTS NON FOURNIS PAR SERAPID France.
/ MOTOR PLATES, DETAILS ON THE DRAWING SER-ZA001-R055-0, ITEMS NOT SUPPLIED BY SERAPID France.

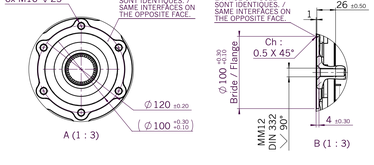
SER-ZD000-0201-0 :
PLATINE CARDAN, DETAILS SUR LE PLAN SER-ZD000-0201-0, ELEMENT NON FOURNI PAR SERAPID France.
/ CARDAN SHAFT PLATE, DETAILS ON THE DRAWING SER-ZD000-0201-0, ITEM NOT SUPPLIED BY SERAPID France.

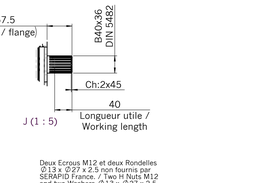
SER-L2050-PL00-0 :
PLATINE CARTER LINKLIFT, DETAILS SUR LE PLAN SER-L2050-PL00-0, ELEMENT NON FOURNI PAR SERAPID France. / DRIVE HOUSING PLATE, DETAILS ON THE DRAWING SER-L2050-PL00-0, ITEM NOT SUPPLIED BY SERAPID France.

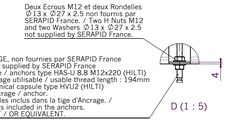


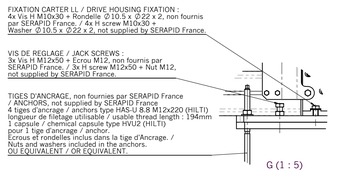












Document necessaire au montage de ce systeme. ***Documents required for assembling this system.***

Plan d'ensemble / General Assembly : THE-20766-2000-0

Manuel d'instructions / Instruction manual : THE-20766-M001-0

TRES IMPORTANT / *VERY IMPORTANT*

CONSIGNES DE SECURITE / *SAFETY INSTRUCTIONS*

Tous les composants mécaniques doivent être impérativement mis de niveau et correctement positionnés suivant les indications et cotations de ce plan.
Le non respect de ces consignes risque d'entrainer une détérioration des différents organes mécanique de cette transmission et une annulation de la garantie SERAPID France.

All the mechanical components must be installed straightly and positionned following the dimensions and indications shown on this drawing.
Not respecting these instructions could lead to a deterioration of the differents parts of the transmission and could cancel SERAPID warranty.

IMPERATIF :
La charge totale doit être uniformément répartie sur chacun des LinkLifts.
IMPERATIVE :
The total load must be distributed uniformly on each LinkLift.

LINKLIFT 30 et/*and* LINKLIFT 50

FIXATION PLATINES / *PLATE FIXING :*
Non fourni par SERAPID France / Not supplied by SERAPID France

-A-Platine linklift, se référer au détail / *Linklift plate (see detail linklift plate)*
-1-Mise à niveau par / *Height setting by :*
3 vis verins / *screw jack* HM12x50 + 3 écrous / *nuts* M12
-2-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
4 tiges d'ancrage / *anchors*
4 capsules chimiques / *chemical capsules*

-B-Platine renvoi d'angle, se référer au détail (si besoin) / *Geared box plate, see detail geared plate (if needed)*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
4 tiges d'ancrage / *anchors*
4 capsules chimiques / *chemical capsules*

-C-Platine moteur, se référer au détail / *Motor plate, see detail motor plate*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
4 tiges d'ancrage / *anchors*
4 capsules chimiques / *chemical capsules*

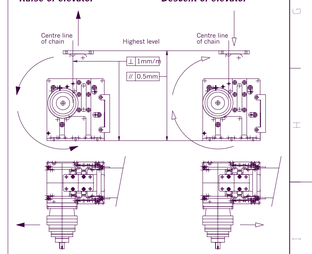
-D-Magasin linklift / *Linklift magazin*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
2 tiges d'ancrage / *anchors*
2 capsules chimiques / *chemical capsules*

-E-Support Cardan, se référer au détail (si besoin) / *Cardan Plate, see detail cardan plate (if needed)*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
2 tiges d'ancrage / *anchors*
2 capsules chimiques / *chemical capsules*

Après mise en position et ancrage, toutes les platines doivent être calées à l'aide d'une resine de calage.

After position setting and anchorage, all the plates must be shimmed with a resin.

Montée de la plateforme / ***Raise of elevator***
Descente de la plateforme / ***Descent of elevator***

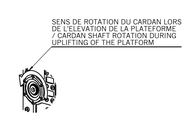


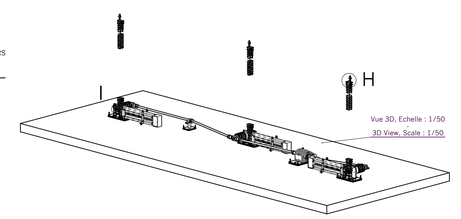
Parallelism between the floor and the highest level 0.5mm max.
Perpendicular position between the ground and the centre line of the chain 1mm/m.

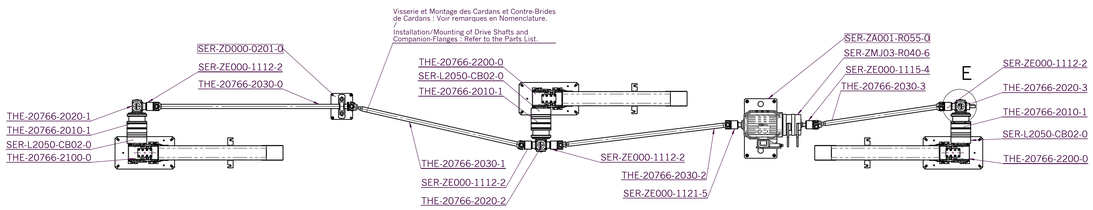
TRANSPORT ET STOCKAGE :
Les composants des systèmes d'élévation LINKLIFT ont une protection contre la corrosion par une peinture industrielle, vernis de protection ou huilage suivant les pièces. Dès réception, les caisses doivent être ouvertes pour vérifier l'état des composants après le transport (particulièrement si il est maritime) et les stocker à l'abri et au sec jusqu'à l'installation.

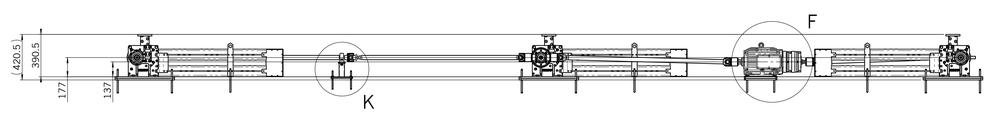
TRANSPORT AND STORAGE :
The components for the LINKLIFT systems have a protection against corrosion by an industrial painting, a protecting varnish or oiling according to the parts. When receiving the woodden boxes, same must imperativly be opened, in order to check the components speciallin after transport and mainly by sea. The storage has to be made in a dry aera.

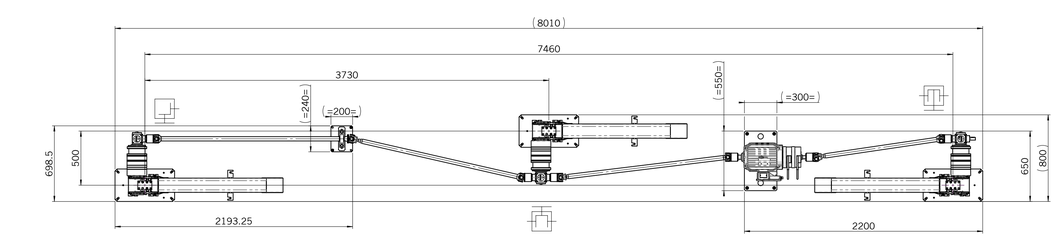


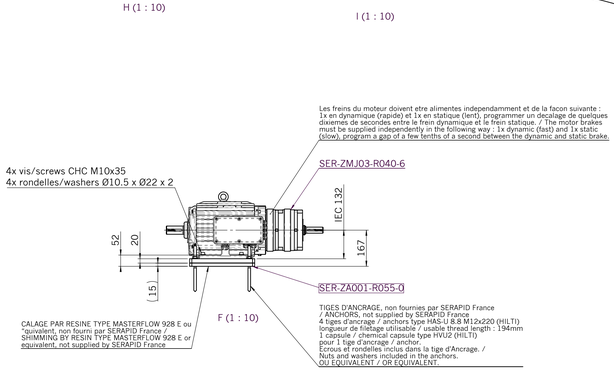


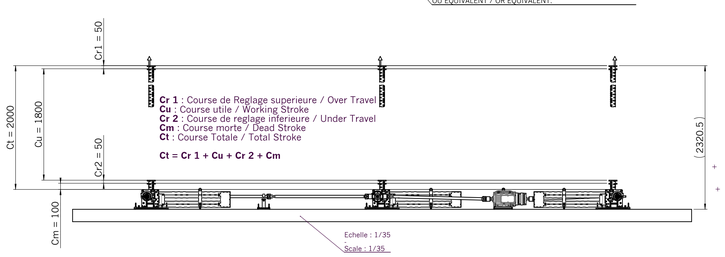








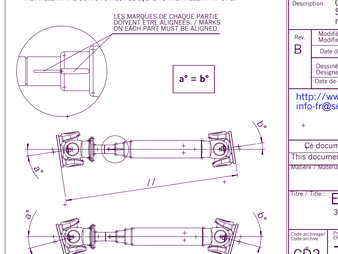




CARDAN / CARDAN SHAFT

IL EST **IMPERATIF** DE RESPECTER LES POSITIONS DES MATERIELS SPECIFIES SUR LE PLAN D'ENSEMBLE AFIN DE GARANTIR L'EGALITE DES ANGLES a ET b. CETTE EGALITE ETANT INDISPENSABLE POUR GARANTIR LE PARFAIT EQUILIBRAGE DU CARDAN ET UN FONCTIONNEMENT OPTIMAL DU MATERIEL.
L'ANGLE EN SORTIE b DOIT ETRE EGAL A L'ANGLE EN ENTREE a.

*IT IS **IMPERATIVE** TO RESPECT ITEMS POSITIONS SPECIFIED ON THE GENERAL ASSEMBLY TO ENSURE EQUAL a AND b ANGLES.*
THIS IS ESSENTIAL TO ENSURE PERFECT BALANCED AND OPTIMAL WORKING OF THE ITEM.
THE ANGLE AT THE OUTPUT b MUST BE EQUAL TO THE ANGLE AT INPUT a.



CARACTERISTIQUE TECHNIQUE / TECHNICAL DATA: Incorporation

Surface de la plateforme / Platform surface	m2 : 11
Masse de la plateforme / Mass of the platform	daN/m2 : 150
Charge utile Statique / Static payload	daN/m2 : 500
Charge utile Dynamique / Dynamic payload	daN/m2 : 250
Force statique / static load	N : 71 500 (on 3 LinkLift) MAX 23 833 N on 1 LinkLift
Force dynamique / dynamic load	N : 44 000 (on 3 LinkLift) MAX 14 667 N on 1 LinkLift

Ces charges sont considérées réparties équitablement sur l'ensemble des LinkLift.
These loads are considered distributed equally over all LinkLift.

Vitesse d'élèvation / speed elevation	mm/s : 50 (with frequency drive)
Course / stroke	mm : Voir sur le plan / Refer to the drawing
Type de chaîne / type of chain	: LL050 (LL2)
Fréquence d'utilisation / frequency of use	: /
Teinte de finition / colors	: Apprêt phosphatique noir mat et standard fournisseurs Black phosphatation and suppliers standards

Projet / Project : University of Oxford
Plateforme / Stage : Orchestra Lift (small)

Description	Changement des positions LinkLift et platine moteur, suppression du Stromag suivant demande client / Change of Linklift and baseplate motor position, removal of limit switch following customer request.				
Rev.	Modifié par / Modified by	gosset.a	Vérifié par / Checked by	VERDIER S.	Approuvé par / Approved by	NOYON L.
B	Date de modif.	20/12/2023	Date	20/12/2023	Date	20/12/2023
	Dessiné par / Designed by	gosset.a	Vérifié par / Checked by	VERDIER S.	Approuvé par / Approved by	NOYON L.
	Date de création	20/09/2023	Date :	20/09/2023	Date :	03/01/2024

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Matière / Material : EXPLOSE / DIN / ASI : | Masse / Weight (Kg) : | Traitement / Treatment :
Volume / Volume (cm³) :

Titre / Title : **Ensemble 3x LinkLift 050 avec motorisation**
3x LinkLift 050 with drive system assembly

Code archivage / Code archive	Prefixe ERP / ERP Prefix	N° de Plan / Drawing's number :	Indice 3D:	Tol. Gén. :	Rugosité :
CD2		THE-20766-2000-0		Voir nota	
			Echelle / Scale :	1:20	Feuille / Size : A0 1/1

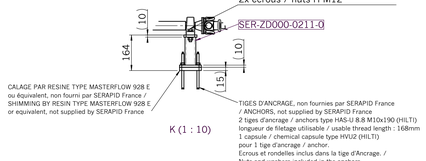
Prefixe ERP	ARTICLE / PART NUMBER	DESCRIPTION FRANCAISE	ENGLISH DESCRIPTION	INFORMATION	FOURNISSEUR / SUPPLIER	ARTICLE / PART NUMBER	QTE / QTY
THE-	20766-3010-1	Réducteur planétaire	Bevel gearbox	RR 210 T FS 1/103.69 (STD) i=1/103.69 ; Breaking torque = 6380 Nm ; Efficiency=0.94 ; Inertia= 0.9kgm² ; color=Supplier's standard	REGINA (DR France)	20766-3010-1	3
THE-	20766-3020-1	Renvoi d'angle	Bevel gearbox	QB 7 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on left side (FLB) + simple shaft exit Ø16 (MKB) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour : Supplier's standard.	DZ Trasmissioni (RR France)	20766-3020-1	1
THE-	20766-3020-2	Renvoi d'angle	Bevel gearbox	QB 9 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on right side (FLC) + simple shaft exit Ø16 (MKC) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour : Supplier's standard.	DZ Trasmissioni (RR France)	20766-3020-2	1
THE-	20766-3020-3	Renvoi d'angle	Bevel gearbox	QB 9 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on right side (FLC) + simple shaft exit Ø16 (MKC) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour : Supplier's standard.	DZ Trasmissioni (RR France)	20766-3020-3	1
THE-	20766-3030-0	CARDAN SIMPLE PALIER	INTERMEDIATE CARDAN SHAFT	Vitesse de rotation : 990 tr/min - Rotation speed : 990 rpm - RAL 1003 - 6 vis/screws M6 DIN 960-10.9 et/and 6 écrous/nuts M6 DIN 980-10 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	20766-3030-0	1
THE-	20766-3030-1	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/min. Couleur : RAL 1003 / IMPERATIVE ; The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-3030-1	1
THE-	20766-3030-2	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/min. Couleur : RAL 1003 / IMPERATIVE ; The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-3030-2	1
THE-	20766-3030-3	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/min. Couleur : RAL 1003 / IMPERATIVE ; The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-3030-3	1
THE-	20766-3100-0	Sous-ensemble LL050 - Sortie d'arbre A	LL050 subassembly - Shaft exit A	Rayon primitif ... / Primitive radius ... : 47.75mm. ; Rendement ... / Efficiency at worst ... : 0.80 ; Détails sur ce plan / Details on this drawing.	SERAPID France	20766-3100-0	2
THE-	20766-3200-0	Sous-ensemble LL050 - Sortie d'arbre B	LL050 subassembly - Shaft exit B	Rayon primitif ... / Primitive radius ... : 47.75mm. ; Rendement ... / Efficiency at worst ... : 0.80 ; Détails sur ce plan / Details on this drawing.	SERAPID France	20766-3200-0	1
SER-	L2050-CB02-0	Ensemble contre-bride + vis (RR210 - LL050/LL050R)	Adapter flange assembly (RR210 - LL050/LL050R)	RR210 - LL050/LL050R Standard fournisseur / Supplier's standard), Couleur / Color : RAL 9005	SERAPID France	L2050-CB02-0	3
SER-	ZE000-1112-2	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø24 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1112-2	4
SER-	ZE000-1115-4	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø28 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1115-4	1
SER-	ZE000-1121-5	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø38 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1121-5	1
SER-	ZMJ03-R040-6	Moteur 4.0 kW, 6 pôles, double frein	Motor 4.0 kW, 6 poles, double brake	Sg 132M-6A-2157 (cast iron casing) - 4 kW ; 6 poles ; 230/400V ; 950rpm ; 50Hz ; Double brake : 2x80 Nm (Rectifier B2-2P : 230 VAC/ 207 VDC) ; Shaft exit / 2nd Shaft exit - Ø38g6x80(M12) / Ø28g6x80(M10) ; Classe isolation / Thermal protection : F IP55, 3 sondes PTC + 3 sondes TKO ; Inductive Microswith : IKZ ; Duty S2 10 minutes ; Colour : RAL 9010 (Supplier's Std).	CANTONI (JET)	ZMJ03-R040-6	1

NOTA :
Toutes les platines ne sont pas fournies par SERAPID France, et non referencees dans cette nomenclature. Se referer aux notes ci-dessous. / All base plates are not supplied by SERAPID France, and not notified in this parts list. Refer to below notes.

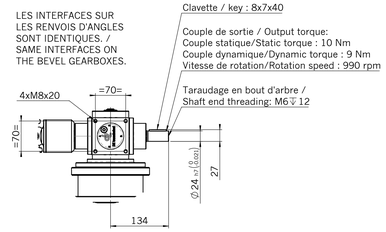
SER-ZA001-R055-0 :
PLATINES MOTEUR, DETAILS SUR LE PLAN SER-ZA001-R055-0, ELEMENTS NON FOURNIS PAR SERAPID France.
/ MOTOR PLATES, DETAILS ON THE DRAWING SER-ZA001-R055-0, ITEMS NOT SUPPLIED BY SERAPID France.

SER-ZD000-0211-0 :
PLATINE CARDAN, DETAILS SUR LE PLAN SER-ZD000-0211-0, ELEMENT NON FOURNI PAR SERAPID France.
/ CARDAN SHAFT PLATE, DETAILS ON THE DRAWING SER-ZD000-0211-0, ITEM NOT SUPPLIED BY SERAPID France.

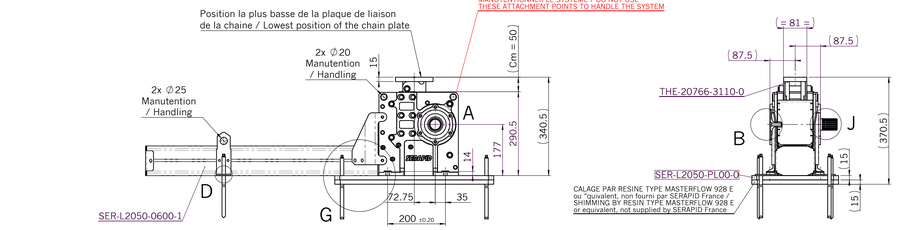
SER-L2050-PL00-0 :
PLATINE CARTER LINKLIFT, DETAILS SUR LE PLAN SER-L2050-PL00-0, ELEMENT NON FOURNI PAR SERAPID France. / DRIVE HOUSING PLATE, DETAILS ON THE DRAWING SER-L2050-PL00-0, ITEM NOT SUPPLIED BY SERAPID France.

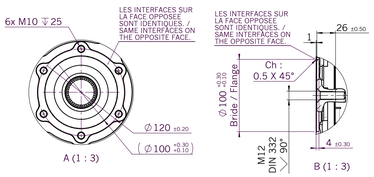


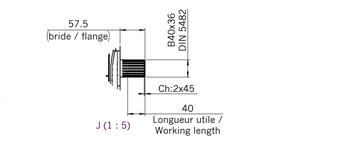
K (1 : 10)

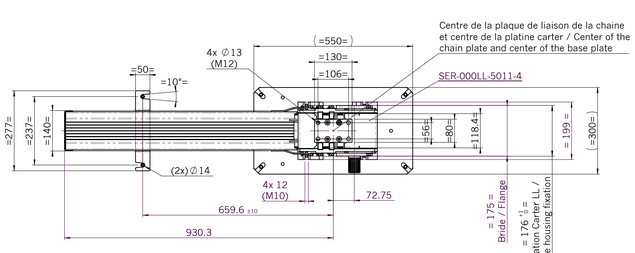


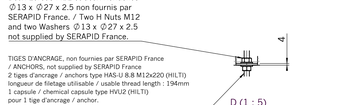
E (1 : 5)

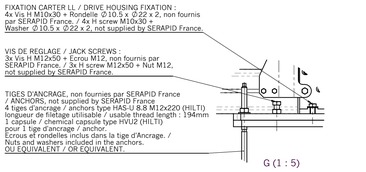


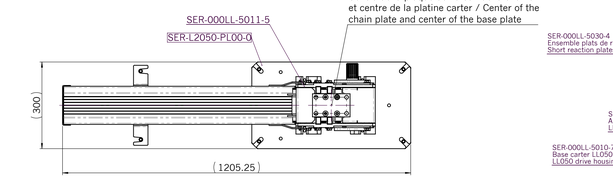


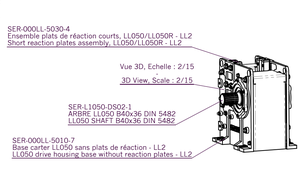




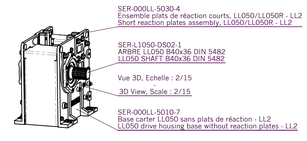








SER-000LL-5011-4
Sous-ensemble LL050, Plats de réaction courts, Sortie A
LL050 sub-assembly, Short reaction plates, Exit A



SER-000LL-5011-5
Sous-ensemble LL050, Plats de réaction courts, Sortie B
LL050 sub-assembly, Short reaction plates, Exit B

Document necessaire au montage de ce systeme. ***Documents required for assembling this system.***

Plan d'ensemble / General Assembly : THE-20766-3000-0

Manuel d'instructions / Instruction manual : THE-20766-M001-0

TRES IMPORTANT / *VERY IMPORTANT*

CONSIGNES DE SECURITE / *SAFETY INSTRUCTIONS*

Tous les composants mécaniques doivent être impérativement mis de niveau et correctement positionnés suivant les indications et cotations de ce plan.
Le non respect de ces consignes risque d'entrainer une détérioration des différents organes mécanique de cette transmission et une annulation de la garantie SERAPID France.

All the mechanical components must be installed straightly and positionned following the dimensions and indications shown on this drawing.
Not respecting these instructions could lead to a deterioration of the differents parts of the transmission and could cancel SERAPID warranty.

IMPERATIF :
La charge totale doit être uniformément répartie sur chacun des LinkLifts.
IMPERATIVE :
The total load must be distributed uniformly on each LinkLift.

LINKLIFT 30 et/*and* LINKLIFT 50

FIXATION PLATINES / *PLATE FIXING* :
Non fourni par SERAPID France / Not supplied by SERAPID France

-A-Platine linklift, se référer au détail / *Linklift plate (see detail linklift plate)*
-1-Mise à niveau par / *Height setting by :*
3 vis verins / *screw jack* HM12x50 + 3 écrous / *nuts* M12
-2-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
4 tiges d'ancrage / *anchors*
4 capsules chimiques / *chemical capsules*

-B-Platine renvoi d'angle, se référer au détail (si besoin) / *Geared box plate, see detail geared plate (if needed)*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
4 tiges d'ancrage / *anchors*
4 capsules chimiques / *chemical capsules*

-C-Platine moteur, se référer au détail / *Motor plate, see detail motor plate*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
4 tiges d'ancrage / *anchors*
4 capsules chimiques / *chemical capsules*

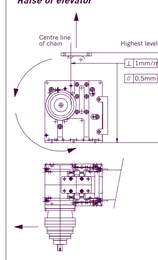
-D-Magasin linklift / *Linklift magazin*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
2 tiges d'ancrage / *anchors*
2 capsules chimiques / *chemical capsules*

-E-Support Cardan, se référer au détail (si besoin) / *Cardan Plate, see detail cardan plate (if needed)*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
2 tiges d'ancrage / *anchors*
2 capsules chimiques / *chemical capsules*

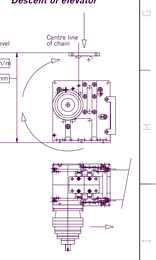
Après mise en position et ancrage, toutes les platines doivent être calées à l'aide d'une resine de calage.

After position setting and anchorage, all the plates must be shimmed with a resin.

Montée de la plateforme ***Raise of elevator***



Descente de la plateforme ***Descent of elevator***



Parallelism between the floor and the highest level 0.5mm max.
Perpendicular position between the ground and the centre line of the chain 1mm/m.

TRANSPORT ET STOCKAGE :
Les composants des systèmes d'élévation LINKLIFT ont une protection contre la corrosion par une peinture industrielle, vernis de protection ou huilage suivant les pièces. Dès réception, les caisses doivent être ouvertes pour vérifier l'état des composants après le transport (particulièrement si il est maritime) et les stocker à l'abri et au sec jusqu'à l'installation.

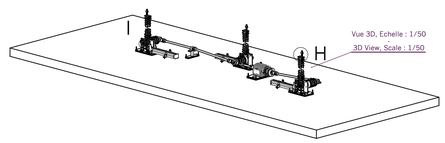
TRANSPORT AND STORAGE :
The components for the LINKLIFT systems have a protection against corrosion by an industrial painting, a protecting varnish or oiling according to the parts. When receiving the woodden boxes, same must imperatively be opened, in order to check the components specially after transport and mainly by sea. The storage has to be made in a dry aera.

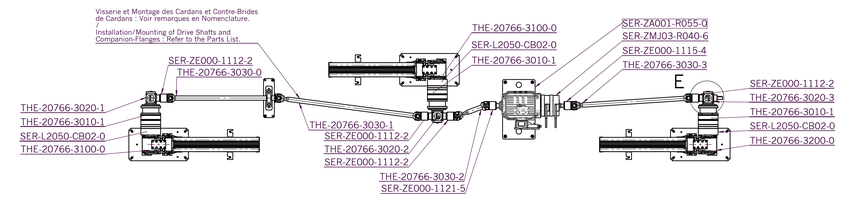


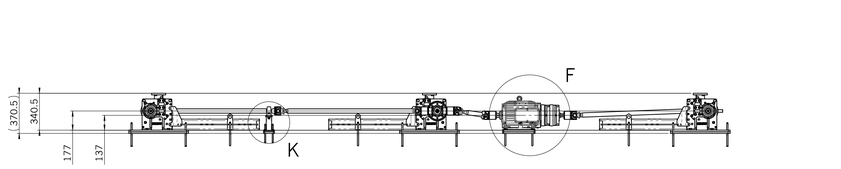
H (1 : 10)

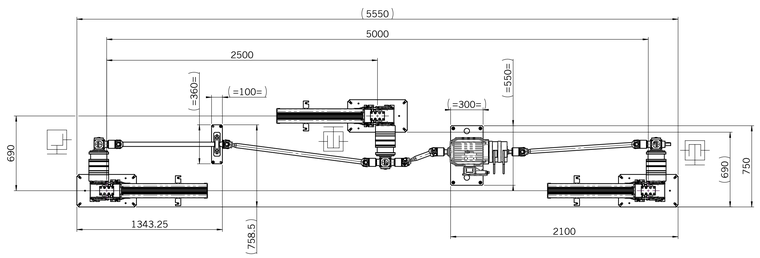


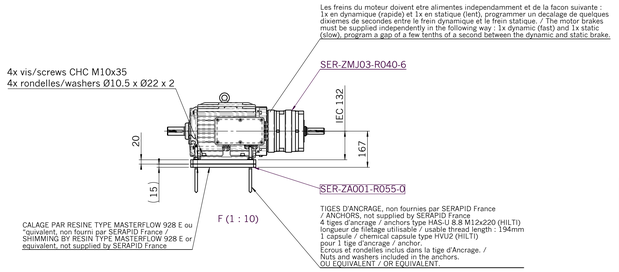
I (1 : 10)



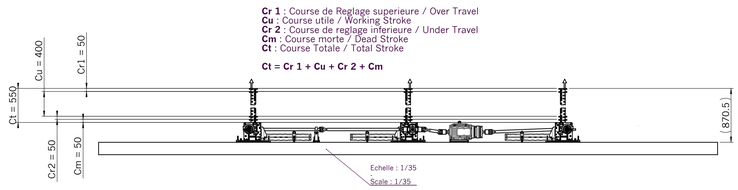








F (1 : 10)



CARACTERISTIQUE TECHNIQUE / TECHNICAL DATA: Incorporation

Surface de la plateforme / Platform surface	m2 : 9.94
Masse de la plateforme / Mass of the platform	daN/m2 : 150
Charge utile Statique / Static payload	daN/m2 : 500
Charge utile Dynamique / Dynamic payload	daN/m2 : 250
Force statique / static load	N : 64 610 (on 3 LinkLift) MAX 21 537 N on 1 LinkLift
Force dynamique / dynamic load	N : 39 760 (on 3 LinkLift) MAX 13 253 N on 1 LinkLift

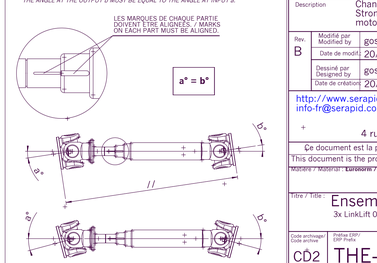
Ces charges sont considérées réparties équitablement sur l'ensemble des LinkLift.
These loads are considered distributed equally over all LinkLift.

Vitesse d'élévation / speed elevation	mm/s : 50 (with frequency drive)
Course / stroke	mm : Voir sur le plan / Refer to the drawing
Type de chaîne / type of chain	: LL050 (LL2)
Fréquence d'utilisation / frequency of use	: /
Teinte de finition / colors	: Apprêt phosphatique noir mat et standard fournisseurs Black phosphatation and suppliers standards

CARDAN / CARDAN SHAFT

IL EST **IMPERATIF** DE RESPECTER LES POSITIONS DES MATERIELS SPECIFIES SUR LE PLAN D'ENSEMBLE AFIN DE GARANTIR L'EGALITE DES ANGLES a ET b. CETTE EGALITE ETANT INDISPENSABLE POUR GARANTIR LE PARFAIT EQUILIBRAGE DU CARDAN ET UN FONCTIONNEMENT OPTIMAL DU MATERIEL.
L'ANGLE EN SORTIE b DOIT ETRE EGAL A L'ANGLE EN ENTREE a.

*IT IS **IMPERATIVE** TO RESPECT ITEMS POSITIONS SPECIFIED ON THE GENERAL ASSEMBLY TO ENSURE EQUAL a AND b ANGLES.*
THIS IS ESSENTIAL TO ENSURE PERFECT BALANCED AND OPTIMAL WORKING OF THE ITEM.
THE ANGLE AT THE OUTPUT b MUST BE EQUAL TO THE ANGLE AT INPUT a.



Projet / Project : University of Oxford
Plateforme / Stage : Stage Riser 01

Description	Changement des positions LinkLift et platine moteur, suppression du Stromag suivant demande client / Change of Linklift and baseplate motor position, removal of limit switch following customer request.				
Rev. B	Modifié par / Modified by	gosset.a	Vérifié par / Checked by	VERDIER S.	Approuvé par / Approved by NOYON L.
	Date de modif.	20/12/2023	Date	20/12/2023	Date 20/12/2023
	Dessiné par / Designed by	gosset.a	Vérifié par / Checked by	VERDIER S.	Approuvé par / Approved by NOYON L.
	Date de création	20/09/2023	Date :	20/09/2023	Date : 03/01/2024

http://www.serapid.com
info-fr@serapid.com
Tél: +33 (0)2 32 06 35 60
SERAPID RIGID CHAIN TECHNOLOGY
4 rue des Frères Robbe, ZA EUROCHANNEL 76370 Martin-Eglise.

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Matière / Material : EXPLOSE Y DIN Y NO | Masse / Weight (Kg): | Traitement / Treatment :
Volume / Volume (cm³) :

Titre / Title :
Ensemble 3x LinkLift 050 avec motorisation
3x LinkLift 050 with drive system assembly

Code archivage / Code archive	Préfixe ERP / ERP Prefix	N° de Plan / Drawing's number :	Indice 3D:	Tol. Gén. :	Rugosité :
CD2	THE-	20766-3000-0		Voir nota	
			Echelle / Scale :	1:20	Feuille / Size: A0 1/1

Prefixe ERP	ARTICLE / PART NUMBER	DESCRIPTION FRANCAISE	ENGLISH DESCRIPTION	INFORMATION	FOURNISSEUR / SUPPLIER	ARTICLE / PART NUMBER	QTE / QTY
THE-	20766-4010-1	Réducteur planétaire	Bevel gearbox	RR 210 T FS 1/103.69 (STD) i=1/103.69 ; Breaking torque = 6380 Nm ; Efficiency=0.94 ; Inertia= 0.9 gcm² ; color=Supplier's standard	REGMAN (RR France)	20766-4010-1	4
THE-	20766-4020-1	Renvoi d'angle	Bevel gearbox	QB 4 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on right side (FLB) + simple shaft exit Ø16 (MKB) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour : Supplier's standard.	DZ Trasmissioni (RR France)	20766-4020-1	1
THE-	20766-4020-2	Renvoi d'angle	Bevel gearbox	QB 9 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on left side (FLB) + simple shaft exit Ø16 (MKB) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour : Supplier's standard.	DZ Trasmissioni (RR France)	20766-4020-2	1
THE-	20766-4020-3	Renvoi d'angle	Bevel gearbox	QB 9 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on left side (FLC) + simple shaft exit Ø16 (MKC) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour : Supplier's standard.	DZ Trasmissioni (RR France)	20766-4020-3	1
THE-	20766-4020-4	Renvoi d'angle	Bevel gearbox	QB 4 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; B on right side ; Double shaft exit Ø16 (MK2) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour : Supplier's standard.	DZ Trasmissioni (RR France)	20766-4020-4	1
THE-	20766-4020-5	Renvoi d'angle	Bevel gearbox	QB 4 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on left side (FLB) + simple shaft exit Ø16 (MKB) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour : Supplier's standard.	DZ Trasmissioni (RR France)	20766-4020-5	1
THE-	20766-4030-0	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/min. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-4030-0	1
THE-	20766-4030-1	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/min. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-4030-1	1
THE-	20766-4030-2	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/min. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-4030-2	1
THE-	20766-4030-3	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/min. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-4030-3	1
THE-	20766-4030-4	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/min. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-4030-4	1
THE-	20766-4030-5	CARDAN SIMPLE PALIER	INTERMEDIATE CARDAN SHAFT	Vitesse de rotation : 990 tr/min - Rotation speed : 990 rpm - RAL 1003 - 6 vis/screws M6 DIN 960-10.9 et/and 6 écrous/nuts M6 DIN 980-10 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	20766-4030-5	1
THE-	20766-4100-0	Sous-ensemble LL050 - Sortie d'arbre A	LL050 subassembly - Shaft exit A	Rayon primitif ... / Primitive radius ... : 47.75mm. ; Rendement ... / Efficiency at worst ... : 0.80 ; Détails sur ce plan / Details on this drawing	SERAPID France	20766-4100-0	3
THE-	20766-4200-0	Sous-ensemble LL050 - Sortie d'arbre B	LL050 subassembly - Shaft exit B	Rayon primitif ... / Primitive radius ... : 47.75mm. ; Rendement ... / Efficiency at worst ... : 0.80 ; Détails sur ce plan / Details on this drawing	SERAPID France	20766-4200-0	1
SER-	L2050-CB02-0	Ensemble contre-bride + vis (RR210 - LL050/LL050R)	Adapter flange assembly (RR210 - LL050/LL050R)	RR210 - LL050/LL050R (Standard fournisseur / Supplier's standard), Couleur / Color : RAL 9005	SERAPID France	L2050-CB02-0	4
SER-	ZE000-1106-2	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø51 L=65 : RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1106-2	1
SER-	ZE000-1112-2	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø24 L=65 : RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1112-2	7
SER-	ZE000-1115-4	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø28 L=65 : RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1115-4	1
SER-	ZE000-1121-5	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø38 L=65 : RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1121-5	1
SER-	ZMJ03-R040-6	Moteur 4.0 kW, 6 pôles, double frein	Motor 4.0 kW, 6 poles, double brake	Sg 132M-6A-2HS1 (cast iron casing) : 4 kW ; 6 poles ; 230/400V ; 950rpm ; 50Hz ; Double brake : 2x80 Nm (Rectifier BZ 32F - 230 VAC/ 207 VDC) ; Shaft exit / 2nd Shaft exit : Ø38g6x80(M12) / Ø28g6x80(M10) ; Classe isolation / Thermal protection : F IP55, 3 sondes PTC + 3 sondes TKO ; Inductive Microswith : IKZ ; Duty S2 10 minutes ; Colour : RAL 5010 (Supplier's Std).	CANTONI (JET)	ZMJ03-R040-6	1

NOTA :
Toutes les platines ne sont pas fournies par SERAPID France, et non references dans cette nomenclature. Se referer aux notes ci-dessous. / All base plates are not supplied by SERAPID France, and not notified in this parts list. Refer to below notes.

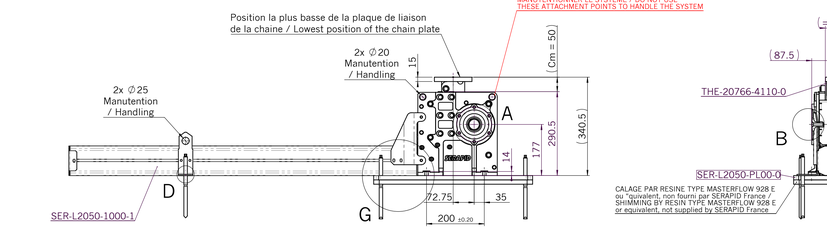
SER-ZA001-R055-0 :
PLATINES MOTEUR, DETAILS SUR LE PLAN SER-ZA001-R055-0, ELEMENTS NON FOURNIS PAR SERAPID France.
/ MOTOR PLATES, DETAILS ON THE DRAWING SER-ZA001-R055-0, ITEMS NOT SUPPLIED BY SERAPID France.

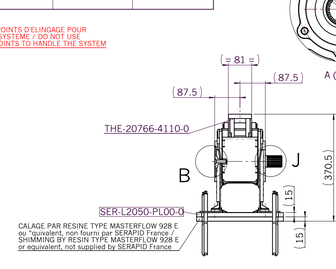
SER-ZD000-0211-0 :
PLATINE CARDAN, DETAILS SUR LE PLAN SER-ZD000-0211-0, ELEMENT NON FOURNI PAR SERAPID France.
/ CARDAN SHAFT PLATE, DETAILS ON THE DRAWING SER-ZD000-0211-0, ITEM NOT SUPPLIED BY SERAPID France.

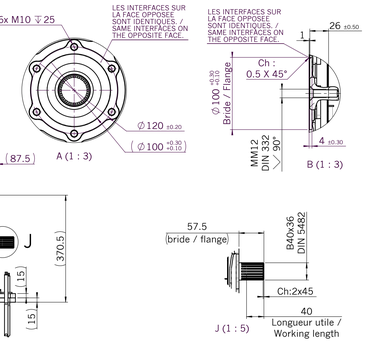
THE-20766-4040-0 :
PLATINES RENVOI D'ANGLE, DETAILS SUR LE PLAN THE-20766-4040-0, ELEMENTS NON FOURNIS PAR SERAPID France.
/ BEVEL GEAR PLATES, DETAILS ON THE DRAWING THE-20766-4040-0, ITEMS NOT SUPPLIED BY SERAPID France.

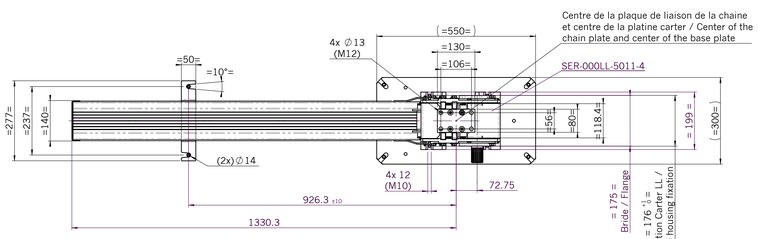
SER-L2050-PL00-0 :
PLATINE CARTER LINKLIFT, DETAILS SUR LE PLAN SER-L2050-PL00-0, ELEMENT NON
FOURNI PAR SERAPID France. / DRIVE HOUSING PLATE, DETAILS ON THE DRAWING
SER-L2050-PL00-0, ITEM NOT SUPPLIED BY SERAPID France.

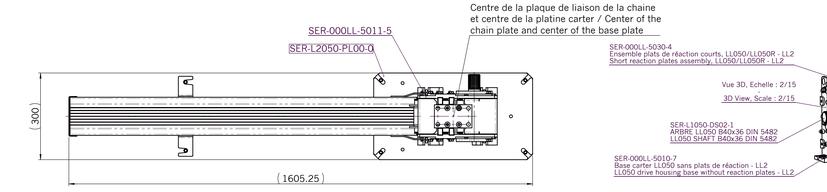
Prefixe ERP	ARTICLE / PART NUMBER	DESCRIPTION FRANCAISE	ENGLISH DESCRIPTION	INFORMATION	FOURNISSEUR / SUPPLIER	ARTICLE / PART NUMBER	THE-20766-4100-0 Exit A - QTE / QTY	THE-20766-4200-0 Exit B - QTE / QTY
THE-	20766-4110-0	Sous-ensemble Chaine LL050	LL050 Chain subassembly	Montage suivant plan : SER-00050-1180-0. Quantité de Maillons STD suivant la nomenclature de cette Affaire.	SERAPID France	20766-4110-0	1	1
SER-	L2050-1000-1	MAGASIN LL050 1 BRIN H / Course Totale = 1000	1 H STRAND MAGAZINE LL050 / Total Stroke = 1000	Standard STI SERAPID Group. LL2, LinkLift de 2ème generation / LinkLift of 2nd generation.	GAULT INDUSTRIES	L2050-1000-1	1	1
SER-000	LL-5011-4	Sous-ensemble LL050, Plats de réaction courts, Sortie A	LL050 sub-assembly, Short reaction plates, Exit A	Nomenclature sur ce plan (vue 3D) / Parts list on this drawing (3D view). Primitive radius = 47.75mm; Efficienty at worst = 0.8	SERAPID France	LL-5011-4	1	-
SER-000	LL-5011-5	Sous-ensemble LL050, Plats de réaction courts, Sortie B	LL050 sub-assembly, Short reaction plates, Exit B	Nomenclature sur ce plan (vue 3D) / Parts list on this drawing (3D view). Primitive radius = 47.75mm; Efficienty at worst = 0.8	SERAPID France	LL-5011-5	-	1

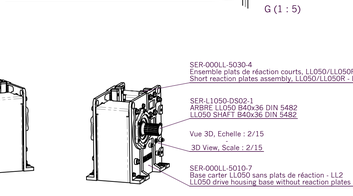


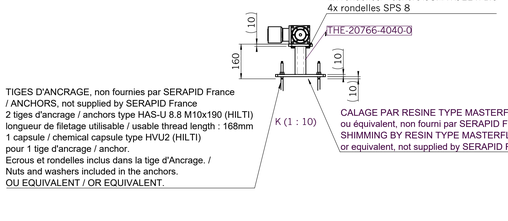


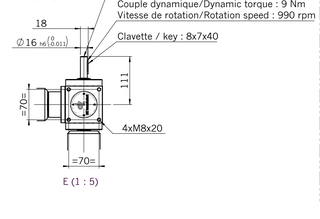


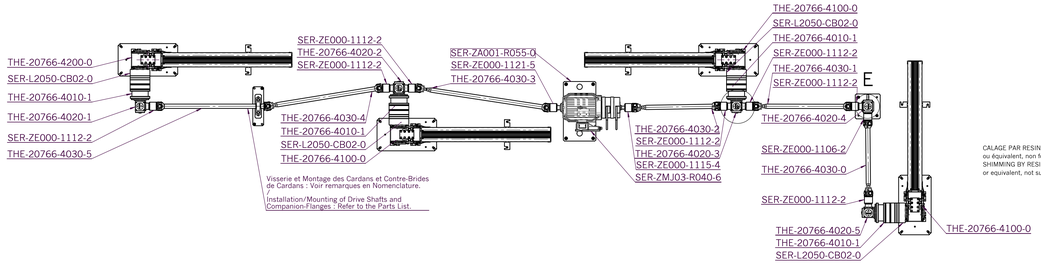


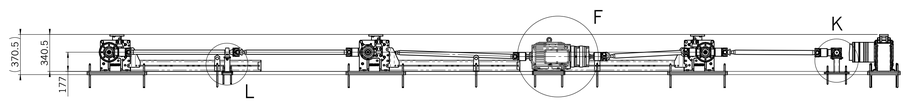


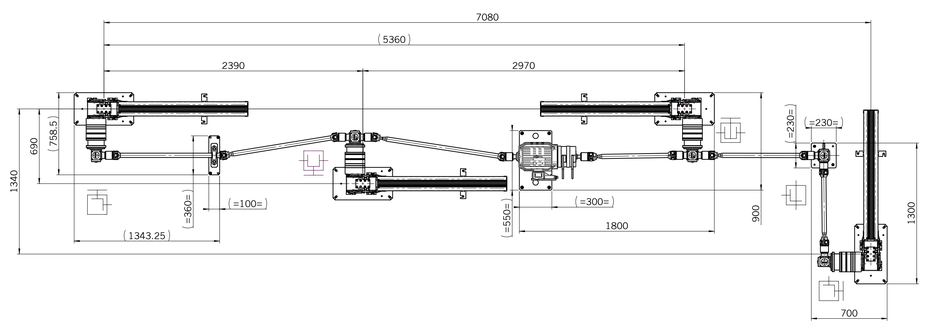


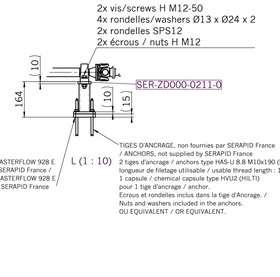


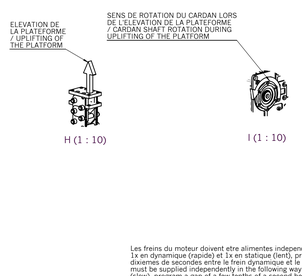


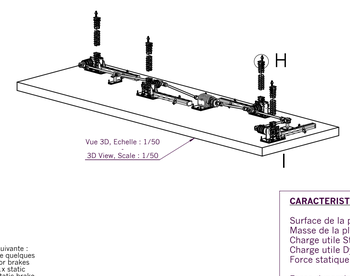


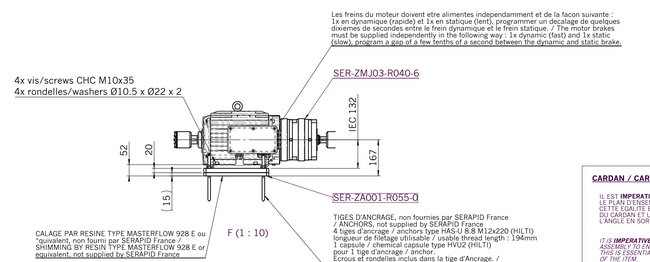


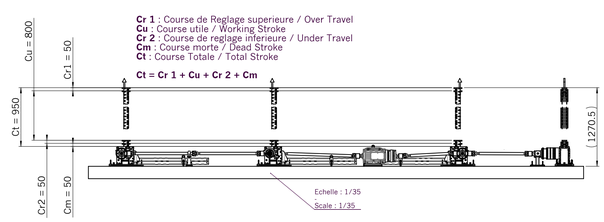


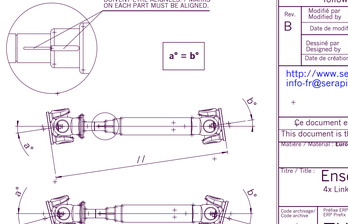












Document necessaire au montage de ce systeme. / ***Documents required for assembling this system.***

Plan d'ensemble / General Assembly : THE-20766-4000-0

Manuel d'instructions / Instruction manual : THE-20766-M001-0

TRES IMPORTANT / *VERY IMPORTANT*

CONSIGNES DE SECURITE / *SAFETY INSTRUCTIONS*

Tous les composants mécaniques doivent être impérativement mis de niveau et correctement positionnés suivant les indications et cotations de ce plan.
Le non respect de ces consignes risque d'entrainer une détérioration des différents organes mécanique de cette transmission et une annulation de la garantie SERAPID France.

All the mechanical components must be installed straightly and positionned following the dimensions and indications shown on this drawing.
Not respecting these instructions could lead to a deterioration of the differents parts of the transmission and could cancel SERAPID waranty.

IMPERATIF :
La charge totale doit être uniformément répartie sur chacun des LinkLifts.
IMPERATIVE :
The total load must be distributed uniformly on each LinkLift.

LINKLIFT 30 et/*and* LINKLIFT 50

FIXATION PLATINES / *PLATE FIXING :*
Non fourni par SERAPID France / Not supplied by SERAPID France

-A-Platine linklift, se référer au détail / *Linklift plate (see detail linklift plate)*
-1-Mise à niveau par / *Height setting by :*
3 vis verins / *screw jack* HM12x90 T + 3 écrous / *nuts* M12
-2-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
4 tiges d'ancrage / *anchors*
4 capsules chimiques / *chemical capsules*

-B-Platine renvoi d'angle, se référer au détail (si besoin) / *Geared box plate, see detail geared plate (if needed)*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
4 tiges d'ancrage / *anchors*
4 capsules chimiques / *chemical capsules*

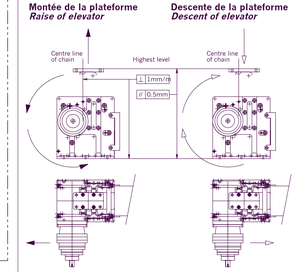
-C-Platine moteur, se référer au détail / *Motor plate, see detail motor plate*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
4 tiges d'ancrage / *anchors*
4 capsules chimiques / *chemical capsules*

-D-Magasin linklift / *Linklift magazin*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
2 tiges d'ancrage / *anchors*
2 capsules chimiques / *chemical capsules*

-E-Support Cardan, se référer au détail (si besoin) / *Cardan Plate, see detail cardan plate (if needed)*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
2 tiges d'ancrage / *anchors*
2 capsules chimiques / *chemical capsules*

Après mise en position et ancrage, toutes les platines doivent être calées à l'aide d'une resine de calage.

After position setting and anchorage, all the plates must be shimmed with a resin.



TRANSPORT ET STOCKAGE :
Les composants des systèmes d'élévation LINKLIFT ont une protection contre la corrosion par une peinture industrielle, vernis de protection ou huilage suivant les pièces. Dès réception, les caisses doivent être ouvertes pour vérifier l'état des composants après le transport (particulièrement si il est maritime) et les stocker à l'abri et au sec jusqu'à l'installation.

TRANSPORT AND STORAGE :
The components for the LINKLIFT systems have a protection against corrosion by an industrial painting, a protecting varnish or oiling according to the parts. When receiving the woodden boxes, same must imperativly be opened, in order to check the components specially after transport and mainly by sea. The storage has to be made in a dry aera.

CARACTERISTIQUE TECHNIQUE / TECHNICAL DATA: Incorporation

Surface de la plateforme / Platform surface	m2	13.82
Masse de la plateforme / Mass of the platform	daN/m2	150
Charge utile Statique / Static payload	daN/m2	500
Charge utile Dynamique / Dynamic payload	daN/m2	250
Force statique / static load		N : 89 830 (on 4 LinkLift) MAX 22 458 N on 1 LinkLift
Force dynamique / dynamic load		N : 55 280 (on 4 LinkLift) MAX 13 820 N on 1 LinkLift

Ces charges sont considérées réparties équitablement sur l'ensemble des LinkLift.
These loads are considered distributed equally over all LinkLift.

Vitesse d'élévation / speed elevation	mm/s	: 50 (with frequency drive)
Course / stroke	mm	: Voir sur le plan / Refer to the drawing
Type de chaîne / type of chain		: LL050 (LL2)
Fréquence d'utilisation / frequency of use		: /
Teinte de finition / colors		: Apprêt phosphatique noir mat et standard fournisseurs Black phosphatation and suppliers standards

CARDAN / CARDAN SHAFT

IL EST **IMPERATIF** DE RESPECTER LES POSITIONS DES MATERIELS SPECIFIES SUR LE PLAN D'ENSEMBLE AFIN DE GARANTIR L'EGALITE DES ANGLES a ET b. CETTE EGALITE ETANT INDISPENSABLE POUR GARANTIR LE PARFAIT EQUILIBRAGE DU CARDAN ET UN FONCTIONNEMENT OPTIMAL DU MATERIEL.
L'ANGLE EN SORTIE b DOIT ETRE EGAL A L'ANGLE EN ENTREE a.

*IT IS **IMPERATIVE** TO RESPECT ITEMS POSITIONS SPECIFIED ON THE GENERAL ASSEMBLY TO ENSURE EQUAL a AND b ANGLES.*
THIS IS ESSENTIAL TO ENSURE PERFECT BALANCED AND OPTIMAL WORKING OF THE ITEM.
THE ANGLE AT THE OUTPUT b MUST BE EQUAL TO THE ANGLE AT INPUT a.

Projet / Project : University of Oxford
Plateforme / Stage : Stage Riser 02

Rev.						
B	Modifié par Modified by	gosset.a	Vérifié par Checked by	VERDIER S.	Approuvé par Approved by	NOYON L.
	Date de modif.	20/12/2023	Date	20/12/2023	Date	20/12/2023
	Dessiné par Designed by	gosset.a	Vérifié par Checked by	VERDIER S.	Approuvé par Approved by	NOYON L.
	Date de création	20/09/2023	Date :	20/09/2023	Date :	20/09/2023

Description : Changement des positions LinkLift et suppression du Stromag suivant demande client / Change of Linklift position and removal of limit switch following customer request.

http://www.serapid.com
info-fr@serapid.com
Tél: +33 (0)2 32 06 35 60
SERAPID RIGID CHAIN TECHNOLOGY
4 rue des Frères Robbe, ZA EUROCHANNEL 76370 Martin-Eglise.

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Matière / Material : **EUROMET DIN F NO** | Masse / Weight (Kg): | Traitement / Treatment :
Volume / Volume (cm³) :

Titre / Title : **Ensemble 4x LinkLift 050 avec motorisation**
4x LinkLift 050 with drive system assembly

Code archivage Code archive	Prefixe ERP/ ERP Prefix	N° de Plan / Drawing's number :	Indice 3D:	Tol. Gén. :	Rugosité :
CD2	THE-	20766-4000-0		Voir nota	
			Echelle / Scale :	1:20	Feuille / Size: A0 1/1

Prefixe ERP	ARTICLE / PART NUMBER	DESCRIPTION FRANCAISE	ENGLISH DESCRIPTION	INFORMATION	FOURNISSEUR / SUPPLIER	ARTICLE / PART NUMBER	QTE / QTY
THE-	20766-5010-1	Réducteur planétaire	Bevel gearbox	RR 210 T FS 1/103.69 (STD) =1/103.69 ; Breaking torque = 6380 Nm ; Efficiency=0.94 ; Inertia= 0.9 gxm² ; color=Supplier's standard.	REGUINA (RR France)	20766-5010-1	5
THE-	20766-5020-1	Renvoi d'angle	Bevel gearbox	Q8 4 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on left side (FLB) + simple shaft exit Ø16 (MKB) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour - Supplier's standard.	DZ Trasmissioni (RR France)	20766-5020-1	1
THE-	20766-5020-2	Renvoi d'angle	Bevel gearbox	Q8 9 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on right side (FLB) + simple shaft exit Ø16 (MKB) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour - Supplier's standard.	DZ Trasmissioni (RR France)	20766-5020-2	1
THE-	20766-5020-3	Renvoi d'angle	Bevel gearbox	Q8 9 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on right side (FLB) + simple shaft exit Ø16 (MKB) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour - Supplier's standard.	DZ Trasmissioni (RR France)	20766-5020-3	1
THE-	20766-5020-4	Renvoi d'angle	Bevel gearbox	Q8 9 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on right side (FLC) + simple shaft exit Ø16 (MKC) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour - Supplier's standard.	DZ Trasmissioni (RR France)	20766-5020-4	1
THE-	20766-5020-5	Renvoi d'angle	Bevel gearbox	Q8 4 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; B on right side ; double shaft exit Ø16 (MK2) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour - Supplier's standard.	DZ Trasmissioni (RR France)	20766-5020-5	1
THE-	20766-5020-6	Renvoi d'angle	Bevel gearbox	Q8 4 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on left side (FLB) + simple shaft exit Ø16 (MKB) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour - Supplier's standard.	DZ Trasmissioni (RR France)	20766-5020-6	1
THE-	20766-5030-0	CARDAN SIMPLE PALIER	INTERMEDIATE CARDAN SHAFT	Vitesse de rotation : 990 tr/min - Rotation speed : 990 rpm - RAL 1003 - 6 vis/screws M6 DIN 960-10.9 et/and 6 écrous/nuts M6 DIN 980-10 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	20766-5030-0	2
THE-	20766-5030-1	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/min. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-5030-1	1
THE-	20766-5030-2	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/min. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-5030-2	1
THE-	20766-5030-3	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/min. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-5030-3	1
THE-	20766-5030-4	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/min. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-5030-4	1
THE-	20766-5030-5	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/min. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-5030-5	1
THE-	20766-5030-6	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/min. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-5030-6	1
THE-	20766-5030-7	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 990 tr/min. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 990 rpm. Color : RAL 1003	SASS	20766-5030-7	1
THE-	20766-5100-0	Sous-ensemble LL050R - Sortie d'arbre A	LL050R subassembly - Shaft ext A	Rayon primitif ... / Primitive radius ... : 47.75mm. ; Rendement ... / Efficiency at worst ... : ext A ; Détails sur ce plan / Details on this drawing	SERAPID France	20766-5100-0	4
THE-	20766-5200-0	Sous-ensemble LL050R - Sortie d'arbre B	LL050R subassembly - Shaft ext B	Rayon primitif ... / Primitive radius ... : 47.75mm. ; Rendement ... / Efficiency at worst ... : ext B ; Détails sur ce plan / Details on this drawing	SERAPID France	20766-5200-0	1
SER-	L2050-CB02-0	Ensemble contre-bride + vis (RR210 - LL050/LL050R)	Adapter flange assembly (RR210 - LL050/LL050R)	RR210 - LL050/LL050R (Standard fourniseur / Supplier's standard), Couleur / Color : RAL 9005	SERAPID France	L2050-CB02-0	5
SER-	ZE000-1106-2	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø16 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1106-2	1
SER-	ZE000-1112-2	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø24 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1112-2	9
SER-	ZE000-1115-4	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø28 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1115-4	2
SER-	ZE000-1121-5	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø38 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1121-5	2
SER-	ZMJ03-R040-6	Moteur 4.0 kW, 6 pôles, double frein	Motor 4.0 kW, 6 poles, double brake	Sg 132M-6A 2H5Y (cast iron casing) ; 4 kW ; 6 poles ; 230/400V ; 950rpm ; 50Hz ; Double brake ; 2x80 Nm (Rectifier BZ-2P : 230 VAC/ 207 VDC) ; Shaft ext / 2nd Shaft ext : Ø38g6x80(M12) / Ø28g6x80(M10) ; Classe isolation / Thermal protection : F IP55, 3 sondes PTC + 3 sondes TKO ; Inductive Microswith : IKZ ; Duty S2 10 minutes ; Colour : RAL 5010 (Supplier's Std).	CANTONI (JET)	ZMJ03-R040-6	2

NOTA :
Toutes les platines ne sont pas fournies par SERAPID France, et non referencees dans cette nomenclature. Se referer aux notes ci-dessous. / All base plates are not supplied by SERAPID France, and not notified in this parts list. Refer to below notes.

SER-ZA001-R055-0 :
PLATINES MOTEUR, DETAILS SUR LE PLAN SER-ZA001-R055-0, ELEMENTS NON FOURNIS PAR SERAPID France.
/ MOTOR PLATES, DETAILS ON THE DRAWING SER-ZA001-R055-0, ITEMS NOT SUPPLIED BY SERAPID France.

SER-ZD000-0211-0 :
PLATINE CARDAN, DETAILS SUR LE PLAN SER-ZD000-0211-0, ELEMENT NON FOURNI PAR SERAPID France.
/ CARDAN SHAFT PLATE, DETAILS ON THE DRAWING SER-ZD000-0211-0, ITEM NOT SUPPLIED BY SERAPID France.

THE-20766-4040-0 :
PLATINES RENVOI D'ANGLE, DETAILS SUR LE PLAN THE-20766-4040-0, ELEMENTS NON FOURNIS PAR SERAPID France.
/ BEVEL GEAR PLATES, DETAILS ON THE DRAWING THE-20766-4040-0, ITEMS NOT SUPPLIED BY SERAPID France.

SER-L2050-PL00-0 :
PLATINE CARTER LINKLIFT, DETAILS SUR LE PLAN SER-L2050-PL00-0, ELEMENT NON FOURNI PAR SERAPID France. / DRIVE HOUSING PLATE, DETAILS ON THE DRAWING SER-L2050-PL00-0, ITEM NOT SUPPLIED BY SERAPID France.

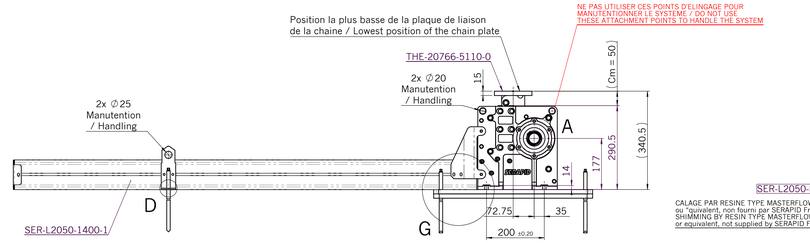
LES INTERFACES SUR LES RENVOIS D'ANGLES SONT IDENTIQUES. / SAME INTERFACES ON THE BEVEL GEARBOXES.

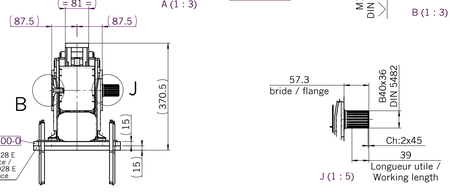
Taraudage en bout d'arbre / Shaft end threading: M6↧12

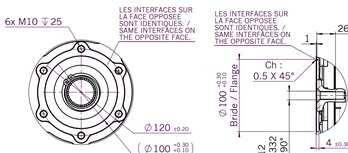
Couple de sortie / Output torque:
Couple statique/Static torque : 17 Nm
Couple dynamique/Dynamic torque : 15 Nm
Vitesse de rotation/Rotation speed : 990 rpm

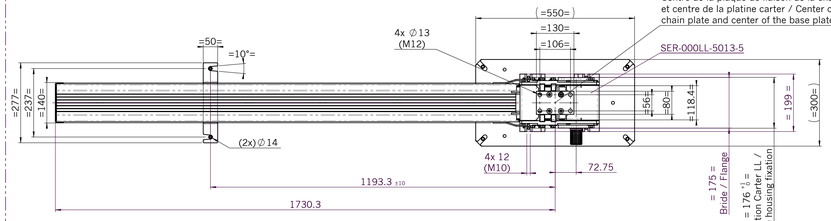
Clavette / key : 8x7x40

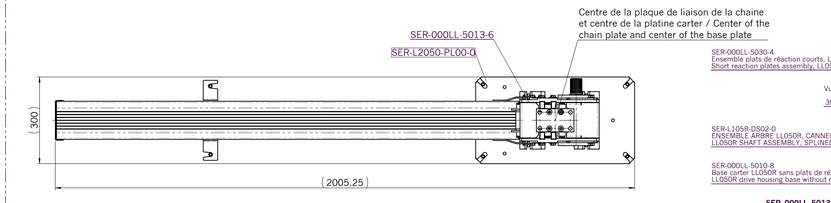
Prefixe ERP	ARTICLE / PART NUMBER	DESCRIPTION FRANCAISE	ENGLISH DESCRIPTION	INFORMATION	FOURNISSEUR / SUPPLIER	ARTICLE / PART NUMBER	THE-20766-5100-0 Exit A - QTE / QTY	THE-20766-5200-0 Exit B - QTE / QTY
THE-	20766-5110-0	Sous-ensemble Chaine LL050R	LL050R Chain subassembly	Montage suivant plan : SER-00050-1181-0. Quantité de Maillons STD suivant la nomenclature de cette Affaire.	SERAPID France	20766-5110-0	1	1
SER-	L2050-1400-1	MAGASIN LL050 1 BRIN H / Course Totale = 1400	1 H STRAND MAGAZINE LL050 / Total Stroke = 1400	Standard STI SERAPID Group, LL2, LinkLift de 2ème generation. / LinkLift of 2nd generation.	GAULT INDUSTRIES	L2050-1400-1	1	1
SER-000	LL-5013-6	Sous-ensemble LL050R, Plats de réaction courts, Sortie B	LL050R sub-assembly, Short reaction plates, Exit B	Nomenclature sur ce plan (vue 3D) / Parts list on this drawing (3D view). Primitive radius = 47.75mm; Efficiency at worst = 0.8	SERAPID France	LL-5013-6	-	1
SER-000	LL-5013-5	Sous-ensemble LL050R, Plats de réaction courts, Sortie A	LL050R sub-assembly, Short reaction plates, Exit A	Nomenclature sur ce plan (vue 3D) / Parts list on this drawing (3D view). Primitive radius = 47.75mm; Efficiency at worst = 0.8	SERAPID France	LL-5013-5	1	-

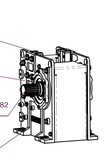




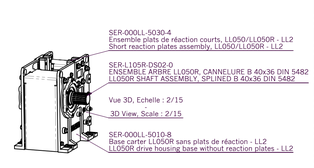




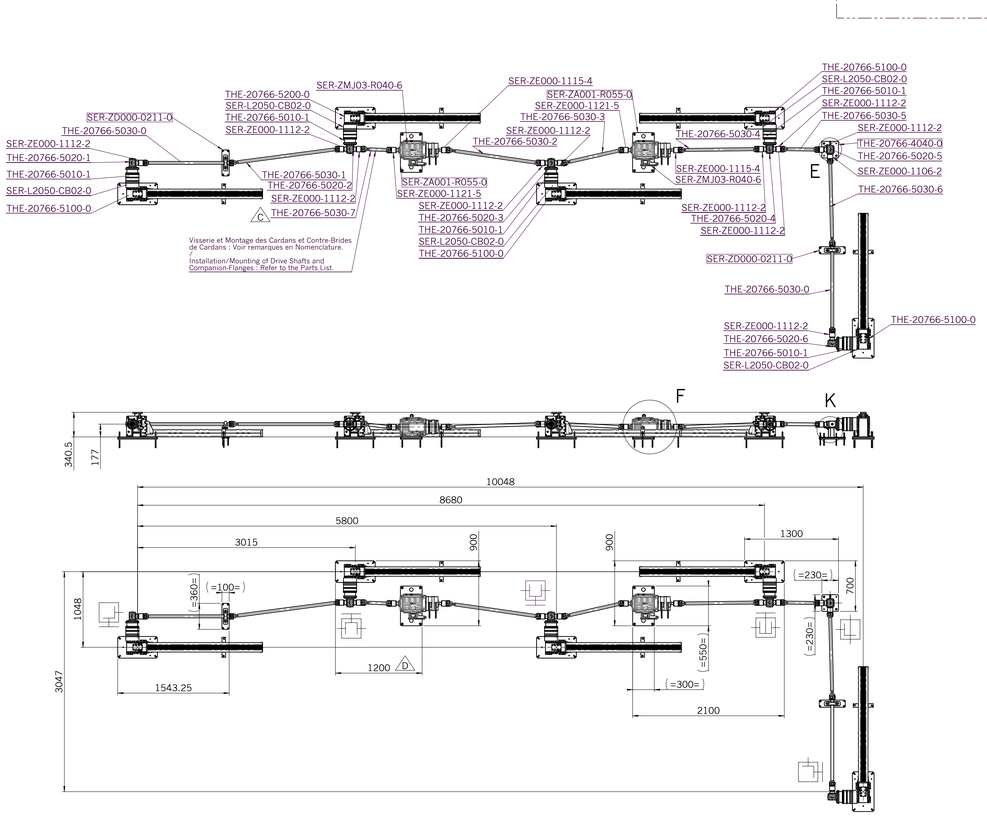


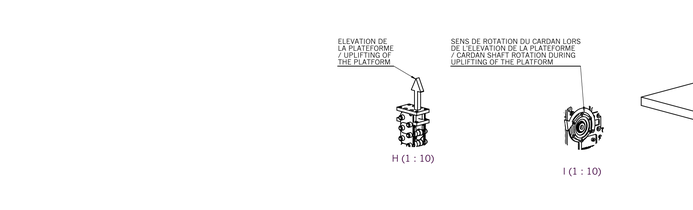


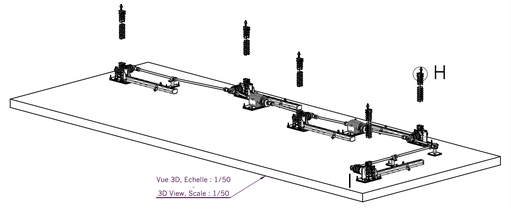
SER-000LL-5013-5
Sous-ensemble LL050R, Plats de réaction courts, Sortie A
LL050R sub-assembly, Short reaction plates, Exit A

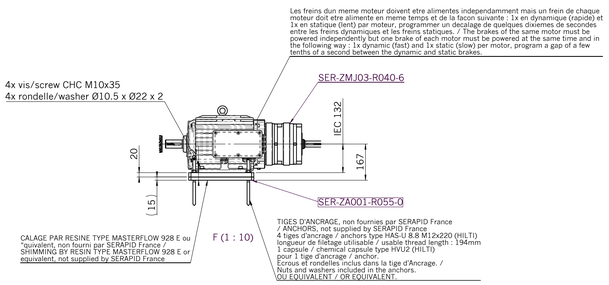


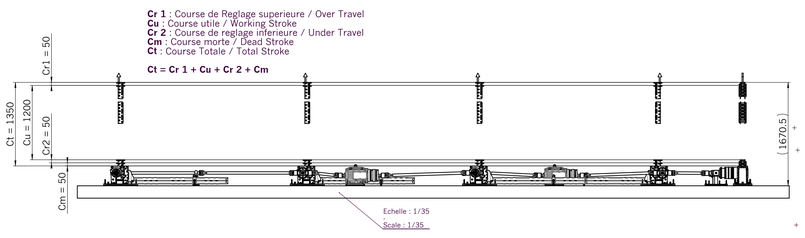
SER-000LL-5013-6
Sous-ensemble LL050R, Plats de réaction courts, Sortie B
LL050R sub-assembly, Short reaction plates, Exit B











Document necessaire au montage de ce systeme. ***Documents required for assembling this system.***

Plan d'ensemble / General Assembly : THE-20766-5000-0

Manuel d'instructions / Instruction manual : THE-20766-M001-0

TRES IMPORTANT / *VERY IMPORTANT*

CONSIGNES DE SECURITE / *SAFETY INSTRUCTIONS*

Tous les composants mécaniques doivent être impérativement mis de niveau et correctement positionnés suivant les indications et cotations de ce plan.
Le non respect de ces consignes risque d'entrainer une détérioration des différents organes mécanique de cette transmission et une annulation de la garantie SERAPID France.

All the mechanical components must be installed straightly and positionned following the dimensions and indications shown on this drawing.
Not respecting these instructions could lead to a deterioration of the differents parts of the transmission and could cancel SERAPID waranty.

IMPERATIF :
La charge totale doit être uniformément répartie sur chacun des LinkLifts.
IMPERATIVE :
The total load must be distributed uniformly on each LinkLift.

LINKLIFT 30 et/*and* LINKLIFT 50

FIXATION PLATINES / *PLATE FIXING :*
Non fourni par SERAPID France / Not supplied by SERAPID France

-A-Platine linklift, se référer au détail / *Linklift plate (see detail linklift plate)*
-1-Mise à niveau par / *Height setting by :*
3 vis verins / *screw jack* HM12x90 + 3 écrous / *nuts* M12
-2-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
4 tiges d'ancrage / *anchors*
4 capsules chimiques / *chemical capsules*

-B-Platine renvoi d'angle, se référer au détail (si besoin) / *Geared box plate, see detail geared plate (if needed)*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
4 tiges d'ancrage / *anchors*
4 capsules chimiques / *chemical capsules*

-C-Platine moteur, se référer au détail / *Motor plate, see detail motor plate*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
4 tiges d'ancrage / *anchors*
4 capsules chimiques / *chemical capsules*

-D-Magasin linklift / *Linklift magazin*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
2 tiges d'ancrage / *anchors*
2 capsules chimiques / *chemical capsules*

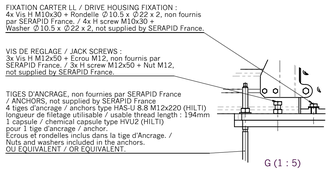
-E-Support Cardan, se référer au détail (si besoin) / *Cardan Plate, see detail cardan plate (if needed)*
-1-Fixation par (ou équivalent) / *Fixing with (or equivalent)*
2 tiges d'ancrage / *anchors*
2 capsules chimiques / *chemical capsules*

Après mise en position et ancrage, toutes les platines doivent être calées à l'aide d'une resine de calage.

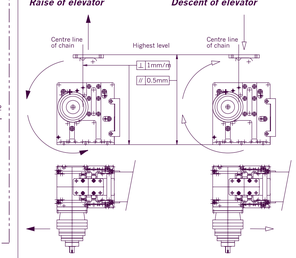
After position setting and anchorage, all the plates must be shimmed with a resin.

Deux Ecrous M12 et deux Rondelles Ø13 x Ø27 x 2.5 non fournis par SERAPID France. / Two H Nuts M12 and two Washers Ø13 x Ø27 x 2.5 capsules chimiques / *chemical capsules*





Montée de la plateforme / ***Raise of elevator***
Descente de la plateforme / ***Descent of elevator***



Parallelism between the floor and the highest level 0.5mm max.
Perpendicular position between the ground and the centre line of the chain 1mm/m.

TRANSPORT ET STOCKAGE :
Les composants des systèmes d'élévation LINKLIFT ont une protection contre la corrosion par une peinture industrielle, vernis de protection ou huilage suivant les pièces. Dès réception, les caisses doivent être ouvertes pour vérifier l'état des composants après le transport (particulièrement si il est maritime) et les stocker à l'abri et au sec jusqu'à l'installation.

TRANSPORT AND STORAGE :
The components for the LINKLIFT systems have a protection against corrosion by an industrial painting, a protecting varnish or oiling according to the parts. When receiving the woodden boxes, same must imperatively be opened, in order to check the components specially after transport and mainly by sea. The storage has to be made in a dry aera.

CARACTERISTIQUE TECHNIQUE / TECHNICAL DATA: Incorporation

Surface de la plateforme / Platform surface	m2 : 26.54	
Masse de la plateforme / Mass of the platform	daN/m2 : 150	
Charge utile Statique / Static payload	daN/m2 : 500	
Charge utile Dynamique / Dynamic payload	daN/m2 : 250	
Force statique / static load	N : 172 510 (on 5 LinkLift)	MAX 34 502 on 1 LinkLift
Force dynamique / dynamic load	N : 106 160 (on 5 LinkLift)	MAX 21 232 on 1 LinkLift

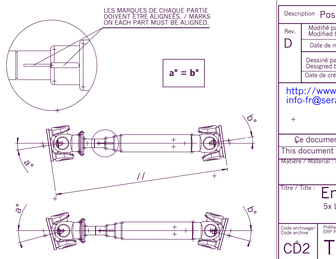
Ces charges sont considérées réparties équitablement sur l'ensemble des LinkLift.
These loads are considered distributed equally over all LinkLift.

Vitesse d'élévation / speed elevation	mm/s : 50 (with frequency drive)	
Course / stroke	mm : Voir sur le plan / Refer to the drawing	
Type de chaîne / type of chain	: LL050R (LL2)	
Fréquence d'utilisation / frequency of use	: /	
Teinte de finition / colors	: Apprêt phosphatique noir mat et standard fournisseurs	Black phosphatation and suppliers standards

CARDAN / CARDAN SHAFT

IL EST **IMPERATIF** DE RESPECTER LES POSITIONS DES MATERIELS SPECIFIES SUR LE PLAN D'ENSEMBLE AFIN DE GARANTIR L'EGALITE DES ANGLES a ET b. CETTE EGALITE ETANT INDISPENSABLE POUR GARANTIR LE PARFAIT EQUILIBRAGE DU CARDAN ET UN FONCTIONNEMENT OPTIMAL DU MATERIEL.
L'ANGLE EN SORTIE b DOIT ETRE EGAL A L'ANGLE EN ENTREE a.

*IT IS **IMPERATIVE** TO RESPECT ITEMS POSITIONS SPECIFIED ON THE GENERAL ASSEMBLY TO ENSURE EQUAL a AND b ANGLES.*
THIS IS ESSENTIAL TO ENSURE PERFECT BALANCED AND OPTIMAL WORKING OF THE ITEM.
THE ANGLE AT THE OUTPUT b MUST BE EQUAL TO THE ANGLE AT INPUT a.



Projet / Project : University of Oxford
Plateforme / Stage : Stage Riser 03

Rev.							
D	Description	Position moteur selon demande client / Motor position following customer request.					
	Modifié par / Modified by	gosset.a	Vérifié par / Checked by	VERDIER S.	Approuvé par / Approved by	NOYON L.	
	Date de modif.	09/01/2024	Date	09/01/2024	Date	09/01/2024	
	Dessiné par / Designed by	gosset.a	Vérifié par / Checked by	VERDIER S.	Approuvé par / Approved by	NOYON L.	
	Date de création	20/09/2023	Date :	20/09/2023	Date :	09/01/2024	

http://www.serapid.com
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SERAPID RIGID CHAIN TECHNOLOGY
4 rue des Frères Robbe, ZA EUROCHANNEL 76370 Martin-Eglise.

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Matière / Material : EUROMAX 7 DIN 7 NO	Masse / Weight (Kg) :	Traitement / Treatment :			
	Volume / Volume (cm³) :				
Titre / Title : Ensemble 5x LinkLift 050R avec motorisation 5x LinkLift 050R with drive system assembly					
Code archivage / Code archive	Préfixe ERP / ERP Prefix	N° de Plan / Drawing's number :	Indice 3D:	Tol. Gén. :	Rugosité :
CD2	THE-	20766-5000-0	B	Voir nota	
			Echelle / Scale : 1:30	Feuille / Size : A0 1/1	

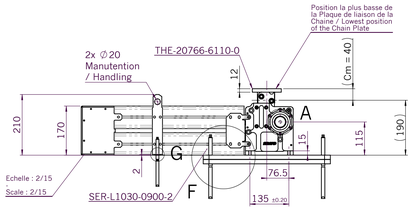
Prefixe ERP	ARTICLE / PART NUMBER	DESCRIPTION FRANCAISE	ENGLISH DESCRIPTION	INFORMATION	FOURNISSEUR / SUPPLIER	ARTICLE / PART NUMBER	QTE / QTY
THE-	17722-2020-0	Ensemble contre-bride (LL030-RR105-110)	Mating flange assembly (LL030-RR105-110)	Standard SERAPID France	SERAPID France	17722-2020-0	2
THE-	20766-6005-1	Moteur 1.5kW, 6 pôles, double freins	Motor 1.5kW, 6 poles, double brake	Sh 90 L6 2 HSY ; 1.5 kW ; 6 poles ; 230/400V ; 900rpm ; 50Hz ; Double brake ; 2x20 Nm (Frein 2 H 2 SP 90 BT 44 – 207 VDC) ; Shaft exit / 2nd Shaft exit : Ø24g6x50(M8) / Ø24g6x50(M8) ; Classe isolation : Thermal protection : F IP55, 3 sondes PTO + 3 sondes PTC ; Inductive Microswith : IK2 ; Duty S2 10 minutes ; Colour : RAL 5010 (Supplier's Std).	CANTONI (JET)	20766-6005-1	1
THE-	20766-6010-1	Réducteur planétaire	Bevel gearbox	RR 105 D FS 1/51.84 (RF) (input : EL Ø35x50 - M12) ; i=1/51.84 ; Breaking torque = 2110 Nm ; Efficiency=0.96 ; Inertia= 0.70 g.m² ; color=Supplier's standard	REGGIANA (RR France)	20766-6010-1	1
THE-	20766-6010-2	Réducteur planétaire	Bevel gearbox	RR 105 D FS 1/51.84 (STD) (input : IEC 71 B5) ; i=1/51.84 ; Breaking torque = 2110 Nm ; Efficiency=0.96 ; Inertia= 0.70 g.m² ; color=Supplier's standard	REGGIANA (RR France)	20766-6010-2	1
THE-	20766-6011-0	Ensemble de vis pour réducteur planétaire	Kit of screws for planetary gearbox	8x Vis CHC M8x100 / 8x screws CHC M8x100	SERAPID France	20766-6011-0	1
THE-	20766-6020-1	Renvoi d'angle	Bevel gearbox	QB 9 R 86 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on right side (FLB) + double shaft exit Ø16 (MK2) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour : Supplier's standard.	DZ Trasmissioni (RR France)	20766-6020-1	1
THE-	20766-6030-0	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 825 tr/min. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 825 rpm. Color : RAL 1003	SASS	20766-6030-0	1
THE-	20766-6030-1	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 825 tr/min. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 825 rpm. Color : RAL 1003	SASS	20766-6030-1	1
THE-	20766-6100-0	Sous-ensemble LL030 - Sortie d'arbre A	LL030 subassembly - Shaft exit A	Rayon primitif ... / Primitive radius ... : 30mm. ; Rendement ... / Efficiency at worst ... : 0.80 ; Détails sur ce plan / Details on this drawing	SERAPID France	20766-6100-0	1
THE-	20766-6200-0	Sous-ensemble LL030 - Sortie d'arbre B	LL030 subassembly - Shaft exit B	Rayon primitif ... / Primitive radius ... : 30mm. ; Rendement ... / Efficiency at worst ... : 0.80 ; Détails sur ce plan / Details on this drawing	SERAPID France	20766-6200-0	1
SER-	ZE000-1106-2	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø16 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1106-2	1
SER-	ZE000-1112-2	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø24 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1112-2	1
SER-	ZE000-1112-3	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø24 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1112-3	1
SER-	ZE000-1119-5	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø35 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1119-5	1

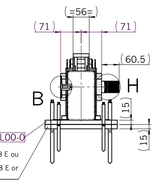
NOTA :
Toutes les platines ne sont pas fournies par SERAPID France, et non references dans cette nomenclature. Se referer aux notes ci-dessous. / All base plates are not supplied by SERAPID France, and not notified in this parts list. Refer to below notes.

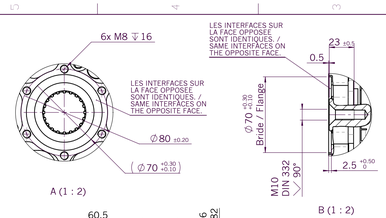
THE-03605-1031-0 :
PLATINES MOTEUR, DETAILS SUR LE PLAN THE-03605-1031-0, ELEMENTS NON FOURNIS PAR SERAPID France.
/ MOTOR PLATES, DETAILS ON THE DRAWING THE-03605-1031-0, ITEMS NOT SUPPLIED BY SERAPID France.

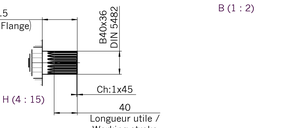
SER-L1030-PL00-0 :
PLATINE CARTER LINKLIFT, DETAILS SUR LE PLAN SER-L1030-PL00-0, ELEMENT NON FOURNI PAR SERAPID France. / DRIVE HOUSING PLATE, DETAILS ON THE DRAWING SER-L1030-PL00-0, ITEM NOT SUPPLIED BY SERAPID France.

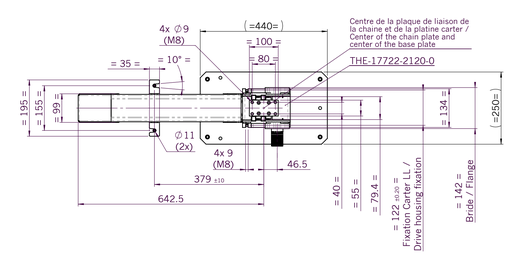
Prefixe ERP	ARTICLE / PART NUMBER	DESCRIPTION FRANCAISE	ENGLISH DESCRIPTION	INFORMATION	FOURNISSEUR / SUPPLIER	ARTICLE / PART NUMBER	THE-20766-6100-0 Exit A - QTE / QTY	THE-20766-6200-0 Exit B - QTE / QTY
THE-	17722-2120-0	Sous-ensemble LL030, Plats de réaction courts, Sortie A	LL030 sub-assembly, Short reaction plates, Exit A	Nomenclature sur ce plan (vue 3D) / Parts list on this drawing (3D view)	SERAPID France	17722-2120-0	1	-
THE-	17722-2220-0	Sous-ensemble LL030, Plats de réaction courts, Sortie B	LL030 sub-assembly, Short reaction plates, Exit B	Nomenclature sur ce plan (vue 3D) / Parts list on this drawing (3D view)	SERAPID France	17722-2220-0	-	1
THE-	20766-6110-0	Sous-ensemble Chaîne LL030	LL030 Chain subassembly	Montage suivant plan : SER-00030-1207-0. Quantité de Maillons STD suivant la nomenclature de cette Affaire.	SERAPID France	20766-6110-0	1	1
SER-	L1030-0900-2	MAGASIN LL030 2BH / Course Totale = 900	2 STRANDS MAGAZINE LL030 / Total Stroke = 900	Standard STI SERAPID Group	GAULT INDUSTRIES	L1030-0900-2	1	1

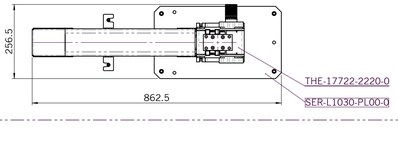




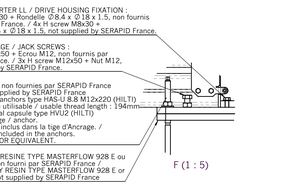


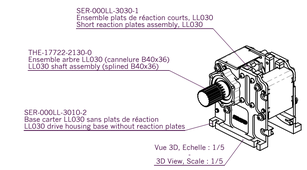




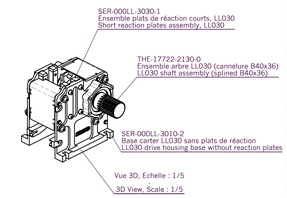




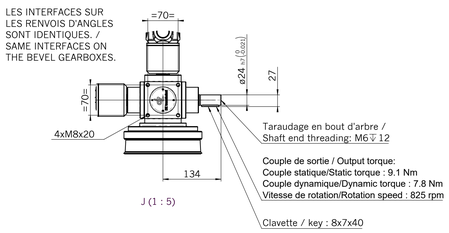




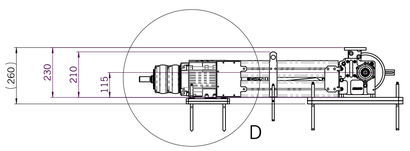
THE-17722-2220-0
Sous-ensemble LL030, Plats de réaction courts, Sortie B
LL030 sub-assembly, Short reaction plates, Exit B

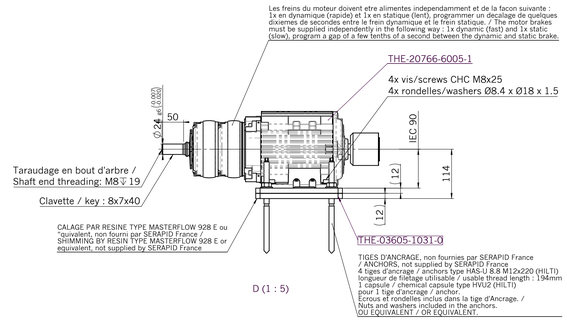


THE-17722-2120-0
Sous-ensemble LL030, Plats de réaction courts, Sortie A
LL030 sub-assembly, Short reaction plates, Exit A

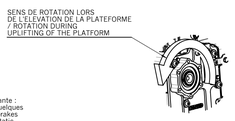


J (1 : 5)





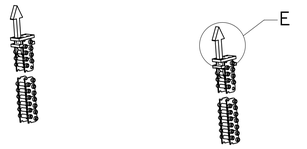
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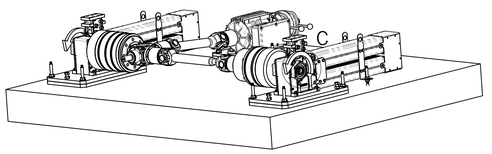


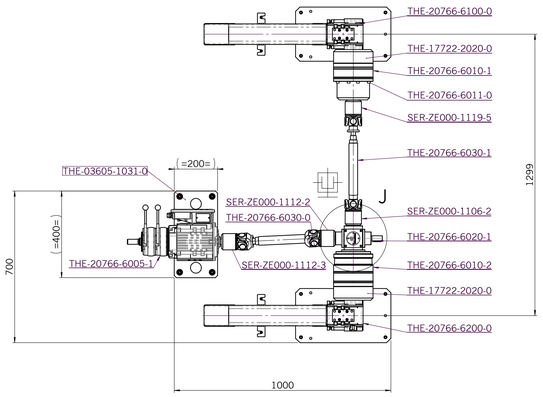
C (1 : 5)

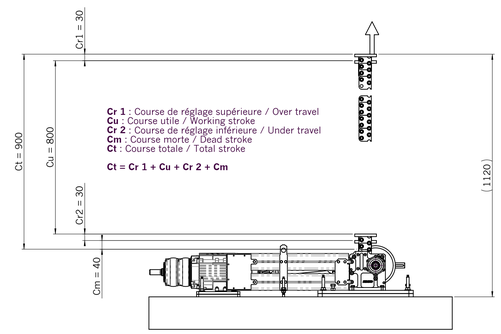


E (1 : 5)





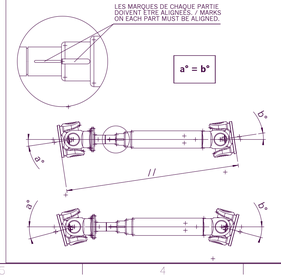




CARDAN / CARDAN SHAFT

IL EST **IMPERATIF** DE RESPECTER LES POSITIONS DES MATERIELS SPECIFIES SUR LE PLAN D'ENSEMBLE AFIN DE GARANTIR L'EGALITE DES ANGLES a ET b. CETTE EGALITE ETANT INDISPENSABLE POUR GARANTIR LE PARFAIT EQUILIBRAGE DU CARDAN ET UN FONCTIONNEMENT OPTIMAL DU MATERIEL.
L'ANGLE EN SORTIE b DOIT ETRE EGAL A L'ANGLE EN ENTREE a.

*IT IS **IMPERATIVE** TO RESPECT ITEMS POSITIONS SPECIFIED ON THE GENERAL ASSEMBLY TO ENSURE EQUAL a AND b ANGLES.*
THIS IS ESSENTIAL TO ENSURE PERFECT BALANCED AND OPTIMAL WORKING OF THE ITEM.
THE ANGLE AT THE OUTPUT b MUST BE EQUAL TO THE ANGLE AT INPUT a.



Document necessaire / Documents required for
au montage de ce système. assembling this system

Plan d'ensemble / General Assembly n° : THE-20766-6000-0

Notice d'instructions / Instruction manual n° : THE-20766-M001-0

TRES IMPORTANT / VERY IMPORTANT

CONSIGNES DE SECURITE / *SAFETY INSTRICTIONS*

Tous les composants mécaniques doivent être impérativement mis de niveau et correctement positionnés suivant les indications et cotations de ce plan.
Le non respect de ces consignes risque d'entrainer une détérioration des différents organes mécanique de cette transmission et une annulation de la garantie SERAPID France.

All the mechanical components must be installed straightly and positionned following the dimensions and indications shown on this drawing.
Not respecting these instructions could lead to a deterioration of the différents parts of the transmission and could cancel SERAPID warranty.

IMPERATIF
La charge totale doit être uniformément répartie sur chacun des LinkLifts.
IMPERATIVE
The total load must be distributed uniformly on each LinkLift.

LINKLIFT 30 et / and LINKLIFT 50

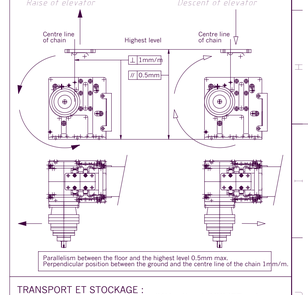
FIXATION PLATINES / *PLATE FIXING*
Non fournis par SERAPID France / Not supplied by SERAPID France

- A-Platine linklift, se référer au détail / *Linklift plate (see detail linklift plate)*
  - 1-Mise à niveau par / *Height setting by*
    3 vis verins / *screw jack HMT250 + 3 écrous / nuts M12*
  - 2-Fixation par / *Fixing with* [*ou équivalent*]
    4 tiges d'ancrage / anchors type HAS-U M12x170/88 (HILTI)
    1 capsule / chemical capsule type HIT-HY 150 330/2
    réf : 359559 (HILTI)
- B-Platine renvoi d'angle, se référer au détail (si besoin) / *Gearbox plate, see detail gearbox plate (if needed)*
  - 1-Fixation par [*ou équivalent*] / *Fixing with* [*or equivalent*]
    4 tiges d'ancrage / anchors type HAS-U M10x190/63 (HILTI)
    1 capsule / chemical capsule type HIT-HY 150 330/2
    réf : 359559 (HILTI)
- C-Platine moteur, se référer au détail / *Motor plate, see detail motor plate*
  - 1-Fixation par [*ou équivalent*] / *Fixing with* [*or equivalent*]
    4 tiges d'ancrage / anchors type HAS-U M10x170/88 (HILTI)
    1 capsule / chemical capsule type HIT-HY 150 330/2
    réf : 359559 (HILTI)
- D-Magasin linklift / *Linklift magazin*
  - 1-Fixation par [*ou équivalent*] / *Fixing with* [*or equivalent*]
    2 tiges d'ancrage / anchors type HAS-U M12x170/88 (HILTI)
    1 capsule / chemical capsule type HIT-HY 150 330/2
    réf : 359559 (HILTI)
- E-Support Cardan, se référer au détail (si besoin) / *Cardan Plate, see detail cardan plate (if needed)*
  - 1-Fixation par [*ou équivalent*] / *Fixing with* [*or equivalent*]
    2 tiges d'ancrage / anchors type HAS-U M10x90/61 (HILTI)
    1 capsule / chemical capsule type HIT-HY 150 330/2
    réf : 359559 (HILTI)

Après mise en position et ancrage, toutes les platines doivent être calées à l'aide d'une resine de calage type MASTERFLOW 928 E, ou équivalent.

After position setting and anchorage, all the plates must be shimmed with a resin type MASTERFLOW 928 E, or equivalent.

Montée de la plateforme / Descente de la plateforme
Raise of elevator Descent of elevator



TRANSPORT ET STOCKAGE :
Les composants des systèmes d'élévation LINKLIFT ont une protection contre la corrosion par une peinture industrielle, vernis de protection ou huilage suivant les pièces. Dès réception, les caisses doivent être ouvertes pour vérifier l'état des composants après le transport (particulièrement si il est maritime) et les stocker à l'abri et au sec jusqu'à l'installation.

TRANSPORT AND STORAGE :
The components for the LINKLIFT systems have a protection against corrosion by an industrial painting, a protecting varnish or oiling according to the parts. When receiving the woodden boxes, same must imperatively be opened, in order to check the components specially after transport and mainly by sea. The storage has to be made in a dry aera.

CARACTERISTIQUE TECHNIQUE / TECHNICAL DATA: Incorporation

Surface de la plateforme / Platform surface	m2 : 2.39
Masse de la plateforme / Mass of the platform	daN/m2 : 150
Charge utile Statique / Static payload	daN/m2 : 500
Charge utile Dynamique / Dynamic payload	daN/m2 : 250
Force statique / static load	N : 15 535 (on 2 LinkLift) (MAX 7 768 N / 1 LL)
Force dynamique / dynamic load	N : 9 560 (on 2 LinkLift) (MAX 4 780 N / 1 LL)

Ces charges sont considérées réparties équitablement sur l'ensemble des LinkLift.
These loads are considered distributed equally over all LinkLift.

Vitesse d'élévation / speed elevation	mm/s : 50 (with frequency drive)
Course / stroke	mm : Voir sur le plan / Refer to the drawing
Type de chaîne / type of chain	: LL030 (LL1)
Fréquence d'utilisation / frequency of use	: /
Teinte de finition / colors	: Apprêt phosphatique noir mat et standard fournisseurs / Black phosphatation and suppliers standards

Projet / Project : University of Oxford
Plateforme / Stage : Stage Riser 04

Description:	Suppression du Stromag suivant demande client / Removal of limit switch following customer request.				
Rev. B	Modifié par / Modified by	gosset.a	Vérifié par / Checked by	VERDIER S.	Approuvé par / Approved by NOYON L.
	Date de modif.	21/12/2023	Date	21/12/2023	Date 21/12/2023
	Dessiné par / Designed by	gosset.a	Vérifié par / Checked by	VERDIER S.	Approuvé par / Approved by NOYON L.
	Date de création	22/03/2022	Date :	22/03/2022	Date : 03/01/2024

http://www.serapid.com
info-fr@serapid.com
SERAPID RIGID CHAIN TECHNOLOGY
Tél: +33 (0)2 32 06 35 60
4 rue des Frères Robbe, ZA EUROCHANNEL 76370 Martin-Eglise

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Matière / Material : **Eurocorte / DIN / AIS:** | Masse / Weight (Kg): | Volume / Volume (cm³) : | Traitement / Treatment :

Titre / Title :
Ensemble 2x LinkLift 030 avec motoristation
2x LinkLift 030 with drive system assembly

Code archivage / Code archive	Préfixe ERP / ERP Prefix	N° de Plan / Drawing's number :	Indice 3D:	Tol. Gén.	Rugosité :
CD2		THE-20766-6000-0		Voir nota	Ra
			Echelle / Scale : 1:10		Feuille / Size: A0 1/1

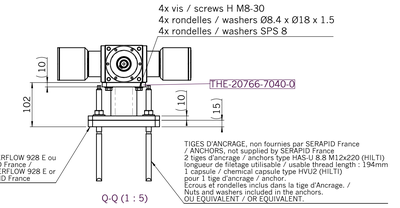
Prefixe ERP	ARTICLE / PART NUMBER	DESCRIPTION FRANCAISE	ENGLISH DESCRIPTION	INFORMATION	FOURNISSEUR / SUPPLIER	ARTICLE / PART NUMBER	QTE / QTY
THE-	17722-2020-0	Ensemble contre-bride (LL030-RR105-110)	Mating flange assembly (LL030-RR105-110)	Standard SERAPID France	SERAPID France	17722-2020-0	4
THE-	20766-6011-0	Ensemble de vis pour réducteur planétaire	Kit of screws for planetary gearbox	8x Vis CHC M8x100 / 8x screws CHC M8x100	SERAPID France	20766-6011-0	2
THE-	20766-7005-1	Moteur 2,2kW, 6 pôles, double freins	Motor 2,2kW, 6 poles, double brake	Sg 112 M6- 2 HSY - 2,2 kW ; 6 poles ; 230/400V ; 900rpm ; 50Hz ; Double brake ; 2x30 Nm (Frein 2 H 2 SP 112 BT 44 – 230 VAC/ 207 VDC) ; Shaft exit / 2nd Shaft exit : Ø28g6x60(M10) / Ø28g6x60(M10) ; Classe isolation / Thermal protection : F IP55, 3 sondes PTO + 3 sondes PTC ; Inductive Microswith ; IK2 ; Duty S2 10 minutes ; Colour : RAL 5010 (Supplier's Std).	CANTONI (JET)	20766-7005-1	1
THE-	20766-7010-1	Réducteur planétaire	Bevel gearbox	RR 105 D FS 1/51.84 (RF)(input : EL Ø35x50 - M12) ; i=1/51.84 ; Breaking torque = 2110 Nm ; Efficiency=0.96 ; Inertia= 0.70 g.m² ; color=Supplier's standard	REGGIANA (RR France)	20766-7010-1	2
THE-	20766-7010-2	Réducteur planétaire	Bevel gearbox	RR 105 D FS 1/51.84 (STD)(input : IEC 71 B5) ; i=1/51.84 ; Breaking torque = 2110 Nm ; Efficiency=0.96 ; Inertia= 0.70 g.m² ; color=Supplier's standard	REGGIANA (RR France)	20766-7010-2	2
THE-	20766-7020-1	Renvoi d'angle	Bevel gearbox	QB 4 R B6 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on right side (FLB) + double shaft exit Ø16 (MK2) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour : Supplier's standard.	DZ Trasmissioni (RR France)	20766-7020-1	1
THE-	20766-7020-2	Renvoi d'angle	Bevel gearbox	QB 9 R B6 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; simple shaft exit Ø16 (MKB) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour : Supplier's standard.	DZ Trasmissioni (RR France)	20766-7020-2	1
THE-	20766-7020-3	Renvoi d'angle	Bevel gearbox	QB 9 R B6 1/1 ; Mounting position : 2 ; Lifetime lubrication (grease) ; Flange mounting on left side (FLC) + simple shaft exit Ø16 (MKC) ; Rapport de reduction / ratio = 1/1 ; Couleur / Colour : Supplier's standard.	DZ Trasmissioni (RR France)	20766-7020-3	1
THE-	20766-7030-0	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 825 tr/min. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 825 rpm. Color : RAL 1003	SASS	20766-7030-0	1
THE-	20766-7030-1	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 825 tr/min. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 825 rpm. Color : RAL 1003	SASS	20766-7030-1	1
THE-	20766-7030-2	CARDAN	CARDAN SHAFT	IMPERATIF : L'angle en sortie doit être égal à l'angle en entrée. Vitesse de rotation : 825 tr/min. Couleur : RAL 1003. / IMPERATIVE : The angle at the output must be equal to the angle at input. Rotation speed : 825 rpm. Color : RAL 1003	SASS	20766-7030-2	1
THE-	20766-7060-0	Accouplement	Coupling	ROTEX 28 SPLIT-hub 7.1 Ø16H7 key DIN 6885 JS9, ROTEX 28 SPLIT-hub 7.1 Ø35H7 key DIN 6885 JS9, ROTEX 28 Spider 98 Sh-A =T-PUR® pupm	KTR	20766-7060-0	2
THE-	20766-7100-0	Sous-ensemble LL030 - Sortie d'arbre A	LL030 subassembly - Shaft exit A	Rayon primitif ... / Primitive radius ... : 30mm. ; Rendement ... / Efficiency at worst ... : 0.80 ; Détails sur ce plan / Details on this drawing	SERAPID France	20766-7100-0	2
THE-	20766-7200-0	Sous-ensemble LL030 - Sortie d'arbre B	LL030 subassembly - Shaft exit B	Rayon primitif ... / Primitive radius ... : 30mm. ; Rendement ... / Efficiency at worst ... : 0.80 ; Détails sur ce plan / Details on this drawing	SERAPID France	20766-7200-0	2
SER-	ZE000-1112-2	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø28 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1112-2	4
SER-	ZE000-1115-4	Contre-bride (cardan)	Mating flange (cardan shaft)	Ø75 x Ø28 x L=65 - RAL 1003. - 6 vis/screws M6x16 DIN 933-10.9 - Montage au frein-filet (fourniture Client) / Mounting with thread lock (supplied by the Customer).	SASS	ZE000-1115-4	2

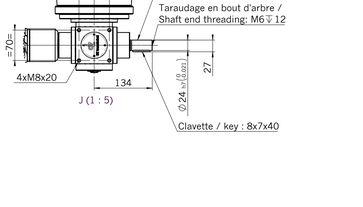
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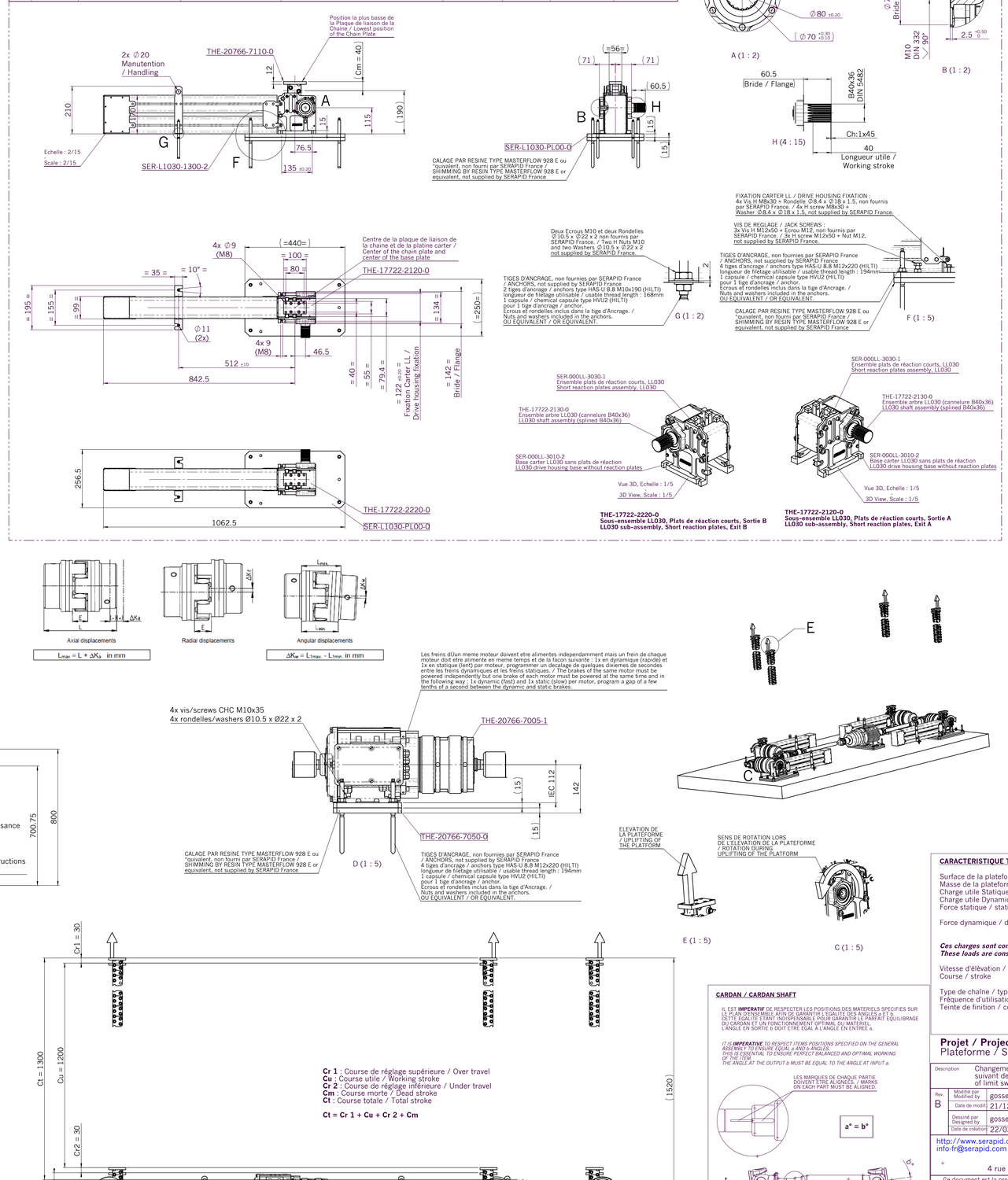
THE-20766-7050-0 :
PLATINES MOTEUR, DETAILS SUR LE PLAN THE-20766-7050-0, ELEMENTS NON FOURNIS PAR SERAPID France.
/ MOTOR PLATES, DETAILS ON THE DRAWING THE-20766-7050-0, ITEMS NOT SUPPLIED BY SERAPID France.

THE-20766-7040-0 :
PLATINES RENVOI D'ANGLE, DETAILS SUR LE PLAN THE-20766-7040-0, ELEMENTS NON FOURNIS PAR SERAPID France.
/ BEVEL GEAR PLATES, DETAILS ON THE DRAWING THE-20766-7040-0, ITEMS NOT SUPPLIED BY SERAPID France.

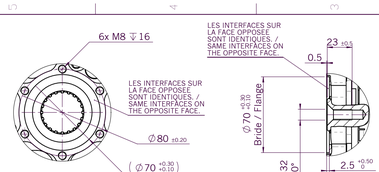
SER-L1030-PL00-0 :
PLAINE CARTER LINKLIFT, DETAILS SUR LE PLAN SER-L1030-PL00-0, ELEMENT NON FOURNI PAR SERAPID France. / DRIVE HOUSING PLATE, DETAILS ON THE DRAWING SER-L1030-PL00-0, ITEM NOT SUPPLIED BY SERAPID France.

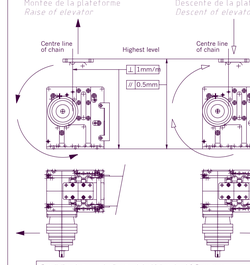


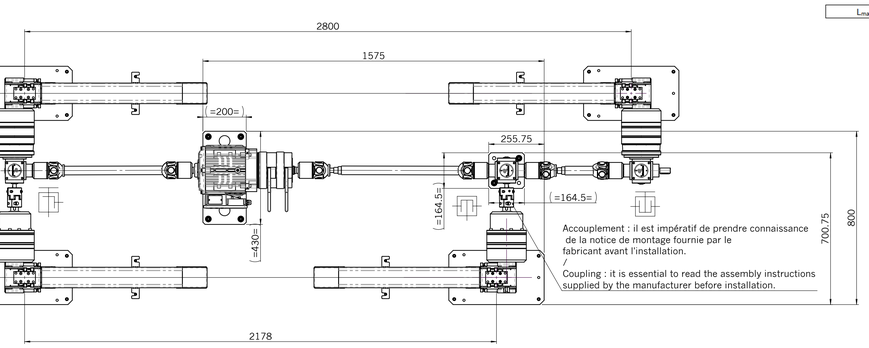


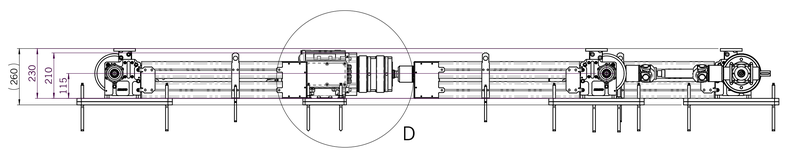


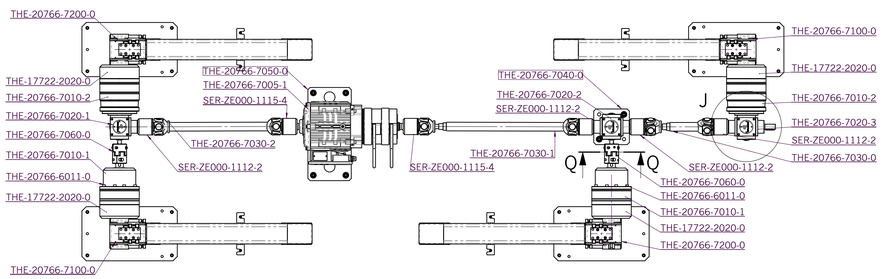
Prefixe ERP	ARTICLE / PART NUMBER	DESCRIPTION FRANCAISE	ENGLISH DESCRIPTION	INFORMATION	FOURNISSEUR / SUPPLIER	ARTICLE / PART NUMBER	THE-20766-7100-0 Exit A - QTE / QTY	THE-20766-7200-0 Exit B - QTE / QTY
THE-	17722-2120-0	Sous-ensemble LL030, Plats de réaction courts, Sortie A	LL030 sub-assembly, Short reaction plates, Exit A	Nomenclature sur ce plan (vue 3D) / Parts list on this drawing (3D view)	SERAPID France	17722-2120-0	1	-
THE-	17722-2220-0	Sous-ensemble LL030, Plats de réaction courts, Sortie B	LL030 sub-assembly, Short reaction plates, Exit B	Nomenclature sur ce plan (vue 3D) / Parts list on this drawing (3D view)	SERAPID France	17722-2220-0	-	1
THE-	20766-7110-0	Sous-ensemble Chaîne LL030	LL030 Chain subassembly	Montage suivant plan : SER-00030-1207-0. Quantité de Maillons STD suivant la nomenclature de cette Affaire.	SERAPID France	20766-7110-0	1	1
SER-	L1030-1300-2	MAGASIN LL030 2BH / Course Totale = 1300	2 STRANDS MAGAZINE LL030 / Total Stroke = 1300	Standard STI SERAPID Group	GAULT INDUSTRIES	L1030-1300-2	1	1

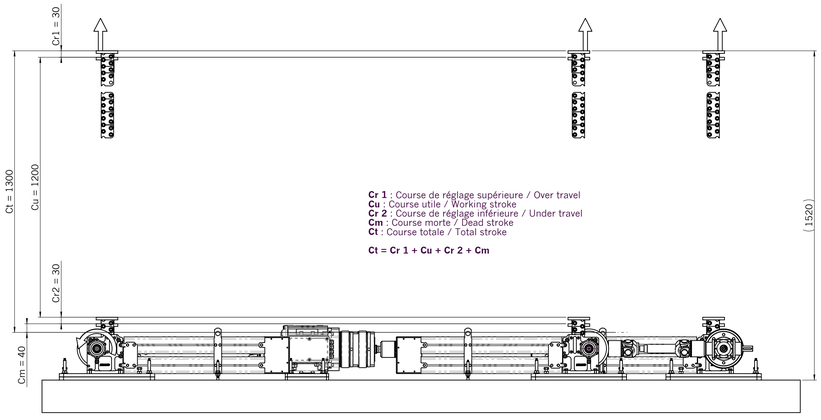












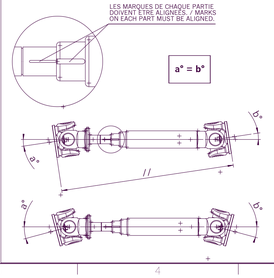
$L_{max} = L + \Delta K_a$ in mm

$\Delta K_w = L_{max.} - L_{min.}$ in mm

CARDAN / CARDAN SHAFT

IL EST **IMPERATIF** DE RESPECTER LES POSITIONS DES MATERIELS SPECIFIES SUR LE PLAN D'ENSEMBLE AFIN DE GARANTIR L'EGALITE DES ANGLES a ET b. CETTE EGALITE ETANT INDISPENSABLE POUR GARANTIR LE PARFAIT EQUILIBRAGE DU CARDAN ET UN FONCTIONNEMENT OPTIMAL DU MATERIEL.
L'ANGLE EN SORTIE b DOIT ETRE EGAL A L'ANGLE EN ENTREE a.

*IT IS **IMPERATIVE** TO RESPECT ITEMS POSITIONS SPECIFIED ON THE GENERAL ASSEMBLY TO ENSURE EQUAL a AND b ANGLES.*
THIS IS ESSENTIAL TO ENSURE PERFECT BALANCED AND OPTIMAL WORKING OF THE ITEM.
THE ANGLE AT THE OUTPUT b MUST BE EQUAL TO THE ANGLE AT INPUT a.



Document necessaire au montage de ce système. / *Documents required for assembling this system*

Plan d'ensemble / General Assembly n° : THE-20766-7000-0

Notice d'instructions / Instruction manual n° : THE-20766-M001-0

TRES IMPORTANT / *VERY IMPORTANT*

CONSIGNES DE SECURITE / *SAFETY INSTRICTIONS*

Tous les composants mécaniques doivent être impérativement mis de niveau et correctement positionnés suivant les indications et cotations de ce plan.
Le non respect de ces consignes risque d'entrainer une détérioration des différents organes mécanique de cette transmission et une annulation de la garantie SERAPID France.

All the mechanical components must be installed straightly and positionned following the dimensions and indications shown on this drawing.
Not respecting these instructions could lead to a deterioration of the differents parts of the transmission and could cancel SERAPID warranty.

IMPERATIF
La charge totale doit être uniformément répartie sur chacun des LinkLifts.
IMPERATIVE
The total load must be distributed uniformly on each LinkLift.

LINKLIFT 30 et / and LINKLIFT 50

FIXATION PLATINES / *PLATE FIXING*
Non fournis par SERAPID France / Not supplied by SERAPID France

- A-Platine linklift, se référer au détail / *Linklift plate (see detail linklift plate)*
  - 1-Mise à niveau par / *Height setting by* : 3 vis verins / *screw jack HMT250* + 3 écrous / *nuts M12*
  - 2-Fixation par / *Fixing with* [*or équivalent*] : 4 tiges d'ancrage / *anchors* type HAS-U 8.8 M12x170/88 (HILTI) 1 capsule / *chemical capsule* type HIT-HY 150 330/2 réf : 355959 (HILTI)
- B-Platine renvoi d'angle, se référer au détail (si besoin) / *Gearbox plate, see detail gearbox plate (if needed)*
  - 1-Fixation par [*ou équivalent*] / *Fixing with* [*or équivalent*] : 4 tiges d'ancrage / *anchors* type HAS-U 8.8 M12x170/88 (HILTI) 1 capsule / *chemical capsule* type HIT-HY 150 330/2 réf : 355959 (HILTI)
- C-Platine moteur, se référer au détail / *Motor plate, see detail motor plate*
  - 1-Fixation par [*ou équivalent*] / *Fixing with* [*or équivalent*] : 4 tiges d'ancrage / *anchors* type HAS-U 8.8 M12x170/88 (HILTI) 1 capsule / *chemical capsule* type HIT-HY 150 330/2 réf : 355959 (HILTI)
- D-Magasin linklift / *Linklift magazin*
  - 1-Fixation par [*ou équivalent*] / *Fixing with* [*or équivalent*] : 2 tiges d'ancrage / *anchors* type HAS-U M12x170/88 (HILTI) 1 capsule / *chemical capsule* type HIT-HY 150 330/2 réf : 355959 (HILTI)
- E-Support Cardan, se référer au détail (si besoin) / *Cardan Plate, see detail cardan plate (if needed)*
  - 1-Fixation par [*ou équivalent*] / *Fixing with* [*or équivalent*] : 2 tiges d'ancrage / *anchors* type HAS-U M12x190/88 (HILTI) 1 capsule / *chemical capsule* type HIT-HY 150 330/2 réf : 355959 (HILTI)

Après mise en position et ancrage, toutes les platines doivent être calées à l'aide d'une resine de calage type MASTERFLOW 928 E, ou équivalent.

After position setting and anchorage, all the plates must be shimmed with a resin type MASTERFLOW 928 E, or equivalent.

TRANSPORT ET STOCKAGE :
Les composants des systèmes d'élévation LINKLIFT ont une protection contre la corrosion par une peinture industrielle, vernis de protection ou huilage suivant les pièces. Dès réception, les caisses doivent être ouvertes pour vérifier l'état des composants après le transport (particulièrement si il est maritime) et les stocker à l'abri et au sec jusqu'à l'installation.

TRANSPORT AND STORAGE :
The components for the LINKLIFT systems have a protection against corrosion by an industrial painting, a protecting varnish or oiling according to the parts. When receiving the wooden boxes, same must imperatively be opened, in order to check the components specially after transport and mainly by sea. The storage has to be made in a dry aera.

CARACTERISTIQUE TECHNIQUE / TECHNICAL DATA: Incorporation

Surface de la plateforme / Platform surface	m2 : 6.12
Masse de la plateforme / Mass of the platform	daN/m2 : 150
Charge utile Statique / Static payload	daN/m2 : 500
Charge utile Dynamique / Dynamic payload	daN/m2 : 250
Force statique / static load	N : 39 780 (on 4 LinkLift) (MAX 9 945 N / 1 LL)
Force dynamique / dynamic load	N : 24 480 (on 4 LinkLift) (MAX 6 120 N / 1 LL)

Ces charges sont considérées réparties équitablement sur l'ensemble des LinkLift.
These loads are considered distributed equally over all LinkLift.

Vitesse d'élévation / speed elevation	mm/s : 50 (with frequency drive)
Course / stroke	mm : Voir sur le plan / Refer to the drawing
Type de chaîne / type of chain	: LL030 (LL1)
Fréquence d'utilisation / frequency of use	: /
Teinte de finition / colors	: Apprêt phosphatique noir mat et standard fournisseurs / Black phosphatation and suppliers standards

Projet / Project : University of Oxford
Plateforme / Stage : Stage Riser 05

Rev.	Description					
B	Changement de la position platine moteur, suppression du Stromag suivant demande client / Change of baseplate motor position, removal of limit switch following customer request.					
	Modifié par / Modified by	gosset.a	Vérifié par / Checked by	VERDIER S.	Approuvé par / Approved by	NOYON L.
	Date de modif.	21/12/2023	Date	21/12/2023	Date	21/12/2023
	Dessiné par / Designed by	gosset.a	Vérifié par / Checked by	VERDIER S.	Approuvé par / Approved by	NOYON L.
	Date de création	22/03/2022	Date :	22/03/2022	Date :	03/01/2024

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info-fr@serapid.com
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Tél: +33 (0)2 32 06 35 60
4 rue des Frères Robbe, ZA EUROCHANNEL 76370 Martin-Eglise

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This document is the property of SERAPID, to reproduce and/or to transmit is prohibited without authorization

Matière / Material : Masse / Weight (Kg) : Traitement / Treatment :
Volume / Volume (cm³) :

Titre / Title :
Ensemble 4x LinkLift 030 avec moteristation
4x LinkLift 030 with drive system assembly

Code archivage / Code archive	Prefixe ERP / ERP Prefix	N° de Plan / Drawing's number :	Indice 3D:	Tol. Gén. :	Rugosité :
CD2	THE-	THE-20766-7000-0		Voir nota	Ra

Echelle / Scale : 1:10 — Feuille / Size : A0 1/1

11. Appendix 3 – Chain

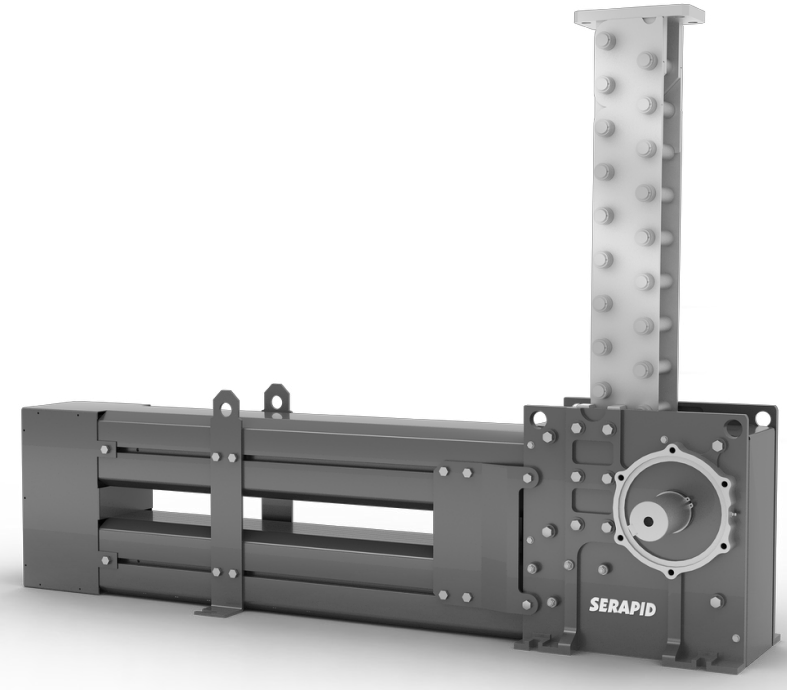
SERAPID
RIGID CHAIN TECHNOLOGY

LINKLIFT

LINKLIFT® *Standard/THE*

Installation and maintenance manual

Information and instructions for the optimal use of LinkLift actuator models 30, 50, 50R, 80, 80R, 100 and 100R



SER - 000LL - M001 - 2 - V01 - 2022 01

Manual presentation

We thank you for choosing high-quality SERAPID product.

To ensure optimal product performance, it is important to read this document, which provides the unit's assembly, use and maintenance instructions.

The information in this manual concerns the standard LinkLift product.

This product must only be assembled, used and serviced for applications approved by SERAPID and in accordance with the instructions in this document. Any non-compliance with these instructions may result in the being invalidated product warranty offered by SERAPID.

SERAPID reserves the right to make changes to these products without being held responsible for updating their manuals.

According to the selected configurations, certain visual elements of this document may differ but the function remains the same.

This manual is intended for use by:

- the installation supervisor
- operators
- maintenance staff

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Safety 1

	p. 3
1.1 Caution/Danger pictographs	
1.2 Location of risks	

Product presentation 2

	p. 4 - 9
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2.2 System configuration	
2.3 Options	
2.4 Marking and declaration of conformity	

Assembly and installation 3

	p. 10 - 30
3.1 Product receipt and handling	
3.2 Safety instructions	
3.3 Assembly guidelines	
3.4 Installation procedure	
3.5 Product commissioning	

Maintenance 4

	p. 31- 37
4.1 Preventive maintenance	
4.2 Lubrication	
4.3 Re-commissioning	
4.4 Annex A - Lubricants for the chain	

1 SAFETY

1.1 Caution/Danger pictographs

Throughout this manual, symbols are used to alert you to the safety risks and guide you through the correct operating procedures.

In addition to this information, always be very attentive to ensure your own safety.

The installation, use and maintenance of the LinkLift must only be carried out by qualified, authorised personnel.

SERAPID cannot be held responsible in the event of non-compliance with the safety measures provided in this manual.

Symbols :


General obligation


General ban


Obligation to wear gloves

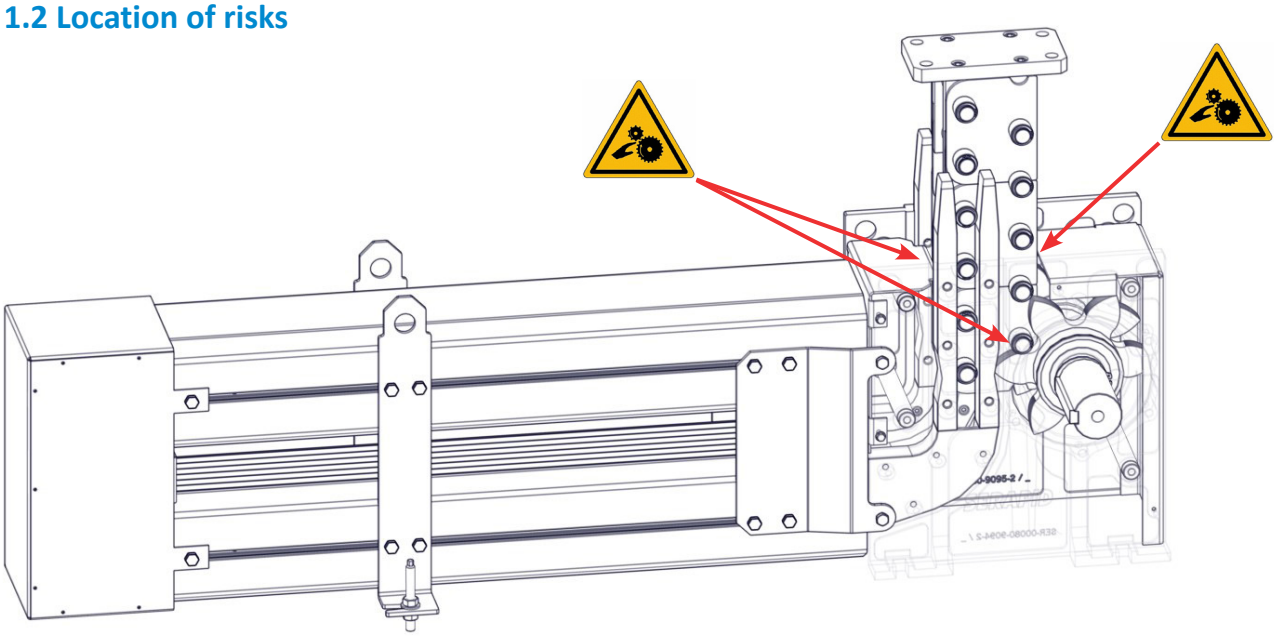

Comments or information


General danger


Danger of hands being caught or crushed

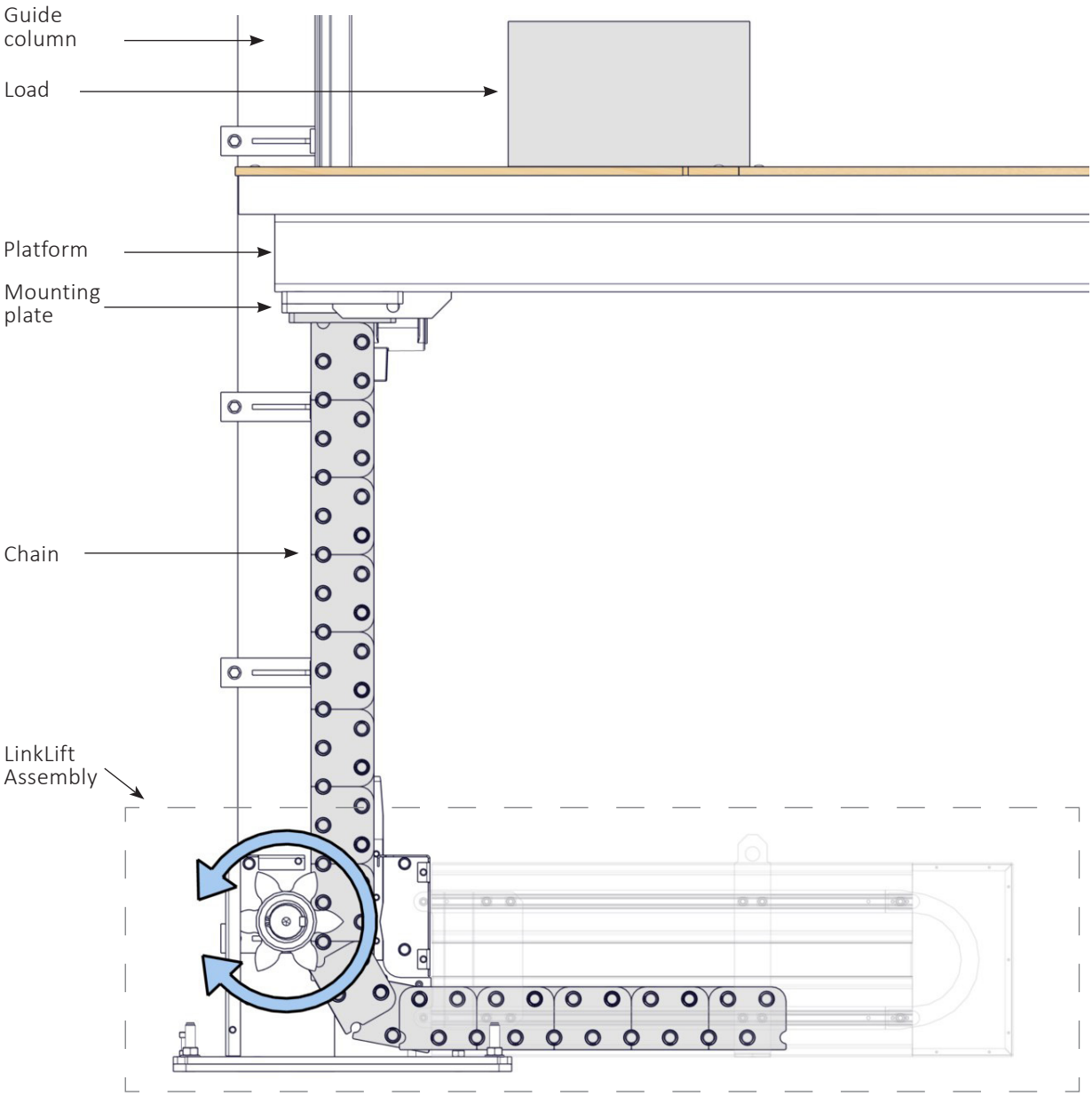

Suspended load danger

1.2 Location of risks



2 PRODUCT PRESENTATION

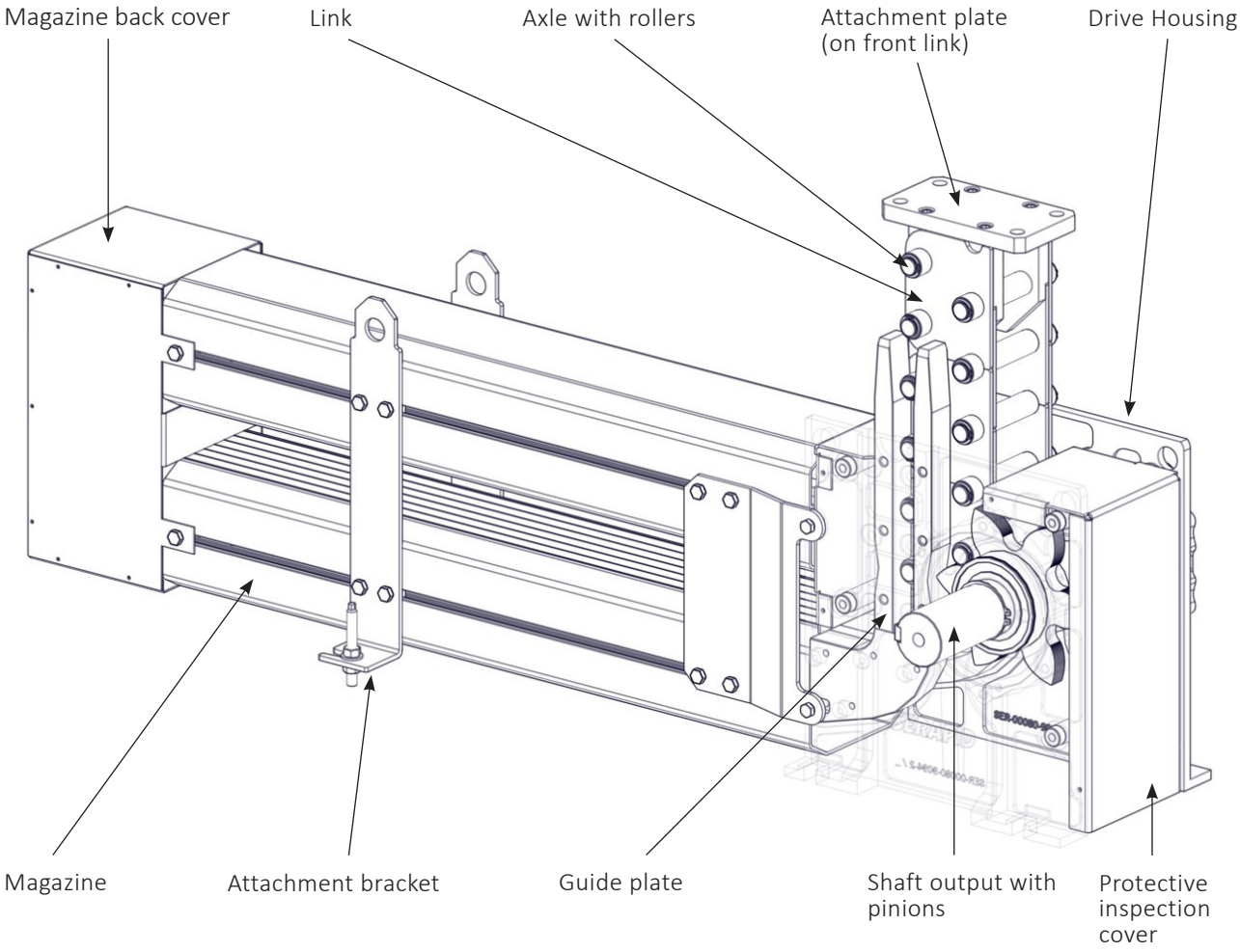
2.1 Description



The LinkLift was specially designed to perform the vertical, **guided** (scissor system or guide rails) lifting of various loads.
LinkLift technology is based on the principle of the SERAPID rigid chain, which is driven by pinions from its horizontal storage position to its vertical position.
With the front of the chain attached to the platform, it acts as a rigid bar.

The lifting of people with LinkLift products is a specific application that must be approved by a certification body.

LinkLift main components



The product's general characteristics can be found in the commercial documentation, the design drawing and the labels on the product.

The LinkLift can be used in temperatures from -20°C to +50°C. For other operating temperature, please contact SERAPID.

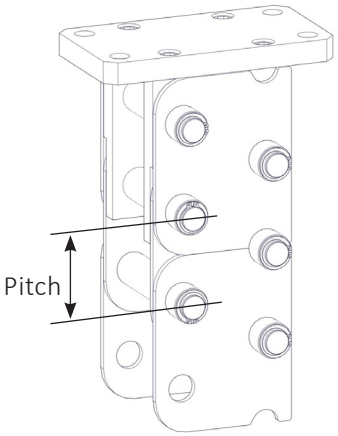
The protective inspection covers should only be removed during maintenance operations (with equipment stationary and locked-out).

2.2 System configuration

There are 4 basic versions of LinkLift products as well as 2 associated variations :

- LinkLift 30 (LL30)
- LinkLift 50 and 50R (LL50/R)
- LinkLift 80 and 80R (LL80/R)
- LinkLift 100 and 100R (LL100/R)

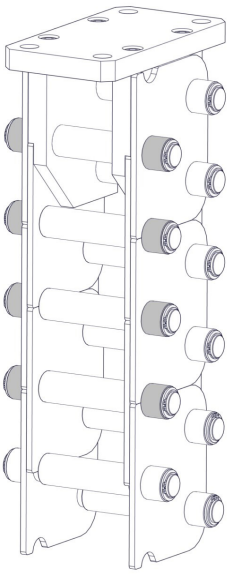
The numbered indicators correspond to the chain pitch (in mm).



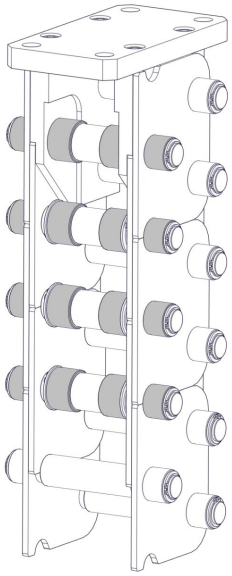
Chain

There are 2 types of chains:

Standard
(2 drive rollers)



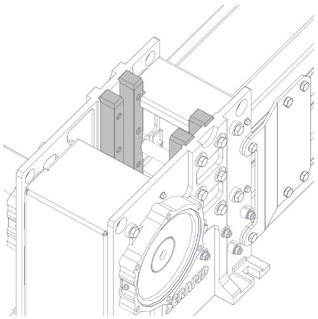
Reinforced "R"
(4 drive rollers)



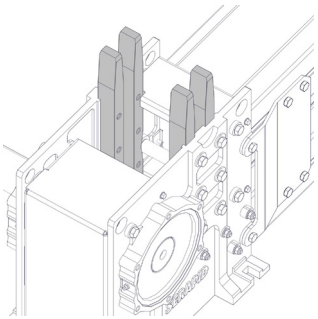
Drive housing

- **Pinions**: the housing has 2 pinions in its standard version and 4 in its reinforced "R" version.
- **Output shaft(s)**: According to the LinkLift's versions, the output shaft(s) are splined or keyed.
- **Guide plates**: 2 types can be supplied according to the project details (stroke and/or speed).

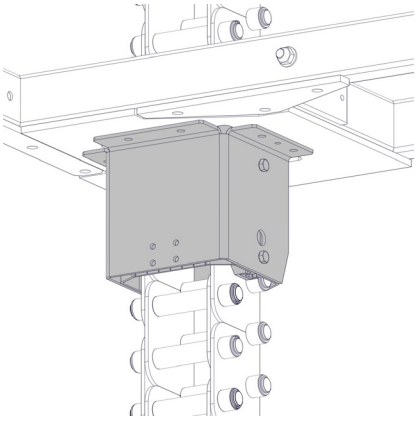
Short guide plates



Long guide plates



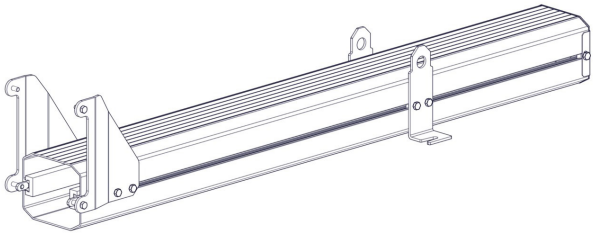
- **Intermediate pick-up frame**: reduces chain deflection on long lifting strokes.



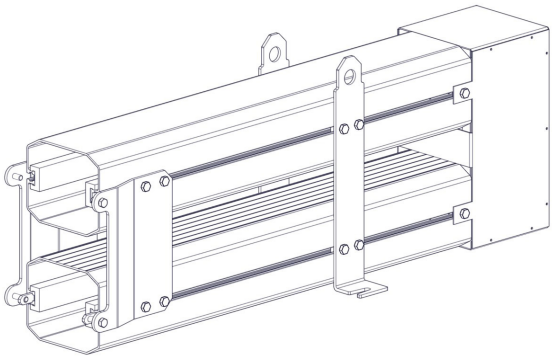
Magazine

Used to store the chain.
Different configurations and dimensions are possible to meet specific requirements:

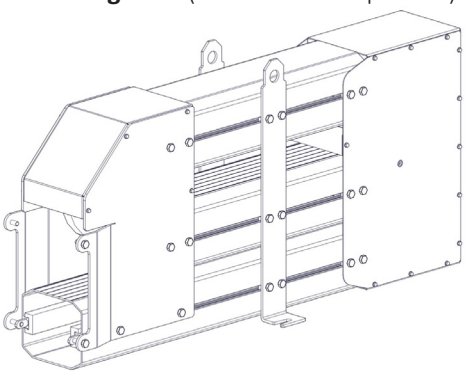
- **1-strand magazine**



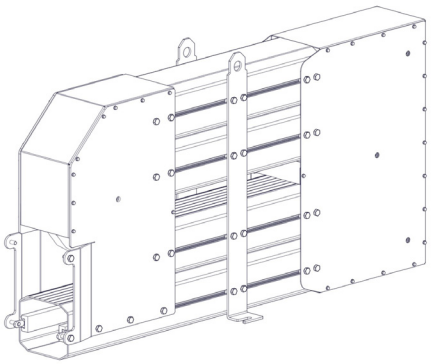
- **2-strand magazine**



- **3-strand magazine** (all models except LL30)

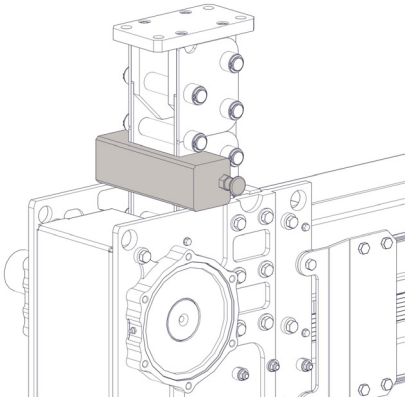


- **4-strand magazine** (For LL80 and LL50)



2.3 Options

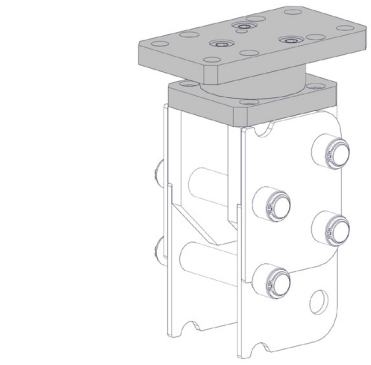
- **Maintenance block**: used to lock and secure the chain in an position during servicing.
  (the blocks must be stored in an interlocked box. See manual SER-000LL-M005)

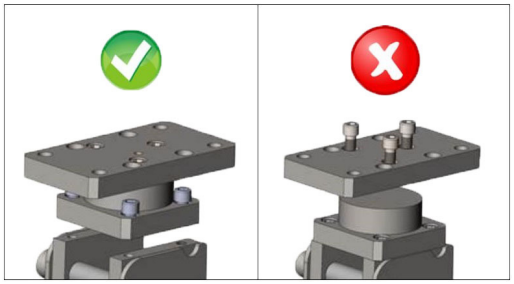


Load cell:

Used for measuring the loads applied on each lifting column. The addition of this sensor involves changing the low-position dead stroke (distance between the attachment plate and the upper section of the guide plates).

Load cell manual: SER-000LL-M006.





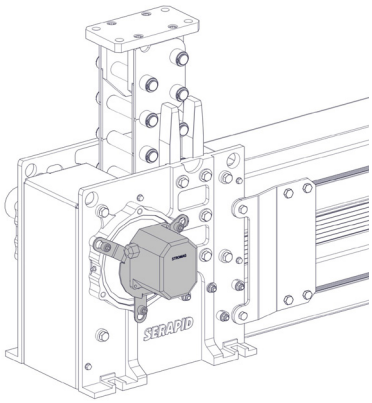
The load cell cannot be separated from its attachment plate (these are calibrated together in the factory).

Geared cam limit switch:

This option is used to set the platform's intermediate and ultimate stopping positions (low and high stops, acceleration and deceleration positions, etc.).

Manual SER-000LL-M007.

Geared cam limit switch

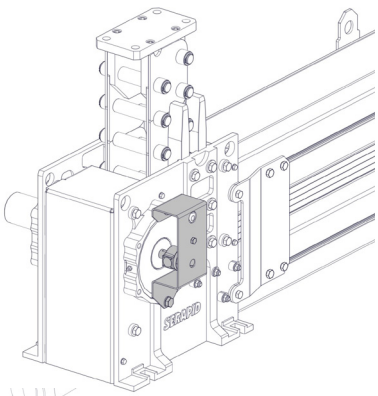


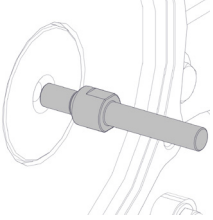
Encoder:

This is a revolving sensor that provides position and speed feedback. It is used to measure the rotation speed or define a precise position.

The encoder bracket can be positioned at 0° or 180° according to the attachment threading on the drive housing.

Encoder



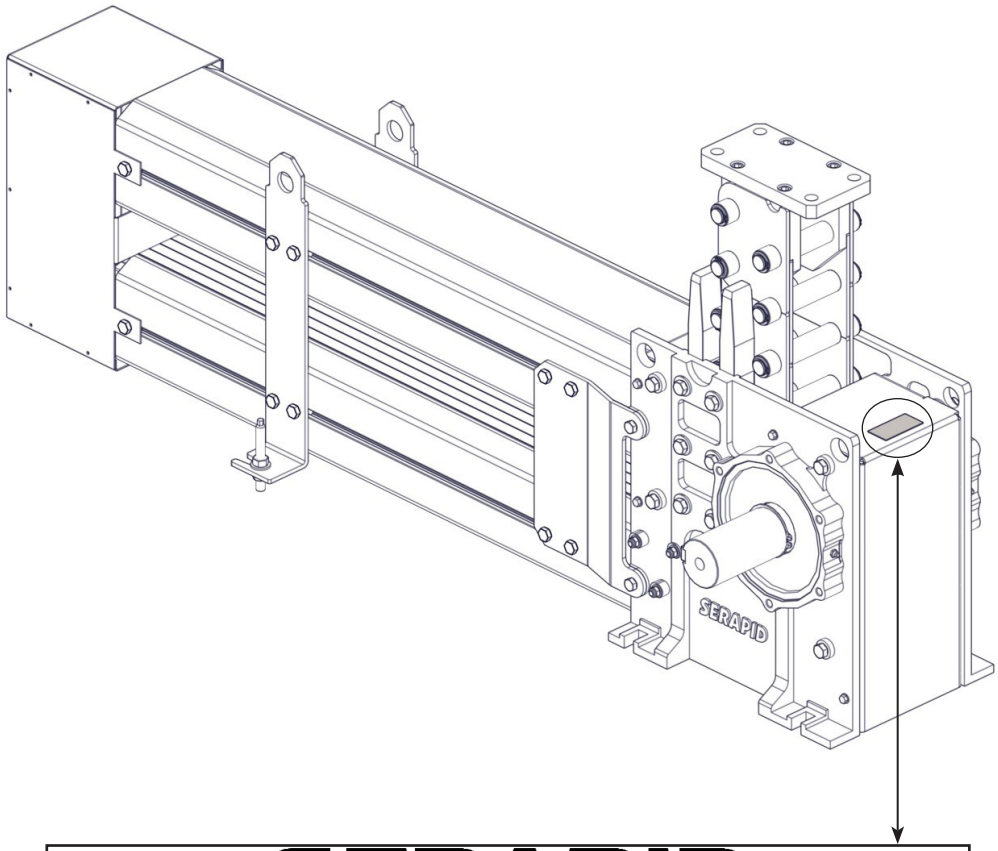


Thread lock must be used when installing the couplings on the shaft.

2.4 Marking and declaration of conformity

The LinkLift product complies with the Machine Directive 2006-42-EC, Lifts Directive 2014/33/EU (based on EN81: 20, 31, 41 and 50), the EN 17206 norm and is certified by the TUV organisation.

There is always a SERAPID label on the product which allows the product to be traced by providing the order reference and its main characteristics. Any change to the technical parameters must be communicated to SERAPID for approval in order to preserve the guarantee's validity.



CE

SERAPID

RIGID CHAIN TECHNOLOGY

Zone Bleue - 76370 Rouxmesnil-Bouteilles - FRANCE

Tél : +33 (0)2.32.06.35.60

Reference/Referenz : _____ **Typ(e) :**

Date / Datum : **V (mm/s) :**

Course totale / Total stroke / Gesamthub (mm) :

Effort / Force / Kraft dyn. (N) :

Effort / Force / Kraft stat. (N) :

For any communication with your SERAPID contact representative, please specify the product reference (**as per the example above**).

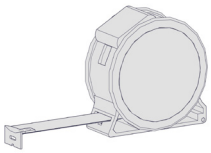
3 ASSEMBLY AND INSTALLATION

Necessary tools (not provided):

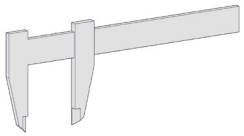
Pencil/pen



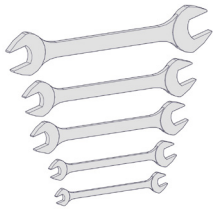
Tape measure



Calliper



Spanners



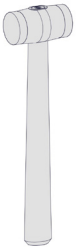
Torque wrench



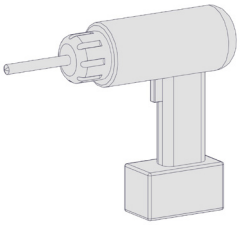
Ruler



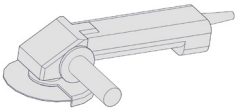
Mallet



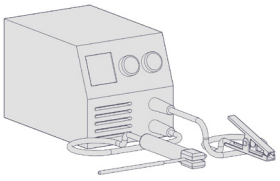
Drill



Grinder



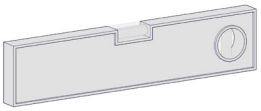
Welding machine



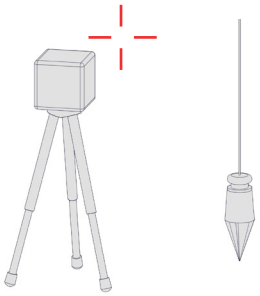
Slings, shackles



Precison level



Laser level/plumb line



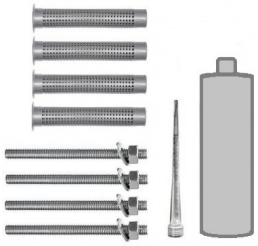
Supports



Thread lock

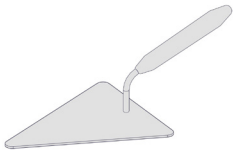


Chemical anchors

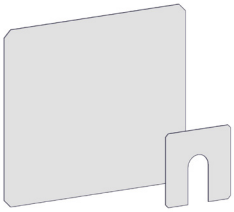


Cement or sealing resin





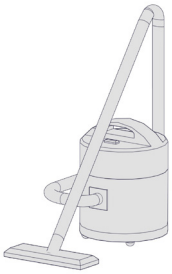
Thin adjustment shims



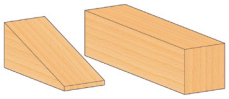
Protective film



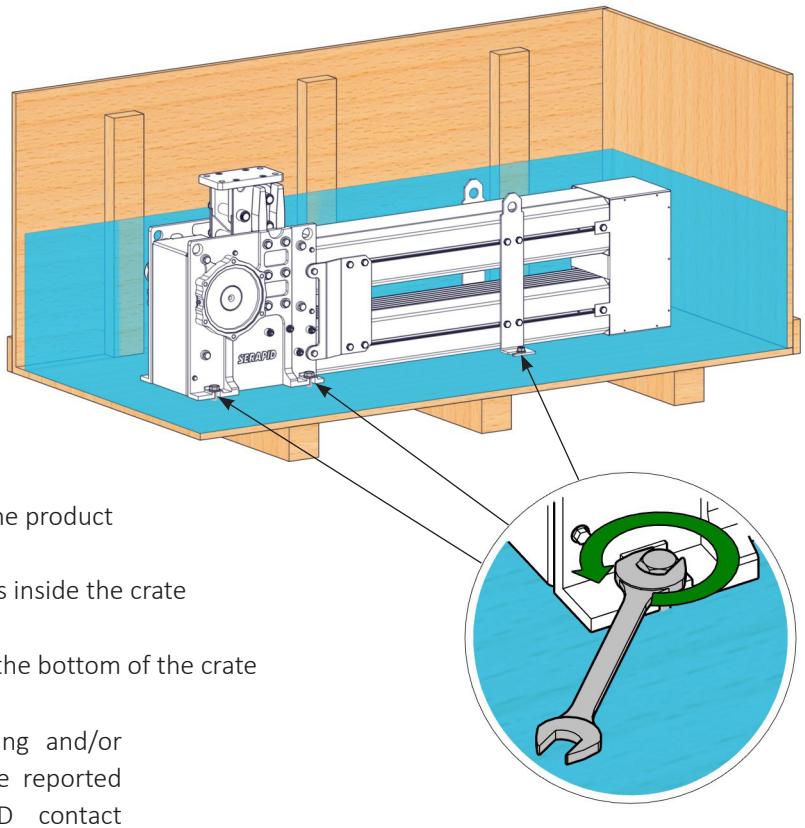
Broom/vacuum cleaner



Wooden wedges



3.1 Product receipt and handling

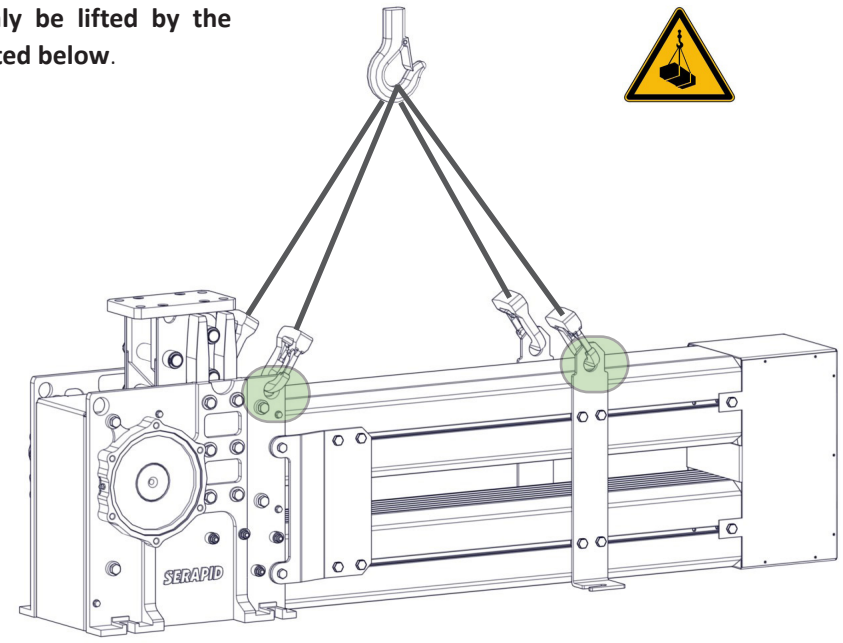


- Check the condition of the wooden crate
- Remove the top, then take off the sides
- Open the plastic film without damaging the product
- Check the condition of all the components inside the crate
- Unscrew the attachment bolts located at the bottom of the crate

If any damage to the packaging and/or product is observed, it must be reported immediately to your SERAPID contact representative and it will be subject to a reservation concerning your transporter.

Recycle the packaging waste to respect environmental practices.

The product must only be lifted by the slinging points illustrated below.



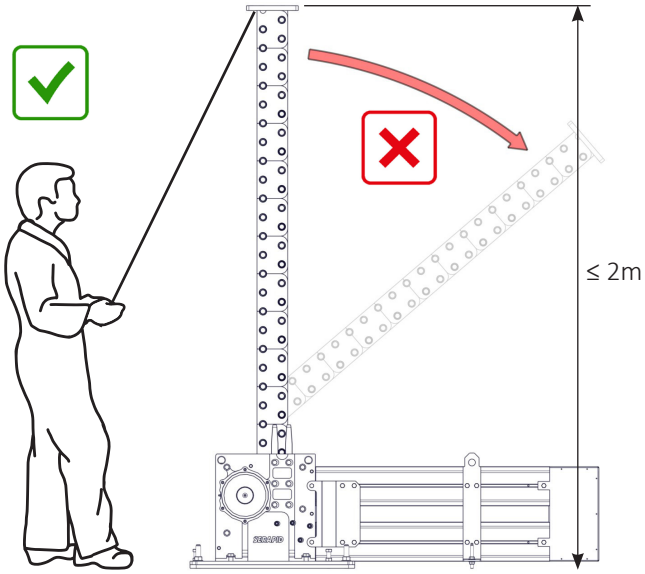
It is the responsibility of the user to implement a lifting method and use appropriate and certified lifting equipment (sling features, hooks, lifting angle, proper weight distribution, etc.).

Approximate weight in kg per meter of chain:

Reference	LL30/MD	LL50/R/ MD	LL80/R/ MD	LL100/R/ MD
Weight **(Kg/m)**	26	54/59	136/150	278/302

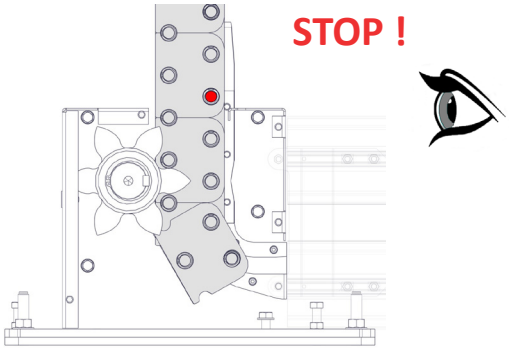
3.2 Safety instructions

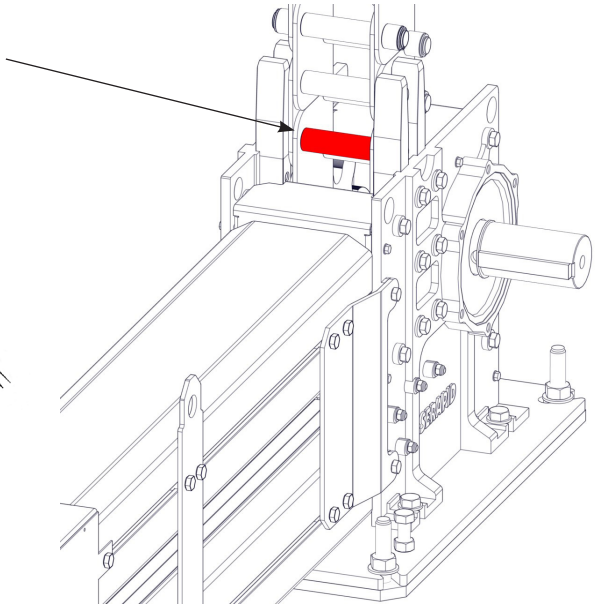
The chain must be held during the lifting process to avoid it falling over.



The chain cannot continue to be raised up if the red axle is visible.

The red axle means that the maximum stroke has been reached. The chain must be stopped otherwise the chain and the drive housing will be damaged.



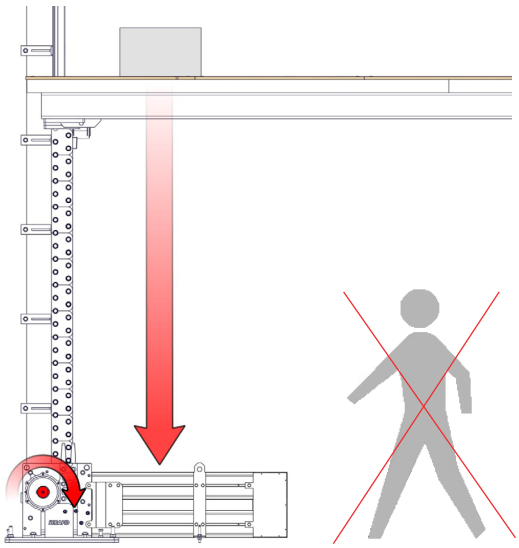


Careful! **Reversible system**

A braking system or propping must be used to support the platform in position and avoid the load from falling suddenly.

The use of a variable speed drive is necessary (mandatory from 50 mm/s and up) to manage accelerations and decelerations.

No personnel can be under the platform while it is being operated. Access to the area of use must be monitored.



3.3 Assembly guidelines

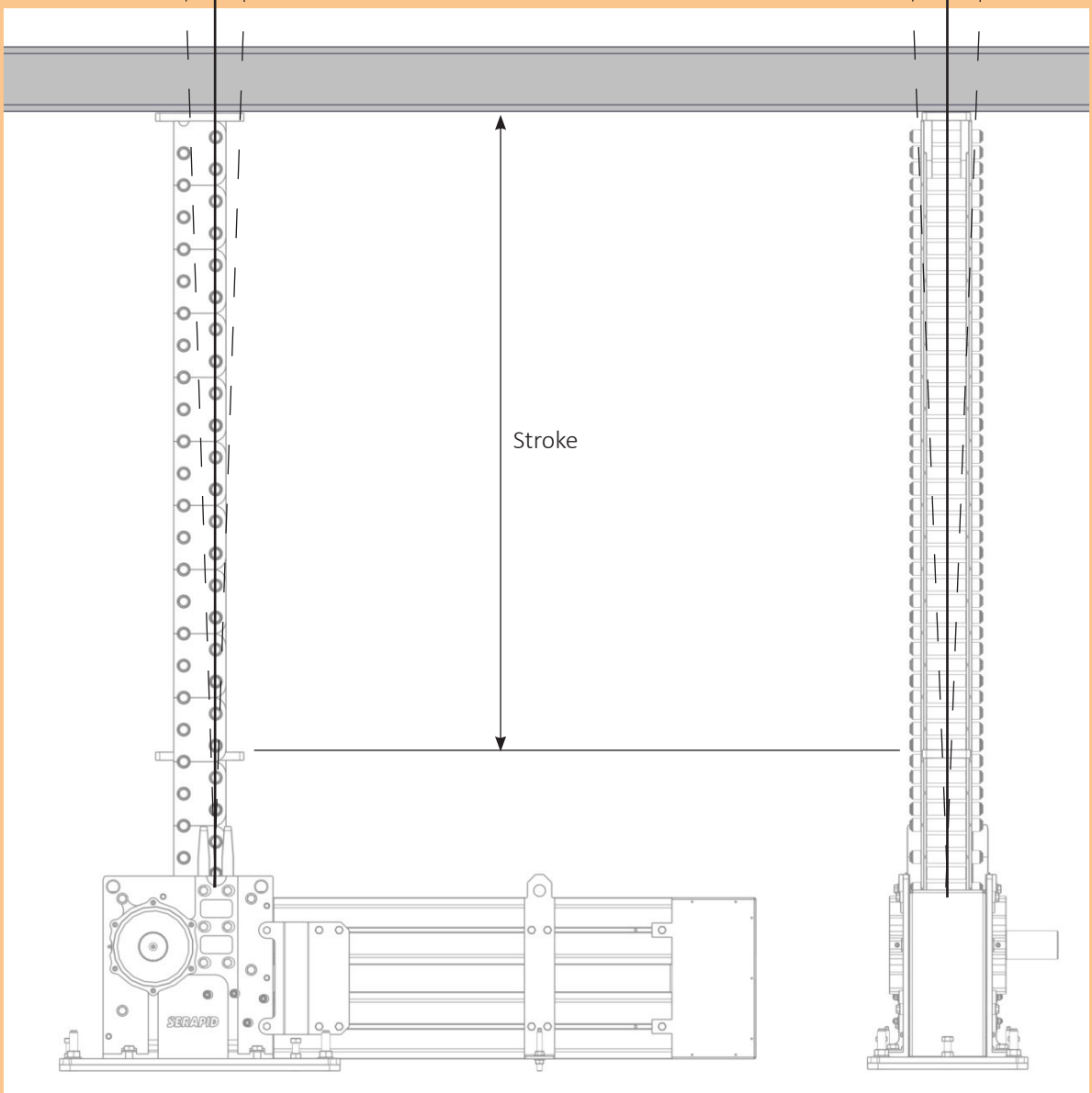
Chain alignment

The alignment tolerances must be respected in order to avoid any conditions that could cause damage to the equipment (mechanical or vibro-acoustic).

It is recommended to use precise measuring equipment (laser, theodolite, etc.).

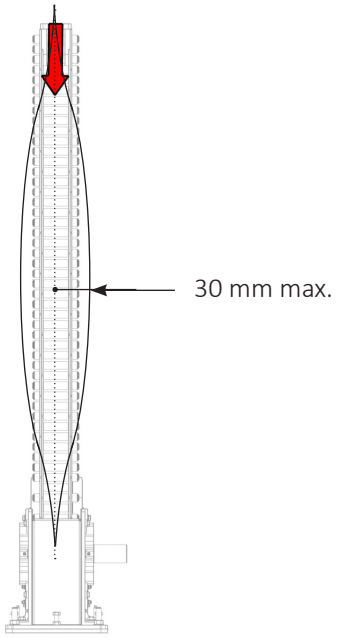
The goal is to minimise the misalignments between the drive housing and the front link to ensure that the chain moves in a perfectly vertical line. It's therefore essential that platform's guiding is accurate.

Maximum tolerance: 2 mm per meter of stroke



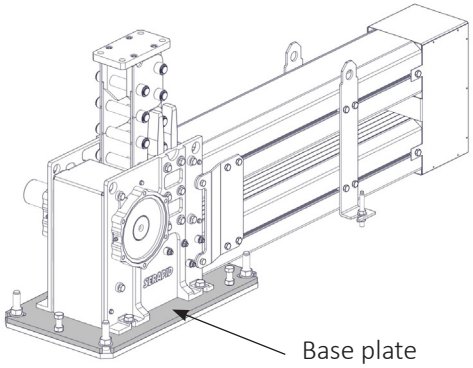
Chain buckling

When the equipment is installed and put into service, verify that the **maximum deflection does not exceed 30 mm, regardless of the load.**



Base plates

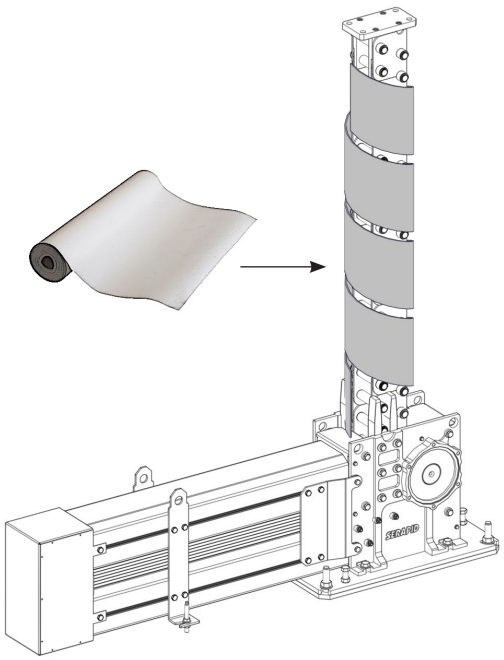
The LinkLift must be installed on a base plate. SERAPID can sell you this component or provide its drawing.



Chain protection throughout the entire installation

A protective oil film was placed on the chain after it was assembled at SERAPID's facilities. In order to maintain this protective film, the chain must be protected against contamination.

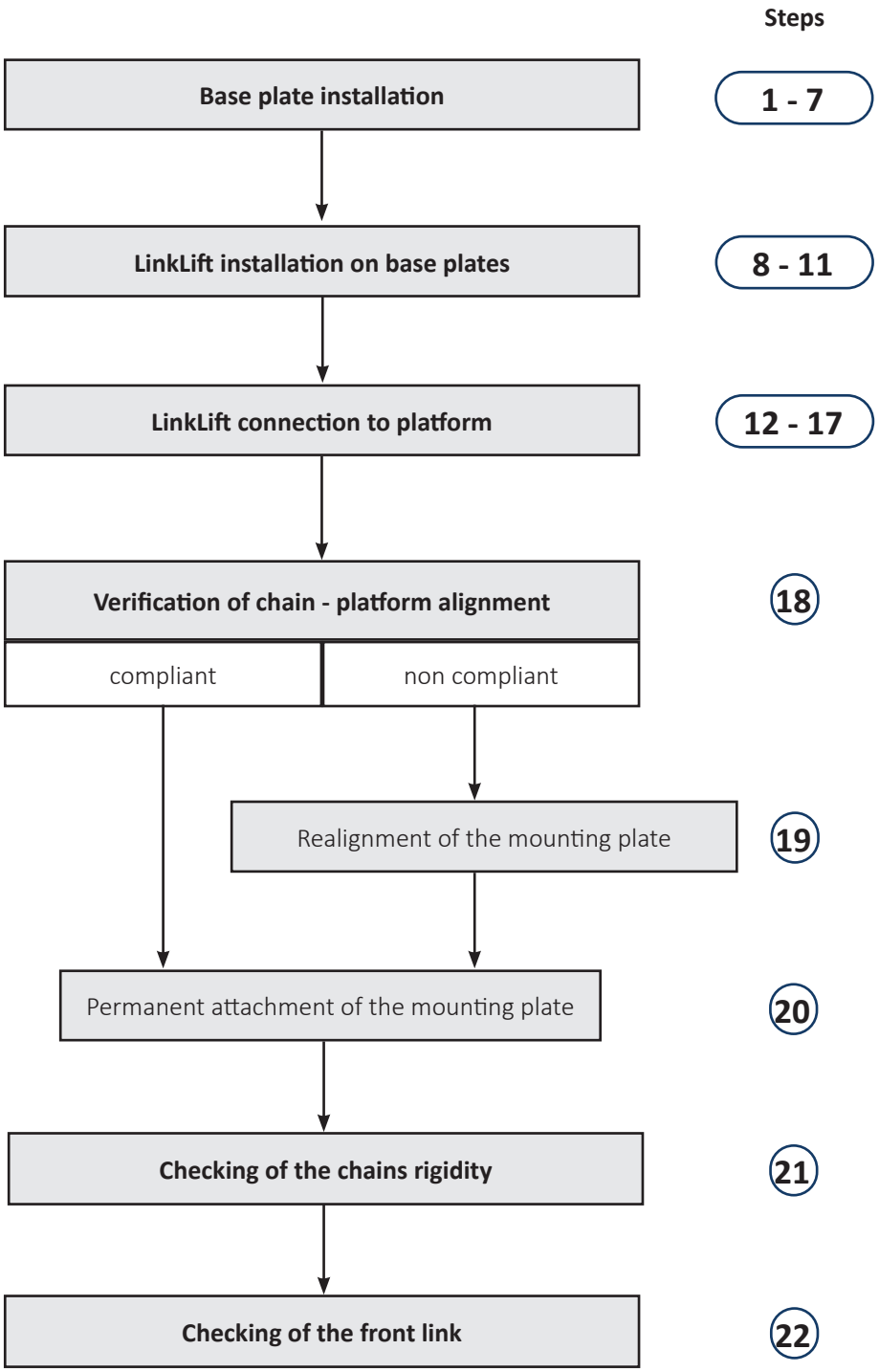
The chain must be protected against any polluting elements (grinding and welding debris, dust, rain, etc.).



3.4 Installation procedure

Assembling the unit consists of several steps:

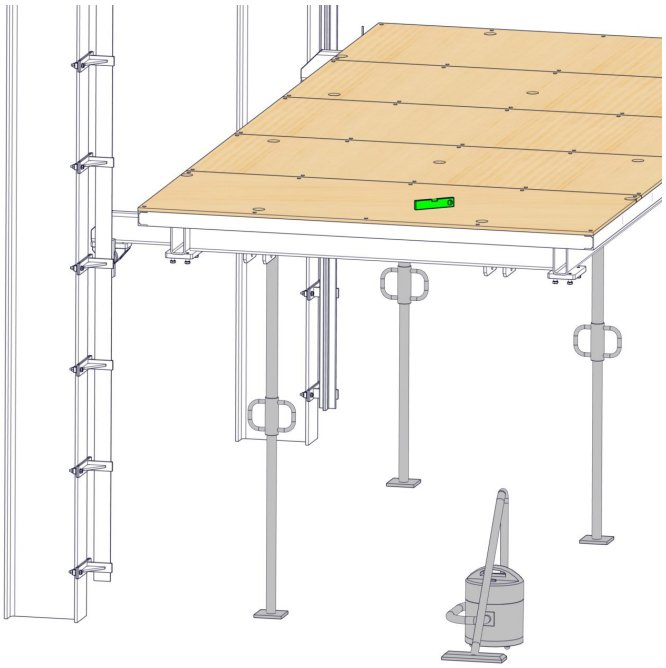
If the platform needs to be installed, steps 1, 4 and 9 cannot be done.



Base plate installation

1 *to be done if the platform is already in place*
Place the platform about 2 m up from the ground on a secured system (ex: props) **and level it**.

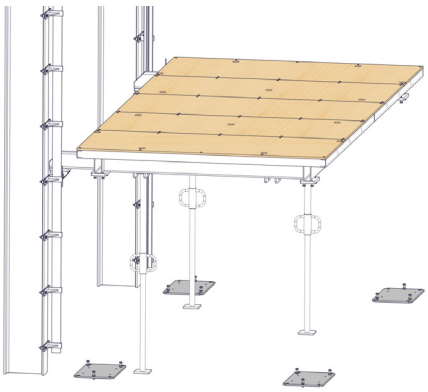
Reminder: the platform must be guided (scissor system or guide rails).



2 **Clean the installation area**

Remove all the debris and residue that may contaminate the assembly area.

3 **Place and centre the base plates on the ground** in accordance with the drawings.

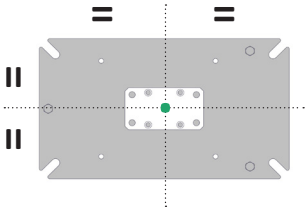


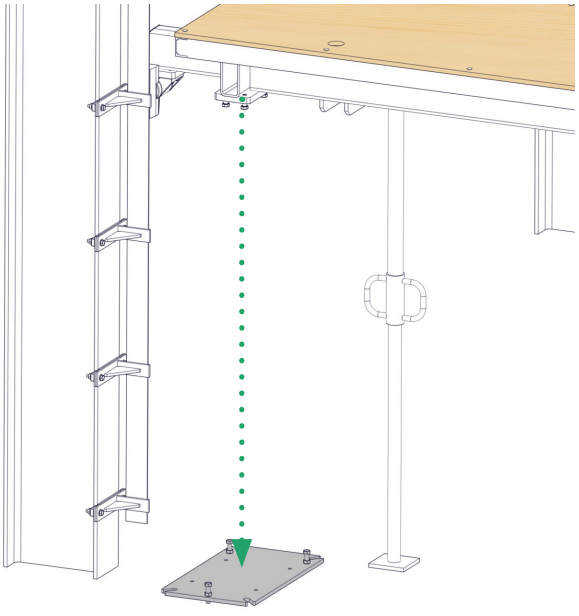
The base plate is attached to the drive housing at the delivery time (except on special request of the customer).

4 *to be done if the platform is already in place*
Verify that **the base plates are correctly centred with the platform**

This centring must be carefully followed as it is essential for the success of the following steps.

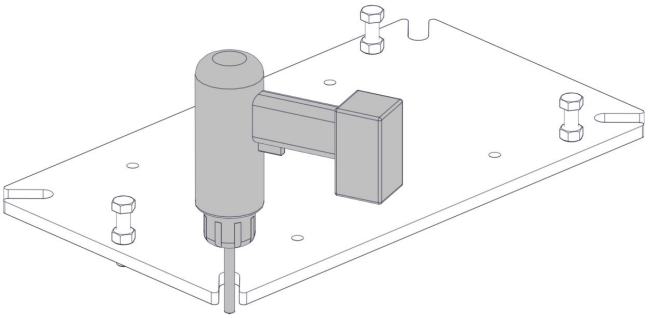
It is strongly recommended to use a laser centring device or a plumb line.



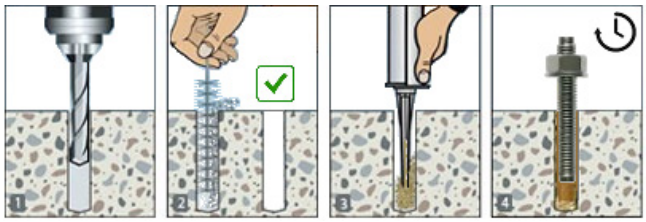


5 When the base plate is centred, **install the 4 anchoring bolts,** observing the following diameters:

Reference	LL30/MD	LL50/R/ MD	LL80/R/ MD	LL100/R/ MD
Diameter	M10	M12	M20	M20

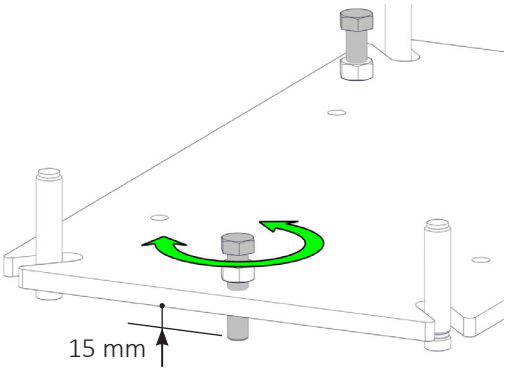


It is recommended to use chemical fixings while following the manufacturer's instructions.

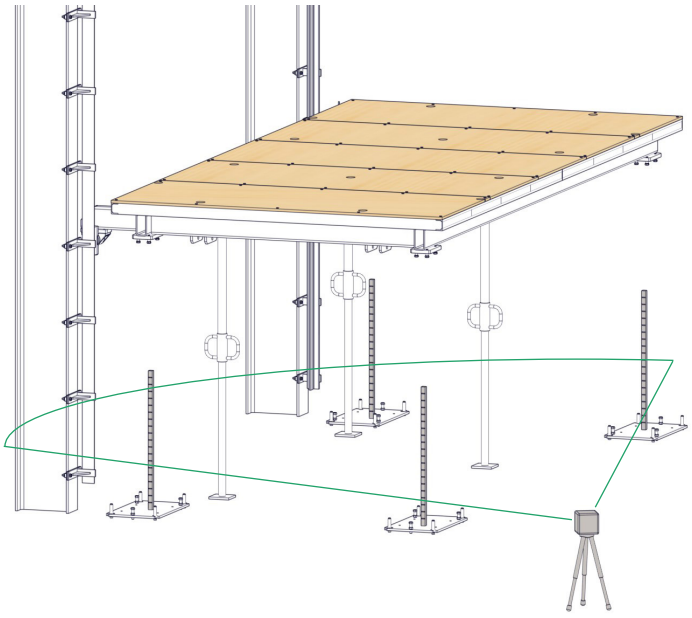


6 **Levelling of the base plates**

Loosen the locknuts, then screw in the adjustment bolts to **raise the base plates 15 mm off the ground**.

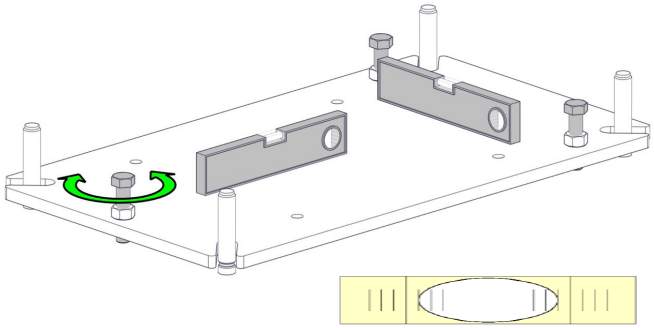


Adjust all the base plates to the same height with an overall tolerance of +/- 0.5 mm.

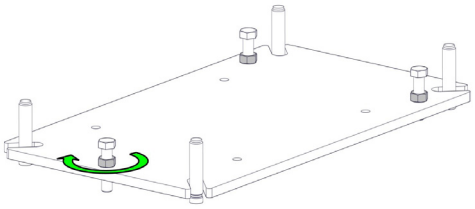


It is recommended to use a laser levelling device or a theodolite.

Level each base plate using the adjustment bolts (use a precision level).

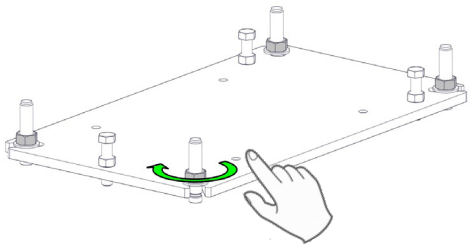


When the base plate is perfectly level, **tighten the locknuts** on the adjustment screws.

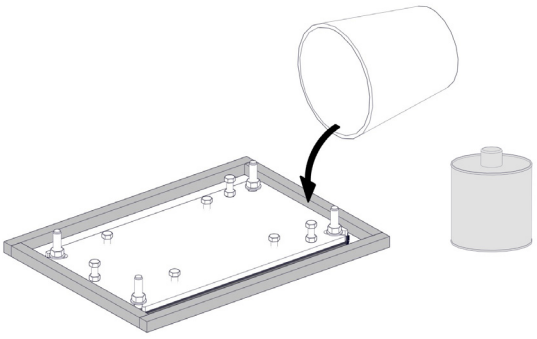


7 Base plate sealing

Tighten the nuts on the anchoring bolts by hand.

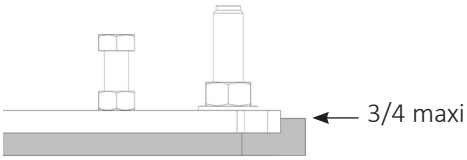


Create a frame around the plates then **pour cement** or a sealing resin.
(Tighten the drive housing attachment bolts to avoid clogging the threads)

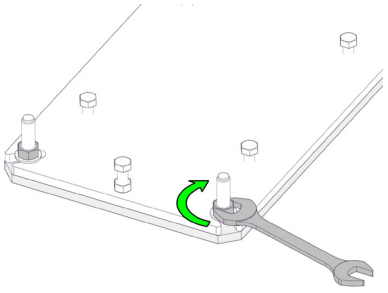


Cement or a resin must be of an appropriate strength to support the maximum load applied to the plate.

Make sure not go above the maximum level so the sealant does not cover the top of the base plate.

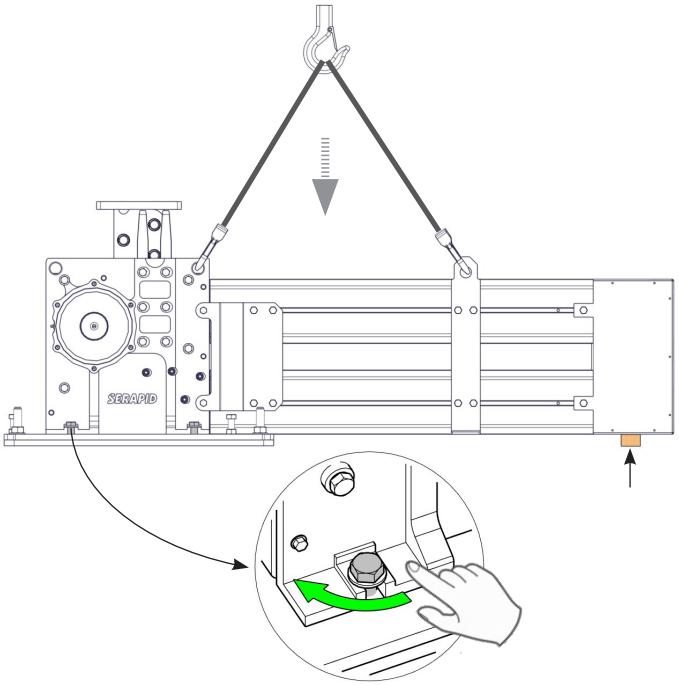


When the sealant is dry, tighten the nuts on the anchoring bolts to the torque level specified by the manufacturer.



LinkLift installation on base plates

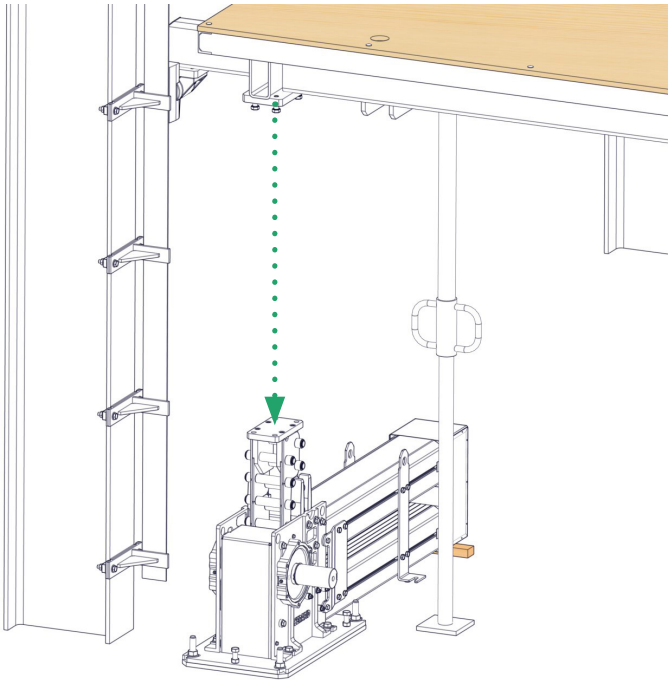
8 **Place the LinkLift** on the base plate and **position wooden wedges under the magazine.**



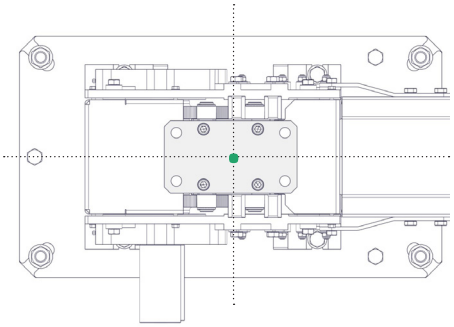
Tighten the attachment bolts on the drive housing.

Reference	LL30/MD	LL50/R/ MD	LL80/R/ MD	LL100/R/ MD
Diameter	4xM8	4xM10	4xM16	6xM16

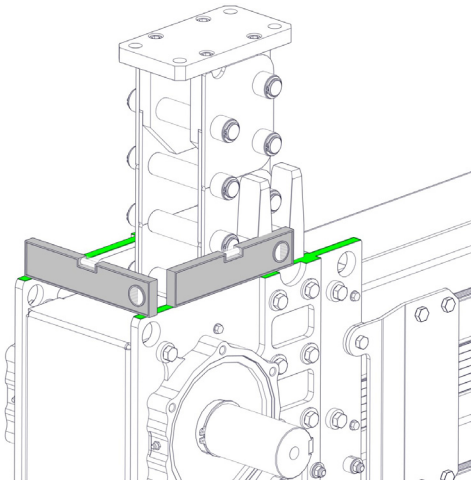
9 *to be done if the platform is already in place*
Centre the LinkLift with the platform.



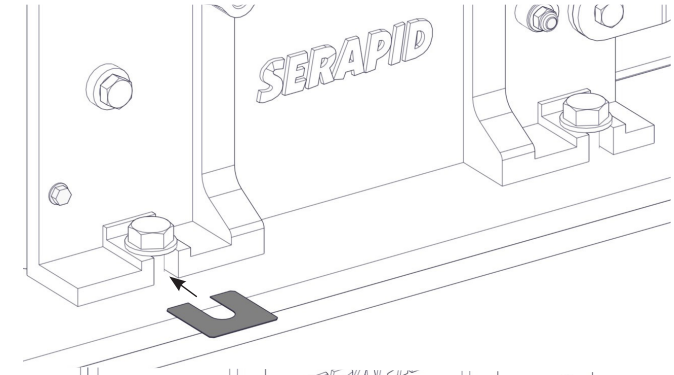
It is recommended to use a laser centring device or a plumb line.



10 **Level** the LinkLift using the machined surfaces of the drive housing as references.

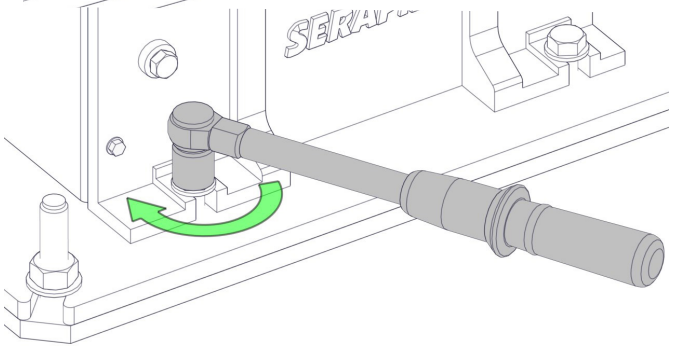


If the LinkLift is not level, use thin shims between the drive housing and the base plates.



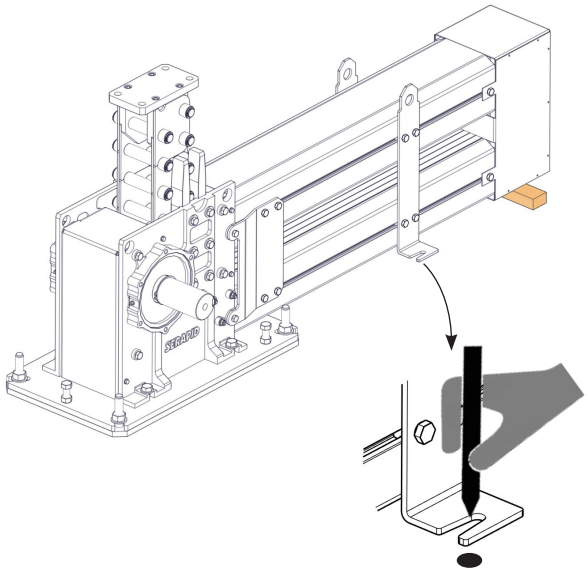
When the LinkLift is level, **tighten the attachment bolts on the drive housing**.

Tighten the bolts to the recommended torque level (diameter and bolt quality).
Use thread lock, locking washers or an equivalent to secure the fixings.

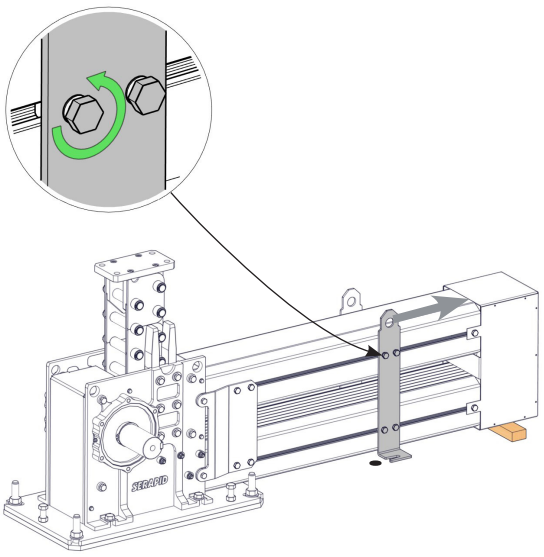


11 Magazine attachment

Mark the position of the attachment bracket drill holes on the ground.

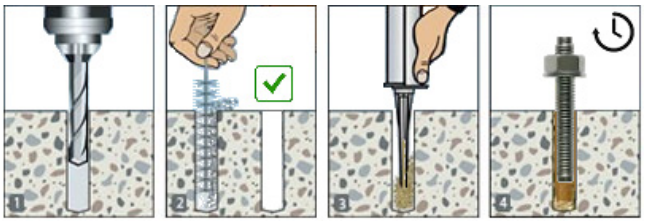


Slightly loosen the bolts on the attachment brackets then **move the brackets out of the way**.



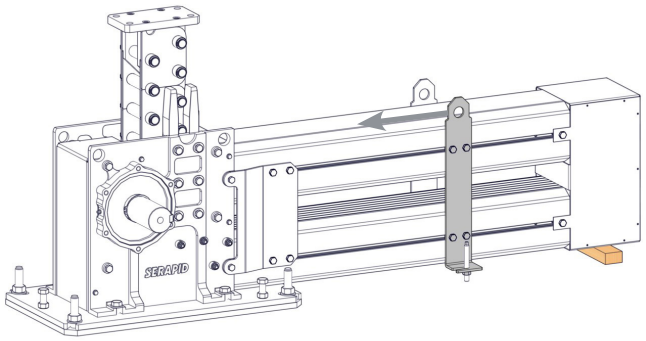
Drill and set the attachment bracket anchoring points observing the following diameters :

Reference	LL30/MD	LL50/R/MD	LL80/R/MD	LL100/R/MD
Diameter	2xM10	2xM12	2xM12	2xM16

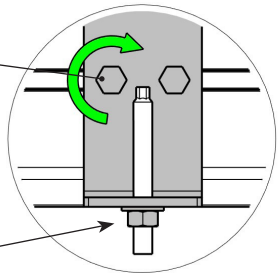


It is recommended to use chemical fixings while following the manufacturer's instructions.

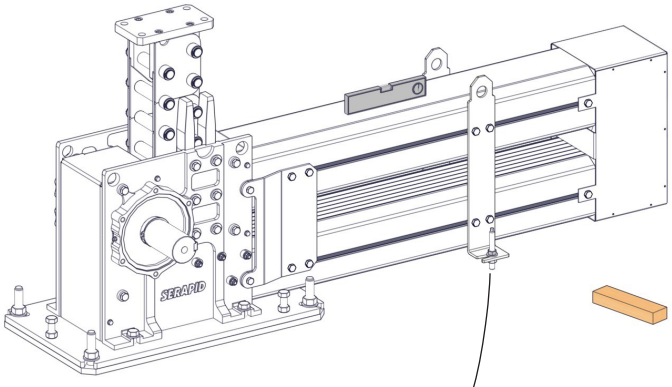
Return the attachment brackets to the anchoring points and **tighten the magazine bolts to the correct torque**.



Reference	LL30/MD	LL50/R/MD	LL80/R/MD	LL100/R/MD
Torque (N.m)	10	10	30	30

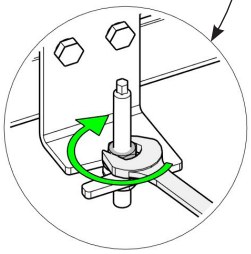


Place the nuts under the attachment bracket (without forcing them).



Remove the wooden wedges supporting the magazine.

Check **the magazine is levelled.**

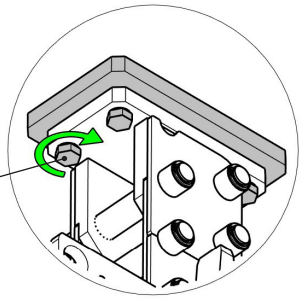


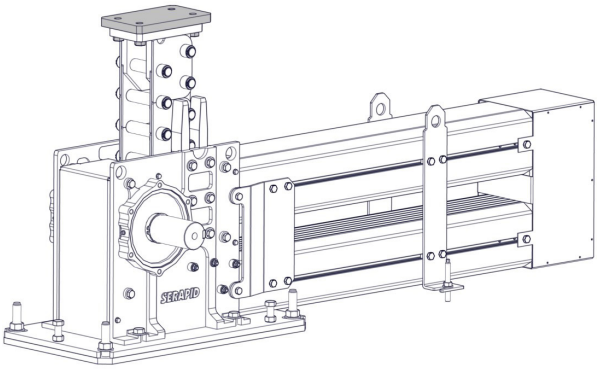
Tighten the nuts on the anchoring bolts to the torque rate prescribed by the manufacturer.

LinkLift connection to platform

12 **Attach the mounting plate** (not provided) on the attachment plate by tightening the bolts.

Reference	LL30/MD	LL50/R/ MD	LL80/R/ MD	LL100/R/ MD
Diameter	4 x M8	4 x M12	4 x M16	4 x M20

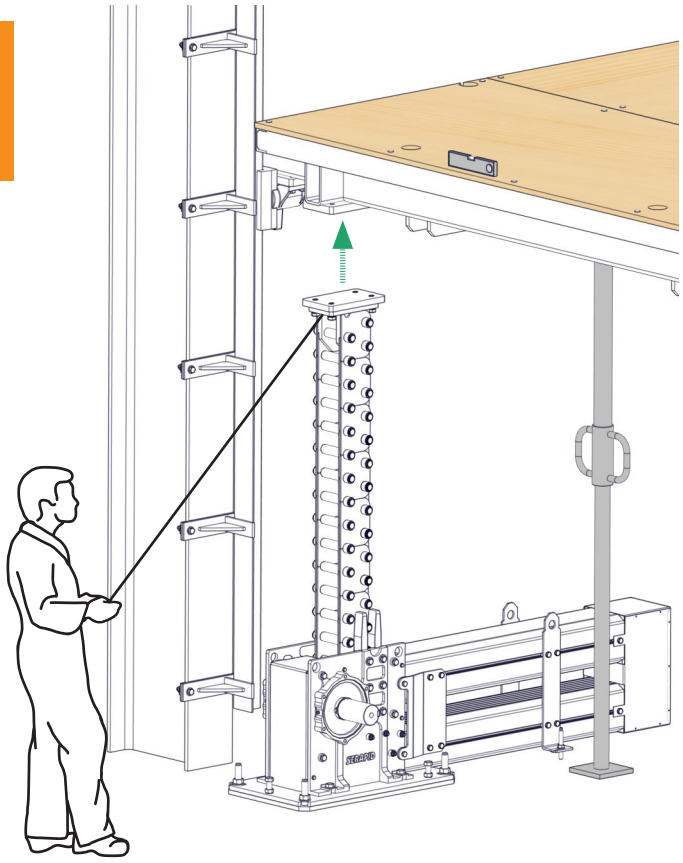




The mounting plate is designed to be welded under the platform.

13 **Establishing contact between the LinkLift** and the platform

For this step, the platform, motorisation and braking system must already be installed and operational.

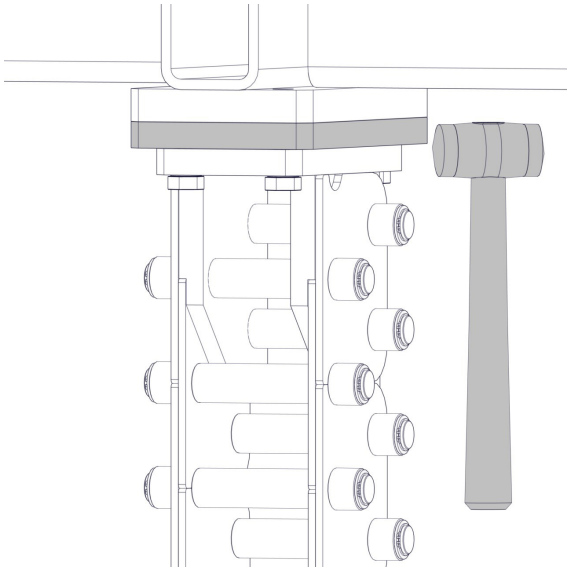


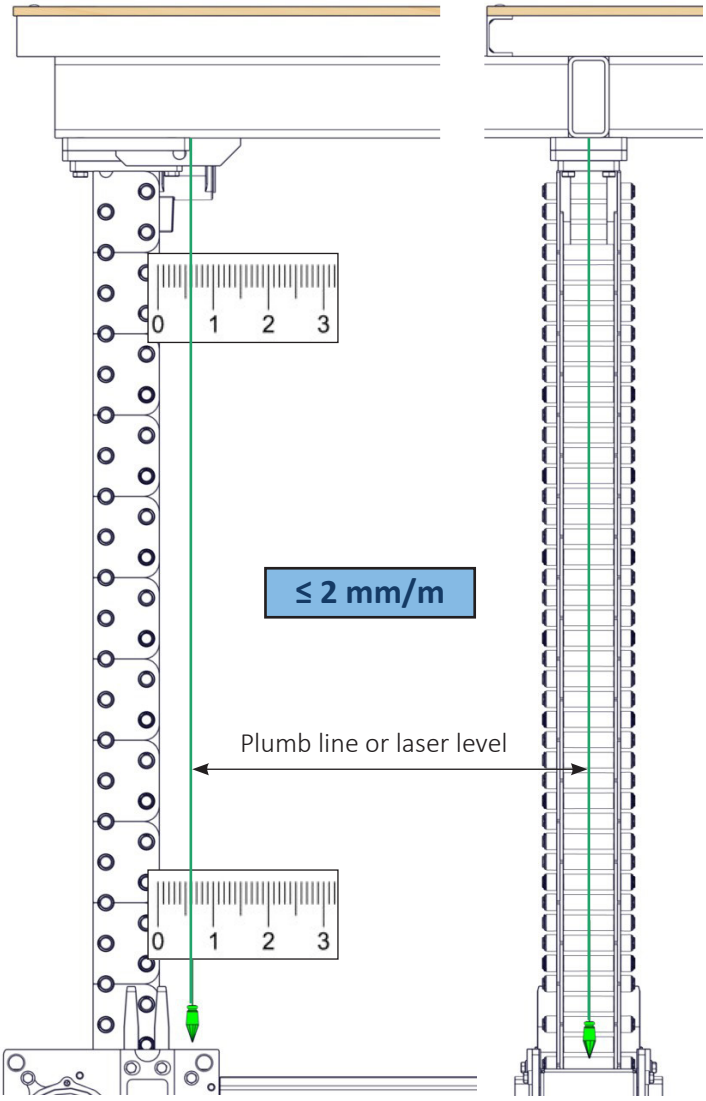
The platform must be guided and levelled to around 2 m from the ground on a secured system (ex.: props).
The chain is secured to ensure it does not falling over during attachment to the platform.

Raise the chain slowly until it touches the platform without lifting it.

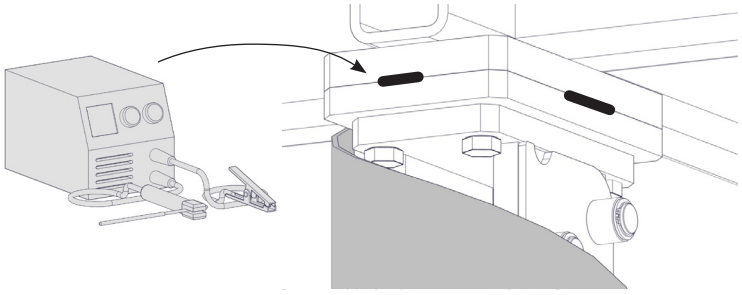
14 **Check the chain alignment in both directions.**

If needed, lightly tap on the mounting plate with a mallet to adjust the alignment.



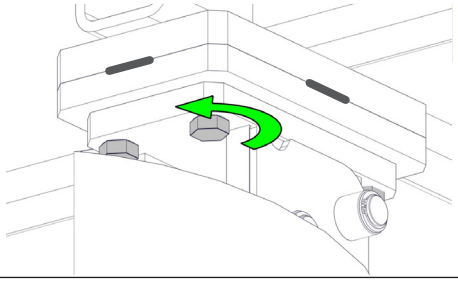


15 **Spot weld the mounting plate** to temporarily attach it.



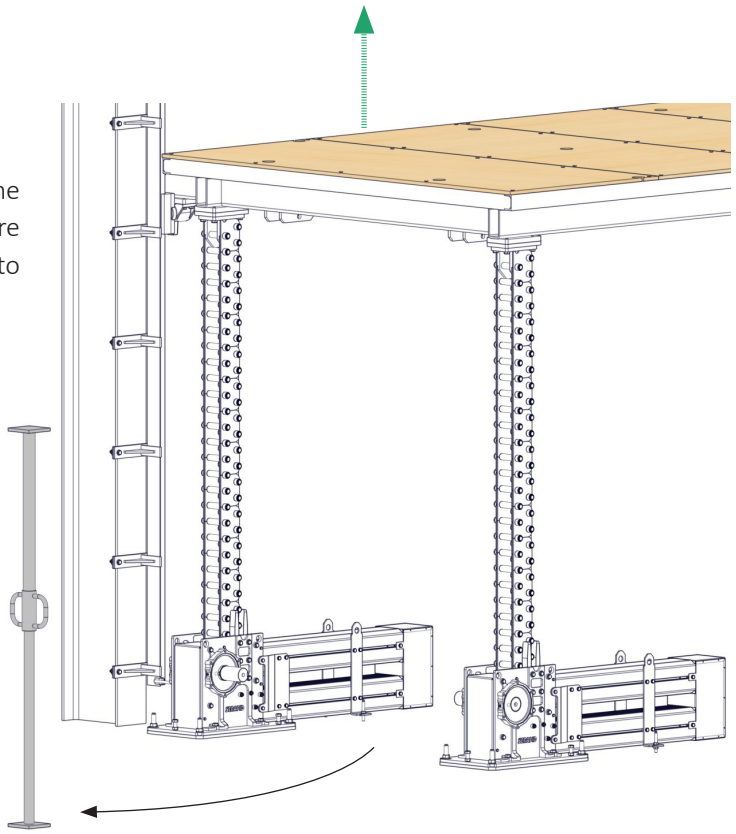
The chain must be protected against any welding debris.

Slightly loosen the 4 bolts on the attachment plate without removing them.



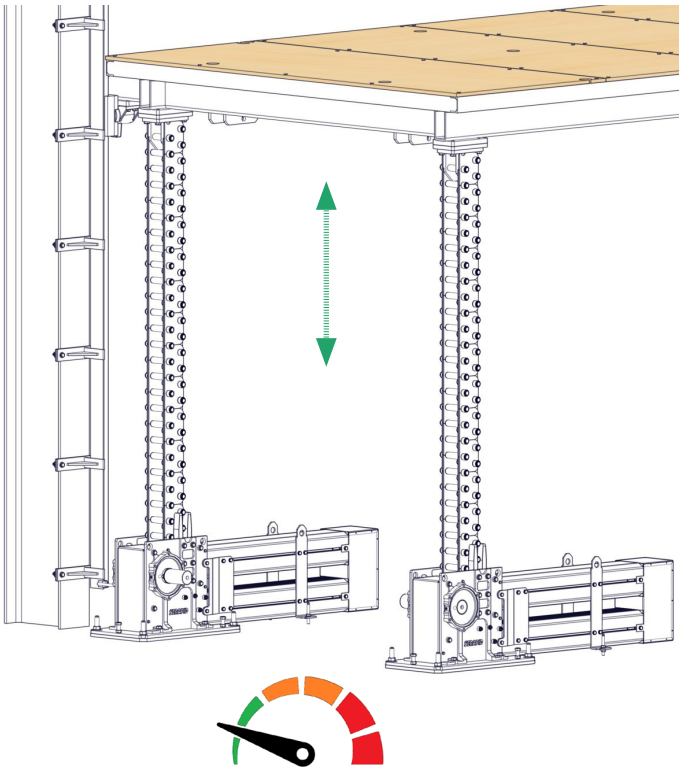
16 **Raise the platform** and remove the supports.

The operator must verify that the motorisation and braking systems are operational before permitting access to the area under the platform.



17 **Carry out 2 complete raising - lowering cycles at a slow operating speed** (< 30 mm/s).

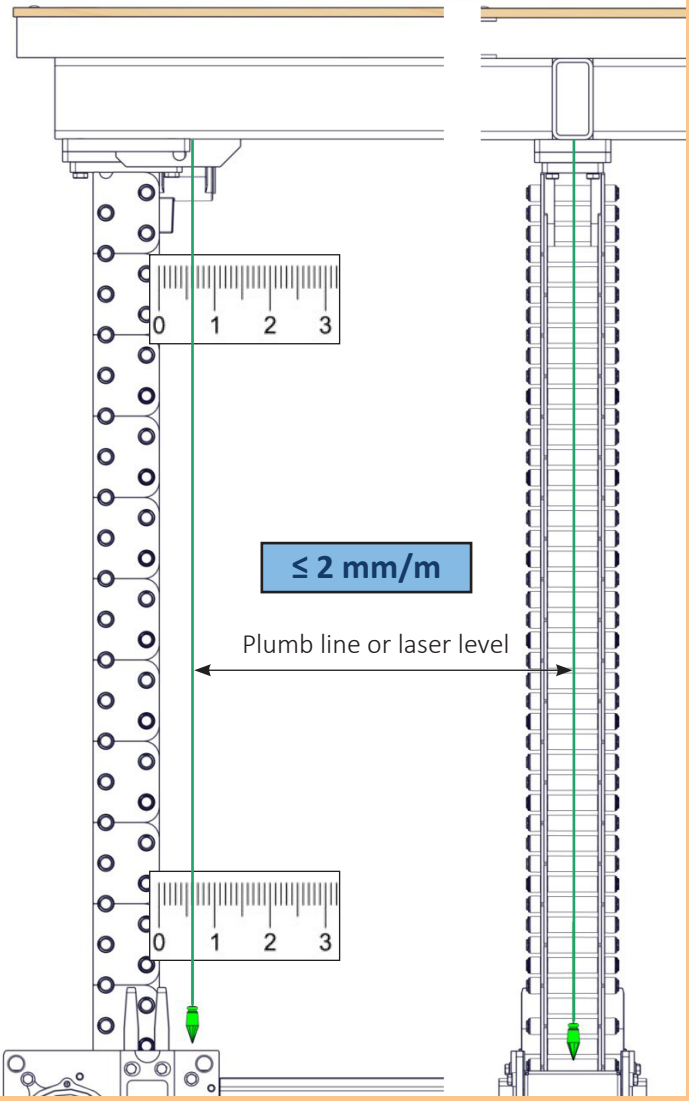
At all times the operator must verify that no one is under the platform.



Verification of chain - platform alignment

18 **Inspect the chain alignment in both directions when it is in the high position.**

(Essential to check alignment in accordance with § 3.3)



Alignment inspection. Conformity ≤ 2 mm/m

yes

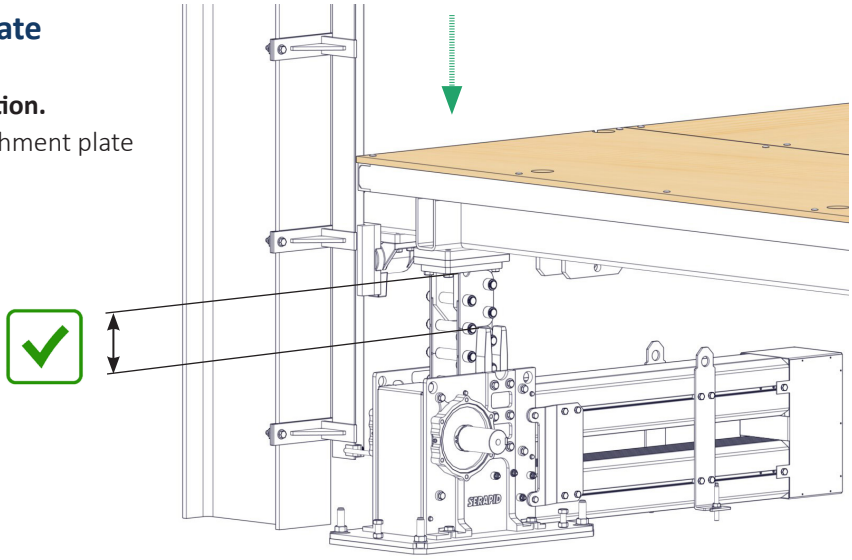
Permanent attachment of the mounting plate **Go to step** **20**

no

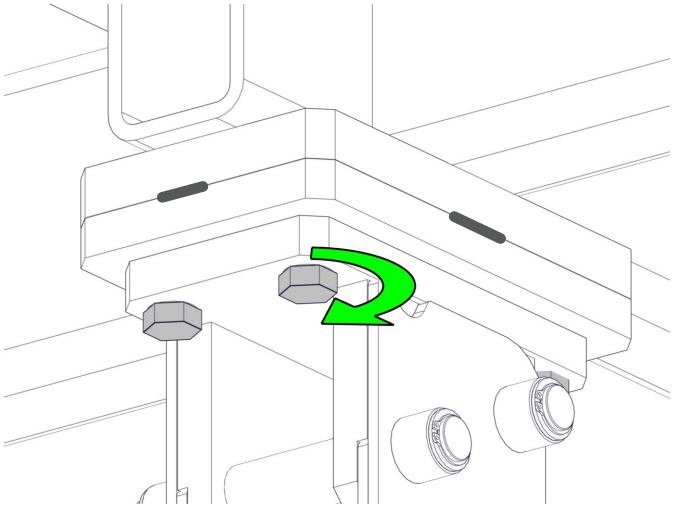
Realignment of the mounting plate **Go to step** **19**

Realignment of the mounting plate

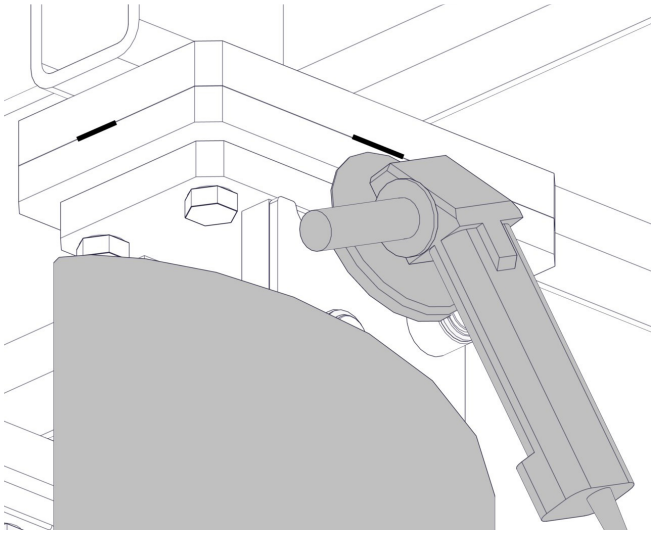
19 **Lower the platform to the low position.**
(space of one link between the attachment plate and the guide plates)



Tighten the bolts on the attachment plate.

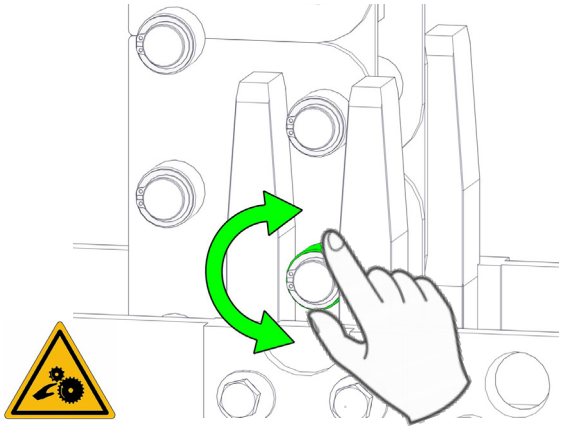


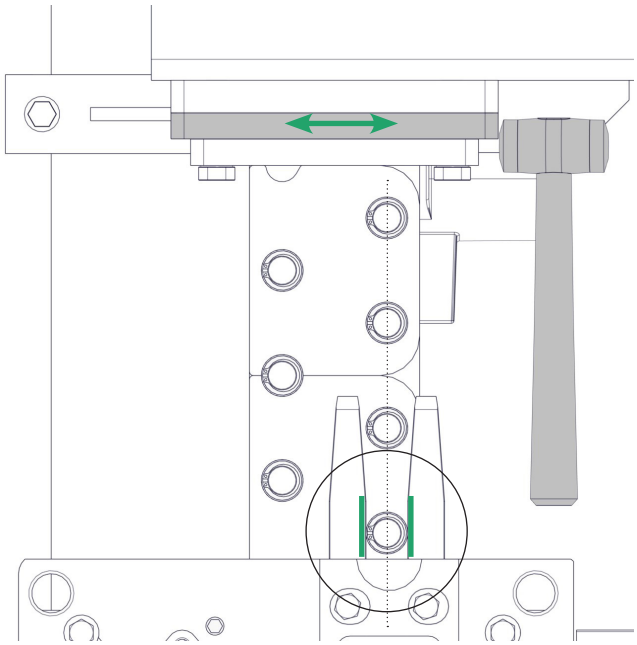
Remove the spot welds on the mounting plate.



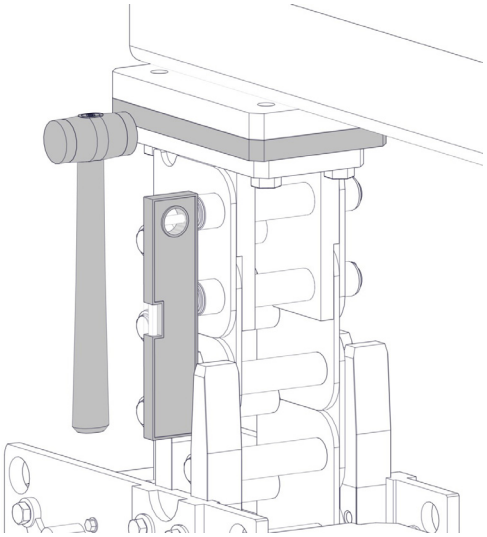
The chain must be protected against any grinding debris.

Lightly tap with a mallet to move the mounting plate.
The roller must turn freely between the flat surfaces of the guide plates.





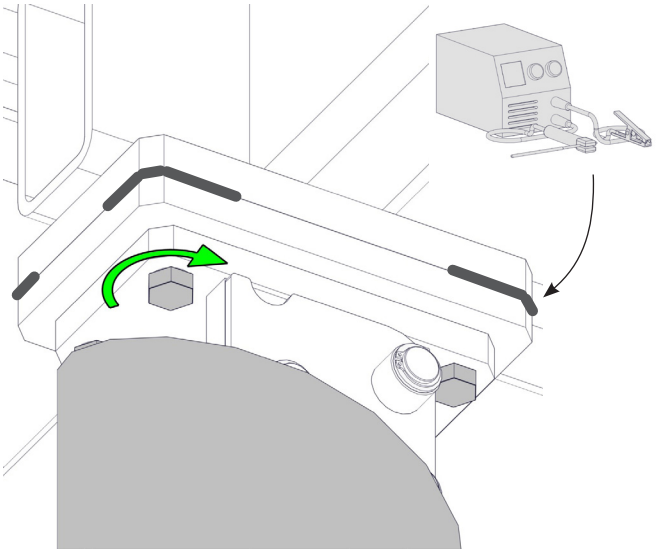




For the other alignment direction, place a level vertically on the end of the axles.

Definitive attachment of the mounting plate

20 When the alignment is correct, **weld the mounting plate onto the platform** (stitch weld at the 4 corners).

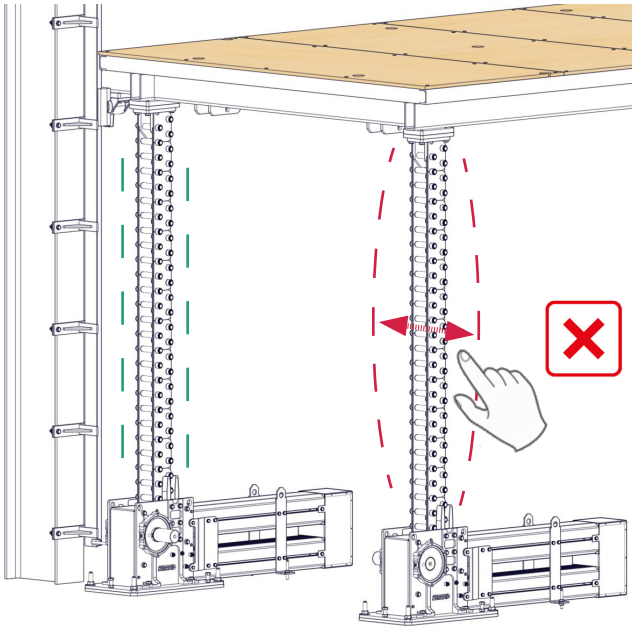


Tighten the bolts on the attachment plate using thread lock or locking washers.



The chain must be protected against any welding debris.

Verification of the chains rigidity

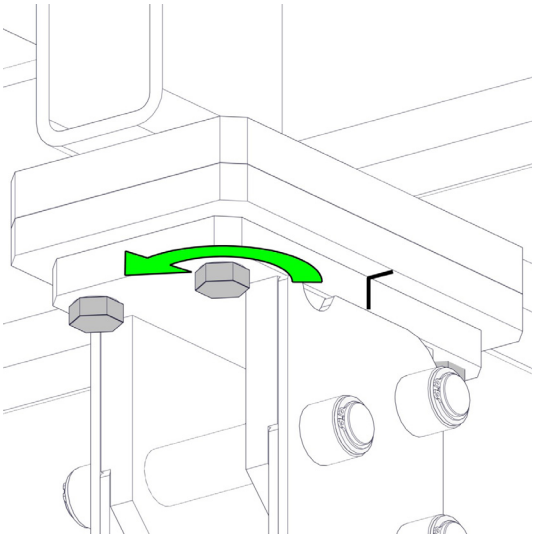


21 **Lift the platform up** to about 2m

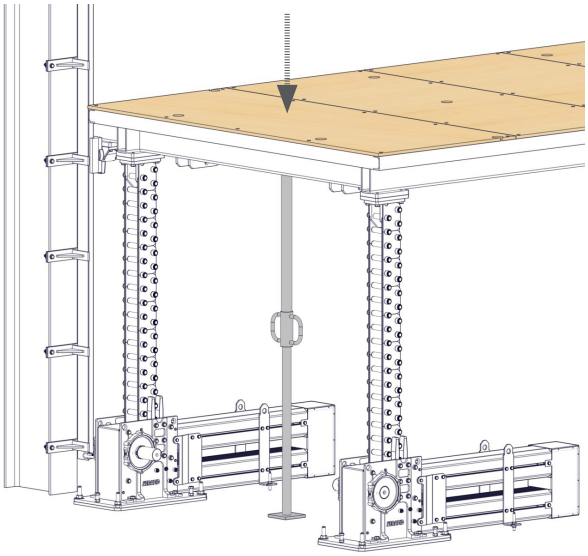
To check the load distribution on the different LinkLifts, **shake each chain and compare their rigidities.**

Gloves must be worn for this task.

If one chain seems more flexible (or moves more than others), a thin shim must be put in place via the following operations:

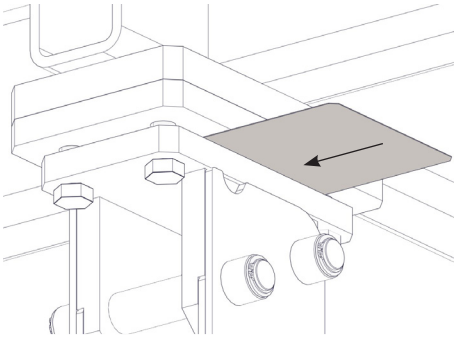


• **Trace** the attachment plate's position and **slightly loosen** its bolts.

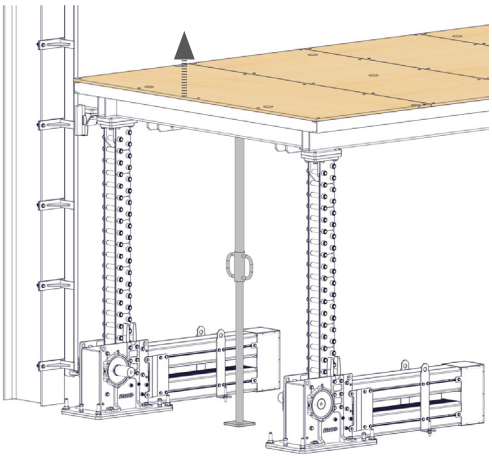


• **Lower the platform** on a secured system (ex.: props).

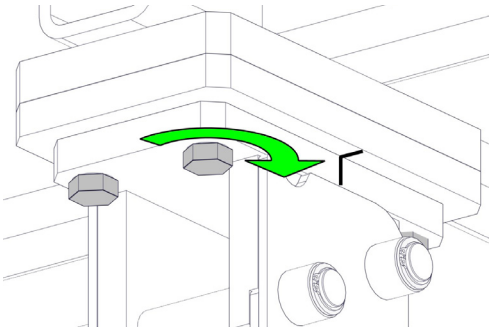
• **Place a thin shim** between the attachment plate and the welded mounting plate.



• Check the alignment of the attachment plate, then **raise the platform a few centimetres** to remove the supports.



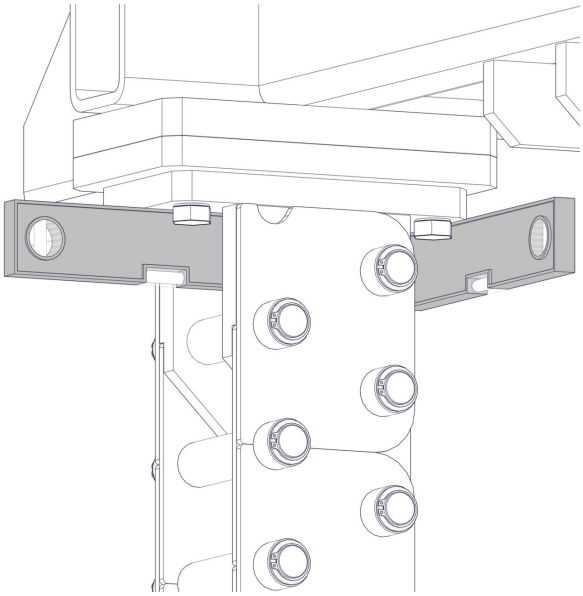
• **Tighten the bolts** on the attachment plate.



Use the thread lock, locking washers or equivalent to secure the attachments.

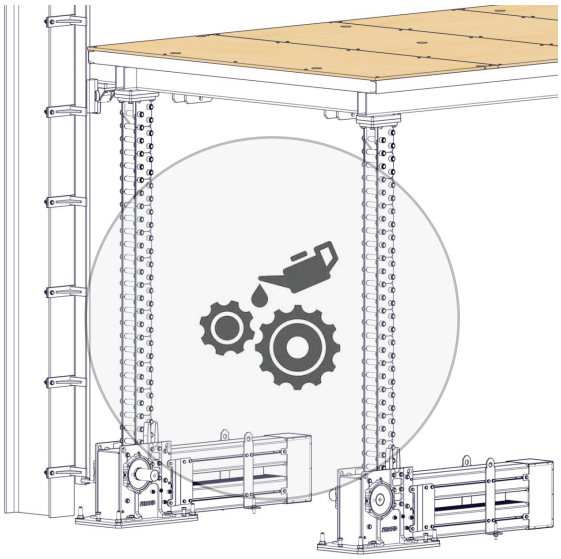
Checking of the front link

22 **Check that the attachment plate is level in both directions.**

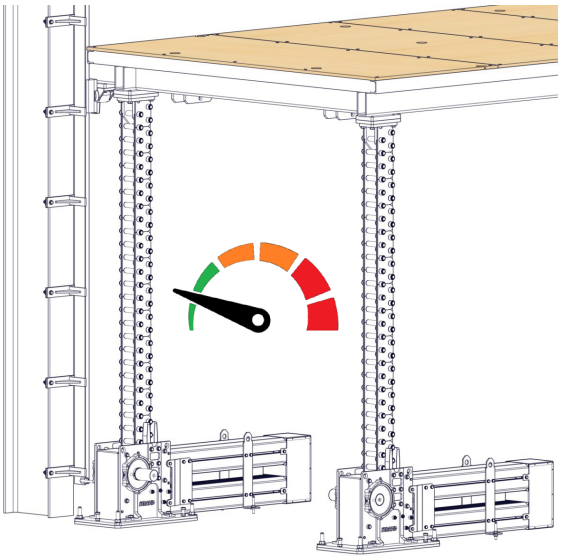


If the plate is not level, place a thin shim between the attachment plate and the welded mounting plate.

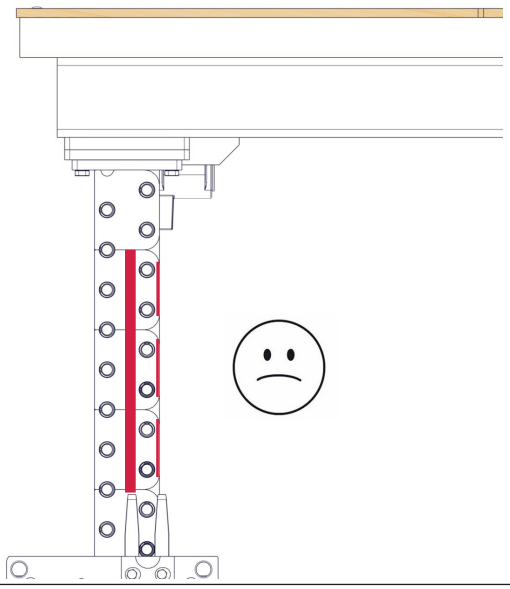
3.5 Product commissioning



The LinkLift system must be completely lubricated before being put into operation.
(See instructions §4.2)



The first tests must be performed **at a slow operating speed** in order to verify that there are no unusual noises or vibrations in the system.

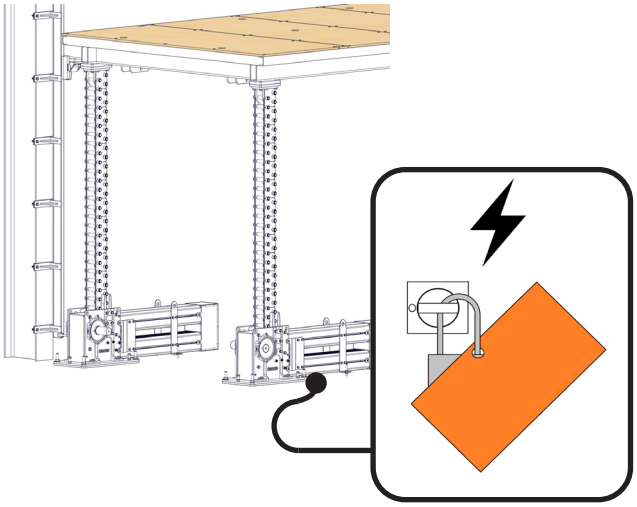


After several operational cycles, if significant wear marks are observed on the lateral surfaces of the links, the LinkLift's alignment must be verified in accordance with the assembly guidelines in §3.3.

4 MAINTENANCE

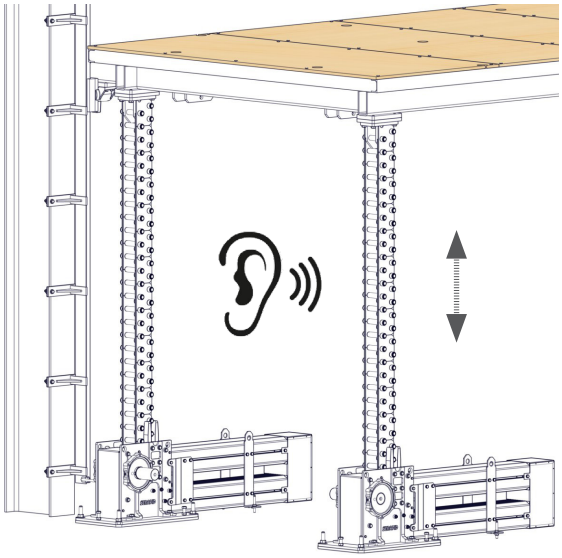
Safety

Maintenance operations must be performed on a **locked-out unit** and under the supervision of a qualified technician.



4.1 Preventive maintenance

Maintenance must be performed **every year.**



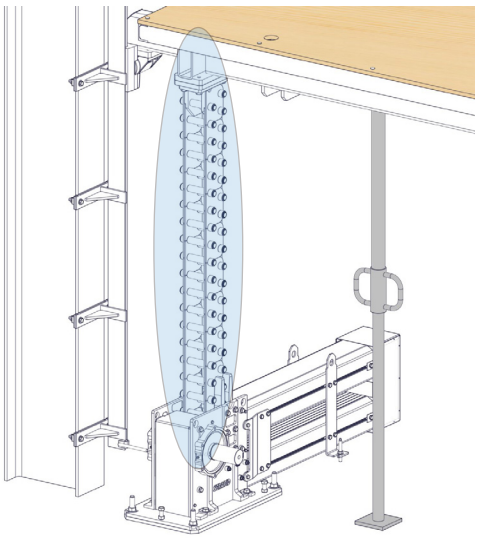
Functional verification

Activate the system without any load and verify that there are no unusual noises, vibrations or system behaviours.

Checking of chain components

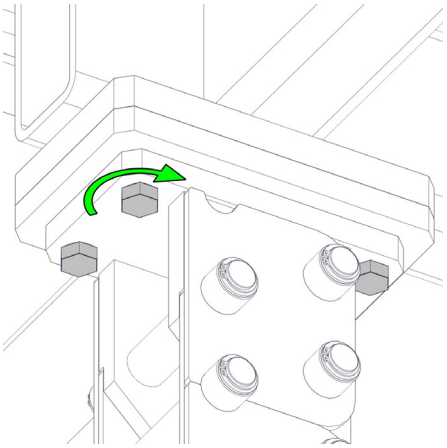
To carry out a full inspection of the chain, **stop the platform every 1.50 m** until the top position is reached.

The platform must be secured in position during each of these inspections.
The SERAPID maintenance block can be used to assist this operation (manual SER-000LL-M005).



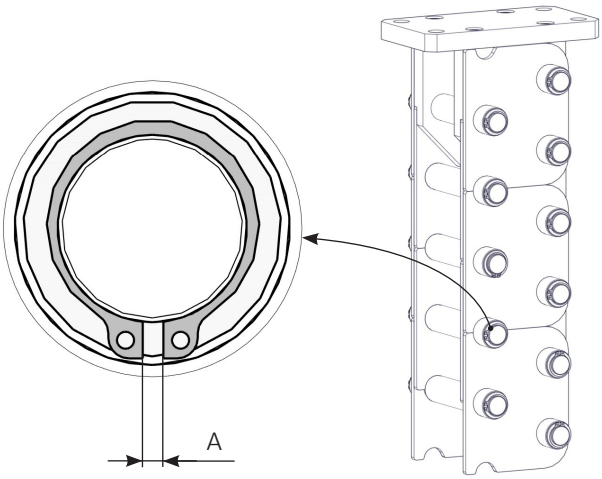
System Checking

Attachment to the platform



Verify that the attachment **plate bolts are correctly tightened** to the platform.

Circlips



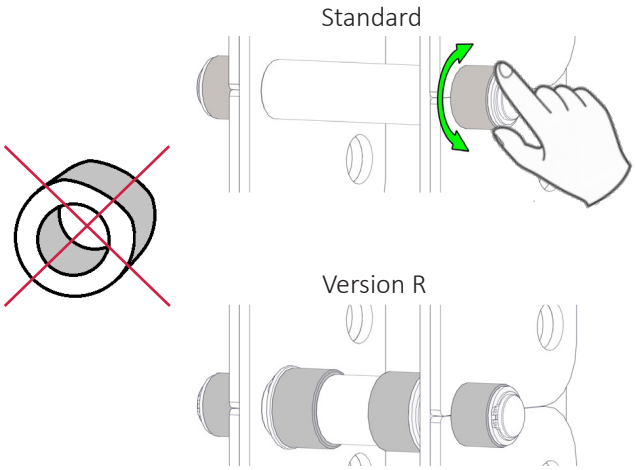
Check that all the circlips: general condition, proper positioning in the groove and the "A" spacing.

Reference	LL30/MD	LL50/R/ MD	LL80/R/ MD	LL100/R/ MD
A	1.5 mm	2 mm	2 mm	3 mm

The circlip must be replaced if it was removed or if the "A" dimension is more than as specified.

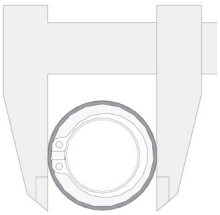
Multiple circlips must not be removed at the same time.

Rollers



Turn the rollers to verify that they rotate freely. If they are jammed, try shaking the chain. If the problem persists, remove the roller for further inspection.

Replace the rollers if they are jammed, deformed or if the diameters are less than the values on the table:



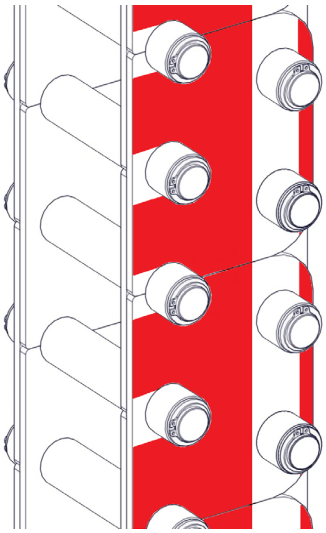
Reference	LL30/ MD	LL50/ MD	LL50R/ MD	LL80/ MD	LL80R/ MD	LL100/ MD	LL100R/ MD
Ø min. in mm	17.80	21.80	26.80	31.80	39.80	39.80	49.80

Lateral link surfaces

The marks caused by the rubbing of the pinions and the guide plates must only be on the outside of the chain plate and superficial.

Check that there are no cracks, deformations or deep wear marks.

The chain and pinions must be replaced if there is significant wear.



Checking of the drive housing and magazine

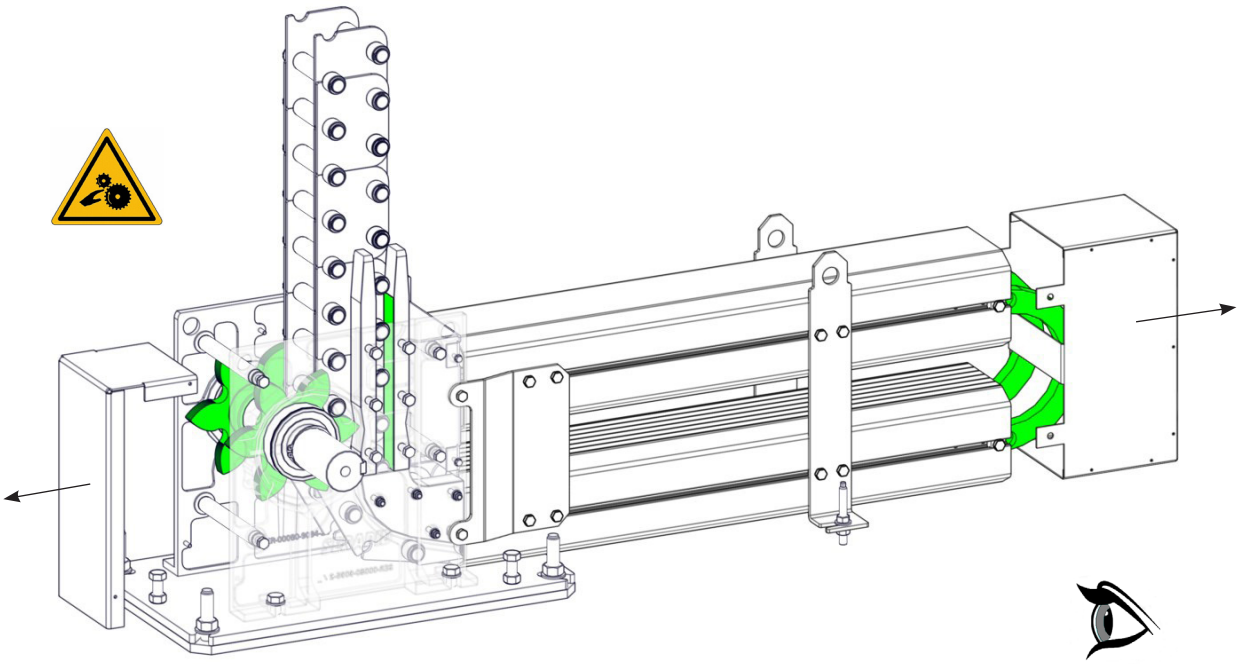
Inspect to make sure none of the attachment bolts have loosened and that the drive housing is level.

Remove the protective cover to **inspect if the guide plates and pinions are worn (no deep mark, no burr).**

If several rollers need to be replaced, the pinions and guide plates will also need to be replaced.

Raise the **platform up to its highest position**, **then pull back the magazine back cover** (not applicable for LL30) to verify the condition of the 180° curve piece and the roller track.

Inspect to ensure that there is no debris or foreign objects in the housing.



4.2 Lubrication

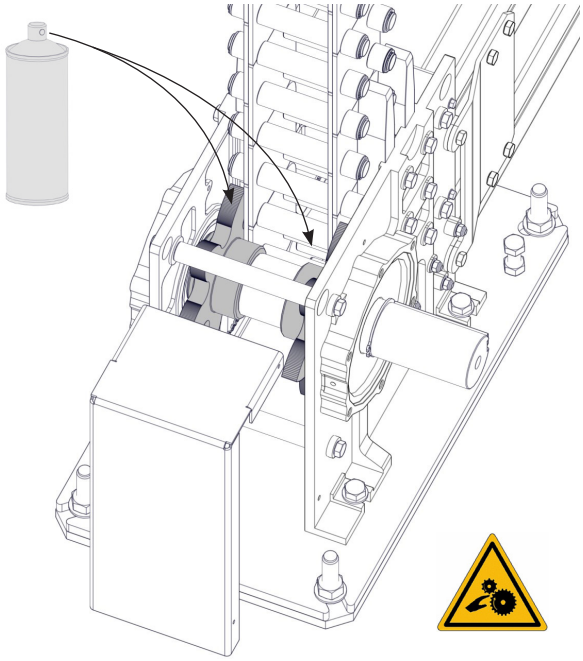
Applications	Lubrication frequency
Standard, theatre Product reference label (§2.4) **THE**	**Before the first commissioning** and **every 2,000 cycles** or **every year** (whichever occurs first)

The lubrication frequencies must be respected, otherwise the product's lifetime will be significantly reduced.

Type of lubricant: refer to annex A (§4.4).
Application: spray or brush.

Pinions

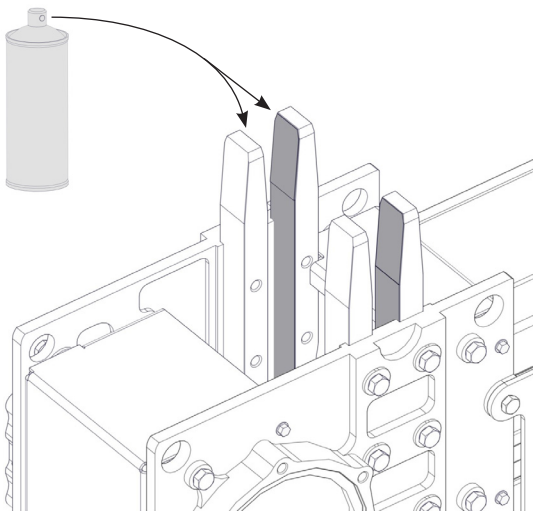
Remove the protective cover and lubricate the pinions (each tooth and the sides) for about 3 revolutions.



Put the protective cover back on at the end of servicing.

Guide plates

Spray the lubricant on the inside of the guide plates (move the chain if needed).



Chain components

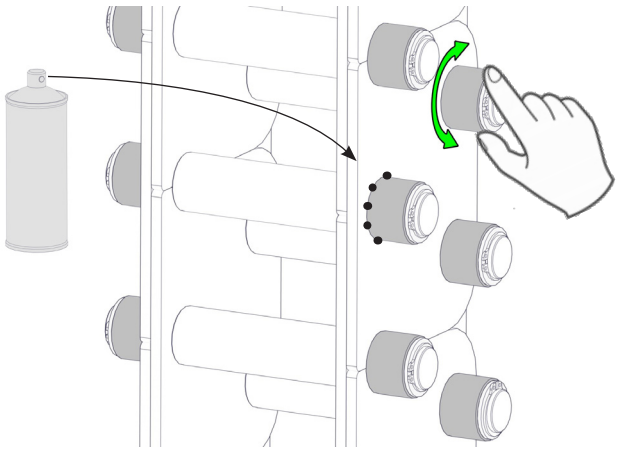
The following operations must be applied throughout the entire length of the chain.

Rollers

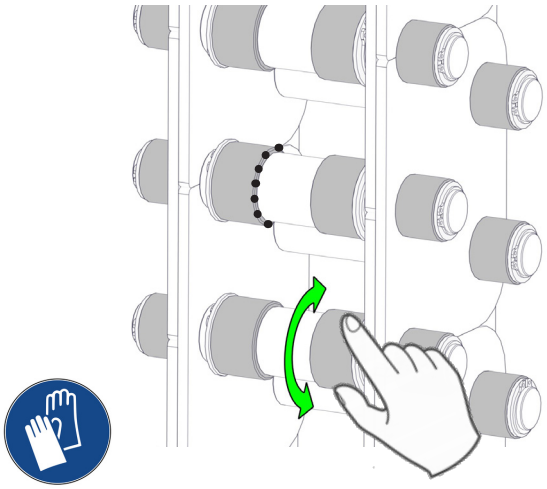
Cover all of the rollers with lubricant, especially the sides.

Verify that the rollers spin freely.
If the roller is jammed, refer to §4.1.

Standard

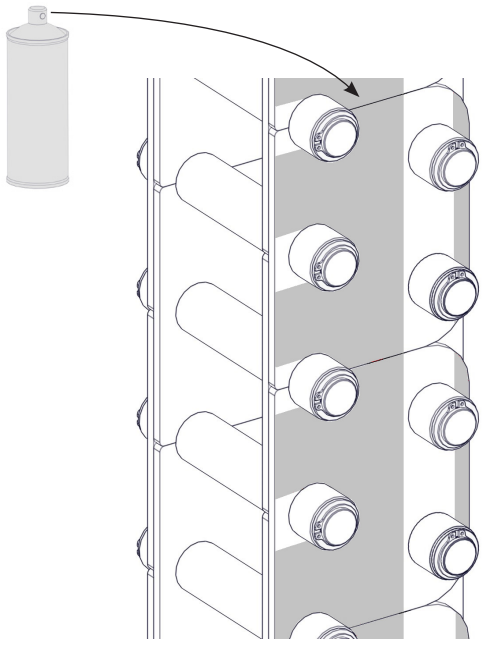


Version R



Lateral surfaces of the chain

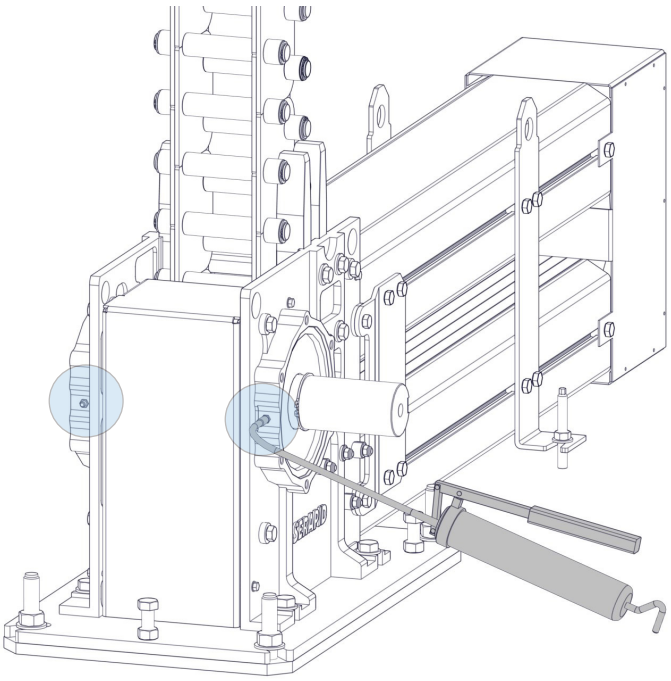
Place a film of oil on both sides of the chain as it goes up and down.



Lubrication of the bearings

The LinkLifts 30 and 50 do not require this operation because they have permanently greased and sealed bearings.

Reference	LL30/MD	LL50/R/ MD	LL80/R/ MD	LL100/R/ MD
Grease	/	/	No 2 lithium base for heavy loads	



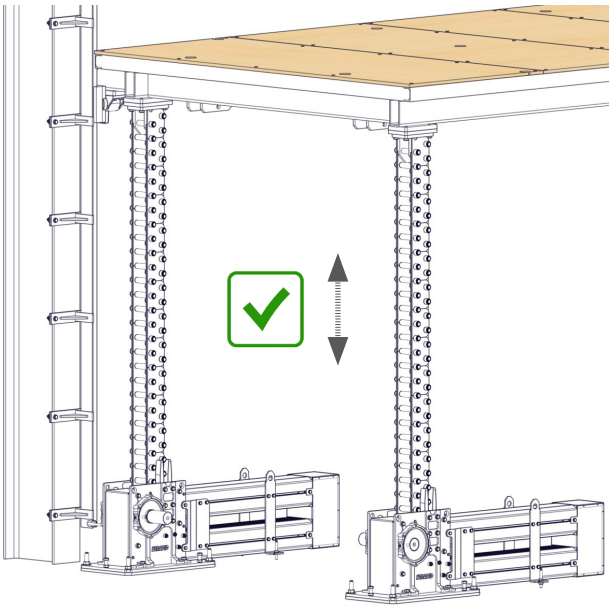
Using a manual grease pump, inject 10 grams of grease into each grease point.

It is recommended to activate the chain while injecting the grease into the bearings.

4.3 Re-commissioning

After the lubrication tasks have been completed, run the platform through a complete cycle in order to spread the lubricant over all of the LinkLift's components.

The system can now be put back into operation.



4.4 Annex A

Lubricants for the chain

Frequency	Lubricant	Manufacturer	References
< 10 cyles / Hour	High-pressure oil	SOGELUB	SYNTHOGEAR 5000 H 50
		MOBIL	Mobil SHC Gear 3200
		other	extreme pressure, lithium base Kinematic viscosity > 1000 cSt USA use: Tri-Flow PTFE lubricant or DuPont Teflon chain saver

Frequency	Lubricant	Manufacturer	References
10 - 20 cyles / Hour	High pressure grease	AGIP	Grease SM
		CASTROL	APX-T Castrol LM Castrol MP Tribol GR100-2PD Multipurpose
		FUCHS	Renolit MP735 Renolit FLM2 Renolit MP150
		MOBIL	Mobilith SHC 100 Mobil grease MP Mobil grease spécial Mobilux EP2
		TOTAL	Multis EP2 Multis MS2
		CHEVRON	Delo Heavy duty Moly EP2 Moly greases EP
		SHELL	Gadus S2 V220-2 Gadus S2 V220 AC2 Gadus S2 V220 AD2 Gadus S3 V460D-2

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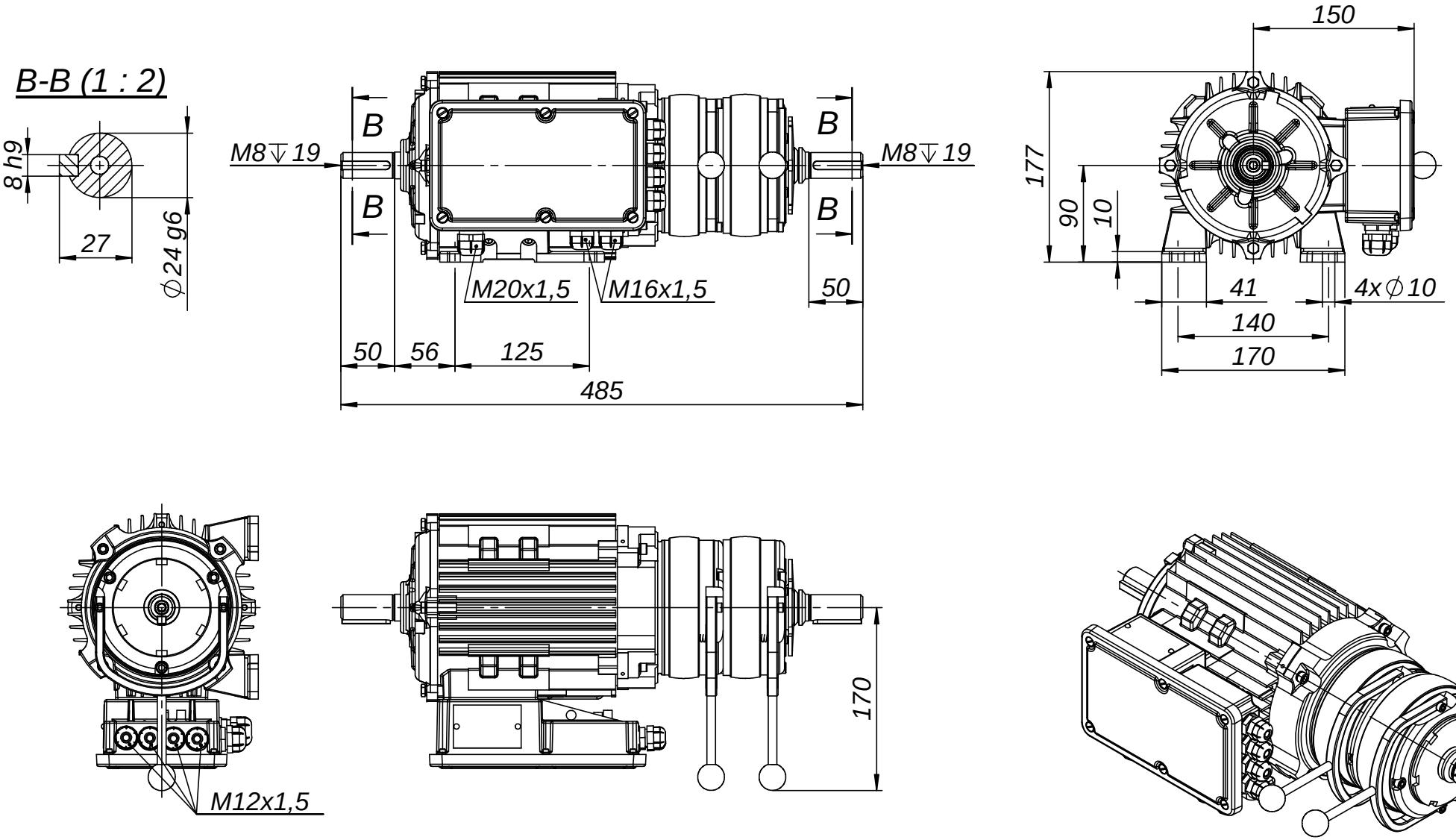
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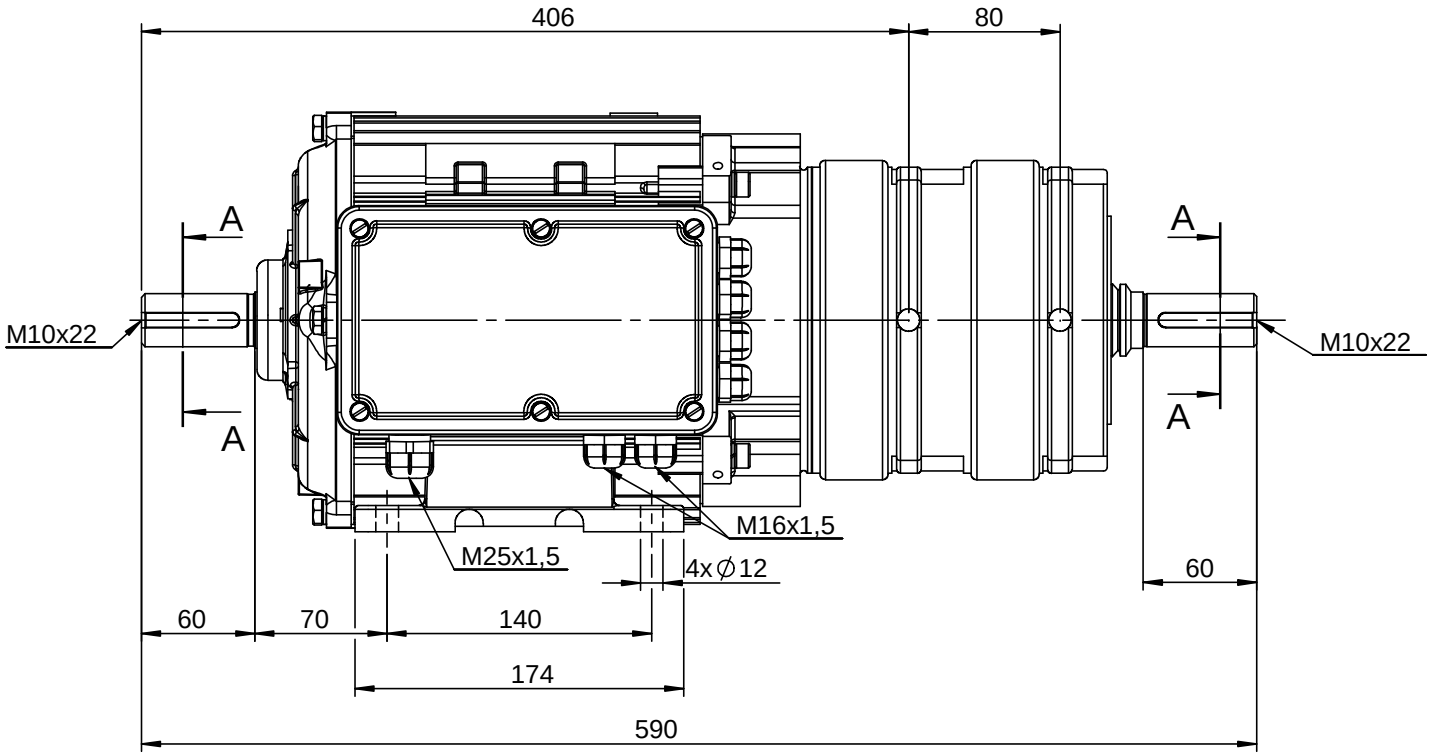
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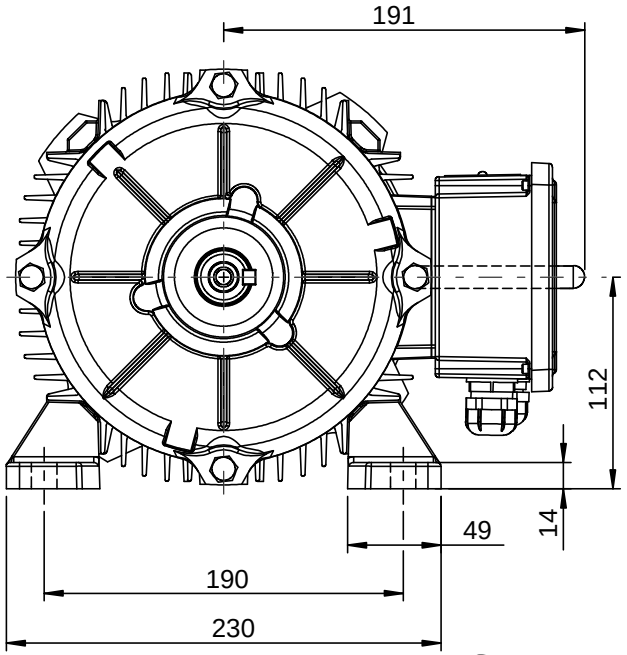
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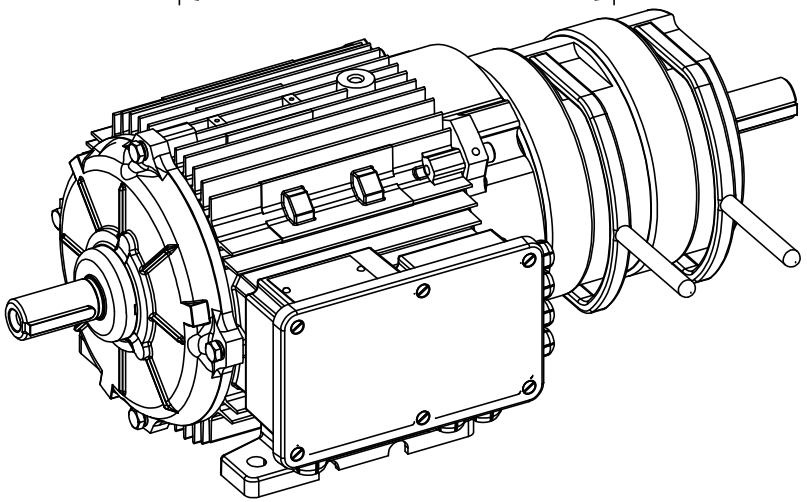
12. Appendix 4 – Motor



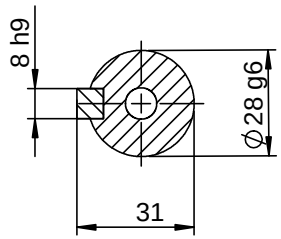
CELMA indukta / Cantoni GROUP	Motor type **Sh 90L-6-HSY**	
	Drawing no. S-1521-03-2015	Scale 1:5







A-A (1 : 2)



since 1920
CELMA indukta
since 1878
Cantoni GROUP

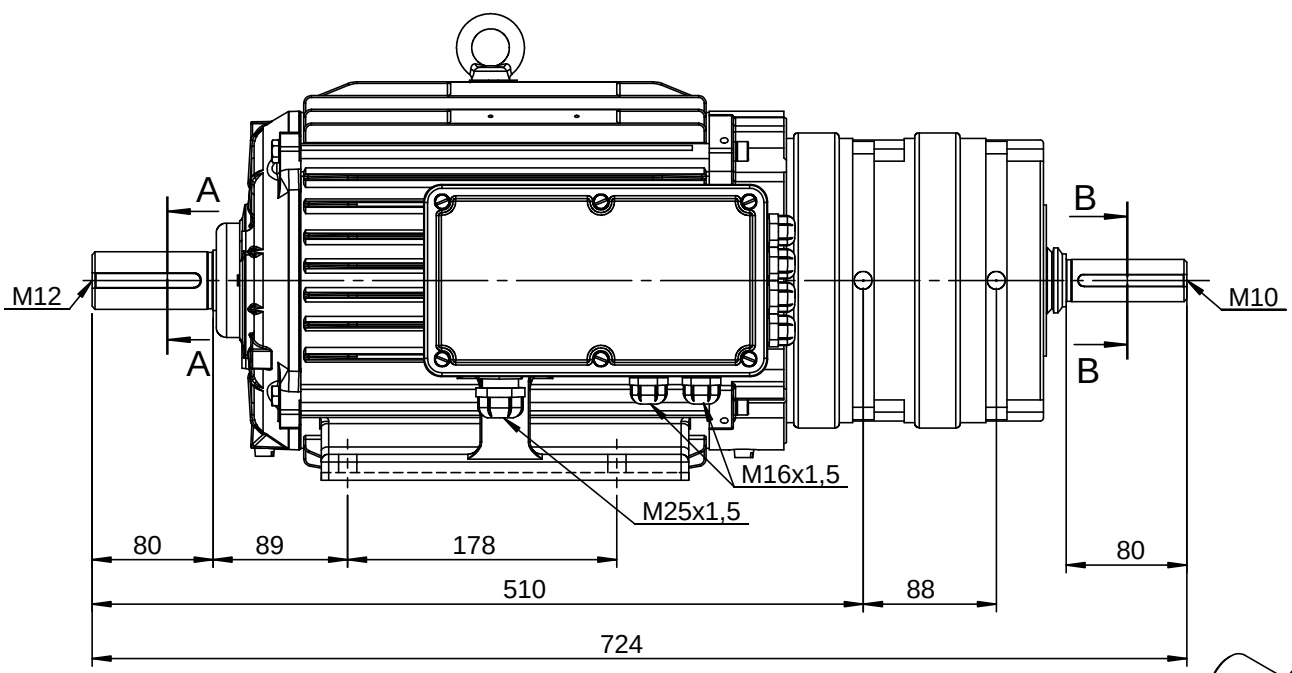
Motor type

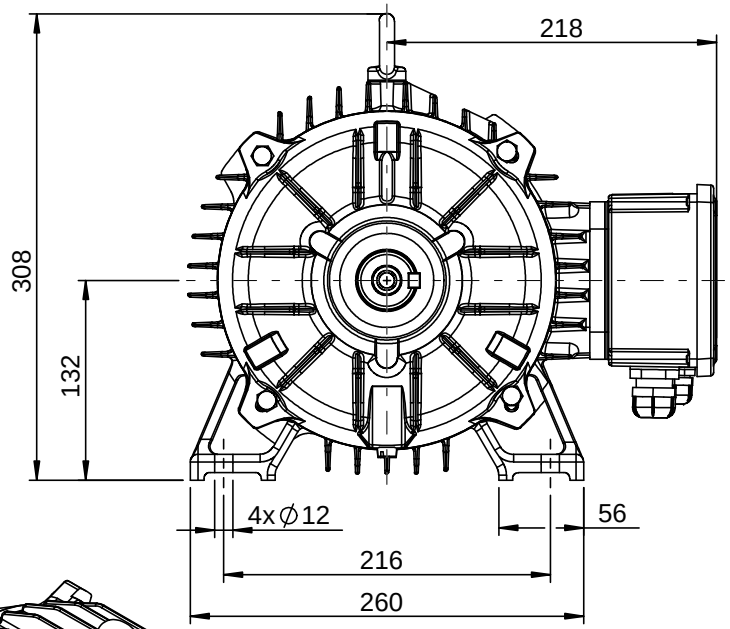
Sg 112M-6-2HSY

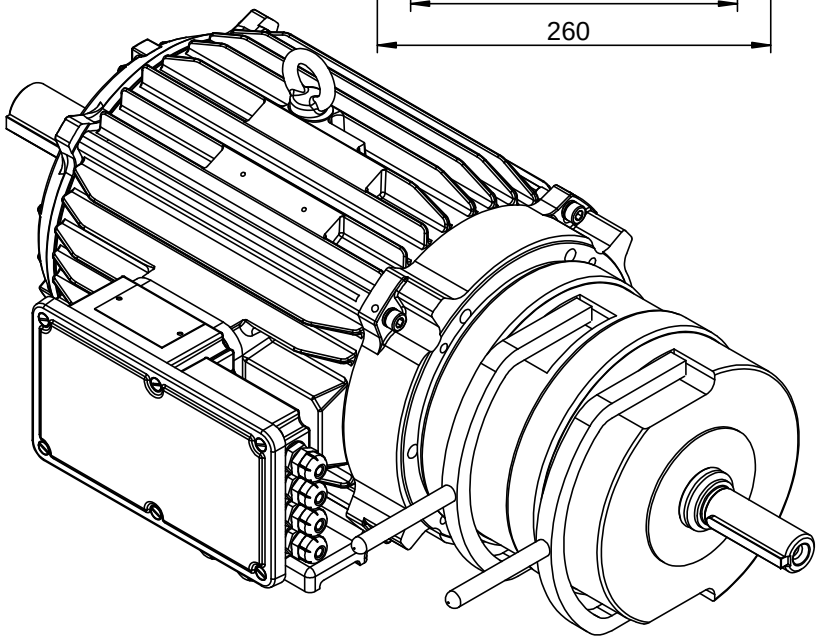
Drawing no.

S-2125-01-2016

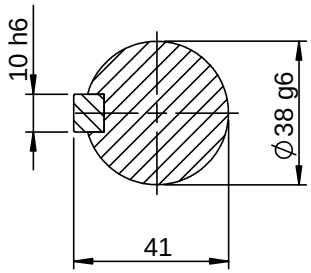
Scale



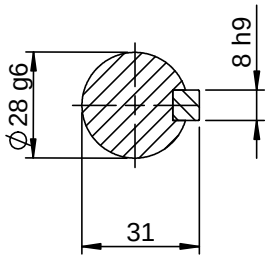




A-A (1 : 2)



B-B (1 : 2)



since 1920
CELMA indukta
since 1878
Cantoni GROUP

Motor type

Sg 132M-6A-2HSY

Drawing no.

S-2142-01-2016

Scale

1:5

TECHNICAL SPECIFICATION OF 3-PHASE INDUCTION MOTOR WITH SQUIRREL-CAGE ROTOR [SPECYFIKACJA TECHNICZNA 3-FAZOWEGO SILNIKA INDUKCYJNEGO Z WIRNIKIEM KLATKOWYM]

1.	Motor type [Typ silnika]	Sg 112M-6-2HSY
2.	Rated power [Moc znamionowa]	2,2/kW
3.	Duty [Rodzaj pracy]	S2-10min
4.	Efficiency class [Klasa sprawności]	IE1
5.	Rated voltage [Napięcie znamionowe]	220-240/380-420V
6.	Rated frequency [Częstotliwość znamionowa]	50 Hz
7.	Stotor circuit [Połączenie stojan]	Δ/Y
8.	Number of terminals [Liczba zacisków]	6
9.	Rated speed [Prędkość znamionowa]	960 min^{-1}
10.	Rated torque [Moment znamionowy]	21,9 Nm
11.	Rated current [Prąd znamionowy]	8,5/4,9 A
12.	Efficiency @ P_N	83,8 %
13.	Power factor @ P_N	0,78
14.	Locked-rotor current [Prąd rozruchowy] – I_l/I_N	5,9
15.	Locked-rotor torque [Moment rozruchowy] – T_l/T_N	2,2
16.	Breakdown torque [Moment maksymalny] – T_b/T_N	2,8
17.	Moment of rotor inertia [Moment bezwładności]	0,0180 kgm^2
18.	Approximate weight [Przybliżona waga]	50 kg
19.	Thermal classification/temp. rise [Klasa izolacji/przyrost temp.]	F/B
20.	Sound pressure level @ 1m L_{pA} [Poziom ciśnienia akustycznego w odległości 1m - L_{pA}]	≤60 dB(A)
21.	Vibration grade acc. to IEC 60034-14 [Poziom drgań wg IEC 60034-14]	Grade A - ≤1,6 mm/s (free suspension)
22.	Ambient temperature [Temperatura otoczenia]	-15 ÷ +40°C
23.	Relative humidity [Wilgotność względna]	95%
24.	Altitude above sea level [Wysokość ustawienia n.p.m.]	1000m
25.	Mounting arragement [Forma wykonania mechanicznego]	IM B3/IM 1001
26.	Method of cooling [System chłodzenia]	IC 410
27.	Degree protection [Stopień ochrony] :	IP 55
28.	Location boxes of main terminals [Usytuowanie skrzynki zacisków głównych]	On right side looking from drive end
29.	Cabel gland – quantity x size [Dławnice – ilość x wielkość]	4 x M12 x 1,5 2 x M16 x 1,5 1 x M25 x 1,5
30.	Direction of rotation [Kierunek wirowania]	CW/CCW
31.	Roller bearings [Łożyska toczne] : • DE side [strona napędowa] • NDE side [strona przeciwnapędowa]	 6306 2Z C3 6306 2Z C3
32.	Paniting [Malowanie]	RAL 5010
33.	Type brake	2H2SP 112BT.44.207VDC 2x30Nm d30 2 x KZ microswiches 2 x rectifier 400VAC/207VDC
34.	Windings thermal protection [Zabezpieczenie termiczne uzwojeń]	3 x PTC 150°C [1 pcs/phase] 3 x TKO 150°C [1 pcs/phase]
35.	Bearings thermal protection [Zabezpieczenie termiczne łożysk]	- [1 pcs/bearing node]
36.	Anti-condensation heaters [Grzałki antykondensacyjne]	-
37.	Vibration measuring SPM pin [Wtyk pomiarowy SPM]	-
38.	Insulated of bearing chamber [Izolowana komora łożyskowa]	-

NOTES:

The shaft ends: DE ϕ 28g6 x 60 mm, NDE ϕ 28g6 x 60 mm.

Date: 26.06.2023

TECHNICAL SPECIFICATION OF 3-PHASE INDUCTION MOTOR WITH SQUIRREL-CAGE ROTOR [SPECYFIKACJA TECHNICZNA 3-FAZOWEGO SILNIKA INDUKCYJNEGO Z WIRNIKIEM KLATKOWYM]

1.	Motor type [Typ silnika]	Sh 90L-6-2HSY S01-044-070
2.	Rated power [Moc znamionowa]	1,5 kW
3.	Duty [Rodzaj pracy]	S2-10min
4.	Efficiency class [Klasa sprawności]	IE1
5.	Rated voltage [Napięcie znamionowe]	230/400V ± 5%
6.	Rated frequency [Częstotliwość znamionowa]	50 Hz ± 2%
7.	Stotor circuit [Połączenie stojan]	Δ/Y
8.	Number of terminals [Liczba zacisków]	6
9.	Rated speed [Prędkość znamionowa]	900 min^{-1}
10.	Rated torque [Moment znamionowy]	15,9 Nm
11.	Rated current [Prąd znamionowy]	7,4/4,2A
12.	Efficiency [Sprawność]	71,0 %
13.	Power factor [Współczynnik mocy]	0,72
14.	Locked-rotor current [Prąd rozruchowy] – I_l/I_N	3,8
15.	Locked-rotor torque [Moment rozruchowy] – T_l/T_N	1,9
16.	Breakdown torque [Moment maksymalny] – T_b/T_N	2,0
17.	Moment of rotor inertia [Moment bezwładności]	0,0029 kgm^2
18.	Approximate weight [Przybliżona waga]	25 kg
19.	Thermal classification/temp. rise [Klasa izolacji/przyrost temp.]	F/B
20.	Sound pressure level @ 1m L_{pA} [Poziom ciśnienia akustycznego w odległości 1m - L_{pA}]	≤53 dB(A)
21.	Vibration grade acc. to IEC 60034-14 [Poziom drgań wg IEC 60034-14]	Grade A - ≤1,6 mm/s (free suspension)
22.	Ambient temperature [Temperatura otoczenia]	-15 ÷ +40°C
23.	Relative humidity [Wilgotność względna]	95%
24.	Altitude above sea level [Wysokość ustawienia n.p.m.]	1000m
25.	Mounting arragement [Forma wykonania mechanicznego]	IM 1002 two shaft end
26.	Method of cooling [System chłodzenia]	IC 410 without fan and fan cover
27.	Degree protection [Stopień ochrony] :	
	• motor [silnik]	IP 55
	• terminal boxes [skrzynka zaciskowa]	IP 55
28.	Location boxes of main terminals [Usytuowanie skrzynki zacisków głównych]	On the right
29.	Direction of rotation [Kierunek wirowania]	CW/CCW
30.	Roller bearings [Łożyska toczne] :	
	• DE side [strona napędowa]	6205 2Z C3
	• NDE side [strona przeciwnapędowa]	6205 2Z C3
31.	Paniting [Malowanie]	RAL 5010
32.	Windings thermal protection [Zabezpieczenie termiczne uzwojeń]	3 x PTC 150°C [1 pcs/phase] 3 x thermoswitches NC 150°C [1 pcs/phase]
33.	Type brake	2H2SP90.BT.44 207VDC 2x20Nm 2 x 30W 2 x 0,15A Microswitches 2xIKZ
34.	Rectifier	2 x PS2 230VAC/207VDC

NOTES:

Dimensions of second end shaft : ϕ24mm x 50mm g6

Date: 07.09.2022

TECHNICAL SPECIFICATION OF 3-PHASE INDUCTION MOTOR WITH SQUIRREL-CAGE ROTOR [SPECYFIKACJA TECHNICZNA 3-FAZOWEGO SILNIKA INDUKCYJNEGO Z WIRNIKIEM KLATKOWYM]

1.	Motor type [Typ silnika]	Sg 132M-6A-2HSY
2.	Rated power [Moc znamionowa]	4,0 **//** 4,8 kW
3.	Duty [Rodzaj pracy]	S2-10min
4.	Efficiency class	**IE1**
5.	Rated voltage [Napięcie znamionowe]	220-240/380-420V **//** 440-480V
6.	Rated frequency [Częstotliwość znamionowa]	50 **//** 60 Hz ±2%
7.	Stotor circuit [Połączenie stojan]	Δ/Y
8.	Number of terminals [Liczba zacisków]	6
9.	Rated speed [Prędkość znamionowa]	950 **//** 1145 min^{-1}
10.	Rated torque [Moment znamionowy]	40,2 Nm
11.	Rated current [Prąd znamionowy]	15,1/8,7 **//** 8,8A
12.	Efficiency @ P_N	84,0 **//** 85,5 %
13.	Power factor @ P_N	0,79 **//** 0,80
14.	Locked-rotor current [Prąd rozruchowy] – I_l/I_N	6,0
15.	Locked-rotor torque [Moment rozruchowy] – M_l/M_N	2,4
16.	Breakdown torque [Moment maksymalny] – T_b/T_N	3,1
17.	Moment of rotor inertia [Moment bezwładności]	0,034 kgm^2
18.	Approximate weight [Przybliżona waga]	92 kg
19.	Thermal classification/temp. rise [Klasa izolacji/przyrost temp.]	F/B
20.	Sound pressure level @ 1m L_{pA} [Poziom ciśnienia akustycznego w odległości 1m - L_{pA}]	≤62 dB(A)
21.	Vibration grade acc. to IEC 60034-14 [Poziom drgań wg IEC 60034-14]	Grade A - ≤2,2 mm/s (free suspension)
22.	Ambient temperature [Temperatura otoczenia]	-15 ÷ +40°C
23.	Relative humidity [Wilgotność względna]	95%
24.	Altitude above sea level [Wysokość ustawienia n.p.m.]	1000m
25.	Mounting arragement [Forma wykonania mechanicznego]	IM B3/1002
26.	Method of cooling [System chłodzenia]	IC 410
27.	Degree protection [Stopień ochrony] : • motor [silnik] • terminal boxes [skrzynka zaciskowa]	 IP 55 IP 55
28.	Cabel gland – quantity x size [Dławnice – ilość x wielkość]	1 x M25 x 1,5 1 x M16 x 1,5 1 x M12 x 1,5
29.	Direction of rotation [Kierunek wirowania]	CW/CCW
30.	Roller bearings [Łożyska toczne] : • DE side [strona napędowa] • NDE side [strona przeciwnapędowa]	 6308 2Z C3 6308 2Z C3
31.	Location boxes of main terminals [Usytuowanie skrzynki zacisków głównych]	on the right side
32.	Paniting [Malowanie]	RAL 5010
33.	Windings thermal protection [Zabezpieczenie termiczne uzwojeń]	3 x PTC 150°C [1 pcs/phase] 3 x TKO 150°C [1 pcs/phase]
34.	Bearings thermal protection [Zabezpieczenie termiczne łożysk]	- [1 pcs/bearing node]
35.	Anti-condensation heaters [Grzałki antykondensacyjne]	- [1 pcs/bearing node]
36.	Vibration measuring SPM pin [Wtyk pomiarowy SPM]	-
37.	Insulated of bearing chamber [Izolowana komora łożyskowa]	-
38.	Type brake	2H2SP 132BT.44.207VDC 2 x 80Nm 2x 55W 2 x 0,27A 2 x Rectifier B2-2P 230VAC/207VDC IKZ

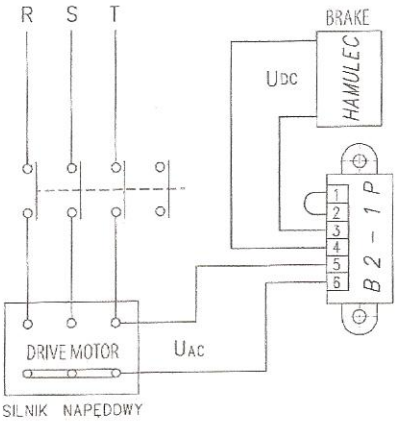
NOTES:
Two shaft ends: DE ϕ38g6 x 80mm, NDE ϕ28g6 x 80mm
Motor no. S01-048-058

Date: 10.10.2018

Rectifier circuit **B2–1P** for energizing DC brake

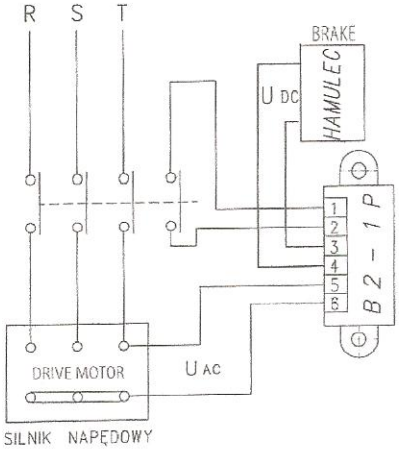
The rectifier B2–1P forms a complete unit for direct installation. The terminal strip provided facilitates installation and connection to the circuit. The rectifier allows feeding input voltage max. 600 VAC which after rectification provides DC voltage of value equal to input voltage divided by the constant 2.22. Maximum value of rectified current is 2A.
For example: voltage 400 VAC fed to rectifier terminals gives at rectifier output voltage of 180 VDC – 400 VAC : 2.22 = 180 VDC – voltage 230 VAC fed to input of rectifier gives at output voltage of 104 VDC – 230 VAC : 2.22 = 104 VDC.

Disconnection of power supply on AC side



The diagram presents connection of rectifier B2-1P to supply circuit of motor. When disconnecting the voltage, the magnetic field causes the coil current to flow further through the rectifying diodes and drops slowly. The magnetic field reduces gradually causing prolonged time of braking action and consequently delayed increase of braking torque. If action time is irrelevant, brake should be connected on the AC side. When switching off, the supply circuits act as rectifying diodes

Disconnection of power supply on DC side

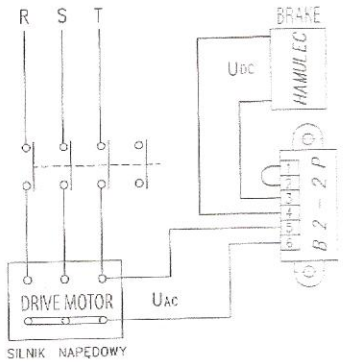


The diagram presents connection of rectifier B2-1P into electric motor circuit. The coil current is interrupted between the coil and supply (rectifier) circuit. The magnetic field reduces very quickly, giving short time of braking action and consequently rapid growth of braking torque. When switching off on DC voltage side, a high peak voltage is generated in the coil causing faster wear of contacts due to sparking.
For protecting the coil against peak voltages and protecting the contacts against excessive wear, the rectifier circuit is provided with protective facility allowing brake connection on DC voltage side.

Rectifier circuit B2–2P for energizing DC brake

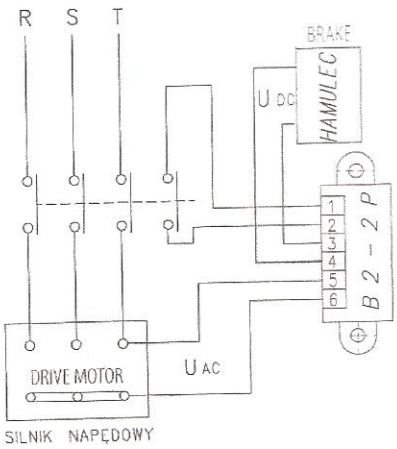
The rectifier B2–2P forms a complete unit for direct installation. The terminal strip provided facilitates installation and connection to the circuit. The rectifier allows feeding input voltage max. 400 VAC which after rectification provides DC voltage of value equal to input voltage divided by the constant 1.11. Maximum value of rectified current is 2A.
For example: voltage 230 VAC fed to rectifier terminals gives at rectifier output voltage of 230 VDC – 230 VAC : 1.11 = 207 VDC

Disconnection of power supply on AC side

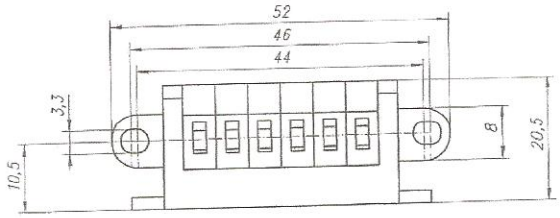


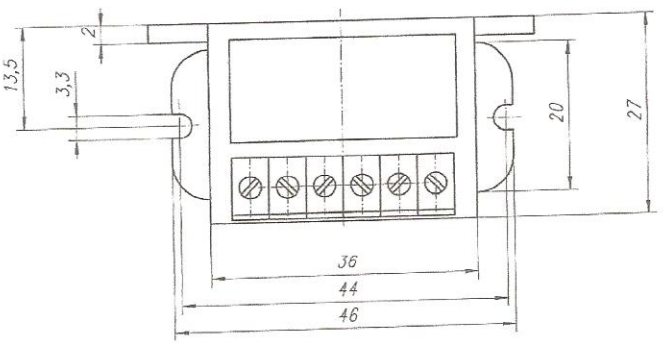
The diagram presents connection of rectifier B2-2P to supply circuit of motor. When disconnecting the voltage, the magnetic field causes the coil current to flow further through the rectifying diodes and drops slowly. The magnetic field reduces gradually causing prolonged time of braking action and consequently delayed increase of braking torque. If action time is irrelevant, brake should be connected on the AC side. When switching off, the supply circuits act as rectifying diodes.

Disconnection of power supply on DC side



The diagram presents connection of rectifier B2-2P into electric motor circuit. The coil current is interrupted between the coil and supply (rectifier) circuit. The magnetic field reduces very quickly, giving short time of braking action and consequently rapid growth of braking torque. When switching off on DC voltage side, a high peak voltage is generated in the coil causing faster wear of contacts due to sparking.
For protecting the coil against peak voltages and protecting the contacts against excessive wear, the rectifier circuit is provided with protective facility allowing brake connection on DC voltage side.





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ELECTROMAGNETIC DISC BRAKES 2H2SP WITH CONSTANT BRAKING TORQUE



PN-EN 81-20
PN-EN 81-50



Used in lifting mechanisms are mechanical brakes, electrically released spring actuated disk brakes, designed on the basis of brake H2SP. This brake immobilizes the weight during damage, incorrect manoeuver or breakdown. The brake must transfer all forces occurring in such situations. To meet such requirements while maintaining the drive as simple as possible in the mechanical part, simple asynchronous motor is used controlled by frequency converters, provided with electromagnetic disk brake of design specific for hoisting systems. Safety considerations have required designing a braking mechanism with dual safety circuit and maximum reduction of noise level during dynamic operation of brake unit. Drive system fitted with brake 2H2SP operates very quietly in spite of maintaining all electrical and mechanical parameters.

The specific feature of this brake is that there are two brake discs installed on the common motor shaft, each with independent electromagnetic circuit while ensuring the braking moment necessary for correct operation of the drive. It's simple and compact design permits applications in elevator mechanisms, drive motors, which should ensure smooth operation and redundant safety circuits. An additional feature is that the brake with this design has mechanical specifications necessary for the drive function, whereas the installation dimensions are equal to classic brakes, which allows them to be used in the space available on drive motors.

Applications:

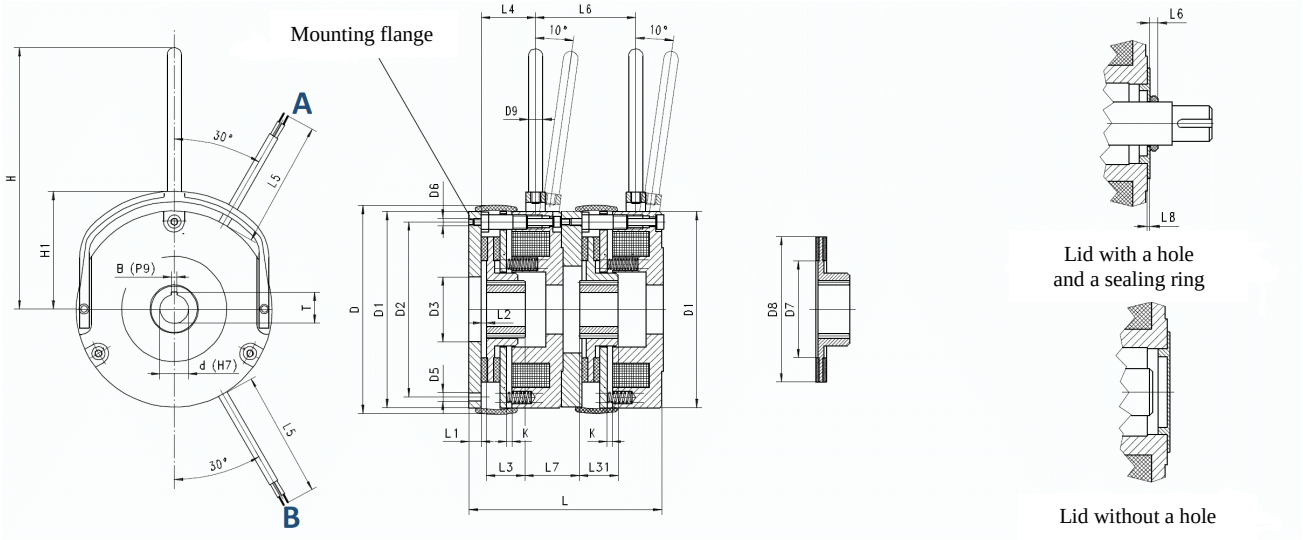
-passenger elevator drives, platforms, cranes, overhead travelling cranes - wherever one has to keep in mind strict regulations of technical supervisory authorities applicable to elevator equipment. Brakes meet strict safety regulations related to elevator design and installation defined in PN-EN 81-20, EN 81-50 standards.

Parameters			Unit	Brake type											
				2H2SP 63	**2H2SP 71**	**2H2SP 80**	**2H2SP 90**	**2H2SP 100**	**2H2SP 112**	**2H2SP 132**	**2H2SP 160**	**2H2SP 180**	**2H2SP 200**	**2H2SP 280**	**2H2SP 315**
Supply voltage		U_n	[V]	24 , 104 , 180 , 207										24, 104, 180	
Power		$P_{20°}$	[W]	2x20	2x25	2x30	2x30	2x40	2x50	2x55	2x65	2x75	2x100	2x250	2x340
Braking torque		M_h	[Nm]	2x4	2x8	2x16	2x20	2x32	2x60	2x100	2x150	2x240	2x500	2x1000	2x1600
Max. speed		n_{max}	min^{-1}	3000											
Weight		G	[kg]	2,1	4,4	7,8	7,8	12,5	17,0	25,0	36,0	58,0	92,0	163,0	245,0
Ambient temperature		T	^0C	-25 ÷ +40											
Operating time *	On direct voltage side	$t_{0,1}$	ms	35	65	90	90	120	150	180	300	400	500	500	600
		$t_{0,9}$		17	35	40	40	50	65	90	110	200	270	300	500
	On alternating voltage side	$t_{0,1}$	ms	35	65	90	90	120	150	180	300	400	500	500	600
		$t_{0,9}$		Brake disconnection on alternating current side causes about five-times growth in braking time t_{09} with respect to disconnection on direct current side											

$t_{0,1}$ - releasing time (from switching on current to drop in braking torque to 10% M_{nom})
$t_{0,9}$ - braking time (from switching off current to attaining 90% M_{nom})

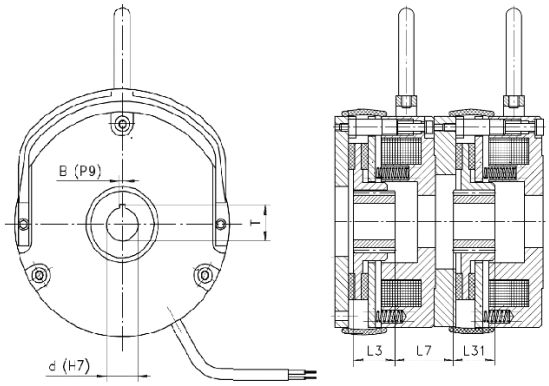
*) Values of releasing and braking times are given as approximations, since they depend on mode of assembly/installation, temperature and power supply.

Cable output :
A – 2H2SP100 , 2H2SP112 , 2H2SP132 , 2H2SP160, 2H2SP180, 2H2SP280, 2H2SP315
B – 2H2SP63 , 2H2SP71 , 2H2SP80 , 2H2SP90 , 2H2SP200



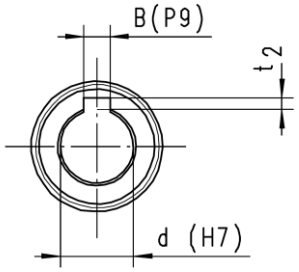
Type	M_h [Nm]	D	D1	D2	D3	D5	D6	D7	D8	D9	L	L1	L2	L3	L31	L4	L5	L6	L7	K	H	H1
2H2SP63	2x4	87	84	72	25	4,5x3	M4x3	47	62	8	86	6	1,8	18	24	25	450	45	23	0,2	100	51
2H2SP71	2x8	106	102	90	30	5,5x3	M5x3	59	76	8	97	7	2,5	20	27	28	450	50	25	0,2	115	61
2H2SP80	2x16	132	125	112	44	6,4x3	M6x3	61	95	10	118	9	3,5	20	28	34	450	61	32	0,2	170	73
2H2SP90	2x20	132	125	112	44	6,4x3	M6x3	61	95	10	118	9	3,5	20	28	34	450	61	32	0,2	170	73
2H2SP100	2x32	157	148	132	45	6,4x3	M6x3	74	114	10	133	9	3	25	34	37	450	69	34	0,3	184	94
2H2SP112	2x60	169	162	145	55	8,4x3	M8x3	90	124	12	156	11	3	30	42	40	450	80	37	0,3	191	102
2H2SP132	2x100	195	188	170	84	8,4x3	M8x3	100	154	12	170	11	3	30	42	40	450	88	45	0,3	204	116
2H2SP160	2x150	221	215	196	104	9,0x4	M8x6	130	176	12	190	11	4,5	35	45	52	450	110	55	0,3	230	129
2H2SP180	2x240	257	252	230	134	11x6	M10x6	148	207	14	220	11	5	40	55	62	800	115	60	0,5	339	157
2H2SP200	2x500	308	302	278	120	11x6	M10x6	198	255	14	250	12,5	6	50	65	80	800	130	70	0,5	466	182
2H2SP280	2x1000	356	342	308	150	13x6	M12x6	200	270	20	306	25	0	70	80	90	1500	150	70	0,6	408	206
2H2SP315	2x1600	412	400	360	170	13x6	M12x6	210	300	20	340	25	0	80	90	98	1500	180	76	0,6	434	232

Geared bushing hole diameters



Type	d	B	T	d_{max}	d_{smax} *	L3	L31	L7
2H2SP63	15	5	17,3	15		18	24	23
2H2SP71	15	5	17,3	15		20	27	25
2H2SP80	19	6	21,8	25		20	28	32
2H2SP90	19	6	21,8	25		20	28	32
2H2SP100	25	8	28,3	25		25	34	34
2H2SP112	25	8	28,3	35**		30	42	37
2H2SP132	35**	8	38,3	35**		30	42	45
2H2SP160	40	12	43,3	45	50	35	45	55
2H2SP180	42	12	45,3	45	50	40	55	60
2H2SP200	42	12	45,3	45	75	50	65	70
2H2SP280	55	16	59,3	75		70	80	70
2H2SP315	70	20	74,9	100		80	90	76

Normalized hole diameter ranges



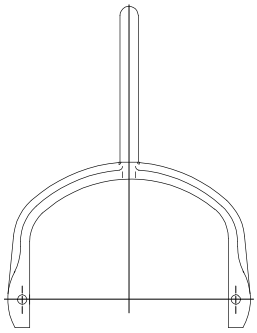
Hole diameter [mm]	B	t_2
above - to		
10 - 12	4	1,8
12 – 17	5	2,3
17 – 22	6	2,8
22 – 30	8	3,3
30 – 38	10	3,3
38 – 44	12	3,3
44 – 50	14	3,8
50 – 58	16	4,3
58 - 65	18	4,4
65 - 75	20	4,9
75 - 85	22	5,4
85 - 95	25	5,4
95 -110	28	6,4

d - standard geared bushing hole diameters
d smax - maximum geared bushing hole diameters
d* smax - at extra charge it is possible to manufacture the brakes with the specially increased diameter of the gear hub
** for the 2H2SP112 and 2H2SP132 brakes and for the geared bushing hole diameters from 32 to 35mm, the key groove with the width of 8 mm (the width of the groove is incompatible with PN/M-85005 and DIN 6885 standards)

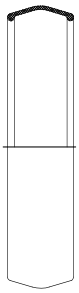
BRAKES EQUPMENT :



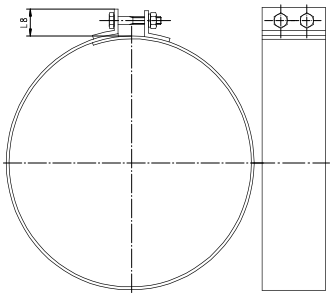
Mounting flange



Lever for manual release

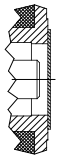


Brake cover

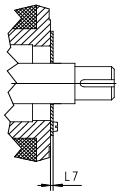


IP56 brake cover

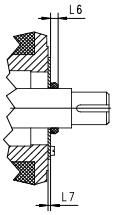
Type	L8
2H2SP56	10
2H2SP63	12
2H2SP71	12
2H2SP80	10
2H2SP90	10
2H2SP100	12
2H2SP112	14
2H2SP132	14
2H2SP160	14
2H2SP180	14
2H2SP200	14
2H2SP280	14
2H2SP315	14



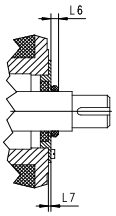
Lid
without a hole



Lid
with a hole



Lid with a hole
and a sealing ring



Lid with a hole
and special packing

ELECTRICAL EQUIPMENT

A number of modules, ranging from simple circuits with classic designs, to complex assemblies ensuring quick action and drives positioning have been designed to drive the brakes. Relevant brake applications with switching in the primary or secondary circuits are ensured by half- or full-wave rectifiers and fast electronic circuits. The manufacturer recommends to use as low alternating current voltages as possible to supply the brakes. Appropriate choice of the control voltage will prevent or at least limit surges that may occur in power supply circuits. It is not recommended to use extensively long control wiring, which would be a source of harmful surges.

Rectifier B2-1P

The B2–1P rectifiers series forms a complete wave rectifier unit for direct installation. The terminal strip provided facilitates installation and connection to the circuit.

Rectifier B2-1P cooperates with brakes 2H2SP63 ÷ 2H2SP200.

RECTIFIER PARAMETERS			
		B2-1P-400	B2-1P-600
Maximum input voltage (alternating voltage AC)	U_{IN}	400 VAC	600 VAC
Maximum output voltage (direct voltage DC)	U_{OUT}	0,45 U_{IN}	0,45U_{IN}
Maximum continuous output current rectifier	I_{OUT}	2A	2A

For example

Maximum input voltage
(alternating voltage) - U_{IN} = 230VAC,

The resulting output voltage of the rectifier
(direct voltage) - 0,45U_{IN}= 0,45 x 230=104VDC

Rectifier B5-1P

The B5–1P rectifiers series forms a complete wave rectifier unit for direct installation. The terminal strip provided facilitates installation and connection to the circuit.

Rectifier B5-1P cooperates with brakes 2H2SP63 ÷ 2H2SP315.

RECTIFIER PARAMETERS			
		B5-1P-400	B5-1P-600
Maximum input voltage (alternating voltage AC)	U_{IN}	400 VAC	600 VAC
Maximum output voltage (direct voltage DC)	U_{OUT}	0,45 U_{IN}	0,45U_{IN}
Maximum continuous output current rectifier	I_{OUT}	5A	5A

For example

Maximum input voltage
(alternating voltage) - U_{IN} = 230VAC,

The resulting output voltage of the rectifier
(direct voltage) - 0,45U_{IN}= 0,45 x 230=104VDC

Rectifier B2-2P

The B2–2P rectifiers series forms a complete full-wave rectifier unit for direct installation. The terminal strip provided facilitates installation and connection to the circuit. The rectifier allows feeding input voltage max. 400VAC, 2A which after rectification provides DC voltage of value equal to 0,9 input voltage.

Rectifier B2-2P cooperates with brakes 2H2SP63 ÷ 2H2SP200.

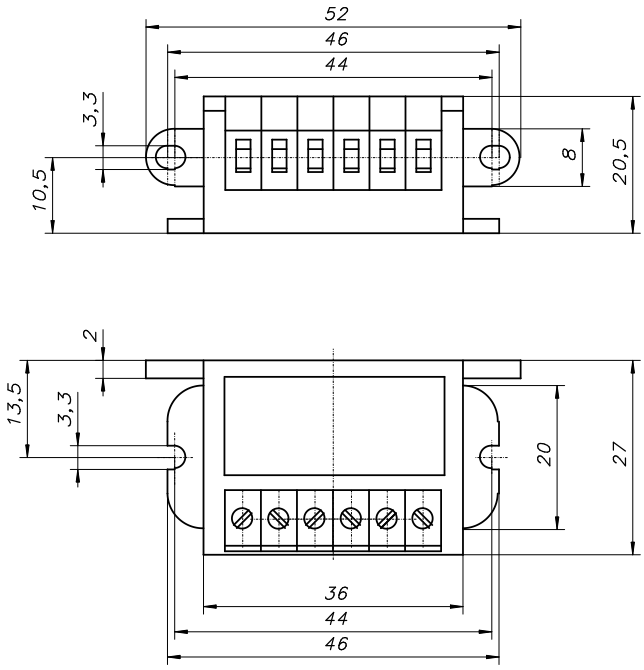
RECTIFIER PARAMETERS		
Maximum input voltage (alternating voltage AC)	U_{IN}	250 VAC
Maximum output voltage (direct voltage DC)	U_{OUT}	$0{,}9U_{IN}$
Maximum continuous output current rectifier	I_{OUT}	2A

For example

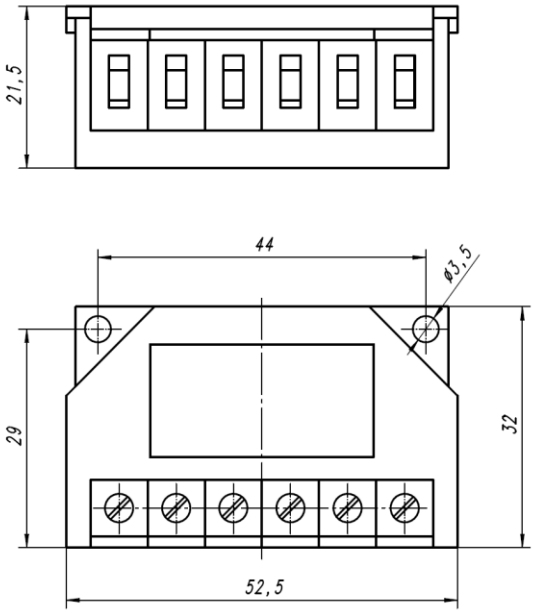
Maximum input voltage (alternating voltage) - U_{IN} = 230VAC,
The resulting output voltage of the rectifier (direct voltage) - $0{,}9U_{IN}$= 0,9 x 230=207VDC

Rectifiers dimensions

B2-1P-400,
B5-1P-400,
B2-2P

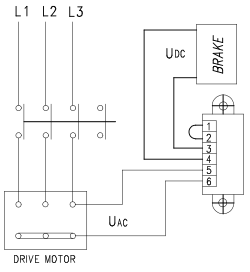


B2-1P-600,
B5-1P-600



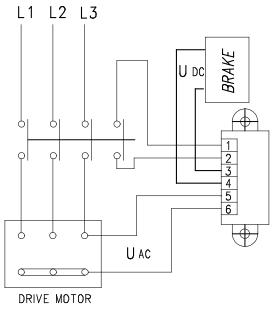
Disconnection of power supply on AC side

The diagram presents connection of rectifiers to supply circuit of motor. When disconnecting the voltage, the magnetic field causes the coil current to flow further through the rectifying diodes and drops slowly. The magnetic field reduces gradually causing prolonged time of braking action and consequently delayed increase of braking torque. If action time is irrelevant, brake should be connected on the AC side. When switching off, the supply circuits act as rectifying diodes.

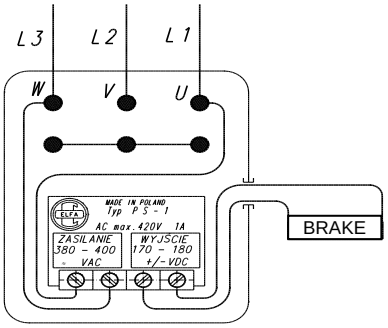


Disconnection of power supply on DC side

The diagram presents connection of rectifiers into electric motor circuit. The coil current is interrupted between the coil and supply (rectifier) circuit. The magnetic field reduces very quickly, **giving short time of braking action and consequently rapid growth of braking torque**. When switching off on DC voltage side, a high peak voltage is generated in the coil causing faster wear of contacts due to sparking. For protecting the coil against peak voltages and protecting the contacts against excessive wear, the rectifier circuit is provided with protective facility allowing brake connection on DC voltage side.



Rectifier PS-1



Circuit PS-1 is built on the basis of MOSFET type semiconductor technique which enabled achieving effects not available in traditional designs. The brake electromagnet energized through circuit of this construction enables the brake to achieve connection and disconnection time parameters analogous to breaking of circuit on direct current side. The parameters obtained are not however gained through utilization of additional electrical circuits and switches.

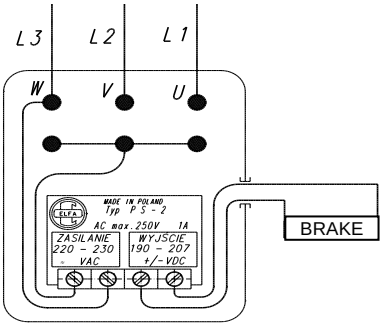
Simplicity of installation and parameters achieved enable very wide application, particularly in cases requiring positioning of drives, operation with high frequency of actuations compounded with repeatability of brake connecting and disconnecting times.

Supply circuit PS-1 forms a complete unit for direct installation. Provided with a four-terminal strip, it enables unhindered adaptation in every cooperating circuit. The circuit is adapted for supply from alternating current source of 380-400 VAC max. 420 VAC which after rectification and appropriate formation enables obtaining direct voltage of 170-180 VDC for brake supply.

The diagram below shows the method of connecting the circuit PS 1 into supply circuit of brake cooperating with 3x400 VAC electric motor with star-connected winding.

Rectifier PS-1 cooperates with brakes 2H2SP63 ÷ 2H2SP180.

Rectifier PS-2



Circuit PS-2 is built on the basis of MOSFET type semiconductor technique which enabled achieving effects not available in traditional designs. The brake electromagnet energized through circuit of this construction enables the brake to achieve connection and disconnection time parameters analogous to breaking of circuit on direct current side. The parameters obtained are not however gained through utilization of additional electrical circuits and switches.

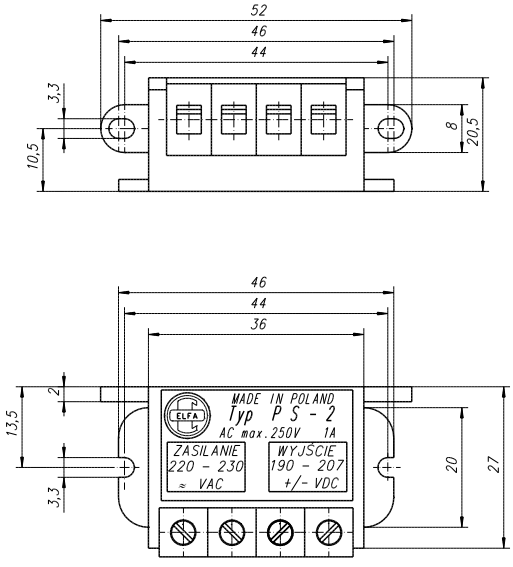
Simplicity of installation and parameters achieved enable very wide application, particularly in cases requiring positioning of drives, operation with high frequency of actuations compounded with repeatability of brake connecting and disconnecting times.

Supply circuit PS 2 forms a complete unit for direct installation. Provided with a four-terminal strip, it enables unhindered adaptation in every cooperating circuit. The circuit is adapted for supply from alternating current source of 220-230 VAC max. 250 VAC which after rectification and appropriate formation enables obtaining direct voltage of 190-207 VDC for brake supply.,

The diagram below shows the method of connecting the circuit PS 2 into supply circuit of brake cooperating with 3x400 VAC electric motor with star-connected winding.

Rectifier PS-2 cooperates with brakes 2H2SP63 ÷ 2H2SP200.

Rectifiers PS-1, PS-2 dimensions

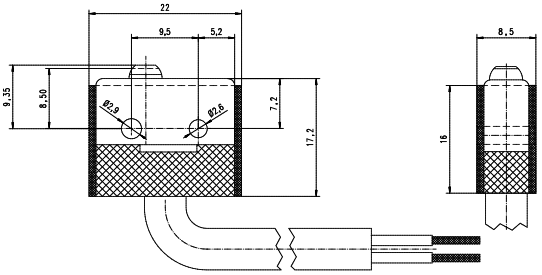


CONTROL AND SIGNALING CIRCUTS – microswitches

Having in mind the user who requires the control of the brake, we have designed special signaling and control circuits, which enable to control the state of the brake (engaged, disengaged) and the wear of the plate lining. The usage of these circuits enables to control the brake with the use of automatic elements, which ensure high level of safety and reliability. Due to its compact design, the microswitch can be used in any other applications, as long as its parameters meet design requirements.

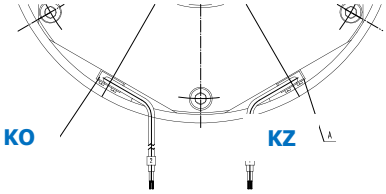
MICROSWITCHES - ELECTRIC PARAMETERS			
Switch parameter	**Switch KZ**	**Switch KO**	**Inductive sensor**
Max. voltage AC	250 V AC	250 V AC	
Max. AC switching current	5 A	6 A	
Max. Voltage DC	28V DC	220V DC	10 ÷ 30 VDC
Max. DC switching current	3 A / 28V DC	6A / 12V DC 3A / 24V DC 1A / 60V DC 0,5A / 110V DC 0,25A / 220V DC	100mA
Protection rating	IP 66	IP 66	IP 67
Terminals	NO /NC	NO /NC	NO

MICROSWITCH DIMENSIONS



Response monitoring microswitch – **KZ** or **IKZ** (KZ – microswitch, IKZ – inductive sensor) **–** control of the state of brake (engaged, disengaged),

Microswitch of the brake lining control – KO or **IKO** (KO – microswitch, IKO – inductive sensor) **–** the microswitch indicates approaching the maximum wear of the brake disc and the necessity of the brake's regulation or replacement of the disc brake, which enables further work of the brake. The regulation procedure is described in the brake operating manual.



SAMPLE INSTALATION

Microswitches set **KZ+KO** or **IKZ + IKO** is available from type H2SP80 inclusive.

PROCTECTIVE CIRCUITS – thermal protection

To protect electromagnet windings against heat build-up (slow-changing overloads) thermal sensor are used. In our offer we have PTC thermistors, which feature high resistance gradients when their rated temperature is reached - posistors - P or bimetallic thermal sensor - B.

Posistor-based sensors are made in the form of an insulated pill with connecting wires extending inside a teflon insulation, installed directly on the electromagnet windings. Sensor circuit terminals are routed outside the brake to the terminal box and connected to a separate connection block or terminal strip. So-called resistance relays are intended for thermistorbased PTC temperature sensors. When temperature of at least one of the sensors rises above the rated value, the circuit resistance suddenly increases triggering the relay.

Posistor thermal protection – **P**

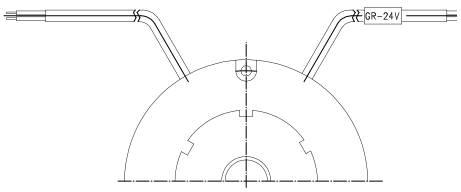
Note! PTC sensor terminals must not be connected directly to the contactor.

The brake protection has the form of a bimetallic sensor. Brake operation is controlled by a sensor or by a set of sensors, which ensure its safe operation; excessive temperature indication is obtained from the thermal switch installed inside the brake electromagnet's housing rated for a specific temperature. When the limit temperature for the sensor is exceeded, the information for the automatic control equipment is sent or the brake circuit is disconnected.

Bimetallic thermal protection – **B**

AUXILIARY CIRCUITS – anti-condensation heaters

The so-called parking heating is used to prevent vapours condensation inside the brake. The equipment is particularly useful in negative temperatures or in high humidity environments. The heater is supplied through its dedicated pair of wires. The heater power supply voltage matches customer requirements. – the need to define the voltage during order.



SAMPLE INSTALATION

Anti-condensation heaters – **GR -____V**



Note that simultaneous supply of the heater and brake electromagnet is not permitted.

2H2SP [ ] . [ ] [ ] . [ ] **VDC** [ ] **Nm d** [ ] [ ] **...**

MECHANICAL SIZE
63,71,80,90,100,112,132, 160,180,200,280,315

CONFIGURATION	
WITHOUT FITTING / ACCESORIES	1
LEVER FOR MANUAL RELEASE	2
MOUNTING FLANGE	3
LEVER FOR MANUAL RELEASE + MOUNTING FLANGE	4

Execution options for the customer's request:
- non-standard diameter of the sleeve gear brake d(H7)
- equipped with heating elements in the winding (need to define the voltage supply) – e.g. **GR___V**
- work at low temperatures -400C - **Z**
- posistor thermal protection - **P**
- bimetallic thermal protection - **B**
- other voltage brake
- response monitoring microswitch (engaged, disengaged) - **KZ** or **IKZ** (KZ – microswitch, IKZ – inductive sensor)
- microswitch of the brake lining control - **KO** or **IKO** (KO – microswitch, IKO – inductive sensor)
- microswitches set or inductive sensors set - **KZ+KO** or **IKZ+IKO**

EXAMPLE :

2H2SP 100. 10. 104VDC 2x32Nm d25 GR230VAC
2H2SP 80. 32. 180VDC 12Nm d19
2H2SP 112. 22. 24VDC 60Nm d25 KZ KO

DIAMETER OF SLEEVE GEAR d(H7)

CLIMATIC VERSION
ACCORDING TO STANDARDS : e.g. MT, TH

NOMINAL BRAKING TORQUE [Nm]											
2H2SP 63	2H2SP 71	2H2SP 80	2H2SP 90	2H2SP 100	2H2SP 112	2H2SP 132	2H2SP 160	2H2SP 180	2H2SP 200	2H2SP 280	2H2SP 315
2x4	2x8 2x6 2x3	2x16 2x12 2x5	2x20 2x16 2x12 2x5	2x32 2x24 2x16	2x60 2x45 2x30	2x100 2x80 2x60	2x150 2x120 2x75	2x240 2x180 2x120	2x500 2x360 2x270	2x1000 2x900 2x800 2x700 2x600	2x1600 2x1300 2x1050

OPERATING VOLTAGE [V DC]
24 , 104 , 180 , 207

PROTECTION RATING	
BASIC VERSION – WITH HOLE D4	0
VERSION IP 54 - WITHOUT HOLE D4	1
VERSION IP 54 - WITH HOLE D4 + V-RING SEALING	2
VERSION IP 55 - WITHOUT HOLE D4	3
VERSION IP 55 - WITH HOLE D4 + V-RING SEALING	4
VERSION IP 56 - WITHOUT HOLE D4 + IP56 BRAKE COVER	5
VERSION IP 56 – WITH HOLE D4 + SPECIAL SEALING + IP56 BRAKE COVER	6

The producer reserves the right to modify as a result of developing the product.
It is possible to realize special versions.



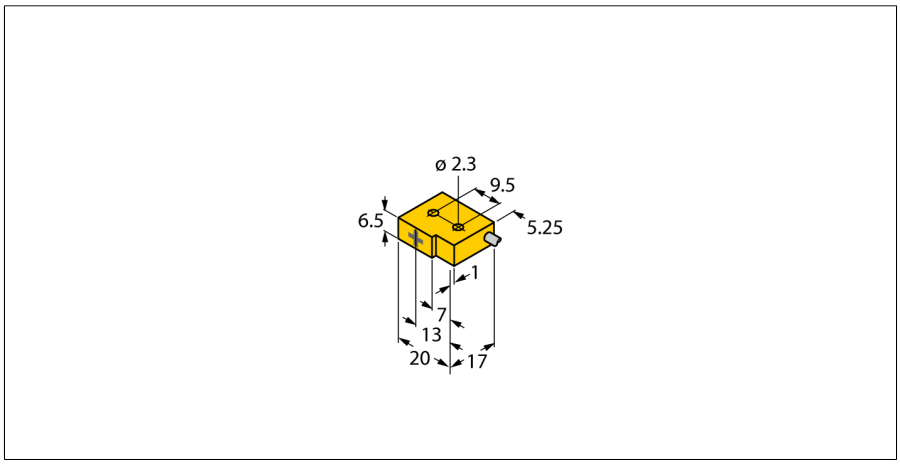
TURCK

Industrial Automation

SENSORS

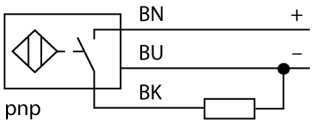
Sense it! Connect it! Bus it! Solve it!

Inductive sensor
Resistant to magnetic fields
BI1-Q6.5-AP6/S34



- **Rectangular, height 6.5 mm**
- **Active face, lateral**
- **Plastic, PP GR-20**
- **Resistant to magnetic fields (weld resistant), for DC and AC fields**
- **DC 3-wire, 10…30 VDC**
- **NO contact, PNP output**
- **Cable connection**

Wiring Diagram



Type designation	BI1-Q6.5-AP6/S34
Ident no.	4613401

Rated switching distance Sn	1 mm
Mounting conditions	flush
Assured switching distance	≤ (0,81 x Sn) mm
Correction factors	St37 = 1; Al = 0.1; stainless steel = 0.7; Ms = 0.25
Repeatability	≤ 2 % of full scale
Temperature drift	≤ ± 10 %
Hysteresis	3…15 %
Ambient temperature	-25…+70 °C

Operating voltage	10… 30VDC
Residual ripple	≤ 10 % U_{ss}
DC rated operational current	≤ 150 mA
No-load current I_0	≤ 15 mA
Residual current	≤ 0.1 mA
Isolation test voltage	≤ 0.5 kV
Short-circuit protection	yes/ cyclic
Voltage drop at I_e	≤ 1.8 V
Wire breakage / Reverse polarity protection	yes/ complete
Output function	3-wire, NO contact, PNP
Switching frequency	0.03 kHz

Construction	rectangular, Q6.5
Dimensions	20 x 17 x 6.5 mm
Housing material	Plastic, PP GR-20
Electrical connection	cable
Cable quality	2 mm, Gray, Lif9Y-11Y, PUR, 2m
Cable cross section	3 x 0.08 mm²
Litz wire	40x0.05mm
Vibration resistance	55 Hz (1 mm)
Shock resistance	30 g (11 ms)
Protection class	IP67
MTTF	2283 years acc. to SN 29500 (Ed. 99) 40 °C

Functional principle

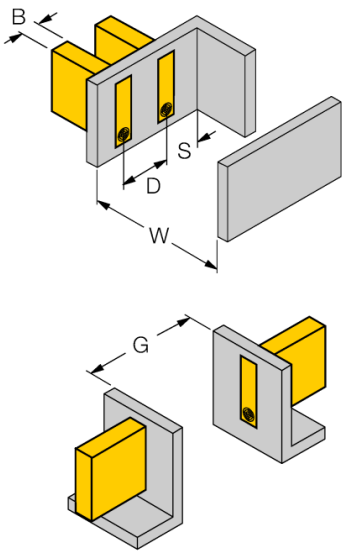
Inductive sensors detect metal objects contactless and wear-free. For this purpose they use a high-frequency electromagnetic AC field that interacts with the target. The sensors hosting a ferrite core coil generate the AC field through an LC resonant circuit. Magnetic field sensors incorporate a special ferrite core making them immune to magnetic AC and DC fields. Hence, they can be applied in welding systems.

Edition • 2016-11-04T07:23:41+01:00

Inductive sensor
Resistant to magnetic fields
BI1-Q6.5-AP6/S34

Distance D	2 x B
Distance W	3 x Sn
Distance S	1 x B
Distance G	6 x Sn

Width of the active face B	6.5 mm



Note for installation in ST37:
4-side flush mounting is not possible

Edition • 2016-11-04T07:23:41+01:00

Hans Turck GmbH & Co.KG ● D-45472 Mülheim an der Ruhr ● Witzlebenstraße 7 ● Tel. 0208 4952-0 ● Fax 0208 4952-264 ● more@turck.com ● www.turck.com

TURCK

Industrial Automation

Qty

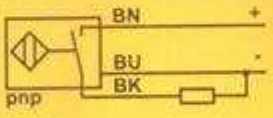
1

Type

BI1-Q6,5-AP6/S34

Ident-No. 4613401

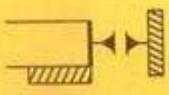
CE



10...30 VDC
150 mA Ⓚ

IP67

c UL us
LISTED
36 GN
Class 2 Source
IND.CONT.EQ.
Enclosure Type 1



Sn: 1 mm

Warning:Hazardous voltage can cause electrical shock and burns.
Disconnect power before proceeding with any work on this equipment.

Made in Switzerland
Hans Turck GmbH & Co. KG · Witzlebenstraße 7 · 45472 Mülheim/Ruhr · Germany
Phone +49 208 49 52-0 · Fax +49 208 49 52-264 · more@turck.com · www.turck.com

1618I

13. Appendix 5 – Drive Shaft

Kunde *customer*	**Serapid France, Rouxmesnil-Bouteilles, France**				
Projekt *project*	**D01: THE-20766-1CF2-0-Rev.B** **Gelenkwellen für Hubsystem, cardan shafts for lifting system**				
Sass Projekt *Sass project*	**EP8329**	*Kundenbestellung Nummer customer order number*	**-**	Sass Auftrag Nummer *Sass order number*	**-**

Lieferumfang scope of delivery

Gilt als Ersatzteil + Stückliste validity as parts + spare parts list

	St *pcs*	Benennung *Description*	*Maß size mm*	Sass ID Client ID	Zeichnungsnummer *drawing number*	Bemerkung *remarks*
01	1	Gelenkwelle *cardan shaft*	LE=779 L1=745	50005602630104330745 1030-0	A-500-009-0202-075-0745-R	-
02	1	Gelenkwelle *cardan shaft*	LE=779 L1=745	50005602630104330745 1030-0	A-500-009-0202-075-0745-R	-
03	1	Gelenkwelle *cardan shaft*	LE=952 L1=920	50005602630104330920 1030-1	A-500-009-0202-075-0920-R	-
04	1	Gelenkwelle *cardan shaft*	LE=1025 L1=995	50005602630104330995 1030-2	A-500-009-0202-075-0995-R	-
05	1	Gelenkwelle *cardan shaft*	LE=1229 L1=1195	50005602630104331195 1030-5	A-500-009-0202-075-1195-R	-
06	1	Gelenkwelle *cardan shaft*	LE=1514 L1=1480	50005602630104331480 1030-4	A-500-009-0202-075-1480-R	-
07	1	Gelenkwelle *cardan shaft*	LE=1869 L1=1835	50005602630104331835 1030-3	A-500-009-0202-075-1835-R	-
08	3	Anschlussflansch *companion flange*	Ø16/Ø8,5	- 1106-2	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
09	4	Anschlussflansch *companion flange*	Ø24/Ø8,5	- 1112-2	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
10	2	Anschlussflansch *companion flange*	Ø28/Ø12,5	- 1115-4	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
11	3	Anschlussflansch *companion flange*	Ø35/Ø12,5	- 1119-5	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
12	2	Anschlussflansch *companion flange*	Ø38/Ø12,5	- 1121-5	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*

Gelenkwellenfabrik Wilhelm Sass KG
E-mail: verkauf@w-sass.de
Brookstraße 14
22145 Stapelfeld
Telefon: +49(0)40-22 63 301-0
Telefax: +49(0)40-22 63 301-19

www.gelenkwellenfabrik.de

13	14	Satz Sechskantschrauben *set of hexagon bolts*	M6x16 DIN 933 X6 = 84 St/pcs	S.010.367 S010-11		
14	1	Satz Technische Dokumentation in Deutsch und Englisch 9800119, in Papier oder/und als pdf Datei, je bestehend aus: Technische Datenblatt, Einbauzeichnungen, Gebrauchsanleitung mit Einbau- und Wartungsanweisung, Sicherheitshinweisen, Schmiermittelanweisung und alternative Schmierstoffangaben *Set technical documentation in German and English 9800119, in paper back or/and as pdf file, each consist of:* *technical data sheet, drawings, instruction manual with installation and maintenance instruction, safety information, greasing regulations and alternative lubricants*				

Technische Daten technical data

Antrieb *propulsion*

Type	Elektromotor *electric motor*	Leistung kW *power kW*	-	Drehzahl U/min *Revolution rpm*	-	Übersetzung *ratio*	-

Betriebsbedingungen *operational conditions*

Teil einer Anlage mit Überdachung oder im Freien
part of a indoors or outdoors plant

Temperatur °C *temperature °C*	- 30 bis *to* + 120	Einbaulage *operational level*	horizontal *horizontal*

Schmierung *lubrication*

Verschiebung *slip unit*	Wartungsfrei, Keilnabe Rilsan beschichtet mit Profilschutz *service free, sleeve part Rilsan coated with spline protection*		
Gelenkkreuze *universal joints*	Zentralschmierung am Kreuzkörper mit Schmiernippel (DIN71412 mit Kunststoff Schutzkappe) *central greasing system on universal joint body with greasing nipple (DIN71412 with plastic cap)*		
Büchsenlagerung *bearing at cups*	Rollenlager *roller bearings*	Schmiermittel *lubricant*	Fuchs Renolit LX-PEP 2

Die Kardanwellen werden von uns im betriebsbereiten Zustand geliefert. Ein Abschmieren vor der Inbetriebnahme ist daher unter normalen Bedingungen nicht nötig. Flanschflächen müssen vor der Montage blank und sauber sein.
The cardan shafts are ready for operation. Under normal circumstances no extra greasing before start is needed. Cardan flange faces have to be clean and blank before assembling.

Betriebsdaten Pos. ***operational data item***	**01-07**	**-**	**-**	**-**	**-**	**Bemerkung** ***remarks***
max. Drehmoment Nm *max. torque Nm*	450	-	-	-	-	
Grenzdrehmoment Nm *limit torque Nm*	650	-	-	-	-	
Betriebsdrehmoment Nm *operational torque Nm*	14-29	-	-	-	-	
Betriebsdrehzahl U/min *operational revolution rpm*	990	-	-	-	-	
Max. möglicher Beugewinkel *max. available deflection angle*	24°	-	-	-	-	
Beugewinkel im Arbeitsbetrieb *deflection angle in operation*	1° - 8°	-	-	-	-	

Gewicht und Massenträgheitsmoment siehe entsprechende Zeichnung
Weigh and, inertia moment see corresponding drawing

Auswuchten ***balancing***	Gelenkwellen nach DIN ISO 1940 – G16 *cardan shafts according to DIN ISO 1940 – G16*
Markierung ***marking***	Alle Gelenkwellen und Anschlussflansche werden mit den kundeneigenen ID Nummern versehen *cardan shafts and adapter flanges labelled with customer ID numbers*

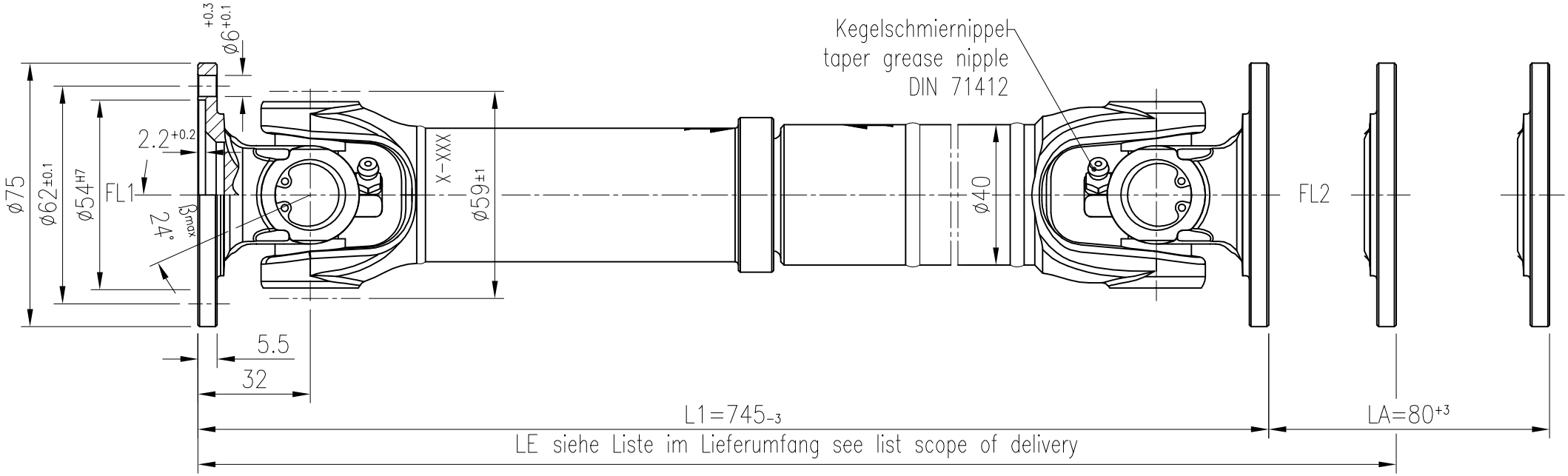
Korrosionsschutz *corrosion protection*

Bennennung	**description**	**Farbton**	***colour***	**RAL**	
Grundierung	*primary coat*	-	-	-	
2 Komponenten PU Decklack	*2 component PU final coat*	gelb glänzend	*yellow glossy*	1003	
Anschlussflansche mit Außenkörper Anstrich	*companion flange with outside painting*				
Nabenpassungen mit Ölfilm korrosionsgeschützt	*sleeve fit with oil film protection*				
Flanschoberflächen mit Korrosionsschutzfilm	*face of flanges with anti-corrosion film*				

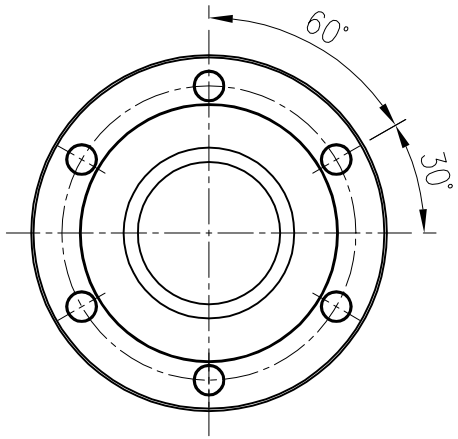
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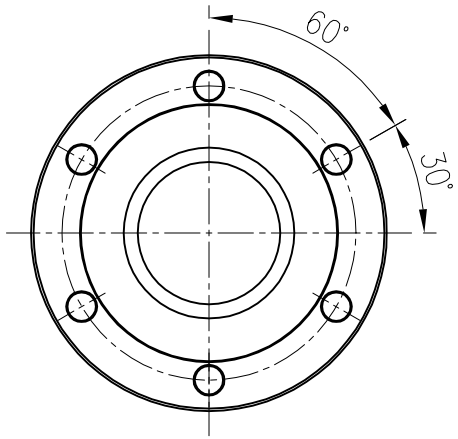
Gelenkwellenfabrik Wilhelm Sass KG
E-mail: verkauf@w-sass.de
Brookstraße 14
22145 Stapelfeld
Telefon: +49(0)40-22 63 301-0
Telefax: +49(0)40-22 63 301-19



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.001156 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

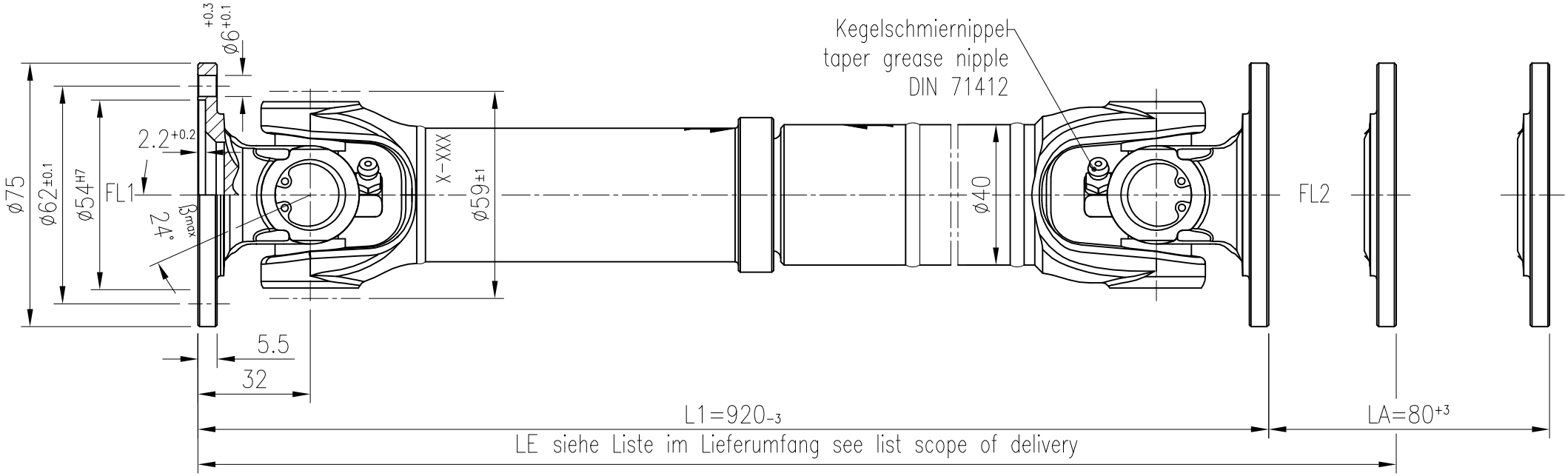
Vertraulich: Alle Rechte vorbehalten, kopieren nur mit Genehmigung der Wilhelm Sass KG
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Tel.: 040-2263301-0
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info@w-sass.de

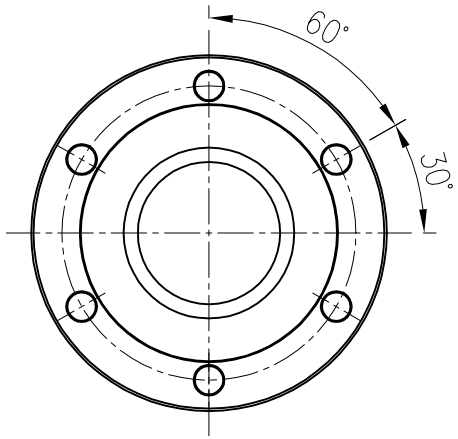
Maßstab Scale					
Gewicht Weight 3.6kg	0	Made	08.07.16	Stoll	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

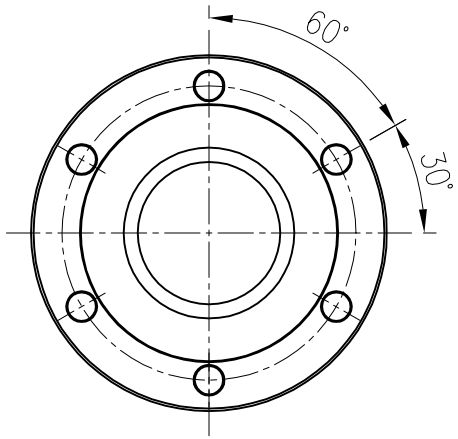
Artikelnummer Part Number	Zeichnungsnummer Drawing Number	Format Form
	A-500-009-0202-075-0745-R	A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA) (length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten (ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit inertia moment 0.001274 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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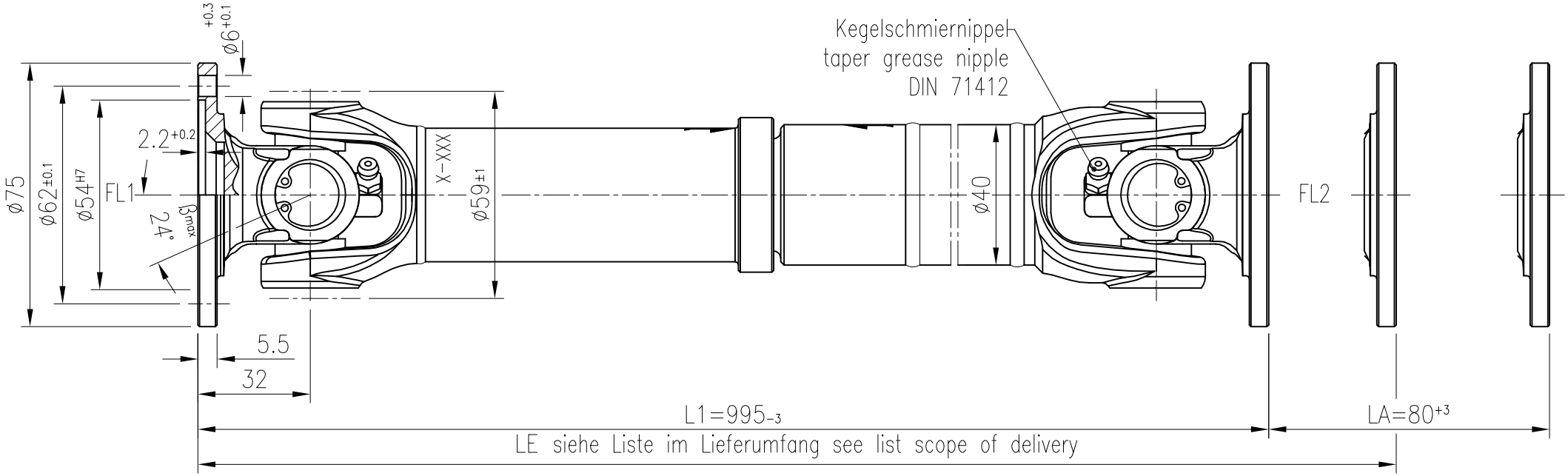
Maßstab Scale					
Gewicht Weight 3.9kg	0	Made	05.01.21	Förster	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

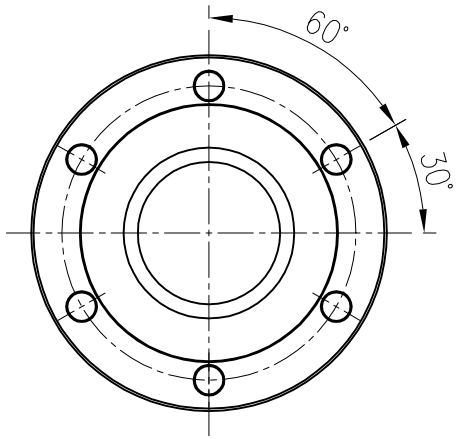
Artikelnummer Part Number:

Zeichnungsnummer Drawing Number: A-500-009-0202-075-0920-R

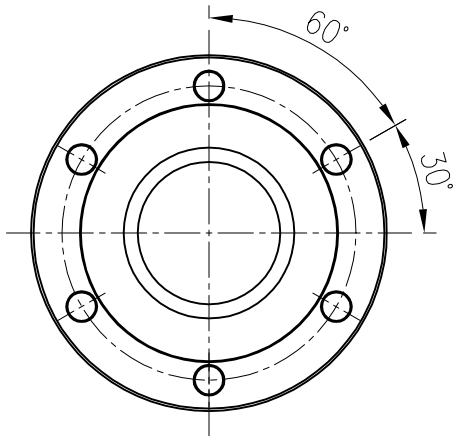
Format Form: A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.001324 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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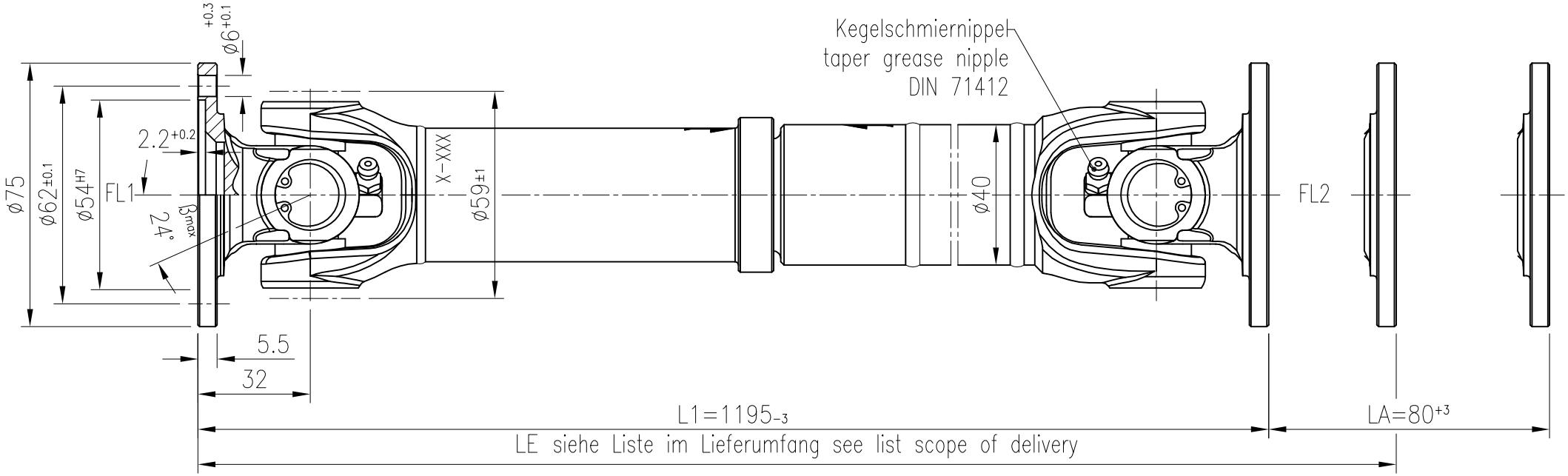
Maßstab Scale	– –				
Gewicht Weight	4.1kg	0	Made	04.01.24	Stoll
		Revision	Bezeichnung description	Datum date	bearbeitet revised

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

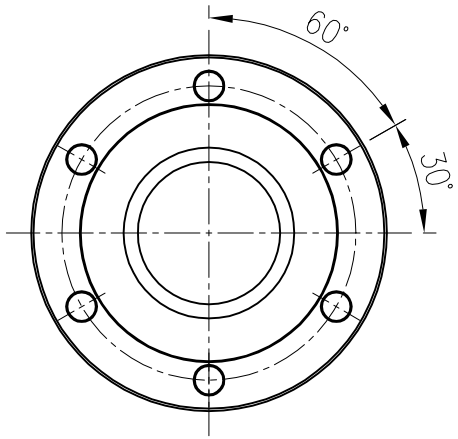
Artikelnummer Part Number:

Zeichnungsnummer Drawing Number: A-500-009-0202-075-0995-R

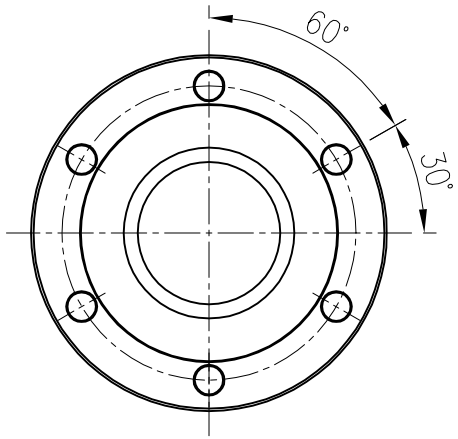
Format Form: A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA) (length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten (ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit inertia moment 0.001459 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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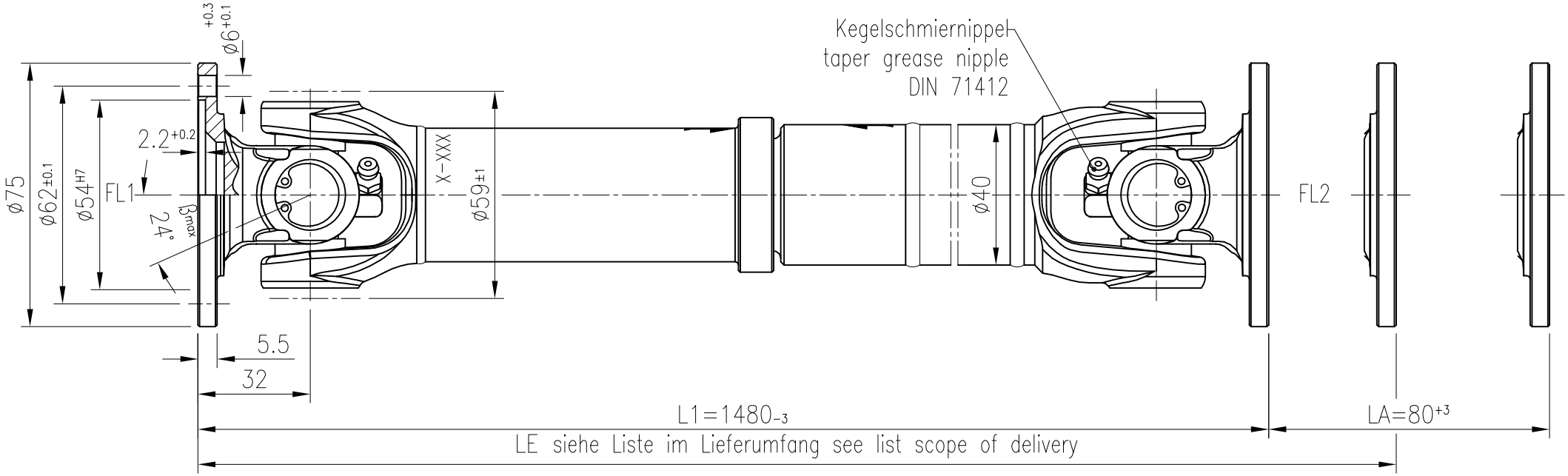
Maßstab Scale					
Gewicht Weight 4.4kg	0	Made	08.01.20	Stoll	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

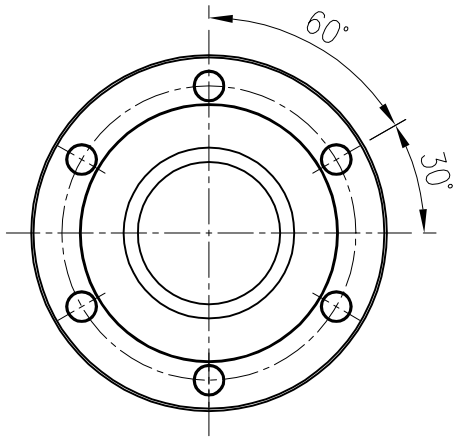
Artikelnummer Part Number:

Zeichnungsnummer Drawing Number: A-500-009-0202-075-1195-R

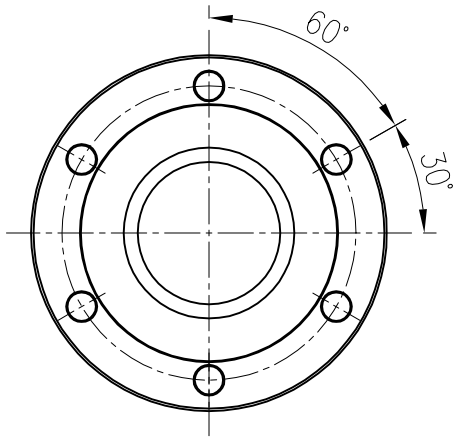
Format Form: A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.001651 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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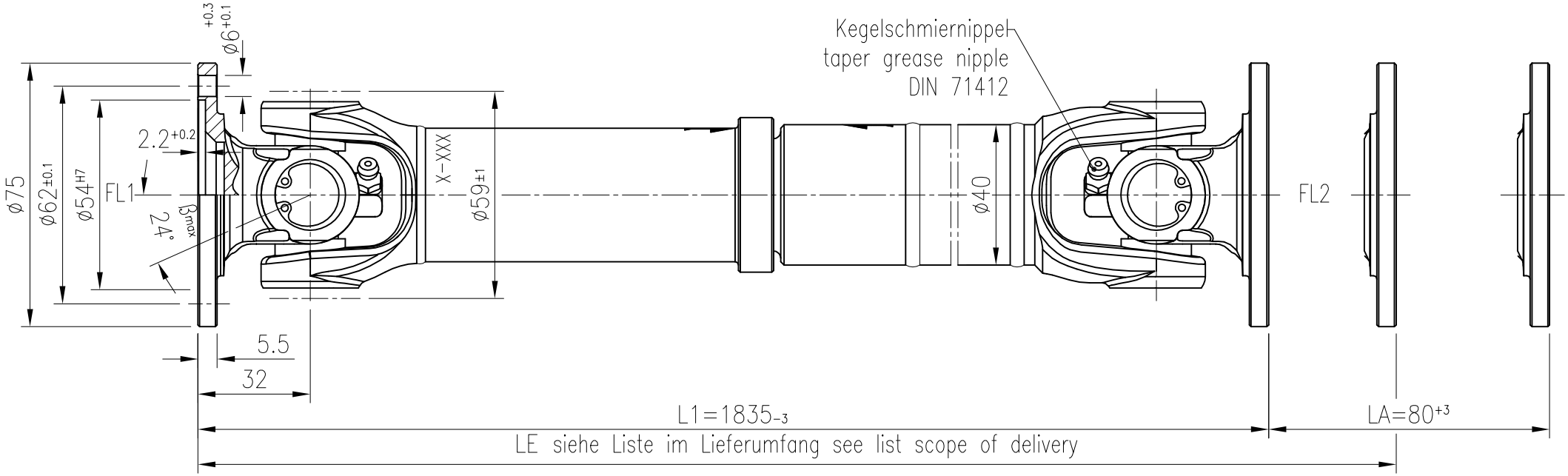
Maßstab Scale					
Gewicht Weight 5.0kg	0	Made	29.11.19	Stoll	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

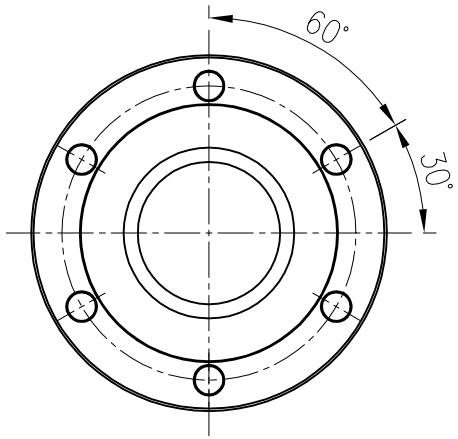
Artikelnummer
Part Number

Zeichnungsnummer
Drawing Number: A-500-009-0202-075-1480-R

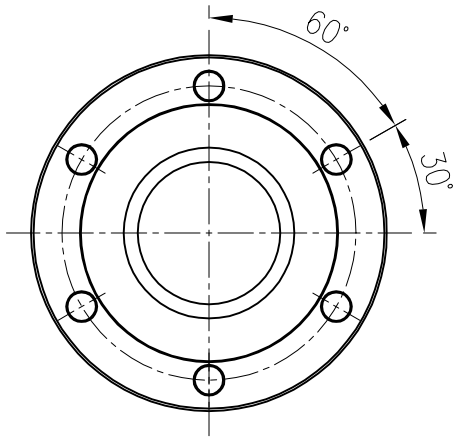
Format
Form: A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.001890 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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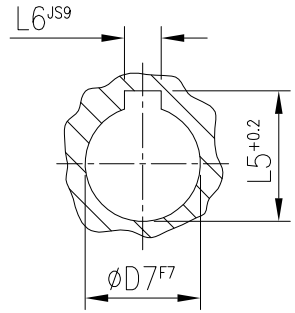
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Fax.:040-2263301-19
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Maßstab Scale	– –				
Gewicht Weight	5.6kg	0	Made	25.10.22	Stoll
		Revision	Bezeichnung description	Datum date	bearbeitet revised

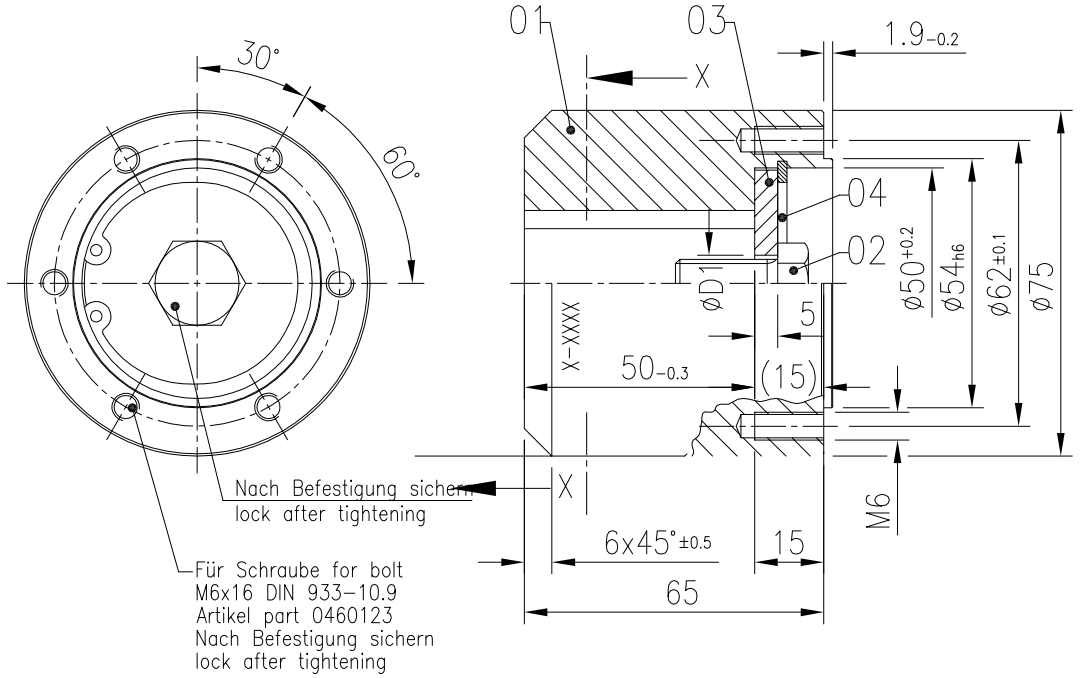
Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

Artikelnummer Part Number	Zeichnungsnummer Drawing Number	Format Form
	A-500-009-0202-075-1835-R	A4

Schnitt section X–X



Seeger Ring Circlip Position item 04	
DIN 472	Sass ID
ø50x2	0600047



Anschlussflansch companion flange Position item 01				Zentralschraube Center bolt Position item 02		Unterlegscheibe washer Position item 03		Serapid ID	Gewicht gesamt weight total [Kg]
ØD7	L6	L5	Sass ID	DIN 933–10.9	Sass ID	ØD1	Sass ID	SER–ZE000–	
ø10	3	11.4	0400901	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	2.00
ø12	4	13.8	0400902	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	1.98
ø13	5	15.3	0400903	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	1.97
ø14	5	16.3	0400904	M4x16*	0460159	ø5.5 (M5+M4)	0600074	1104–0	1.97
ø14	5	16.3	0400904	M5x16	0460023	ø5.5 (M5+M4)	0600074	1104–1	1.97
ø14	5	16.3	0400904	M6x20	0460012	ø8.5 (M6+M8)	0600057	1104–2	1.96
ø15	5	17.3	0400905	M6x20	0460012	ø8.5 (M6+M8)	0600057	1105–2	1.96
ø16	5	18.3	0400906	M5x16	0460023	ø5.5 (M5+M4)	0600074	1106–1	1.95
ø16	5	18.3	0400906	M6x20	0460012	ø8.5 (M6+M8)	0600057	1106–2	1.94
ø17	5	19.3	0400907	–	–	–	–	–	1.94
ø18	6	20.8	0400908	M6x20	0460012	ø8.5 (M6+M8)	0600057	1108–2	1.92
ø19	6	21.8	0400909	M6x20	0460012	ø8.5 (M6+M8)	0600057	1109–2	1.91
ø19	6	21.8	0400909	M8x20	0460042	ø8.5 (M6+M8)	0600057	1109–3	1.91
ø20	6	22.8	0400910	M8x20	0460042	ø8.5 (M6+M8)	0600057	1110–3	1.90
ø22	6	24.8	0400911	–	–	–	–	–	1.88
ø24	8	27.3	0400912	M6x20	0460012	ø8.5 (M6+M8)	0600057	1112–2	1.84
ø24	8	27.3	0400912	M8x20	0460042	ø8.5 (M6+M8)	0600057	1112–3	1.84
ø24	8	27.3	0400912	M10x25	0460033	ø12.5 (M10+M12)	0600058	1112–4	1.84
ø25	8	28.3	0400913	M8x20	0460042	ø8.5 (M6+M8)	0600057	1113–3	1.83
ø25	8	28.3	0400913	M10x25	0460033	ø12.5 (M10+M12)	0600058	1113–4	1.83
ø26	8	29.3	0400914	M6x20	0460012	ø8.5 (M6+M8)	0600057	1114–2	1.81
ø26	8	29.3	0400914	M8x20	0460042	ø8.5 (M6+M8)	0600057	1114–3	1.81
ø28	8	31.3	0400915	M8x20	0460042	ø8.5 (M6+M8)	0600057	1115–3	1.78
ø28	8	31.3	0400915	M10x25	0460033	ø12.5 (M10+M12)	0600058	1115–4	1.78
ø28	8	31.3	0400915	M12x25	0460032	ø12.5 (M10+M12)	0600058	1115–5	1.78
ø30	8	33.3	0400916	M10x25	0460033	ø12.5 (M10+M12)	0600058	1116–4	1.74
ø32	10	35.3	0400917	M8x20	0460042	ø8.5 (M6+M8)	0600057	1117–3	1.70
ø32	10	35.3	0400917	M10x25	0460033	ø12.5 (M10+M12)	0600058	1117–4	1.70
ø32	10	35.3	0400917	M12x25	0460032	ø12.5 (M10+M12)	0600058	1117–5	1.70
ø34	10	37.3	0400918	–	–	–	–	–	1.66
ø35	10	38.3	0400919	M8x20	0460042	ø8.5 (M6+M8)	0600057	1119–3	1.64
ø35	10	38.3	0400919	M10x25	0460033	ø12.5 (M10+M12)	0600058	1119–4	1.64
ø35	10	38.3	0400919	M12x25	0460032	ø12.5 (M10+M12)	0600058	1119–5	1.65
ø36	10	39.3	0400920	–	–	–	–	–	1.62
ø38	10	41.3	0400921	M10x25	0460033	ø12.5 (M10+M12)	0600058	1121–4	1.57
ø38	10	41.3	0400921	M12x25	0460032	ø12.5 (M10+M12)	0600058	1121–5	1.58
ø38	10	41.3	0400921	M16x35	0460046	ø16.5 (M14+M16)	0600059	1121–7	1.59
ø40	12	43.3	0400922	M16x35	0460046	ø16.5 (M14+M16)	0600059	1122–7	1.53
ø42	12	45.3	0400923	M10x25	0460033	ø12.5 (M10+M12)	0600058	1123–4	1.47
ø42	12	45.3	0400923	M12x25	0460032	ø12.5 (M10+M12)	0600058	1123–5	1.47
ø42	12	45.3	0400923	M16x35	0460046	ø16.5 (M14+M16)	0600059	1123–7	1.48

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XXXXXX–X= ID Markierung einschließlich aller Kunden ID Daten
ID marking including all customers ID data

Achtung: Flanschlochkreisschnitt versetzt zur Hauptschnittebene
attention: section of hole circle different to main section

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>0.5 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2.0

Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage
general tolerances for radius, chamfer, angle, form and positition
nach according ISO 2768–1+2 (DIN 7168) m/Klasse K m/class K

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Maßstab Scale	– –				
Gewicht Weight					
	17	1106–2	26.04.22	Förster	
	16	1112–2	30.03.22	Stoll	
	15	1114–2	25.10.21	Förster	
	0	Made	23.09.09	Förster	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung
Name
Anschlussflansch nach DIN (ISO 7646)
companion flange according DIN (ISO 7646)

Artikelnummer
Part Number

Zeichnungsnummer
Drawing Number
A–040–52–075–L01

Format
Form
A4

Kunde *customer*	**Serapid France, Rouxmesnil-Bouteilles, France**				
Projekt *project*	**D02: THE-20766-2CF2-0-Rev.B** **Gelenkwellen für Hubsystem, cardan shafts for lifting system**				
Sass Projekt *Sass project*	**EP8329**	*Kundenbestellung Nummer customer order number*	**-**	Sass Auftrag Nummer *Sass order number*	**-**

Lieferumfang scope of delivery

Gilt als Ersatzteil + Stückliste validity as parts + spare parts list

	St *pcs*	Benennung *Description*	*Maß size mm*	Sass ID Client ID	Zeichnungsnummer *drawing number*	Bemerkung *remarks*
01	1	Gelenkwelle *cardan shaft*	LE=1230 L1=1200	50005602630104331200 2030-3	A-500-009-0202-075-1200-RL	-
02	1	Gelenkwelle *cardan shaft*	LE=1617 L1=1585	50005602630104331585 2030-2	A-500-009-0202-075-1585-R	-
03	1	Gelenkwelle *cardan shaft*	LE=1672 L1=1640	50005602630104331640 2030-1	A-500-009-0202-075-1640-R	-
04	1	Zwischenwelle *Intermediate shaft*	LE/L1=1800	54200342630104331800 2030-0	A-542-009-0212-075-1800-R	mit Stehlager *with pillow bearing*
05	4	Anschlussflansch *companion flange*	Ø24/Ø8,5	- 1112-2	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
06	1	Anschlussflansch *companion flange*	Ø28/Ø12,5	- 1115-4	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
07	1	Anschlussflansch *companion flange*	Ø38/Ø12,5	- 1121-5	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
08	7	Satz Sechskantschrauben *set of hexagon bolts*	M6x16 DIN 933 X6 = 42 St/pcs	S.010.367 S010-11		
09	1	Satz Technische Dokumentation in Deutsch und Englisch 9800119, in Papier oder/und als pdf Datei, je bestehend aus: Technische Datenblatt, Einbauzeichnungen, Gebrauchsanleitung mit Einbau- und Wartungsanweisung, Sicherheitshinweisen, Schmiermittelanweisung und alternative Schmierstoffangaben *Set technical documentation in German and English 9800119, in paper back or/and as pdf file, each consist of:* *technical data sheet, drawings, instruction manual with installation and maintenance instruction, safety information, greasing regulations and alternative lubricants*				

231011-Serapid-D02-EP8329.docx

www.gelenkwellenfabrik.de

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Telefax: +49(0)40-22 63 301-19

Technische Daten technical data

Antrieb *propulsion*

Type	Elektromotor *electric motor*	Leistung kW *power kW*	-	Drehzahl U/min *Revolution rpm*	-	Übersetzung *ratio*	-

Betriebsbedingungen *operational conditions*

Teil einer Anlage mit Überdachung oder im Freien
part of a indoors or outdoors plant

Temperatur °C *temperature °C*	- 30 bis *to* + 120	Einbaulage *operational level*	horizontal *horizontal*

Schmierung *lubrication*

Verschiebung *slip unit*	Wartungsfrei, Keilnabe Rilsan beschichtet mit Profilschutz *service free, sleeve part Rilsan coated with spline protection*		
Gelenkkreuze *universal joints*	Zentralschmierung am Kreuzkörper mit Schmiernippel (DIN71412 mit Kunststoff Schutzkappe) *central greasing system on universal joint body with greasing nipple (DIN71412 with plastic cap)*		
Büchsenlagerung *bearing at cups*	Rollenlager *roller bearings*	Schmiermittel *lubricant*	Fuchs Renolit LX-PEP 2

Die Kardanwellen werden von uns im betriebsbereiten Zustand geliefert. Ein Abschmieren vor der Inbetriebnahme ist daher unter normalen Bedingungen nicht nötig. Flanschflächen müssen vor der Montage blank und sauber sein.
The cardan shafts are ready for operation. Under normal circumstances no extra greasing before start is needed. Cardan flange faces have to be clean and blank before assembling.

Betriebsdaten Pos. ***operational data*** *item*	**01-04**	**-**	**-**	**-**	**-**	**Bemerkung** ***remarks***
max. Drehmoment Nm *max. torque Nm*	450	-	-	-	-	
Grenzdrehmoment Nm *limit torque Nm*	650	-	-	-	-	
Betriebsdrehmoment Nm *operational torque Nm*	23	-	-	-	-	
Betriebsdrehzahl U/min *operational revolution rpm*	990	-	-	-	-	
Max. möglicher Beugewinkel *max. available deflection angle*	24°	-	-	-	-	
Beugewinkel im Arbeitsbetrieb *deflection angle in operation*	1° – 13°	-	-	-	-	

Gewicht und Massenträgheitsmoment siehe entsprechende Zeichnung
Weigh and, inertia moment see corresponding drawing

Auswuchten ***balancing***	Gelenkwellen nach DIN ISO 1940 – G16 *cardan shafts according to DIN ISO 1940 – G16*
Markierung ***marking***	Alle Gelenkwellen und Anschlussflansche werden mit den kundeneigenen ID Nummern versehen *cardan shafts and adapter flanges labelled with customer ID numbers*

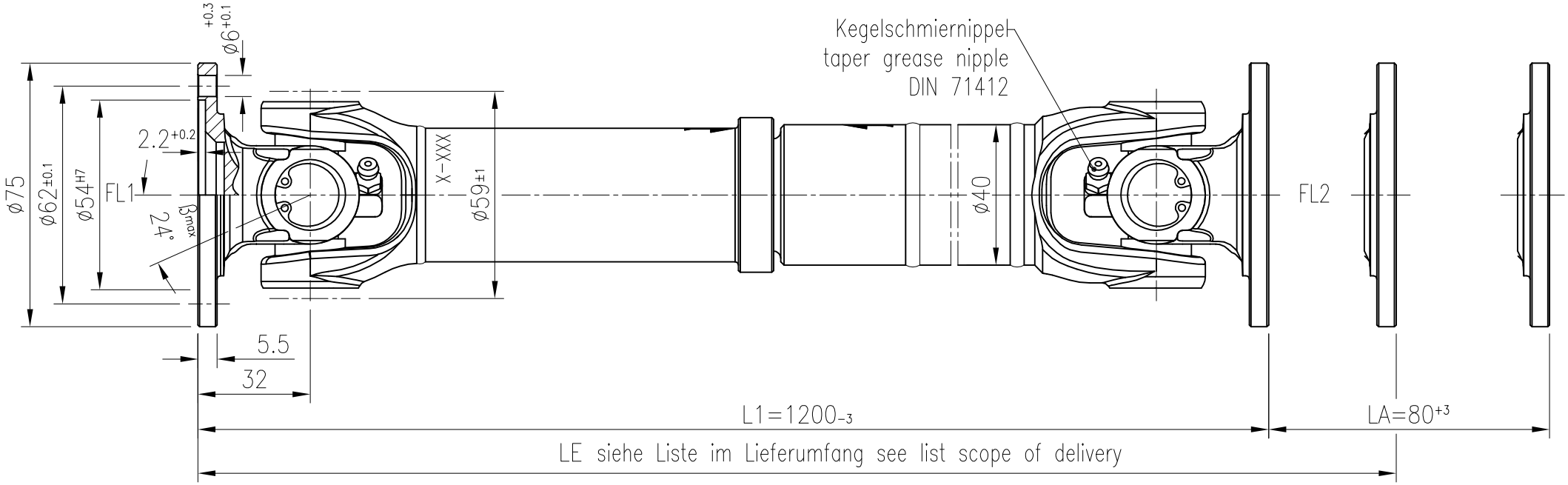
Korrosionsschutz *corrosion protection*

Bennenung	**description**	**Farbton**	***colour***	**RAL**	
Grundierung	*primary coat*	-	-	-	
2 Komponenten PU Decklack	*2 component PU final coat*	gelb glänzend	*yellow glossy*	1003	
Anschlussflansche mit Außenkörper Anstrich	*companion flange with outside painting*				
Nabenpassungen mit Ölfilm korrosionsgeschützt	*sleeve fit with oil film protection*				
Flanschoberflächen mit Korrosionsschutzfilm	*face of flanges with anti-corrosion film*				

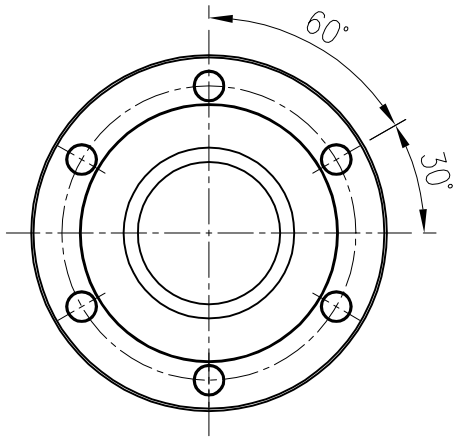
231011-Serapid-D02-EP8329.docx

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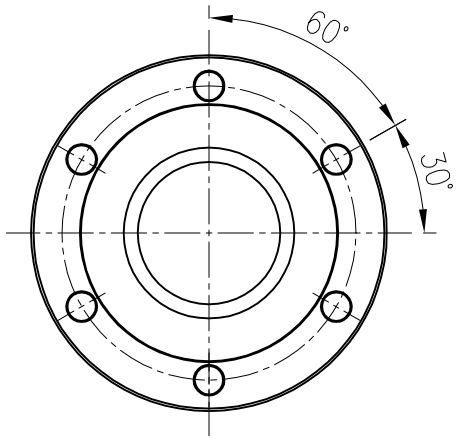
Gelenkwellenfabrik Wilhelm Sass KG
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22145 Stapelfeld
Telefon: +49(0)40-22 63 301-0
Telefax: +49(0)40-22 63 301-19



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.001463 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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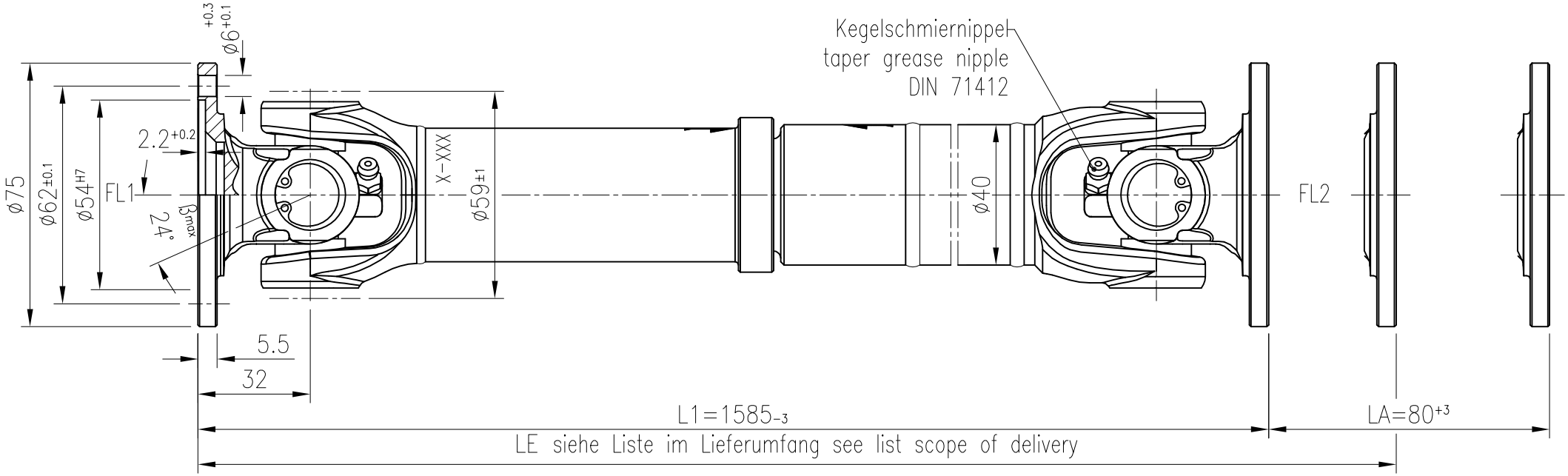
Maßstab Scale					
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	1	VS=0130270	07.11.22	Förster	
Gewicht Weight 4.4kg	0	Made	25.07.18	Stoll	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

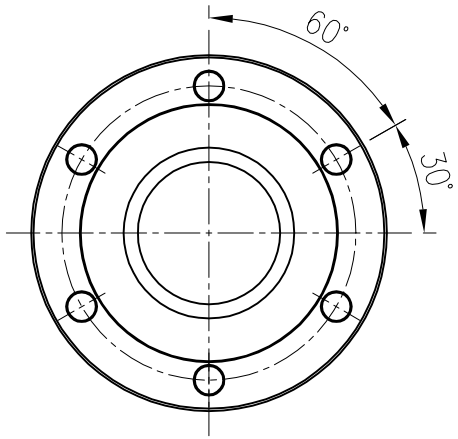
Artikelnummer
Part Number

Zeichnungsnummer
Drawing Number: A-500-009-0202-075-1200-RL

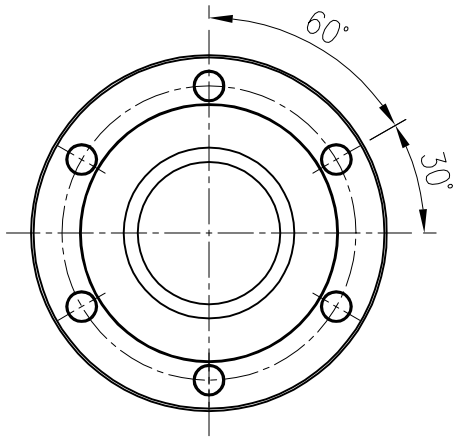
Format Form: A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.001722 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

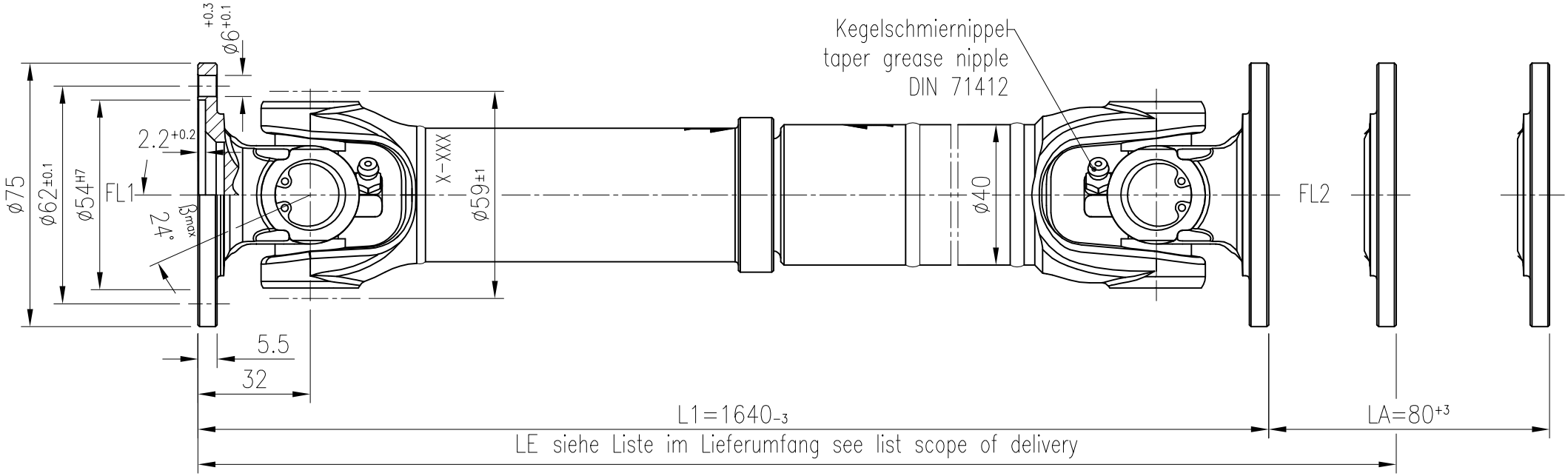
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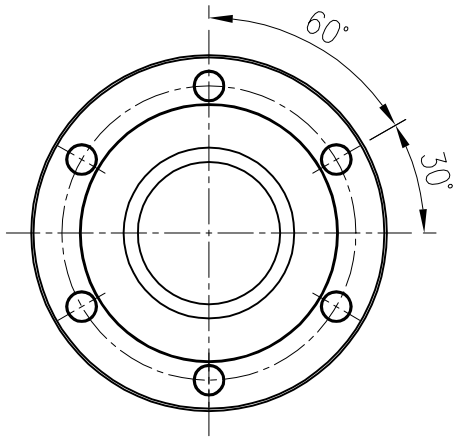
Maßstab Scale					
Gewicht Weight 5.2kg	0	Made	04.10.19	Stoll	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

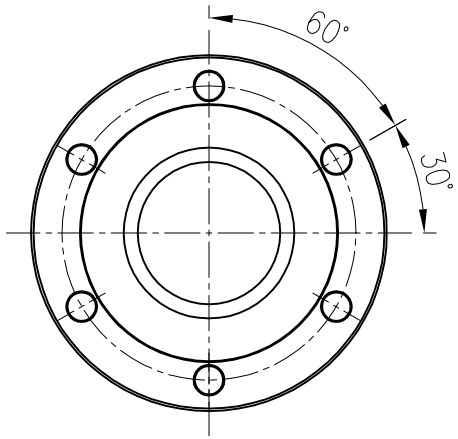
Artikelnummer Part Number	Zeichnungsnummer Drawing Number	Format Form
	A-500-009-0202-075-1585-R	A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.001759 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

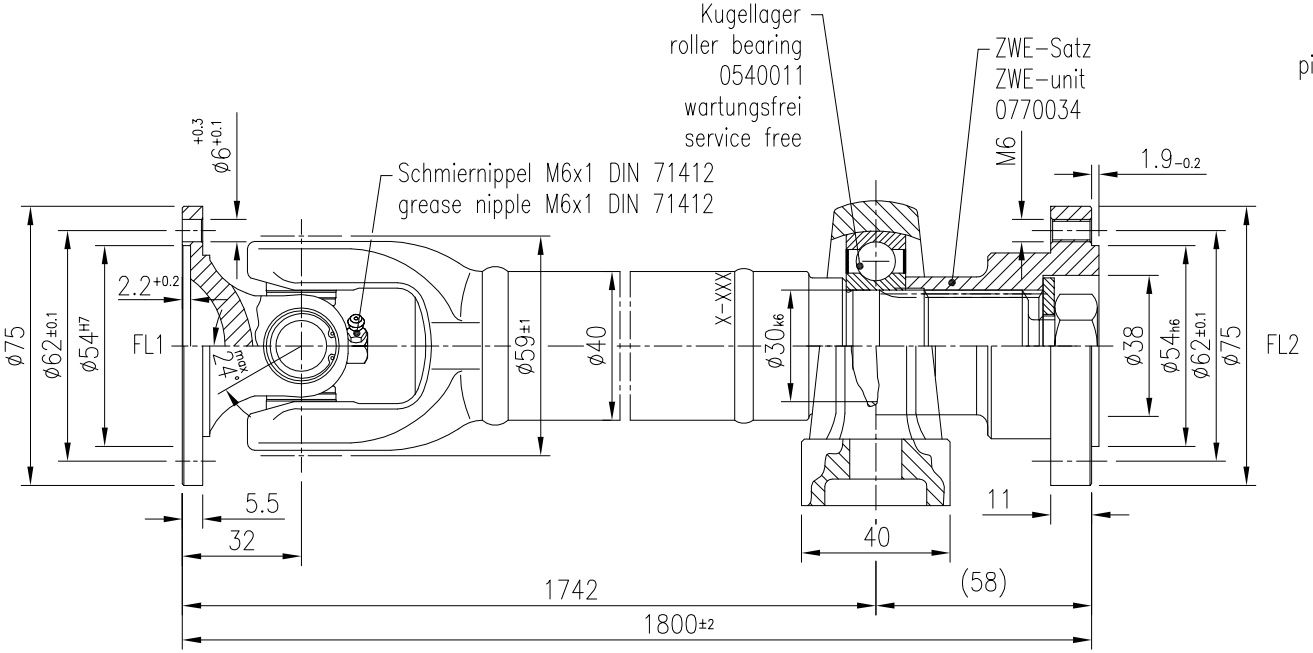
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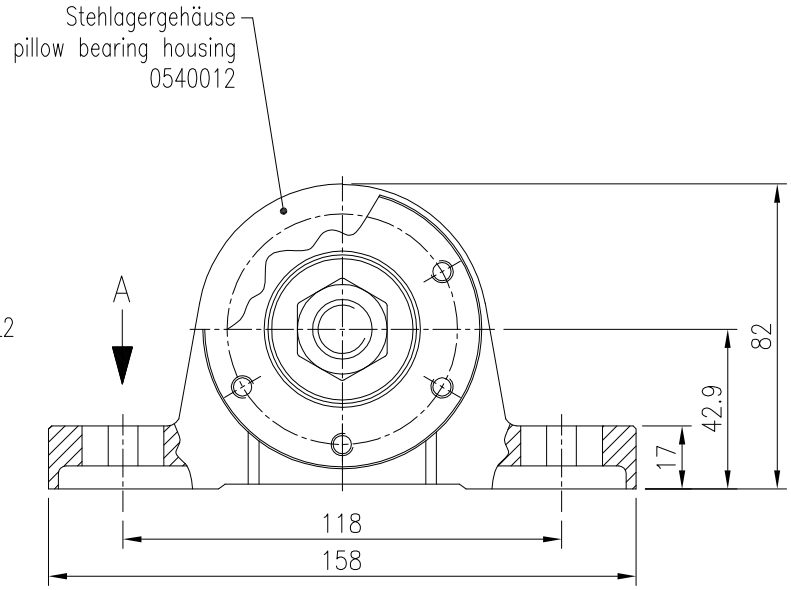
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Maßstab Scale					
Gewicht Weight 5.3kg	0	Made	05.08.22	Förster	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

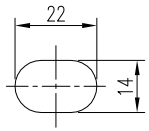
Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

Artikelnummer Part Number	Zeichnungsnummer Drawing Number	Format Form
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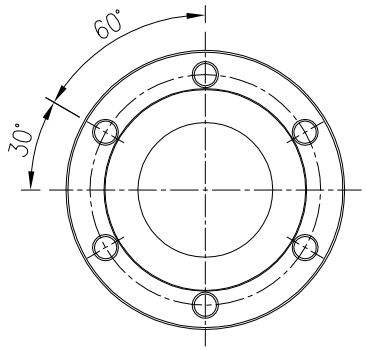




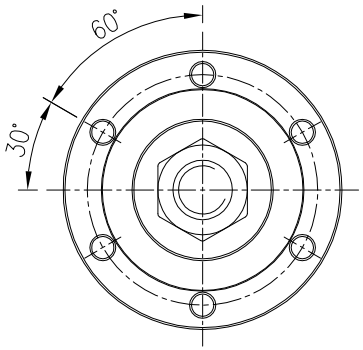
Ansicht (view) A



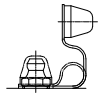
Ansicht (View) FL1



Ansicht (View) FL2



L1 = LE = Einbaulänge (operational length)



Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet

All grease nipples fitted with plastic caps

XXXXXX-X = ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

Massenträgheit
inertia moment 0.001920 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0

Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage
general tolerances for radius, chamfer, angle, form and positition
nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L

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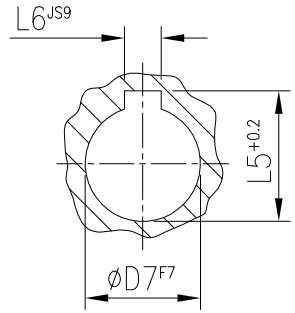
Maßstab Scale	– –				
Gewicht Weight	6.2kg	0	Made	04.01.24	Stoll
		Revision	Bezeichnung description	Datum date	bearbeitet revised

Benennung
Name

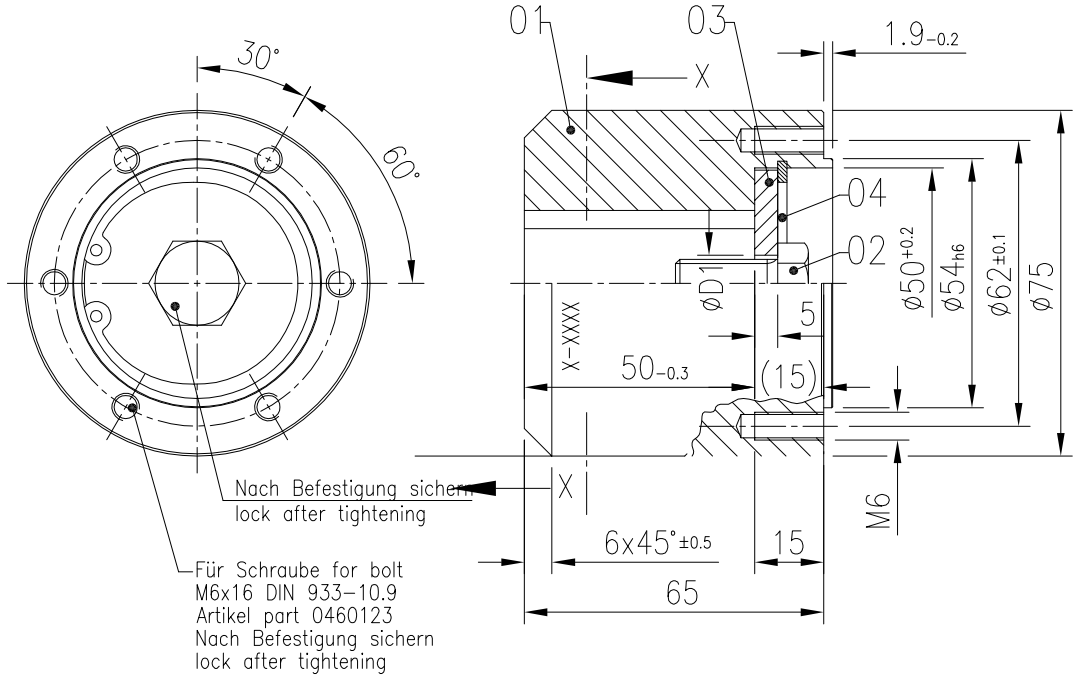
Zwischenwelle mit Stehlager
Intermediate shaft with support bearing

Artikelnummer Part Number	Zeichnungsnummer Drawing Number	Format Form
	A-542-009-0212-075-1800-R	A4

Schnitt section X–X



Seeger Ring Circlip Position item 04	
DIN 472	Sass ID
ø50x2	0600047



Anschlussflansch companion flange Position item 01				Zentralschraube Center bolt Position item 02		Unterlegscheibe washer Position item 03		Serapid ID	Gewicht gesamt weight total [Kg]
ØD7	L6	L5	Sass ID	DIN 933–10.9	Sass ID	ØD1	Sass ID	SER–ZE000–	
ø10	3	11.4	0400901	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	2.00
ø12	4	13.8	0400902	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	1.98
ø13	5	15.3	0400903	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	1.97
ø14	5	16.3	0400904	M4x16*	0460159	ø5.5 (M5+M4)	0600074	1104–0	1.97
ø14	5	16.3	0400904	M5x16	0460023	ø5.5 (M5+M4)	0600074	1104–1	1.97
ø14	5	16.3	0400904	M6x20	0460012	ø8.5 (M6+M8)	0600057	1104–2	1.96
ø15	5	17.3	0400905	M6x20	0460012	ø8.5 (M6+M8)	0600057	1105–2	1.96
ø16	5	18.3	0400906	M5x16	0460023	ø5.5 (M5+M4)	0600074	1106–1	1.95
ø16	5	18.3	0400906	M6x20	0460012	ø8.5 (M6+M8)	0600057	1106–2	1.94
ø17	5	19.3	0400907	–	–	–	–	–	1.94
ø18	6	20.8	0400908	M6x20	0460012	ø8.5 (M6+M8)	0600057	1108–2	1.92
ø19	6	21.8	0400909	M6x20	0460012	ø8.5 (M6+M8)	0600057	1109–2	1.91
ø19	6	21.8	0400909	M8x20	0460042	ø8.5 (M6+M8)	0600057	1109–3	1.91
ø20	6	22.8	0400910	M8x20	0460042	ø8.5 (M6+M8)	0600057	1110–3	1.90
ø22	6	24.8	0400911	–	–	–	–	–	1.88
ø24	8	27.3	0400912	M6x20	0460012	ø8.5 (M6+M8)	0600057	1112–2	1.84
ø24	8	27.3	0400912	M8x20	0460042	ø8.5 (M6+M8)	0600057	1112–3	1.84
ø24	8	27.3	0400912	M10x25	0460033	ø12.5 (M10+M12)	0600058	1112–4	1.84
ø25	8	28.3	0400913	M8x20	0460042	ø8.5 (M6+M8)	0600057	1113–3	1.83
ø25	8	28.3	0400913	M10x25	0460033	ø12.5 (M10+M12)	0600058	1113–4	1.83
ø26	8	29.3	0400914	M6x20	0460012	ø8.5 (M6+M8)	0600057	1114–2	1.81
ø26	8	29.3	0400914	M8x20	0460042	ø8.5 (M6+M8)	0600057	1114–3	1.81
ø28	8	31.3	0400915	M8x20	0460042	ø8.5 (M6+M8)	0600057	1115–3	1.78
ø28	8	31.3	0400915	M10x25	0460033	ø12.5 (M10+M12)	0600058	1115–4	1.78
ø28	8	31.3	0400915	M12x25	0460032	ø12.5 (M10+M12)	0600058	1115–5	1.78
ø30	8	33.3	0400916	M10x25	0460033	ø12.5 (M10+M12)	0600058	1116–4	1.74
ø32	10	35.3	0400917	M8x20	0460042	ø8.5 (M6+M8)	0600057	1117–3	1.70
ø32	10	35.3	0400917	M10x25	0460033	ø12.5 (M10+M12)	0600058	1117–4	1.70
ø32	10	35.3	0400917	M12x25	0460032	ø12.5 (M10+M12)	0600058	1117–5	1.70
ø34	10	37.3	0400918	–	–	–	–	–	1.66
ø35	10	38.3	0400919	M8x20	0460042	ø8.5 (M6+M8)	0600057	1119–3	1.64
ø35	10	38.3	0400919	M10x25	0460033	ø12.5 (M10+M12)	0600058	1119–4	1.64
ø35	10	38.3	0400919	M12x25	0460032	ø12.5 (M10+M12)	0600058	1119–5	1.65
ø36	10	39.3	0400920	–	–	–	–	–	1.62
ø38	10	41.3	0400921	M10x25	0460033	ø12.5 (M10+M12)	0600058	1121–4	1.57
ø38	10	41.3	0400921	M12x25	0460032	ø12.5 (M10+M12)	0600058	1121–5	1.58
ø38	10	41.3	0400921	M16x35	0460046	ø16.5 (M14+M16)	0600059	1121–7	1.59
ø40	12	43.3	0400922	M16x35	0460046	ø16.5 (M14+M16)	0600059	1122–7	1.53
ø42	12	45.3	0400923	M10x25	0460033	ø12.5 (M10+M12)	0600058	1123–4	1.47
ø42	12	45.3	0400923	M12x25	0460032	ø12.5 (M10+M12)	0600058	1123–5	1.47
ø42	12	45.3	0400923	M16x35	0460046	ø16.5 (M14+M16)	0600059	1123–7	1.48

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*=933–8.8

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XXXXXX–X= ID Markierung einschließlich aller Kunden ID Daten
ID marking including all customers ID data

Achtung: Flanschlochkreisschnitt versetzt zur Hauptschnittebene
attention: section of hole circle different to main section

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>0.5 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2.0

Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage
general tolerances for radius, chamfer, angle, form and positition
nach according ISO 2768–1+2 (DIN 7168) m/Klasse K m/class K

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Maßstab Scale	– –				
Gewicht Weight					
	17	1106–2	26.04.22	Förster	
	16	1112–2	30.03.22	Stoll	
	15	1114–2	25.10.21	Förster	
	0	Made	23.09.09	Förster	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung
Name
Anschlussflansch nach DIN (ISO 7646)
companion flange according DIN (ISO 7646)

Artikelnummer
Part Number

Zeichnungsnummer
Drawing Number
A–040–52–075–L01

Format
Form
A4

Kunde *customer*	**Serapid France, Rouxmesnil-Bouteilles, France**				
Projekt *project*	**D03: THE-20766-3CF2-0-Rev.B** **Gelenkwellen für Hubsystem, cardan shafts for lifting system**				
Sass Projekt *Sass project*	**EP8329**	*Kundenbestellung Nummer customer order number*	-	Sass Auftrag Nummer *Sass order number*	-

Lieferumfang scope of delivery

Gilt als Ersatzteil + Stückliste validity as parts + spare parts list

	St *pcs*	Benennung *Description*	*Maß size mm*	Sass ID Client ID	Zeichnungsnummer *drawing number*	Bemerkung *remarks*
01	1	Gelenkwelle *cardan shaft*	LE=350 L1=320	50005602630104330320 3030-2	A-500-009-0202-075-0320-R	-
02	1	Gelenkwelle *cardan shaft*	LE=1120 L1=1090	50005602630104331090 3030-3	A-500-009-0202-075-1090-RL	-
03	1	Gelenkwelle *cardan shaft*	LE=1358 L1=1325	50005602630104331325 3030-1	A-500-009-0202-075-1325-R	-
04	1	Zwischenwelle *Intermediate shaft*	LE/L1=1000	54200342630104331000 3030-0	A-542-009-0212-075-1000-R	mit Stehlager *with pillow bearing*
05	4	Anschlussflansch *companion flange*	Ø24/Ø8,5	- 1112-2	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
06	1	Anschlussflansch *companion flange*	Ø28/Ø12,5	- 1115-4	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
07	1	Anschlussflansch *companion flange*	Ø38/Ø12,5	- 1121-5	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
08	7	Satz Sechskantschrauben *set of hexagon bolts*	M6x16 DIN 933 X6 = 42 St/pcs	S.010.367 S010-11		
09	1	Satz Technische Dokumentation in Deutsch und Englisch 9800119, in Papier oder/und als pdf Datei, je bestehend aus: Technische Datenblatt, Einbauzeichnungen, Gebrauchsanleitung mit Einbau- und Wartungsanweisung, Sicherheitshinweisen, Schmiermittelanweisung und alternative Schmierstoffangaben *Set technical documentation in German and English 9800119, in paper back or/and as pdf file, each consist of: technical data sheet, drawings, instruction manual with installation and maintenance instruction, safety information, greasing regulations and alternative lubricants*				

231011-Serapid-D03-EP8329.docx

www.gelenkwellenfabrik.de

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Technische Daten technical data

Antrieb *propulsion*

Type	Elektromotor *electric motor*	Leistung kW *power kW*	-	Drehzahl U/min *Revolution rpm*	-	Übersetzung *ratio*	-

Betriebsbedingungen *operational conditions*

Teil einer Anlage mit Überdachung oder im Freien
part of a indoors or outdoors plant

Temperatur °C *temperature °C*	- 30 bis *to* + 120	Einbaulage *operational level*	horizontal *horizontal*

Schmierung *lubrication*

Verschiebung *slip unit*	Wartungsfrei, Keilnabe Rilsan beschichtet mit Profilschutz *service free, sleeve part Rilsan coated with spline protection*		
Gelenkkreuze *universal joints*	Zentralschmierung am Kreuzkörper mit Schmiernippel (DIN71412 mit Kunststoff Schutzkappe) *central greasing system on universal joint body with greasing nipple (DIN71412 with plastic cap)*		
Büchsenlagerung *bearing at cups*	Rollenlager *roller bearings*	Schmiermittel *lubricant*	Fuchs Renolit LX-PEP 2

Die Kardanwellen werden von uns im betriebsbereiten Zustand geliefert. Ein Abschmieren vor der Inbetriebnahme ist daher unter normalen Bedingungen nicht nötig. Flanschflächen müssen vor der Montage blank und sauber sein.
The cardan shafts are ready for operation. Under normal circumstances no extra greasing before start is needed. Cardan flange faces have to be clean and blank before assembling.

Betriebsdaten Pos. ***operational data*** *item*	**01-04**	**-**	**-**	**-**	**-**	**Bemerkung** ***remarks***
max. Drehmoment Nm *max. torque Nm*	450	-	-	-	-	
Grenzdrehmoment Nm *limit torque Nm*	650	-	-	-	-	
Betriebsdrehmoment Nm *operational torque Nm*	21	-	-	-	-	
Betriebsdrehzahl U/min *operational revolution rpm*	990	-	-	-	-	
Max. möglicher Beugewinkel *max. available deflection angle*	24°	-	-	-	-	
Beugewinkel im Arbeitsbetrieb *deflection angle in operation*	1° - 22°	-	-	-	-	

Gewicht und Massenträgheitsmoment siehe entsprechende Zeichnung
Weigh and, inertia moment see corresponding drawing

Auswuchten ***balancing***	Gelenkwellen nach DIN ISO 1940 – G16 *cardan shafts according to DIN ISO 1940 – G16*
Markierung ***marking***	Alle Gelenkwellen und Anschlussflansche werden mit den kundeneigenen ID Nummern versehen *cardan shafts and adapter flanges labelled with customer ID numbers*

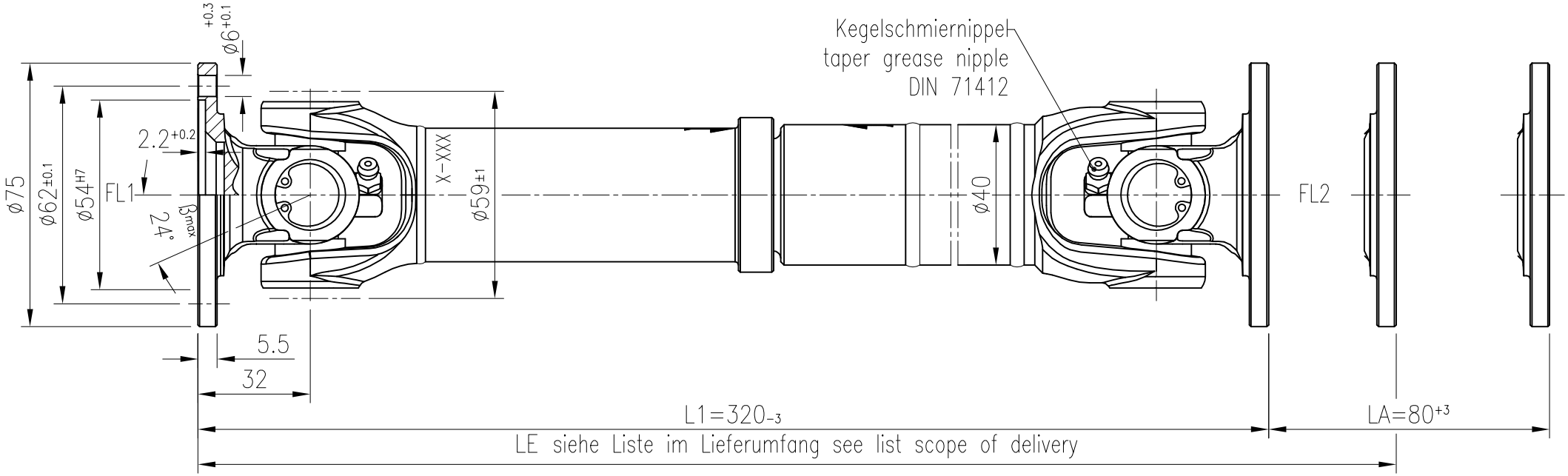
Korrosionsschutz *corrosion protection*

Bennenung	**description**	**Farbton**	***colour***	**RAL**	
Grundierung	*primary coat*	-	-	-	
2 Komponenten PU Decklack	*2 component PU final coat*	gelb glänzend	*yellow glossy*	1003	
Anschlussflansche mit Außenkörper Anstrich	*companion flange with outside painting*				
Nabenpassungen mit Ölfilm korrosionsgeschützt	*sleeve fit with oil film protection*				
Flanschoberflächen mit Korrosionsschutzfilm	*face of flanges with anti-corrosion film*				

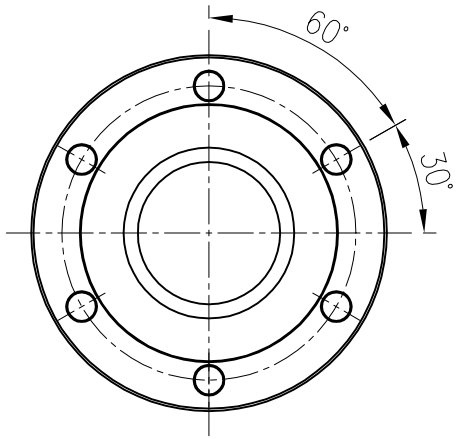
231011-Serapid-D03-EP8329.docx

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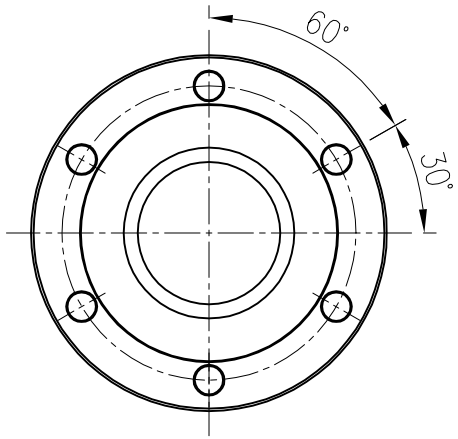
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Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.000869 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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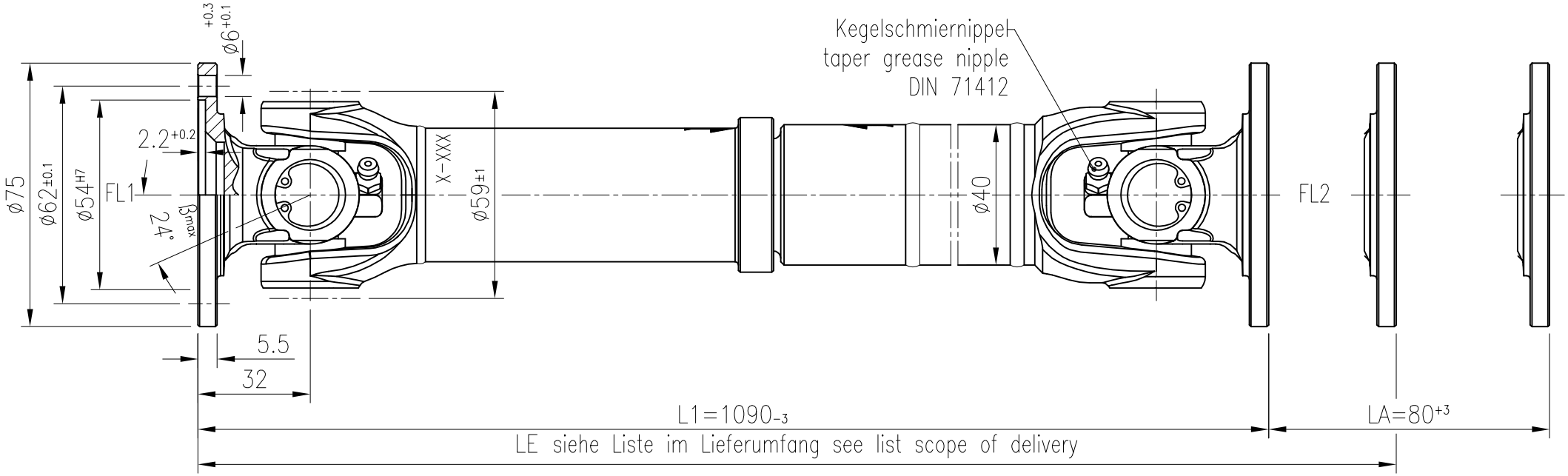
Maßstab Scale					
Gewicht Weight 2.8kg	0	Made	18.06.19	Förster	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

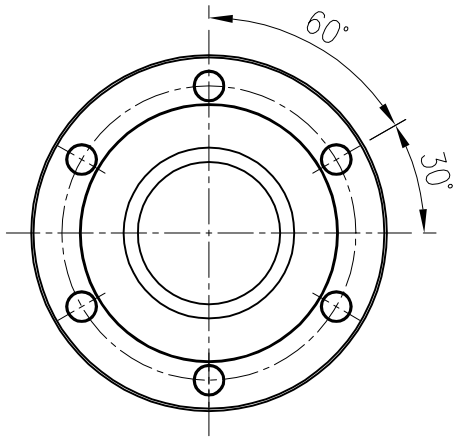
Artikelnummer
Part Number

Zeichnungsnummer
Drawing Number: A-500-009-0202-075-0320-R

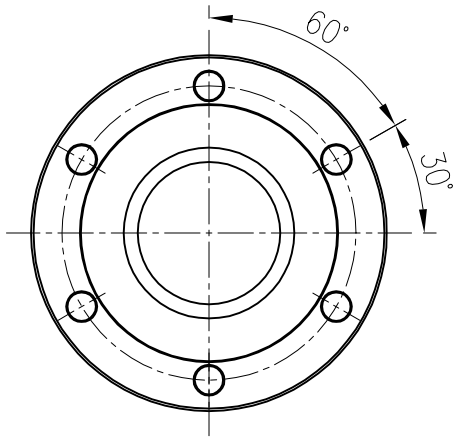
Format
Form: A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.001388 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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Maßstab Scale: --

Revision	Bezeichnung description	Datum date	bearbeitet revised
0	m, inertia moment	06.04.20	Förster
0	Made	27.04.17	Förster

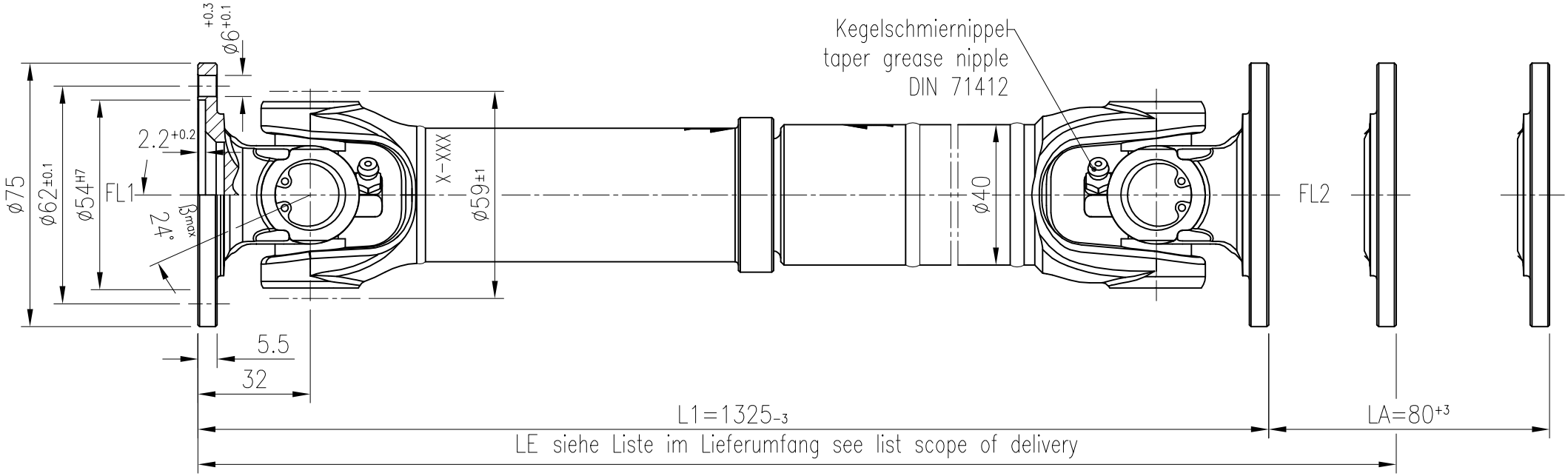
Gewicht Weight 4.2kg

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

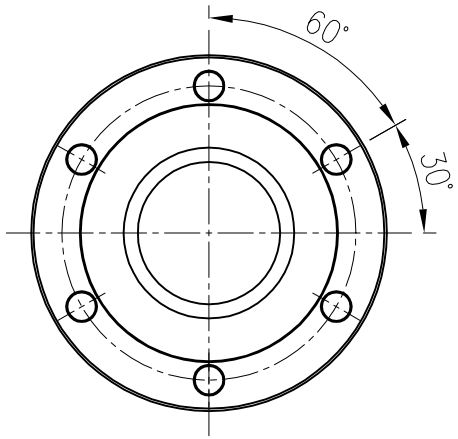
Artikelnummer Part Number:

Zeichnungsnummer Drawing Number: A-500-009-0202-075-1090-RL

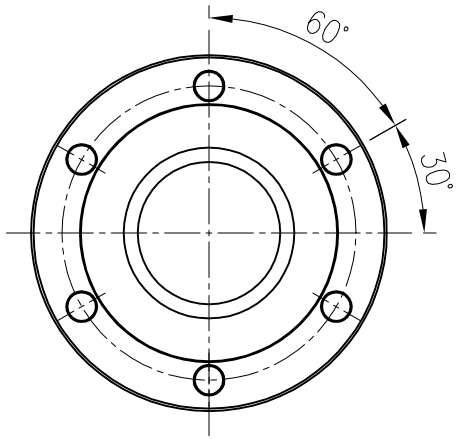
Format Form: A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.001547 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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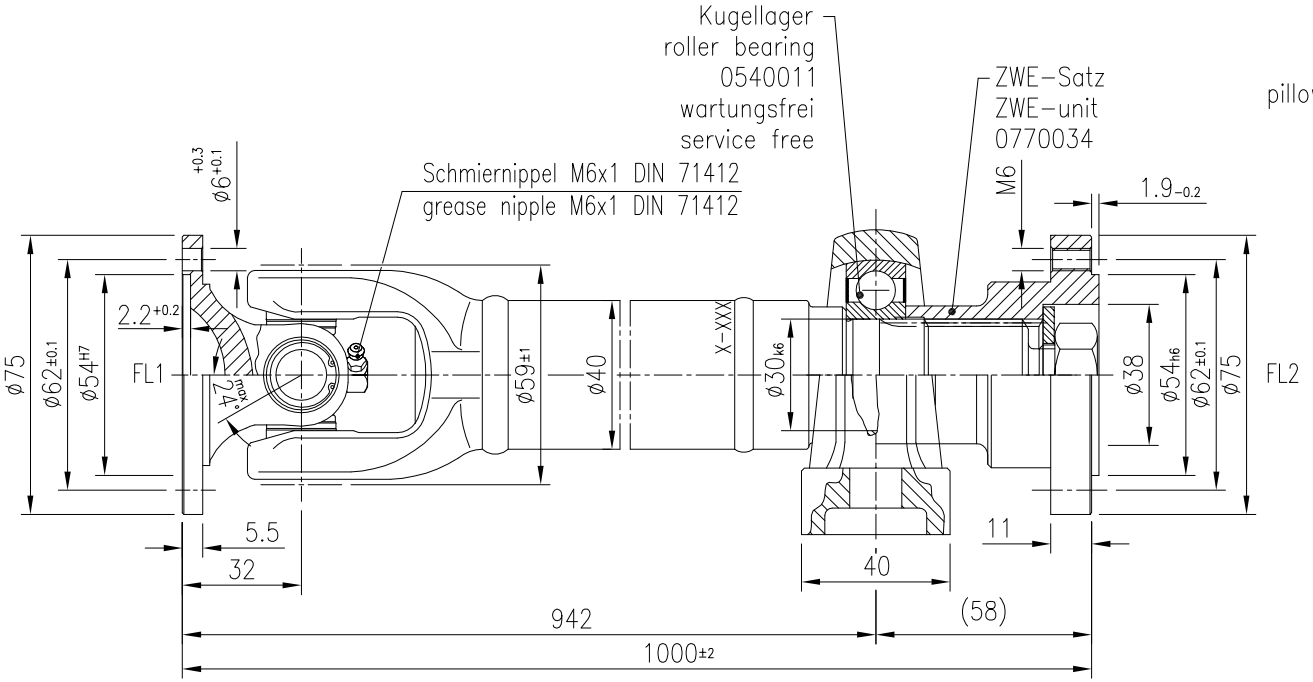
Maßstab Scale	– –				
Gewicht Weight	4.7kg	0	Made	08.12.16	Förster
		Revision	Bezeichnung description	Datum date	bearbeitet revised

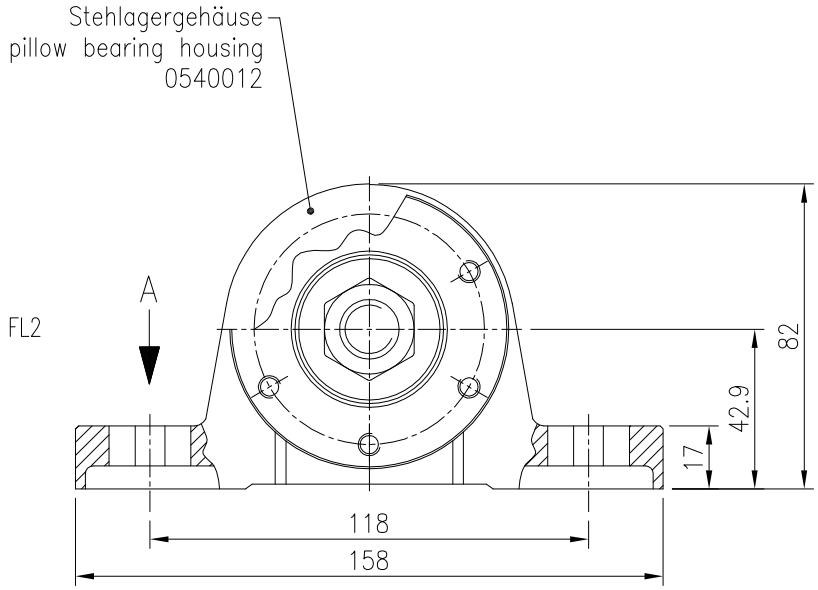
Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

Artikelnummer
Part Number

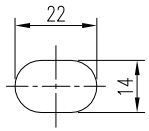
Zeichnungsnummer
Drawing Number: A-500-009-0202-075-1325-R

Format
Form: A4

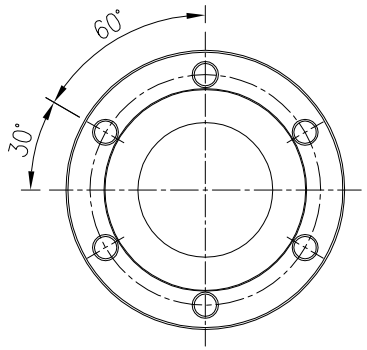




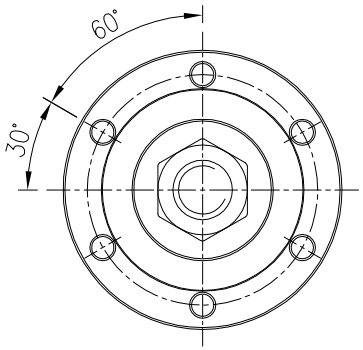
Ansicht (view) A



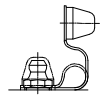
Ansicht (View) FL1



Ansicht (View) FL2



L1 = LE = Einbaulänge (operational length)



Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet

All grease nipples fitted with plastic caps

XXXXXX-X = ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

Alte Zeichnung old drawing A-542-009-0202-075-1000-R

Massenträgheit inertia moment 0.001381 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0

Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage
general tolerances for radius, chamfer, angle, form and positition
nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L

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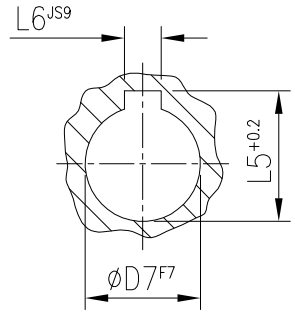
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Fax.:040-2263301-19
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Maßstab Scale					
– –					
	1	drawing no.	31.05.21	Förster	
Gewicht Weight 4.7kg	0	Made	17.05.21	Förster	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

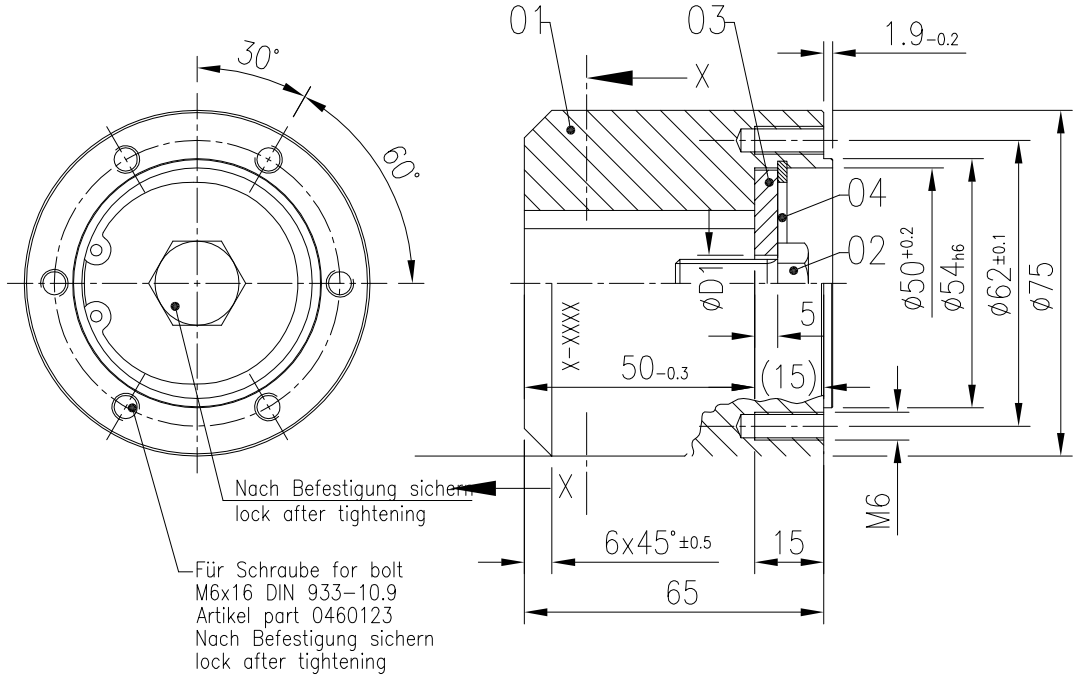
Benennung Name
Zwischenwelle mit Stehlager
Intermediate shaft with support bearing

Artikelnummer Part Number	Zeichnungsnummer Drawing Number	Format Form
	A-542-009-0212-075-1000-R	A4

Schnitt section X–X



Seeger Ring Circlip Position item 04	
DIN 472	Sass ID
ø50x2	0600047



Anschlussflansch companion flange Position item 01				Zentralschraube Center bolt Position item 02		Unterlegscheibe washer Position item 03		Serapid ID	Gewicht gesamt weight total [Kg]
ØD7	L6	L5	Sass ID	DIN 933–10.9	Sass ID	ØD1	Sass ID	SER–ZE000–	
ø10	3	11.4	0400901	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	2.00
ø12	4	13.8	0400902	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	1.98
ø13	5	15.3	0400903	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	1.97
ø14	5	16.3	0400904	M4x16*	0460159	ø5.5 (M5+M4)	0600074	1104–0	1.97
ø14	5	16.3	0400904	M5x16	0460023	ø5.5 (M5+M4)	0600074	1104–1	1.97
ø14	5	16.3	0400904	M6x20	0460012	ø8.5 (M6+M8)	0600057	1104–2	1.96
ø15	5	17.3	0400905	M6x20	0460012	ø8.5 (M6+M8)	0600057	1105–2	1.96
ø16	5	18.3	0400906	M5x16	0460023	ø5.5 (M5+M4)	0600074	1106–1	1.95
ø16	5	18.3	0400906	M6x20	0460012	ø8.5 (M6+M8)	0600057	1106–2	1.94
ø17	5	19.3	0400907	–	–	–	–	–	1.94
ø18	6	20.8	0400908	M6x20	0460012	ø8.5 (M6+M8)	0600057	1108–2	1.92
ø19	6	21.8	0400909	M6x20	0460012	ø8.5 (M6+M8)	0600057	1109–2	1.91
ø19	6	21.8	0400909	M8x20	0460042	ø8.5 (M6+M8)	0600057	1109–3	1.91
ø20	6	22.8	0400910	M8x20	0460042	ø8.5 (M6+M8)	0600057	1110–3	1.90
ø22	6	24.8	0400911	–	–	–	–	–	1.88
ø24	8	27.3	0400912	M6x20	0460012	ø8.5 (M6+M8)	0600057	1112–2	1.84
ø24	8	27.3	0400912	M8x20	0460042	ø8.5 (M6+M8)	0600057	1112–3	1.84
ø24	8	27.3	0400912	M10x25	0460033	ø12.5 (M10+M12)	0600058	1112–4	1.84
ø25	8	28.3	0400913	M8x20	0460042	ø8.5 (M6+M8)	0600057	1113–3	1.83
ø25	8	28.3	0400913	M10x25	0460033	ø12.5 (M10+M12)	0600058	1113–4	1.83
ø26	8	29.3	0400914	M6x20	0460012	ø8.5 (M6+M8)	0600057	1114–2	1.81
ø26	8	29.3	0400914	M8x20	0460042	ø8.5 (M6+M8)	0600057	1114–3	1.81
ø28	8	31.3	0400915	M8x20	0460042	ø8.5 (M6+M8)	0600057	1115–3	1.78
ø28	8	31.3	0400915	M10x25	0460033	ø12.5 (M10+M12)	0600058	1115–4	1.78
ø28	8	31.3	0400915	M12x25	0460032	ø12.5 (M10+M12)	0600058	1115–5	1.78
ø30	8	33.3	0400916	M10x25	0460033	ø12.5 (M10+M12)	0600058	1116–4	1.74
ø32	10	35.3	0400917	M8x20	0460042	ø8.5 (M6+M8)	0600057	1117–3	1.70
ø32	10	35.3	0400917	M10x25	0460033	ø12.5 (M10+M12)	0600058	1117–4	1.70
ø32	10	35.3	0400917	M12x25	0460032	ø12.5 (M10+M12)	0600058	1117–5	1.70
ø34	10	37.3	0400918	–	–	–	–	–	1.66
ø35	10	38.3	0400919	M8x20	0460042	ø8.5 (M6+M8)	0600057	1119–3	1.64
ø35	10	38.3	0400919	M10x25	0460033	ø12.5 (M10+M12)	0600058	1119–4	1.64
ø35	10	38.3	0400919	M12x25	0460032	ø12.5 (M10+M12)	0600058	1119–5	1.65
ø36	10	39.3	0400920	–	–	–	–	–	1.62
ø38	10	41.3	0400921	M10x25	0460033	ø12.5 (M10+M12)	0600058	1121–4	1.57
ø38	10	41.3	0400921	M12x25	0460032	ø12.5 (M10+M12)	0600058	1121–5	1.58
ø38	10	41.3	0400921	M16x35	0460046	ø16.5 (M14+M16)	0600059	1121–7	1.59
ø40	12	43.3	0400922	M16x35	0460046	ø16.5 (M14+M16)	0600059	1122–7	1.53
ø42	12	45.3	0400923	M10x25	0460033	ø12.5 (M10+M12)	0600058	1123–4	1.47
ø42	12	45.3	0400923	M12x25	0460032	ø12.5 (M10+M12)	0600058	1123–5	1.47
ø42	12	45.3	0400923	M16x35	0460046	ø16.5 (M14+M16)	0600059	1123–7	1.48

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*=933–8.8

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XXXXXX–X= ID Markierung einschließlich aller Kunden ID Daten
ID marking including all customers ID data

Achtung: Flanschlochkreisschnitt versetzt zur Hauptschnittebene
attention: section of hole circle different to main section

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>0.5 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2.0

Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage
general tolerances for radius, chamfer, angle, form and positition
nach according ISO 2768–1+2 (DIN 7168) m/Klasse K m/class K

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Maßstab Scale	– –				
Gewicht Weight					
	17	1106–2	26.04.22	Förster	
	16	1112–2	30.03.22	Stoll	
	15	1114–2	25.10.21	Förster	
	0	Made	23.09.09	Förster	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung
Name
Anschlussflansch nach DIN (ISO 7646)
companion flange according DIN (ISO 7646)

Artikelnummer
Part Number

Zeichnungsnummer
Drawing Number
A–040–52–075–L01

Format
Form
A4

Kunde *customer*	**Serapid France, Rouxmesnil-Bouteilles, France**				
Projekt *project*	**D04: THE-20766-4CF2-0-Rev.B** **Gelenkwellen für Hubsystem, cardan shafts for lifting system**				
Sass Projekt *Sass project*	**EP8329**	*Kundenbestellung Nummer customer order number*	-	Sass Auftrag Nummer *Sass order number*	-

Lieferumfang scope of delivery

Gilt als Ersatzteil + Stückliste validity as parts + spare parts list

	St *pcs*	Benennung *Description*	*Maß size mm*	Sass ID Client ID	Zeichnungsnummer *drawing number*	Bemerkung *remarks*
01	1	Gelenkwelle *cardan shaft*	LE=707 L1=675	50005602630104330675 4030-0	A-500-009-0202-075-0675-R	-
02	1	Gelenkwelle *cardan shaft*	LE=818 L1=785	50005602630104330785 4030-2	A-500-009-0202-075-0785-RK	-
03	1	Gelenkwelle *cardan shaft*	LE=914 L1=880	50005602630104330880 4030-1	A-500-009-0202-075-0880-RK	-
04	1	Gelenkwelle *cardan shaft*	LE=1105 L1=1075	50005602630104331075 4030-4	A-500-009-0202-075-1075-R	-
05	1	Gelenkwelle *cardan shaft*	LE=1259 L1=1225	50005602630104331225 4030-3	A-500-009-0202-075-1225-RK	-
06	1	Zwischenwelle *Intermediate shaft*	LE/L1=1000	54200342630104331000 4030-5	A-542-009-0212-075-1000-R	mit Stehlager *with pillow bearing*
07	1	Anschlussflansch *companion flange*	Ø16/Ø8,5	- 1106-2	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
08	7	Anschlussflansch *companion flange*	Ø24/Ø8,5	- 1112-2	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
09	1	Anschlussflansch *companion flange*	Ø28/Ø12,5	- 1115-4	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
10	1	Anschlussflansch *companion flange*	Ø38/Ø12,5	- 1121-5	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
11	11	Satz Sechskantschrauben *set of hexagon bolts*	M6x16 DIN 933 X6 = 66 St/pcs	S.010.367 S010-11		
12	1	Satz Technische Dokumentation in Deutsch und Englisch 9800119, in Papier oder/und als pdf Datei, je bestehend aus: Technische Datenblatt, Einbauzeichnungen, Gebrauchsanleitung mit Einbau- und Wartungsanweisung, Sicherheitshinweisen, Schmiermittelanweisung und alternative Schmierstoffangaben *Set technical documentation in German and English 9800119, in paper back or/and as pdf file, each consist of:* *technical data sheet, drawings, instruction manual with installation and maintenance instruction, safety information, greasing regulations and alternative lubricants*				

231011-Serapid-D04-EP8329.docx

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Technische Daten technical data

Antrieb *propulsion*

Type	Elektromotor *electric motor*	Leistung kW *power kW*	-	Drehzahl U/min *Revolution rpm*	-	Übersetzung *ratio*	-

Betriebsbedingungen *operational conditions*

Teil einer Anlage mit Überdachung oder im Freien
part of a indoors or outdoors plant

Temperatur °C *temperature °C*	- 30 bis *to* + 120	Einbaulage *operational level*	horizontal *horizontal*

Schmierung *lubrication*

Verschiebung *slip unit*	Wartungsfrei, Keilnabe Rilsan beschichtet mit Profilschutz *service free, sleeve part Rilsan coated with spline protection*		
Gelenkkreuze *universal joints*	Zentralschmierung am Kreuzkörper mit Schmiernippel (DIN71412 mit Kunststoff Schutzkappe) *central greasing system on universal joint body with greasing nipple (DIN71412 with plastic cap)*		
Büchsenlagerung *bearing at cups*	Rollenlager *roller bearings*	Schmiermittel *lubricant*	Fuchs Renolit LX-PEP 2

Die Kardanwellen werden von uns im betriebsbereiten Zustand geliefert. Ein Abschmieren vor der Inbetriebnahme ist daher unter normalen Bedingungen nicht nötig. Flanschflächen müssen vor der Montage blank und sauber sein.
The cardan shafts are ready for operation. Under normal circumstances no extra greasing before start is needed. Cardan flange faces have to be clean and blank before assembling.

Betriebsdaten Pos. ***operational data*** *item*	**01-06**	**-**	**-**	**-**	**-**	**Bemerkung** ***remarks***
max. Drehmoment Nm *max. torque Nm*	450	-	-	-	-	
Grenzdrehmoment Nm *limit torque Nm*	650	-	-	-	-	
Betriebsdrehmoment Nm *operational torque Nm*	19	-	-	-	-	
Betriebsdrehzahl U/min *operational revolution rpm*	990	-	-	-	-	
Max. möglicher Beugewinkel *max. available deflection angle*	24°	-	-	-	-	
Beugewinkel im Arbeitsbetrieb *deflection angle in operation*	1° - 10°	-	-	-	-	

Gewicht und Massenträgheitsmoment siehe entsprechende Zeichnung
Weigh and, inertia moment see corresponding drawing

Auswuchten ***balancing***	Gelenkwellen nach DIN ISO 1940 – G16 *cardan shafts according to DIN ISO 1940 – G16*
Markierung ***marking***	Alle Gelenkwellen und Anschlussflansche werden mit den kundeneigenen ID Nummern versehen *cardan shafts and adapter flanges labelled with customer ID numbers*

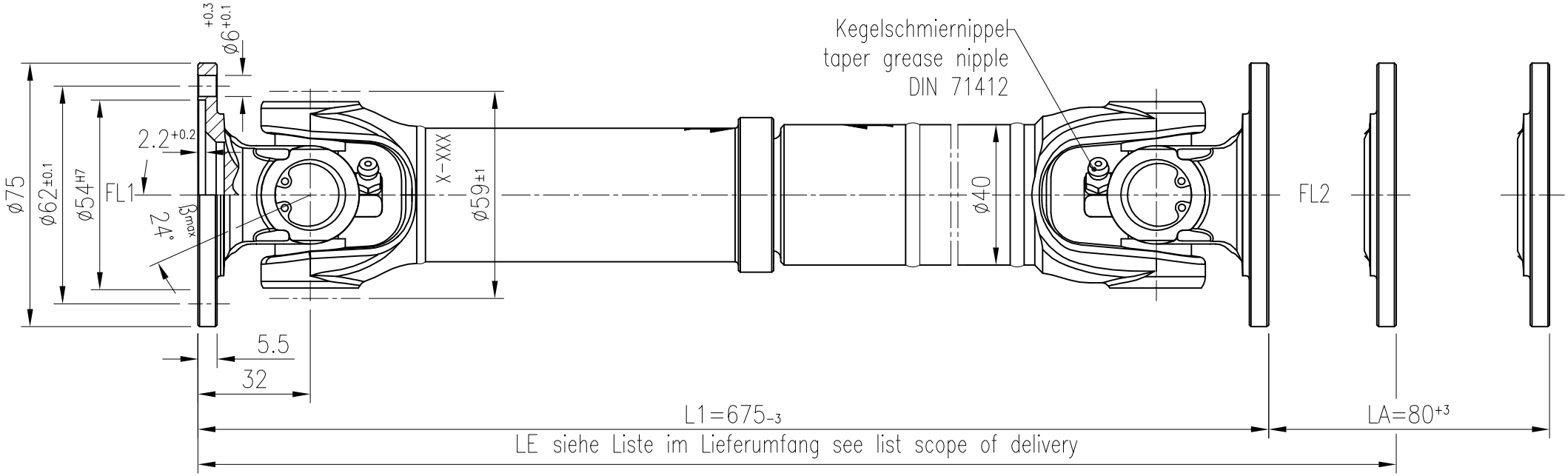
Korrosionsschutz *corrosion protection*

Bennenung	**description**	**Farbton**	***colour***	**RAL**	
Grundierung	*primary coat*	-	-	-	
2 Komponenten PU Decklack	*2 component PU final coat*	gelb glänzend	*yellow glossy*	1003	
Anschlussflansche mit Außenkörper Anstrich	*companion flange with outside painting*				
Nabenpassungen mit Ölfilm korrosionsgeschützt	*sleeve fit with oil film protection*				
Flanschoberflächen mit Korrosionsschutzfilm	*face of flanges with anti-corrosion film*				

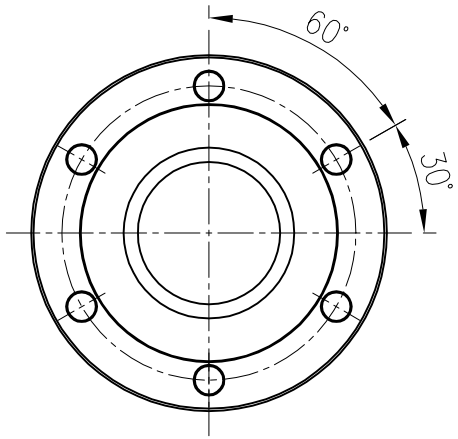
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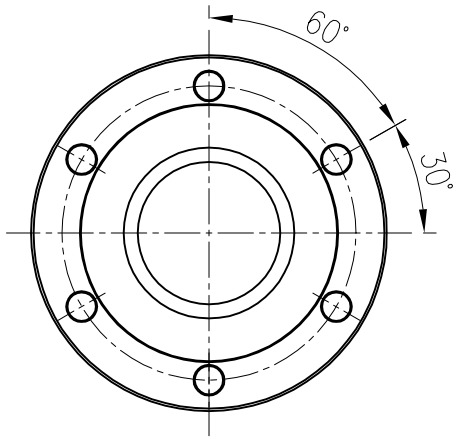
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Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.001108 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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Revision			Datum date	bearbeitet revised
1	VS 0130270	03.11.22	Stoll	
0	Made	11.07.13	Förster	

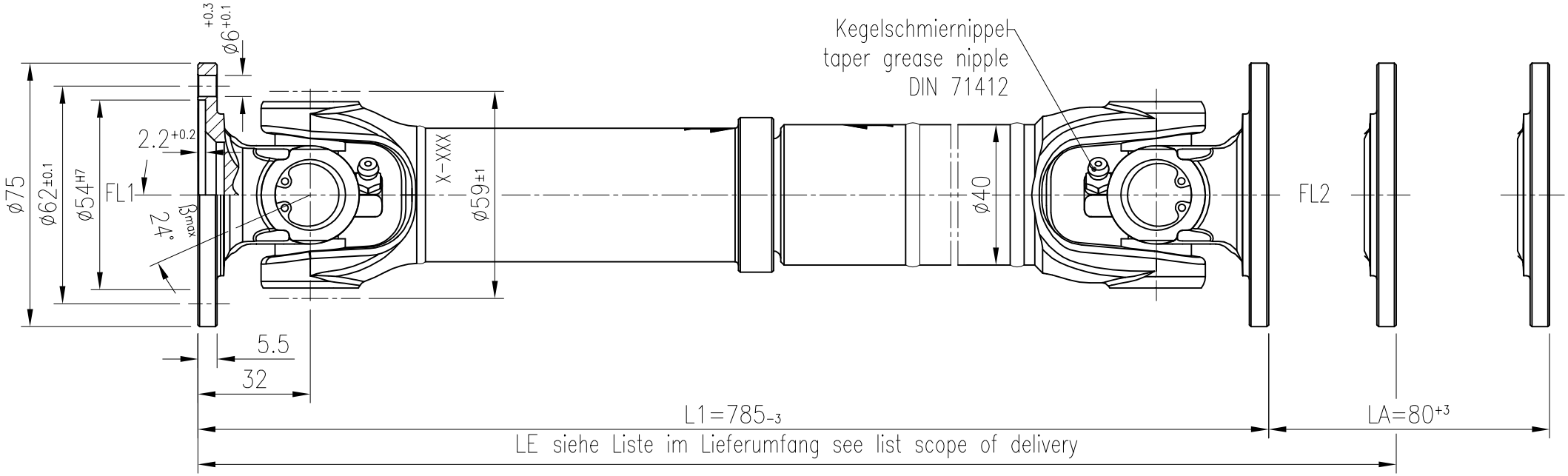
Maßstab Scale: --
Gewicht Weight: 3.5kg

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

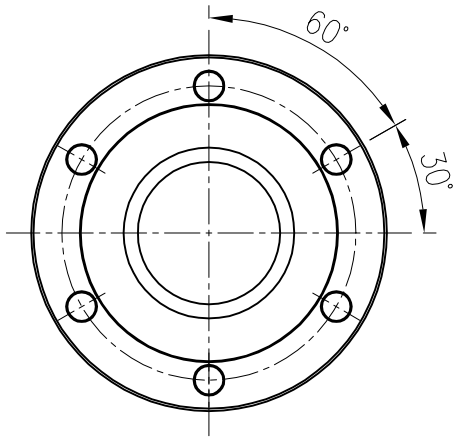
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Zeichnungsnummer Drawing Number: A-500-009-0202-075-0675-R

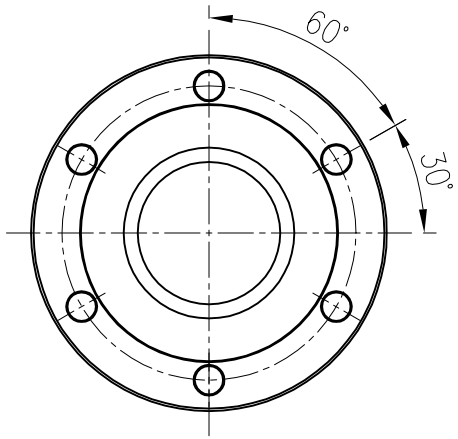
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Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.001183 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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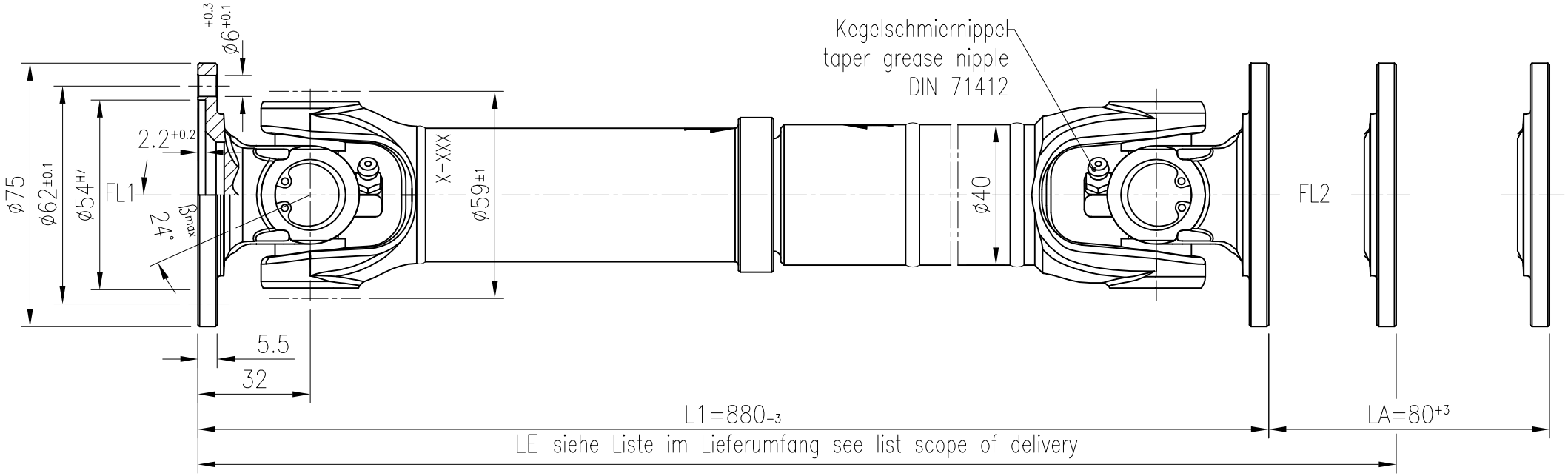
Maßstab Scale					
Gewicht Weight 3.7kg	0	Made	04.01.24	Stoll	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

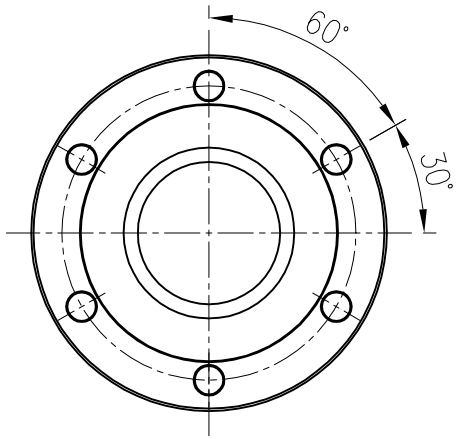
Artikelnummer
Part Number

Zeichnungsnummer
Drawing Number: A-500-009-0202-075-0785-RK

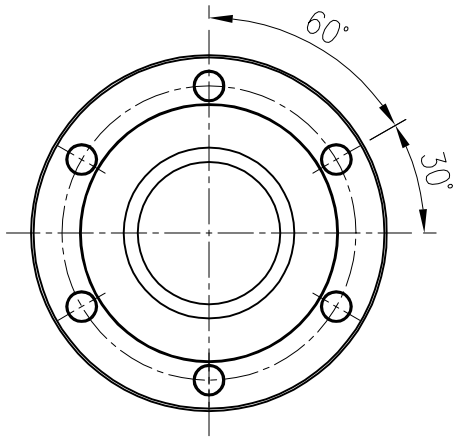
Format
Form: A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

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LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten (ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit inertia moment 0.001247 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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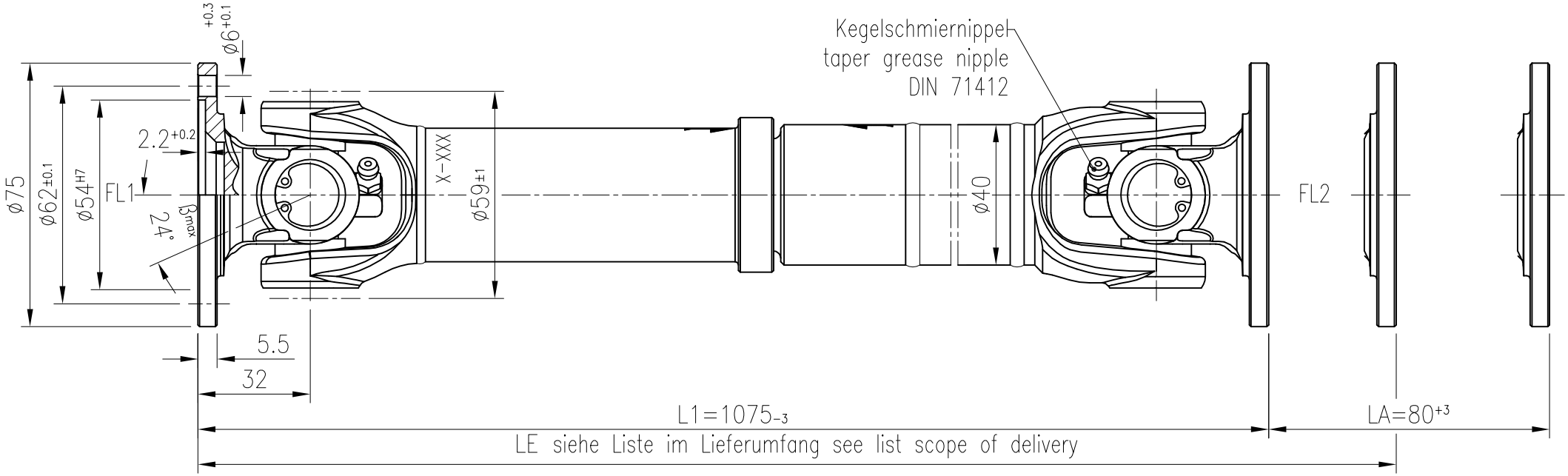
Maßstab Scale					
Gewicht Weight 3.8kg	0	Made	04.01.24	Stoll	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

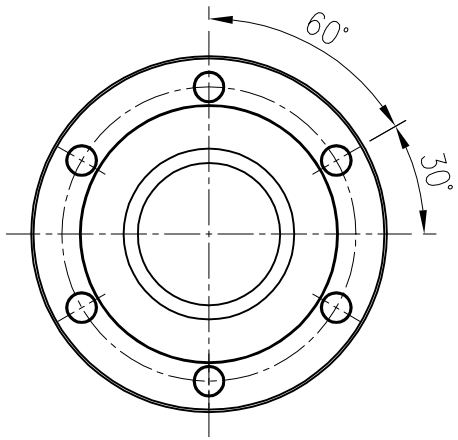
Artikelnummer Part Number:

Zeichnungsnummer Drawing Number: A-500-009-0202-075-0880-RK

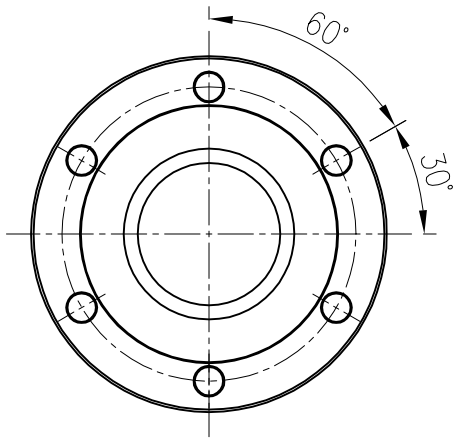
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Ansicht (View) FL1



Ansicht (View) FL2





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All grease nipples fitted with plastic caps

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LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten (ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit inertia moment 0.001378 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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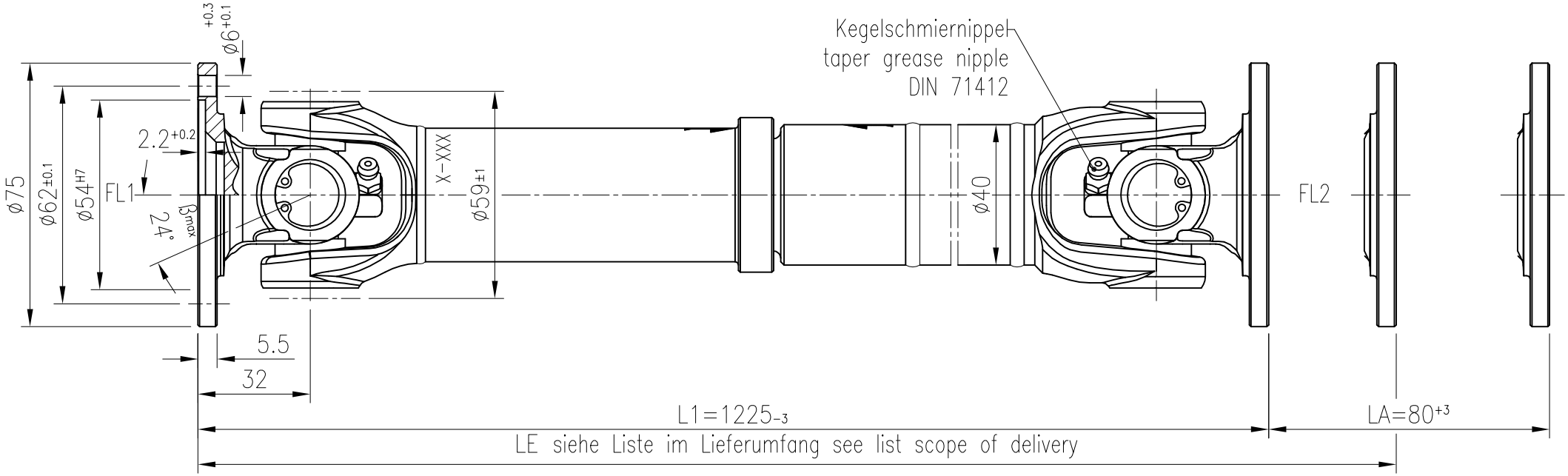
Maßstab Scale					
Gewicht Weight 4.2kg	0	Made	01.09.22	Stoll	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

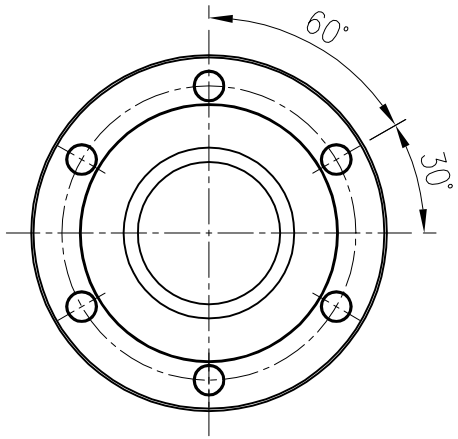
Artikelnummer Part Number:

Zeichnungsnummer Drawing Number: A-500-009-0202-075-1075-R

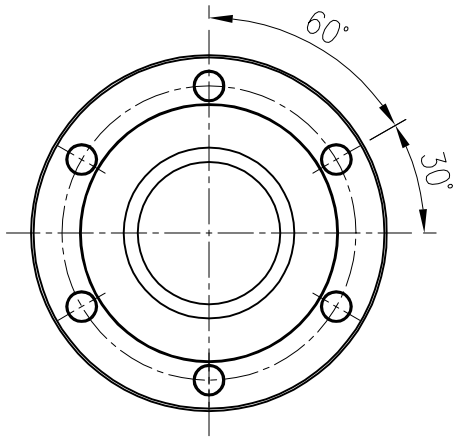
Format Form: A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA) (length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten (ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit inertia moment 0.001479 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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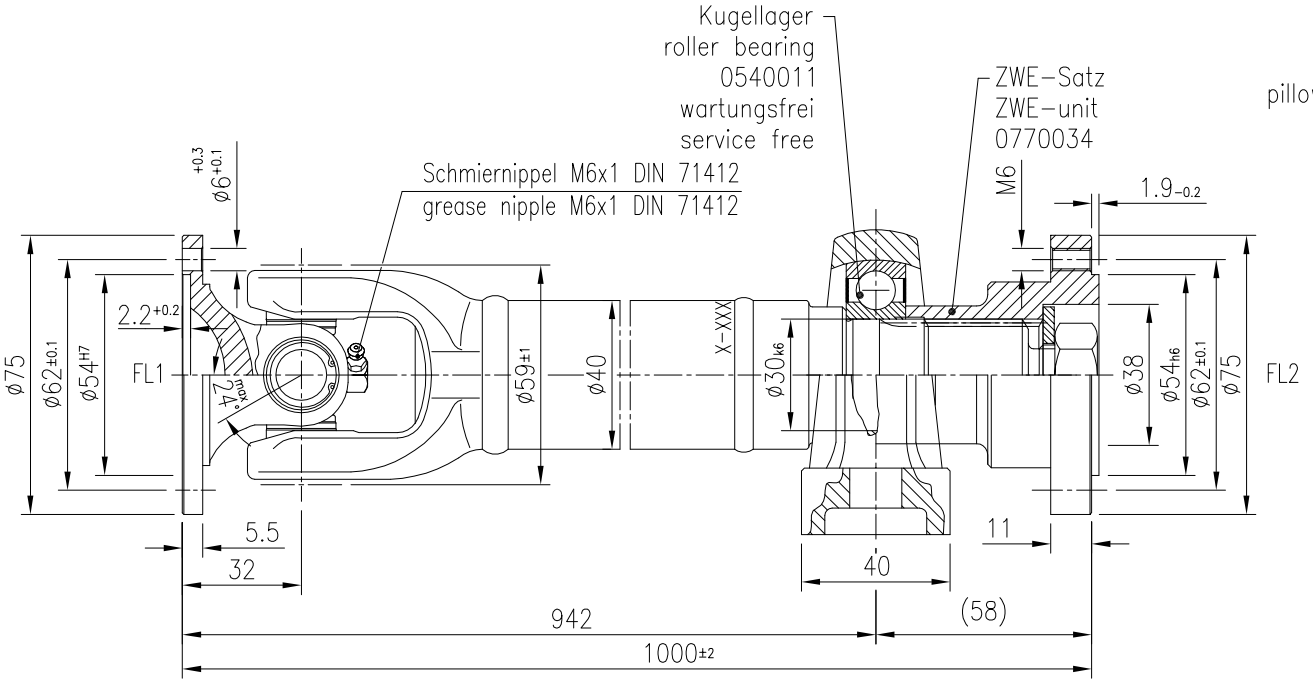
Maßstab Scale					
Gewicht Weight 4.5kg	0	Made	01.09.22	Stoll	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

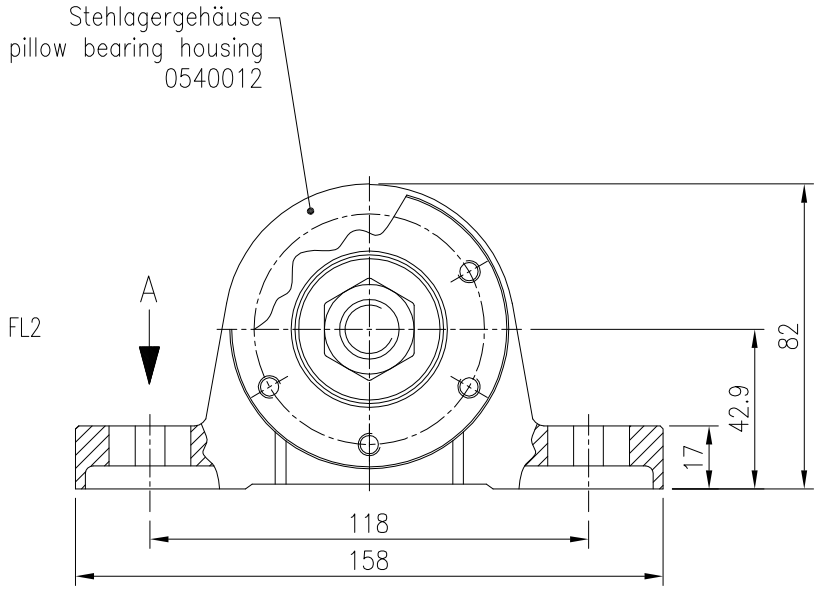
Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

Artikelnummer Part Number:

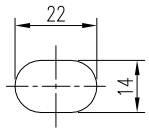
Zeichnungsnummer Drawing Number: A-500-009-0202-075-1225-RK

Format Form: A4

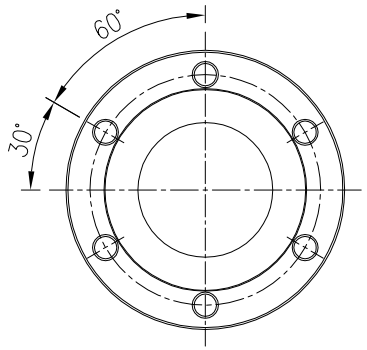




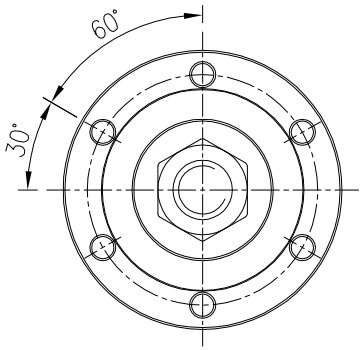
Ansicht (view) A



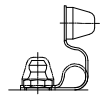
Ansicht (View) FL1



Ansicht (View) FL2



L1 = LE = Einbaulänge (operational length)



Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet

All grease nipples fitted with plastic caps

XXXXXX-X = ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

Alte Zeichnung old drawing A-542-009-0202-075-1000-R

Massenträgheit inertia moment 0.001381 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0

Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage
general tolerances for radius, chamfer, angle, form and positition
nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L

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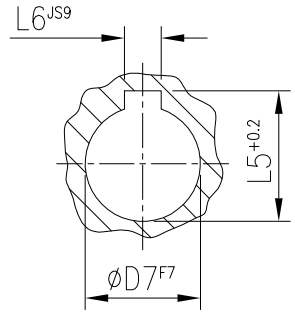
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Maßstab Scale					
– –					
	1	drawing no.	31.05.21	Förster	
Gewicht Weight 4.7kg	0	Made	17.05.21	Förster	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

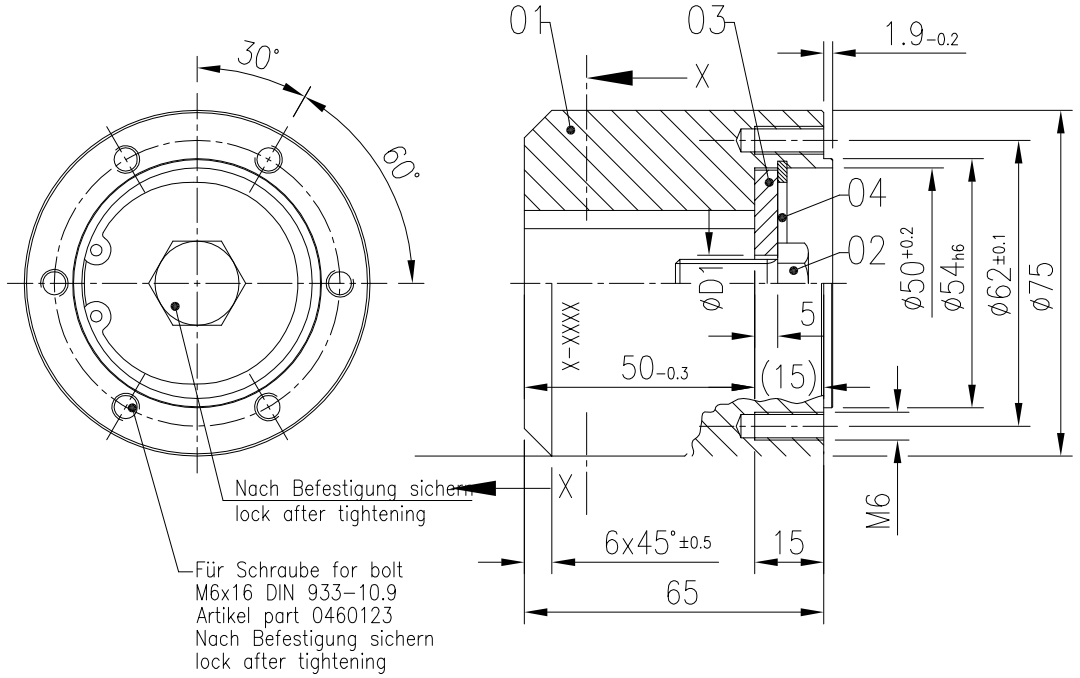
Benennung Name
Zwischenwelle mit Stehlager
Intermediate shaft with support bearing

Artikelnummer Part Number	Zeichnungsnummer Drawing Number	Format Form
	A-542-009-0212-075-1000-R	A4

Schnitt section X–X



Seeger Ring Circlip Position item 04	
DIN 472	Sass ID
ø50x2	0600047



Anschlussflansch companion flange Position item 01				Zentralschraube Center bolt Position item 02		Unterlegscheibe washer Position item 03		Serapid ID	Gewicht gesamt weight total [Kg]
ØD7	L6	L5	Sass ID	DIN 933–10.9	Sass ID	ØD1	Sass ID	SER–ZE000–	
ø10	3	11.4	0400901	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	2.00
ø12	4	13.8	0400902	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	1.98
ø13	5	15.3	0400903	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	1.97
ø14	5	16.3	0400904	M4x16*	0460159	ø5.5 (M5+M4)	0600074	1104–0	1.97
ø14	5	16.3	0400904	M5x16	0460023	ø5.5 (M5+M4)	0600074	1104–1	1.97
ø14	5	16.3	0400904	M6x20	0460012	ø8.5 (M6+M8)	0600057	1104–2	1.96
ø15	5	17.3	0400905	M6x20	0460012	ø8.5 (M6+M8)	0600057	1105–2	1.96
ø16	5	18.3	0400906	M5x16	0460023	ø5.5 (M5+M4)	0600074	1106–1	1.95
ø16	5	18.3	0400906	M6x20	0460012	ø8.5 (M6+M8)	0600057	1106–2	1.94
ø17	5	19.3	0400907	–	–	–	–	–	1.94
ø18	6	20.8	0400908	M6x20	0460012	ø8.5 (M6+M8)	0600057	1108–2	1.92
ø19	6	21.8	0400909	M6x20	0460012	ø8.5 (M6+M8)	0600057	1109–2	1.91
ø19	6	21.8	0400909	M8x20	0460042	ø8.5 (M6+M8)	0600057	1109–3	1.91
ø20	6	22.8	0400910	M8x20	0460042	ø8.5 (M6+M8)	0600057	1110–3	1.90
ø22	6	24.8	0400911	–	–	–	–	–	1.88
ø24	8	27.3	0400912	M6x20	0460012	ø8.5 (M6+M8)	0600057	1112–2	1.84
ø24	8	27.3	0400912	M8x20	0460042	ø8.5 (M6+M8)	0600057	1112–3	1.84
ø24	8	27.3	0400912	M10x25	0460033	ø12.5 (M10+M12)	0600058	1112–4	1.84
ø25	8	28.3	0400913	M8x20	0460042	ø8.5 (M6+M8)	0600057	1113–3	1.83
ø25	8	28.3	0400913	M10x25	0460033	ø12.5 (M10+M12)	0600058	1113–4	1.83
ø26	8	29.3	0400914	M6x20	0460012	ø8.5 (M6+M8)	0600057	1114–2	1.81
ø26	8	29.3	0400914	M8x20	0460042	ø8.5 (M6+M8)	0600057	1114–3	1.81
ø28	8	31.3	0400915	M8x20	0460042	ø8.5 (M6+M8)	0600057	1115–3	1.78
ø28	8	31.3	0400915	M10x25	0460033	ø12.5 (M10+M12)	0600058	1115–4	1.78
ø28	8	31.3	0400915	M12x25	0460032	ø12.5 (M10+M12)	0600058	1115–5	1.78
ø30	8	33.3	0400916	M10x25	0460033	ø12.5 (M10+M12)	0600058	1116–4	1.74
ø32	10	35.3	0400917	M8x20	0460042	ø8.5 (M6+M8)	0600057	1117–3	1.70
ø32	10	35.3	0400917	M10x25	0460033	ø12.5 (M10+M12)	0600058	1117–4	1.70
ø32	10	35.3	0400917	M12x25	0460032	ø12.5 (M10+M12)	0600058	1117–5	1.70
ø34	10	37.3	0400918	–	–	–	–	–	1.66
ø35	10	38.3	0400919	M8x20	0460042	ø8.5 (M6+M8)	0600057	1119–3	1.64
ø35	10	38.3	0400919	M10x25	0460033	ø12.5 (M10+M12)	0600058	1119–4	1.64
ø35	10	38.3	0400919	M12x25	0460032	ø12.5 (M10+M12)	0600058	1119–5	1.65
ø36	10	39.3	0400920	–	–	–	–	–	1.62
ø38	10	41.3	0400921	M10x25	0460033	ø12.5 (M10+M12)	0600058	1121–4	1.57
ø38	10	41.3	0400921	M12x25	0460032	ø12.5 (M10+M12)	0600058	1121–5	1.58
ø38	10	41.3	0400921	M16x35	0460046	ø16.5 (M14+M16)	0600059	1121–7	1.59
ø40	12	43.3	0400922	M16x35	0460046	ø16.5 (M14+M16)	0600059	1122–7	1.53
ø42	12	45.3	0400923	M10x25	0460033	ø12.5 (M10+M12)	0600058	1123–4	1.47
ø42	12	45.3	0400923	M12x25	0460032	ø12.5 (M10+M12)	0600058	1123–5	1.47
ø42	12	45.3	0400923	M16x35	0460046	ø16.5 (M14+M16)	0600059	1123–7	1.48

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*=933–8.8

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XXXXXX–X= ID Markierung einschließlich aller Kunden ID Daten
ID marking including all customers ID data

Achtung: Flanschlochkreisschnitt versetzt zur Hauptschnittebene
attention: section of hole circle different to main section

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>0.5 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2.0

Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage
general tolerances for radius, chamfer, angle, form and positition
nach according ISO 2768–1+2 (DIN 7168) m/Klasse K m/class K

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Maßstab Scale	– –				
Gewicht Weight					
	17	1106–2	26.04.22	Förster	
	16	1112–2	30.03.22	Stoll	
	15	1114–2	25.10.21	Förster	
	0	Made	23.09.09	Förster	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung
Name
Anschlussflansch nach DIN (ISO 7646)
companion flange according DIN (ISO 7646)

Artikelnummer
Part Number

Zeichnungsnummer
Drawing Number
A–040–52–075–L01

Format
Form
A4

Kunde *customer*	**Serapid France, Rouxmesnil-Bouteilles, France**				
Projekt *project*	**D05: THE-20766-5CF2-0-Rev.C** **Gelenkwellen für Hubsystem, cardan shafts for lifting system**				
Sass Projekt *Sass project*	**EP8329**	*Kundenbestellung Nummer customer order number*	-	Sass Auftrag Nummer *Sass order number*	-

Lieferumfang scope of delivery

Gilt als Ersatzteil + Stückliste validity as parts + spare parts list

	St *pcs*	Benennung *Description*	*Maß size mm*	Sass ID Client ID	Zeichnungsnummer *drawing number*	Bemerkung *remarks*
01	1	Gelenkwelle *cardan shaft*	LE=539 L1=505	50005602630104330505 5030-5	A-500-009-0202-075-0505-R	-
02	1	Gelenkwelle *cardan shaft*	LE=876 L1=845	50005602630104330845 5030-3	A-500-009-0202-075-0845-R	-
03	1	Gelenkwelle *cardan shaft*	LE=1118 L1=1085	50005602630104331085 5030-4	A-500-009-0202-075-1085-R	-
04	1	Gelenkwelle *cardan shaft*	LE=1210 L1=1180	50005602630104331180 5030-6	A-500-009-0202-075-1180-RK	-
05	1	Gelenkwelle *cardan shaft*	LE=1320 L1=1290	50005602630104331290 5030-2	A-500-009-0202-075-1290-RK	-
06	1	Gelenkwelle *cardan shaft*	LE=1529 L1=1495	50005602630104331495 5030-1	A-500-009-0202-075-1495-R	-
07	1	Gelenkwelle *cardan shaft*	LE=428 L1=395	50005602630104330395 5030-7	A-500-009-0202-075-0395-R	-
08	1	Zwischenwelle *Intermediate shaft*	LE/L1=1200	54200342630104331200 5030-0	A-542-009-0212-075-1200-R	mit Stehlager *with pillow bearing*
09	1	Zwischenwelle *Intermediate shaft*	LE/L1=1200	54200342630104331200 5030-0	A-542-009-0212-075-1200-R	mit Stehlager *with pillow bearing*
10	1	Anschlussflansch *companion flange*	Ø16/Ø8,5	- 1106-2	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
11	9	Anschlussflansch *companion flange*	Ø24/Ø8,5	- 1112-2	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
12	2	Anschlussflansch *companion flange*	Ø28/Ø12,5	- 1115-4	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
13	2	Anschlussflansch *companion flange*	Ø38/Ø12,5	- 1121-5	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*

231011-Serapid-D05-EP8329.docx

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14	16	Satz Sechskantschrauben *set of hexagon bolts*	M6x16 DIN 933 X6 = 96 St/pcs	S.010.367 S010-11		
15	1	Satz Technische Dokumentation in Deutsch und Englisch 9800119, in Papier oder/und als pdf Datei, je bestehend aus: Technische Datenblatt, Einbauzeichnungen, Gebrauchsanleitung mit Einbau- und Wartungsanweisung, Sicherheitshinweisen, Schmiermittelanweisung und alternative Schmierstoffangaben *Set technical documentation in German and English 9800119, in paper back or/and as pdf file, each consist of: technical data sheet, drawings, instruction manual with installation and maintenance instruction, safety information, greasing regulations and alternative lubricants*				

Technische Daten *technical data*

Antrieb *propulsion*

Type	Elektromotor *electric motor*	Leistung kW *power kW*	-	Drehzahl U/min *Revolution rpm*	-	Übersetzung *ratio*	-

Betriebsbedingungen *operational conditions*

Teil einer Anlage mit Überdachung oder im Freien
part of a indoors or outdoors plant

Temperatur °C *temperature °C*	- 30 bis *to* + 120	Einbaulage *operational level*	horizontal *horizontal*

Schmierung *lubrication*

Verschiebung *slip unit*	Wartungsfrei, Keilnabe Rilsan beschichtet mit Profilschutz *service free, sleeve part Rilsan coated with spline protection*		
Gelenkkreuze *universal joints*	Zentralschmierung am Kreuzkörper mit Schmiernippel (DIN71412 mit Kunststoff Schutzkappe) *central greasing system on universal joint body with greasing nipple (DIN71412 with plastic cap)*		
Büchsenlagerung *bearing at cups*	Rollenlager *roller bearings*	Schmiermittel *lubricant*	Fuchs Renolit LX-PEP 2

Die Kardanwellen werden von uns im betriebsbereiten Zustand geliefert. Ein Abschmieren vor der Inbetriebnahme ist daher unter normalen Bedingungen nicht nötig. Flanschflächen müssen vor der Montage blank und sauber sein.
The cardan shafts are ready for operation. Under normal circumstances no extra greasing before start is needed. Cardan flange faces have to be clean and blank before assembling.

Betriebsdaten Pos. ***operational data*** *item*	**01-09**	**-**	**-**	**-**	**-**	**Bemerkung** ***remarks***
max. Drehmoment Nm *max. torque Nm*	450	-	-	-	-	
Grenzdrehmoment Nm *limit torque Nm*	650	-	-	-	-	
Betriebsdrehmoment Nm *operational torque Nm*	50	-	-	-	-	
Betriebsdrehzahl U/min *operational revolution rpm*	990	-	-	-	-	
Max. möglicher Beugewinkel *max. available deflection angle*	24°	-	-	-	-	
Beugewinkel im Arbeitsbetrieb *deflection angle in operation*	1° - 14°	-	-	-	-	

Gewicht und Massenträgheitsmoment siehe entsprechende Zeichnung
Weigh and, inertia moment see corresponding drawing

Auswuchten ***balancing***	Gelenkwellen nach DIN ISO 1940 – G16 *cardan shafts according to DIN ISO 1940 – G16*
Markierung ***marking***	Alle Gelenkwellen und Anschlussflansche werden mit den kundeneigenen ID Nummern versehen *cardan shafts and adapter flanges labelled with customer ID numbers*

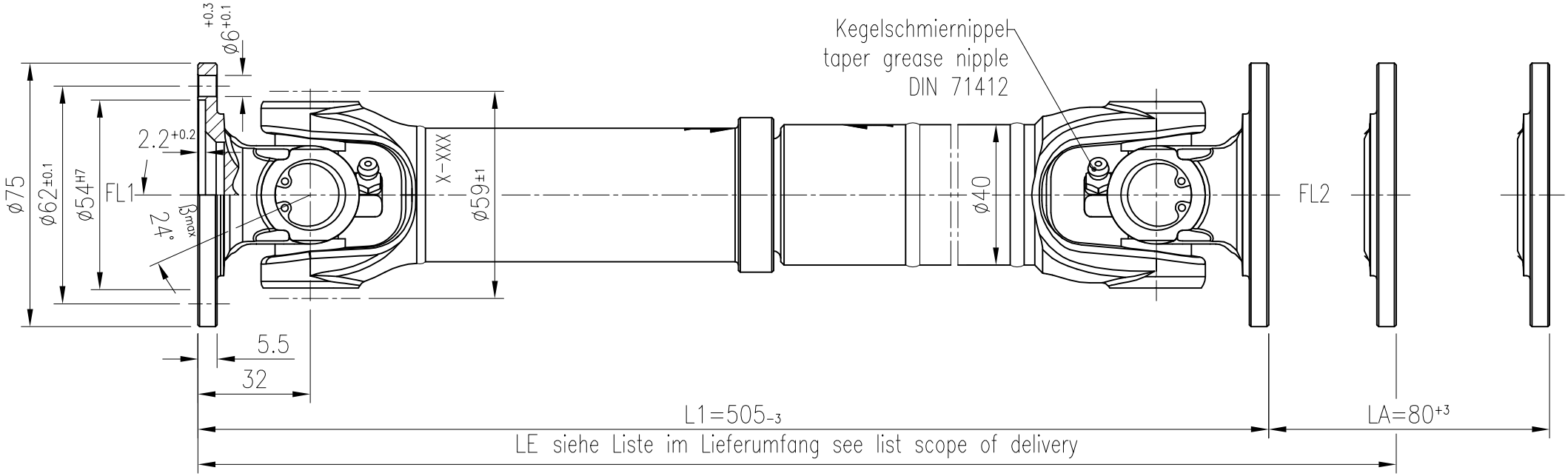
Korrosionsschutz *corrosion protection*

Bennennung	**description**	**Farbton**	***colour***	**RAL**	
Grundierung	*primary coat*	-	-	-	
2 Komponenten PU Decklack	*2 component PU final coat*	gelb glänzend	*yellow glossy*	1003	
Anschlussflansche mit Außenkörper Anstrich	*companion flange with outside painting*				
Nabenpassungen mit Ölfilm korrosionsgeschützt	*sleeve fit with oil film protection*				
Flanschoberflächen mit Korrosionsschutzfilm	*face of flanges with anti-corrosion film*				

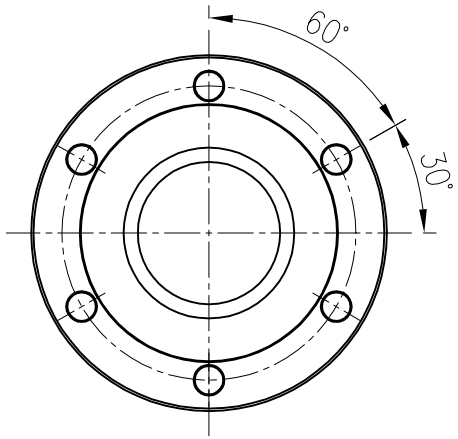
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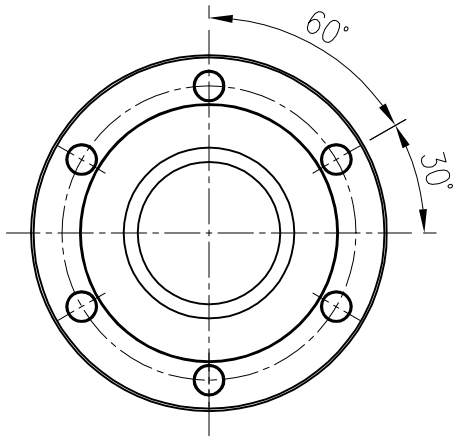
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22145 Stapelfeld
Telefon: +49(0)40-22 63 301-0
Telefax: +49(0)40-22 63 301-19



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.000994 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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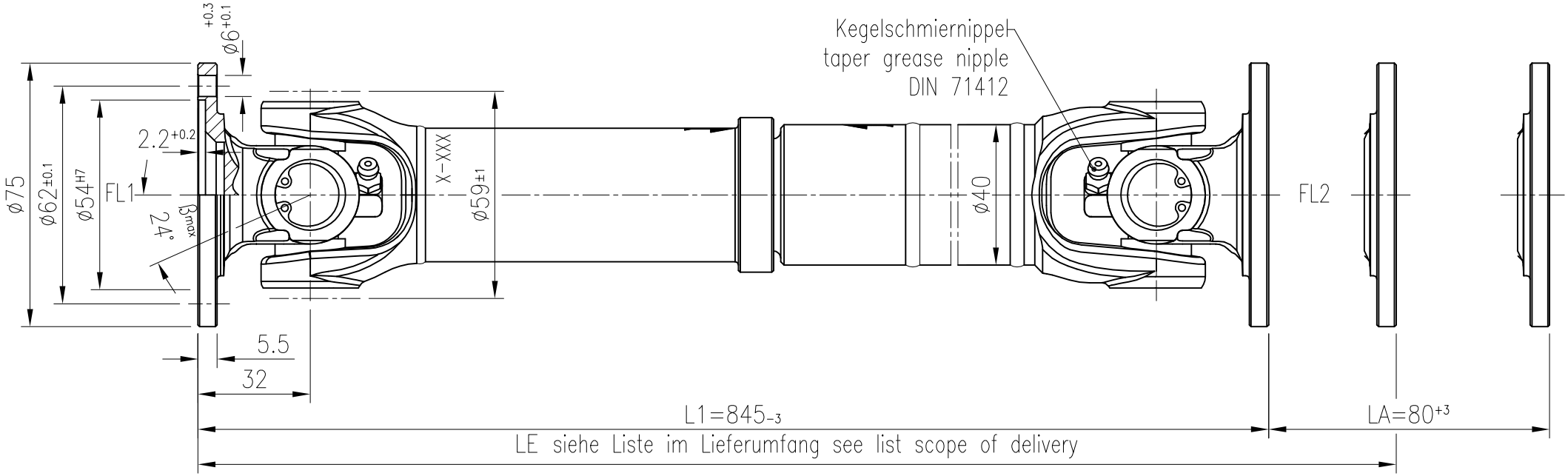
Maßstab Scale	– –				
Gewicht Weight	3.1kg	0	Made	09.01.18	Förster
		Revision	Bezeichnung description	Datum date	bearbeitet revised

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

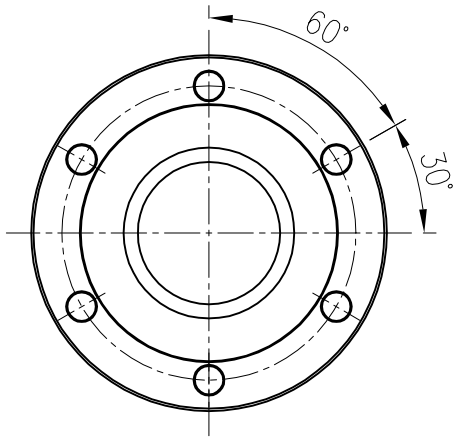
Artikelnummer
Part Number

Zeichnungsnummer
Drawing Number: A-500-009-0202-075-0505-R

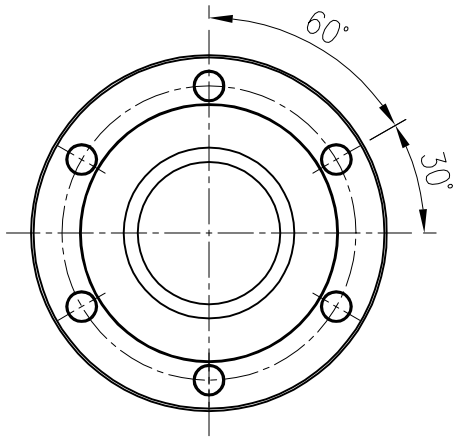
Format
Form: A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA) (length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten (ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit inertia moment 0.001223 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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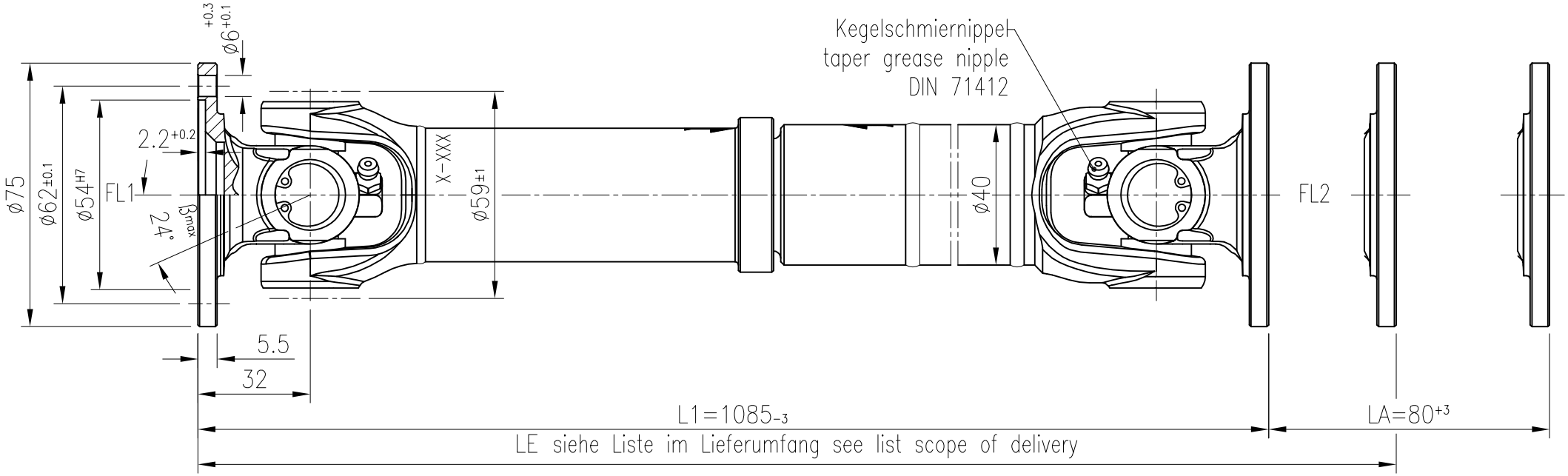
Maßstab Scale					
Gewicht Weight 3.8kg	0	Made	04.01.24	Stoll	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

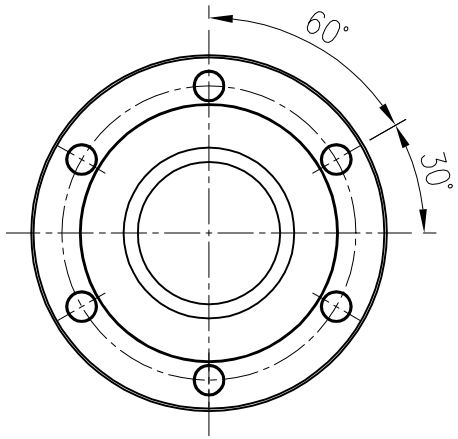
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Zeichnungsnummer Drawing Number: A-500-009-0202-075-0845-R

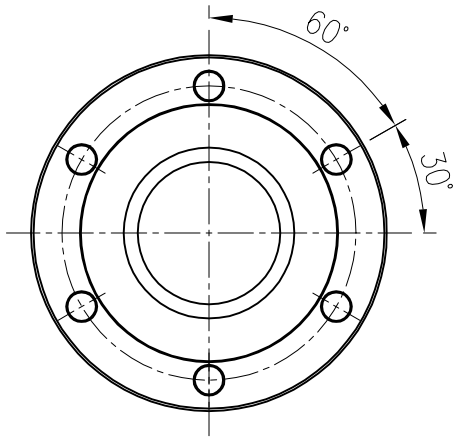
Format Form: A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA) (length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten (ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit inertia moment 0.001385 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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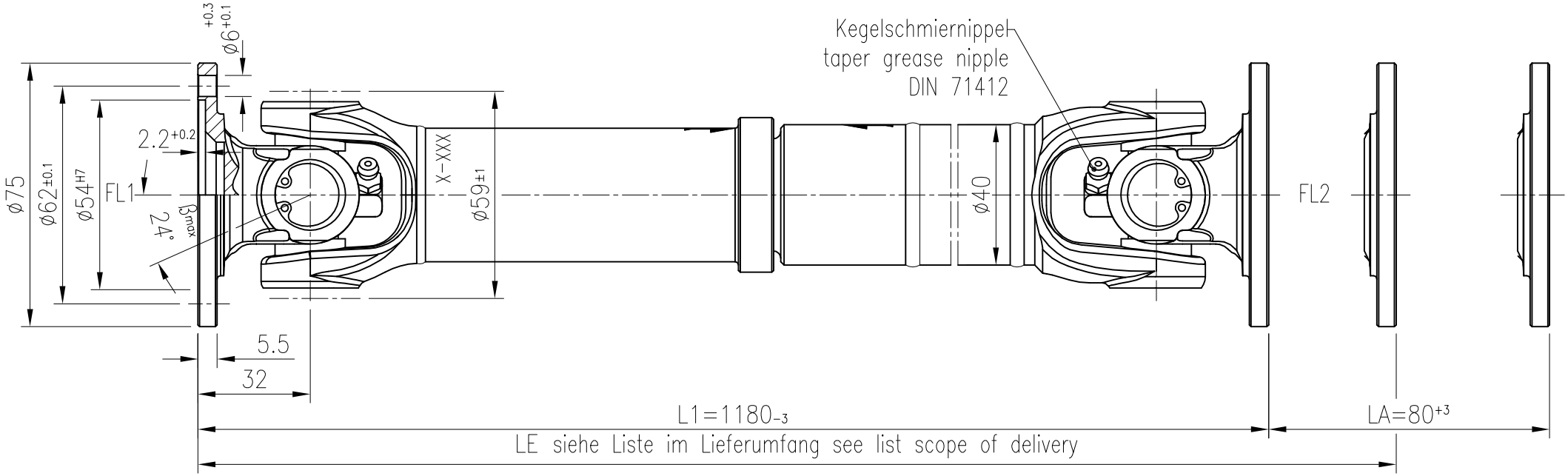
Maßstab Scale	– –				
Gewicht Weight	4.2kg	0	Made	04.01.24	Stoll
		Revision	Bezeichnung description	Datum date	bearbeitet revised

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

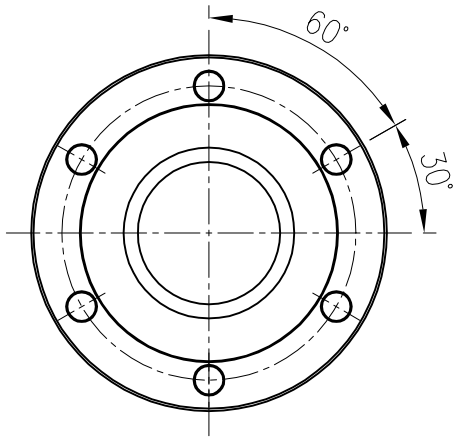
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Zeichnungsnummer Drawing Number: A-500-009-0202-075-1085-R

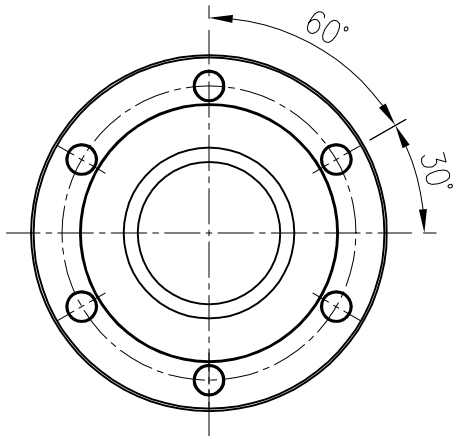
Format Form: A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA) (length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten (ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit inertia moment 0.001449 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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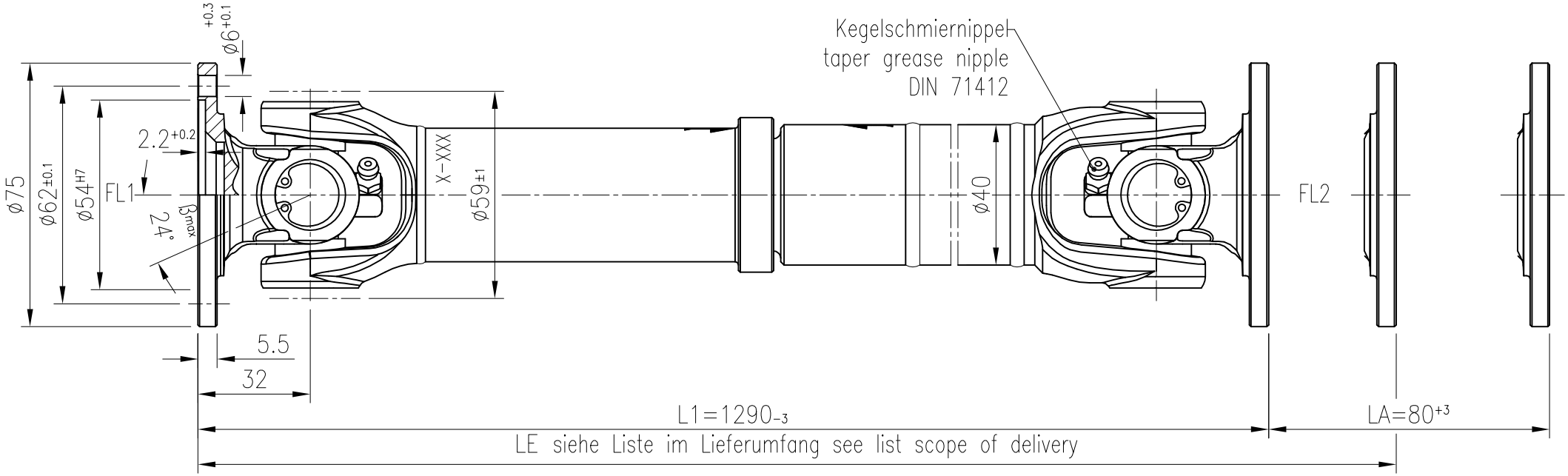
Maßstab Scale	– –				
Gewicht Weight	4.4kg	0	Made	02.06.20	Stoll
		Revision	Bezeichnung description	Datum date	bearbeitet revised

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

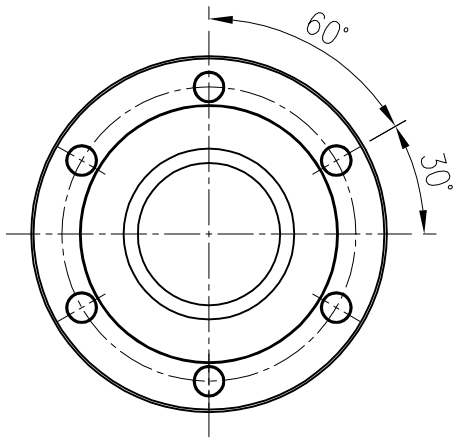
Artikelnummer Part Number:

Zeichnungsnummer Drawing Number: A-500-009-0202-075-1180-RK

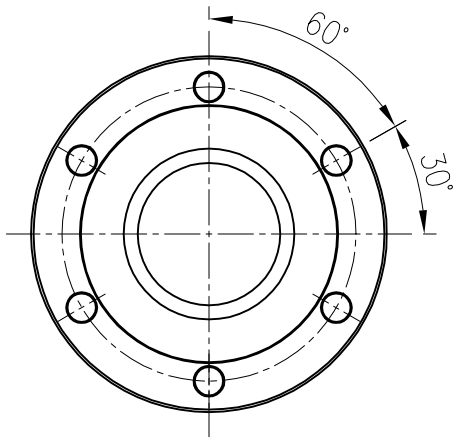
Format Form: A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.001523 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

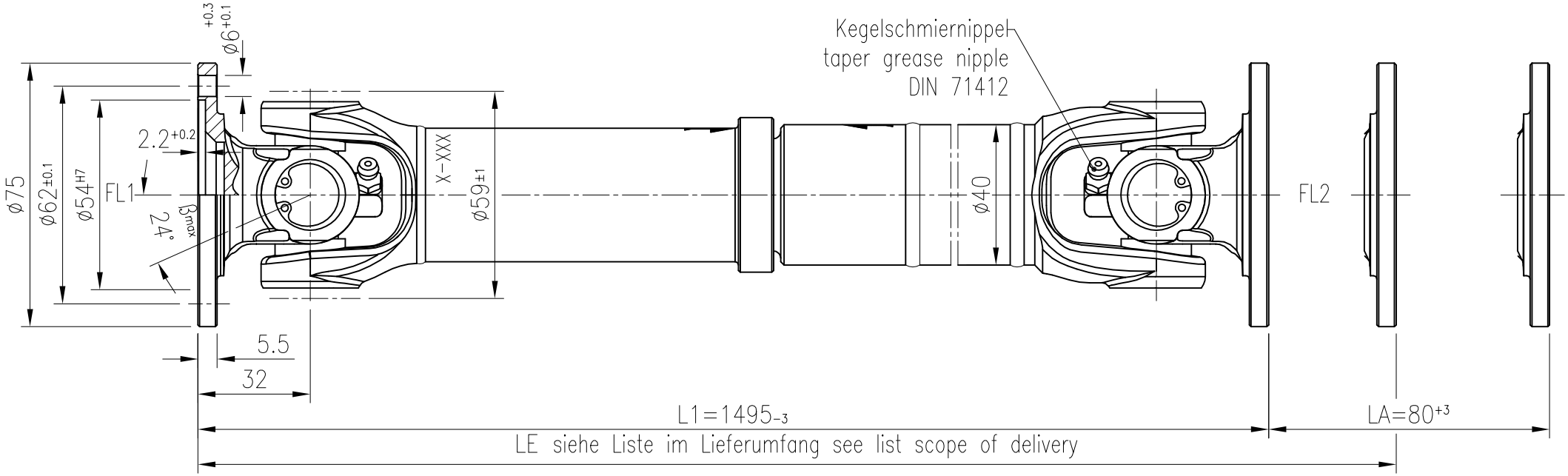
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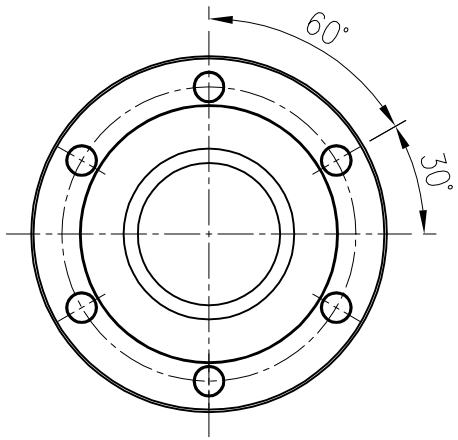
Maßstab Scale					
Gewicht Weight 4.6kg	0	Made	10.01.24	Stoll	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

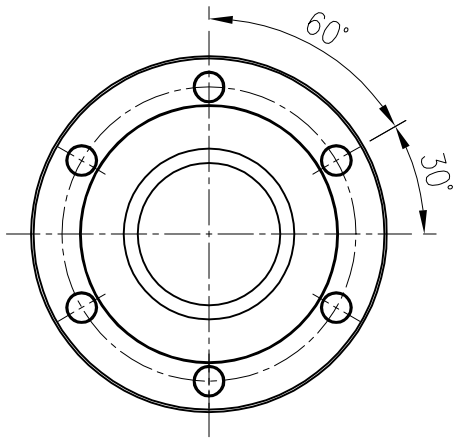
Artikelnummer Part Number	Zeichnungsnummer Drawing Number	Format Form
	A-500-009-0202-075-1290-RK	A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.001661 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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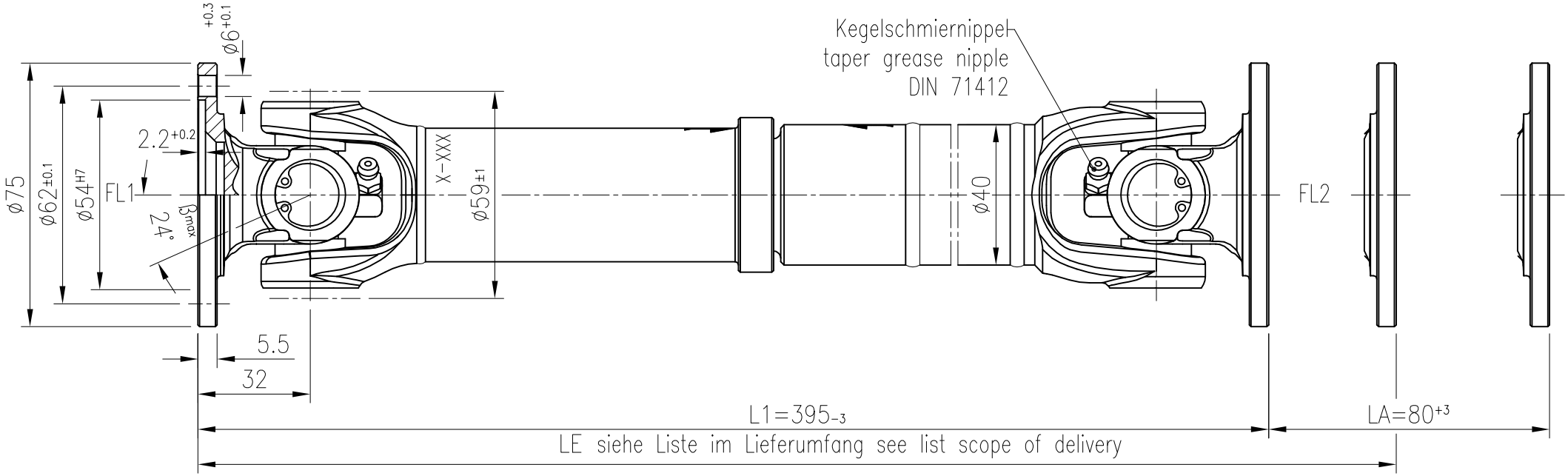
Maßstab Scale					
Gewicht Weight 5.0kg	0	Made	17.12.19	Stoll	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

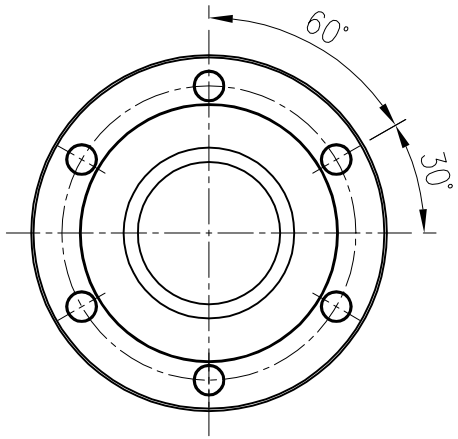
Artikelnummer
Part Number

Zeichnungsnummer
Drawing Number: A-500-009-0202-075-1495-R

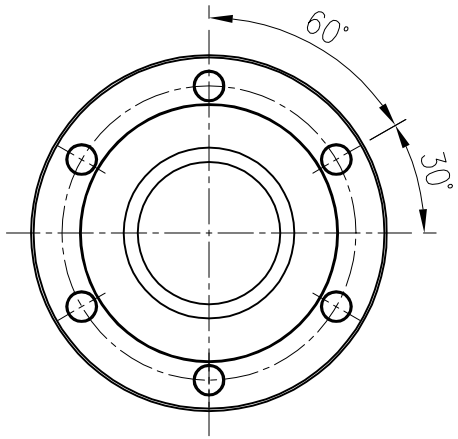
Format
Form: A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.000920 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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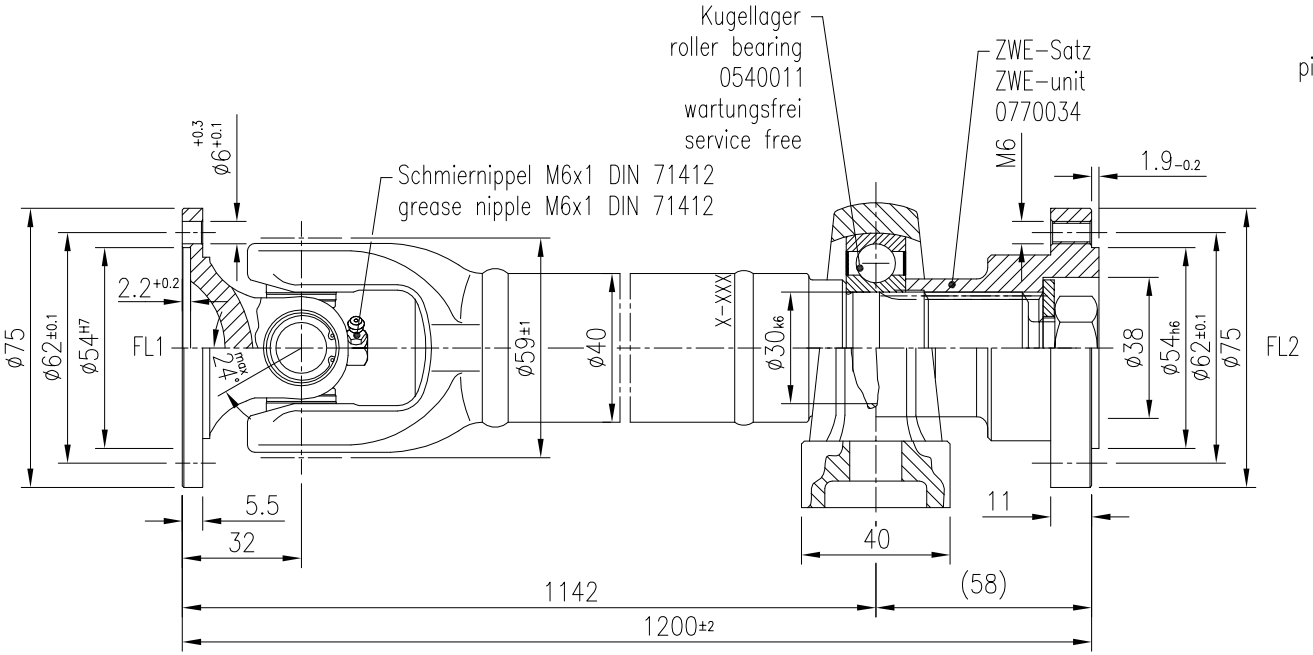
Maßstab Scale					
Gewicht Weight 2.9kg	0	Made	23.11.22	Stoll	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

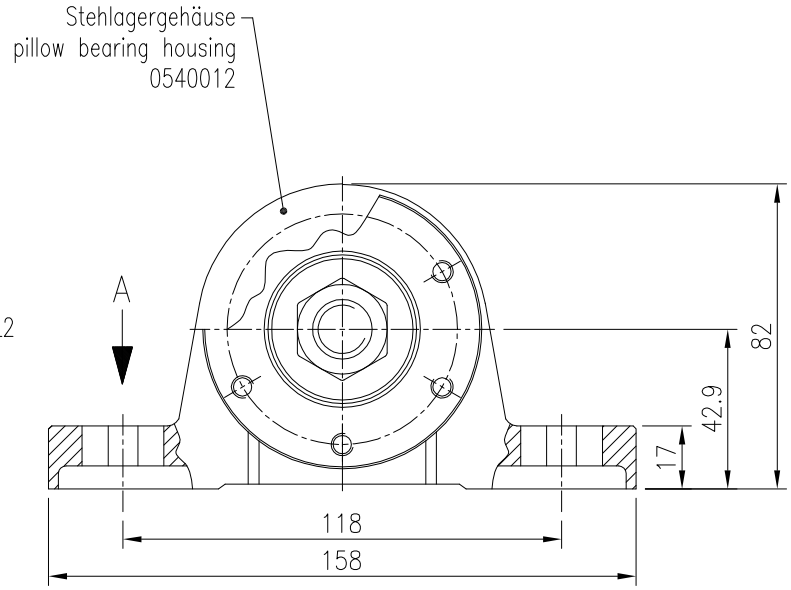
Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

Artikelnummer
Part Number

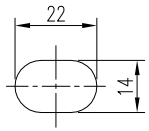
Zeichnungsnummer
Drawing Number: A-500-009-0202-075-0395-R

Format
Form: A4

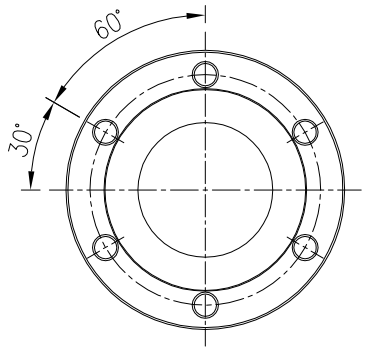




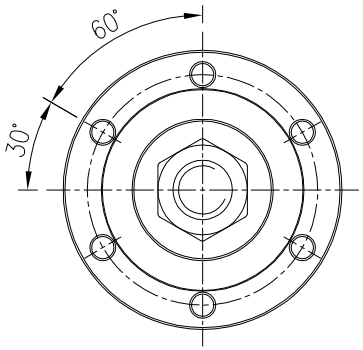
Ansicht (view) A



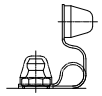
Ansicht (View) FL1



Ansicht (View) FL2



L1 = LE = Einbaulänge (operational length)



Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet

All grease nipples fitted with plastic caps

XXXXXX-X = ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

Massenträgheit
inertia moment 0.001516 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0

Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage
general tolerances for radius, chamfer, angle, form and positition
nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L

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Maßstab Scale					
Gewicht Weight 5.0kg	0	Made	04.01.24	Stoll	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

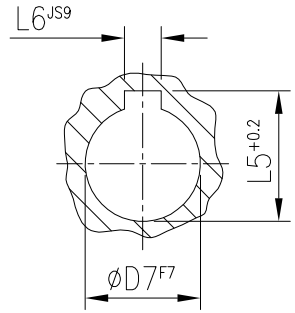
Benennung
Name
Zwischenwelle mit Stehlager
Intermediate shaft with support bearing

Artikelnummer
Part Number

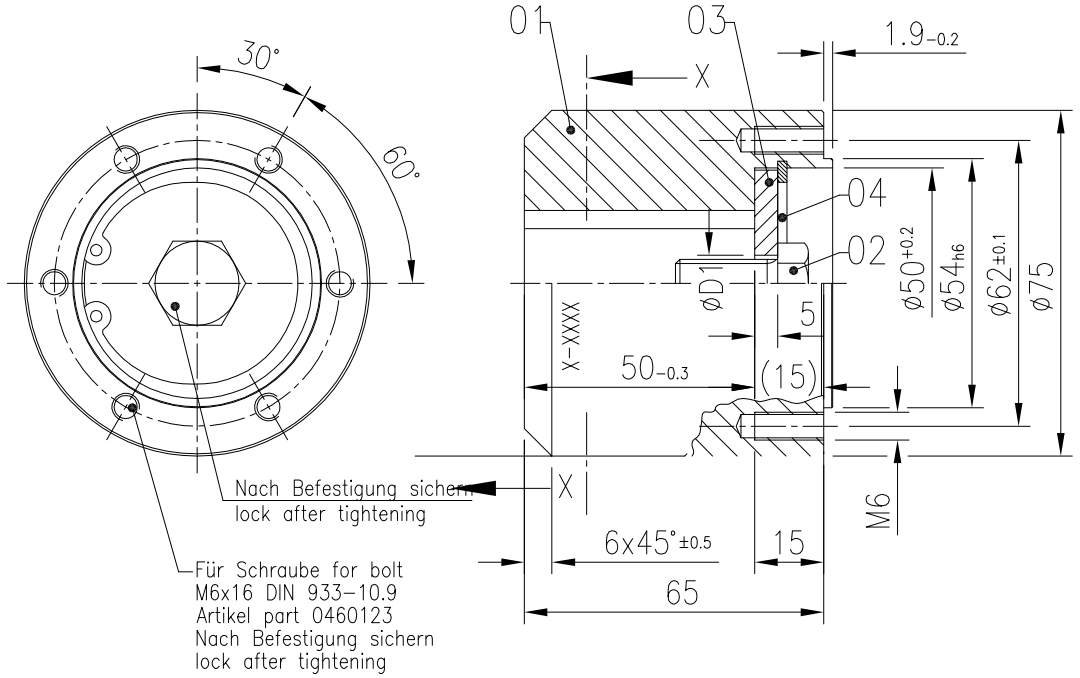
Zeichnungsnummer
Drawing Number
A-542-009-0212-075-1200-R

Format
Form
A4

Schnitt section X–X



Seeger Ring Circlip Position item 04	
DIN 472	Sass ID
ø50x2	0600047



Anschlussflansch companion flange Position item 01				Zentralschraube Center bolt Position item 02		Unterlegscheibe washer Position item 03		Serapid ID	Gewicht gesamt weight total [Kg]
ØD7	L6	L5	Sass ID	DIN 933–10.9	Sass ID	ØD1	Sass ID	SER–ZE000–	
ø10	3	11.4	0400901	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	2.00
ø12	4	13.8	0400902	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	1.98
ø13	5	15.3	0400903	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	1.97
ø14	5	16.3	0400904	M4x16*	0460159	ø5.5 (M5+M4)	0600074	1104–0	1.97
ø14	5	16.3	0400904	M5x16	0460023	ø5.5 (M5+M4)	0600074	1104–1	1.97
ø14	5	16.3	0400904	M6x20	0460012	ø8.5 (M6+M8)	0600057	1104–2	1.96
ø15	5	17.3	0400905	M6x20	0460012	ø8.5 (M6+M8)	0600057	1105–2	1.96
ø16	5	18.3	0400906	M5x16	0460023	ø5.5 (M5+M4)	0600074	1106–1	1.95
ø16	5	18.3	0400906	M6x20	0460012	ø8.5 (M6+M8)	0600057	1106–2	1.94
ø17	5	19.3	0400907	–	–	–	–	–	1.94
ø18	6	20.8	0400908	M6x20	0460012	ø8.5 (M6+M8)	0600057	1108–2	1.92
ø19	6	21.8	0400909	M6x20	0460012	ø8.5 (M6+M8)	0600057	1109–2	1.91
ø19	6	21.8	0400909	M8x20	0460042	ø8.5 (M6+M8)	0600057	1109–3	1.91
ø20	6	22.8	0400910	M8x20	0460042	ø8.5 (M6+M8)	0600057	1110–3	1.90
ø22	6	24.8	0400911	–	–	–	–	–	1.88
ø24	8	27.3	0400912	M6x20	0460012	ø8.5 (M6+M8)	0600057	1112–2	1.84
ø24	8	27.3	0400912	M8x20	0460042	ø8.5 (M6+M8)	0600057	1112–3	1.84
ø24	8	27.3	0400912	M10x25	0460033	ø12.5 (M10+M12)	0600058	1112–4	1.84
ø25	8	28.3	0400913	M8x20	0460042	ø8.5 (M6+M8)	0600057	1113–3	1.83
ø25	8	28.3	0400913	M10x25	0460033	ø12.5 (M10+M12)	0600058	1113–4	1.83
ø26	8	29.3	0400914	M6x20	0460012	ø8.5 (M6+M8)	0600057	1114–2	1.81
ø26	8	29.3	0400914	M8x20	0460042	ø8.5 (M6+M8)	0600057	1114–3	1.81
ø28	8	31.3	0400915	M8x20	0460042	ø8.5 (M6+M8)	0600057	1115–3	1.78
ø28	8	31.3	0400915	M10x25	0460033	ø12.5 (M10+M12)	0600058	1115–4	1.78
ø28	8	31.3	0400915	M12x25	0460032	ø12.5 (M10+M12)	0600058	1115–5	1.78
ø30	8	33.3	0400916	M10x25	0460033	ø12.5 (M10+M12)	0600058	1116–4	1.74
ø32	10	35.3	0400917	M8x20	0460042	ø8.5 (M6+M8)	0600057	1117–3	1.70
ø32	10	35.3	0400917	M10x25	0460033	ø12.5 (M10+M12)	0600058	1117–4	1.70
ø32	10	35.3	0400917	M12x25	0460032	ø12.5 (M10+M12)	0600058	1117–5	1.70
ø34	10	37.3	0400918	–	–	–	–	–	1.66
ø35	10	38.3	0400919	M8x20	0460042	ø8.5 (M6+M8)	0600057	1119–3	1.64
ø35	10	38.3	0400919	M10x25	0460033	ø12.5 (M10+M12)	0600058	1119–4	1.64
ø35	10	38.3	0400919	M12x25	0460032	ø12.5 (M10+M12)	0600058	1119–5	1.65
ø36	10	39.3	0400920	–	–	–	–	–	1.62
ø38	10	41.3	0400921	M10x25	0460033	ø12.5 (M10+M12)	0600058	1121–4	1.57
ø38	10	41.3	0400921	M12x25	0460032	ø12.5 (M10+M12)	0600058	1121–5	1.58
ø38	10	41.3	0400921	M16x35	0460046	ø16.5 (M14+M16)	0600059	1121–7	1.59
ø40	12	43.3	0400922	M16x35	0460046	ø16.5 (M14+M16)	0600059	1122–7	1.53
ø42	12	45.3	0400923	M10x25	0460033	ø12.5 (M10+M12)	0600058	1123–4	1.47
ø42	12	45.3	0400923	M12x25	0460032	ø12.5 (M10+M12)	0600058	1123–5	1.47
ø42	12	45.3	0400923	M16x35	0460046	ø16.5 (M14+M16)	0600059	1123–7	1.48

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*=933–8.8

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XXXXXX–X= ID Markierung einschließlich aller Kunden ID Daten
ID marking including all customers ID data

Achtung: Flanschlochkreisschnitt versetzt zur Hauptschnittebene
attention: section of hole circle different to main section

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>0.5 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2.0

Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage
general tolerances for radius, chamfer, angle, form and positition
nach according ISO 2768–1+2 (DIN 7168) m/Klasse K m/class K

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Maßstab Scale	– –				
Gewicht Weight					
	17	1106–2	26.04.22	Förster	
	16	1112–2	30.03.22	Stoll	
	15	1114–2	25.10.21	Förster	
	0	Made	23.09.09	Förster	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung
Name
Anschlussflansch nach DIN (ISO 7646)
companion flange according DIN (ISO 7646)

Artikelnummer
Part Number

Zeichnungsnummer
Drawing Number
A–040–52–075–L01

Format
Form
A4

Kunde *customer*	**Serapid France, Rouxmesnil-Bouteilles, France**				
Projekt *project*	**D06: THE-20766-6CF2-0-Rev.B** **Gelenkwellen für Hubsystem, cardan shafts for lifting system**				
Sass Projekt *Sass project*	**EP8329**	*Kundenbestellung Nummer customer order number*	-	Sass Auftrag Nummer *Sass order number*	-

Lieferumfang scope of delivery

Gilt als Ersatzteil + Stückliste validity as parts + spare parts list

	St *pcs*	Benennung *Description*	*Maß size* mm	Sass ID Client ID	Zeichnungsnummer *drawing number*	Bemerkung *remarks*
01	1	Gelenkwelle *cardan shaft*	LE=395 L1=365	50005602630104330365 6030-0	A-500-009-0202-075-0365-R	-
02	1	Gelenkwelle *cardan shaft*	LE=446 L1=415	50005602630104330415 6030-1	A-500-009-0202-075-0415-R	-
03	1	Anschlussflansch *companion flange*	Ø16/Ø8,5	- 1106-2	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
04	1	Anschlussflansch *companion flange*	Ø24/Ø8,5	- 1112-2	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
05	1	Anschlussflansch *companion flange*	Ø24/Ø8,5	- 1112-3	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
06	1	Anschlussflansch *companion flange*	Ø35/Ø12,5	- 1119-5	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
07	4	Satz Sechskantschrauben *set of hexagon bolts*	M6x16 DIN 933 X6 = 24 St/pcs	S.010.367 S010-11		
08	1	Satz Technische Dokumentation in Deutsch und Englisch 9800119, in Papier oder/und als pdf Datei, je bestehend aus: Technische Datenblatt, Einbauzeichnungen, Gebrauchsanleitung mit Einbau- und Wartungsanweisung, Sicherheitshinweisen, Schmiermittelanweisung und alternative Schmierstoffangaben *Set technical documentation in German and English 9800119, in paper back or/and as pdf file, each consist of:* *technical data sheet, drawings, instruction manual with installation and maintenance instruction, safety information, greasing regulations and alternative lubricants*				

231011-Serapid-D06-EP8329.docx

www.gelenkwellenfabrik.de

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Technische Daten technical data

Antrieb *propulsion*

Type	Elektromotor *electric motor*	Leistung kW *power kW*	-	Drehzahl U/min *Revolution rpm*	-	Übersetzung *ratio*	-

Betriebsbedingungen *operational conditions*

Teil einer Anlage mit Überdachung oder im Freien
part of a indoors or outdoors plant

Temperatur °C *temperature °C*	- 30 bis *to* + 120	Einbaulage *operational level*	horizontal *horizontal*

Schmierung *lubrication*

Verschiebung *slip unit*	Wartungsfrei, Keilnabe Rilsan beschichtet mit Profilschutz *service free, sleeve part Rilsan coated with spline protection*		
Gelenkkreuze *universal joints*	Zentralschmierung am Kreuzkörper mit Schmiernippel (DIN71412 mit Kunststoff Schutzkappe) *central greasing system on universal joint body with greasing nipple (DIN71412 with plastic cap)*		
Büchsenlagerung *bearing at cups*	Rollenlager *roller bearings*	Schmiermittel *lubricant*	Fuchs Renolit LX-PEP 2

Die Kardanwellen werden von uns im betriebsbereiten Zustand geliefert. Ein Abschmieren vor der Inbetriebnahme ist daher unter normalen Bedingungen nicht nötig. Flanschflächen müssen vor der Montage blank und sauber sein.
The cardan shafts are ready for operation. Under normal circumstances no extra greasing before start is needed. Cardan flange faces have to be clean and blank before assembling.

Betriebsdaten Pos. ***operational data*** *item*	**01+02**	**-**	**-**	**-**	**-**	**Bemerkung** ***remarks***
max. Drehmoment Nm *max. torque Nm*	450	-	-	-	-	
Grenzdrehmoment Nm *limit torque Nm*	650	-	-	-	-	
Betriebsdrehmoment Nm *operational torque Nm*	5	-	-	-	-	
Betriebsdrehzahl U/min *operational revolution rpm*	825	-	-	-	-	
Max. möglicher Beugewinkel *max. available deflection angle*	24°	-	-	-	-	
Beugewinkel im Arbeitsbetrieb *deflection angle in operation*	1° - 7°	-	-	-	-	

Gewicht und Massenträgheitsmoment siehe entsprechende Zeichnung
Weigh and, inertia moment see corresponding drawing

Auswuchten ***balancing***	Gelenkwellen nach DIN ISO 1940 – G16 *cardan shafts according to DIN ISO 1940 – G16*
Markierung ***marking***	Alle Gelenkwellen und Anschlussflansche werden mit den kundeneigenen ID Nummern versehen *cardan shafts and adapter flanges labelled with customer ID numbers*

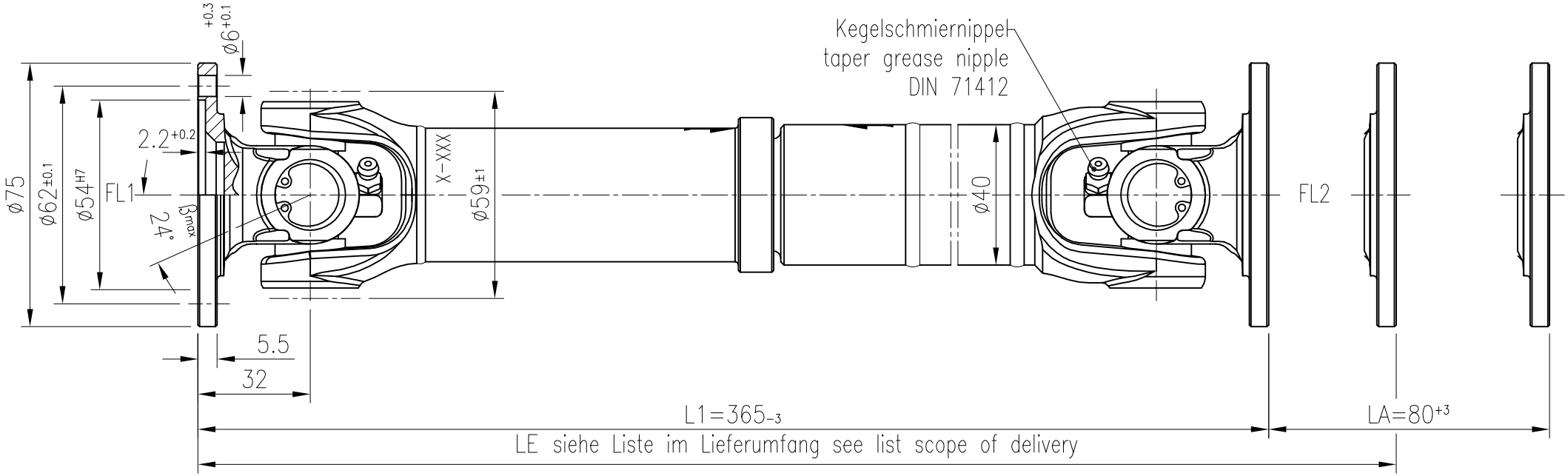
Korrosionsschutz *corrosion protection*

Bennenung	**description**	**Farbton**	***colour***	**RAL**	
Grundierung	*primary coat*	-	-	-	
2 Komponenten PU Decklack	*2 component PU final coat*	gelb glänzend	*yellow glossy*	1003	
Anschlussflansche mit Außenkörper Anstrich	*companion flange with outside painting*				
Nabenpassungen mit Ölfilm korrosionsgeschützt	*sleeve fit with oil film protection*				
Flanschoberflächen mit Korrosionsschutzfilm	*face of flanges with anti-corrosion film*				

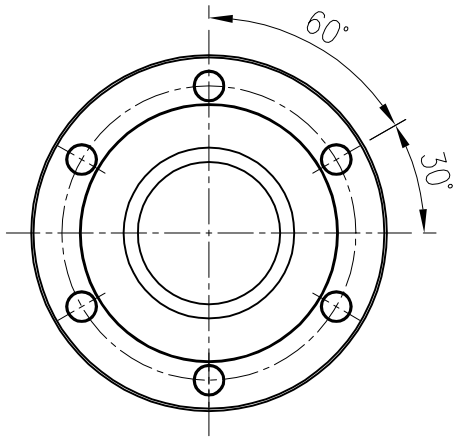
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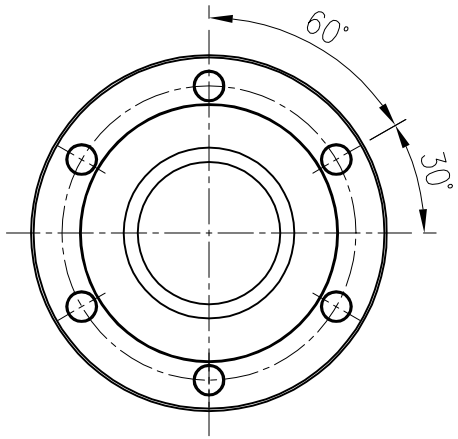
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Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.000899 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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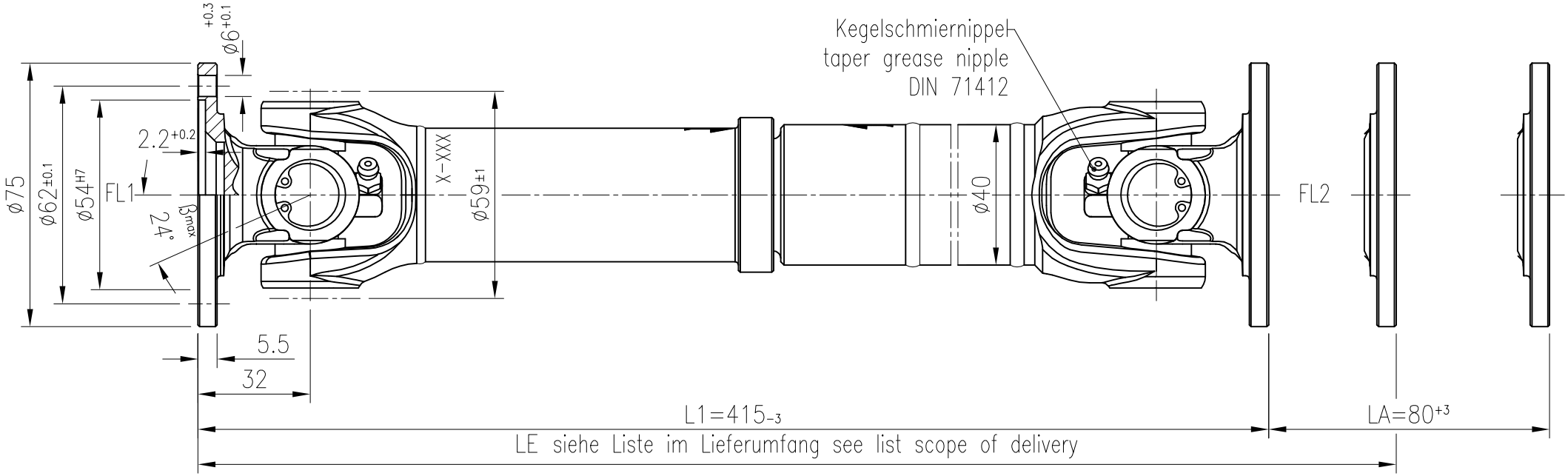
Maßstab Scale					
Gewicht Weight 2.9kg	0	Made	30.06.17	Stoll	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

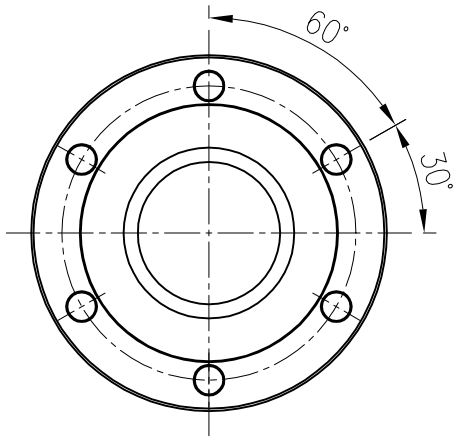
Artikelnummer Part Number:

Zeichnungsnummer Drawing Number: A-500-009-0202-075-0365-R

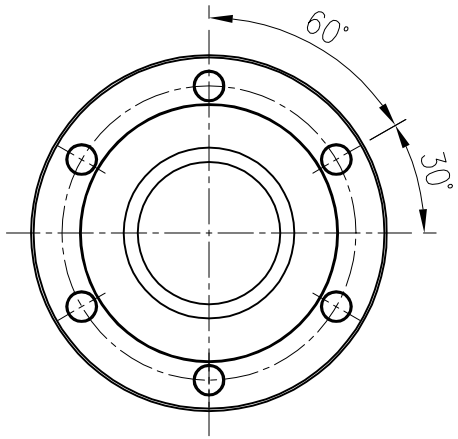
Format Form: A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.000933 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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Maßstab Scale					
Gewicht Weight 3.0kg	0	Made	05.01.24	Stoll	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

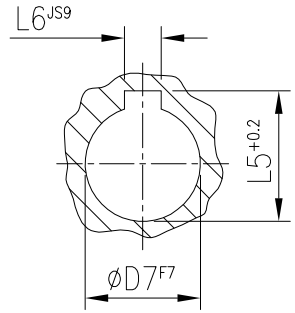
Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

Artikelnummer
Part Number

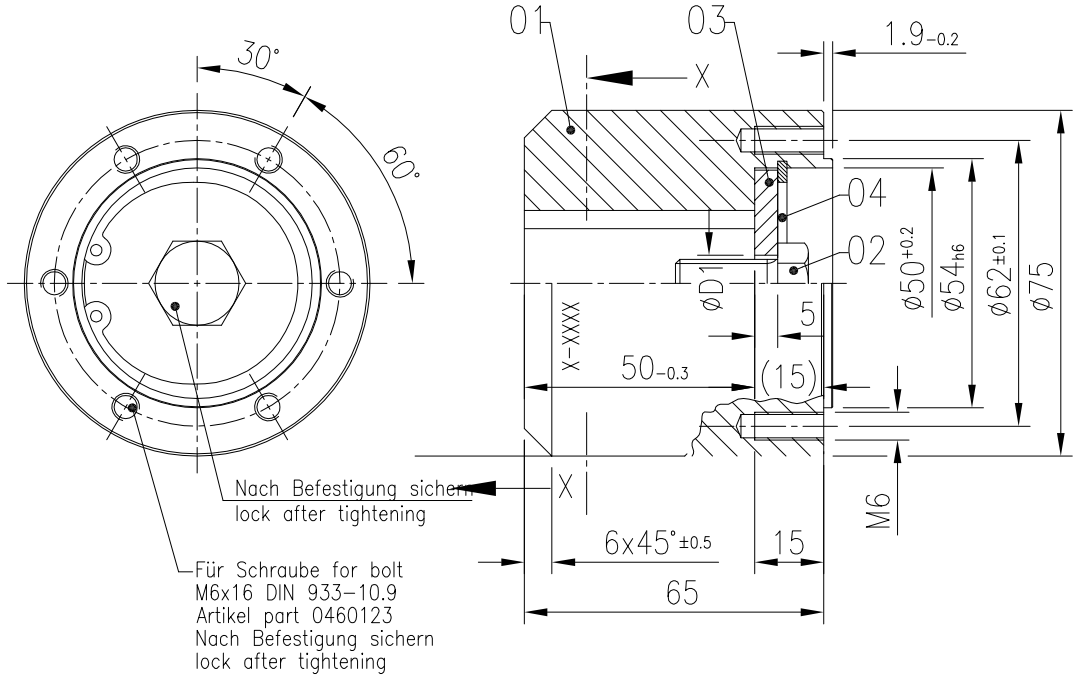
Zeichnungsnummer
Drawing Number: A-500-009-0202-075-0415-R

Format
Form: A4

Schnitt section X–X



Seeger Ring Circlip Position item 04	
DIN 472	Sass ID
ø50x2	0600047



Anschlussflansch companion flange Position item 01				Zentralschraube Center bolt Position item 02		Unterlegscheibe washer Position item 03		Serapid ID	Gewicht gesamt weight total [Kg]
ØD7	L6	L5	Sass ID	DIN 933–10.9	Sass ID	ØD1	Sass ID	SER–ZE000–	
ø10	3	11.4	0400901	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	2.00
ø12	4	13.8	0400902	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	1.98
ø13	5	15.3	0400903	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	1.97
ø14	5	16.3	0400904	M4x16*	0460159	ø5.5 (M5+M4)	0600074	1104–0	1.97
ø14	5	16.3	0400904	M5x16	0460023	ø5.5 (M5+M4)	0600074	1104–1	1.97
ø14	5	16.3	0400904	M6x20	0460012	ø8.5 (M6+M8)	0600057	1104–2	1.96
ø15	5	17.3	0400905	M6x20	0460012	ø8.5 (M6+M8)	0600057	1105–2	1.96
ø16	5	18.3	0400906	M5x16	0460023	ø5.5 (M5+M4)	0600074	1106–1	1.95
ø16	5	18.3	0400906	M6x20	0460012	ø8.5 (M6+M8)	0600057	1106–2	1.94
ø17	5	19.3	0400907	–	–	–	–	–	1.94
ø18	6	20.8	0400908	M6x20	0460012	ø8.5 (M6+M8)	0600057	1108–2	1.92
ø19	6	21.8	0400909	M6x20	0460012	ø8.5 (M6+M8)	0600057	1109–2	1.91
ø19	6	21.8	0400909	M8x20	0460042	ø8.5 (M6+M8)	0600057	1109–3	1.91
ø20	6	22.8	0400910	M8x20	0460042	ø8.5 (M6+M8)	0600057	1110–3	1.90
ø22	6	24.8	0400911	–	–	–	–	–	1.88
ø24	8	27.3	0400912	M6x20	0460012	ø8.5 (M6+M8)	0600057	1112–2	1.84
ø24	8	27.3	0400912	M8x20	0460042	ø8.5 (M6+M8)	0600057	1112–3	1.84
ø24	8	27.3	0400912	M10x25	0460033	ø12.5 (M10+M12)	0600058	1112–4	1.84
ø25	8	28.3	0400913	M8x20	0460042	ø8.5 (M6+M8)	0600057	1113–3	1.83
ø25	8	28.3	0400913	M10x25	0460033	ø12.5 (M10+M12)	0600058	1113–4	1.83
ø26	8	29.3	0400914	M6x20	0460012	ø8.5 (M6+M8)	0600057	1114–2	1.81
ø26	8	29.3	0400914	M8x20	0460042	ø8.5 (M6+M8)	0600057	1114–3	1.81
ø28	8	31.3	0400915	M8x20	0460042	ø8.5 (M6+M8)	0600057	1115–3	1.78
ø28	8	31.3	0400915	M10x25	0460033	ø12.5 (M10+M12)	0600058	1115–4	1.78
ø28	8	31.3	0400915	M12x25	0460032	ø12.5 (M10+M12)	0600058	1115–5	1.78
ø30	8	33.3	0400916	M10x25	0460033	ø12.5 (M10+M12)	0600058	1116–4	1.74
ø32	10	35.3	0400917	M8x20	0460042	ø8.5 (M6+M8)	0600057	1117–3	1.70
ø32	10	35.3	0400917	M10x25	0460033	ø12.5 (M10+M12)	0600058	1117–4	1.70
ø32	10	35.3	0400917	M12x25	0460032	ø12.5 (M10+M12)	0600058	1117–5	1.70
ø34	10	37.3	0400918	–	–	–	–	–	1.66
ø35	10	38.3	0400919	M8x20	0460042	ø8.5 (M6+M8)	0600057	1119–3	1.64
ø35	10	38.3	0400919	M10x25	0460033	ø12.5 (M10+M12)	0600058	1119–4	1.64
ø35	10	38.3	0400919	M12x25	0460032	ø12.5 (M10+M12)	0600058	1119–5	1.65
ø36	10	39.3	0400920	–	–	–	–	–	1.62
ø38	10	41.3	0400921	M10x25	0460033	ø12.5 (M10+M12)	0600058	1121–4	1.57
ø38	10	41.3	0400921	M12x25	0460032	ø12.5 (M10+M12)	0600058	1121–5	1.58
ø38	10	41.3	0400921	M16x35	0460046	ø16.5 (M14+M16)	0600059	1121–7	1.59
ø40	12	43.3	0400922	M16x35	0460046	ø16.5 (M14+M16)	0600059	1122–7	1.53
ø42	12	45.3	0400923	M10x25	0460033	ø12.5 (M10+M12)	0600058	1123–4	1.47
ø42	12	45.3	0400923	M12x25	0460032	ø12.5 (M10+M12)	0600058	1123–5	1.47
ø42	12	45.3	0400923	M16x35	0460046	ø16.5 (M14+M16)	0600059	1123–7	1.48

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*=933–8.8

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XXXXXX–X= ID Markierung einschließlich aller Kunden ID Daten
ID marking including all customers ID data

Achtung: Flanschlochkreisschnitt versetzt zur Hauptschnittebene
attention: section of hole circle different to main section

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>0.5 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2.0

Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage
general tolerances for radius, chamfer, angle, form and positition
nach according ISO 2768–1+2 (DIN 7168) m/Klasse K m/class K

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Maßstab Scale	– –				
Gewicht Weight					
	17	1106–2	26.04.22	Förster	
	16	1112–2	30.03.22	Stoll	
	15	1114–2	25.10.21	Förster	
	0	Made	23.09.09	Förster	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung
Name
Anschlussflansch nach DIN (ISO 7646)
companion flange according DIN (ISO 7646)

Artikelnummer
Part Number

Zeichnungsnummer
Drawing Number
A–040–52–075–L01

Format
Form
A4

Kunde *customer*	**Serapid France, Rouxmesnil-Bouteilles, France**				
Projekt *project*	**D07: THE-20766-7CF2-0-Rev.B** **Gelenkwellen für Hubsystem, cardan shafts for lifting system**				
Sass Projekt *Sass project*	**EP8329**	*Kundenbestellung Nummer customer order number*	**-**	Sass Auftrag Nummer *Sass order number*	**-**

Lieferumfang scope of delivery

Gilt als Ersatzteil + Stückliste validity as parts + spare parts list

	St *pcs*	Benennung *Description*	*Maß size mm*	Sass ID Client ID	Zeichnungsnummer *drawing number*	Bemerkung *remarks*
01	1	Gelenkwelle *cardan shaft*	LE=324 L1=290 LA=80	513/009.0290-03 7030-0	A-513-009-0202-075-0290-RN	-
02	1	Gelenkwelle *cardan shaft*	LE=605 L1=575	50005602630104330575 7030-2	A-500-009-0202-075-0575-RK	-
03	1	Gelenkwelle *cardan shaft*	LE=747 L1=715	50005602630104330715 7030-1	A-500-009-0202-075-0715-R	-
04	4	Anschlussflansch *companion flange*	Ø24/Ø8,5	- 1112-2	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
05	2	Anschlussflansch *companion flange*	Ø28/Ø12,5	- 1115-4	A-040-52-075-L01	je inklusiv: *each inclusive*: 1x Zentralschraube *centering bolt* 1x Sicherungsring *circlip* 1x Sicherungsscheibe *retaining washer*
06	6	Satz Sechskantschrauben *set of hexagon bolts*	M6x16 DIN 933 X6 = 36 St/pcs	S.010.367 S010-11		
07	1	Satz Technische Dokumentation in Deutsch und Englisch 9800119, in Papier oder/und als pdf Datei, je bestehend aus: Technische Datenblatt, Einbauzeichnungen, Gebrauchsanleitung mit Einbau- und Wartungsanweisung, Sicherheitshinweisen, Schmiermittelanweisung und alternative Schmierstoffangaben *Set technical documentation in German and English 9800119, in paper back or/and as pdf file, each consist of: technical data sheet, drawings, instruction manual with installation and maintenance instruction, safety information, greasing regulations and alternative lubricants*				

231011-Serapid-D07-EP8329.docx

www.gelenkwellenfabrik.de

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Technische Daten technical data

Antrieb *propulsion*

Type	Elektromotor *electric motor*	Leistung kW *power kW*	-	Drehzahl U/min *Revolution rpm*	-	Übersetzung *ratio*	-

Betriebsbedingungen *operational conditions*

Teil einer Anlage mit Überdachung oder im Freien
part of a indoors or outdoors plant

Temperatur °C *temperature °C*	- 30 bis *to* + 120	Einbaulage *operational level*	horizontal *horizontal*

Schmierung *lubrication*

Verschiebung *slip unit*	Wartungsfrei, Keilnabe Rilsan beschichtet mit Profilschutz *service free, sleeve part Rilsan coated with spline protection*		
Gelenkkreuze *universal joints*	Zentralschmierung am Kreuzkörper mit Schmiernippel (DIN71412 mit Kunststoff Schutzkappe) *central greasing system on universal joint body with greasing nipple (DIN71412 with plastic cap)*		
Büchsenlagerung *bearing at cups*	Rollenlager *roller bearings*	Schmiermittel *lubricant*	Fuchs Renolit LX-PEP 2

Die Kardanwellen werden von uns im betriebsbereiten Zustand geliefert. Ein Abschmieren vor der Inbetriebnahme ist daher unter normalen Bedingungen nicht nötig. Flanschflächen müssen vor der Montage blank und sauber sein.
The cardan shafts are ready for operation. Under normal circumstances no extra greasing before start is needed. Cardan flange faces have to be clean and blank before assembling.

Betriebsdaten Pos. ***operational data*** *item*	**01-03**	**-**	**-**	**-**	**-**	**Bemerkung** ***remarks***
max. Drehmoment Nm *max. torque Nm*	450	-	-	-	-	
Grenzdrehmoment Nm *limit torque Nm*	650	-	-	-	-	
Betriebsdrehmoment Nm *operational torque Nm*	12	-	-	-	-	
Betriebsdrehzahl U/min *operational revolution rpm*	825	-	-	-	-	
Max. möglicher Beugewinkel *max. available deflection angle*	24°	-	-	-	-	
Beugewinkel im Arbeitsbetrieb *deflection angle in operation*	1° - 3°	-	-	-	-	

Gewicht und Massenträgheitsmoment siehe entsprechende Zeichnung
Weigh and, inertia moment see corresponding drawing

Auswuchten ***balancing***	Gelenkwellen nach DIN ISO 1940 – G16 *cardan shafts according to DIN ISO 1940 – G16*
Markierung ***marking***	Alle Gelenkwellen und Anschlussflansche werden mit den kundeneigenen ID Nummern versehen *cardan shafts and adapter flanges labelled with customer ID numbers*

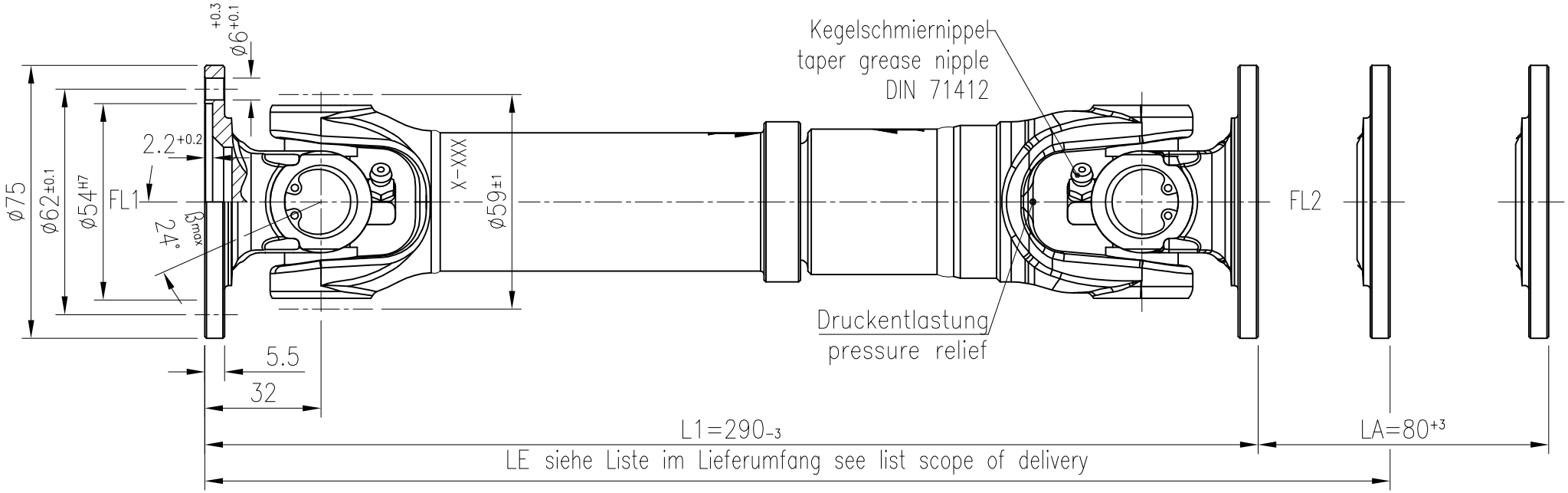
Korrosionsschutz *corrosion protection*

Bennenung	**description**	**Farbton**	***colour***	**RAL**	
Grundierung	*primary coat*	-	-	-	
2 Komponenten PU Decklack	*2 component PU final coat*	gelb glänzend	*yellow glossy*	1003	
Anschlussflansche mit Außenkörper Anstrich	*companion flange with outside painting*				
Nabenpassungen mit Ölfilm korrosionsgeschützt	*sleeve fit with oil film protection*				
Flanschoberflächen mit Korrosionsschutzfilm	*face of flanges with anti-corrosion film*				

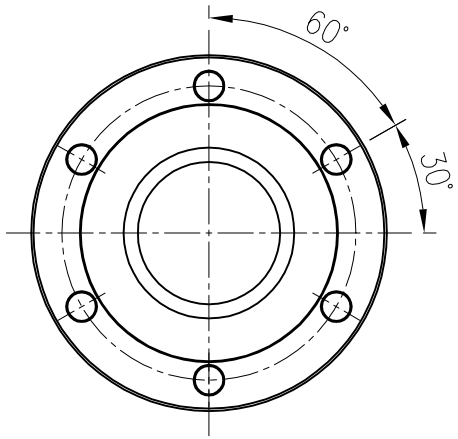
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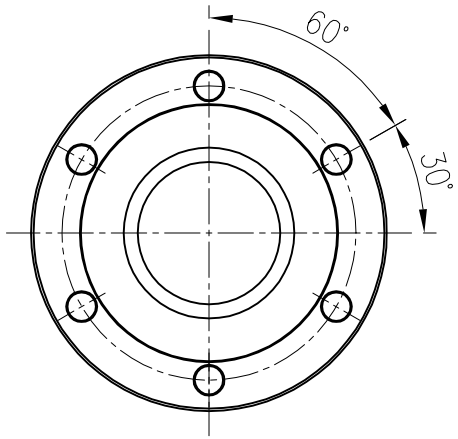
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Brookstraße 14
22145 Stapelfeld
Telefon: +49(0)40-22 63 301-0
Telefax: +49(0)40-22 63 301-19



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.000843 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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Revision	Bezeichnung description	Datum date	bearbeitet revised
1	LA=80	25.07.18	Stoll
0	Made	09.12.16	Stoll

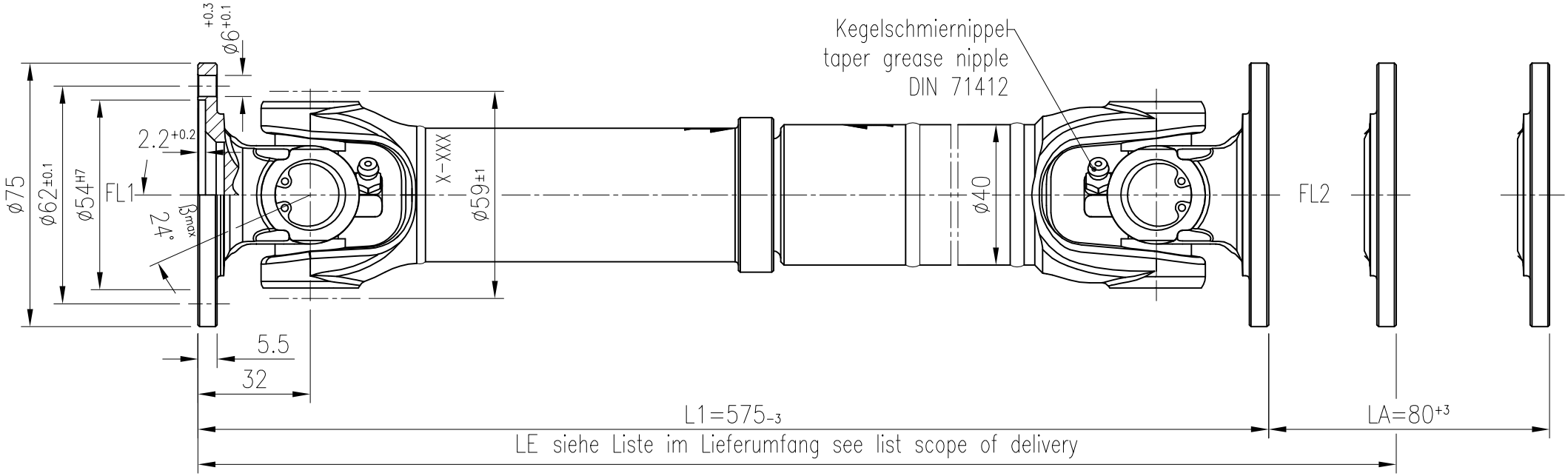
Maßstab Scale --
Gewicht Weight 2.7kg

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

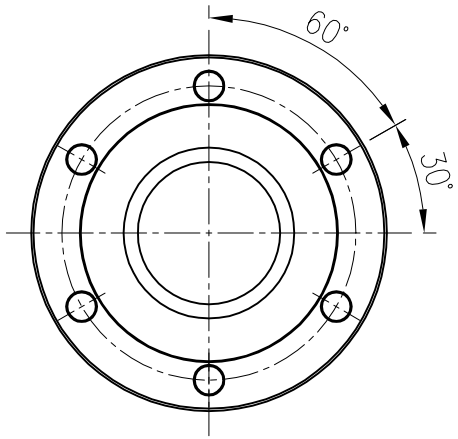
Artikelnummer Part Number

Zeichnungsnummer Drawing Number: A-513-009-0202-075-0290-RN

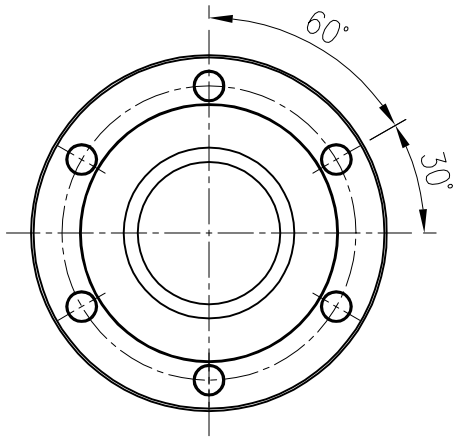
Format Form: A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.001041 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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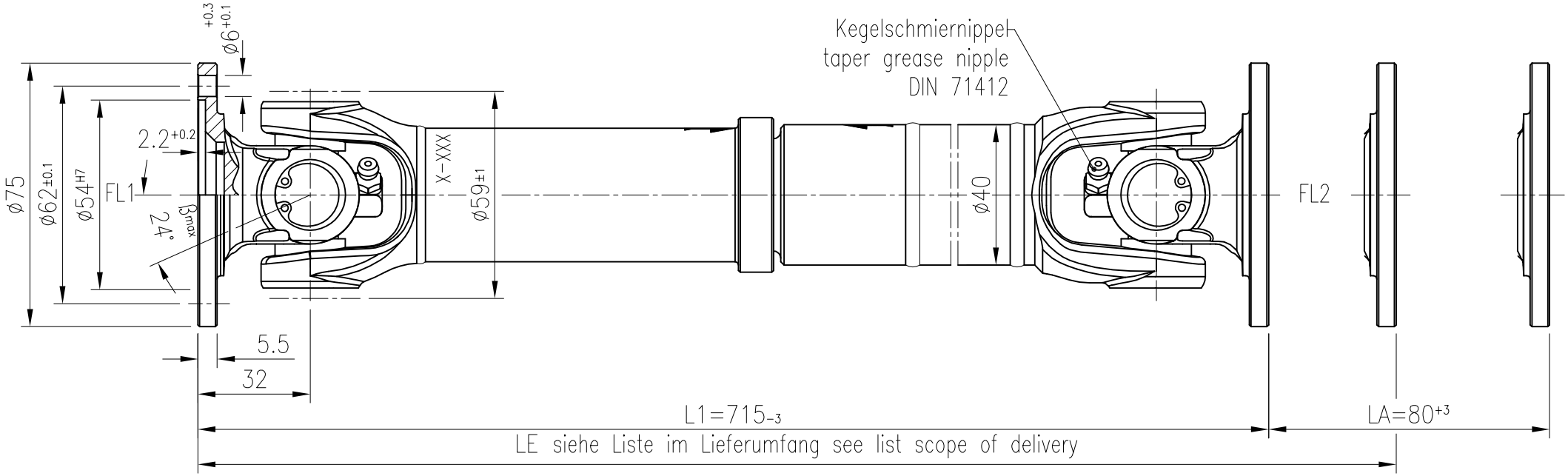
Maßstab Scale					
Gewicht Weight 3.3kg	0	Made	05.08.22	Förster	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

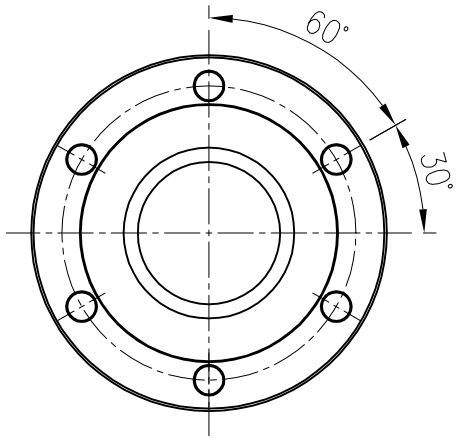
Artikelnummer Part Number:

Zeichnungsnummer Drawing Number: A-500-009-0202-075-0575-RK

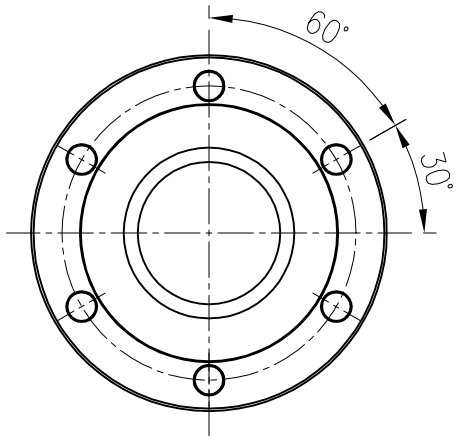
Format Form: A4



Ansicht (View) FL1



Ansicht (View) FL2





Alle Schmiernippel sind mit Kunststoff Schutzkappen ausgerüstet
All grease nipples fitted with plastic caps

L1 = Baulänge mit zusammengeschobenen Längenausgleich (LA)
(length with compressed length compensation)

LE = Rechnerische Einbaulänge (arithmetical operation length)

LA = Längenausgleich (length compensation)

XXXXXX-X= ID Markierung einschließlich aller Kunden ID Daten
(ID marking including all customers ID data)

= Positionsmarkierung (position mark)

Massenträgheit
inertia moment 0.001135 kgm²

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>3 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage general tolerances for radius, chamfer, angle, form and positition nach according ISO 2768-1+2 (DIN 7168) c/Klasse L c/class L						

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Maßstab Scale					
Gewicht Weight 3.5kg	0	Made	16.06.22	Förster	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

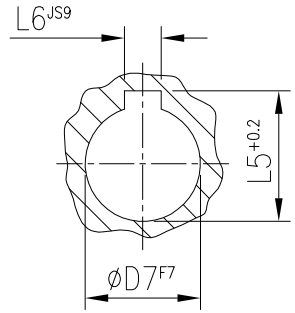
Benennung Name: Gelenkwelle mit Längenausgleich
cardan shaft with length compensation

Artikelnummer Part Number:

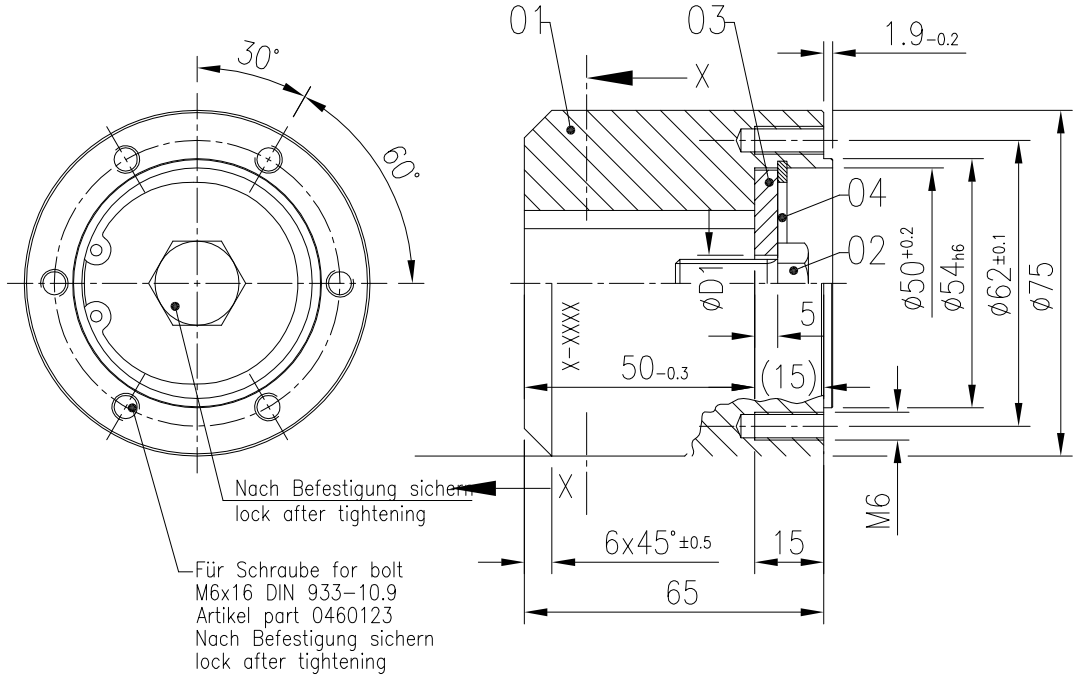
Zeichnungsnummer Drawing Number: A-500-009-0202-075-0715-R

Format Form: A4

Schnitt section X–X



Seeger Ring Circlip Position item 04	
DIN 472	Sass ID
ø50x2	0600047



Anschlussflansch companion flange Position item 01				Zentralschraube Center bolt Position item 02		Unterlegscheibe washer Position item 03		Serapid ID	Gewicht gesamt weight total [Kg]
ØD7	L6	L5	Sass ID	DIN 933–10.9	Sass ID	ØD1	Sass ID	SER–ZE000–	
ø10	3	11.4	0400901	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	2.00
ø12	4	13.8	0400902	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	1.98
ø13	5	15.3	0400903	M4x16*	0460159	ø5.5 (M5+M4)	0600074	–	1.97
ø14	5	16.3	0400904	M4x16*	0460159	ø5.5 (M5+M4)	0600074	1104–0	1.97
ø14	5	16.3	0400904	M5x16	0460023	ø5.5 (M5+M4)	0600074	1104–1	1.97
ø14	5	16.3	0400904	M6x20	0460012	ø8.5 (M6+M8)	0600057	1104–2	1.96
ø15	5	17.3	0400905	M6x20	0460012	ø8.5 (M6+M8)	0600057	1105–2	1.96
ø16	5	18.3	0400906	M5x16	0460023	ø5.5 (M5+M4)	0600074	1106–1	1.95
ø16	5	18.3	0400906	M6x20	0460012	ø8.5 (M6+M8)	0600057	1106–2	1.94
ø17	5	19.3	0400907	–	–	–	–	–	1.94
ø18	6	20.8	0400908	M6x20	0460012	ø8.5 (M6+M8)	0600057	1108–2	1.92
ø19	6	21.8	0400909	M6x20	0460012	ø8.5 (M6+M8)	0600057	1109–2	1.91
ø19	6	21.8	0400909	M8x20	0460042	ø8.5 (M6+M8)	0600057	1109–3	1.91
ø20	6	22.8	0400910	M8x20	0460042	ø8.5 (M6+M8)	0600057	1110–3	1.90
ø22	6	24.8	0400911	–	–	–	–	–	1.88
ø24	8	27.3	0400912	M6x20	0460012	ø8.5 (M6+M8)	0600057	1112–2	1.84
ø24	8	27.3	0400912	M8x20	0460042	ø8.5 (M6+M8)	0600057	1112–3	1.84
ø24	8	27.3	0400912	M10x25	0460033	ø12.5 (M10+M12)	0600058	1112–4	1.84
ø25	8	28.3	0400913	M8x20	0460042	ø8.5 (M6+M8)	0600057	1113–3	1.83
ø25	8	28.3	0400913	M10x25	0460033	ø12.5 (M10+M12)	0600058	1113–4	1.83
ø26	8	29.3	0400914	M6x20	0460012	ø8.5 (M6+M8)	0600057	1114–2	1.81
ø26	8	29.3	0400914	M8x20	0460042	ø8.5 (M6+M8)	0600057	1114–3	1.81
ø28	8	31.3	0400915	M8x20	0460042	ø8.5 (M6+M8)	0600057	1115–3	1.78
ø28	8	31.3	0400915	M10x25	0460033	ø12.5 (M10+M12)	0600058	1115–4	1.78
ø28	8	31.3	0400915	M12x25	0460032	ø12.5 (M10+M12)	0600058	1115–5	1.78
ø30	8	33.3	0400916	M10x25	0460033	ø12.5 (M10+M12)	0600058	1116–4	1.74
ø32	10	35.3	0400917	M8x20	0460042	ø8.5 (M6+M8)	0600057	1117–3	1.70
ø32	10	35.3	0400917	M10x25	0460033	ø12.5 (M10+M12)	0600058	1117–4	1.70
ø32	10	35.3	0400917	M12x25	0460032	ø12.5 (M10+M12)	0600058	1117–5	1.70
ø34	10	37.3	0400918	–	–	–	–	–	1.66
ø35	10	38.3	0400919	M8x20	0460042	ø8.5 (M6+M8)	0600057	1119–3	1.64
ø35	10	38.3	0400919	M10x25	0460033	ø12.5 (M10+M12)	0600058	1119–4	1.64
ø35	10	38.3	0400919	M12x25	0460032	ø12.5 (M10+M12)	0600058	1119–5	1.65
ø36	10	39.3	0400920	–	–	–	–	–	1.62
ø38	10	41.3	0400921	M10x25	0460033	ø12.5 (M10+M12)	0600058	1121–4	1.57
ø38	10	41.3	0400921	M12x25	0460032	ø12.5 (M10+M12)	0600058	1121–5	1.58
ø38	10	41.3	0400921	M16x35	0460046	ø16.5 (M14+M16)	0600059	1121–7	1.59
ø40	12	43.3	0400922	M16x35	0460046	ø16.5 (M14+M16)	0600059	1122–7	1.53
ø42	12	45.3	0400923	M10x25	0460033	ø12.5 (M10+M12)	0600058	1123–4	1.47
ø42	12	45.3	0400923	M12x25	0460032	ø12.5 (M10+M12)	0600058	1123–5	1.47
ø42	12	45.3	0400923	M16x35	0460046	ø16.5 (M14+M16)	0600059	1123–7	1.48

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*=933–8.8

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XXXXXX–X= ID Markierung einschließlich aller Kunden ID Daten
ID marking including all customers ID data

Achtung: Flanschlochkreisschnitt versetzt zur Hauptschnittebene
attention: section of hole circle different to main section

Allgemeintoleranzen für Längenmaße: general tolerances for length size:						
>0.5 ..6	>6 ..30	>30 ..120	>120 ..400	>400 ..1000	>1000 ..2000	>2000 ..4000
±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2.0

Allgemeintoleranzen für Rundungen, Fasen, Winkel, Form und Lage
general tolerances for radius, chamfer, angle, form and positition
nach according ISO 2768–1+2 (DIN 7168) m/Klasse K m/class K

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Maßstab Scale	– –				
Gewicht Weight					
	17	1106–2	26.04.22	Förster	
	16	1112–2	30.03.22	Stoll	
	15	1114–2	25.10.21	Förster	
	0	Made	23.09.09	Förster	
	Revision	Bezeichnung description	Datum date	bearbeitet revised	

Benennung
Name
Anschlussflansch nach DIN (ISO 7646)
companion flange according DIN (ISO 7646)

Artikelnummer
Part Number

Zeichnungsnummer
Drawing Number
A–040–52–075–L01

Format
Form
A4

Operator's Manual for Cardan Shafts

Foreword

This is an Operator's Manual in accordance with Directive 2006/42/EC on Machinery of the European Parliament and Council dated 17 May 2006 and as an amendment to Directive 95/16/EC (revised version). The requirements for unfinished machines and/or machine parts shall apply. Technical safety instructions are not collated in a separate chapter and are covered with the relevant, individual topics.

Warning: Read this Operator's Manual before installation and start-up. The cardan shafts are supplied by us ready for use. Under normal circumstances, it is therefore not necessary to top up lubricant prior to start-up. Flange surfaces must be bare and clean prior to assembly. Installation, removal and maintenance may be carried out only by suitably qualified technical staff.

Contact

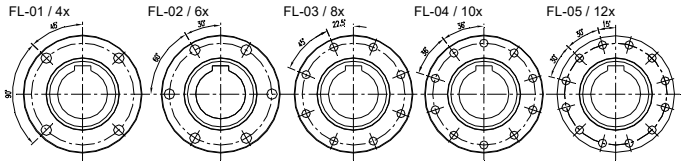
● Technical agency: *Tel. 0049 (0)40-2263301-30, E-mail: tb@w-sass.de* ● Internet: *www.w-sass.de* ● 24-hour service: *Tel. 0049 (0)40-2263301-0*

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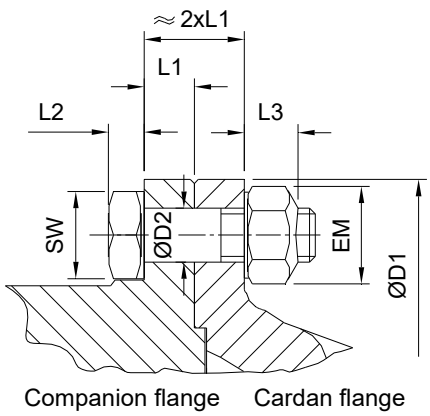
01 Flange screw connection

High-strength cardan bolts of rigidity class 10.9 or hexagonal bolts similar to DIN 960-10.9 should be used for the screw connection of the cardan flange with the companion flange. If bolts compliant with DIN 931-10.9 and/or DIN 933-10.9 are used for companion flanges with threaded bores, the adjusted torque values must be observed. Only self-locking nuts compliant with DIN 980-10 may be used. If other nuts are used, the nut must be secured without fail. The bolt must be secured when using threaded bores in the companion flange. Please note that the bolt can not always be inserted from the cardan-shaft side. The bolt should therefore be pushed through from the companion-flange side and the nut should be screwed in place from the flange side. Unless otherwise specified, all of our cardan shafts are supplied in this form. Unless otherwise requested, the cardan shafts are supplied without a set of bolts. Naturally, we can also supply you with any set of bolts if required. The flanges should be bolted in a slightly oiled condition. However, an excess of oil or even grease should never be applied to the bolts and nuts. When tightening or loosening locking bolts or nuts, the existing thread lock is always destroyed. The nut or bolt must therefore always be re-locked after tightening or loosening.



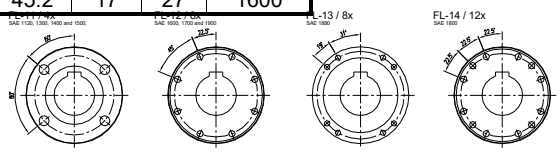
Screw connection, DIN flange
In accordance with ISO 7646
Cardan bolts, rigidity class 10.9
Hexagonal bolts, similar to DIN 960-10.9
Hexagonal nut DIN 980-10
**** = Size 114: M10x1x35 mm*

ØD1 mm	L1 mm	ØD2 mm	Flange	Bolts					
				Size	SW* mm	EM** mm	L2 mm	L3 mm	Torq. Nm
58	4	Ø5	FL-01 (4)	M5x15	8	8.8	3.5	5	9
65	5	Ø6	FL-01 (4)	M6x20	10	11.1	4	6	14
75	6	Ø6	FL-02 (6)	M6x20	10	11.1	4	6	14
90	8	Ø8	FL-01 (4)	M8x1x25	13	14.4	5.3	8	36
100	8	Ø8	FL-02 (6)	M8x1x25	13	14.4	5.3	8	36
120	10	Ø8 Ø10	FL-03 (8)	M8x1x30 M10x1x30***	13 17	14.4 18.9	5.3 6.4	8 10	36 70
150	12	Ø10 Ø12 Ø14	FL-03 (8) FL-04 (10) FL-05 (12)	M10x1x35 M12x1.5x40 M14x1.5x45	17 19 22	18.9 21.1 24.5	6.4 7.5 8.8	10 12 14	70 120 190
180	14	Ø12 Ø14 Ø16	FL-03 (8) FL-04 (10) FL-05 (12)	M12x1.5x45 M14x1.5x45 M16x1.5x50	19 22 24	21.1 24.5 26.8	7.5 8.8 10	12 14 16	120 190 300
225	15	Ø16	FL-03 (8) FL-05 (12)	M12x1.5x50 M16x1.5x50	19 24	21.1 26.8	7.5 10	12 16	120 300
250	18	Ø18	FL-03 (8)	M18x1.5x60	27	30.2	11.5	18	450
285	20	Ø20	FL-03 (8)	M20x1.5x65	30	33.6	12.5	20	620
315	22	Ø22	FL-03 (8)	M22x1.5x75	32	35.8	14	22	830
350	25	Ø22	FL-04 (10)	M22x1.5x75	32	35.8	14	22	830
390	28	Ø24	FL-04 (10)	M24x1.5x85	36	40	15	24	1100
435	32	Ø27	FL-04 (10)	M27x1.5x95	41	45.2	17	27	1600



*SW = across flats, **EM = corner dimension

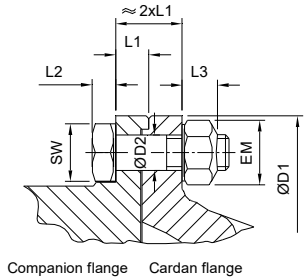
Screw connection, SAE flange
In accordance with ISO 7647
Cardan bolts, rigidity class 10.9
Hexagonal bolts DIN 960-10.9
Hexagonal nut DIN 980-10



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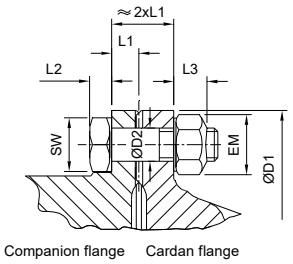
ØD1 mm	SAE Type	L1 mm	ØD3 mm	Flange	Bolts					
					Size	SW	EM	L2	L3	Torq. Nm
90	*1100*	6	Ø8	FL-11 (4)	M8x1x25 5/16"x1"	13	14.4	5.3	8	36
96	*1300*	7	Ø10 Ø9.5	FL-11 (4)	M10x1x30 3/8"x1 3/16"	17	18.9	6.4	10	70
116	*1400*	8	Ø12 Ø11.2	FL-11 (4)	M12x1.5x40 7/16"x1 5/8"	19	21.1	7.5	12	120
150	*1500*	8	Ø14 Ø12.7	FL-01 (4)	M14x1.5x45 1/2"x1 3/4"	22	24.5	8.8	14	190 120
175	*1600*	10	Ø10 Ø9.5	FL-12 (8)	M10x1x30 3/8"x1 3/16"	17	18.9	6.4	10	70
203	*1700 1800*	11	Ø12 Ø11	FL-12 (8) FL-14 (12)	M12x1.5x40 7/16"x1 5/8"	19	21.1	7.5	12	120
245	*1880*	15	Ø16	FL-13 (8)	M16x1.5x50	24	26.8	10	16	300
250	*1900 GS*	18	Ø12	FL-14 (12)	M12x1.5x50 7/16"x1 5/8"	19	21.1	7.5	12	120
276	*1900*	18	Ø16	FL-12 (8)	M16x1.5x60	24	26.8	10	16	300



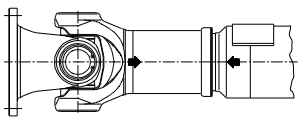
Screw connection, KV flange

In accordance with ISO 12667 and ISO 8667. All cross-toothed flanges have four bolts per flange. Cardan bolts, rigidity class 10.9, hexagonal bolts similar to DIN 960-10.9, hexagonal nuts DIN 980-10.

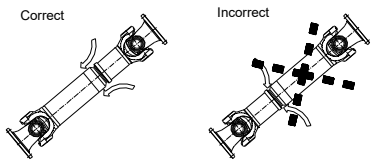
ØD1 mm	L3 mm	ØD2 mm	Bolts					
			Size	SW mm	EM mm	L2 mm	L3 mm	Torq. Nm
100	10	Ø8	M8x1x30	13	14.4	5.3	8	36
120	14	Ø11	M10x1x40	17	18.9	6.4	10	70
150	16	Ø13	M12x1.5x45	19	21.1	7.5	12	120
180	18	Ø15	M14x1.5x55	22	24.5	8.8	14	190
200	20	Ø15	M14x1.5x55	22	24.5	8.8	14	190



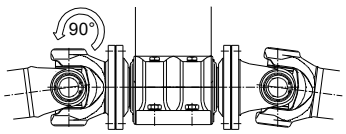
02 Installation



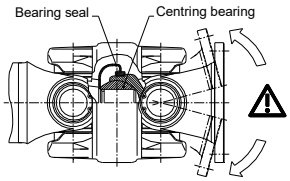
- Before installation, remove any transport locks, if applicable.
- Before installation, check whether the cardan shaft is connected precisely in line with the marking on the offset.
- If the cardan shaft is painted, make sure that the area for the length adjuster remains free.
- Use only bolts and nuts of the correct quality and size in accordance with the table.
- Always install the cardan shaft so that dirt is deflected from the offset and water can drain away.
- Always tighten flange screw connections in cross-wise sequence with a torque wrench in accordance with the table.



- Before screwing them together, always ensure that the front faces of the cardan flange and the opposite flange are free of any dirt, grease, oil, anti-corrosion agents and paint.
- Never exchange the offset or other cardan-shaft parts of different cardan shafts. Otherwise, the cardan shafts would no longer be balanced properly.
- If it is necessary to pull the cardan shaft fully out of the offset, pay close attention to the marking when putting the offset back together.
- Never remove weight panels or other parts from the cardan shaft or carry out any other conversion work. Otherwise, the function of the cardan shaft would no longer be guaranteed and our guarantee would be rendered null and void immediately.



- Following installation, the length adjuster must have freedom of movement on both sides, so that both the minimum and maximum operating lengths can be set with the length adjuster.
- Always install cardan shafts without a length adjuster free from any tension.
- On gearboxes, intermediate bearings and similar machine elements with cardan connections on both sides, the cardan shafts should each be attached with a 90° offset.
- Never rotate the cardan shaft with assembly tools such as pipe extensions or levers in the joint. Grease nipples and seals could be damaged.
- Check the companion flange. Its shape and size must correspond precisely to the cardan flange.

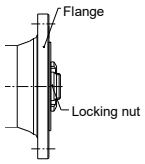


- Protect cardan shafts with a centred double joint against tilting too far during installation. Otherwise, the centring bearing could be damaged.
- All other machine parts must be positioned outside the working area and the rotation diameter of the cardan shaft.
- To ensure the safety of the vehicle, important machine elements must be protected to ensure that they cannot be damaged if a fault occurs in the cardan shaft.
- Before starting up the cardan shaft, play close attention to the instructions for topping up lubricant.

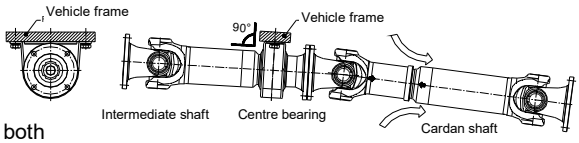
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Installation of cardan-shaft strands



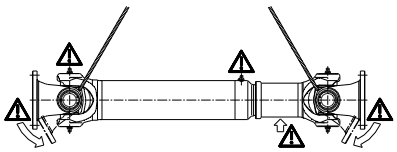
- Intermediate shafts and cardan-shaft strands are supplied completely assembled with the relevant centre bearings. Therefore never disassemble the bearings before installation, but secure them together with the cardan shaft.
- Never loosen or tighten the locking nuts or locking bolt(s) of the bearing, as otherwise the safety mechanism will be destroyed.
- When installing the cardan-shaft strand, observe the relevant installation specifications of the manufacturer.
- Secure the centre bearing on the vehicle only when the drive side and the output side of the cardan-shaft strand have been attached. The centre or intermediate-shaft bearing must always be installed without any force.
- The cardan-shaft strand is generally relatively long and so considerable leverage forces are applied to the joints during installation. To ensure that the joints are not damaged during installation, do not allow the cardan-shaft strand to sag or the joints to be bent excessively.
- The intermediate bearing must always be positioned at right angles to the intermediate shaft and to the cardan-shaft strand.
- The frame under the bearing mount must be sturdy and strong enough to withstand the applied forces.
- Position the cardan-shaft strand so that any dirt is deflected from the offset and water can drain away.
- To secure the centre bearing on the vehicle frame, follow the specifications of the vehicle manufacturer and use the bolts stipulated there to secure the bearing accordingly.
- Following installation, the length adjuster must have freedom of movement on both sides, so that both the minimum and maximum operating lengths can be set with the length adjuster.

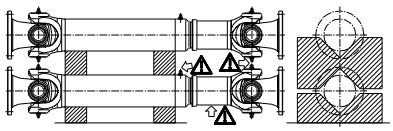


03 Removal

- When removing the cardan shaft, prevent the offset from slipping down.
- If the marking on the offset is no longer visible, apply a position marking on the spline and the spline bore hub before pulling them apart.
- Always work safely. Secure the joints against tipping over. When performing removal work under the vehicle, prevent the cardan shaft from falling down.
- Never exchange different parts of different cardan shafts.

04 Transport and storage





- Ensure that all shipments are always horizontal. If a vertical transport is inevitable, ensure that the offset cannot slide out.
- When transporting with a forklift truck, place wood under the machine and lift only under the pipe.
- Always pay close attention to the grease nipples. No squared timber or lifting cables may be allowed to touch the grease nipples.
- No load may be applied to the profile protection under any circumstances during storage or transportation.
- In the event of crane transportation, use only plastic cables or lifting straps. If only steel cables are available, apply edge protectors to the contact points.
- During transportation and storage, always protect the cardan shaft against rolling away with wedges
- If you intend to stack several cardan shafts on top of each other, please use only suitable wooden or prisms. frames, which prevent the shafts from rolling out.
- Always store cardan shafts in dry places. Never apply loads to the offset or the profile protection.
- During storage, place supports only under the pipe. The joints, flanges, offsets, profile protection And grease nipples must be free and must not be loaded.
- Secure any cardan shafts with a centred double joint against bending too far during transportation and storage. Otherwise, the centring bearing will be damaged.

Storage conditions for cardan shafts and vertical bearings

All parts should be stored in their original packaging. The storage area must be clean, dry, dust-free and without any chemical vapours and the stored items must be at rest, i.e. without any vibrations. The applicable maximum room parameters are as follows: -5°C to +25°C for the temperatures, 8°C for the temperature difference between day and night and 65% for the relative humidity. Given compliance with all of these specifications, cardan shafts and vertical bearings can be stored for up to 5 years. Before start-up with parts that have been stored for longer than one year, it is necessary, however, to completely replace the old lubricant with a top-up procedure.

05 Maintenance and lubrication

Topping up lubricant and inspection of the cardan shaft can be carried out together with inspections of the vehicle or the machine. Of course, all of our specifications with regard to the lubricant intervals are only guidelines, because they are dependent on individual operating conditions. Every user must therefore determine his/her intervals for topping up lubricant and inspections at his/her own discretion.

Intervals for topping up lubricant and inspections *(guidelines)*

Vehicle or machine	***Topping up lubricant every***	***or max. after***	***Inspection every***	***or max. after***
Commercial vehicles in long-distance use and all comparable vehicles	50,000 km	12 months	100,000 km	12 months
Commercial vehicles in mixed on-road/off-road use Commercial vehicles in urban use All vehicles in comparable use	25,000 km	6 months	50,000 km	12 months
Buses/coaches in long-distance use	50,000 km	12 months	100,000 km	12 months
Buses/coaches in urban use	25,000 km	3 months	50,000 km	6 months
Commercial vehicles and construction machines in construction site use* Work vehicles, tractors, military vehicles* All vehicles in comparable use*	12,500 km or 250 h	3 months or after use in water	25,000 km	6 months
Ship engines	1,500 h	12 months	1,500 h	12 months
All types of industrial plant and lifting devices in intensive production	500 h	6 months	500 h	6 months

** Lubricant must be topped up in all cases after driving through rivers or other waters.*

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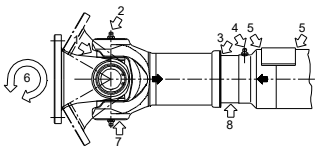
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Cleaning the cardan shaft
Never clean the cardan shaft with a high-pressure cleaner or steam blaster. However, if such a cleaning procedure cannot be avoided, always top up the lubricant in the cardan shaft afterwards in the described manner until only fresh grease emerges from the seals.

Topping up lubricant
Before topping up the lubricant, clean the grease nipples and ensure that the grease can pass through properly. Do not top up the lubricant with excessive pressure or in a jerky fashion. We recommend 5 bar. Continue to top up the lubricant until the fresh grease emerges from the seals of the bearings. At the spline end, top up only with 2 to 3 strokes off the grease gun per interval. Always observe the seals carefully and top up the lubricant sensitively.

Lubricants
The cardan shafts are always supplied by us in lubricated condition. Cardan shafts that have been stored for longer than six months should always have their lubricant topped up without fail before start-up. Use only lithium-soap greases. We use and recommend *Fuchs Renolit LX-PEP 2* or *Microlube GL 262* as standard lubricant. The latter is a special grease on a mineral-oil basis with a special lithium soap. Other lubricant brands which can also be used as a standard grease are as follows: *BP Energrease LS 2, Esso Beacon EP 2, Shell Alvania EP 2, Mobil Mobilux 2.* Do not use any sodium-bicarbonate greases, Molykote lubricants or lubricants containing MoS_2 additives! If the cardan shaft is fitted with a low- or high-temperature cross and bearing kit, use only appropriate greases! Unless noted otherwise in the drawing, the grease nipples on our cardan shafts comply with DIN 71412. All grease nipples compliant with DIN 71412 are fitted with a removable plastic cap to protect against dirt and moisture.
All other lubricants may be used for standard operations which satisfy the following requirements:
Operating temperature: -30°C to +140°C consistency class: 2 (DIN 51818, NLGI), penetration: approx. 265 to 295 (DIN ISO 2137), drop point: >220 to 250°C (DIN ISO 2176), density: approx. 0.9 g/cm³ (DIN 51757 at 20°C), water resistance: approx. 1 to 90 (DIN 51807 – 3 h/90°C), flow pressure: approx. 1400 mbar (DIN 51805 – 25°C), anti-corrosion properties: 1 (DIN 51802 Emcor test), speed characteristics: approx. 300,000 to 400,000 (dm x n).

Inspection checklist *(may be carried out with the cardan shaft installed in the vehicle or plant)*
- Check the firm fit of the flange and the screw connections. If necessary, tighten with a torque wrench according to the table.
- Check whether all the bearing bushings of the cross and bearing kits are still firmly secured with safety rings (7).
- Check the bases of the bushings for discolouration or distortion, which indicates a positional fault or overheating (7). In the event of discolouration, the entire cross and bearing kit must be replaced.
- Check the bases of the bushings for traces of rotation under the locking ring, which indicate that the bushing has spun (7). In this case, the fork element and the cross and bearing kit must be replaced.
- Check whether any weight panels have come loose or have been lost (5). In the event of damaged or lost weight panels, the cardan shaft must be balanced again.
- Conduct a visual inspection of all the seals on the cross and bearing kits (1). If a seal is damaged, worn or lost, the cross and bearing kit must be replaced.
- Examine all seals in the offset and any possible plastic coatings for damage (1+3+8). In the event of damage, the seals must be replaced or the relevant parts must be exchanged by us.



- Check all grease nipples (2+4) and their protective caps. If necessary, replace the grease nipples and clean the lubrication ducts, if required, enabling the grease to pass through freely.
- Relieve the load on the shaft by raising it slightly and try to rotate the offset and the joints (6). If it is possible to rotate them, the cardan shaft has too much play and must be overhauled.
- Carry out a visual inspection for dents in the pipe or in the profile protection and check all parts of the cardan shaft for visible cracks or breaks. If cracks are evident anywhere or a dent can be detected in the pipe, the shaft must be overhauled by us.
- Examine the centre bearing in intermediate shafts and cardan-shaft strands:

The bearing must not cause any noise during running. If noises occur, the bearing must be replaced. In the event of elastic intermediate bearings, the elastic rubber insert must not show any cracks or damage; it must fit precisely and be well anchored in its position. The roller bearing must also be anchored precisely in its position on the bearing frame. There must be no play in the position of the bearing in the rubber insert. Check the mounting bolts. If necessary, tighten according to the table above. The actual roller bearing must run smoothly, must not show any damage or have any play and must not cause any noise during running. The companion flange must be positioned firmly on the bearing shaft and it must not be possible to move it. There must be no play during rotation or on the horizontal plane. A loose washer or guard plate may be a sign of a loose flange. If necessary, tighten the locking bolts or nuts according to the table above.

06 EC Declaration of Conformity in accordance with EC Machinery Directive 2006/42/EC and EC Chemicals Regulation 1907/2006 (REACH)

Product: ***Cardan shafts*** Type: ***GW-500*** *to* ***GW-599***

We hereby declare that the cardan shafts described above satisfy the relevant fundamental health and safety requirements of the corresponding EC Directives with regard to their conception, design and the version brought into circulation by us. In the event of any modification to the cardan shafts that is not authorised by us, this Declaration shall become invalid. Internal measures ensure that the series devices always comply with the requirements of the currently applicable EC Directives and any related standards. It is forbidden to start up the part until the machine in which this part is incorporated has satisfied all requirements of the currently applicable EC Directives and any related standards.
The signatory is authorised to act on behalf of the company.

Stapelfeld



Gelenkwellenfabrik Wilhelm Sass KG, Brookstraße 14, D-22145 Stapelfeld. Court of Jurisdiction: Reinbek, Commercial Register A 2151

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Instruction Manual cardan shafts

Preamble

This is a instruction manual according the Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast). The instruction does apply to the regulation for partly completed machinery and accordingly machine parts. Safety regulations are not summarised in a separate chapter, but described in the chapters of the specific agenda items.
Attention: Read the instruction manual before installation and start of operation! The cardan shafts are ready for operation. Under normal circumstances no extra greasing before start is needed. Cardan flange faces have to be clean and blank before assembling! Installation, dismantling and maintenance have to be executed by qualified skilled workers only!

Contacts

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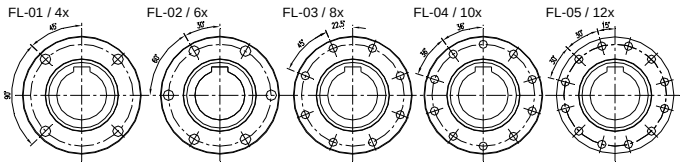
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01 Flange bolting **02** Installation **03** Dismantling **04** Transport and Storage **05** Maintenance and Lubrication **06** EU Declaration of Conformity

01 Flange bolting

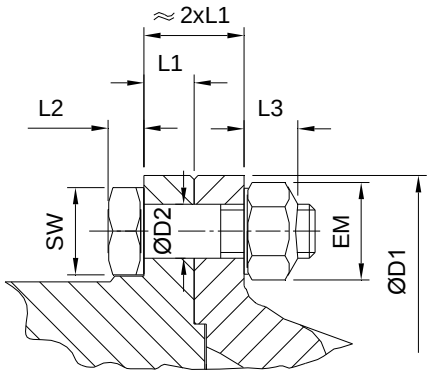
Use the high-strength cardan bolts of the quality grade 10.9, or hexagon bolts DIN 960-10.9 only. By using of bolts according DIN 931-10.9 accordingly DIN 933-10.9 at companion flanges with tap holes, consider the different bolt and nut torque moment. Use the self-locking hexagon nuts DIN 980-10 (all metal) only. By using standard nuts secure the nut. By using companion flanges with tap holes secure the bolts by locking. It is not every time possible to insert the bolts from the cardan shaft flange side. The normal procedure by bolting of cardan shaft flanges is to insert the bolt from the companion flange side in the hole and screw the nut from the cardan flange side on the bolt. This is the standard of all our cardan shafts, if not different arranged. We deliver our cardan shafts normally without bolting. As a matter of course we shall supply on customer request together with the cardan shafts the corresponding sets of cardan bolting. The bolts shall be in a lightly oiled condition, but never put to much oil or any kind of grease on it. The locking of securing bolts or nuts will be destroyed by tighten and loosening. Therefore after tighten and loosening a bolt or nut, secure and lock it again.

Bolting for DIN flanges
According ISO 7646
cardan bolts of the quality grade 10.9
Hexagon bolts equal DIN 960-10.9
Hexagon nut DIN 980-10



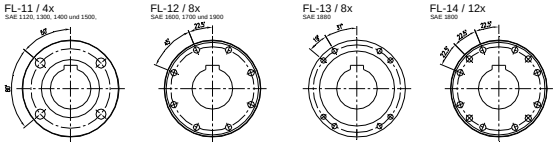
*** = size 114: M10x1x35mm

ØD1 mm	L1 mm	ØD2 mm	Flansch flange	Schrauben bolts					
				Maß size	SW mm	EM mm	L2 mm	L3 mm	Mt Nm
58	4	Ø5	FL-01 (4)	M5x15	8	8.8	3.5	5	9
65	5	Ø6	FL-01 (4)	M6x20	10	11.1	4	6	14
75	6	Ø6	FL-02 (6)	M6x20	10	11.1	4	6	14
90	8	Ø8	FL-01 (4)	M8x1x25	13	14.4	5.3	8	36
100	8	Ø8	FL-02 (6)	M8x1x25	13	14.4	5.3	8	36
120	10	Ø8 Ø10	FL-03 (8)	M8x1x30 M10x1x30***	13 17	14.4 18.9	5.3 6.4	8 10	36 70
150	12	Ø10 Ø12 Ø14	FL-03 (8) FL-04 (10) FL-05 (12)	M10x1x35 M12x1.5x40 M14x1.5x45	17 19 22	18.9 21.1 24.5	6.4 7.5 8.8	10 12 14	70 120 190
180	14	Ø12 Ø14 Ø16	FL-03 (8) FL-04 (10) FL-05 (12)	M12x1.5x45 M14x1.5x45 M16x1.5x50	19 22 24	21.1 24.5 26.8	7.5 8.8 10	12 14 16	120 190 300
225	15	Ø16	FL-03 (8) FL-05 (12)	M12x1.5x50 M16x1.5x50	19 24	21.1 26.8	7.5 10	12 16	120 300
250	18	Ø18	FL-03 (8)	M18x1.5x60	27	30.2	11.5	18	450
285	20	Ø20	FL-03 (8)	M20x1.5x65	30	33.6	12.5	20	620
315	22	Ø22	FL-03 (8)	M22x1.5x75	32	35.8	14	22	830
350	25	Ø22	FL-04 (10)	M22x1.5x75	32	35.8	14	22	830
390	28	Ø24	FL-04 (10)	M24x1.5x85	36	40	15	24	1100
435	32	Ø27	FL-04 (10)	M27x1.5x95	41	45.2	17	27	1600



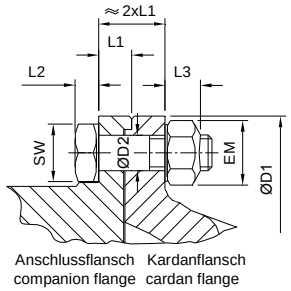
Anschlussflansch companion flange
Kardanflansch cardan flange

Bolting SAE flanges
According ISO 7647
cardan bolts of the quality grade 10.9
Hexagon bolts DIN 960-10.9
Hexagon nut DIN 980-10



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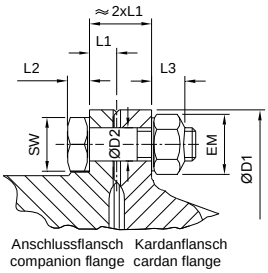
ØD1 mm	SAE Type	L1 mm	ØD3 mm	Flansch flange	Schrauben bolts					
					Maß size	SW	EM	L2	L3	Mt Nm
90	*1100*	6	Ø8	FL-11 (4)	M8x1x25 5/16"x1"	13	14.4	5.3	8	36
96	*1300*	7	Ø10 Ø9.5	FL-11 (4)	M10x1x30 3/8"x1 3/16"	17	18.9	6.4	10	70
116	*1400*	8	Ø12 Ø11.2	FL-11 (4)	M12x1.5x40 7/16"x1 5/8"	19	21.1	7.5	12	120
150	*1500*	8	Ø14 Ø12.7	FL-01 (4)	M14x1.5x45 1/2"x1 3/4"	22	24.5	8.8	14	190 120
175	*1600*	10	Ø10 Ø9.5	FL-12 (8)	M10x1x30 3/8"x1 3/16"	17	18.9	6.4	10	70
203	*1700* *1800*	11	Ø12 Ø11	FL-12 (8) FL-14 (12)	M12x1.5x40 7/16"x1 5/8"	19	21.1	7.5	12	120
245	*1880*	15	Ø16	FL-13 (8)	M16x1.5x50	24	26.8	10	16	300
250	*1900* *GS*	18	Ø12	FL-14 (12)	M12x1.5x50 7/16"x1 5/8"	19	21.1	7.5	12	120
276	*1900*	18	Ø16	FL-12 (8)	M16x1.5x60	24	26.8	10	16	300



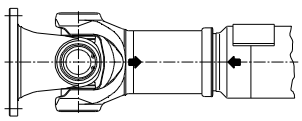
Bolting for KV / XS (x-serration) flange

According ISO 12667 and ISO 8667, all KV/XS flanges are equipped with 4 bolts, cardan bolts of the quality grade 10.9, hexagon bolts equal DIN 960-10.9, hexagon nut DIN 980-10

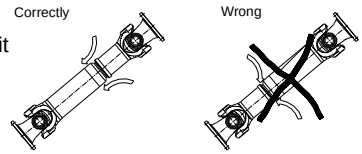
ØD1 mm	L3 mm	ØD2 mm	Schrauben bolts					
			Maß size	SW mm	EM mm	L2 mm	L3 mm	Mt Nm
100	10	Ø8	M8x1x30	13	14.4	5.3	8	36
120	14	Ø11	M10x1x40	17	18.9	6.4	10	70
150	16	Ø13	M12x1.5x45	19	21.1	7.5	12	120
180	18	Ø15	M14x1.5x55	22	24.5	8.8	14	190
200	20	Ø15	M14x1.5x55	22	24.5	8.8	14	190



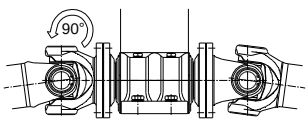
02 Installation

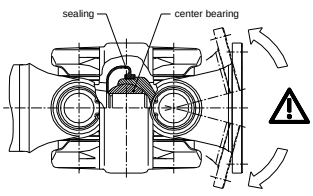


- First remove possible transport lock before start of installation.
- Check the position of the slip unit male and female parts. The marking of the female unit and the male unit shall be in line.
- Ensure at the slip unit, that the slip range of the length compensation is free off any coating, when painting the cardan shaft.
- Use bolts and nuts in the right quality and size according to our above bolting tables only.
- The installation of the cardan shaft has to be carried out so that no dirt or water shall run into the slip unit parts. Moisture and water shall be able to flow or to drip from the cardan shaft.
- Tighten the bolts always via cross. Use torque spanner only.
- Clean the surface of the flanges from dirt, crease, oil, paint and anti corrosion protection before bolting.
- Never interchange the slip unit or any other parts of the cardan shaft with parts of an other cardan shaft. Otherwise the cardan shaft will be never more in balance and vibrate in operation.
- If it is necessary to remove both slip unit parts, make sure, that by assembling the markings of both parts are in line.
- Never remove or change balancing plates or any other parts of the cardan shaft, or redesign and modify the cardan shaft. It will malfunction the cardan shaft and our warranty will be invalid.



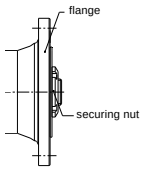
- Ensure that the slip range of the length compensation is free to both sides. Make sure, that the slip unit can compensate the length between the maximum and minimum operation length of the cardan shaft.
- Install the cardan shafts without length compensation unstressed
- For gearboxes, bearings or similar machinery parts with cardan shafts on both sides: The flange bolting of the driving cardan shaft and the driven cardan shaft shall be attached 90° shifted to each other.
- Do not turn the cardan joints with pinch bar or pipe because this may damage the sealing system and grease nipples.
- Check the companion flanges. Type, size and design shall be the same as the cardan flanges.
- Installation of cardan shafts with centred double joints: Secure the double joints against a to wide deflection angle or hanging. Otherwise the centred bearing can be damaged.
- Take measurements, which ensure, that no other machinery or plant unit is in the range of the rotation radios and slip area of the cardan shaft.
- Read first the instructions of your plant or vehicle manufacturer.
- Secure all other machinery or plant units in the area of the cardan shaft by frames, guards etc. In case of damage at the cardan shaft, other units shall be not affected.
- Before start of operation: Read greasing instructions



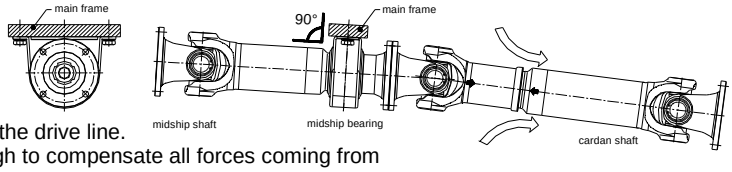


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Additional information for the installation of drive lines



- Normally we deliver the intermediate shafts and drive lines complete assembled with the intermediate bearing. Install the midship bearing every time together with the whole drive line. Never dismantle the intermediate bearing from the drive line. Therefore fix it together with the whole drive line.
- Never tighten or loose the securing bolt(s) or securing nut of the intermediate bearing unit. Otherwise lock will be damaged.
- Read before installation of the drive line the instruction manual of the vehicle or machine manufacturer. Use only the specified mounting place and bolting according the instruction manual of the vehicle or machine manufacturer.
- Tighten the intermediate bearing frame bolts only after bolting the flanges of the drive line. Install the intermediate bearing unstressed.
- By installation work often large torque can appear on the drive line joints. Secure the joints against a to wide deflection angle or hanging. Otherwise the joints and the midship bearing can be damaged.
- Install the intermediate bearing only in the right angle (90°) to the intermediate shaft or drive line.
- Ensure that the slip range of the length compensation is free to both sides. Make sure, that the slip unit can compensate the length between the maximum and minimum operation length of the drive line.

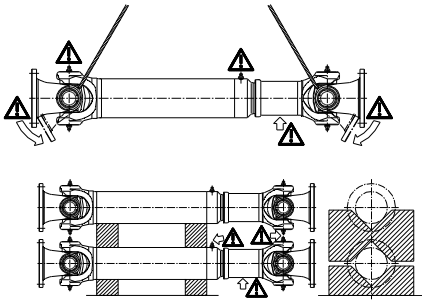


- The basic frame of the vehicle or machine shall be strong enough to compensate all forces coming from the intermediate bearing.
- The installation of the cardan shaft has to be carried out so that no dirt or water shall run into the slip unit parts. Moisture and water shall be able to flow or to drip from the drive line.

03 Dismantling

- Secure the slip unit against slipping out and falling.
- If the marking on the both slip unit parts is never more visible, make new marking before you dismantle both parts.
- Always: safety first. Secure the joints and slip unit against hanging down and falling. By dismantling under the vehicle or plant secure the whole cardan shaft against falling.
- Never exchange parts of the dismantled cardan shaft with parts of an other cardan shaft.

04 Transport and Storage



- All transport shall be carried out in horizontal position.
- By transport with the forklift put timber between fork and cardan tube.
- Never transport or store cardan shafts with stress or load on the slip unit.
- By lifting with ropes use textile or synthetic material only.
- Store the cardan shafts only in the dry.
- Secure the cardan shafts in the store room and by transportation with wedges, prism or cradles against rolling.
- Take the grease nipple in consideration. Square timbers and lifting ropes shall not destroy the grease nipples.
- Transport and storage of cardan shafts with centred double joints: Secure the double joints against a to wide deflection angle or hanging. Otherwise the centred bearing can be damaged.

Storage conditions for cardan shafts and pillow block bearings

All items shall be stored in the original packing. The storing and the storeroom shall be clean, dry, dust free, without any chemical vapor and in resting position without any vibration. The maximum data for the environment of the storeroom is for the temperature -5°C to +25°C, fore the temperature difference between day and night 8°C and for the relative humidity of air 65%. By observation of these regulations the stored cardan shafts and pillow block bearings can be stored up to 5 years. For all parts longer stored as 1 year: Change by complete greasing all the old grease against the new one before initial operation.

05 Maintenance and Greasing

Greasing and inspection of the cardan shaft can be carried out by the normal maintenance and inspection intervals of the vehicle or the machine. As a matter of course all our information about greasing and inspection intervals are just guideline data, because only the operation conditions are accountable for the interval schedule. Therefore only the operator can determinate the greasing and inspection intervals.

Greasing and inspection intervals *(guideline)*

vehicle or machine	***greasing all***	***or maximal after***	***inspection all***	***or maximal after***
commercial vehicles used in long distance traffic and all similar used vehicles	50 000 km	12 months	100 000 km	12 months
commercial vehicles used partly on road and off road commercial vehicles used in city traffic and all similar used vehicles	25 000 km	6 months	50 000 km	12 months
busses used in long distance traffic	50 000 km	12 months	100 000 km	12 months
busses used in city traffic	25 000 km	3 months	50 000 km	6 months
commercial vehicles and building machines used on sites* industrial vehicles, tractors, military vehicles* and all similar used vehicles*	12 500 km or 250 h	3 months and each river crossing	25 000 km	6 months
ship engines	1500 h	3 months	1500 h	6 months
all types of industrial plants and lifting systems	500 h	6 months	500 h	6 months

** After river crossing or equal task: grease the cardan shaft!*

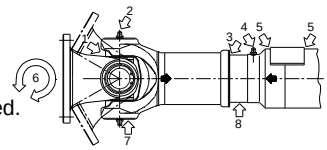
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Cleaning of cardan shaft
Don't clean the cardan shaft with a high pressure cleaning machine or with a steam cleaner. If it should happen once: grease immediately according to our above instructions so long as the new grease appears.

Greasing
Clean the grease nipple and the grease channels before start of greasing. Grease always gentle. Don't use to much pressure. We recommend about 5 bar. Stop greasing after fresh grease appear on the seals. The slip unit grease only with 2-3 grease gun strokes per maintenance interval. Grease with feeling. Watch every time the seals.

Lubricant
We always deliver all cardan shafts in greased condition. For cardan shaft in storage or out of operation longer than 6 months: Grease before putting into operation again! Use lithium complex grease only. We recommend Microlube GL 262 as standard lubricant and Klüberplex BEM 34-132 as high performance and high temperature lubricant of Klueber Lubrication, Munich, Germany. This lubricants are special complex grease on a mineral hydrocarbon base. Alternative lubricant brands for our standard grease are: BP Energrease LS 2, Esso – Beacon EP 2, Shell Alvania EP 2, Mobil Mobilux 2. Do not use sodium grease, Molykote paste or lubricant with MoS_2 additives! If your cardan shaft is equipped with special low or high temperature universal joint, use only the special low or high temperature grease! The greasing nipples of our cardan shafts correspond to the standard DIN 71412, if the drawing not comments a different type. All greasing nipples DIN 71412 are equipped with plastic dirt covers.
But you can use any other lubricant that matches following performance data:
Operation temperature range: -30°C to 140°C (high performance lubricant -45°), consistence class: 2 (DIN 51818, NLGI), penetration: approx. 265-295 (DIN ISO 2137), drop point: > 220-250°C (DIN ISO 2176), density: approx. 0.9 g/cm³ (DIN 51757 at 20°), water resistance: approx. 1 – 90 (DIN 51807 – 3h/90°C), flow pressure: approx. 1400 mbar (DIN 51805 -25°C), corrosion protection behaviour: 1 (DIN 51802 Emcor test), speed factor: approx. 300 000 (dm x n).

Check list for inspection *(can be carried out with the cardan shaft on site)*



- Proof the tightening of the flange bolting. If important, tighten the bolts with the right torque according to the above lists.
- Check the cups of the universal joint bearing. The snap rings have to sit on the right place (7).
- Control the colour or form of the universal joint bearing cups. If the normal metallic colour or form has changed, may be the bearing is damaged due to excessive heat (7). Change the whole universal joint.
- Proof the cups of the universal joint bearing. If you see grooves or turning marks in the area of the snap rings, the cup then revolves in the hole. The damaged part with the hole (flange or fork) has to be changed.
- Check the seals of the bearing cups (1). Is a seal damaged or worn out, change the whole bearing cup.
- Proof whether the balance plates are in place, not damaged and not loose (5). By damaged, lost or loose balance plates: The cardan shaft has to be balanced.
- Check the slip unit. Seal of the profile protection and synthetic coating (Rilsan) have to be without damages (1+3+8). If there are damages, change the slip unit.
- Control all the greasing nipples (2+4) and the dirt caps. If necessary clean the grease nipple and the grease channels.
- Take the load from the cardan shaft by lifting it a bit. Try to turn the slip unit and the universal joints (6). If the part moves, it is to much play in the unit.
- Control the tube and the profile protection whether there are bumps or scratches on it. Check also all other parts and lines of weld whether there are cuts or broken parts. If a part or line of weld is defective, the cardan shaft has to be overhauled.
- By intermediate shafts and drive lines consider:

There shall be no noise from the bearing by running of the cardan shaft. If necessary change the bearing of the intermediate shaft. By Elastic Midship Bearings: Check the elastic inlay, whether there are cracks or cuts. The cushion or elastic inlay has to sit in its place in the frame or bracket. The ball or roller bearing shall sit in its right place, without any play in the seat. Check the fastening bolts. If necessary, tighten the bolts with the right torque according to our above list. The ball or roller bearing shall run smooth and without any play or noise. Proof the intermediate bearing flanges: The flange shall sit tight on the key seat of the shaft. There has to be no turning or horizontal play. Loose dirt covers can be a sign for loose flanges. Securing bolts or nuts shall sit tight. If necessary, tighten the bolts with the right torque according to our above list. By tighten or loose the securing bolt(s) or securing nut of the intermediate bearing unit, lock will be damaged. By any kind of tighten or loose of securing bolts or nuts: You have to secure the bolts or nuts again.

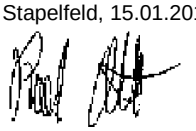
06 EU Declaration of Conformity according EU Machinery Directive 2006/42/EC

Product: ***Cardan shafts type: GW-500*** *to* ***GW-599***

We hereby declare that the cardan shafts described above confirms to the relevant fundamental safety and health requirements of the appropriate EU Directives and relevant Standards, both in its basic design and construction as well as in the version marketed by us. This declaration will cease to be valid if any modification is made to the cardan shaft without our express approval. Appropriate internal measures have been taken to ensure that series production units conform at all times to the requirements of current EU Directives and relevant Standards. Initial operation of this machine part is prohibit, so long as the machine, where this machine part is embedded, is not conform in all items with the requirements of current EC Directives and relevant standards.

The signatory is authorized to act on behalf of the company management

Stapelfeld, 15.01.2010



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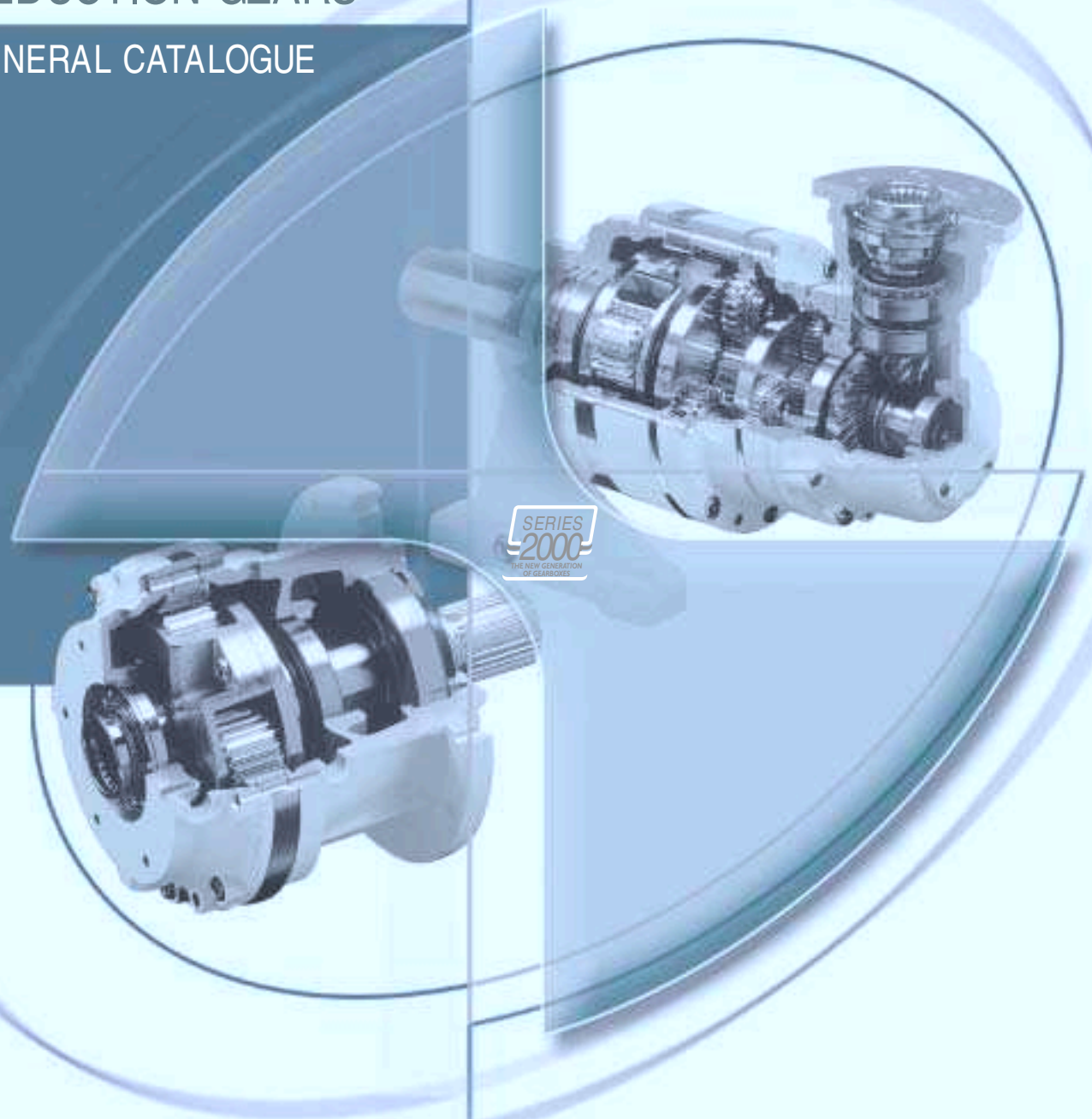
14. Appendix 6 – Gearbox

REGGIANA RIDUTTORI

Quality and Technology

PLANETARY REDUCTION GEARS

GENERAL CATALOGUE



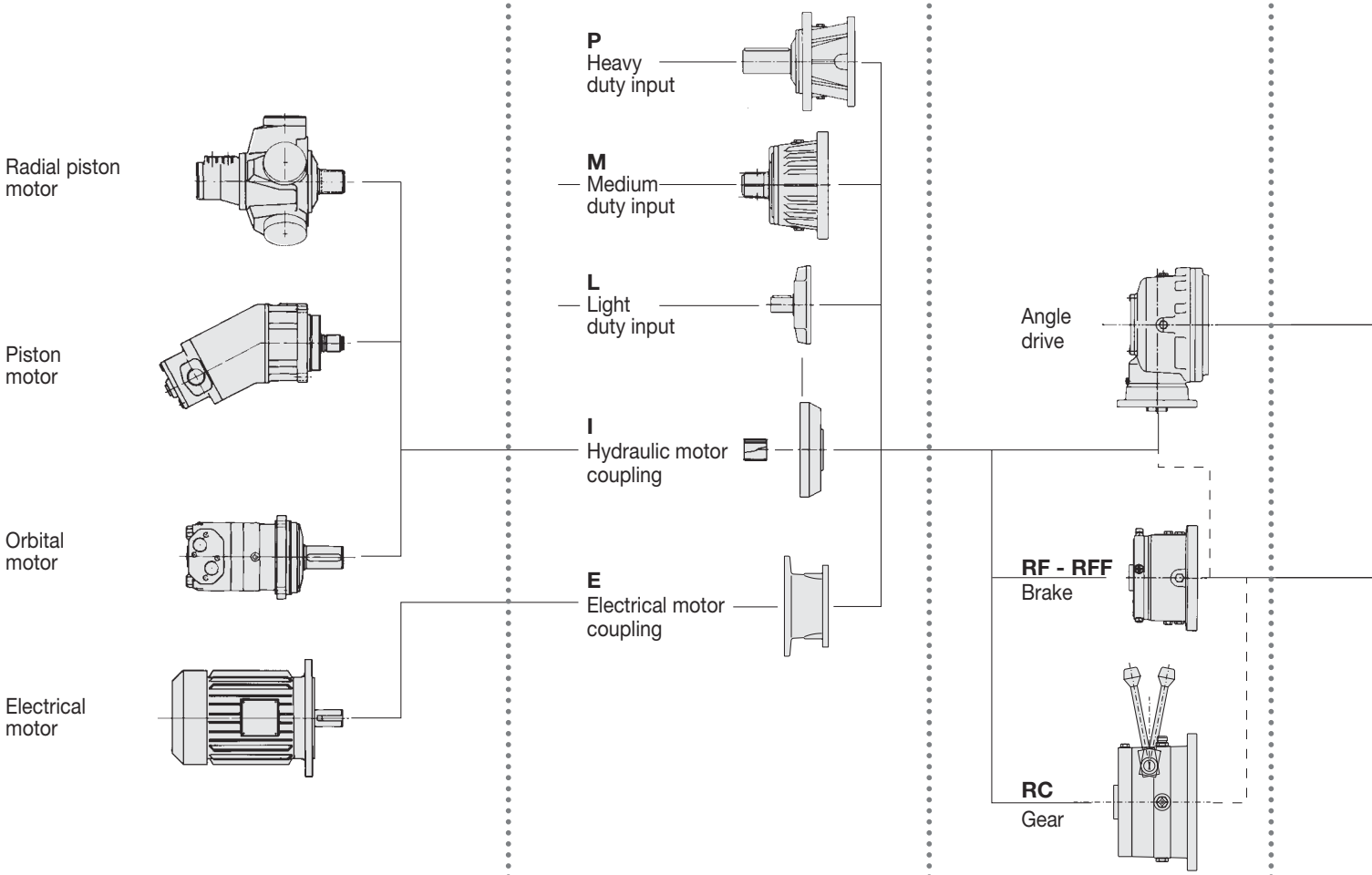
from 65 to 50000 daNm



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MOTOR TYPE	INPUT	OPTIONAL GROUPS



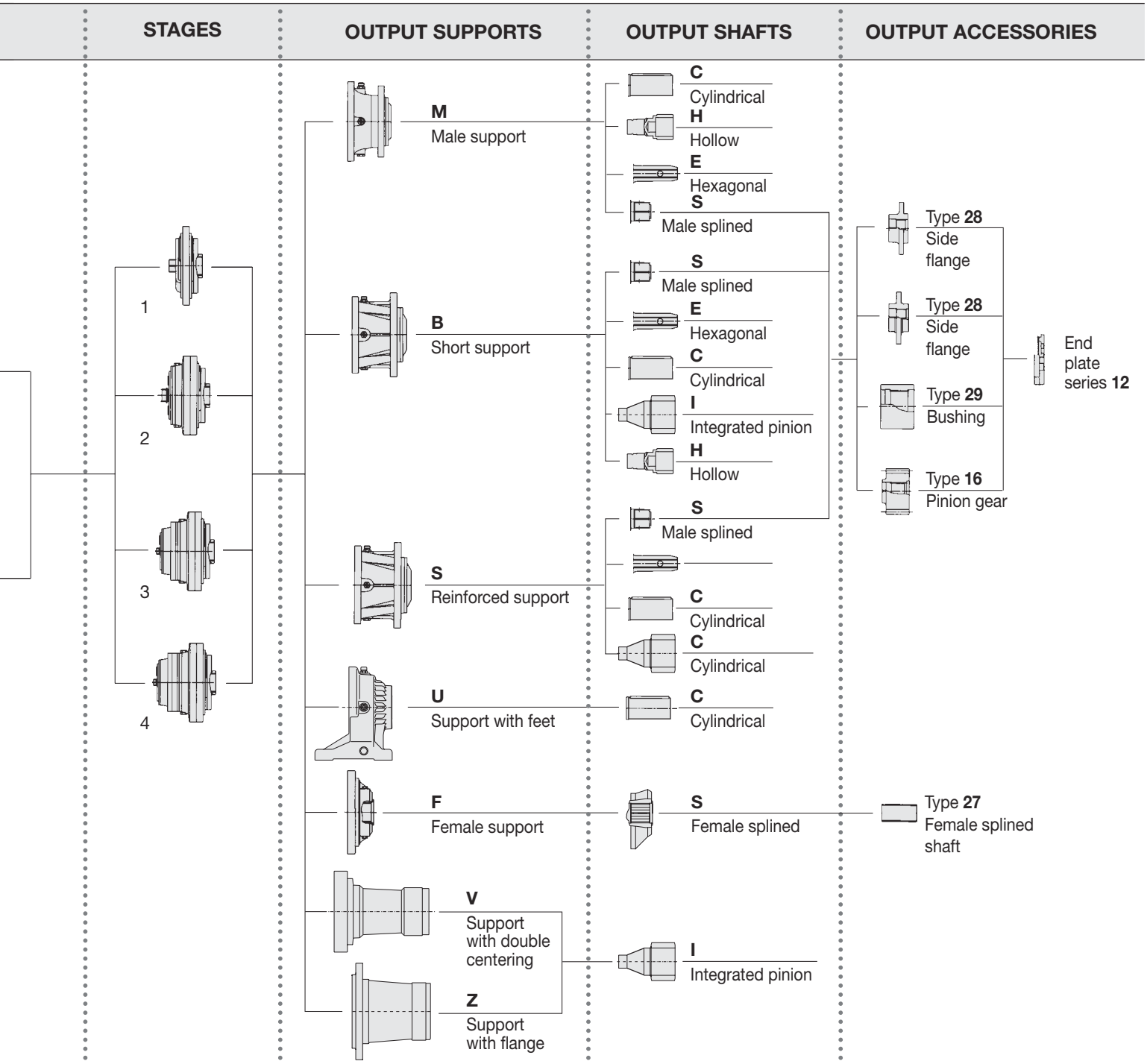
PRODUCT IDENTIFICATION SCHEME

Consulting the above diagram and this catalogue the client can find all the elements necessary to facilitate the choice of reduction gear for his needs. Reggiana Riduttori reduction gears are identified with the letters and numbers given on the right. All our reduction gears have a metal identification plaque giving the basic information regarding the product. The following plaque is an example:



REDUCTION GEAR TYPE	SIZE	No. STAGES
RR = Linear **RA** = Angular	**65... 50.0000**	**–** = Single **D** = Double **T** = Triple **Q** = Quadruple

The **first box** contains the **denomination of the reduction gear** identified by its torque, No. of stages and type of output support (e.g. **RR510 FS**).
The **second box** contains the **reduction ratio** which can be found in the specific tables for each group of reduction gears listed in the catalogue (e.g. **7,0 on page 51**).
The **third box** contains the **ordering code number** which is available to the **RR sales network.**



REDUCTION RATIO	OUTPUT SUPPORTS	OUTPUT SHAFTS	OUTPUT SIDE ACCESSORIES	INPUTS	OPTIONS
3,00.....8000,00	**M** = Male **F** = Female **C** = Short **S** = Reinforced **U** = With feet **V** = Rotation with double centering **Z** = Rotation with flange	**C** = Cylindrical shaft **E** = Hexagonal shaft **H** = Hollow shaft **S** = Splined shaft **S** = Female splined shaft **I** = Integral pinion	**28** = Side flange **28** = Central flange **29** = Bushing **16** = Pinion gear **12** = End plate **27** = Splined shaft	**L** = Light **M** = Medium **P** = Heavy **I** = Hydraulic motor coupling **E** = Electrical motor coupling	**RF** = brake for reduction gear **RFF** = brake for angular reduction gear **RC** = Gear

The **4th box** contains the **braking torque** of the brake which is given only if the reduction gear is provided with negative hydraulic brake (e.g. **RFF ... page 53**)
The **5th box** contains the **order number.**
The **6th box** contains the progressive **serial number** which is extremely useful for production and the quality department for identifying the exact product. This number is also available to the **RR sales network.**

Symbol	Unit of measure	Description
C_{rt}	-	Coefficient that correlates the thermal power to the conformation of the reduction gear
F_a	daN	Axial load allowed on the output shafts
F_{a0}	daN	Maximum axial load on the output shafts
F_d	-	Corrective coefficient of the radial load F_r relating to the number of cycles
F_r	daN	Radial load allowed on the output and input shafts
F_{rsc}	daN	Load required or applicable
f_s	-	Service factor
h	h	Length in hours
η	-	Dynamic efficiency
i	-	Reduction ratio
K	-	Corrective coefficient of the thermal power P_t relating to the input speed
K_1	-	Corrective coefficient of the thermal power P_t relating to the use percentage
Kg	Kg	Mass of the reduction gear
l	Liters	Quantity of oil to fill reduction gear
n_1	min^{-1}	Angular input speed
n_{1MAX}	min^{-1}	Maximum angular input speed
n_2	min^{-1}	Angular output speed
n_2xh	-	Number of working cycles
P’	kW	Installed mechanical power
P_s	kW	Thermal power to dissipate
P_t	kW	Thermal power
P_{t1}	kW	Corrected thermal power
q	Liters/min^{-1}	Oil capacity of the cooling system
T_2	daNm	Theoretical torque transmitted by the reduction gear in output
T_{2a}	daNm	Torque required in output
T_{2am}	daNm	Average torque required in output
T_{2c}	daNm	Theoretical corrected torque in output
T_{2eff}	daNm	Actual torque required in output
T_{2MAX}	daNm	Maximum torque transmitted in output
t_c	°C	Operating temperature
t_a	°C	Ambient temperature
T_f	-	Corrective coefficient of the theoretical torque transmitted T_2
t_s	°C	Oil temperature in output from the heat exchanger

Warranty regulations:

Reggiana Riduttori s.r.l. guarantees its products for 12 months from the date of shipment.
The warranty shall lose its validity should the defect or anomaly result from the incorrect or inadequate application of the product.

General instructions:

- Upon delivery of the reduction gear check that it has not suffered damage during transport and that all prescribed accessories are present.
- The reduction gear is intended for use in environments and for applications that are in line with the provisions of the project.
- All improper use of the reduction gear is prohibited.
- Replacement or alteration of parts of the machine, that have not been authorized by REGGIANA RIDUTTORI, can give rise to accident risk, and therefore relieve the constructor from any civil or penal responsibility, and cause the warranty to lose its effect.

3. TECHNICAL CHARACTERISTICS

For the right choice of reduction gear, it is necessary to know the meaning of the values given below.

Maximum input speed n_{1MAX}

This indicates the maximum speed allowed in input for brief periods or in intermittent operation; the value is given in **tab.A** for each size of reduction gear, both in linear and angular conformation.
The input speed of the reduction gear is limited by the peripheral speed of the gears, the bearings and the seals.
For an angular reduction gear we advise not exceeding 1500 min^{-1} in continuous operation, otherwise the noise level rises considerably and the temperature increases due to the oil shaking.
In the L,M,P (Light, Medium and Heavy) type inputs, we advise not exceeding 1500 min^{-1} in continuous operating conditions, so as not to cause significant increase in the temperature of the oil. In the case of negative brakes we advise not exceeding the following speeds: RF2 : 1500 min^{-1}; RF5 : 1000 min^{-1}; RF170 ÷ 290 : 750 min^{-1}.
In general when the loading conditions provide for long periods with speed near n_{1MAX} or with a peak speed exceeding that given in **table A**, contact the technical commercial service.

Output torque T_2

This is the value of the torque transmitted in continuous operation with service factor f_s =1, equaling a theoretical life of 30000 $n_2$xh corresponding to 1.8 million revolutions of the output shaft. This value is given in **tab.B** for each size of reduction gear.
Torque T_2 is limited by the surface resistance and by the resistance to flexure of the teeth of the gears in compliance with the standard ISO6336.
For the right choice of the reduction gear, when the life requested is far from 30000 $n_2$xh, multiply the value of the torque T_2 by the corrective coefficient T_f given in **graph 2** on page 14.

Maximum torque T_{2MAX}

This represents the value of the maximum torque allowed in output for brief periods or for occasional peaks, without permanent damage being made to the most stressed elements.
In general it equals T_2x 1.5, making sure that this value does not exceed that given in **tab.1**.
When the loading conditions foresee frequent start-ups, frequent inversions or long times at the maximum torque, limit the value of the torque installed or select a greater size of reduction gear.

Tab 1 T_{2MAX} **TORQUE TABLE**

Type **RR**	65	105	110	210	210S	310	310S	510	510S	710	710S	810	810S	1010
T_{2MAX} (daNm)	120	180	200	250	330	550	650	700	750	850	930	1450	1450	1750

Type **RR**	1700	1700 B	2700	3500	5000	6300	8000	12500	16000	22000	32000	40000	50000
T_{2MAX} (daNm)	2650	2650	3600	4500	6200	10500	15500	30000	33000	42000	46000	72000	90000

Transmission ratio i

This indicates the actual ratio between the input n_1 and output n_2 speed of the reduction gear.

Service factor fs

For correct sizing of the reduction gear, insert a corrective coefficient f_s that multiplies the torque requested T_{2a}.
The purpose is to assess approximately the type of the load and its intervention frequency.
Some of the most frequent applications for planetary reduction gears are given on page 13.

Efficiency η

The efficiency is a nondimensional number, defined as the ratio between the output power and the input power of the reduction gear. The value of the efficiency limited to only the planetary reduction gear, single stage in conditions of average speed and torque T_2, equals 0.97-0.98. This value decreases in the following cases:

- Decrease in the torque applied
- Increase in rotation speed
- Reduction gears in multistage configuration

The value of the efficiency of angular reduction gears is usually lower than that of the linear reduction gears.

Operating temperature T_c

The recommended operating temperature for linear or angular reduction gears is between –20°C and +90°C.
Different conditions of use are however possible, using particular design devices (specific lubricating oil, use of suitable materials and seals) specifically assessed by the technical-commercial service.

Radial load F_r

OUTPUT SHAFTS
Beside each support in the version:

- Splined male
- Cylindrical male
- Support for rotation

the curve of the radial loads allowed for the life of the bearing ISO L10 of 100000 $n_2$xh is given. This value is mainly limited by the fatigue resistance of the bearings in compliance with the standard ISO 281.
In the output supports: splined male and cylindrical male, the radial load allowed is combined with an axial load (positioned on the rotation axis) shown beside the curve. For the lengths of time requested which are different from 100000 $n_2$xh a corrective coefficient F_d is introduced as illustrated in the example shown on page 11.
The technical data sheets of the reduction gears in the female version purposely do not give the curves of the radial loads, as generally they are not suitable for supporting such loads, nevertheless for the applications that take into consideration radial loads on female supports the suitability can be assessed by contacting the technical-commercial service.

INPUT SHAFTS
Beside each support in the version:

- Cylindrical male

the curve of the radial loads allowed for the life of the bearing ISO L10 of 100000 $n_2$xh is given. This value is mainly limited by the fatigue resistance of the bearings in compliance with the standard ISO 281.
In the cylindrical male input supports the radial load acts singularly without being combined with an axial load.
For the lengths of time requested which are different from 100000 $n_2$xh a corrective coefficient F_d is introduced as illustrated in the example shown on page 11.

Axial load F_a

Tab. 2 shows for each size of reduction gear the axial load allowed acting singularly on the output supports, for life of the bearings ISO L10 of 100000 $n_2$xh.
The axial load shown in the table is positioned on the rotation axis of the output shaft and is valid for both directions (entering and coming out of the support).

Tab 2 **TABLE OF DYNAMIC AXIAL LOADS - F_a**

Type **RR**	65	105	110	210	210 S	310	310 S	510	510 S	710	710 S	810	810S
Fa (daN)	1800	1000	1000	1000	3500	3500	3800	3500	3800	3800	4500	5800	6700
Type **RR**	**1010**	**1700**	**1700 B**	**2700**	**3500**	**5000**	**6300**	**8000**	**12500**	**16000**	**22000**	**32000**	
Fa (daN)	6000	7300	7300	1850	2500	3200	3800	4350	7100	7100	12000	12000	

Maximum axial load F_{a0}

Tab. 3 gives the maximum axial load for each size reduction gear applied for brief lengths of time or for occasional peaks acting singularly on the support, without permanent damage occurring.
The maximum axial load given in the table is positioned on the rotation axis of the output shaft and is valid for both directions (entering and coming out of the support).

Tab 3 **TABLE OF DYNAMIC AXIAL LOADS - F_{a0}**

Type **RR**	65	105	110	210	210 S	310	310 S	510	510 S	710	710 S	810	810S
Fa0 (daN)	1800	1800	1800	1800	1800	4000	4000	4000	4000	4000	9000	9000	9000
Type **RR**	**1010**	**1700**	**1700 B**	**2700**	**3500**	**5000**	**6300**	**8000**	**12500**	**16000**	**22000**	**32000**	
Fa0 (daN)	10000	10000	10000	1850	2500	3200	3800	4350	7100	7100	16000	16000	

Thermal power P_t

This is the value of power which when applied in input to the reduction gear in continued prolonged operation stabilizes the oil temperature inside the reduction gear at 90°C; in the following testing conditions:

- Lubrication by shaking
- Reduction gear mounted in a horizontal position, not subject to air flows.
- Revs in input 1000 min^{-1}.
- Quantity of oil corresponding to half-full.
- Mineral oil ISO VG150.
- Ambient temperature 20°C.

To select the suitable type of reduction gear for the type of application it is necessary to know the torque T_{2a} (daNm) and the output speed n_2 (min^{-1}), where the latter, based on the input speed n_1 (min^{-1}) shall define the ratio of transmission **i** with the following relation:

$$i = \frac{n_1}{n_2}$$

Otherwise, if the installed power P'(kW) and the input revs n_1 (min^{-1}), is known, the torque T_{2a} (daNm) is calculated using the following relation:

$$T_{2a} = \frac{955 \times P'}{n_2}$$

In which for simplification we do not consider the efficiency of the reduction gear.

Successively it is necessary to define the service factor f_s which indicatively is calculated depending on the following parameters:

- Operating machine *(Consult **table 10** in relation to the classification of the applications).*
- Daily use
- Start-up frequency

It identifies a multiplicative coefficient of the torque applied T_{2a}. See **table 9** below.
The actual torque requested in output T_{2eff} becomes:

$$T_{2eff} = T_{2a} \times f_s$$

Tab 9

Service factor f_s

		Uniform		
U		Hours of operation per day		
		less than 1	*from 1 to 8*	*from 8 to 24*
no. start-ups / hour	*less than 6*	**0,7**	**0,9**	**1,1**
	from 6 to 60	**0,9**	**1,2**	**1,4**
	more than 60	**1,2**	**1,5**	**1,7**
		Moderate		
M		Hours of operation per day		
		less than 1	*from 1 to 8*	*from 8 to 24*
no. start-ups / hour	*less than 6*	**0,9**	**1,1**	**1,3**
	from 6 to 60	**1,1**	**1,4**	**1,6**
	more than 60	**1,4**	**1,7**	**2**
		Heavy		
H		Hours of operation per day		
		less than 1	*from 1 to 8*	*from 8 to 24*
no. start-ups / hour	*less than 6*	**1**	**1,3**	**1,7**
	from 6 to 60	**1,4**	**1,7**	**2**
	more than 60	**1,7**	**2,1**	**2,5**

Tab 10

CLASSIFICATION OF THE APPLICATIONS

Compressors, fans			
Axial and radial compressors	U		
Cooling tower fans		M	
Induced draft fans		M	
Rotating piston compressors		M	
Turbo compressors	U		

Chemical Industry			
Stirrers (liquid materials)	U		
Agitators (semi-liquid materials)		M	
Centrifugal machines (heavy)		M	
Centrifugal machines (light)	U		
Cooling drums		M	
Drying drums		M	
Mixers		M	

Compressors			
Piston compressors			H
Turbo compressors		M	

Conveyors			
Slat conveyor		M	
Ballast hoister		M	
Pocket conveyor belt		M	
Conveyor belt (voluminous material)		M	
Conveyors (goods in pieces)			H
Bucket conveyor for flours	U		
Chain conveyor		M	
Circular conveyor		M	
Hoists			H
Inclined hoist			H
Steel conveyor belt		M	
Lifts for people		M	
Screw conveyors		M	
Concave belt conveyor		M	
Winch conveyor		M	

Cranes			
Mechanism of the drilling arm		M	
Hoist mechanism	U		
Rotating mechanism		M	
Translation mechanism			H

Dredges			
Bucket conveyors			H
Bucket wheels			H
Tool-holding heads			H
Winches for maneuvers		M	
Pumps		M	
Rotating mechanism		M	
Translation mechanism (tracked vehicle)			H
Translation mechanism (rails)		M	

Machinery for the food industry			
Machines for filling bottles and containers	U		
Cane crushers		M	
Knives for cane			H
Cane mill			H
Kneading machine			H
Tanks for macerating (crystallizers)			H
Packing machinery	U		
Cutters for sugar beet		M	
Machines for washing sugar beet		M	

Building machinery			
Concrete mixers		M	
Hoists		M	
Machinery for road construction		M	

Generators and transformers			
Frequency transformers			H
Generators			H
Generators for welding machine			H

Laundries			
Inverters		M	
Washing machines		M	
Ironing machines		M	

Metal rollers			
Shears for rolling mills			H
Chain drives		M	
Cold rolling mills			H
Plants for continuous melting			H
Cooling blocks		M	
Shears for discarding			H
Rolling mills for medium and heavy plates			H
Roughing mills and ingots			H
Mechanical hands			H
Sheet shears			H
Roller rectifier		M	
Roller tables (heavy)			H
Roller tables (light)			H
Tube-welding machines		M	
Winding machines (wire washer)		M	
Flush drawing boards		M	

Machines for working metal			
Counter shafts, shafts in line	U		
Press for hot-pressing			H
Hammers			H
Auxiliary guides, machine tools	U		
Main guides, machine tools		M	
Machines for metal planing			H
Rectifier for metal sheet			H
Presses			H
Presses for forging			H
Shears		M	
Machine for folding metals		M	

Petrol industry			
Conveying pumps		M	
Rotating drill equipment			H

Machines for paper			
Rolling presses			H
Coupling			H
Drying drum			H
Drying cylinder			H
Beater			H
Grinder for pulp			H
Suction rollers			H
Suction presses			H
Wet presses			H
Willows			H

Machines for plastic			
Rolling presses		M	
Grinders		M	
Extruders		M	
Mixers		M	

Pumps			
Centrifugal pump (light liquids)	U		
Centrifugal pump (viscose liquids)			H
Piston pumps			H
Pushbutton pump			H
Pressure pump			H

Machinery for rubber			
Rolling presses		M	
Extruders			H
Mixers		M	
Kneading machines			H
Rolling mills			H

Machines for working stone and clay			
Hammer mills			H
Rolling mills for refining			H
Switch			H
Presses for bricks			H
Rotating kiln			H
Tube rolling mills			H

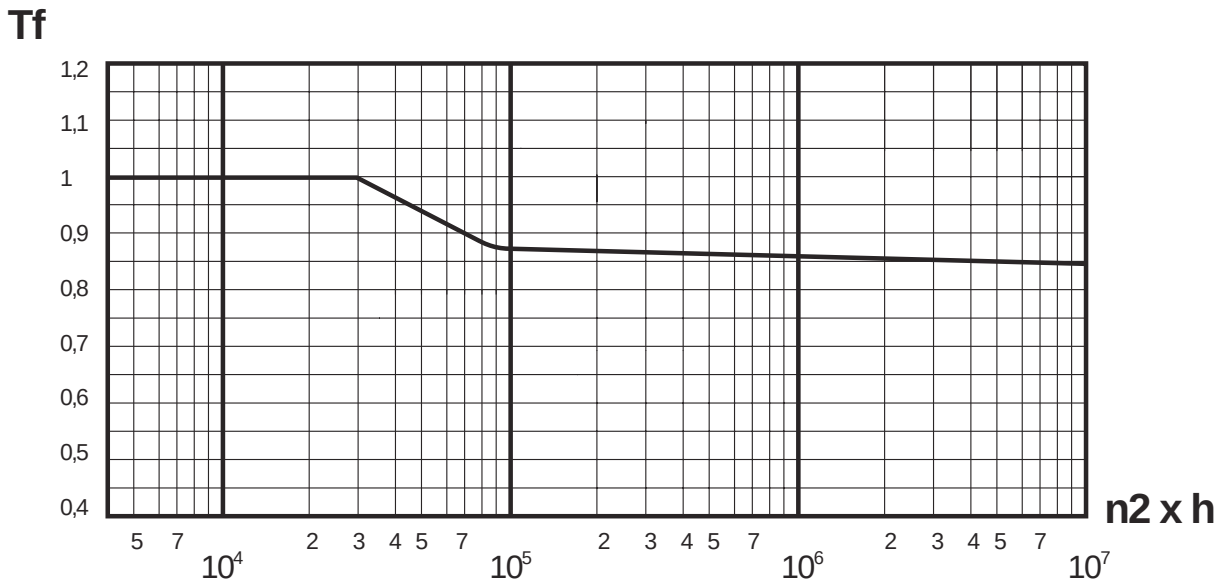
Textile machines			
Batchers		M	
Looms for weaving		M	
Machine for printing and dyeing		M	
Tank for tanning		M	
Willows		M	

Water treatments			
Aerators		M	
Screw pump		M	

Machines for working wood			
Bark-peeling machine			H
Planing machines		M	
Frame for saws			H
Machines for working wood	U		

If the life requested differs from n2xh=30000, use **graph 2** to calculate the corrective coefficient T_f.

Graph 2



The corrected output torque T_{2c} becomes:

$$T_{2c} = T_2 \times T_f$$

The following relation will always have to be verified :

$$T_{2c} > T_{2eff} \quad \text{or} \quad T_2 > T_{2eff}$$

Selection criteria for variable operating

In certain cases there are variable operating conditions with different output twisting moments, at different intervals of time, therefore a torque can be calculated approximately as in the following example:

Example:

a) Torque 820 daNm for 65% of the time
b) Torque 1100 daNm for 25% of the time
c) Torque 1300 daNm for 10% of the time

$$T2a_m = \sqrt[6,6]{820^{6,6} \times 0,65 + 1100^{6,6} \times 0,25 + 1300^{6,6} \times 0,10} = 1029 \text{ daNm}$$

Then considering the service factor f_s we obtain:

$$T_{2eff} = T_{2am} \times f_s$$

Always verifying the following expression.

$$T_2 > T_{2eff}$$

REGGIANA RIDUTTORI

Title: **Data application sheet for the selection of the reduction gear** TR-434

Reserved for technical commercial service: **Checked:** **Date:**

Request no: .....

REFERENCES

Name of client : Address :

Project ref.: e-mail Contact:

OPERATING CONDITIONS

? Application description:

? Configuration required (**RR**-Linear **RA**-Angular): | Size and stages required (**D**-Double **T**-Triple **Q**-Quadruple): | ? Type of output required (**MS**-male splined shaft **FS**-female splined shaft, **ZI - VI** by rotation....)

? Ratio reduction required Min/Max (Ratio between input revs and output revs of reduction gear)

? Motorization (**E**-electric **O**-hydraulic **I**-indirect)

Type and/or size (Specify type and size of motor)

Duration required (Overall operating time of reduction gear in hours)

? Service factor **Fs** (Corrective coefficient that multiplies torque required)

Operating hours per day (Actual daily operating time in hours)

Number of start-ups per hour (Number of start-ups or phases repeated in one hour)

Ambient temperature (Minimum and maximum temperature reached during the day °C)

Reduction gear assembly type (With reference to Fig.3 indicate the position of the reduction gear)

Type of lubricant envisaged (Indicate brand and code of oil)

Duration in continuous operation (Average time of a working phase in minutes)

Average pause duration (Average stop phase time)

Possible negative static brake (Static braking torque required in input to the reduction gear in daNm.)

Brake release pressure (Min and max pressure available for opening the brake in bar.)

Number of reduction gears planned per year (-)

WORKING CYCLES

? WORK CYCLES	Time percent.	OUTPUT (FIG. 1)					INPUT (FIG. 2)		
		° Torque	Speed	Radial load	Distance	# Axial load	Radial load	Distance	# Axial load
[-]	[-]	T2 [daNm]	n2 [min-1]	Fr 2 [daN]	x 2 [mm]	Fa 2 [daN]	Fr 1 [daN]	x 1 [mm]	Fa 1 [daN]
1									
2									
3									
4									
5									

DIAGRAMS

° Indicate the value of the torque without application factor

Enter the positive value (+) when directed towards the inside of the reduction gear.

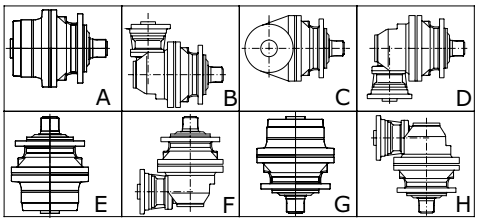


Fig.3

Fig. 1

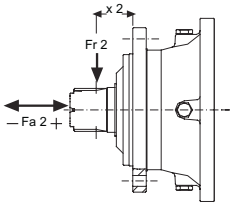
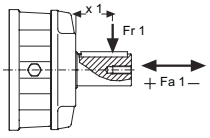


Fig. 2



MOTORIZATION

E - ELECTRICAL

Nominal power: ..... kW
Power used: ..... kW
Nominal speed: G/1
Working speed: G/1
Size IEC: ..... -
Shape (**B3 - B5 - B14**): ..... -
Weight: ..... Kg

O - HYDRAULIC

Type (**Orbital - Pistons**): ..... -
Diagram (**Axial - Radial**): ..... -
Displacement: ..... CC/Rev
Max pressure: ..... bar
Operating pressure: ..... bar
Operating speed: G/1
Coupling: ..... -

I - INDIRECT

Installed power: ..... kW
Diam. driving pulley: ..... mm
Diam. driven pulley: ..... mm
Input speed n1: G/1
Type of connection: ..... -
Diam. driven shaft: ..... mm

Distance in mm. between flange connection and motor centre of gravity: ..... mm

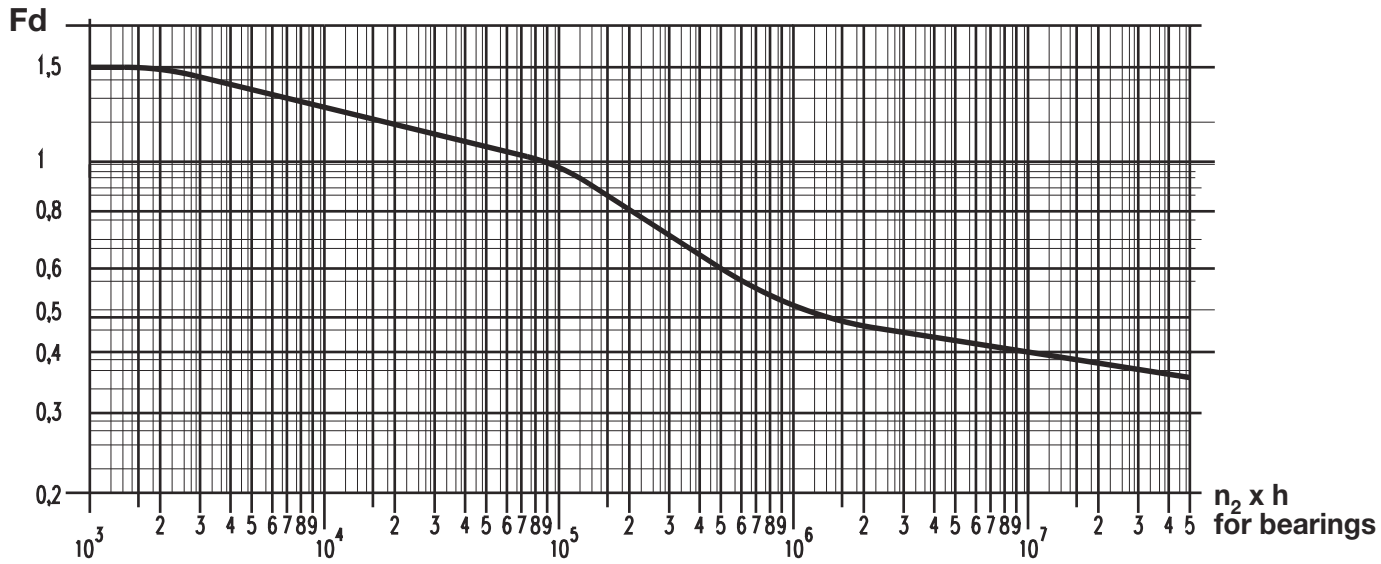
NOTES

Supplementary accessories required, indicate the presence of further accessories on output side such as: **drive intake flanges, splined bushings, pinions for slewing, end plates, splined shafts; or kit for oil expansion.**

Indicate technical documentation requested: **(duration verification - dimensional drawings – exploded drawings – tests certificates – manuals)**

? ***Information needed for selecting the reduction gear***

Graph 3



N.B. - For shaft fatigue verification and life of bearings with combined loads, contact Reggiana Riduttori technical service

Example 1:
knowing the position of the load and the life n_2 **x h** of the reduction gear, we want to know the applicable load **FRsc** on the output shaft.
On the page relating to the reduction gear concerned, we can obtain the load
Fr corresponding to n_2 **x h =** 10^5 in the known position: from graph 3 we can obtain the coefficient **Fd** which multiplied by the load **Fr** gives the applicable load **FRsc**.

KNOWING:

Type of reduction gear	RR65
Position of the load	60 mm
Radial load **Fr**:	800 daN
n_2 **x h**:	500000

From the graph we obtain:

Fd:	0,6

Of which:

Applicable load **FRsc**:	0,6x800 = 480 daN

Example 2:
Knowing the position of the load requested **FRsc** and its value we want to know the life n_2 **x h** at the output shaft.
On the page relating to the reduction gear concerned, we can obtain the load
Fr corresponding to n_2 **x h =** 10^5 in the known position. From the calculation of the ratio between the load requested **FRsc** and the load **Fr** the coefficient **Fd** is obtained. Finally the correct life n_2 **x h** is obtained from graph 3.

KNOWING:

Type of reduction gear	RR65
Position of the load	60 mm
Load requested **FRsc**:	320 daN

From the catalogue we obtain:

Radial load **Fr**:	800 daN

Of which:

Fd:	320:800 = 0,4

From the graph we obtain:

n_2 **x h**:	$1x10^7$ = 10.000.000

Table 6 gives the values of thermal power allowed, under the following testing conditions:

- Lubrication by shaking
- Reduction gear mounted in a horizontal position not subject to air flows.
- Input revs 1000 min^{-1}
- Quantity of oil corresponding to half-full
- Mineral oil ISO VG150
- Ambient temperature 20°C.

both in linear and angular configuration.

With installed power greater than the thermal P_t, a cooling system has to be provided. For intermittent services, with installed power greater than P_t, where the time of permanence is greater than the pause period, the temperature inside the reduction gear is subject to increasing elevation.

Tab 6

THERMAL POWER Pt (kW)

Crt / TYPE	17	34	34	50	50	66	66	82
	RR	RA	RR	RA	RR	RA	RR	RA
	1 STAGE		2 STAGES		3 STAGES		4 STAGES	
65	9	-	5	-	4	-	-	-
105	12	13	6	9	5	-	-	-
110	12	13	6	9	5	-	-	-
210	15	14	8	10	6	-	5	-
310	20	18	12	13	8	10	7	-
510	21	23	13	14	10	11	8	-
710	21	23	13	14	10	11	8	-
810	35	33	21	19	16	15	13	-
1010	39	33	23	24	17	17	14	-
1700	48	38	28	27	21	19	16	-
1700 B	43	34	24	23	19	17	15	-
2700	38	47	23	26	17	17	14	-
3500	48	45	29	29	22	23	18	-
5000	62	51	38	35	28	22	22	-
6300	63	-	42	47	31	31	24	-
8000	77	-	46	40	33	32	27	-
12500	101	-	62	50	44	38	35	-
16000	101	-	62	-	46	45	36	34
22000	137	-	90	-	66	57	52	46
32000	137	-	90	-	66	57	52	46
40000	247	-	152	-	109	90	85	72
50000	247	-	152	-	109	90	85	72

In the versions with feet support increase the Pt by 20%

The following example shows the procedure for determining whether the reduction gear needs a cooling system or not.

- Ambient temperature: t_a = **30°C**
- Time in continuous operating: **24 minutes**.
- Reduction gear input speed: n_1 = **1500 min^{-1}**
- Reduction gear used: **RR1010T** (3 stages)
- Installed power: P' = **30 kW**

Use the following expression to determine the correct thermal power:

$$P_{t1} = \frac{P_t K}{K_1}$$

Tab 7

K_1		AMBIENT TEMPERATURE T_a				
Work cycle **minutes**	Work cycle **% hour**	10°C	20°C	30°C	40°C	50°C
60 (continuous service)	100%	0,90	1	1,15	1,45	1,75
48	80%	0,80	0,90	1	1,25	1,55
36	60%	0,70	0,80	0,90	1,10	1,40
24	40%	0,60	0,70	0,75	0,95	1,20
12	20%	0,50	0,60	0,70	0,85	1

Tab 8

Input speed n_1 (revs/min)	K
500	1,08
750	1,04
1000	1,00
1250	0,95
1500	**0,89**
1750	0,82
2000	0,75
2250	0,66
2500	0,59
2750	0,54
3000	0,48

Table 6 gives the thermal power P_t of the RR1010T: **17 kW**.
The corrective coefficients K and K_1 correlate the real operating conditions with the testing conditions.
By increasing the input speed inside the reduction gear more heat is generated, to keep the oil temperature unchanged the power transmitted has to be decreased; in the specific case to 1500 min^{-1} **K =: 0.89** as shown in **table 8**.
The coefficient K_1 correlates the variation in thermal power P_t with the percentage of time in an hour of continuous operating and the ambient temperature. With a duration of 24 minutes at 30°C **K_1= 0.75** as shown in **table 7**.

$$P_{t1} = \frac{17 \times 0.89}{0.75} = 20.2 \text{ kW}$$

As the installed thermal power P' **30 kW** is greater than the thermal power that can be transmitted P_{t1} **20.2 kW**, the reduction gear needs a cooling system.
The thermal power to dissipate equals:

$$P_s = \frac{(P' - P_{t1}) \times C_{rt}}{860}$$

C_{rt} indicates the coefficient that correlates the thermal power P_t with the conformation of the reduction gear.
In **table 6** the C_{rt} of the reduction gear **RR1010** in a three-stage linear version equals **50**.

$$P_s = \frac{(30 - 20.2) \times 50}{860} = 0.57 \text{ kW}$$

In the hypothesis that we use a cooling system with oil recirculation, the capacity needed for dissipating the heat is given by the following relation:

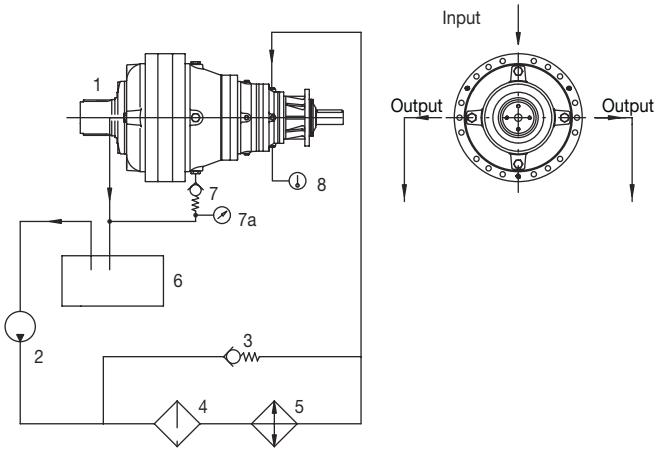
$$q = \frac{(P' - P_{t1}) \times C_{rt}}{(t_c - t_s)} \times 0.07$$

The difference of oil temperature in the heat exchanger is shown with **$(t_c - t_s)$**
In the hypothesis that the operating temperature t_c is **90°C** (oil entering the exchanger) and a temperature in output from the exchanger t_s is **65°C**, the capacity of oil needed for the exchanger will be:

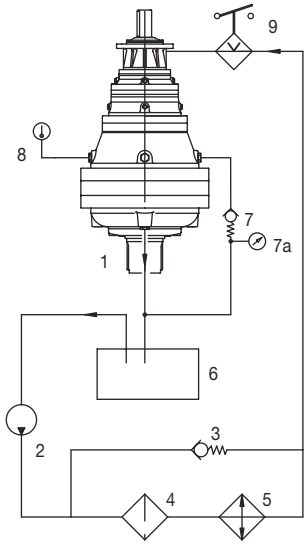
$$q = \frac{(30 - 20.2) \times 50}{(90 - 65)} \times 0.07 \cong 1.4 \text{ liters/min.}$$

Example of oil recirculation cooling system

HORIZONTAL VERSION



VERTICAL VERSION



1 - REDUCTION GEAR
2 - PUMP
3 - SAFETY VALVE
4 - FILTER
5 - HEAT EXCHANGER
6 - AUXILIARY TANK
7 - SAFETY VALVE
(Pmax=0.3-0.4 bar)
7a - (Possible control gauge)
8 - TEMPERATURE BULB
(Max. Temp. 90°C)
9 - FLOWMETER
(Recommended for
vertical mounting).

NOTES :

- suction of the motion output side of the reduction gear
- oil suction speed less than 1 m/s: take the diameter of the plugs into account
- We advise using 2 outputs for horizontal mounting

The reduction gears are supplied without lubricant, which has to be added by the user before start-up.
The purely indicative quantities of oil necessary for the various types of mounting are given on pages 18-19-20-21-22-23.
It is advisable to carefully check the level of the oil after filling.

- **In horizontal mounting,** the oil must reach halfway along the axis of the reduction gear.
- **In vertical mounting** (upwards or downwards), the reduction gear has to be filled completely making the air escape by loosening at least one plug in the higher part, as shown in the figures on page 8.

  The operation can be made easier by using the special tank kit.

  With this kit, which is supplied separately, all the parts of the reduction gear can be oil-bath lubricated during motion.

Use **tab. 5** to check the correct position of the plugs, in accordance with the type of mounting specified in the order request.

Correct lubrication leads to good operation and long life of the reduction gear.

We advise using oil for gearings with EP additive with viscosity ISO VG (expressed according to ISO 34488) depending on the operating temperature, as shown in **table 4.**

We advise lowering the viscosity of the oil, in concurrence with the high rotation speed and vertical mounting of the reduction gear.

For brakes in configuration RF 5/ - RF170 and RFF5/, we advise a hydraulic mineral oil ISO VG32, as given in the technical data sheets of the reduction gears.

The quantity of oil necessary for correct filling is shown according to the mounting position.

If there are large variations in the ambient temperature, we advise using synthetic lubricants, with EP additives, with a minimum viscosity index 165.

The maximum operating temperature, measured inside the reduction gear must not exceed 90°C.

Contamination

In addition to being provided without lubricant the reduction gears are not run in. During the first hours of operation the contact between the metallic surfaces causes diffusion of metallic particles in the oil. The contaminated oil reduces the life of the bearings and accentuates the wear of the gears. As indicated in chapter "13. MAINTENANCE" the first oil change must be made within the first 100 hours of operation. If an oil re-circulation plant is available, special filters will have to guarantee the integrity of the reduction gear, reducing the contaminated particles.

Reduction gears in the versions:

- **VI**
- **ZI**
- **SI** (where the greaser is present)

are without grease, and we recommend using lithium soap grease for bearings (mineral base oil).

Tab 4 LUBRICANTS FOR REDUCTION GEARS

MINERAL

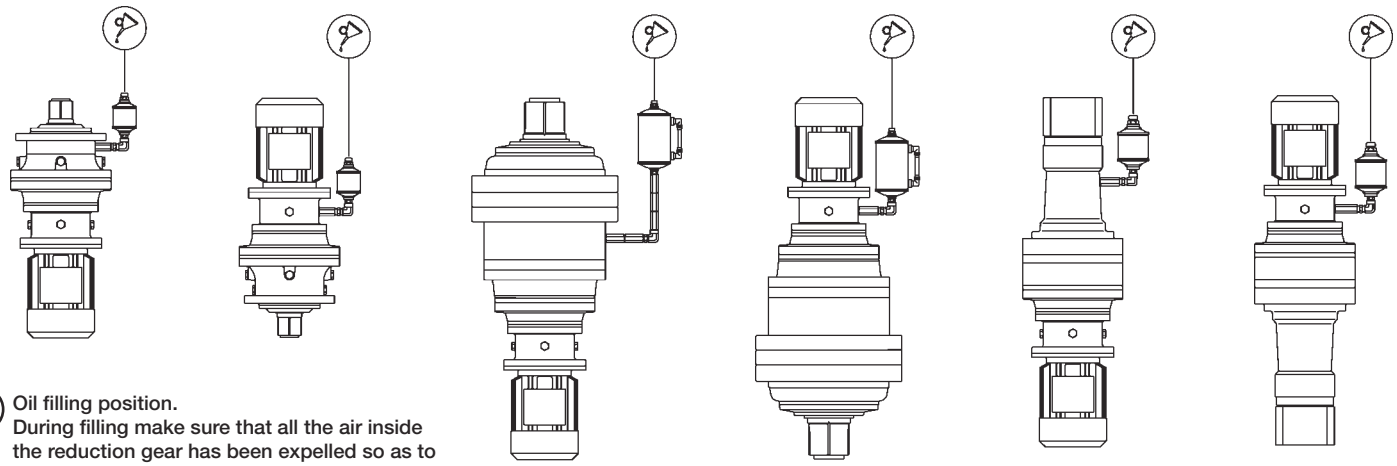
AMBIENT TEMPERATURE		-20°C ÷ +5°C	+5°C ÷ +40°C	+30°C ÷ +65°C	+40°C ÷ +65°C
VISCOSITY	ISO VG	100	150	220	320
	°E/50°C	7,3	10,8 ÷ 12,5	15 ÷ 18	22 ÷ 26
AGIP - IP		MELLANA - BLASIA 100	MELLANA - BLASIA 150	MELLANA - BLASIA 220	MELLANA - BLASIA 320
BP-MACH		ENERGOL GR-HP100	ENERGOL GR-HP150	ENERGOL GR-HP220	ENERGOL GR-HP320
CASTROL		ALPHA SP 100	ALPHA SP 150	ALPHA SP 220	ALPHA SP 320
CHEVRON		NL GEAR COMPOUND 100	NL GEAR COMPOUND 150	NL GEAR COMPOUND 220	NL GEAR COMPOUND 320
ELF		REDUCTELF SP 100	REDUCTELF SP 150	REDUCTELF SP 220	REDUCTELF SP 320
ESSO		SPARTAN EP 100	SPARTAN EP 150	SPARTAN EP 220	SPARTAN EP 320
FINA		GIRAN 100	GIRAN 150	GIRAN 220	GIRAN 320
IP		MELLANA 100	MELLANA 150	MELLANA 220	MELLANA 320
MOBIL		—	MOBILGEAR 629	MOBILGEAR 630	MOBILGEAR 632
SHELL		OMALA EP 100	OMALA EP 150	OMALA EP 220	OMALA EP 320
TOTAL		CARTER EP 100	CARTER EP 150	CARTER EP 220	CARTER EP 320
KLUBER		KLUBER OIL GEM 1-100	KLUBER OIL GEM 1-150	KLUBER OIL GEM 1-220	KLUBER OIL GEM 1-320

SYNTHETIC

	0°C ÷ +20°C	+20°C ÷ +40°C
SHELL	TIVELA S150	TIVELA S220
AGIP	BLASIA S150	BLASIA S220
ESSO	GLYCOLUBE 150	GLYCOLUBE 220
IP	PONTIAX HDS	PONTIAX HDS
KLUBER	SYNTHESO D150 EP	SYNTHESO D220 EP
MOBIL	SHC 629	SHC 630
BP-MACH		ERNESYN HTX 220

N.B.: Do not mix synthetic oils of a different nature.

Assembly representation of the complete Kit



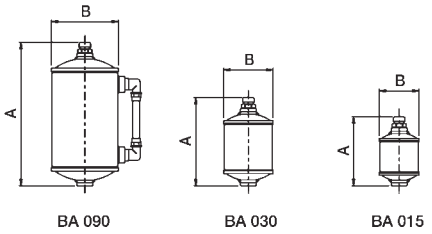
Oil filling position.
During filling make sure that all the air inside the reduction gear has been expelled so as to guarantee correct lubrication.

Code of the complet kit

Code of the tank

Assembly representation of the complete Kit

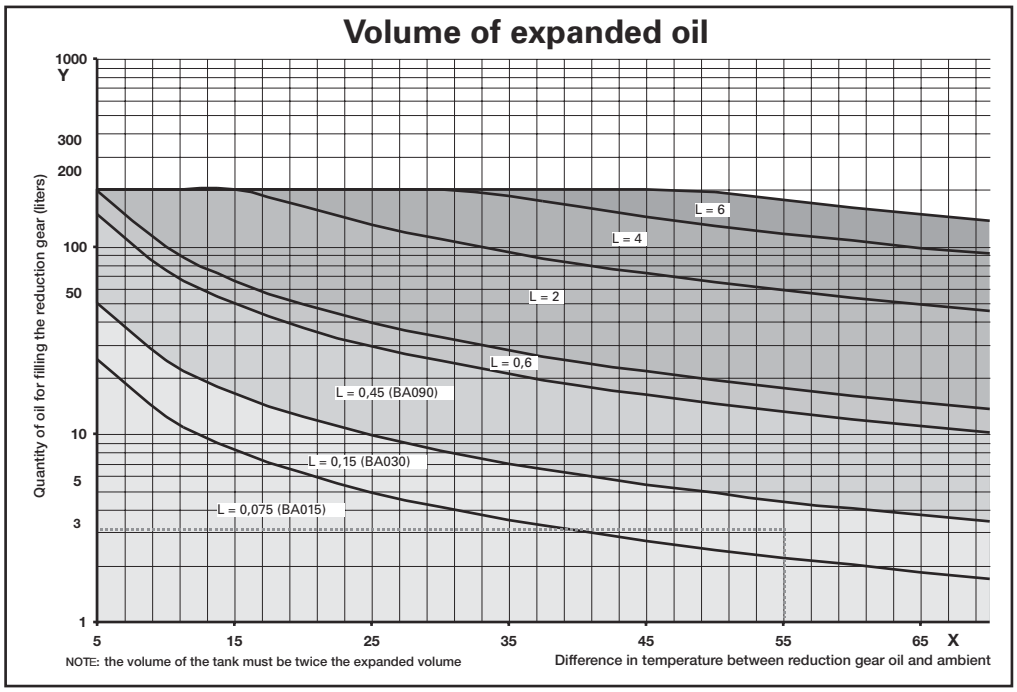
TYPE	A	B	Oil capacity lt.	Code of the complete kit	Code of the tank
BA 015	110	Ø 65	~ 0,15	154 - 5764	154F1562
BA 030	140	Ø 80	~ 0,30	154 - 5749	154F1563
BA 090	225	Ø 104	~ 0,90	154 - 5733	154F1561



BA 090 BA 030 BA 015

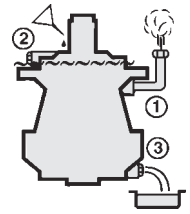
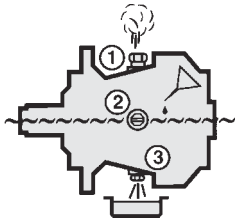
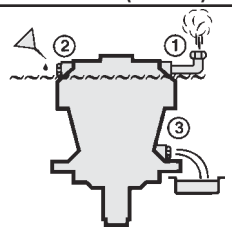
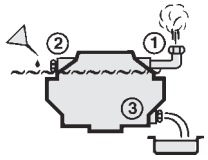
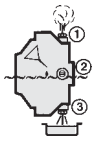
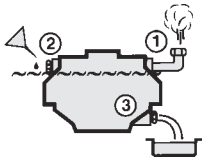
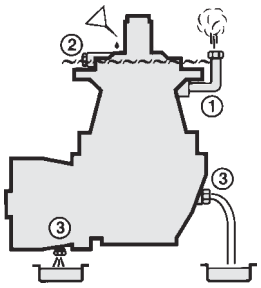
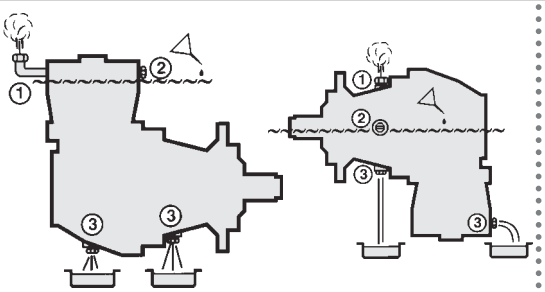
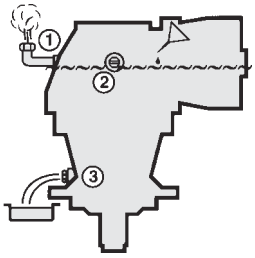
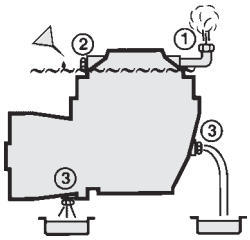
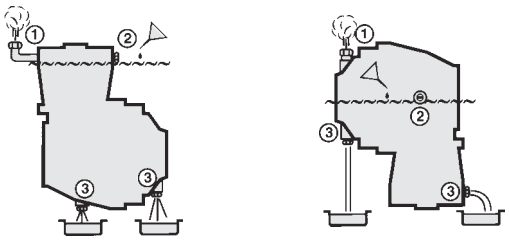
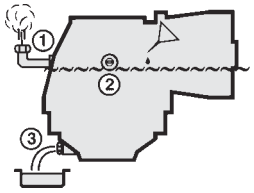
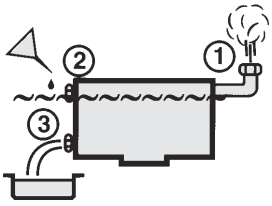
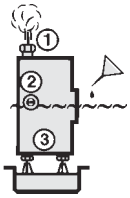
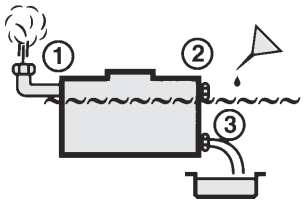
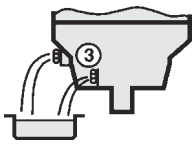
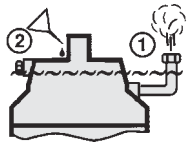
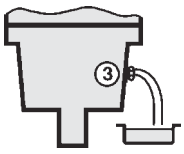
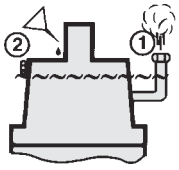
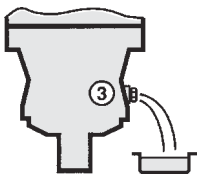
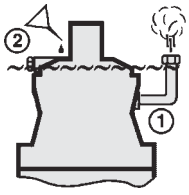
SELECTING THE OIL TANK

The following example explains how to use **graph 1**, by the means of which the volume of the expanded oil and the relative tank are determined.



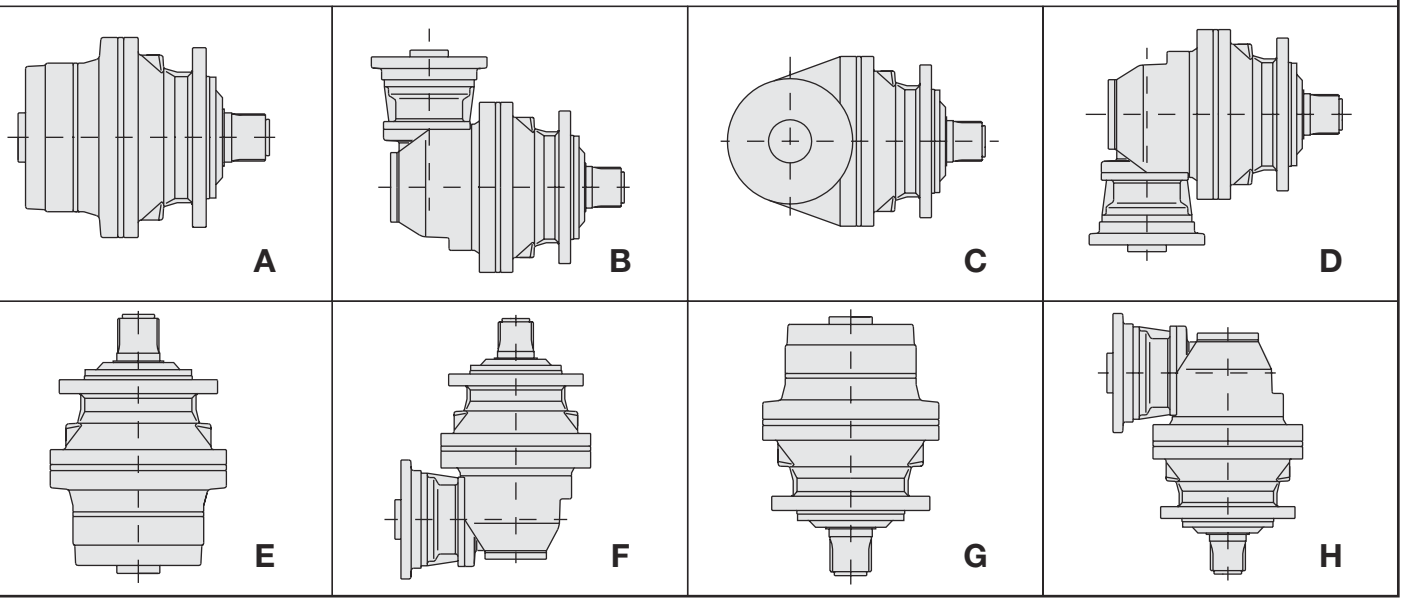
Graph 1

Example: A reduction gear with oil capacity of **3** liters at the operating temperature of 80°C and at the ambient temperature of 25°C. On the graph crossing over the value of (80-25=) **55**°C of the X-axis with the value **3** of the Y-axis find a point belonging to the area with expanded volume 0.15 liters. The tank recommended must have double the volume of that found: 0.15x2=0.3 from which **BA030.**

Tab 5	PLUG POSITION		
TYPE	VERTICAL (upw.)	HORIZONTAL	VERTICAL (downw.)
RR			
RR-F			
RA			
RA-F			
BRAKE TYPE RF			
INPUT TYPE L			
INPUT TYPE M			
INPUT TYPE P			

① AIR BLEEDING PLUG ② LEVEL PLUG ③ DRAIN PLUG

MALE VERSION REDUCTION GEARS from 65 to 510



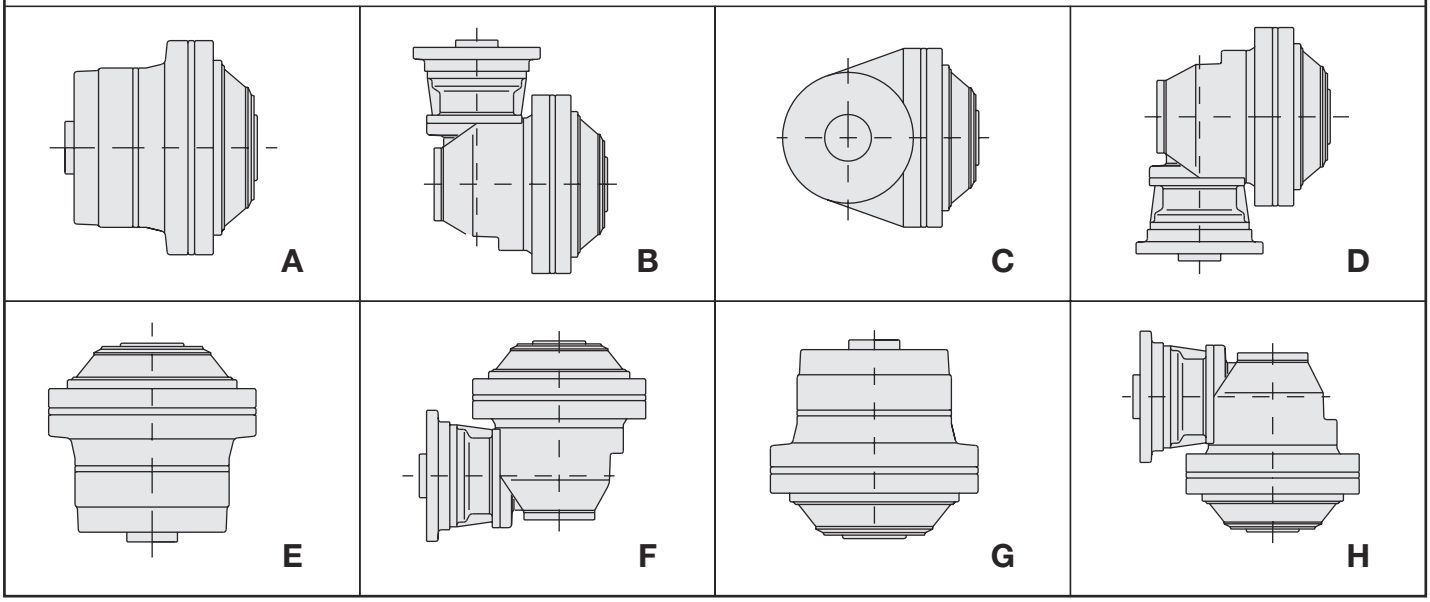
TYPE	OIL QUANTITY l. POSITION A	E	G	MASS Kg
RR 65 M...	0,21	0,35	0,35	7
RR 65D M...	0,26	0,44	0,44	10
RR 65T M...	–	–	–	12
RR 105 M...	0,5	1	1	14
RR 105D M...	0,7	1,5	1,5	20
RR 105T M...	0,5	1,5	1,5	21
RR 110 M...	0,5	1	1	11
RR 110D M...	0,7	1,5	1,5	15
RR 110T M...	0,9	2	2	18
RR 210 M...	0,6	1,2	1,3	24
RR 210D M...	0,7	1,7	1,7	25
RR 210T M...	1	2,2	2,2	27
RR 210Q M...	–	–	–	28
RR 210 S...	0,8	1,4	1,4	23
RR 210D S...	1,1	1,9	1,9	28
RR 210T S...	1,2	2,4	2,4	32
RR 310 M...	1,2	1,9	1,9	21
RR 310D M...	1,4	2,6	2,6	36
RR 310T M...	1,5	2,7	2,6	38
RR 310Q M...	4,0	–	–	41
RR 310 S...	1,2	2,2	2,2	43
RR 310D S...	1,7	3,2	3,5	47
RR 310T S...	2,3	4,4	4,4	49
RR 310Q S...	–	–	–	53
RR 510 M...	1,1	2,0	1,8	35
RR 510D M...	1,8	3,1	3,1	52
RR 510T M...	2,1	3,8	3,8	55
RR 510Q M...	–	–	–	59
RR 510 S...	1,2	2,2	2,2	44
RR 510D S...	2	3,7	3,7	60
RR 510T S...	2,3	4,4	4,4	61
RR 510Q S...	–	–	–	–

TYPE	OIL QUANTITY l. POSITION B	C	D	F	H	MASS Kg
RA 105 M...	2,1	0,85	0,95	2,1	1,1	33
RA 105D M...	–	–	–	–	–	37
RA 110 M...	2,1	0,85	0,95	2,1	1,1	33
RA 110D M...	–	–	–	–	–	–
RA 210 M...	2,3	1	1,2	2,2	2	35
RA 210D M...	–	–	–	–	–	22
RA 210T M...	–	–	–	–	–	43
RA 210 S...	2,6	1,3	1,4	2,5	2,2	38
RA 210D S...	–	–	–	–	–	33
RA 310 M...	3,6	1,6	1,7	3,6	1,9	46,5
RA 310D M...	4	1,8	1,9	4	2,1	52
RA 310T M...	–	–	–	–	–	56
RA 310 S...	4,8	2,2	2,3	4,8	2,5	57,6
RA 310D S...	5,2	2,4	2,5	5,2	2,7	61
RA 310T S...	–	–	–	–	–	–
RA 510 M...	4,5	1,9	2,1	4,5	2,5	81
RA 510D M...	4,8	2,2	2,3	4,8	2,6	67
RA 510T M...	5,4	2,5	2,6	5,4	2,9	67
RA 510 S...	4,9	2,1	2,3	4,9	2,7	92
RA 510D S...	5,2	2,4	2,5	5,2	2,8	77
RA 510T S...	5,8	2,7	2,8	5,8	3	78

* Oil quantity changes according to the type of motor flange

Address Reggiana Riduttori commercial network for further technical data.

FEMALE VERSION REDUCTION GEARS from 65 to 510



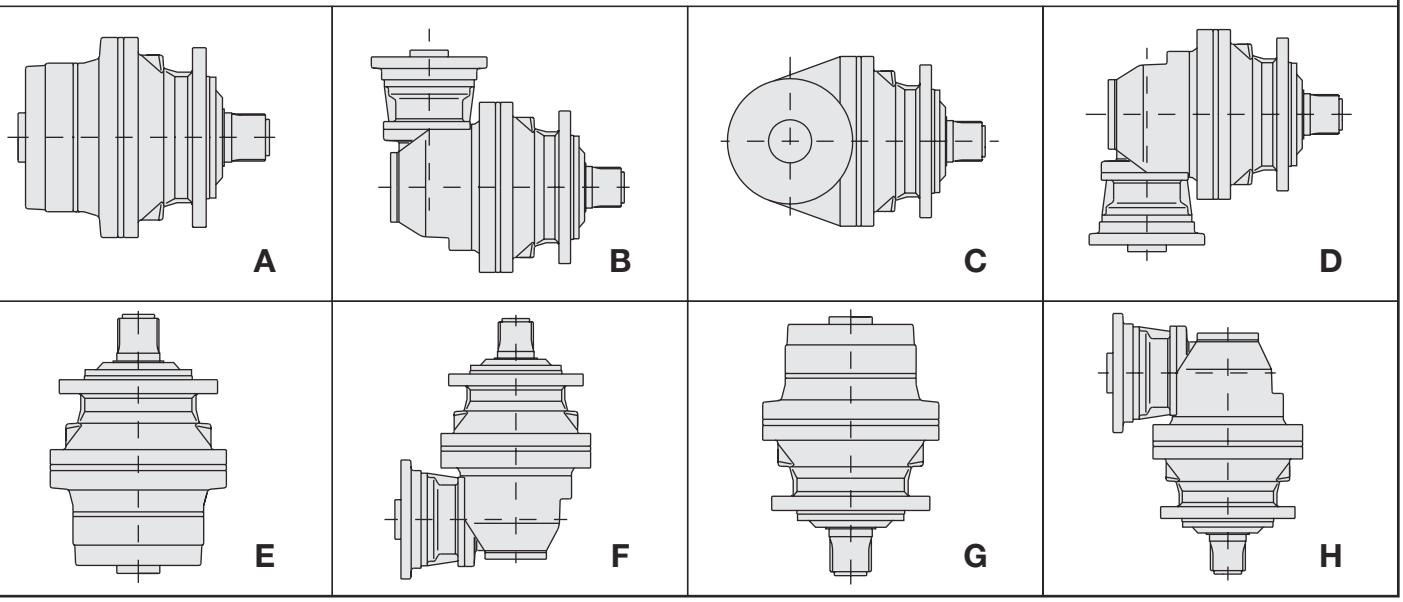
TYPE	OIL QUANTITY l. POSITION A	E	G	MASS Kg
RR 65 FS	0,2	0,3	0,3	3,5
RR 65D FS	0,28	0,4	0,4	5,5
RR 65T FS	–	–	–	6,8
RR 105 FS	0,55	1,1	1,1	8
RR 105D FS	0,8	1,6	1,6	9
RR 105T FS	1	2,1	2,1	14
RR 110 FS	0,55	1,1	1,1	7,5
RR 110D FS	0,8	1,6	1,6	9
RR 110T FS	1	2,1	2,1	15
RR 210 FS	0,7	1,2	1,2	9
RR 210D FS	0,9	1,7	1,7	14
RR 210T FS	1	2,2	2,2	22
RR 210Q FS	–	–	–	–
RR 310 FS	0,9	1,7	1,5	20
RR 310D FS	1,2	2,1	2,1	23
RR 310T FS	1,5	2,7	2,7	26,5
RR 310Q FS	–	–	–	–
RR 510 FS	0,9	1,3	1,3	28
RR 510D FS	1,6	2,9	2,9	39
RR 510T FS	1,9	3,6	3,6	28,5
RR 510Q FS	–	–	–	49

TYPE	OIL QUANTITY l. POSITION B	C	D	F	H	MASS Kg
RA 105 FS	1,8	1,0	1,1	1,7	1,1	30
RA 105D FS	2,0	1,2	1,4	2,2	2,0	32
RA 110 FS	2,2	0,9	1	2,2	1,2	31
RA 110D FS	–	–	–	–	–	–
RA 210 FS	2,3	1	1,2	2,2	2	33
RA 210D FS	–	–	–	–	–	34
RA 310 FS	2,4	1,4	1,5	2,6	2,1	40
RA 310D FS	3,4	1,5	1,6	3,4	1,8	42,5
RA 310T FS	4	1,8	1,9	4	2,1	45
RA 510 FS	4,1	2,8	1,9	4,1	2,3	70
RA 510D FS	4,4	2	2,1	4,4	2,3	58
RA 510T FS	5	1,7	2,4	5	2,6	57

* Oil quantity changes according to the type of motor flange

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MALE VERSION REDUCTION GEARS from 710 to 1700B



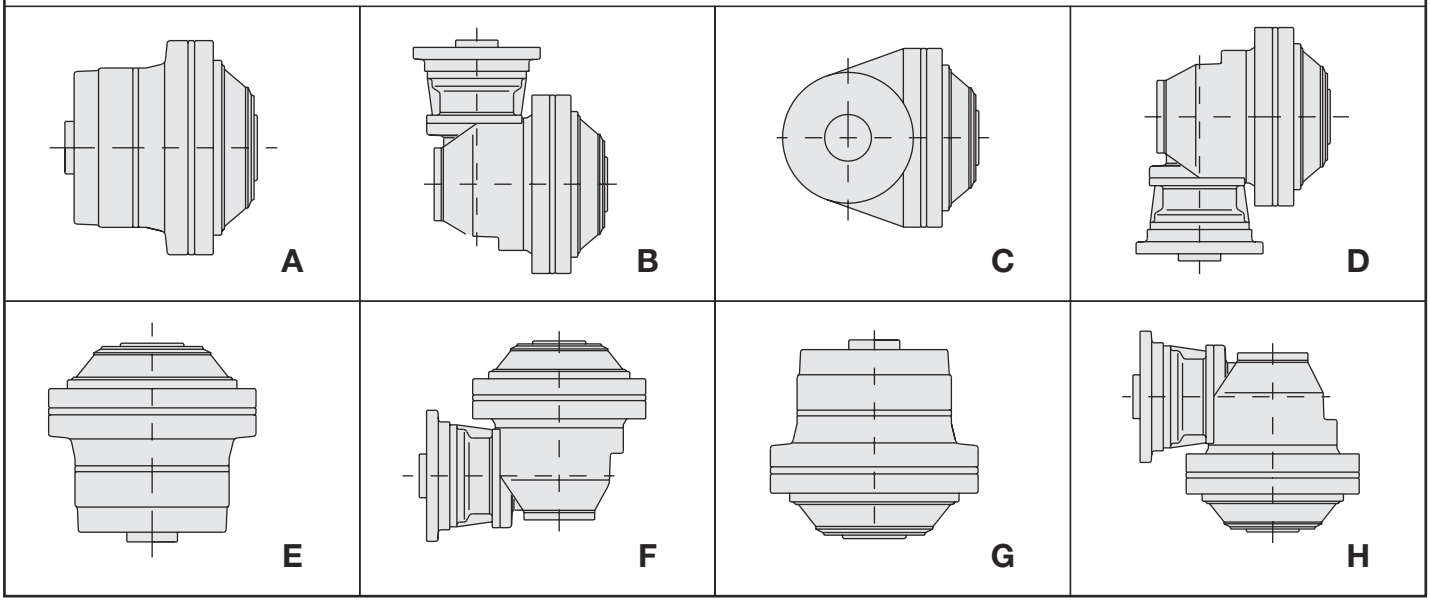
TYPE	OIL QUANTITY l. POSITION A	E	G	MASS Kg
RR 710 M...	1,1	1,6	1,6	34
RR 710D M...	1,8	3,1	3,1	54
RR 710T M	2,1	3,8	3,8	56
RR 710Q M...	5,0	–	–	57
RR 710 S...	1,2	2,2	2,2	50
RR 710D S...	2	3,7	3,7	60
RR 710T S...	2,3	4,4	4,4	67
RR 710Q S...	–	–	–	75
RR 810 M...	* 1,8	* 3,2	* 3,2	64
RR 810D M...	2,6	4,8	4,8	77
RR 810T M...	2,9	5,4	5,4	83
RR 810Q M...	–	–	–	87
RR 810 S...	* 2	* 3,9	* 3,9	70
RR 810D S...	2,8	5,4	5,4	81
RR 810T S...	3,1	6	6	86
RR 810Q S...	–	–	–	94
RR 1010 M...	* 2,5	* 4,5	* 4,5	82
RR 1010D M...	3,2	6,0	6,5	100
RR 1010T M...	3,8	7,1	7,1	121
RR 1010Q M...	–	–	–	–
RR 1700 B...	* 3,2	* 6,8	* 6,8	112
RR 1700D B...	3,8/–	8/–	8/–	136/–
RR 1700T B...	5,5	9,7	9,7	147
RR 1700Q B...	–	–	–	–

TYPE	OIL QUANTITY l. POSITION B	C	D	F	H	MASS Kg
RA 710 M...	4,5	1,9	2,1	4,5	2,5	74
RA 710D M...	4,8	2,2	2,3	4,8	2,6	77
RA 710T M...	5,4	2,5	2,6	5,4	2,9	78
RA 710 S...	4,9	2,1	2,3	4,9	2,7	92
RA 710D S...	5,2	2,4	2,5	5,2	2,8	73
RA 710T S...	5,8	2,7	2,8	5,8	3	85
RA 810 M...	8,0	4,0	4,5	8,5	6,0	111
RA 810D M...	8,5	4,5	5	9	6,5	114
RA 810T M...	7,1	3,2	3,4	7,1	3,6	97
RA 810 S...	6,6	2,8	3	6,6	3,4	117
RA 810D S...	7	3,1	3,3	7	3,5	98
RA 810T S...	7,5	3,4	3,8	7,5	3,7	103
RA 1010 M...	8,0	3,5	4,5	7,0	6,8	124
RA 1010D M...	9,8	5,5	6,0	10,0	8,5	143
RA 1010T M...	8,8	4,2	4,3	8,8	8,9	148
RA 1700 B...	17,5/	8,5/	10/	17,5/	14/	227/
RA 1700D B...	10,3	4,8	5	10,3	5,8	179
RA 1700T B...	12,2	7,5	9	13,5	13,5	155

* Oil quantity changes according to the type of motor flange

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FEMALE VERSION REDUCTION GEARS from 710 to 6300



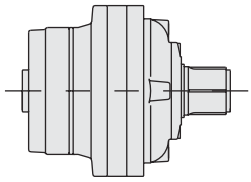
TYPE	OIL QUANTITY l. POSITION A	E	G	MASS Kg
RR 710 FS	0,9	1,3	1,3	27
RR 710D FS	1,6	2,9	2,9	25,5
RR 710T FS	1,9	3,6	3,6	28,5
RR 710Q FS	–	–	–	–
RR 810 FS	* 1,7	* 2,7	* 2,2	41
RR 810D FS	2,2	4	4	61
RR 810T FS	2,7	5	5	63
RR 810Q FS	–	–	–	66
RR 1010 FS	* 2,1	* 3,7	* 3,7	53
RR 1010D FS	2,6	4,7	4,7	77
RR 1010T FS	3,3	6,1	6,1	99
RR 1010Q FS	–	–	–	102
RR 1700 FS	* 2,4	* 5	* 5	70
RR 1700D FS	2,9	5,9	5,7	89
RR 1700T FS	3,5	7,1	6,8	105
RR 1700Q FS	–	–	–	106
RR 2700 FS	* 3,8	* 7,2	* 7,2	112
RR 2700D FS	4,6	8,8	8,8	118
RR 2700T FS	5,4	10,2	10,2	137
RR 2700Q FS	–	–	–	158
RR 3500 FS	4,4	8,2	8,2	120
RR 3500D FS	5,4	10,2	10,2	185
RR 3500T FS	6	11,4	11,4	175
RR 3500Q FS	–	–	–	–
RR 5000 FS	* 5,2	* 9,6	* 9,6	230
RR 5000D FS	* 8	14,2	14,2	270
RR 5000T FS	10	17,7	17,7	288
RR 5000Q FS	–	–	–	–
RR 6300 FS	* 5	* 9,2	* 9,2	240
RR 6300D FS	* 7,8	* 13,8	* 13,8	280
RR 6300T FS	9,8	17,2	17,2	340
RR 6300Q FS	–	–	–	–

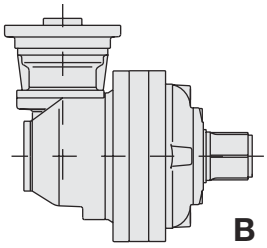
TYPE	OIL QUANTITY l. POSITION B	C	D	F	H	MASS Kg
RA 710 FS	4,1	2,3	1,9	4,1	2,3	72
RA 710D FS	4,4	2	2,1	4,4	2,3	52
RA 710T FS	5	2,3	2,4	5	2,6	57
RA 810 FS	5,8	2,4	2,6	5,8	3	82
RA 810D FS	6,1	2,7	2,9	6,1	3,1	57
RA 810T FS	6,7	3	3,2	6,7	3,6	67
RA 1010 FS	6,9	3,1	3,3	6,9	3,6	90
RA 1010D FS	7,9	3,6	3,8	7,9	4,2	109
RA 1010T FS	7,8	3,7	3,8	7,8	4	94
RA 1700 FS	8,1	3,7	3,9	8,1	4,2	100
RA 1700D FS	8,7	4	4,2	8,7	4,5	119
RA 1700T FS	10,4	5	5,1	10,4	5,3	104
RA 2700 FS	16,9	7,9	8,2	16,9	8,7	212
RA 2700D FS	12,9	6,1	6,3	12,9	6,7	164
RA 2700T FS	13,5	6,5	6,6	13,5	6,9	175
RA 3500 FS	18,3	8,6	8,9	18,3	9,4	230
RA 3500D FS	14,1	6,7	6,9	14,1	7,3	200
RA 3500T FS	14,7	7	7,2	14,7	7,9	218
RA 5000 FS	20	9,4	9,7	20	10,3	330
RA 5000D FS	19,3	9,3	9,5	19,3	9,8	313
RA 5000T FS	23,1	11,2	11,4	23,1	11,7	320
RA 6300D FS	19,4	9,2	9,3	9,2	9,5	323
RA 6300T FS	23,1	11	11	11	11,2	341

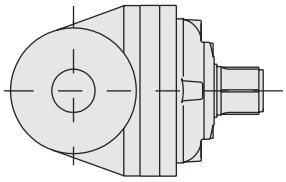
* Oil quantity changes according to the type of motor flange

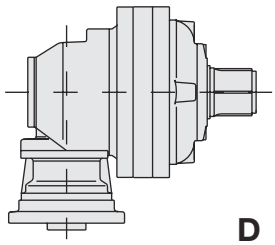
Address Reggiana Riduttori commercial network for further technical data.

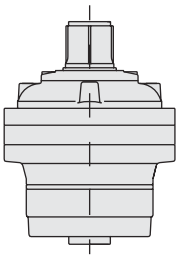
MALE VERSION REDUCTION GEARS from 1700 to 32000

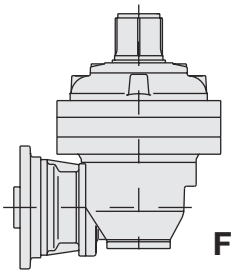

A

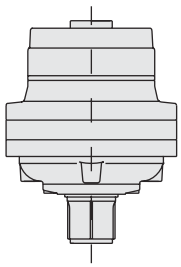

B

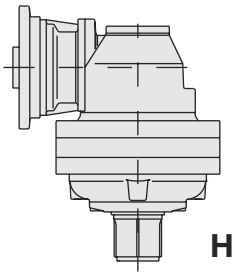

C


D


E


F


G


H

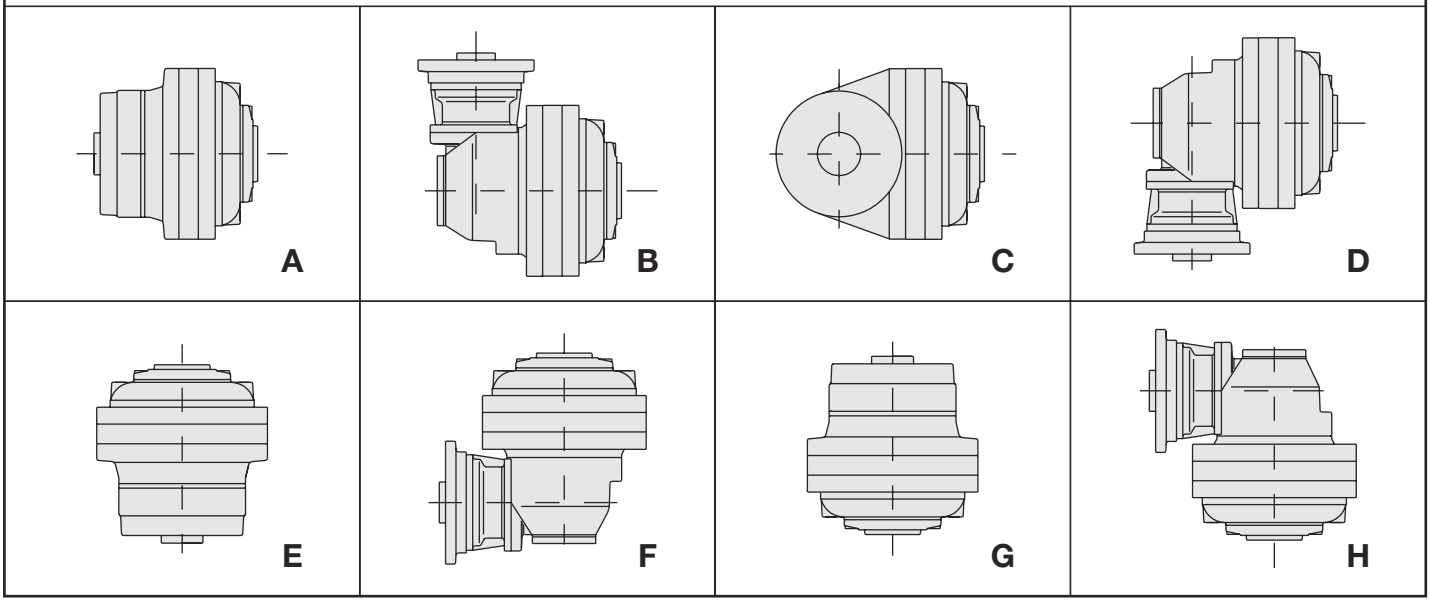
TYPE	OIL QUANTITY l. POSITION A	E	G	MASS Kg
RR 1700 M...	3,2	6,8	6,8	117
RR 1700D M...	3,8	8	8	112
RR 1700T M...	5,5	9,7	9,7	130
RR 1700Q M...	–	–	–	–
RR 2700 M...	* 3,6	* 6,8	* 6,8	126
RR 2700D M...	5,5	9,8	8,0	155
RR 2700T M...	5,2	9,8	9,8	175
RR 2700Q M...	–	–	–	–
RR 3500 M...	* 4,2	* 7,8	* 7,8	148
RR 3500D M...	* 5,2	* 9,8	* 9,8	185
RR 3500T M...	* 5,8	* 11	11	230
RR 3500Q M...	–	–	–	233
RR 5000 M...	* 5	* 9,2	* 9,2	175
RR 5000D M...	* 7,8	* 13,88	* 13,88	315
RR 5000T M...	9,8	17,2	17,2	290
RR 5000Q M...	11,0	20,0		320
RR 6300 M...	* 4,8	* 9	* 9	270
RR 6300D M...	* 7,6	13,6	13,6	325
RR 6300T M...	9,6	17	17	343
RR 6300Q M...	–	–	–	370
RR 8000 M...	* 18,2	* 21,8	* 21,8	606
RR 8000D M...	* 19,2	* 23,8	* 23,8	702
RR 8000T M...	* 19,8	* 25	* 25	739
RR 8000Q M...	–	–	–	–
RR 12500 M...	* 21,2	* 24,8	* 24,8	1014
RR 12500D M...	* 22,2	* 26,8	* 26,8	1216
RR 12500T M...	* 22,8	* 28	* 28	1267
RR 12500Q M...	24,0		50,0	1100
RR 16000 M...	* 21,2	* 24,8	* 24,8	1090
RR 16000D M...	* 23,5	* 28	* 28	1298
RR 16000T M...	* 24	* 30	* 30	1317
RR 16000Q M...	–	–	–	–
RR 22000 M...	* 32,3	* 37,5	* 37,5	1630
RR 22000D M...	* 34,6	* 40,1	* 40,1	1750
RR 22000T M...	* 35,2	* 43,3	* 43,3	1867
RR 22000Q M...	–	–	–	–
RR 32000 M...	* 32	* 37	* 37	1750
RR 32000D M...	* 34,3	* 40,5	* 40,5	1820
RR 32000T M...	* 34,9	* 42,8	* 42,8	2010
RR 32000Q M...	–	–	–	–

TYPE	OIL QUANTITY l. POSITION B	C	D	F	H	MASS Kg
RA 1700 M...	9,7	4,5	4,7	9,7	5,1	160
RA 1700D M...	10,3	4,8	5	10,3	5,8	179
RA 1700T M...	12,5	7,5	9,0	13,5	13,5	157
RA 2700 M...	16,5	7,7	8	16,5	8,5	236
RA 2700D M...	12,5	5,9	6,1	12,5	6,5	200
RA 2700T M...	13	6,2	6,4	13	6,7	173
RA 3500 M...	17,9	8,4	8,7	17,9	9,2	155
RA 3500D M...	13,7	6,5	6,7	13,7	7	228
RA 3500T M...	14,3	6,8	7	14,3	7,4	246
RA 5000 M...	19,5	9,2	9,5	19,5	10	285
RA 5000D M...	19	9,1	9,3	19	8,7	358
RA 5000T M...	22,7	11	1,2	22,7	11,6	376
RA 6300D M...	18,8	9	9,1	18,8	9,3	368
RA 6300T M...	22,5	11	10,8	22,5	11	386
RA 8000D M...	39	21	25	39	32	780
RA 8000T M...	35,3	16,9	22	35,3	22,2	786
RA 12500D M...	36,7	17,4	26,2	36,7	26,4	1326
RA 12500T M...	39,9	19	24,3	39,9	24,5	1314
RA 16000T M...	41	21	26	41	25,5	1370
RA 16000Q M...	43	23,5	27	42,3	26,3	1411
RA 22000T M...	50,3	23,9	39,7	50,3	39,9	1917
RA 22000Q M...	51,5	25	41	51,5	41,3	1972
RA 32000T M...	49,1	23,4	39,4	49,1	39,6	2060
RA 32000Q M...	51	26	40,7	51,3	41	2115

* Oil quantity changes according to the type of motor flange

Address Reggiana Riduttori commercial network for further technical data.

FEMALE VERSION REDUCTION GEARS from 8000 to 50000



TYPE	OIL QUANTITY l. POSITION A	E	G	MASS Kg
RR 8000 FS	* 18,8	* 22,2	* 22,2	549
RR 8000D FS	* 19,4	* 24,2	* 24,2	645
RR 8000T FS	* 20	* 25,4	* 25,4	682
RR 8000Q FS	–	–	–	–
RR 12500 FS	* 21,4	* 25,2	* 25,2	935
RR 12500D FS	* 22,4	* 27,2	* 27,2	1137
RR 12500T FS	* 23	* 28,4	* 28,4	1015
RR 12500Q FS	45,0	–	75,0	1100
RR 16000 FS	* 21,4	* 25,2	* 25,2	1011
RR 16000D FS	* 24,5	* 30	* 30	1350
RR 16000T FS	* 24,7	* 31,2	* 31,2	1240
RR 16000Q FS	–	–	–	–
RR 22000 FS	* 32,5	* 37,9	* 37,9	1540
RR 22000D FS	* 34,8	* 40,5	* 40,5	1660
RR 22000T FS	* 35,4	* 43,8	108,0	1777
RR 22000Q FS	65	–	115,0	2063
RR 32000 FS	* 32,2	* 37,4	* 37,4	1660
RR 32000D FS	* 34,5	* 40,9	* 40,9	1730
RR 32000T FS	* 35	* 43,2	* 43,2	1920
RR 32000Q FS	65,0	115,0	115,0	2063
RR 40000 FS	–	–	–	2280
RR 40000D FS	–	–	–	3280
RR 40000T FS	–	–	–	3630
RR 40000Q FS	95	165,0	165,0	4095
RR 50000 FS	–	–	–	2500
RR 50000D FS	–	–	–	3500
RR 50000T FS	–	–	–	3850
RR 50000Q FS	–	–	–	–

TYPE	OIL QUANTITY l. POSITION B	C	D	F	H	MASS Kg
RA 8000D FS	32,8	15,7	23,4	15,7	23,6	755
RA 8000T FS	50	17,2	22,2	17,2	22,4	729
RA 12500D FS	37,3	17,9	26,4	17,9	26,6	1247
RA 12500T FS	40,5	19,4	24,5	19,4	24,7	1235
RA 16000T FS	42	21,3	25,7	21	25,7	1340
RA 16000Q FS	43,2	22,5	27	22,3	28	1345
RA 22000T FS	51	24,4	39,9	24,4	40,1	1827
RA 22000Q FS	52,3	25,7	41,2	25,7	41,7	1899
RA 32000T FS	49,7	23,7	39,6	23,7	39,8	1970
RA 32000Q FS	50	24	39,5	24,3	40	2040
RA 40000T FS	–	–	–	–	–	3740
RA 40000Q FS	–	–	–	–	–	3770
RA 50000T FS	–	–	–	–	–	3960
RA 50000Q FS	–	–	–	–	–	3987

* Oil quantity changes according to the type of motor flange

Address Reggiana Riduttori commercial network for further technical data.

9. MOUNTING THE REDUCTION GEAR

During the installation phase make sure that the housings and the splining are carried out correctly and that the reduction gear is mounted correctly.
Note: We advise using screws in class 10.9 or 12.9, where the application is submitted to heavy knocks, frequent stops, start-ups, inversions or when 70% of the maximum torque allowed is exceeded.
(Reference table of preloading and tightening moment for screws with ISO coarse thread – page 24)

It is very important to prevent the support flanges of the reduction gears from being powered during the mounting phase, and to do this make sure that the counter-flange for fastening adheres perfectly to the reduction gear flange.
Check both in the male and the female versions that the alignment between the reduction gear shaft and the splined countershaft is correct (sleeve, joint, splined shaft, etc.), so that the splined profiles do not deteriorate (Fig.1).

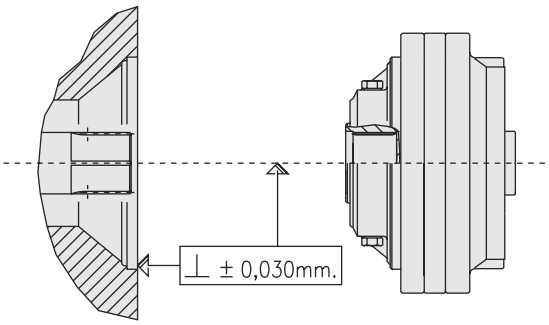


Fig. 1

When mounting the female reduction gears place the splined shaft in coupling with the reduction gear with tolerance (**e9**). In addition it is important to provide holes to house the pins. The overhang advised from the support surface is shown in Fig. 2a, 2b.
Before mounting, the oil plugs, exhausts, curves, etc., have to be provided, taking into account the mounting position of the reduction gear.
The tightening of the screws has to be controlled after 50 hours of operation.

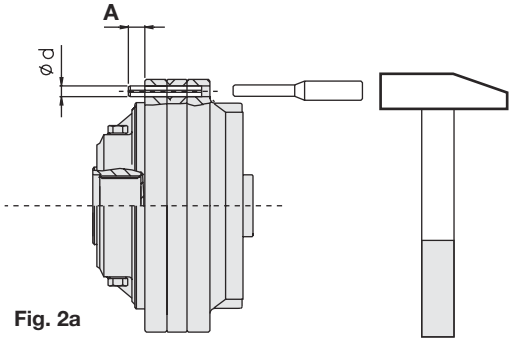


Fig. 2a

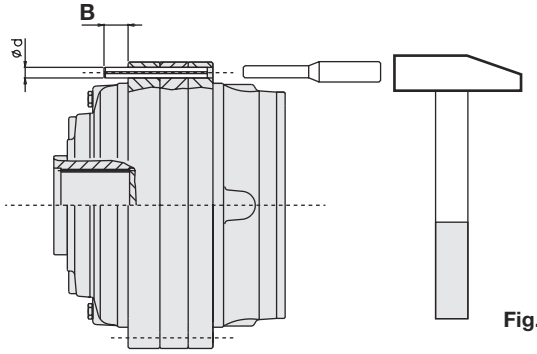


Fig. 2b

TYPE	Ød	A
RR 310 FS **RR 310D FS** **RR 310T FS** **RR 310Q FS**	10	14
RR 510 FS **RR 510D FS** **RR 510T FS** **RR 510Q FS**	10	14
RR 710 FS **RR 710D FS** **RR 710T FS** **RR 710Q FS**	10	14
RR 810 FS **RR 810D FS** **RR 810T FS** **RR 810Q FS**	12	14
RR 1010 FS **RR 1010D FS** **RR 1010T FS** **RR 1010Q FS**	12	13
RR 1700 FS **RR 1700D FS** **RR 1700T FS** **RR 1700Q FS**	12	13

TYPE	Ød	B
RR 2700 M... **RR 2700 FS** **RR 2700D M...** **RR 2700D FS** **RR 2700T M...** **RR 2700T FS** **RR 2700Q M...** **RR 2700Q FS**	14	25
RR 3500 M... **RR 3500 FS** **RR 3500D M...** **RR 3500D FS** **RR 3500T M...** **RR 3500T FS** **RR 3500Q M...** **RR 3500Q FS**	14	18
RR 5000 M... **RR 5000 FS** **RR 5000D M...** **RR 5000D FS** **RR 5000T M...** **RR 5000T FS** **RR 5000Q M...** **RR 5000Q FS**	16	22
RR 6300 M... **RR 6300 FS** **RR 6300D M...** **RR 6300D FS** **RR 6300T M...** **RR 6300T FS** **RR 6300Q M...** **RR 6300Q FS**	16	22

TYPE	Ød	B
RR 8000 M... **RR 8000 FS** **RR 8000D M...** **RR 8000D FS** **RR 8000T M...** **RR 8000T FS** **RR 8000Q M...** **RR 8000Q FS**	20	10
RR 12500 M... **RR 12500 FS** **RR 12500D M...** **RR 12500D FS** **RR 12500T M...** **RR 12500T FS** **RR 12500Q M...** **RR 12500Q FS**	20	10
RR 16000 M... **RR 16000 FS** **RR 16000D M...** **RR 16000D FS** **RR 16000T M...** **RR 16000T FS** **RR 16000Q M...** **RR 16000Q FS**	20	10

- Before starting up the machine the first time check that all the levels are correct.
- Check that, on the reduction gears that have disk brake mounted, the operating pressure of the hydraulic circuit is sufficient to completely open the disk brake to prevent the brake disks from over-heating and consuming too rapidly.
- In consideration of the type of brake, the operating pressure must not go below the minimum opening pressure of the brake so as to avoid the braking action.
- Check that all the screws with ISO metric threading are correctly tightened (see table “Torque wrench settings”)

PRELOAD AND TIGHTENING MOMENT TABLE FOR SCREWS WITH ISO COARSE THREAD

The preload has been calculated at 70% of the minimum yield strength and giving the average value of 0.14 to the friction coefficient.

Screw dimension	Max. preload V (Kg)			Max. tightening moment Ma (daNm)		
	8.8 8 G	**10.9 10 K**	**19.9 12 K**	**8.8 8 G**	**10.9 10 K**	**19.9 12 K**
M 4x0.7	394	554	665	0.31	0.43	0.52
M 5x0.8	635	895	1070	0.60	0.84	1.01
M 6x1	902	1270	1520	1.03	1.46	1.75
M 7x1	1300	1280	2180	1.69	2.36	2.83
M 8x1.25	1640	2310	2770	2.48	3.49	4.19
M 9x1.25	2160	3050	3630	3.67	5.18	6.17
M 10x1.5	2600	3660	4380	4.97	7.00	8.37
M 12x1.75	3780	5320	6380	8.46	11.90	14.30
M 14x2	5160	7250	8700	13.46	18.92	22.70
M16x2	7020	9900	11900	20.40	28.80	34.60
M 18x2.5	8600	12100	14500	28.40	40.00	48.00
M20x2.5	11000	15540	18500	39.60	55.60	66.60
M 22x2.5	13600	19100	22900	53.00	74.50	90.00
M 24x3	15900	22300	26700	70.00	98.00	117.00
M 27x3	20600	28900	34700	101.00	142.00	170.00
M 30x3.5	28000	39900	46700	150.00	213.00	250.00

11. SUPPLY CONDITIONS

The reduction gears are delivered in the following conditions:

- Ready for being installed in the mounting position as defined with the client.
- Without lubricating oil unless otherwise specified in the contract
- Painted with red synthetic anti-oxidation paint which can be painted over
- The coupling surfaces are not painted, and are covered with a film of protective oil.
- The final painting is at the discretion of the client.
- Tested
- Accurately packed

Packing

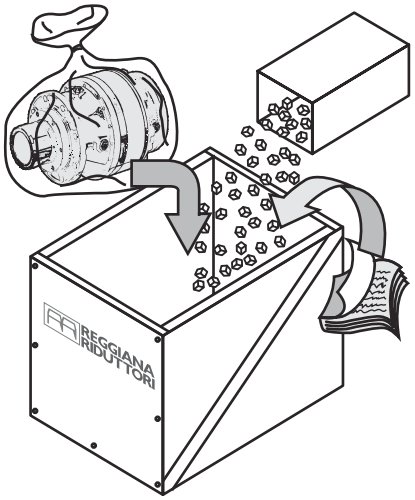


All REGGIANA RIDUTTORI products are packed and shipped, according to each separate case, in crates or on pallets. In addition, all the products are packed with packaging which can withstand normal industrial environments, unless otherwise agreed upon between

Preparation for shipping

The reduction gear will be prepared for shipping:

- wound in a plastic sack
- placed in a wooden crate
- protected with polystyrene or other material
- accompanied by use, maintenance and storing handbook



Transport

We recommend handling the reduction gears with extreme care during transport to prevent them from being damaged.

12. RECEIVING – HANDLING AND STORING



- All handling must be done with suitable hoisting means, avoiding knocks that could cause damage.
- Check that the article received is intact immediately upon receiving it and in the presence of the forwarder.
- The forwarder must be notified immediately of the presence of any anomalies found and he shall sign the complaint form.
- Store the material in a closed place, placed on benches made of wood or other material and protected against humidity.
- For storing periods of over 60 days, protect the coupling surfaces (centrings, motor connection flanges, input joints, etc.) with a special antioxidant (of the type TEXIL, PRS, etc.).
- For storing periods of over 6 months, the reduction gears have to be placed with the exhaust plug in the highest position and they have to be filled with oil. The external machined parts (centrings, couplings, spot-facing, etc.) should be covered with grease.



13. MAINTENANCE

Ordinary maintenance:

- The first oil change must be made after 100 hours of operation, and then every 12 months or 2000 hours of operation.
- Make the oil change when the reduction gear is still hot to facilitate emptying and to prevent the formation of sludge.
- Check the level of the oil at least once a month and when needed top up with oil of the same type as that present inside the reduction gear.
- Avoid mixing mineral oil with synthetic oil.
- The lubricating oil for type RF2/ brakes is the same as that used for lubricating the gears of the reduction gear, therefore if the oil inside the reduction gear is replaced, the oil in the brake is also automatically replaced. Except for the type RF5/ and RF170 type brakes, in which the oil inside is different from that of the reduction gear.

ATTENTION: ***if upon checking the oil levels on the reduction gears with disk brake and hydraulic motor, an increase of the levels is discovered, probably there has been an oil leakage from the brake seals or from the rotating seal of the motor. In this case, contact "REGGIANA RIDUTTORI assistance centre"***

Extraordinary maintenance:

- Extraordinary maintenance is the competence of "REGGIANA RIDUTTORI assistance centre", therefore it is prohibited to open the reduction gear for any type of operation that does not fall within the category of those defined as "ordinary maintenance".
- REGGIANA RIDUTTORI shall not assume any responsibility for any operation carried out that does not fall within the category of ordinary maintenance, and which has caused damage to people and objects.



ATTENTION: ***dispose of all reject materials in accordance with the current laws***

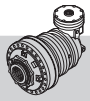
14. TROUBLESHOOTING

Should an anomaly occur during operation consult the following table. If the problem persists, contact the closest "REGGIANA RIDUTTORI assistance centre"

ANOMALY	POSSIBLE CAUSE	SOLUTION
Oil leakage from the seals	1) Hardening of the seals due to prolonged storing	1) Clean the area and check for leakage after a few days
	2) Seals damaged or worn	2) Contact an Assistance Centre
Vibrations and/or excessive noise	1) Reduction gear not installed correctly	1) Check the fixing
	2) Internal anomaly	2) Contact an Assistance Centre
The stationing disk brake is not released	1) Lack of pressure in the brake	1) Check the brake connection
	2) Disks stuck due to period of stationing	2) Apply pressure + brake rotation
	3) Brake seals faulty	3) Contact an Assistance Centre
Over-heating	1) Lack of oil	1) Add oil
	2) Disk brake does not completely open	2) Check brake opening pressure
	3) High thermal power	3) Contact an Assistance Centre
With motor activated the reduction gear does not rotate	1) Incorrect mounting of motor	1) Check coupling between motor and reduction gear
	2) Brakes blocked	2) Check the braking system
	3) Internal anomaly	3) Contact an Assistance Centre
Stationing disk brake does not block	1) Residual pressure in the circuit	1) Check hydraulic circuit
	2) Disks worn	2) Contact an Assistance Centre

RR105 | .. | i

	i	T_2 [Nm]						n_{1max}	T_{2max}	P_t
		n_2 x h								
	1/…	**10000** (10^4)	**25000** ($2.5 \cdot 10^4$)	**50000** ($5 \cdot 10^4$)	**100000** (10^5)	**500000** ($5 \cdot 10^5$)	**1000000** (10^6)	[min^{-1}]	[Nm]	[kW]
RR105	**3.21**	1220	1160	1140	1130	930	760	3500	1800	11.8 (M...) 17.9 (UC) 7.9 (FS)
	4.10	1160	1070	1060	1050	900	730			
	5.42	1030	940	850	790	720	690			
	7.20	760	640	560	540	490	470			
RR105D	**11.27**	1220	1160	1140	1130	930	760	3500	1800	6.4 (M...) 9.5 (UC) 4.7 (FS)
	14.39	1160	1070	1060	1050	900	730			
	19.07	1160	1070	1060	1050	900	730			
	25.46	1160	1070	1060	1050	900	730			
	33.66	1030	940	850	790	720	690			
	44.71	760	640	560	540	490	470			
RR105T	**50.51**	1160	1070	1060	1050	900	730	3500	1800	4.7 (M...) 6.7 (UC) 3.5 (FS)
	66.92	1160	1070	1060	1050	900	730			
	89.37	1160	1070	1060	1050	900	730			
	118.39	1160	1070	1060	1050	900	730			
	158.11	1160	1070	1060	1050	900	730			
	209.02	1030	940	850	790	720	690			
	277.66	760	640	560	540	490	470			

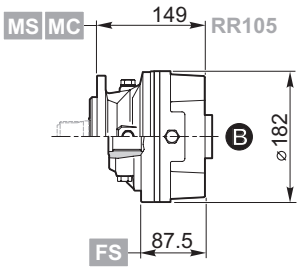


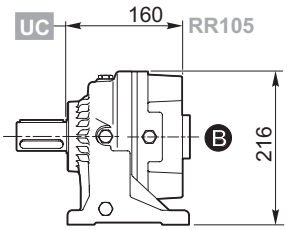
RA105 | .. | i

	i	T_2 [Nm] n_2 x h						n_{1max}	T_{2max}	P_t
	1/…	**10000** (10^4)	**25000** ($2.5 \cdot 10^4$)	**50000** ($5 \cdot 10^4$)	**100000** (10^5)	**500000** ($5 \cdot 10^5$)	**1000000** (10^6)	[min^{-1}]	[Nm]	[kW]
RA105	**10.34**	1220	1160	1140	1130	930	760	3500	1800	12.5 (M...) 15.5 (UC) 10.5 (FS)
	13.20	1160	1070	1060	1050	900	730			
	17.45	1030	940	850	790	720	690			
	23.18	760	640	560	540	490	470			
	31.91	1030	890	840	790	700	660			
	42.39	760	640	560	540	490	470			
RA105D	**33.18**	1220	1160	1140	1130	930	760	3500	1800	8.7 (M...) 10.8 (UC) 7.6 (FS)
	42.38	1220	1160	1140	1130	930	760			
	54.13	1160	1070	1060	1050	900	730			
	71.55	1160	1070	1060	1050	900	730			
	95.05	1160	1070	1060	1050	900	730			
	125.66	1030	940	850	790	720	690			
	166.92	760	640	560	540	490	470			
	173.81	1160	1070	1060	1050	900	730			
	229.77	1030	940	850	790	720	690			
	305.23	760	640	560	540	490	470			

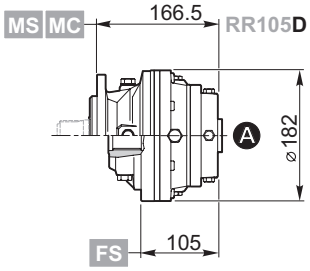
RR105 | .. | i | ..

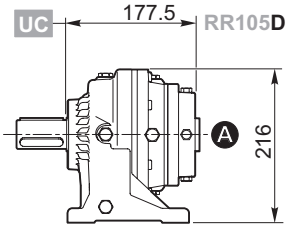
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MS MC
149
RR105
B
⌀182
FS
87.5

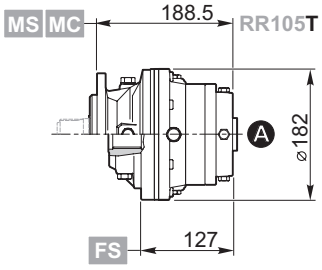

UC
160
RR105
B
216

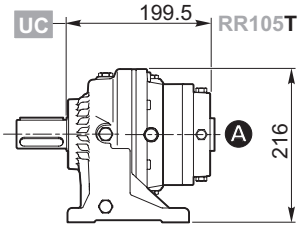
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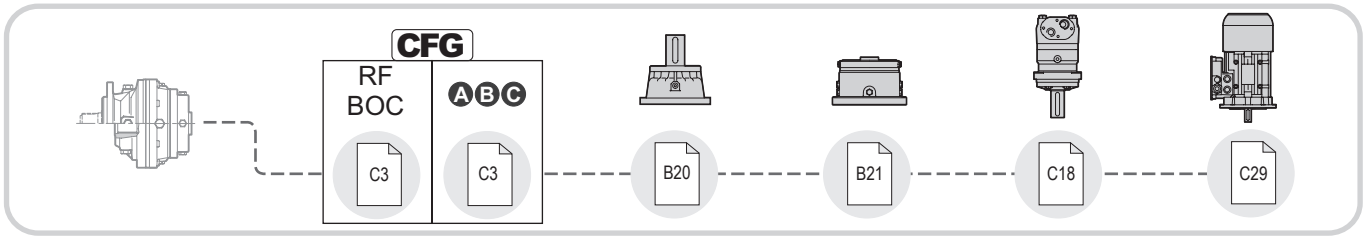

MS MC
166.5
RR105D
A
⌀182
FS
105

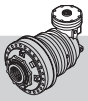

UC
177.5
RR105D
A
216

T


MS MC
188.5
RR105T
A
⌀182
FS
127


UC
199.5
RR105T
A
216

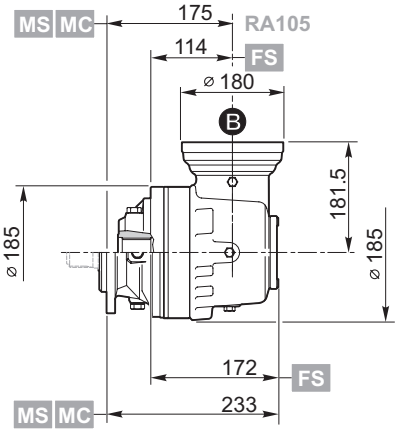

CFG
RF
BOC
ABC
C3
C3
B20
B21
C18
C29

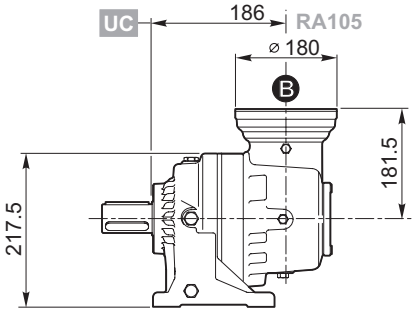


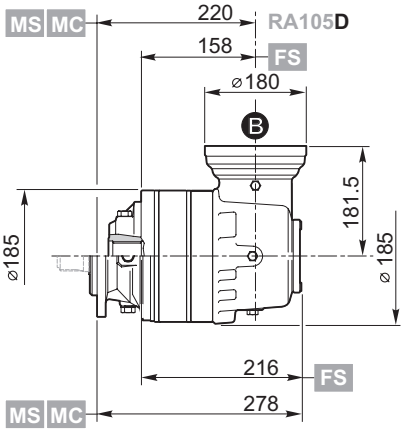
RA105 | .. | i | ..

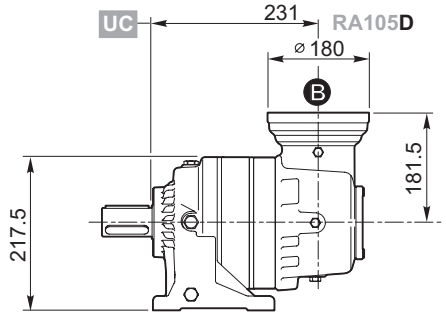
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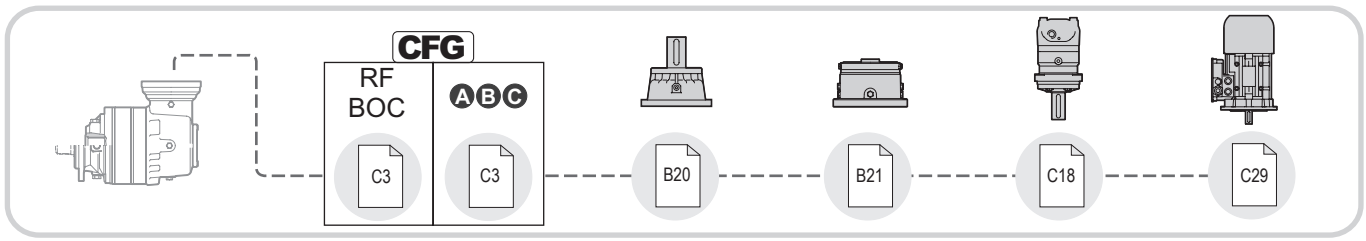
D


MS MC
175
RA105
114
FS
⌀ 180
B
181.5
⌀ 185
⌀ 185
172
FS
MS MC
233


UC
186
RA105
⌀ 180
B
181.5
217.5


MS MC
220
RA105D
158
FS
⌀180
B
181.5
⌀185
⌀ 185
216
FS
MS MC
278


UC
231
RA105D
⌀ 180
B
181.5
217.5

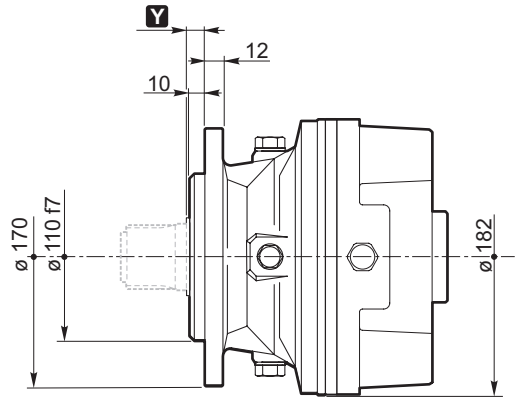

CFG
RF
BOC
ABC
C3
C3
B20
B21
C18
C29

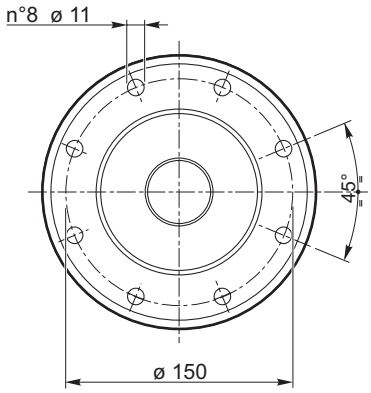
RR105 RA105	..	i	..

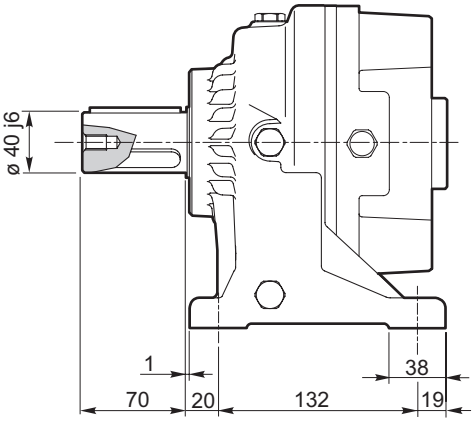
MS

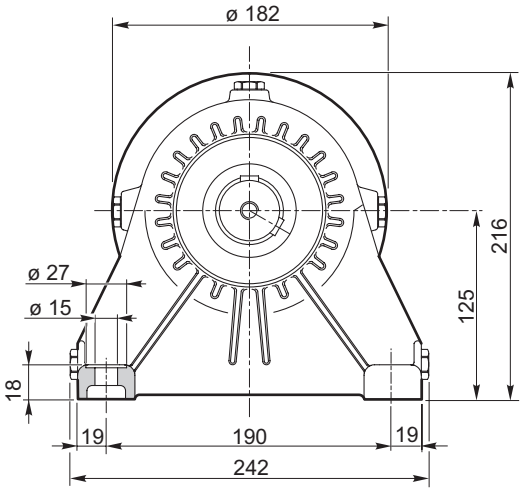
MC

UC

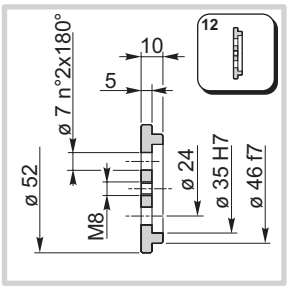


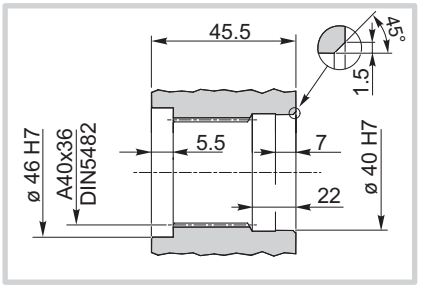


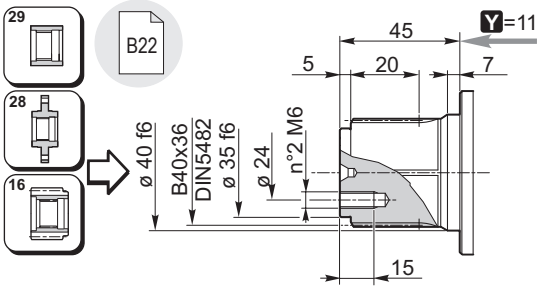




MS

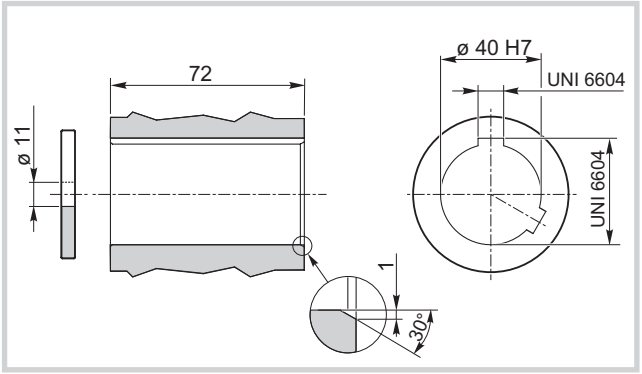


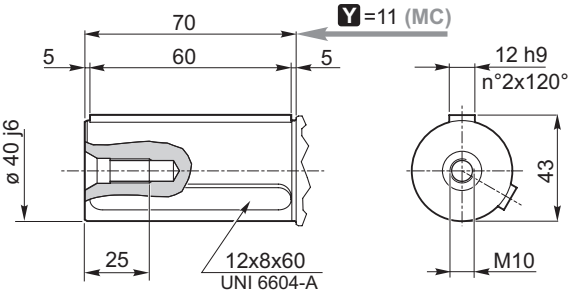


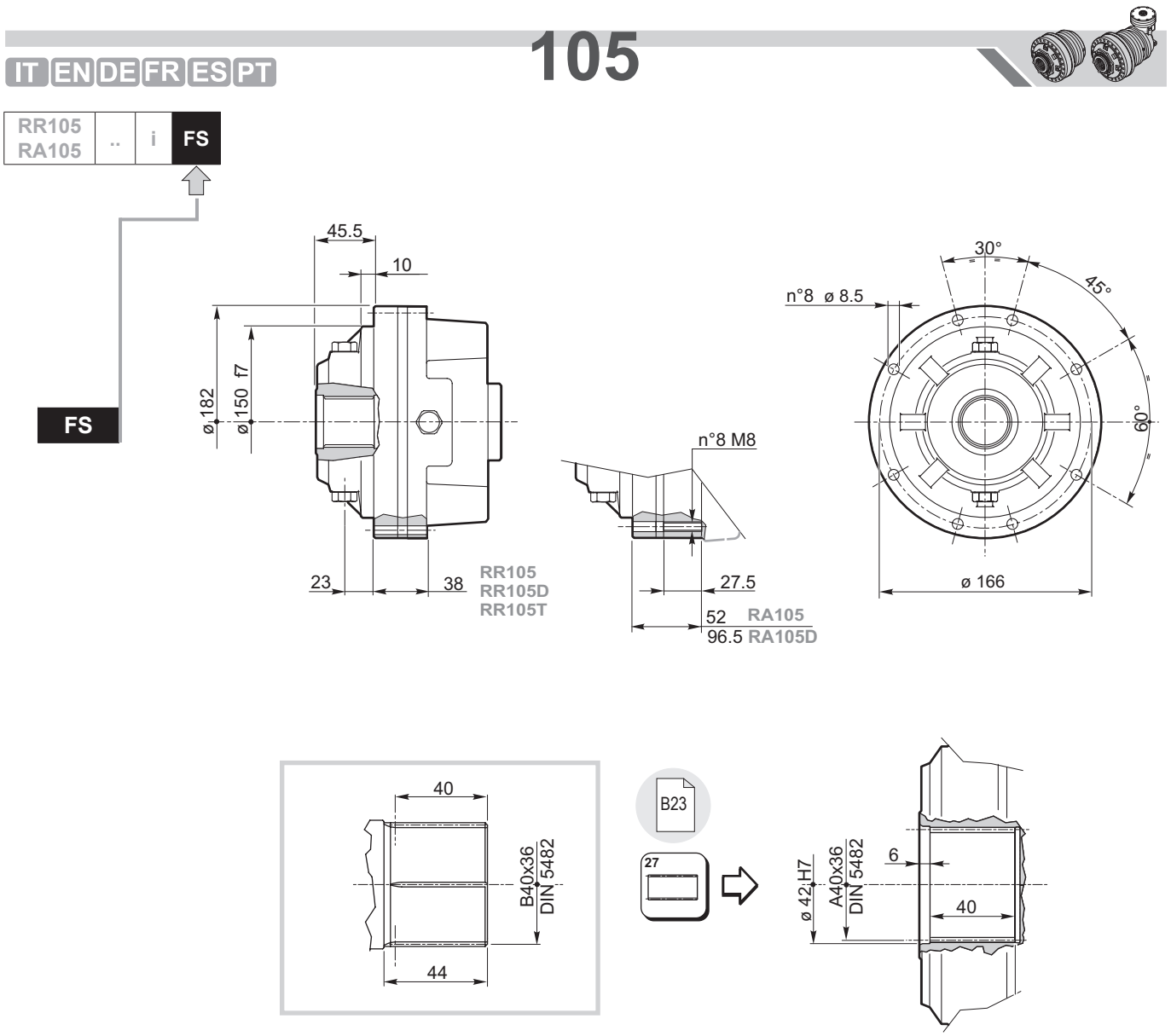


MC

UC

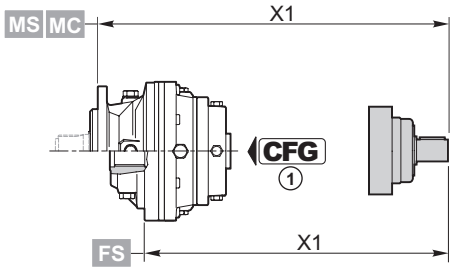


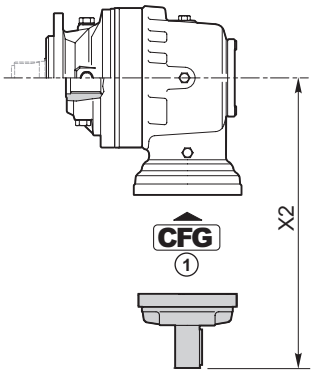



RR105
RA105
..
i
FS
FS
45.5
10
ø182
ø150 f7
23
38
RR105
RR105D
RR105T
n°8 M8
27.5
52
96.5
RA105
RA105D
30°
45°
60°
n°8 ø 8.5
ø 166
40
B40x36
DIN 5482
44
B23
27
ø 42 H7
A40x36
DIN 5482
6
40

L35-1 L35-2

C9

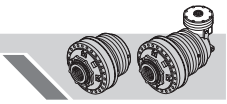


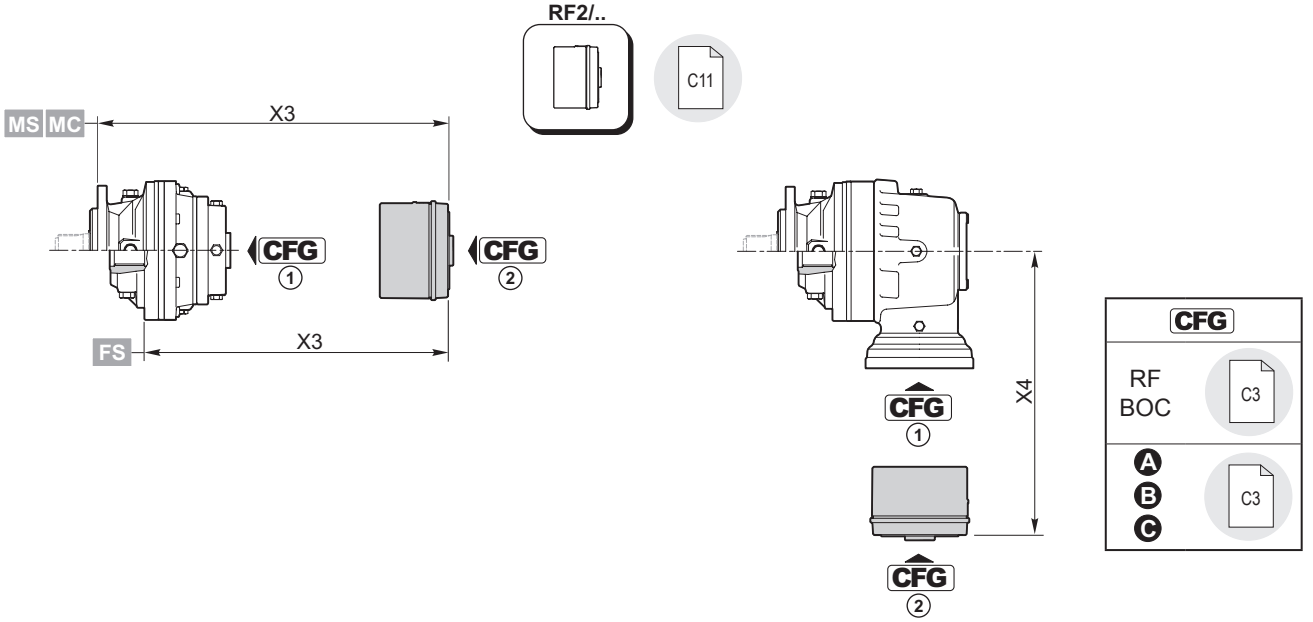


	CFG ①		code	X1
RR105	BOC	**L35-2**	154-2190M1	238.5 (M...) 177 (FS)
RR105D	RF	**L35-1**	154B4054	254.5 (M...) 193 (FS)
RR105T	RF	**L35-1**	154B4054M1	276.5 (M...) 215 (FS)

	CFG ①		code	X2
RA105	BOC	**L35-2**	154-2190M1	270.5
RA105D	BOC	**L35-2**	154-2190M1	270.5

CFG	
RF BOC	C3
A B C	C3



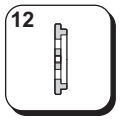


RF2/..	CFG ①	T_f [Nm]	CFG ② B		OMP/OMR SAE A 2B Ø 25	OMP/OMR SAE A 2B 1" 6B	OMP/OMR SAE A 4B Ø 25	OMP/OMR SAE A 4B 1" 6B	
			code	X3	code	code	code	code	X3
RR105	RF	70	154-2838M1	187.5 (M...) 126 (FS)	154-2863	154-2863M11	154-2635	154-2635M11	177.5 (M...) 116 (FS)
		140	154-2839M1		154-2864	154-2864M11	154-2636	154-2636M11	
		210	154-2840M1		154-2865	154-2865M11	154-2637	154-2637M11	
		320	154-2841M1		154-2866	154-2866M11	154-2638	154-2638M11	
		430	154-2842M1		154-2867	154-2867M11	154-2639	154-2639M11	
		600	154B8962M1		154B9665	154B9665M11	154B9666	154B9666M11	

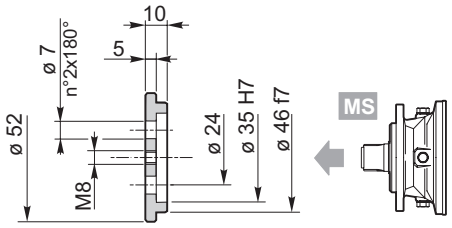
	CFG ①	T_f [Nm]	CFG ② A		OMP/OMR SAE A 2B Ø 25	OMP/OMR SAE A 2B 1" 6B	OMP/OMR SAE A 4B Ø 25	OMP/OMR SAE A 4B 1" 6B	
			code	X3	code	code	code	code	X3
RR105D	RF	70	154-2832M1	232.5 (M...) 171 (FS)	154-2858M1	154-2858M5			228 (M...) 166.5 (FS)
		140	154-2833M1		154-2859M1	154-2859M5			
		210	154-2834M1		154-2860M1	154-2860M5			
		320	154-2836M1		154-2861M1	154-2861M5			
		430	154-2837M1		154-2862M1	154-2862M5			
		600	154B8959M1		154B9663M1	154B9663M5			
RR105T	RF	70	154-2832M3	254.5 (M...) 193 (FS)	154-2858M3	154-2858M7			250 (M...) 188.5 (FS)
		140	154-2833M3		154-2859M3	154-2859M7			
		210	154-2834M3		154-2860M3	154-2860M7			
		320	154-2836M3		154-2861M3	154-2861M7			
		430	154-2837M3		154-2862M3	154-2862M7			
		600	154B8959M3		154B9663M3	154B9663M7			

	CFG ①	T_f [Nm]	CFG ② B		OMP/OMR SAE A 2B Ø 25	OMP/OMR SAE A 2B 1" 6B	OMP/OMR SAE A 4B Ø 25	OMP/OMR SAE A 4B 1" 6B	
			code	X4	code	code	code	code	X4
RA105	RF	70	154-2838M12	223.8	154-2863M12	154-2863M13	154-2635M12		213.8
		140	154-2839M12		154-2864M12	154-2864M13	154-2636M12		
		210	154-2840M12		154-2865M12	154-2865M13	154-2637M12		
		320	154-2841M12		154-2866M12	154-2866M13	154-2638M12		
		430	154-2842M12		154-2867M12	154-2867M13	154-2639M12		
		600	154B8962M12		154B9665M12	154B9665M13	154B9666M12		
RA105D	RF	70	154-2838M12	223.8	154-2863M12	154-2863M13	154-2635M12		213.8
		140	154-2839M12		154-2864M12	154-2864M13	154-2636M12		
		210	154-2840M12		154-2865M12	154-2865M13	154-2637M12		
		320	154-2841M12		154-2866M12	154-2866M13	154-2638M12		
		430	154-2842M12		154-2867M12	154-2867M13	154-2639M12		
		600	154B8962M12		154B9665M12	154B9665M13	154B9666M12		

12



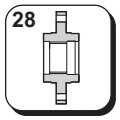
Kg 0.1



154-3063

Materiale / *Material* / Material / Matériau / *Material* / Material:
Acciaio / *Steel* / Stahl / Acier / *Acero* / Aço
C40 EN 10083-1 (1.1186)

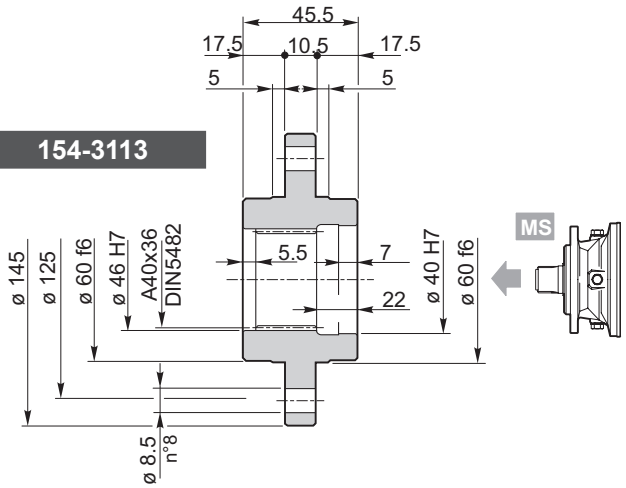
28



Kg 1.6

Materiale / *Material* / Material / Matériau / *Material* / Material:
Acciaio / *Steel* / Stahl / Acier / *Acero* / Aço EN 10083-1-C40 (1.1186)

154-3113



T_{2max} = **1740** Nm

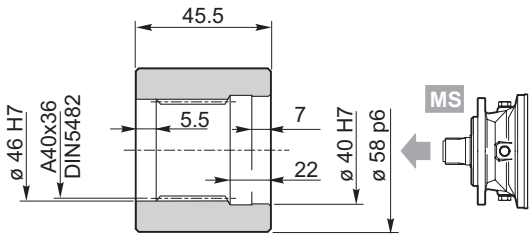
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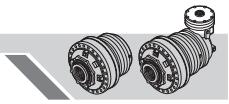


Kg 0.5

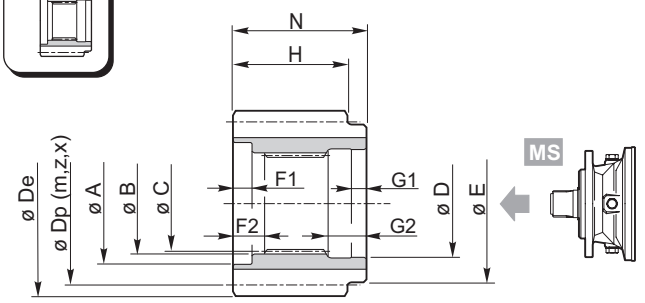
Materiale / *Material* / Material / Matériau / *Material* / Material:
Acciaio / *Steel* / Stahl / Acier / *Acero* / Aço 39NiCrMo3 UNI 7845 (1.6511)

154-3094





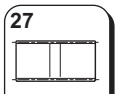
16



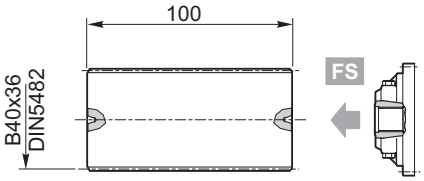
Materiale / *Material* / Material
Matériau / *Material* / Material
Acciaio / *Steel* / Stahl / Acier / *Acero* / Aço
39NiCrMo3 UNI 7845 (1.6511)

	A	B	C	D	E	F1	F2	G1	G2	N	m	z	x	H	Dp	De	Code
MS	53	46 F6	DIN5482 A40x36	40 F6	50	2	7.5	7	21	47.5	4	15	0.5	44.5	60	69.8	**154-3072**
	53	46 F6	DIN5482 A40x36	40 F6	50	2	7.5	7	21	47.5	4	32	0	44.5	128	135	**154-3104**
	53	46 F6	DIN5482 A40x36	40 F6	50	2	7.5	7	21	47.5	6	12	0.25	44.5	72	84.8	**154-3073**
	53	46 F6	DIN5482 A40x36	40 F6	50	2	7.5	7	21	47.5	5	14	0.5	44.5	70	84	**154-2709**
	53	46 F6	DIN5482 A40x36	40 F6	50	2	7.5	7	21	47.5	6	24	0	44.5	144	154	**154-2285**
	53	46 F6	DIN5482 A40x36	40 F6	50	2	7.5	7	21	47.5	8	16	0.25	44.5	128	145	**154-2707**

27



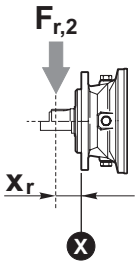
Kg 0.9

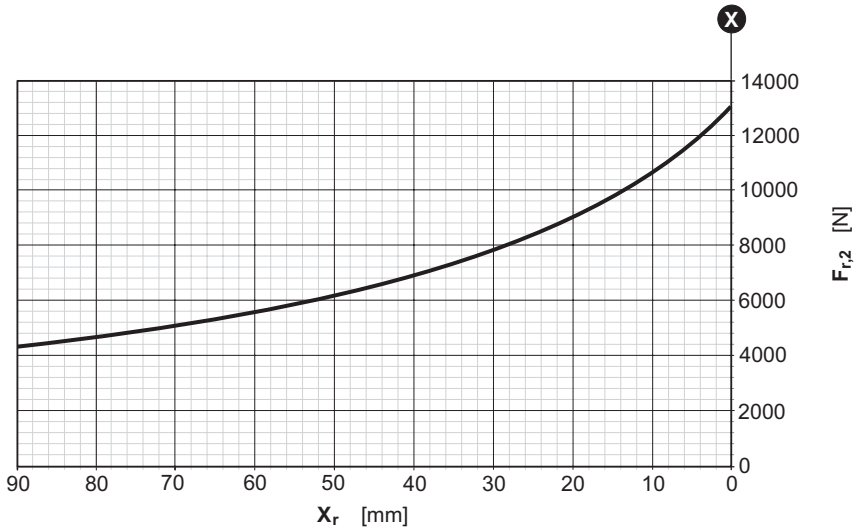


154-3050

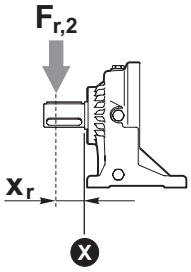
Materiale / Materiale / Material
Matériau / *Material* / Material:
Acciaio / *Steel* / Stahl / Acier / *Acero* / Aço
39NiCrMo3 UNI 7845 (1.6511)

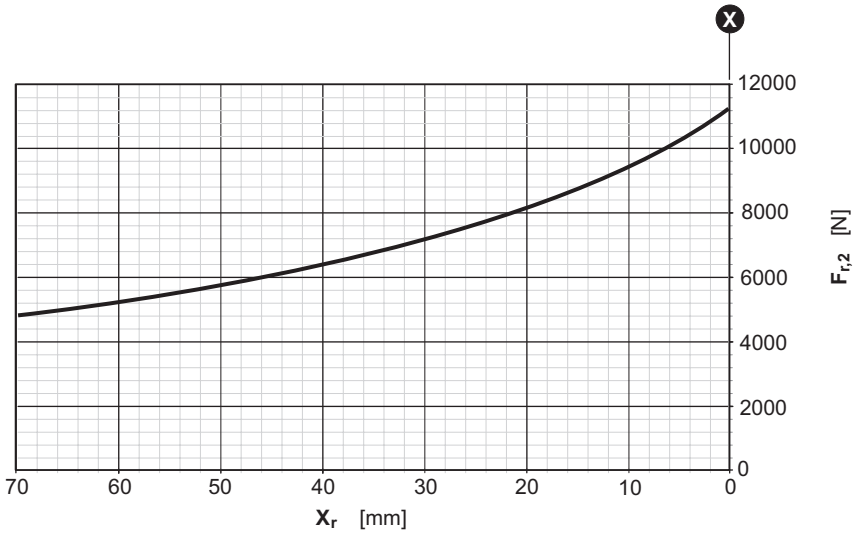
RR RA	105	..	MS MC



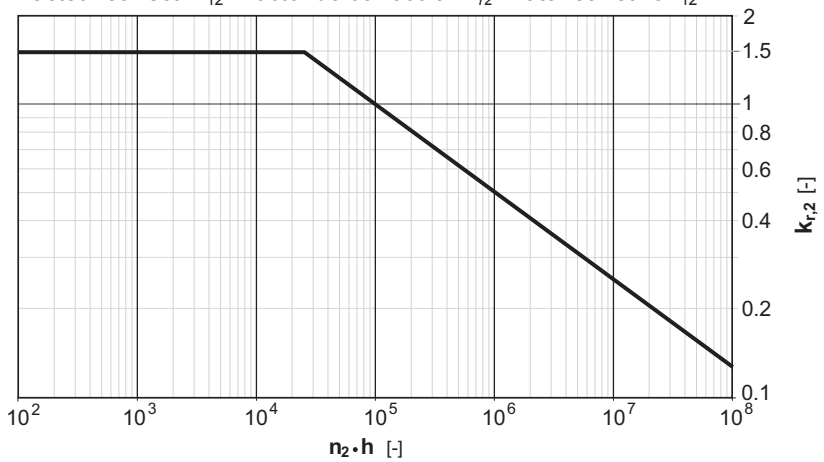


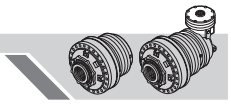
RR RA	105	..	UC



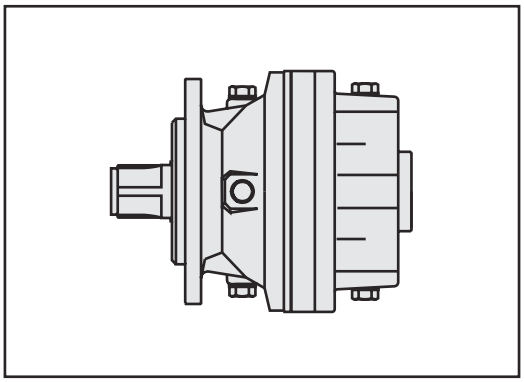


Fattore correttivo k_{r2} / *k_{r2} Corrective coefficient* / Korrekturfaktor k_{r2}
Facteur correctif k_{r2} / *Factor de corrección k_{r2}* / Fator corretivo k_{r2}





SIZE 210 REDUCTION GEAR

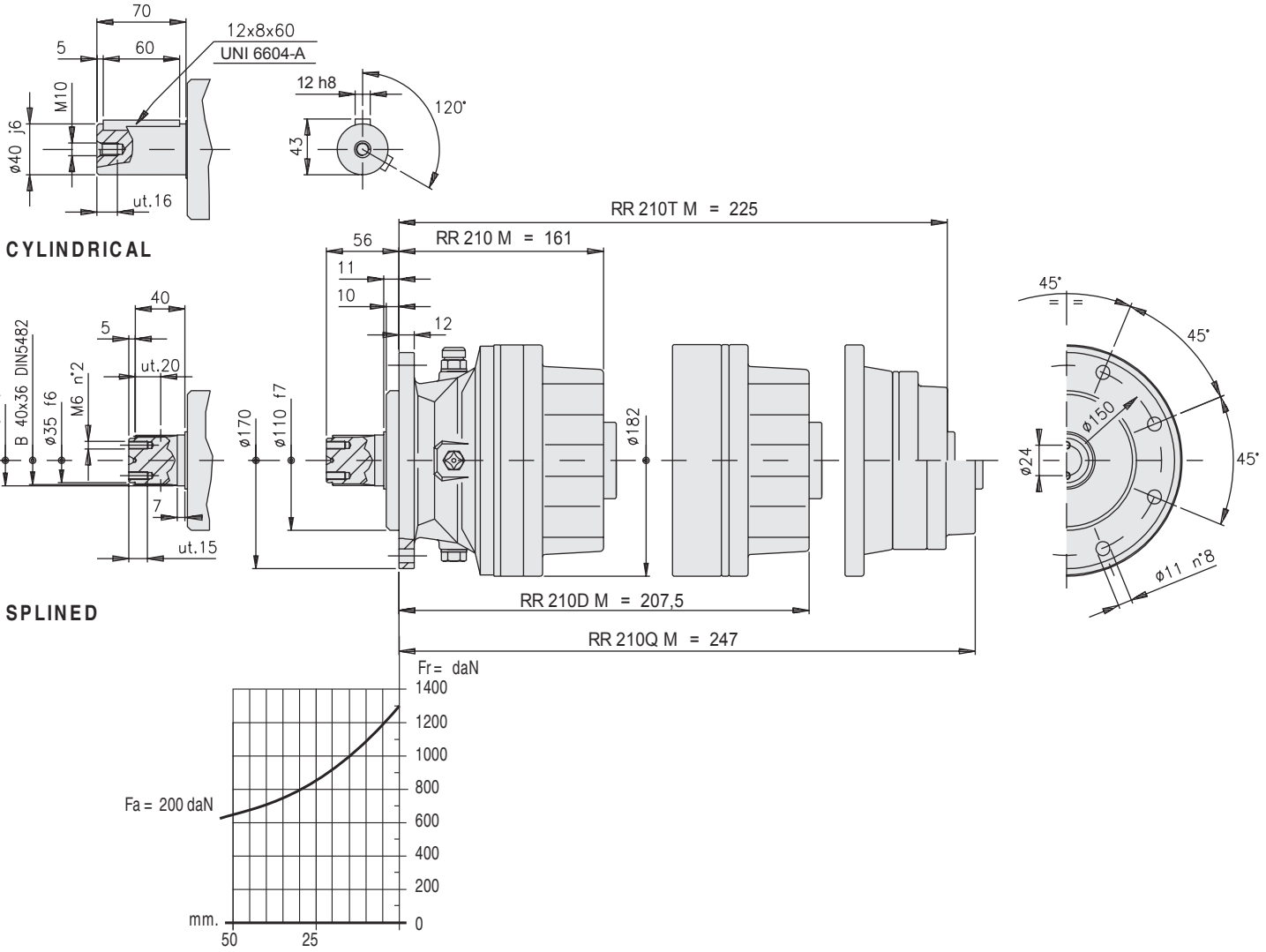


Tab. A

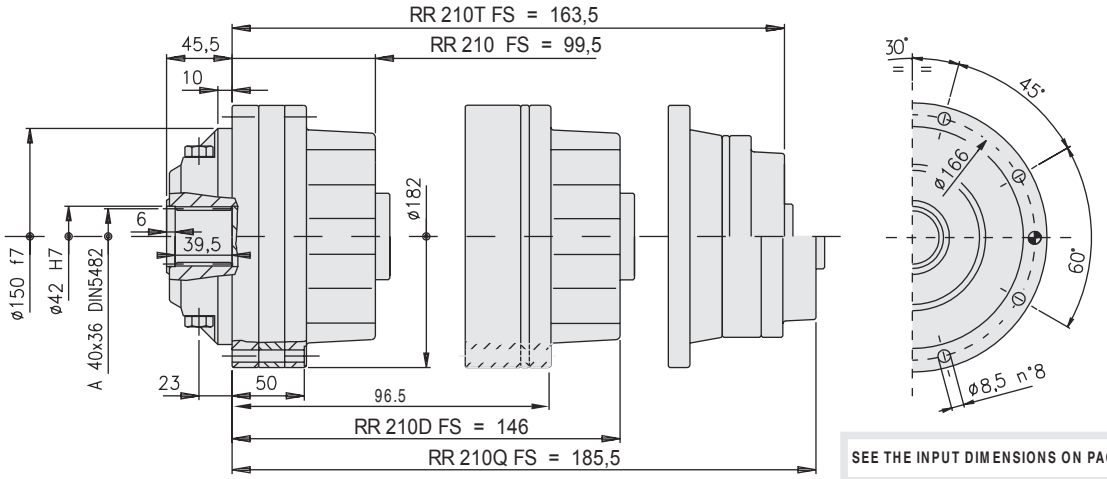
TYPE	RR 210 M... RR 210 FS RR 210 S...	RR 210D M... RR 210D FS RR 210D S...	RR 210T M... RR 210T FS RR 210T S...	RR 210Q M... RR 210Q FS RR 210Q S...
Number of stages	1	2	3	4
Type of input	B	B	A	A
Max. input revs n1 (min^{-1})	3500	3500	3500	3500

TYPE	RA 210 M... RA 210 FS RA 210 S...	RA 210D M... RA 210D FS RA 210D S...		
Number of stages	1	2	-	-
Type of input	X	X	-	-
Max. input revs n1 (min^{-1})	3500	3500	-	-

MALE LINEAR VERSION RR 210 M... - RR 210D M... - RR 210T M... - RR 210Q M...



FEMALE LINEAR VERSION RR 210 FS - RR 210D FS - RR 210T FS - RR 210Q FS



SEE THE INPUT DIMENSIONS ON PAGES 144-147

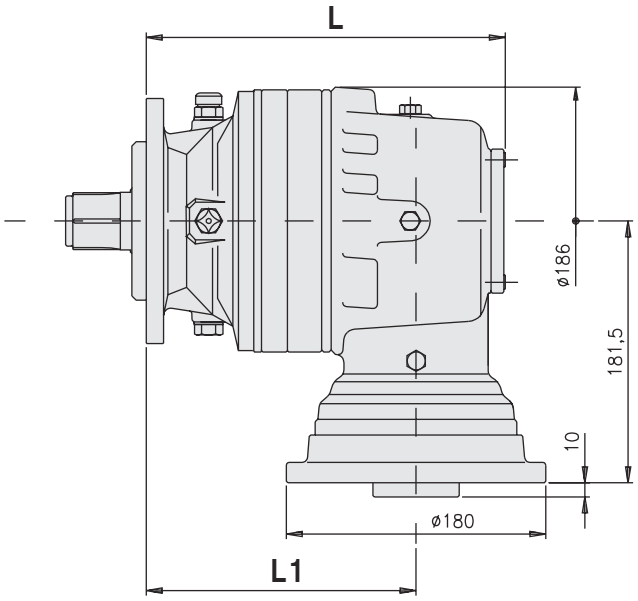
Tab. B

PART No. – RATIOS – TORQUES (ISO Standards)											
RR 210 M... RR 210 FS RR 210 S...			RR 210D M... RR 210D FS RR 210D S...			RR 210T M... RR 210T FS RR 210T S...			RR 210Q M... RR 210Q FS RR 210Q S...		
PART No. 210/...	...../1	T2 daNm	PART No. 210/...	...../1	T2 daNm	PART No. 210/...	...../1	T2 daNm	PART No. 210/...	...../1	T2 daNm
33	3,31	225	109	10,96	225	601	60,18	225	2798	279,84	225
39	3,91	200	129	12,94	225	710	71,09	200	3305	330,57	200
49	4,94	165	152	15,29	200	803	80,37	225	4176	417,65	200
57	5,78	150	193	19,32	200	898	89,82	200	4886	488,66	200
70	7,09	110	226	22,60	200	1050	105,09	200	5577	557,76	200
			285	28,55	165	1199	119,95	200	5626	652,60	200
			350	35,02	165	1403	140,34	200	8245	824,52	165
			409	40,98	150	1773	177,32	165	8715	871,54	200
			502	50,27	110	2175	217,50	165	10113	1011,39	165
						2544	254,49	150	11833	1183,36	165
						3121	312,16	110	13506	1350,69	165
									15803	1580,36	150
									19385	1938,54	110

PART No. – RATIOS – TORQUES (ISO Standards)								
RA 210 M... RA 210 FS RA 210 S...			RA 210D M... RA 210D FS RA 210D S...					
PART No. 210/...	...../1	T2 daNm	PART No. 210/...	...../1	T2 daNm			
106	10,66	150	352	35,28	225			
125	12,59	175	416	41,67	225			
159	15,91	165	492	49,23	200			
186	18,61	150	622	62,20	200			
228	22,83	110	727	72,77	200			
290	29,09	140	919	91,94	165			
340	34,03	150	1127	112,78	165			
417	41,75	110	1319	131,96	150			
			1618	161,86	110			
			1967	196,71	150			
			2062	206,22	165			
			2412	241,29	150			
			2959	295,98	110			

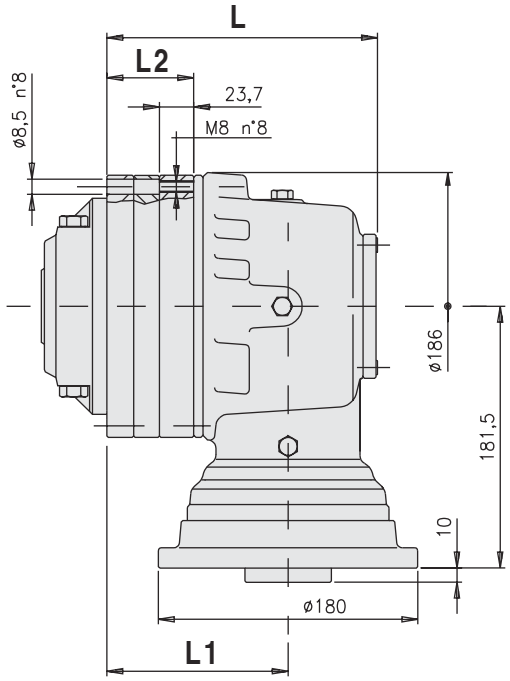
Note: To mount the RR 210/210 F reduction gear, use screws with resistance class (UNI 3740/3)12.9.

MALE ANGULAR VERSION RA 210 M... - RA 210D M...



TYPE	L	L1
RA 210 M...	249,5	187
RA 210D M...	296,5	234

FEMALE ANGULAR VERSION RA 210 FS - RA 210D FS

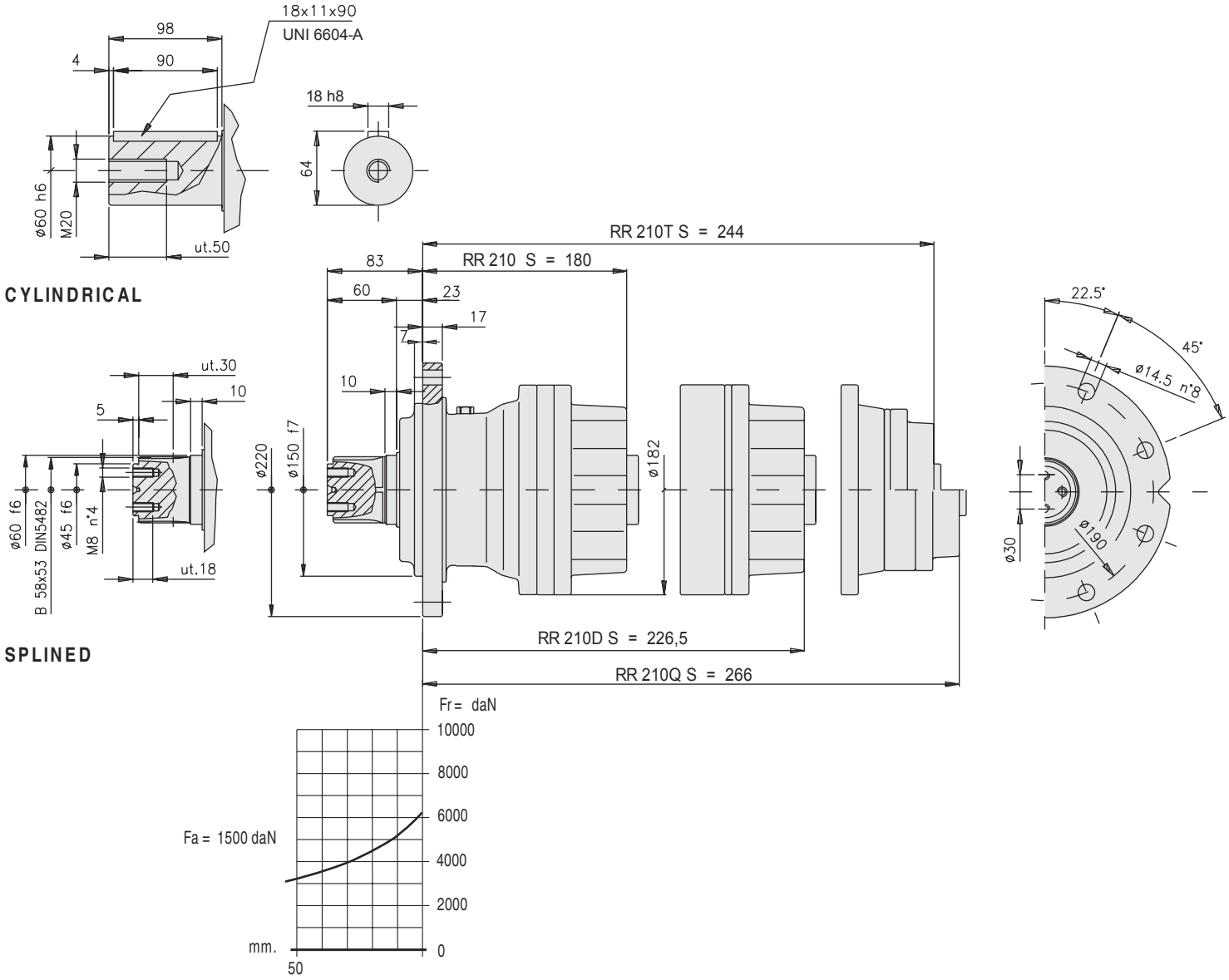


TYPE	L	L1	L2
RA 210 FS	188,5	126	60,2
RA 210D FS	234,5	172	106,7

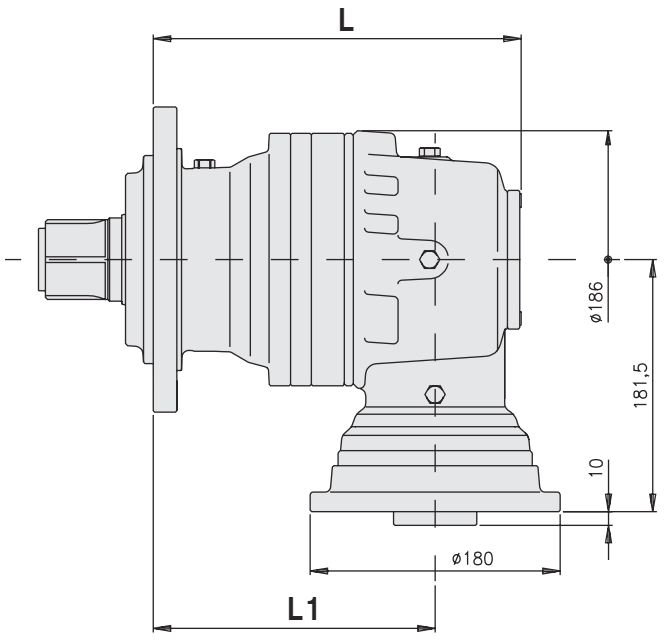
SEE THE INPUT DIMENSIONS ON PAGE 148

SIZE 210S REDUCTION GEAR

LINEAR REINFORCED VERSION RR 210 S... - RR 210D S... - RR 210T S... - RR 210Q S...



ANGULAR REINFORCED VERSION RA 210 S... - RA 210D S...

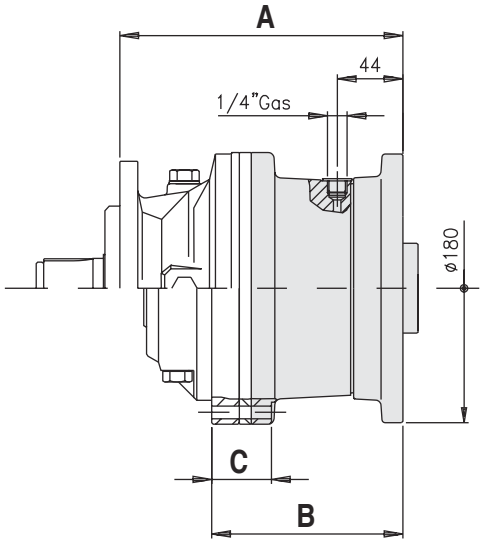


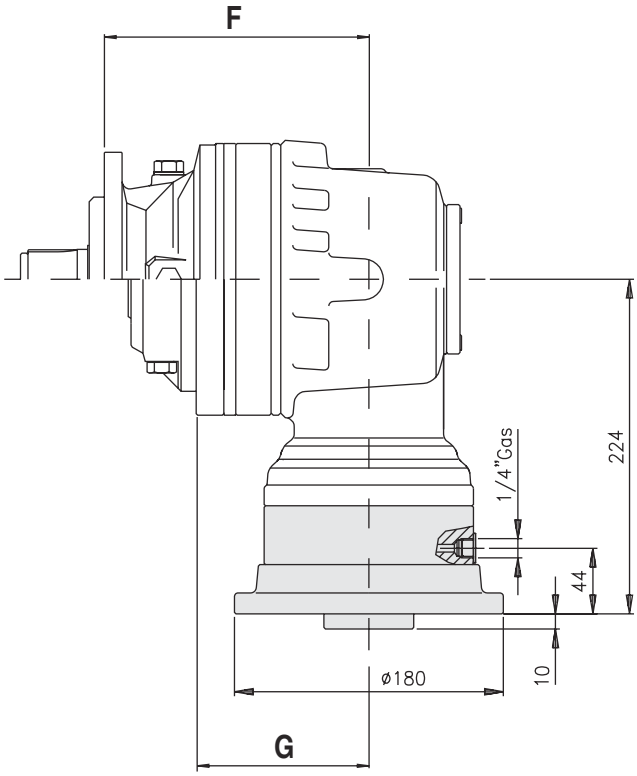
TYPE	L	L1
RA 210 S...	268,5	206
RA 210D S...	315,5	253

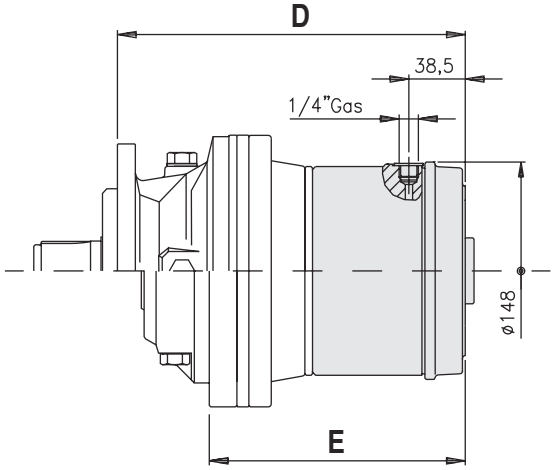
SEE THE INPUT DIMENSIONS ON PAGES 144-148

SIZE 210/210S REDUCTION GEAR

BRAKES SERIES RF 2/7 ÷ 2/60







TYPE	A	B	C	D	E	F	G
RR 210 M...	199,5	-	-	-	-	-	-
RA 210 M...	-	-	-	-	-	187	-
RR 210D M...	246	-	-	-	-	-	-
RA 210D M...	-	-	-	-	-	234	-
RR 210 S...	218,5	-	-	-	-	-	-
RA 210 S...	-	-	-	-	-	206	-
RR 210D S...	265	-	-	-	-	-	-
RA 210D S...	-	-	-	-	-	253	-
RR 210 FS	-	138	50	-	-	-	-
RA 210 FS	-	-	-	-	-	-	126
RR 210D FS	-	184,5	-	-	-	-	-
RA 210D FS	-	-	-	-	-	-	172
RR 210T M...	-	-	-	291	-	-	-
RR 210Q M...	-	-	-	313	-	-	-
RR 210T S...	-	-	-	310	-	-	-
RR 210Q S...	-	-	-	332	-	-	-
RR 210T FS	-	-	-	-	229,5	-	-
RR 210Q FS	-	-	-	-	251,5	-	-

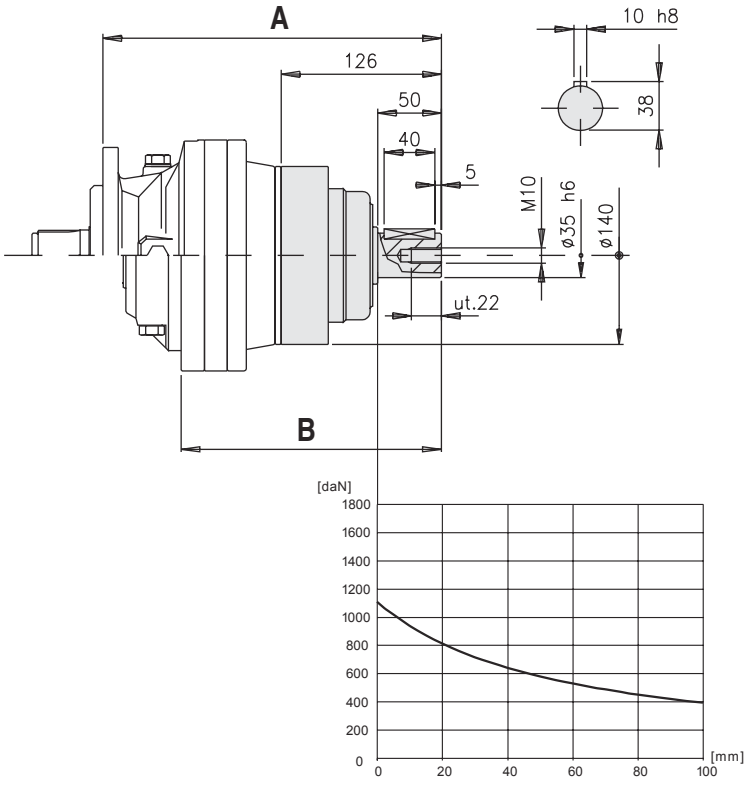
		Mass
Ambient temperature	-20°C ÷ +60°C	Kg 10,5
VISCOSITY	VG 150 10,8.. 12,5°E/50°C	

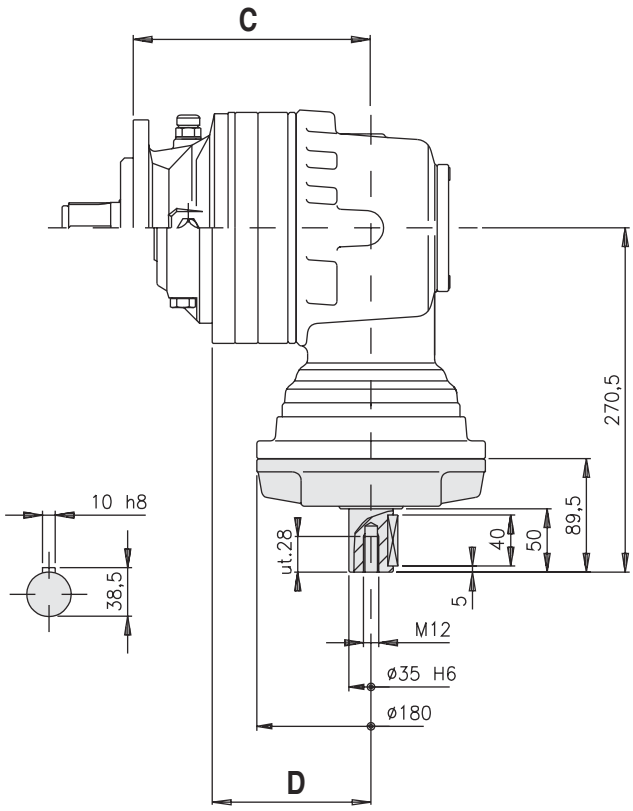
CODE		2/7	2/14	2/21	2/32	2/43	2/60
Static torque	da Nm	6 ÷ 8	13 ÷ 15	20 ÷ 22	31 ÷ 34	41 ÷ 45	57 ÷ 60
Min. opening pressure	bar	4 ÷ 5	8 ÷ 9	12 ÷ 13	18 ÷ 20	24 ÷ 26	27 ÷ 32
Max. opening pressure	bar	300					
Minimum oil capacity for brake opening	cm^3	7 ÷ 8					

SEE THE INPUT DIMENSIONS ON PAGE 149

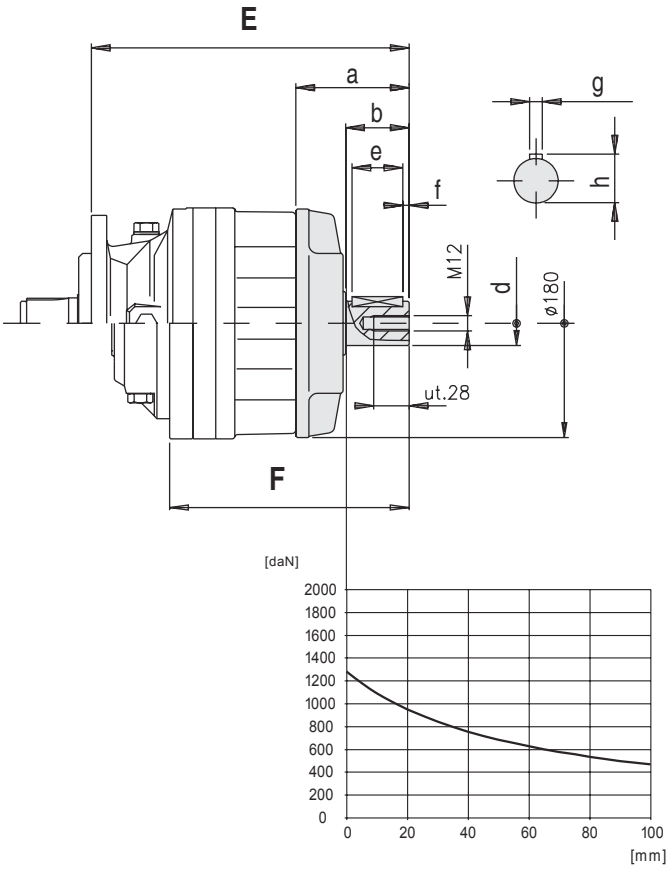
SIZE 210/210S REDUCTION GEAR

SERIES L MALE LIGHT INPUT





TYPE	A	B	C	D
RR 210T M...	313	-	-	-
RR 210Q M...	335	-	-	-
RR 210T S...	332	-	-	-
RR 210Q S...	354	-	-	-
RR 210T FS	-	251,5	-	-
RR 210Q FS	-	273,5	-	-
RA 210 M...			187	-
RA 210D M...			234	-
RA 210 S...			206	-
RA 210D S...			253	-
RA 210 FS			-	126
RA 210D FS			-	172



TYPE	E	F	a	b	d	e	f	g	h
RR 210 M...	282,5	–	121,5	82	48 k6	70	6	14 h8	51,5
RR 210D M...	297	–	89,5	50	35 h6	40	5	10 h8	38,5
RR 210 S...	301,5	–	121,5	82	48 k6	70	6	14 h8	51,5
RR 210D S...	316	–	89,5	50	35 h6	40	5	10 h8	38,5
RR 210 FS	–	221	121,5	82	48 k6	70	6	14 h8	51,5
RR 210D FS	–	235,5	89,5	50	35 h6	40	5	10 h8	38,5

RR 210 T FS 1/103.69
Rating method: DIN 3990/1987 - ISO 6336/1996.
REGGIANA RIDUTTORI shall not be responsible for any damage due to improper use.

Application as speed reducer. Monodirectional load.

Actual total gear ratio		103.97
Assumed efficiency of the gear unit		0.956
Requested application factor		1
Fast shaft:	Revol. per minute	1040
	Torque	23.3 Nm
	Power	2.54 kW
Slow shaft:	Revol. per minute	10
	Torque	2320 Nm
	Power	2.43 kW

105/5.42
Stage No. 1 - Planetary type

Actual gear ratio		5.43
Assumed efficiency of the stage		0.985
Fast shaft of the stage:	Revol. per minute	1040
	Torque	23.3 Nm
Slow shaft of the stage:	Revol. per minute	191.5
	Torque	125 Nm

At the slow shaft of the stage:

Pitting fatigue limit torque	843 Nm
Max. torque for surface static resistance	2380 Nm
Fatigue limit torque for strength against tooth breakage	861 Nm
Max. torque for tooth root resistance to breakage	2220 Nm
Tooth Flank Life, hours	unlimited
Tooth Root Life, hours	unlimited

110/5.78
Stage No. 2 - Planetary type

Actual gear ratio		5.79
Assumed efficiency of the stage		0.985
Fast shaft of the stage:	Revol. per minute	191.5
	Torque	125 Nm
Slow shaft of the stage:	Revol. per minute	33.1
	Torque	712 Nm

At the slow shaft of the stage:

Pitting fatigue limit torque	826 Nm
Max. torque for surface static resistance	2440 Nm
Fatigue limit torque for strength against tooth breakage	1230 Nm
Max. torque for tooth root resistance to breakage	3160 Nm
Tooth Flank Life, hours	unlimited
Tooth Root Life, hours	unlimited

210/3.31

Stage No. 3 - Planetary type		
Actual gear ratio		3.31
Assumed efficiency of the stage		0.985
Fast shaft of the stage:	Revol. per minute	33.1
	Torque	712 Nm
Slow shaft of the stage:	Revol. per minute	10
	Torque	2320 Nm
At the slow shaft of the stage:		
Pitting fatigue limit torque		1760 Nm
Max. torque for surface static resistance		5200 Nm
Fatigue limit torque for strength against tooth breakage		2480 Nm
Max. torque for tooth root resistance to breakage		6380 Nm
Tooth Flank Life, hours		4560
Tooth Root Life, hours		40900

Unit life, hours	4560

210/3.31

Stage No. 3 - Planetary type		
Actual gear ratio		3.31
Assumed efficiency of the stage		0.985
Fast shaft of the stage:	Revol. per minute	33.1
	Torque	576 Nm
Slow shaft of the stage:	Revol. per minute	10
	Torque	1880 Nm
At the slow shaft of the stage:		
Pitting fatigue limit torque		1760 Nm
Max. torque for surface static resistance		5200 Nm
Fatigue limit torque for strength against tooth breakage		2480 Nm
Max. torque for tooth root resistance to breakage		6380 Nm
Tooth Flank Life, hours		16200
Tooth Root Life, hours		unlimited

Unit life, hours	16200

RR 210 T FS 1/103.69
Rating method: DIN 3990/1987 - ISO 6336/1996.
REGGIANA RIDUTTORI shall not be responsible for any damage due to improper use.

Application as speed reducer. Monodirectional load.

Actual total gear ratio		103.97
Assumed efficiency of the gear unit		0.956
Requested application factor		1
Fast shaft:	Revol. per minute	1040
	Torque	18.9 Nm
	Power	2.06 kW
Slow shaft:	Revol. per minute	10
	Torque	1880 Nm
	Power	1.97 kW

105/5.42
Stage No. 1 - Planetary type

Actual gear ratio		5.43
Assumed efficiency of the stage		0.985
Fast shaft of the stage:	Revol. per minute	1040
	Torque	18.9 Nm
Slow shaft of the stage:	Revol. per minute	191.5
	Torque	101 Nm

At the slow shaft of the stage:

Pitting fatigue limit torque	843 Nm
Max. torque for surface static resistance	2380 Nm
Fatigue limit torque for strength against tooth breakage	861 Nm
Max. torque for tooth root resistance to breakage	2220 Nm
Tooth Flank Life, hours	unlimited
Tooth Root Life, hours	unlimited

110/5.78
Stage No. 2 - Planetary type

Actual gear ratio		5.79
Assumed efficiency of the stage		0.985
Fast shaft of the stage:	Revol. per minute	191.5
	Torque	101 Nm
Slow shaft of the stage:	Revol. per minute	33.1
	Torque	576 Nm

At the slow shaft of the stage:

Pitting fatigue limit torque	825 Nm
Max. torque for surface static resistance	2440 Nm
Fatigue limit torque for strength against tooth breakage	1230 Nm
Max. torque for tooth root resistance to breakage	3160 Nm
Tooth Flank Life, hours	unlimited
Tooth Root Life, hours	unlimited

RR 210 T FS 1/103.69
Rating method: DIN 3990/1987 - ISO 6336/1996.
REGGIANA RIDUTTORI shall not be responsible for any damage due to improper use.

Application as speed reducer. Monodirectional load.

Actual total gear ratio		103.97
Assumed efficiency of the gear unit		0.956
Requested application factor		1
Fast shaft:	Revol. per minute	1040
	Torque	16.8 Nm
	Power	1.83 kW
Slow shaft:	Revol. per minute	10
	Torque	1670 Nm
	Power	1.75 kW

105/5.42
Stage No. 1 - Planetary type

Actual gear ratio		5.43
Assumed efficiency of the stage		0.985
Fast shaft of the stage:	Revol. per minute	1040
	Torque	16.8 Nm
Slow shaft of the stage:	Revol. per minute	191.5
	Torque	89.8 Nm

At the slow shaft of the stage:

Pitting fatigue limit torque	843 Nm
Max. torque for surface static resistance	2380 Nm
Fatigue limit torque for strength against tooth breakage	861 Nm
Max. torque for tooth root resistance to breakage	2220 Nm
Tooth Flank Life, hours	unlimited
Tooth Root Life, hours	unlimited

110/5.78
Stage No. 2 - Planetary type

Actual gear ratio		5.79
Assumed efficiency of the stage		0.985
Fast shaft of the stage:	Revol. per minute	191.5
	Torque	89.8 Nm
Slow shaft of the stage:	Revol. per minute	33.1
	Torque	512 Nm

At the slow shaft of the stage:

Pitting fatigue limit torque	825 Nm
Max. torque for surface static resistance	2440 Nm
Fatigue limit torque for strength against tooth breakage	1230 Nm
Max. torque for tooth root resistance to breakage	3160 Nm
Tooth Flank Life, hours	unlimited
Tooth Root Life, hours	unlimited

210/3.31

Stage No. 3 - Planetary type		
Actual gear ratio		3.31
Assumed efficiency of the stage		0.985
Fast shaft of the stage:	Revol. per minute	33.1
	Torque	512 Nm
Slow shaft of the stage:	Revol. per minute	10
	Torque	1670 Nm
At the slow shaft of the stage:		
Pitting fatigue limit torque		1760 Nm
Max. torque for surface static resistance		5200 Nm
Fatigue limit torque for strength against tooth breakage		2480 Nm
Max. torque for tooth root resistance to breakage		6380 Nm
Tooth Flank Life, hours		unlimited
Tooth Root Life, hours		unlimited
Unit life, hours		unlimited

RR 210 T FS 1/103.69
Rating method: DIN 3990/1987 - ISO 6336/1996.
REGGIANA RIDUTTORI shall not be responsible for any damage due to improper use.

Application as speed reducer. Monodirectional load.

Actual total gear ratio		103.97
Assumed efficiency of the gear unit		0.956
Requested application factor		1
Fast shaft:	Revol. per minute	1040
	Torque	17.6 Nm
	Power	1.92 kW
Slow shaft:	Revol. per minute	10
	Torque	1750 Nm
	Power	1.83 kW

105/5.42
Stage No. 1 - Planetary type

Actual gear ratio		5.43
Assumed efficiency of the stage		0.985
Fast shaft of the stage:	Revol. per minute	1040
	Torque	17.6 Nm
Slow shaft of the stage:	Revol. per minute	191.5
	Torque	94.1 Nm

At the slow shaft of the stage:

Pitting fatigue limit torque	843 Nm
Max. torque for surface static resistance	2380 Nm
Fatigue limit torque for strength against tooth breakage	861 Nm
Max. torque for tooth root resistance to breakage	2220 Nm
Tooth Flank Life, hours	unlimited
Tooth Root Life, hours	unlimited

110/5.78
Stage No. 2 - Planetary type

Actual gear ratio		5.79
Assumed efficiency of the stage		0.985
Fast shaft of the stage:	Revol. per minute	191.5
	Torque	94.1 Nm
Slow shaft of the stage:	Revol. per minute	33.1
	Torque	536 Nm

At the slow shaft of the stage:

Pitting fatigue limit torque	825 Nm
Max. torque for surface static resistance	2440 Nm
Fatigue limit torque for strength against tooth breakage	1230 Nm
Max. torque for tooth root resistance to breakage	3160 Nm
Tooth Flank Life, hours	unlimited
Tooth Root Life, hours	unlimited

210/3.31
Stage No. 3 - Planetary type

Actual gear ratio		3.31
Assumed efficiency of the stage		0.985
Fast shaft of the stage:	Revol. per minute	33.1
	Torque	536 Nm
Slow shaft of the stage:	Revol. per minute	10
	Torque	1750 Nm

At the slow shaft of the stage:

Pitting fatigue limit torque	1760 Nm
Max. torque for surface static resistance	5200 Nm
Fatigue limit torque for strength against tooth breakage	2480 Nm
Max. torque for tooth root resistance to breakage	6380 Nm
Tooth Flank Life, hours	37700
Tooth Root Life, hours	unlimited

Unit life, hours 37700

RR 210 T FS 1/103.69
Rating method: DIN 3990/1987 - ISO 6336/1996.
REGGIANA RIDUTTORI shall not be responsible for any damage due to improper use.

Application as speed reducer. Monodirectional load.

Actual total gear ratio		103.97
Assumed efficiency of the gear unit		0.956
Requested application factor		1
Fast shaft:	Revol. per minute	1040
	Torque	27 Nm
	Power	2.94 kW
Slow shaft:	Revol. per minute	10
	Torque	2680 Nm
	Power	2.81 kW

105/5.42
Stage No. 1 - Planetary type

Actual gear ratio		5.43
Assumed efficiency of the stage		0.985
Fast shaft of the stage:	Revol. per minute	1040
	Torque	27 Nm
Slow shaft of the stage:	Revol. per minute	191.5
	Torque	144 Nm

At the slow shaft of the stage:

Pitting fatigue limit torque	843 Nm
Max. torque for surface static resistance	2380 Nm
Fatigue limit torque for strength against tooth breakage	861 Nm
Max. torque for tooth root resistance to breakage	2220 Nm
Tooth Flank Life, hours	unlimited
Tooth Root Life, hours	unlimited

110/5.78
Stage No. 2 - Planetary type

Actual gear ratio		5.79
Assumed efficiency of the stage		0.985
Fast shaft of the stage:	Revol. per minute	191.5
	Torque	144 Nm
Slow shaft of the stage:	Revol. per minute	33.1
	Torque	823 Nm

At the slow shaft of the stage:

Pitting fatigue limit torque	826 Nm
Max. torque for surface static resistance	2450 Nm
Fatigue limit torque for strength against tooth breakage	1230 Nm
Max. torque for tooth root resistance to breakage	3160 Nm
Tooth Flank Life, hours	2530
Tooth Root Life, hours	unlimited

210/3.31		
Stage No. 3 - Planetary type		
Actual gear ratio		3.31
Assumed efficiency of the stage		0.985
Fast shaft of the stage:	Revol. per minute	33.1
	Torque	823 Nm
Slow shaft of the stage:	Revol. per minute	10
	Torque	2680 Nm
At the slow shaft of the stage:		
Pitting fatigue limit torque		1760 Nm
Max. torque for surface static resistance		5200 Nm
Fatigue limit torque for strength against tooth breakage		2480 Nm
Max. torque for tooth root resistance to breakage		6380 Nm
Tooth Flank Life, hours		1980
Tooth Root Life, hours		729
Unit life, hours		729

RR 105 D FS 1/51.84.
Rating method: DIN 3990/1987 - ISO 6336/1996.
REGGIANA RIDUTTORI shall not be responsible for any damage due to improper use.

Application as speed reducer. Monodirectional load.

Actual total gear ratio		51.84
Assumed efficiency of the gear unit		0.97
Requested application factor		1
Fast shaft:	Revol. per minute	829.4
	Torque	7.34 Nm
	Power	0.637 kW
Slow shaft:	Revol. per minute	16
	Torque	369 Nm
	Power	0.618 kW

105/7.2
Stage No. 1 - Planetary type

Actual gear ratio		7.2
Assumed efficiency of the stage		0.985
Fast shaft of the stage:	Revol. per minute	829.4
	Torque	7.34 Nm
Slow shaft of the stage:	Revol. per minute	115.2
	Torque	52 Nm

At the slow shaft of the stage:

Pitting fatigue limit torque	624 Nm
Max. torque for surface static resistance	1810 Nm
Fatigue limit torque for strength against tooth breakage	810 Nm
Max. torque for tooth root resistance to breakage	2080 Nm
Tooth Flank Life, hours	unlimited
Tooth Root Life, hours	unlimited

105-7.2
Stage No. 2 - Planetary type

Actual gear ratio		7.2
Assumed efficiency of the stage		0.985
Fast shaft of the stage:	Revol. per minute	115.2
	Torque	52 Nm
Slow shaft of the stage:	Revol. per minute	16
	Torque	369 Nm

At the slow shaft of the stage:

Pitting fatigue limit torque	621 Nm
Max. torque for surface static resistance	1840 Nm
Fatigue limit torque for strength against tooth breakage	825 Nm
Max. torque for tooth root resistance to breakage	2110 Nm
Tooth Flank Life, hours	unlimited
Tooth Root Life, hours	unlimited

Unit life, hours	unlimited

RR 105 D FS 1/51.84
Rating method: DIN 3990/1987 - ISO 6336/1996.
REGGIANA RIDUTTORI shall not be responsible for any damage due to improper use.

Application as speed reducer. Monodirectional load.

Actual total gear ratio		51.84
Assumed efficiency of the gear unit		0.97
Requested application factor		1
Fast shaft:	Revol. per minute	829.4
	Torque	9.42 Nm
	Power	0.819 kW
Slow shaft:	Revol. per minute	16
	Torque	474 Nm
	Power	0.794 kW

105/7.2
Stage No. 1 - Planetary type

Actual gear ratio		7.2
Assumed efficiency of the stage		0.985
Fast shaft of the stage:	Revol. per minute	829.4
	Torque	9.42 Nm
Slow shaft of the stage:	Revol. per minute	115.2
	Torque	66.8 Nm

At the slow shaft of the stage:

Pitting fatigue limit torque	624 Nm
Max. torque for surface static resistance	1810 Nm
Fatigue limit torque for strength against tooth breakage	810 Nm
Max. torque for tooth root resistance to breakage	2080 Nm
Tooth Flank Life, hours	unlimited
Tooth Root Life, hours	unlimited

105/7.2
Stage No. 2 - Planetary type

Actual gear ratio		7.2
Assumed efficiency of the stage		0.985
Fast shaft of the stage:	Revol. per minute	115.2
	Torque	66.8 Nm
Slow shaft of the stage:	Revol. per minute	16
	Torque	474 Nm

At the slow shaft of the stage:

Pitting fatigue limit torque	622 Nm
Max. torque for surface static resistance	1840 Nm
Fatigue limit torque for strength against tooth breakage	825 Nm
Max. torque for tooth root resistance to breakage	2120 Nm
Tooth Flank Life, hours	unlimited
Tooth Root Life, hours	unlimited

Unit life, hours	unlimited

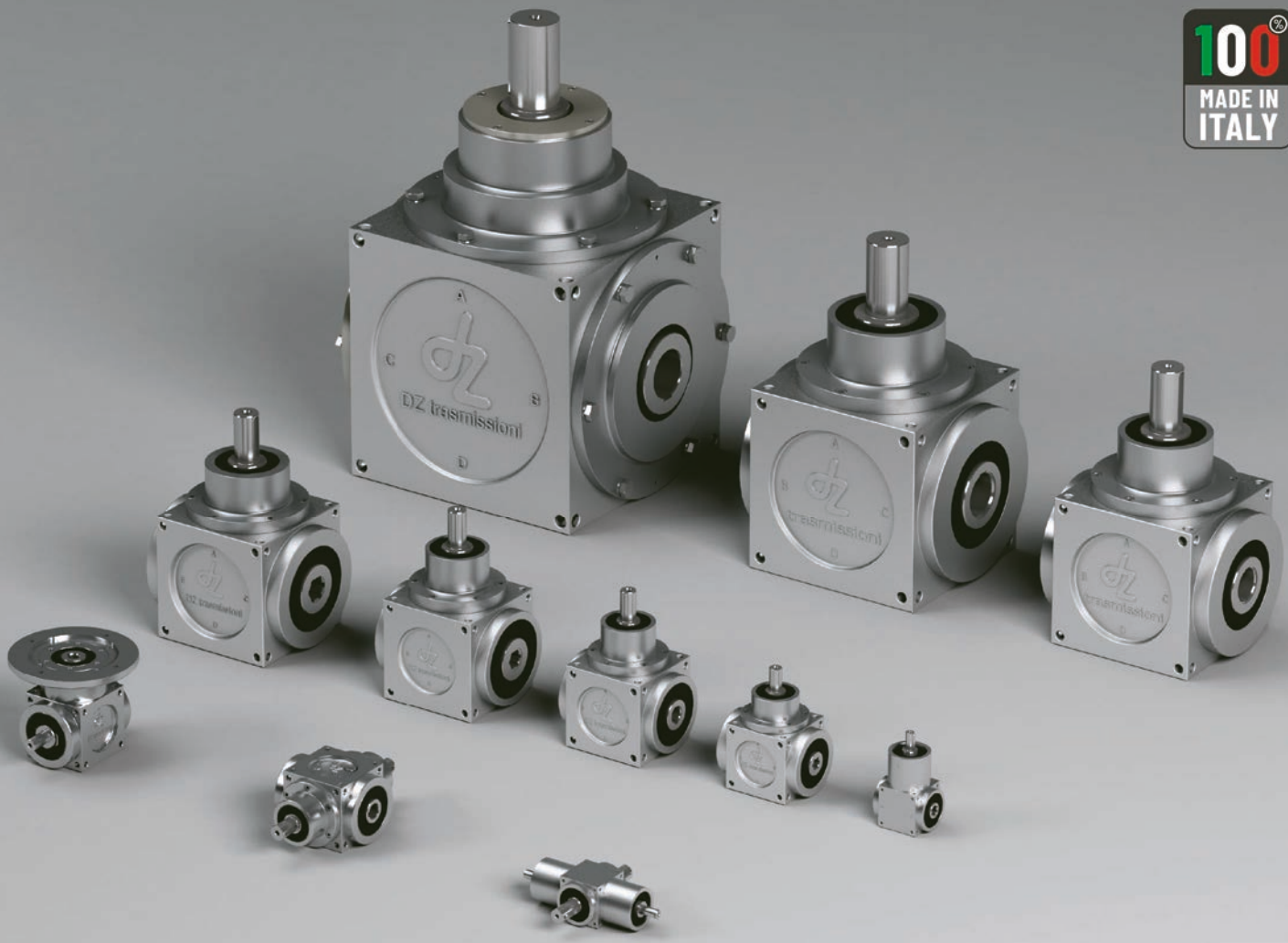
15. Appendix 7 – Bevel Gears

QB SERIES

RINVII ANGOLARI DI PRECISIONE

RIGHT-ANGLE PRECISION GEAR DRIVES

100% MADE IN ITALY



DZ trasmissioni

www.dztrasmissioni.com

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QUATTRO BUONI MOTIVI

I nuovi rinvii **serie QB** vengono prodotti in 8 grandezze. Le novità che caratterizzano il prodotto si possono riassumere in quattro punti:

1 **Più leggeri** Lighter

2 **Più precisi** More accurate

3 **Più robusti** Stronger

4 **Più economici** Cheaper

FOUR GOOD REASONS

The new **QB series** gear drives are produced in 8 sizes. The products' new features can be summed up in four aspects:





VECCHIO PROGETTO OLD PROJECT

Ghisa 4 pezzi - Peso **3,10** Kg
4-piece **cast-iron** - Weight **3.10** Kg

NUOVO PROGETTO NEW PROJECT

Alluminio 2 pezzi - Peso **1,08** Kg
Aluminium 2-piece - Weight **1.08** Kg



Grandezza / Size: **2/86**

VECCHIO PROGETTO OLD PROJECT

Ghisa 4 pezzi - Peso **1,16** Kg
4-piece **cast-iron** - Weight **1.16** Kg

NUOVO PROGETTO NEW PROJECT

Alluminio 1 pezzo - Peso **0,32** Kg
Aluminium 1-piece - Weight **0.32** Kg



Grandezza / Size: **1/54**

Ossidazione Anodica
Anodic Oxidation



GHA Golden Hard Anodizing
Resistenza alla nebbia salina / Corrosion resistance Salt Solution Test: 10000 ore/hours

(INOX 6000 ore - SST 6000 hours)



Brevetto N°**EP1207220** - Patent N°**EP1207220**

LA NOSTRA STORIA

La storia inizia da molto lontano, nel 1946, quando **D**idimo **Z**anetti e il fratello Augusto iniziano un'attività artigianale nel settore meccanico. In quel tempo era appena finita la Seconda Guerra Mondiale, tutto era da ricostruire e nessuno si rendeva conto che le opportunità erano **enormi**. Infatti molti tecnici abili ed esperti, che vennero licenziati da aziende storiche come la Ducati di Bologna (che nel periodo bellico aveva grandi commesse che cessarono, appunto, con la fine del conflitto) si ritrovarono disoccupati e disperati. Tuttavia questa, fu in un certo senso, la loro fortuna, perché inconsapevolmente crearono aziende ancor oggi di grande livello, soprattutto nel settore degli ingranaggi, come appunto i fratelli Zanetti, che nel corso degli anni si separarono dando vita a due aziende eccellenti, la **D**idimo **Z**anetti e la Zanetti Augusto.
Nel 1986, esattamente quarant'anni dopo, da un ramo della **D**idimo **Z**anetti nacque la **DZ** trasmissioni. I primi progetti dei rinvii angolari risalgono al 1979, e da allora fino al 1986 i gruppi angolari venivano costruiti e commercializzati dalla "casa madre". A partire dal 1996 la **DZ** trasmissioni si rese autonoma, ma ancora oggi la Didimo Zanetti (che nel tempo tramite Andrea Zanetti, figlio di Didimo, si è ricongiunta all'azienda del fratello, vantando così due unità produttive a Bologna e ad Aprilia), con oltre 200 persone specializzate nella costruzione di ingranaggi conici, è un fornitore di grandissimo pregio degli ingranaggi conici GLEASON, che sono il cuore pulsante dei gruppi angolari della DZ trasmissioni.

L'AZIENDA

La DZ trasmissioni, con la sua trentennale esperienza, risolve con i rinvii angolari di serie DZ, ZP e QB, ma anche specifici, qualsiasi problema di trasmissione di potenza di un moto rotatorio tra due o più assi disposti a 90° tra loro. La dimensione aziendale e la sua struttura consentono lo studio e la costruzione di trasmissioni speciali in tempi ristretti. Un qualificato servizio tecnico-commerciale è a disposizione per risolvere, nel modo più affidabile ed economico, i problemi del cliente.
Esponeteci il vostro problema, è possibile che tra i tanti "speciali" che già costruiamo per i nostri clienti, durante i trent'anni di attività, ve ne sia uno adeguato alle vostre esigenze.

OUR HISTORY

The story begins a long time ago, in 1946, when **D**idimo **Z**anetti and his brother Augusto began an artisan enterprise in the mechanical sector. The Second World War had just ended, everything had to be rebuilt and no one realized the magnitude of opportunities that lay ahead. In fact, many skilled and experienced technicians, who had been dismissed from companies such as the historical Ducati in Bologna (which had major job orders during the war that ceased with the end of the conflict), were now unemployed and desperate. But, in a sense, this turned out to be their stroke of luck because they unwittingly created companies that today still maintain high quality levels, especially in the gears sector, such as the Zanetti brothers who parted over the years and gave birth to two excellent companies, the **D**idimo **Z**anetti and the Zanetti Augusto.
In 1986, exactly forty years later, **DZ** TRASMISSIONI was founded from a branch of **D**idimo **Z**anetti. The first right-angle gear drive projects date back to 1979 and since then, until 1986, right-angle gear drives were manufactured and marketed by the "parent company". In 1996 **DZ** TRASMISSIONI became independent, but even today Didimo Zanetti (which over time rejoined his brother's company through Andrea Zanetti, Didimo's son, hence boasting two production units in Bologna and in Aprilia), with over 200 employees skilled in manufacturing bevel gears, is a supplier of great value of GLEASON bevel gears, which are the throbbing heart of DZ TRASMISSIONI's angular gears.

THE COMPANY

With its 30 year experience, DZ TRASMISSIONI is able to solve any problem connected with power transmission, through its DZ, ZP and QB right-angle gear drive series and also any specific problem relating to the rotary motion between two or more axes arranged at 90°. The company's capacity and organization enable the study and manufacture of special gearboxes even on a short notice. A qualified technical and sales service is at customer's disposal to solve any problem in the most reliable and cost-saving manner.
Let us know your requirements and we will probably have the right solution to your problem among the various "special" units we have been manufacturing for our customers during our last 30 years of business.







trasmissioni

LA NUOVA SERIE QB

I rinvii angolari serie QB sono stati progettati per applicazioni industriali ove occorre trasmettere un moto rotatorio di potenza tra assi disposti perpendicolarmente tra loro.
Otto diverse grandezze, cinque rapporti di riduzione (o moltiplica) 1:1 - 1:1,5 - 1:2 - 1:3 - 1:4, alberi da diametro 11 a 85 mm, alberi cavi passanti da diametro 12 a 80 mm con linguetta da 4 a 22 mm, oppure alberi cavi con profilo scanalato UNI 8953 NT dal 6x11x14 al 10x72x82. Inoltre sono disponibili alberi cavi predisposti per il trascinamento con calettatore, ed ancora flange con albero cavo e cava linguetta per attacco motore elettrico in versione B5 e B14, dalla grandezza 86 alla 250. Potenze fino a 1.074 Kw, coppie fino a 9.516 Nm, velocità di rotazione fino a 3.000 giri/minuto ed anche oltre.

THE NEW QB SERIES

The right-angle gear drives of the QB series were designed for industrial applications, where it is necessary to transmit rotary power motion between axes arranged perpendicularly.
Eight different sizes, five gear ratios (or speed multipliers) 1:1 - 1:1.5 - 1:2 - 1:3 - 1:4, shafts with diameters ranging from 11 to 85 mm, through hollow shafts with diameters from 12 to 80 mm with splines from 4 to 22 mm, or hollow shafts with UNI 8953 NT grooved profile from 6x11x14 to 10x72x82. Also available are hollow shafts set-up for driving with locking set, and flanges with hollow shaft and spline seat for electric motor coupling in B5 and B14 versions, size from 86 to 250. Powers up to 1,074 kW, torques up to 9,516 Nm, rotation speed up to 3,000 rpm and even faster.

CARATTERISTICHE

CARTER



Le NOVITÀ più importanti di questo progetto stanno nella costruzione del tutto innovativa dei carter che (a parte la taglia più grossa QB 350) sono in lega di alluminio, ricavati da trafilato e/o da fusione: già questo fa calare il peso totale dei gruppi mediamente di 2/3. Inoltre nelle costruzioni classiche in ghisa, ormai obsolete, nell'intento di creare un carter già disponibile per tante diverse situazioni, canonicamente composto da quattro pezzi (corpo cubitale centrale, due flange laterali ed una "torretta"), si è perso di vista il problema che tutti questi elementi necessitano di centraggi su centraggi, fori, filetti e viti che sono molto ingombranti, oltre che molto più costosi che non un pezzo unico, o due pezzi, fino a un massimo di tre, del nostro concetto di carter innovativo.



Oltre al problema dei costi (che non è di poca importanza), c'è anche una fortissima **motivazione tecnica**: la mancanza di flange, centraggi su centraggi e viti ci permette, **a parità di dimensioni esterne dei gruppi**, di avere alesaggi molto più grandi che consentono il montaggio di ingranaggi e cuscinetti che, in alcune taglie, sono più 30-40% delle vecchie progettazioni. Ripeto: a parità di dimensioni esterne; ne consegue che le prestazioni aumentano anche in maniera superiore alle sole dimensioni geometriche degli elementi in gioco.
Inoltre anche la precisione totale, soprattutto per ciò che concerne la ricerca di giochi angolari tra entrata ed uscita sempre più piccoli, ha un grandissimo beneficio. Basti pensare al fatto che col vecchio sistema l'asse B-C era composto da flangia B + carter + flangia C, due cuscinetti centrati sulle flange B e C a loro volta centrate sul carter, che a sua volta centra e supporta l'albero e/o l'albero forato. Viceversa, con il nostro nuovo progetto, abbiamo l'asse B-C sul carter e un solo alesaggio sul quale direttamente si centrano i cuscinetti, che centrano e supportano l'albero e/o l'albero forato.



Molti costruttori promettono giochi angolari contenuti entro 5' di grado o anche meno, e noi non possiamo certo mettere in dubbio ciò che scrivono i nostri concorrenti; ci limitiamo a fare presente ai nostri clienti che l'ottenimento di certi risultati, proprio per la novità del nostro progetto, sono per noi molto più semplici da ottenere realmente.
La prima grandezza è 54 monoblocco rigido in lega d'alluminio; nelle successive dimensioni dall'86 al 166 il carter è composto in due pezzi, sempre in alluminio. Dal 200 al 250 il carter è in tre pezzi, sempre in lega di alluminio, mentre il più grande 350 è in ghisa, ed il carter è in 4 pezzi. L'alluminio, che per i carter è il materiale da noi più utilizzato da sempre sia dal trafilato che da fusione, rispetto alla vecchia concezione del carter progettato in 4 pezzi in ghisa fa calare mediamente il peso totale del gruppo di circa 2/3, aspetto di non poca importanza date le nuove esigenze di risparmio energetico. Immaginate di poter diminuire di 2/3 il peso della vostra autovettura: sicuramente avreste bisogno di qualche litro di benzina o gasolio in meno per raggiungere la stessa meta. Non è un caso che le case automobilistiche leader mondiali sulle autovetture più recenti utilizzino alluminio e non più ghisa per i basamenti dei motori: è evidente che l'alluminio è il materiale del futuro.



FEATURES

HOUSINGS

This project's most important INNOVATION consists in the way the housings are constructed (apart from the largest QB 350 size) which are made of aluminium, drawn and/or through cast: even this feature alone generally reduces the total weight of the units by two thirds. Moreover, in the classic cast iron construction, now obsolete, with the aim of creating a housing already available for many different situations, traditionally made up of four pieces (cube central body, two side flanges and a "tower"), one has lost sight of the problem that all these elements require series of centrings, holes, threads and screws that take up much space, besides being much more expensive than a single piece, or two pieces, up to a maximum of three, as far as our idea of an innovative housing is concerned.
In addition to the cost problem (not of little importance), there is also a very strong **technical reason**: the lack of flanges, series of centrings and screws allows us to have, **units external sizes being the same**, much larger bores which allow the installing of gears and bearings that, in some sizes, are 30-40% larger than the old ones. Again: external sizes being the same, it follows that performance increases even more than just the geometric sizes of the elements involved.
Also, the total precision, especially for what concerns the search for continually less backlash tolerance between input and output, features quite an advantage. Just think about the fact that under the old system, the B-C axis was made up of flange B + housing + flange C, two bearings centered on flanges B and C which were, in turn, centered on the housing, which in turn centers and supports the shaft and/or the hollow shaft. Vice versa, with our new design, the B-C axis is on the housing and only one bore on which the bearings are centered directly, which in turn center and support the shaft and/or the hollow shaft.
Many manufacturers promise to limit backlash within 5' or even less, and we certainly cannot question what our competitors write. We just inform our customers that achieving certain results, precisely thanks to the novelty of our project, is much easier for us in actual fact.
The first size is a 54 rigid monobloc made of aluminium; in the next sizes, from 86 to 166, the housing is made up of two pieces, always aluminium. From size 200 to 250 the housing is in 3 pieces, always aluminium, whereas the largest one 350 is made of cast iron, and the housing is made up of 4 pieces. Aluminium, which is the material we have always used the most, either drawn or cast, generally reduces the unit's total weight by about two thirds, as compared to the old notion of the housing designed in 4 cast iron pieces, an aspect which should not to be underestimated given the new energy-saving requirements. Imagine being able to reduce the weight of your car by two thirds: you might need a fewer liters less petrol or diesel to reach the same destination. It is no coincidence that the world's leading car manufacturers are using aluminium on their newer cars rather than cast iron for the engine crankcases: it is clear that aluminium is the material of the future.

Oltre alla principale caratteristica di leggerezza l'alluminio è di gran lunga meno ossidabile della ghisa; inoltre si presta, secondo esigenza, a molteplici trattamenti come: anodizzazione, fosfocromatazione, e GHA Golden Hard Anodizing (brevetto n° EP1207220) che mediante ioni d'argento inibisce la proliferazione batterica, trattamento eccellente per applicazioni nell'industria alimentare, chimica, farmaceutica e tante altre.
Un carter in alluminio con questo trattamento a 20 micron di spessore resiste in nebbia salina 10.000 ore; lo stesso pezzo in inox AISI 316 resisterebbe 6.000 ore con costi più che doppi.

In addition to its main characteristic, i.e. lightness, aluminium is far less prone to rust than cast iron and is also adaptable to numerous treatments, according to requirements, such as anodizing, phospho-chromatization and GHA Golden Hard Anodizing (Patent No. EP1207220), which uses silver ions to inhibit the proliferation of bacteria, an excellent treatment used in the food, chemical, pharmaceutical industry and may other applications. An aluminium housing subjected to the foregoing 20-micron thick treatment withstands 10,000 hours in salt spray; the same piece made of AISI 316 steel would withstand 6,000 hours and cost more than double.

INGRANAGGI



Conici tagliati su macchine GLEASON, dentatura spiroidale che assicura la massima capacità di carico. Sono costruiti in acciaio al Nikel-Cromo. Il trattamento superficiale di cementazione-tempra garantisce una lunga durata all'usura pur lasciando tenace ed elastico il cuore del dente per sopperire agli urti meccanici. Il gioco angolare tra gli ingranaggi è regolato per garantire un ingranamento ed una silenziosità ottimale; qualora espressamente richiesto può essere ridotto REALMENTE a 5' di gradi misurato sull'albero lento (la corona nei rapporti diversi dall' 1:1) con condizioni speciali di consegna e prezzo.
È importante sapere e comprendere che nei rapporti 1:1 il **gioco angolare** rilevato sull'asse di entrata bloccando quello di uscita, e viceversa, nello stesso punto di rotazione è sempre uguale. E comunque nell'arco di una rotazione a 360° va da un minimo ad un massimo dipendente dalle imperfezioni di lavorazione, e soprattutto dall'errore di eccentricità dei due assi in rotazione.



Negli altri quattro rapporti 1:1,5 - 1:2 - 1:3 e 1:4 c'è da considerare che, per fare un giro completo dell'ingranaggio più grande (corona asse lento), bisogna fare, secondo il rapporto, 1,5 o 2 o 3 o 4 giri sull'ingranaggio più piccolo (pignone asse veloce). Perciò per eseguire un controllo reale e totale del gioco angolare, nei rapporti diversi dall' 1:1, dal suo minimo al suo massimo, bisogna eseguire una rotazione completa della corona che, come detto, corrisponderà a 1,5 o 2 o 3 o 4 giri del pignone e perciò rilevare in diversi punti per ottenere dal minimo al massimo il valore ricercato.
Oltre ciò è **molto importante** considerare che nei rapporti diversi dall' 1:1 l'asse veloce, secondo il rapporto, avrà un gioco angolare di 1.5, 2, 3, 4 volte superiore a quello rilevato nello stesso punto della rotazione dell'albero lento (ingranaggio grande corona).
In conclusione per un **gioco angolare misurato sull'asse lento**, nello stesso punto il gioco angolare dell'asse veloce sarà direttamente proporzionale al rapporto, e per conoscerne il valore lo si moltiplicherà per il rapporto stesso.

GEARS

The bevel gears cut on GLEASON hobbing machines, with spiral toothing which ensures maximum load capacity, are made of nickel-chrome steel. The case-hardening surface treatment ensures maximum service life against wear while leaving the tooth core tough and flexible to resist mechanical shocks. Units are manufactured with backlash tolerances to ensure perfect gear engagement and silent operation. If specifically requested, backlash tolerances can REALLY be reduced to a minimum of 5' measured on the slow shaft (the crown in ratios other than 1:1) with special prices and delivery conditions.
It is important to know and understand that in 1:1 ratios, the **backlash tolerance** measured on the input axis blocking the output axis, and vice versa, is always the same in the same rotation point. And in any case, throughout a 360° rotation, it ranges from minimum to maximum depending on machining imperfections, and especially the error of eccentricity of the two rotating axes.
In the other four ratios, 1:1.5 - 1:2 - 1:3 and 1:4, we have to consider that in order to make a complete revolution of the bigger gear (slow axis crown), there must be, depending on the ratio, 1.5 or 2 or 3 or 4 revolutions on the smaller gear (fast axis pinion). Therefore, in order to perform an actual and total control of the angular backlash, in ratios other than 1:1, from its minimum to its maximum, the crown must perform a complete rotation that, as said above, will correspond to 1.5 or 2 or 3 or 4 revolutions of the pinion and therefore measure at various points to obtain the sought value from minimum to maximum. Besides this, it is **very important** to take into account that in ratios other than 1:1, the fast axis will have, according to ratio, an angular backlash of 1.5, 2, 3, 4 times greater than that measured in the same point of rotation of the slow shaft (large crown gear).
In conclusion, for a **backlash measured on the slow axis**, the fast axis' backlash will be directly proportional to the ratio in the same point. To know its value, multiply it by the ratio itself.

ALBERI E ASSI CAVI E PER CALETTATORI



Sono costruiti in acciaio al carbonio trattati a 80 Kg/mm². Anche gli alberi degli assi veloci, nei rapporti diversi dall' 1:1, non sono di pezzo con l'ingranaggio pignone e perciò temperati, è quindi possibile eseguire sugli stessi ulteriori lavorazioni come anche un semplice foro per una spina per un bloccaggio sia radiale che assiale privo di giochi. Alberi maschi rettificati tutti in tolleranza h7, alberi forati per linguette e/o calettatore rettificati tolleranza H7.
Trascinamenti esterni su alberi maschi tutti con linguetta UNI 6604-A, tolleranza linguetta h9 inserita nella sua sede sull'albero in tolleranza P9 (accoppiamento bloccato) privo di giochi residui. Sedi linguette in tutti gli alberi forati passanti e per motori nelle flange Pam sui fianchi tolleranza H9.



Mentre, all'interno, accoppiamento tra albero e ingranaggi eseguito con forte interferenza e linguette bonificate e successivamente nikelate chimicamente, con spessore minimo 20 micron per conferire la duplice funzione di forte indurimento superficiale (500/530 HV) contro le impronte, e anche di creare forte interferenza sull'accoppiamento per eliminare ogni eventuale gioco radiale residuo possibile.

SHAFTS AND HOLLOW AXES FOR LOCKING SETS

These are manufactured in carbon steel with 80 Kg/mm² surface treatment. Even the shafts of the fast axes, in ratios other than 1:1, are not in one piece with the pinion gear and, as such, tempered. Hence, further processing can be performed on shafts such as even a simple hole for a pin for a backlash-free locking, both radial and axial. Male ground shafts all within tolerance h7, hollow shafts for splines and/or locking sets, ground within tolerance H7. External drives on male shafts all with UNI 6604-A splines, tolerance of spline h9 inserted in its seat on the shaft within tolerance P9 (coupling locked) devoid of residual backlash.
Spline seats in all hollow through shafts and for engines in the Pam flanges on the sides are within tolerance H9 whereas on the inside, coupling between shaft and gears performed with strong interference and quenched and tempered splines and subsequently chemically nickel-plated, with minimum thickness of 20 micron to provide the dual function of strong surface hardening (500/530 HV) against fingerprints, and also to create strong interference on the coupling to eliminate any possible residual radial clearance.



CUSCINETTI

Vengono utilizzati solo cuscinetti di prima marca e, a parte la taglia 54 ove i cuscinetti così piccoli non sono disponibili conici e sono a sfere a gola profonda, tutte le altre taglie in tutti gli assi di rotazione (compresi gli alberi forati ciechi per accoppiamento motori elettrici) sono supportati da cuscinetti a rulli conici, che danno le massime garanzie in tutte le più severe condizioni.

BEARINGS

Only leading brand bearings are used and, apart from size 54 for which bearings this small are not available tapered but are ball bearings in deep races. All the other sizes in all the rotation axes (including the blind hollow shafts for the coupling of electrical motors) are supported by tapered roller bearings, which guarantee maximum performance in the most severe conditions.



TENUTE LUBRIFICANTE INTERNO

Nei centraggi delle flange (ove presenti) la tenuta statica è assicurata da anelli O-RING mentre le chiusure, sempre statiche, quando **non** sono presenti le sporgenze di alberi o alberi forati, sono eseguite con tappi di lamiera rivestiti in materiale nitrilico antiolio.
Le tenute statiche dei tappi dell'olio (ove presenti) sono in alluminio ricotto, mentre le tenute dinamiche sugli elementi in rotazione (oggetti sottoposti a usura) sono tutte eseguite con anelli di tenuta rotanti normalmente in mescola nitrilica, disponibili anche con labbro parapolvere per ambienti particolarmente "sporchi"; temperature funzionamento consigliate -20°C +80°C.
Per situazioni **speciali** sono disponibili anelli in VITON, SILICONE, KALREZ, TEFLON, TENUTE MECCANICHE DI OGNI TIPO, BADERNE; in questi casi è opportuno contattare il nostro servizio tecnico-commerciale per verificare la vostra specifica esigenza.

OIL SEALS

In the centring of the flanges (if any), static seal is ensured by O-RINGS whilst the static closures are performed, when the protusions of shafts or hollow shafts are **not** present, by means of metal caps coated with oil-resistant nitrile material.
The static seals of the oil caps (if any) are made of annealed aluminium while all the dynamic seals on the rotating elements (objects subject to wear and tear) are made with rotating seal rings normally made of nitrile rubber, also available with dust-cover lip for particularly "dirty" places; recommended operating temperature: between -20°C and +80°C.
In **special** cases, we can supply oil seal rings made of VITON, SILICONE, KALREZ, TEFLON, MECHANICAL SEALS OF ANY KIND, GLAND PACKING; in these cases you should contact our technical sales service to check your specific requirements.



LUBRIFICAZIONE

Tutti i gruppi vengono forniti già equipaggiati di lubrificante, la grandezza 54 con grasso sintetico permanente, tutte le altre grandezze con olio.
Nel caso di montaggi in cui l'asse A sia rivolto verso l'alto e magari con rotazione a bassi giri, ove sarebbe difficoltoso raggiungere e lubrificare il cuscinetto vicino alla sporgenza dell'albero A, tutte le taglie in tutti i modelli hanno la possibilità, tramite un anello di tenuta rotante montato all'interno tra i due cuscinetti dell'asse A, di creare una camera che normalmente viene riempita con grasso sintetico di consistenza 00, per una corretta lubrificazione a vita del cuscinetto nella posizione critica.
Vedi Sezione Elementi per la Compilazione Codice Prodotto a pag. 8 per ottenere i rinvii con questa particolare costruzione esecutiva.
Le versioni prive di indicazioni vengono fornite senza la camera di grasso aggiuntiva.
Sono disponibili olii e grassi speciali per applicazioni specifiche.

LUBRICATION

All units are supplied already filled with lubricant, size 54 units are filled with synthetic long-life grease; all other sizes are oil filled.
In the case of assemblies in which the A axis faces upwards and perhaps rotates at low rpm, when it would be difficult to reach and lubricate the bearing near the protusion of shaft A, all sizes in all models allow you to create a chamber, through a rotary seal ring mounted on the inside between the two bearings of axis A, which normally is filled with synthetic grease, 00 consistency, for a correct lifetime lubrication of the bearing in the critical position.
See Section: Items for Completing the Product Code on page 8 to obtain gear drives with this particular construction.
Versions devoid of directions come without the additional grease chamber.
Special oils and greases are available for specific applications.

RENDIMENTO E MOMENTO DI INERZIA

Rendimento: il **rendimento** è un valore variabile che oscilla dal 93 al 97% e che dipende dal rapporto, dal numero di assi presenti (fino a 6 possibili) e dal fatto che il riduttore sia nuovo o rodato.
Momento di inerzia: il **momento di inerzia** è un valore che dipende dal rapporto, dal numero di assi presenti e da altre variabili. In caso di accelerazioni e decelerazioni importanti richiedere i dati specifici al nostro servizio tecnico.

EFFICIENCY AND MOMENT OF INERTIA

Efficiency: The **efficiency** is a value that varies from 93 to 97% and depends on the ratio, the number of axes available (up to 6 possible) and if the regulator is new or run.
Moment of inertia: the **moment of inertia** is a value that depends on the ratio, the number of axes available and other variables. In case of strong acceleration and deceleration, please require specific data to our Technical Dept.

INTRODUZIONE

Nella scelta del rinvio angolare sono determinanti alcuni fattori che si devono individuare nei capitoli che riassumiamo in questa introduzione.
La tipologia del rinvio, in base alle esigenze di movimentazione da soddisfare, può avere più soluzioni di prese di forza.
Questi possono essere: alberi maschi, cavità con trazione tramite linguetta o profilo scanalato di tipo UNI 8953 o trascinamenti tramite calettatori, che sono le tre tipologie standard di nostra produzione.

Si possono avere ulteriori tipologie come ad esempio cavità esagonali o profili scanalati di tipo DIN o altro ancora consultando l'ufficio tecnico per verificare la possibilità costruttiva nella taglia desiderata.

Come già premesso nelle caratteristiche del nostro nuovo progetto innovativo, l'impiego di cuscinetti ed ingranaggi dimensionalmente più grandi a parità di taglia, ci ha permesso di prevedere anche alberi e mozzi con diametri interni sensibilmente maggiori. Questo ci consente sia di poter ingrossare gli alberi in uscita, sia di realizzare fori o scanalati con diametri interni maggiori, permettendoci così di poter sfruttare la maggior capacità di trasmissibilità dovuta al nuovo progetto e per tanto completamente disponibili per soluzioni speciali.

La disposizione ed il numero di prese di forza di produzione standard la si può trovare nella sezione riepilogativa del "Tipo" costruttivo, dove vengono rappresentati anche i sensi di rotazione delle varie uscite, in modo da poter determinare la corretta distribuzione delle rotazioni, partendo dall'asse di **ingresso (albero maschio o cavo) che per semplificare stabiliremo come "A"** ed avrà, sempre per convenzione, una rotazione in senso orario.

Ci permettiamo di consigliare di prestare attenzione, nel verificare le rotazioni delle varie prese di forza in uscita, in quanto dipendono dalla posizione dell'ingranaggio secondario (Corona).
Queste sono rappresentate in modo tridimensionale.
Diverso sarebbe se si considerano gli stessi sensi di rotazione guardando la presa di forza frontalmente.

INTRODUCTION

There are some crucial factors in choosing your right-angle gear drive, which you need to locate in the chapters we have summarized in this introduction.
The type of right-angle gear drive may have multiple types of PTOs, depending on motion requirements.
These can be: male shafts, cavity with traction through locking set or UNI 8953 grooved profile or anchors through locking sets, which are the standard types we manufacture.

You can have other types such as, for example, hexagonal cavities or DIN type grooved profiles or other types, by contacting the technical department to check the possibility of manufacturing items in the required size.

As already mentioned in the features of our innovative design, the use of larger bearings and gears (size being the same) has also allowed us to make shafts and hubs with considerably greater inside diameters. This enables us to be able to enlarge the output shafts and to make holes or grooves having greater inside diameters, so that we can take advantage of the increased transmission capacity thanks to the new design and are therefore fully available for special solutions.

You can find the arrangement and number of standard PTOs in the summary section of the constructive "Type", which also shows the rotating directions of the various outputs, so that you can determine the correct distribution of the rotations, starting from the **input axis (male or hollow shaft) which, to simplify, will be "A"** and will rotate clockwise by convention.

We advise caution in checking the rotations of the various PTOs at output, since they depend on the position of the input gear (Crown).
These are shown in 3D.
It would be different if you consider the same rotating directions looking at the PTO from the front.

AVVERTENZE DATI TECNICI

Nella determinazione del rinvio da impiegare oltre alle esigenze puramente tecniche delle potenze in funzione del numero di giri e delle coppie da trasmettere, bisogna tenere conto della gravosità dell'impiego che dipende da molteplici fattori: Ciclo di funzionamento (intermittente, costante, ecc. ecc.), carichi radiali e assiali gravanti sulla estremità degli alberi, temperature max. e min., ambiente (polveroso ecc. ecc.) tipo di lubrificante.

1) Determinare il fattore di servizio Fs indicato nella Tabella di pag. 18.

2) Calcolare la potenza nominale Pn = Potenza effettiva Pe x Fs.

3) Con la velocità in uscita e la potenza effettiva Pn scegliere a Tabella A a pag. 19 la dimensione ed il rapporto del rinvio da ordinare.

4) Controllare che i carichi radiali Fr e assiali Fa, applicati al centro della sporgenza di ogni singolo albero non superino i valori riportati in Tabella B a pag. 21. Per gli alberi cavi si consideri la forza applicata alla stessa distanza degli alberi maschi.

5) Verificare che la temperatura di esercizio non superi i valori da -20°C ÷ +80°C.

6) Consigliamo vivamente, nei rapporti in moltiplica, di non superare in ingresso il numero di 2000 giri/min. nel rapporto 1,5:1; di 1500 nel rapporto 2:1; 1000 nel rapporto 3:1 e 750 nel rapporto 4:1.

7) In presenza di ambienti particolarmente polverosi e conseguentemente abrasivi evitare l'esposizione diretta del paraolio onde preservarlo per consentire una durata maggiore dello stesso.

TECHNICAL NOTES

Selecting the correct type of angle bevel gear is not simply a question of defining the power required in relation to rpm and the torque to be transmitted. It also involves defining the conditions under which the angle bevel gear will be used. Defining operating conditions involves taking into consideration a number of factor such as the type of operating cycle (intermittent, continuous), radial and axial loads on the shaft ends, maximum and minimum temperatures, ambient conditions (e.g. dust and dirt levels) and the type of lubrificant used. To decide the type and size of angle bevel gear required, proceed as follows.

1) Use Table on page 18 to define the Service Factor for your application.

2) Calculate the Rated Power (Pn); Pn = Pe (Horsepower) x Fs.

3) On Table A on page 19, use the output speed and the rated power (Pn) to select the angle gear size and transmission ratio required for your application.

4) Check that the radial Fr and axial Fa loads applied at the centre of the protusion of every single shaft does not exeed the values shown in Table B on page 21. In the case of hollow shafts you should consider the force applied at the same distance of male shafts.

5) Check that the operating temperature does not exceed -20°C ÷ +80°C.

6) With regard to speed multiplier ratios, we strongly recommend not exceeding 2000 rpm at input in the 1.5:1 ratio; 1500 in the 2:1 ratio; 1000 in the 3:1 ratio and 750 in the 4:1 ratio.

7) If the unit is to be used in very dusty conditions, protect the oil seal against direct exposure to dust to prevent abrasive damage which might shorten the working life of the unit.

ELEMENTI PER LA COMPILAZIONE DEL CODICE PRODOTTO

Una volta individuato il rinvio angolare da ordinare, per evitare disguidi bisogna trasformarlo nel rispettivo ed identificativo Codice Prodotto che nella sua estensione è composto da 5 “campi”:

HINTS FOR COMPILING THE PRODUCT CODE

After locating the right-angle gear drive you intend ordering, and to avoid mix-ups, transform it into the respective identifying Product Code that, when extended, is made up of 5 “fields”:

1	2	3	4	5
Forma costruttiva Tipo	Albero entrata (A): se rinforzato aggiungere "R"	Taglia	Dove presente indicare la flangia PAM di attacco motore elettrico	Rapporto
Constructive form Type	Input shaft (A): if strengthened, add “R”	Size	When present, indicate the PAM flange for coupling the electrical motor	Ratio

Campo 1 **Forma Costruttiva e Tipo**

Dal Tipo n° **1** al n° **33** le Forme costruttive sono Standard, mentre dal Tipo n° **34** al n° **55** sono Forme Costruttive previste e fornibili su richiesta.

Campo 2 **Albero Entrata (A)**

Dove prevista la possibilità dell’Albero Entrata (A) in due diversi diametri, indicare la lettera “**R**” nel caso si desideri quello con il diametro **Maggiore**, mentre senza indicazione verrà fornito quello con il diametro **minore**.

Campo 3 **Taglia o Grandezza**

Le Taglie o grandezze dei nostri riduttori serie QB sono otto:
54 - 86 - 110 - 134 - 166 - 200 - 250 - 350

Campo 4 **Entrata (A) con Flangia PAM**

Dove sull’asse di ingresso (A) è richiesto l’albero cavo cieco per il montaggio di un motore elettrico, indicare la Flangia PAM desiderata e prevista sulle diverse taglie.

Campo 5 **Rapporto di Trasmissione**

I Rapporti di trasmissione dei nostri riduttori serie QB sono cinque:
R 1:1 - R1:1.5 - R 1:2 - R 1:3 - R 1:4

! Per esigenze particolari di lubrificazione, se il riduttore deve essere montato con camera di grasso, aggiungere in fondo al codice la lettera “**P**” (vedi Sezione Lubrificazione a pag. 6).

Field 1 **Constructive Form and Type**

From Type no. **1** to no. **33**, constructive forms are Standard whilst from Type no. **34** to no. **55**, the constructive forms can be supplied on request.

Field 2 **Input Shaft (A)**

When it is possible to order the Input Shaft (A) in two different diameters, indicate letter **R** if you want the one with the **Major** diameter whilst there will be no indication for the one with the **smaller** diameter.

Field 3 **Size**

Our QB series gearboxes come in 8 sizes:
54 - 86 - 110 - 134 - 166 - 200 - 250 - 350

Field 4 **Input (A) with PAM Flange**

When the blind hollow shaft is required on the input axis (A) for the assembly of an electrical motor, please state the required PAM Flange, specified in the various sizes.

Field 5 **Transmission Ratio**

Our QB series gearboxes come in 5 Transmission Ratios:
R 1:1 - R1:1.5 - R 1:2 - R 1:3 - R 1:4

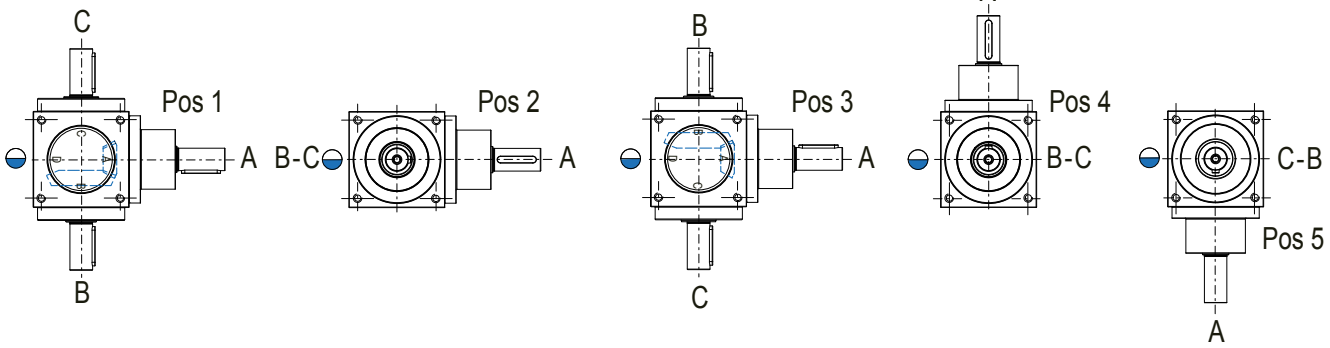
! For special lubrication requirements, if the gearbox must be mounted with the grease chamber, add letter “**P**” at the end of the Code (see Lubrication Section on page 6).

ESEMPI DI COMPOSIZIONE CODICE

EXAMPLES OF HOW THE CODE IS COMPOSED

Forma costruttiva Tipo	Albero entrata (A): se rinforzato aggiungere "R"	Taglia	Dove presente indicare la flangia PAM di attacco motore elettrico	Rapporto
Constructive form Type	Input shaft (A): if strengthened, add “R”	Size	When present, indicate the PAM flange for coupling the electrical motor	Ratio
Tipo - Type 1	R	86		1:1
Tipo - Type 2		134		1:3
Tipo - Type 13		166	80 B14	1:2

POSIZIONI DI MONTAGGIO



NOTE PER LA LUBRIFICAZIONE

Nel caso di funzionamento dei rinvii angolari ad un **basso regime di giri** (< 100 rpm), si potrebbe verificare un'**insufficiente lubrificazione** degli organi interni e per questo, a seconda della tipologia della posizione di montaggio scelta, è consigliato l'impiego delle seguenti applicazioni supplementari necessarie:

- Pos. 1 Sul cuscinetto superiore (lato C) bisogna prevedere l'utilizzo interno di un anello nilos per creare una camera stagna di grasso per garantirne la corretta lubrificazione.
- Pos. 2 Posizione di Montaggio che non necessita di applicazioni Supplementari.
- Pos. 3 Sul cuscinetto superiore (lato B) bisogna prevedere l'utilizzo interno di un anello nilos per creare una camera stagna di grasso per garantirne la corretta lubrificazione.
- Pos. 4 Nel caso di funzionamento con un regime di giri < 100 rpm in entrata, sulla Torretta con cuscinetto superiore (lato A) bisogna prevedere l'utilizzo di un doppio anello di tenuta con camera di grasso.
- Pos. 5 Posizione di Montaggio che non necessita di applicazioni Supplementari.

In caso di **funzionamento in continuo e Fattore di Servizio FS=1** (Vedi note a pagina 18) con un **regime di giri > 600/700 rpm** è consigliato l'impiego di un **Tappo** di **Sfiato** per evitare la formazione di pressioni elevate e di schiume, mentre con un **regime di giri superiore a 1400 rpm** è consigliato l'impiego di un **Circuito Esterno di Raffreddamento**.

FITTING POSITIONS

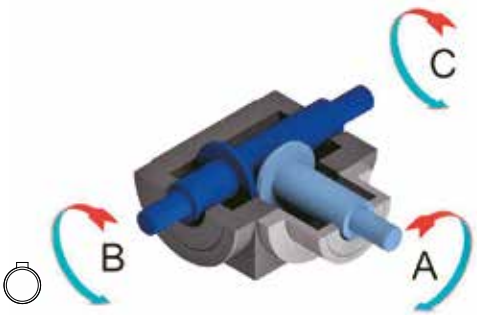
LUBRICATION NOTES

When operating bevel gears at **low rotation rates** (< 100 rpm), **inadequate lubrication** of the internal organs can occur and consequently the use of the following supplementary applications is required, depending on the chosen fitting position:

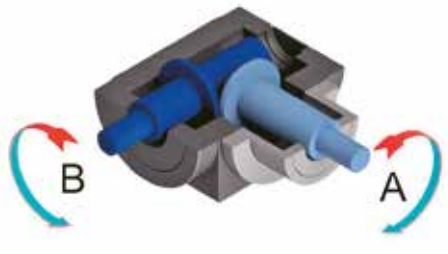
- Pos. 1 On the upper bearing (side C) a nilos ring must be fitted internally to create a sealed grease chamber and ensure adequate lubrication.
- Pos. 2 Fitting position that does not require supplementary applications.
- Pos. 3 On the upper bearing (side B) a nilos ring must be fitted internally to create a sealed grease chamber and ensure adequate lubrication.
- Pos. 4 If operating with input rotation rates < 100 rpm, a double sealing ring must be used with grease chamber on the upper bearing column (side A).
- Pos. 5 Fitting position that does not require supplementary applications.

In cases of **continuous operation and Service Factor FS=1** (see notes on page 18) with **rotation rates > 600/700 rpm** the use of a bleeder vent is recommended to avoid the formation of high pressure and foam, while for rotation **rates above 1400 rpm** the use of an **external cooling circuit** is recommended.

FORME COSTRUTTIVE CON ALBERI O ALBERI CAVI
CONSTRUCTIVE FORMS WITH SHAFTS OR HOLLOW SHAFTS
RAPPORTI DISPONIBILI - AVAILABLE RATIOS
R 1:1 - 1:1.5 - 1:2 - 1:3 - 1:4



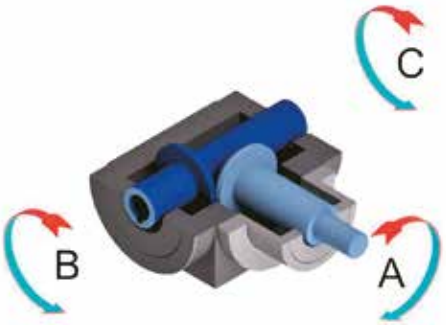
A B-C **TIPO • TYPE 1** PAG. / PAGE 22



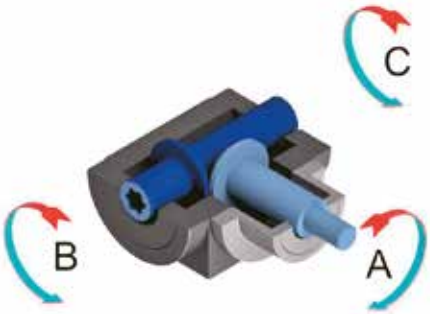
A B **TIPO • TYPE 2** PAG. / PAGE 23



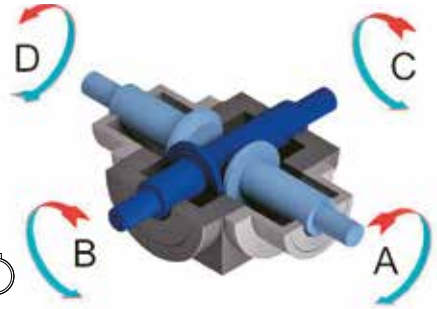
A C **TIPO • TYPE 3** PAG. / PAGE 24



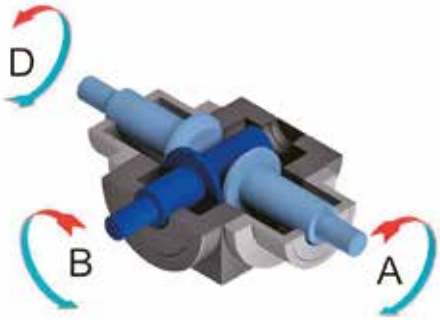
A B-C **TIPO • TYPE 4** PAG. / PAGE 25



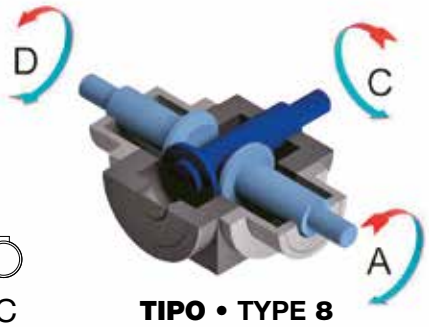
A B-C **TIPO • TYPE 5** PAG. / PAGE 26



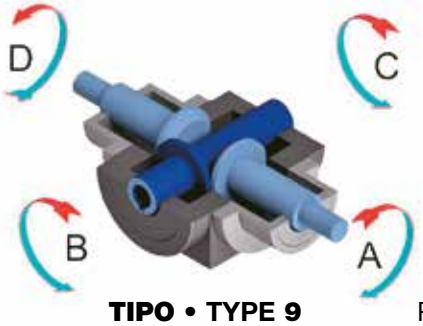
A D B-C **TIPO • TYPE 6** PAG. / PAGE 27



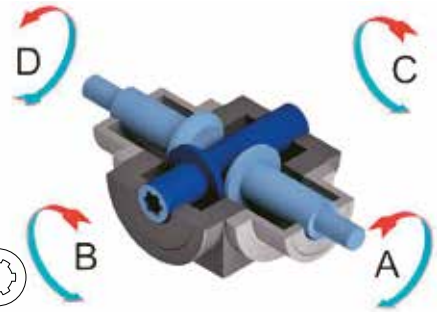
A D B **TIPO • TYPE 7** PAG. / PAGE 28



A D C **TIPO • TYPE 8** PAG. / PAGE 29



A D B-C **TIPO • TYPE 9** PAG. / PAGE 30



A D B C **TIPO • TYPE 10** PAG. / PAGE 31

Albero entrata cavo con linguetta
Hollow Input shaft with spline

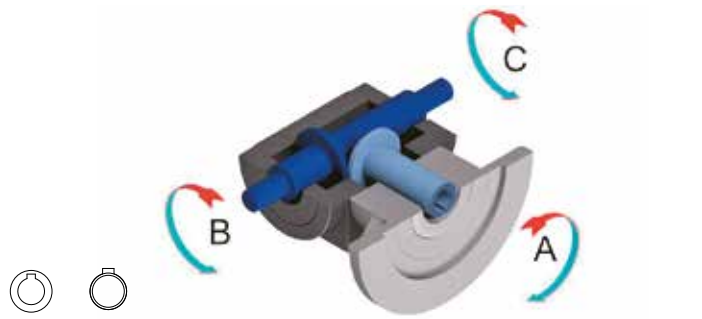
Albero maschio
Male shaft

Albero cavo con linguetta
Hollow shaft with spline

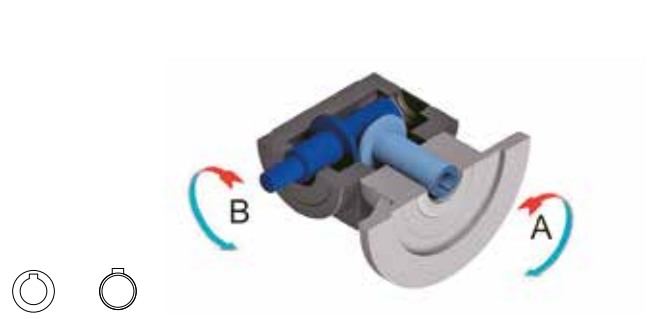
Albero cavo scanalato
Grooved hollow shaft

Albero cavo con calettatore
Hollow shaft with locking set

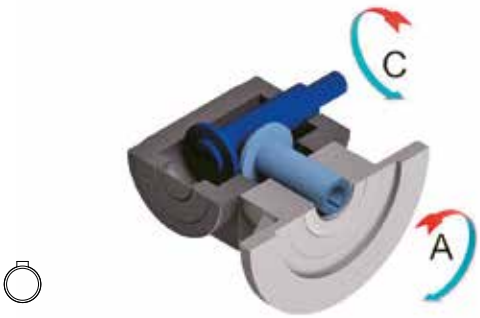
FORME COSTRUTTIVE CON ALBERI O ALBERI CAVI E FLANGIA
CONSTRUCTIVE FORMS WITH SHAFTS OR HOLLOW SHAFTS AND FLANGE
RAPPORTI DISPONIBILI - AVAILABLE RATIOS
R 1:1 - 1:1.5 - 1:2 - 1:3 - 1:4



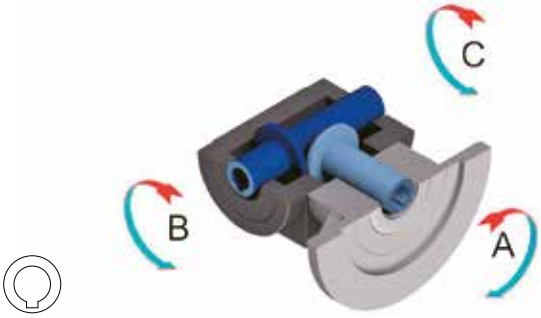
A B-C **TIPO • TYPE 11** PAG. / PAGE 32



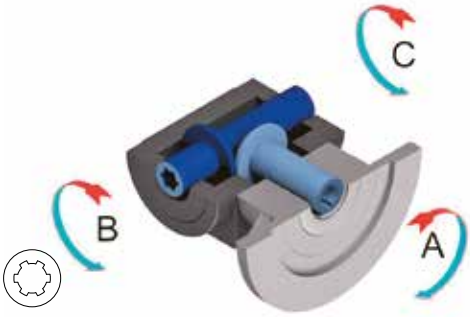
A B **TIPO • TYPE 12** PAG. / PAGE 33



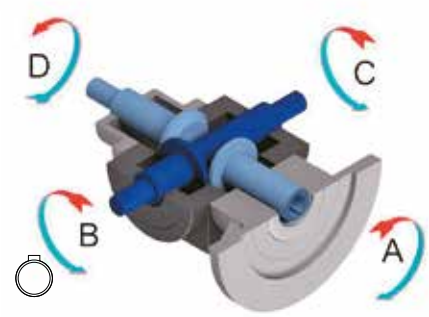
A C **TIPO • TYPE 13** PAG. / PAGE 34



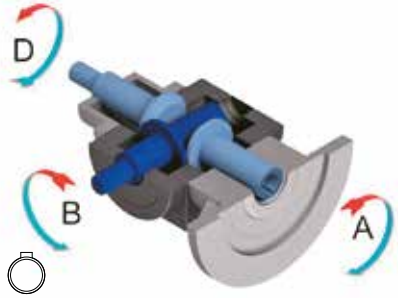
A B-C **TIPO • TYPE 14** PAG. / PAGE 35



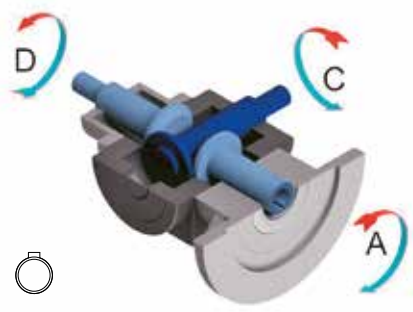
A B-C **TIPO • TYPE 15** PAG. / PAGE 36



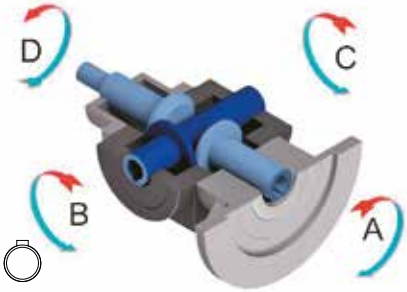
A B-C D **TIPO • TYPE 16** PAG. / PAGE 37



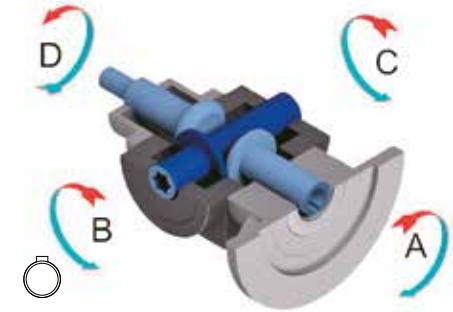
A B D **TIPO • TYPE 17** PAG. / PAGE 38



A C D **TIPO • TYPE 18** PAG. / PAGE 39



A B-C D **TIPO • TYPE 19** PAG. / PAGE 40



A B-C D **TIPO • TYPE 20** PAG. / PAGE 41

Albero entrata cavo con linguetta
Hollow Input shaft with spline

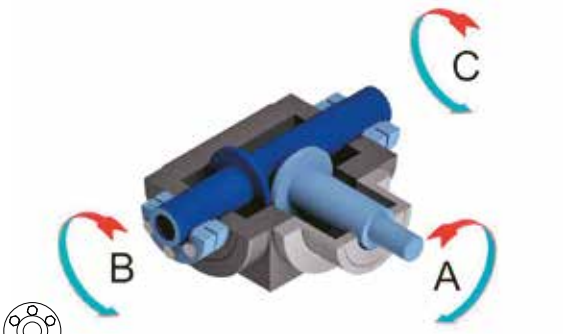
Albero maschio
Male shaft

Albero cavo con linguetta
Hollow shaft with spline

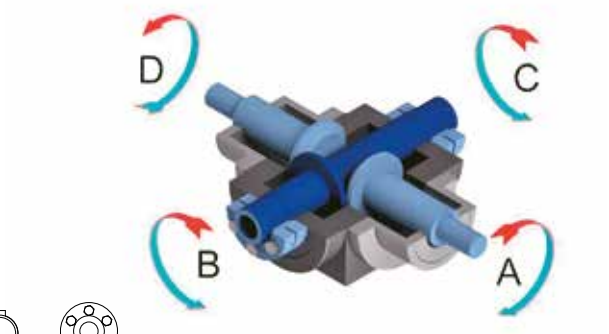
Albero cavo scanalato
Grooved hollow shaft

Albero cavo con calettatore
Hollow shaft with locking set

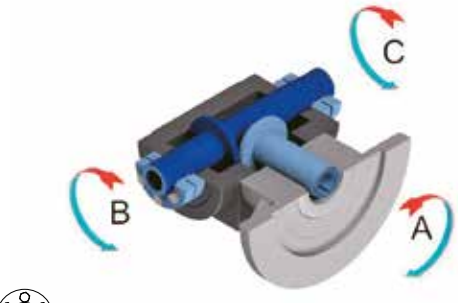
FORME COSTRUTTIVE A RICHIESTA
CONSTRUCTIVE FORMS ON REQUEST
RAPPORTI DISPONIBILI - AVAILABLE RATIOS
R 1:1 - 1:1.5 - 1:2 - 1:3 - 1:4



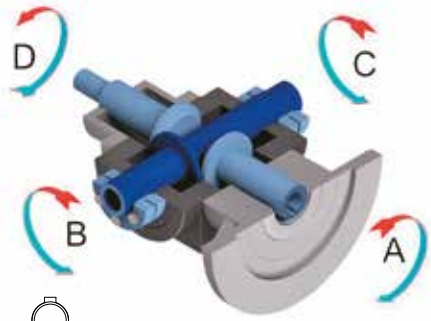
A B-C **TIPO • TYPE 21** PAG. / PAGE 42



A D B-C **TIPO • TYPE 22** PAG. / PAGE 43



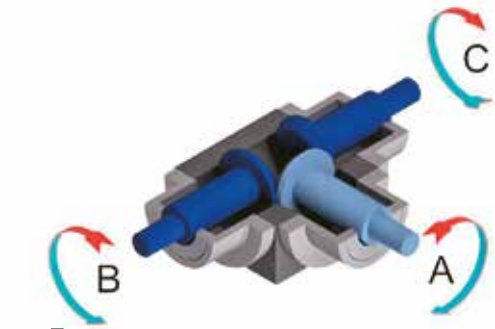
A B-C **TIPO • TYPE 23** PAG. / PAGE 44



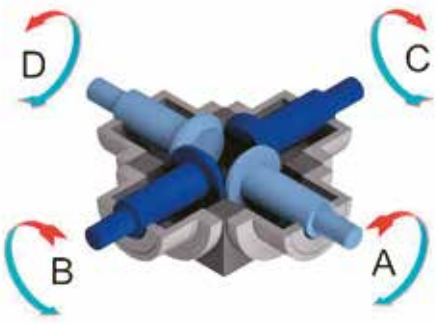
A B-C D **TIPO • TYPE 24** PAG. / PAGE 45



A B **TIPO • TYPE 25-26-27** PAG. / PAGE 46-47-48



A B C **TIPO • TYPE 28-29-30** PAG. / PAGE 49-50-51



A D B C **TIPO • TYPE 31-32-33** PAG. / PAGE 52-53-54

Albero entrata cavo con linguetta
Hollow Input shaft with spline

Albero maschio
Male shaft

Albero cavo con linguetta
Hollow shaft with spline

Albero cavo scanalato
Grooved hollow shaft

Albero cavo con calettatore
Hollow shaft with locking set

FORME COSTRUTTIVE PARTICOLARI (A RICHIESTA)

La grande versatilità di questo tipo di rinvio angolare, risiede proprio nella forma cubitale del carter, che consente di poter aggiungere su ogni lato del cubo di base una presa di forza.
L'unica limitazione che ne deriva sta' nel non poter utilizzare il rapporto 1:1 in quanto non consente la rotazione degli ingranaggi.

Quindi nei rapporti 1:1,5 - 1:2 - 1:3 - 1:4 così come in tutti quelli in moltiplica del rapporto (1,5:1 - 2:1 - 3:1 - 4:1) si possono realizzare tutte le forme costruttive che vengono rappresentate nelle tre pagine seguenti delle forme costruttive particolari.

Consigliamo vivamente, nei rapporti in moltiplica, di non superare in ingresso il numero di 2000 giri/min. nel rapporto 1,5:1; di 1500 nel rapporto 2:1; 1000 nel rapporto 3:1 e 750 nel rapporto 4:1.

Data la particolarità e la complessità di tali forme costruttive, i tempi di consegna di questi prodotti potrebbero essere condizionati dalle disponibilità di magazzino e comunque consigliamo di consultare l'Ufficio Produzione.

SPECIAL CONSTRUCTIVE FORMS (ON REQUEST)

The great versatility of this type of right-angle gear drive lies in the housing's cube shape, which allows you to add a PTO on each side of the standard housing.
The only ensuing limitation is not being able to use the 1:1 ratio because it does not allow the gears to rotate.

Hence, in the 1:1.5 - 1:2 - 1:3 - 1:4 ratios, as well as in all speed multiplier ratios (1.5:1 - 2:1 - 3:1 - 4:1) you can implement all the constructive forms outlined on the three following pages containing special constructive forms.

With regard to speed multiplier ratios, we strongly recommend not exceeding 2000 rpm at input in the 1.5:1 ratio; 1500 in the 2:1 ratio; 1000 in the 3:1 ratio and 750 in the 4:1 ratio.

Due to the particularity and complexity of these constructive forms, the delivery time of these products may be affected by stock availability and in any case please contact our Production Department.

CARTER DELLE FORME COSTRUTTIVE PARTICOLARI

La forma esterna del carter, in tutte le taglie e per tutte le tipologie, presenta due facce contrapposte con un bassofondo dov'è presente il logo DZ e vi si può identificare tramite le lettere "**A**, **B**, **C**, **D**" la disposizione delle sporgenze o cavità delle prese di forza. Come già riportato in precedenza, per convenzione la lettera "**A**" viene considerata come ingresso, mentre le altre, uscite.

Il tappo di carico-scarico olio è presente, nelle versioni a tre vie, nella faccia opposta all'entrata "**A**". nelle versioni ove in questa faccia è presente una presa di forza, esempio quelle a quattro o più vie il tappo dell'olio viene spostato in una delle rimanenti facce disponibili e comunque da concordare con il cliente.

La forma costruttiva Tipo 42 con uscita in "**C**" e "**F**" viene ottenute ruotando il cubo di 90° sull'asse "**B** - **C**", così la presa di forza "**A**" ed "**F**" non corrispondono rispetto alle lettere impresse sul carter. La stessa situazione la si può trovare anche nelle versioni Tipo 34, 35, 40, 41, 51 dove, avendo la necessità dell'uscita in "**F**" al posto di "**E**" come illustrato nel catalogo è sufficiente ruotare il gruppo sull'asse "**B** - **C**" di 90°. Anche in questa situazione si perderà la corrispondenza delle lettere impresse sul carter, ma la simmetria costruttiva consente di disporre della diversa uscita senza variare il legame dei sensi di rotazione delle prese di forza. Lo stesso principio, basato sulla simmetria costruttiva la si può applicare anche alle versioni Tipo 36, 37, 43, avendo necessità dell'uscita "**F**" al posto della "**E**". In questi ultimi si dovrà ruotare il gruppo di 180° sull'asse "**B** - **C**".

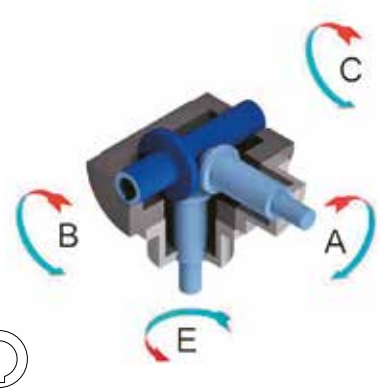
HOUSING WITH SPECIALLY DESIGNED SHAPE

The external shape of the housing, in all sizes and for all types, is made up of two opposing sides and a shallow cavity, where the DZ logo is placed, on which you can identify the position of the protrusions or cavities of the PTOs through letters "**A**, **B**, **C**, **D**". As already stated, by convention letter "**A**" is considered the entry while the others are exits.

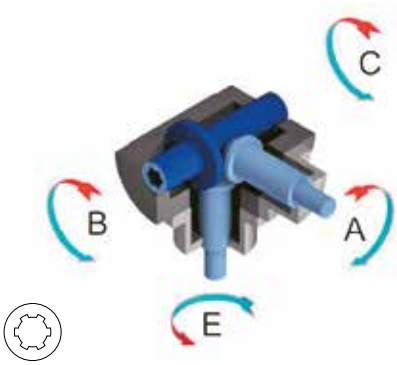
In the 3-way versions the cap, through which oil is loaded and unloaded, is on the side opposite entry "**A**". In the versions in which a PTO is on this side such as, for example, versions with four or more ways, the oil cap is moved to one of the remaining available sides that in any case is to be agreed with the customer.

The Type 42 construction shape with exit in "**C**" and "**F**" is obtained by rotating the cube by 90° on the "**B** - **C**" axis, so that PTOs "**A**" and "**F**" do not match as compared to the letters printed on the housing. The same situation can also be found in Type 34, 35, 40, 41 and 51 versions where, having the need for the exit in "**F**" instead of "**E**" as shown in the catalog, you simply have to rotate the unit on axis "**B** - **C**" by 90°. Also in this case the correspondence of the letters printed on the housing will be lost, but the symmetrical design allows having a different exit without changing the link of the PTO's rotating directions. The same principle, based on the symmetrical design, can also be applied to versions Type 36, 37 and 43, having the need for the "**F**" exit instead of "**E**". In these latter cases, you will have to rotate the unit by 180° on axis "**B** - **C**".

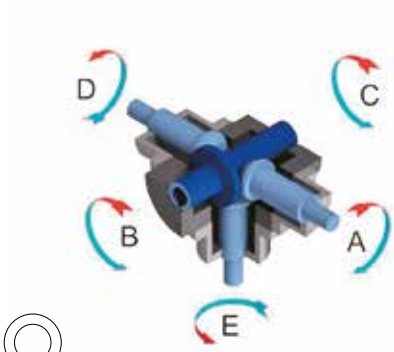
FORME COSTRUTTIVE PARTICOLARI A RICHIESTA
REALIZZABILI SOLO NEI RAPPORTI DIVERSI DA R1:1
SPECIAL CONSTRUCTIVE FORMS ON REQUEST
ONLY POSSIBLE IN RATIOS OTHER THAN R1:1
RAPPORTI DISPONIBILI PER QUESTE FORME COSTRUTTIVE
AVAILABLE RATIOS FOR THESE CONSTRUCTIVE FORMS
R 1:1.5 - 1:2 - 1:3 - 1:4



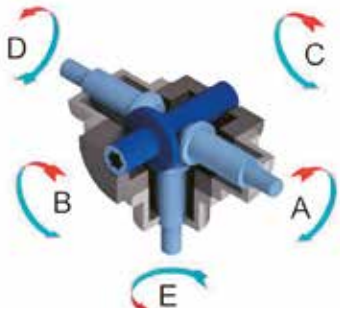
A E B-C **TIPO • TYPE 34**



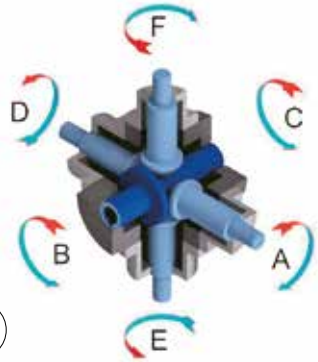
A E B-C **TIPO • TYPE 35**



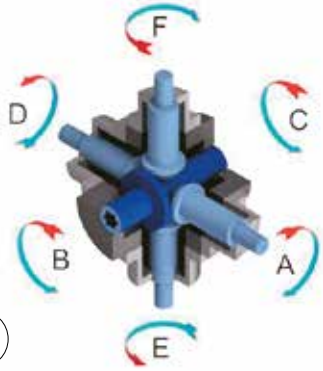
ADE B-C **TIPO • TYPE 36**



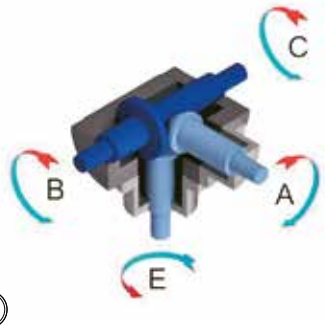
ADE B-C **TIPO • TYPE 37**



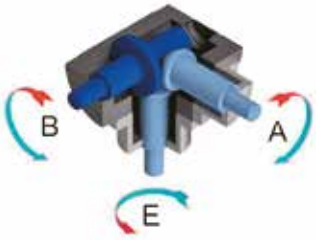
ADEF B-C **TIPO • TYPE 38**



ADEF B-C **TIPO • TYPE 39**



A E B-C **TIPO • TYPE 40**



A E B **TIPO • TYPE 41**

Albero entrata cavo con linguetta
Hollow Input shaft with spline

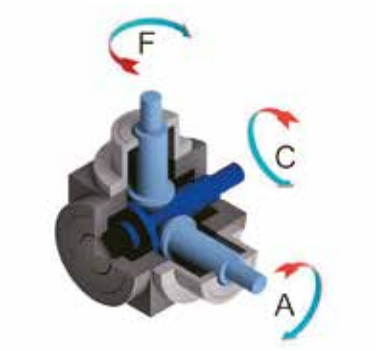
Albero maschio
Male shaft

Albero cavo con linguetta
Hollow shaft with spline

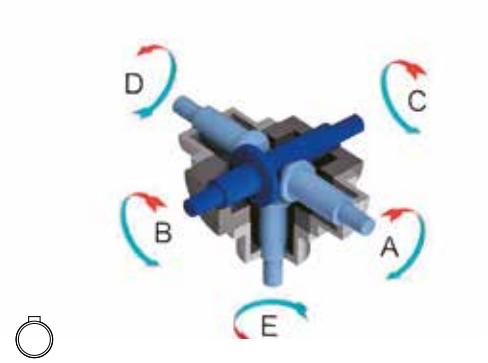
Albero cavo scanalato
Grooved hollow shaft

Albero cavo con calettatore
Hollow shaft with locking set

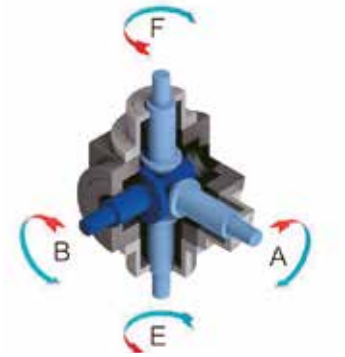
FORME COSTRUTTIVE PARTICOLARI A RICHIESTA
REALIZZABILI SOLO NEI RAPPORTI DIVERSI DA R1:1
SPECIAL CONSTRUCTIVE FORMS ON REQUEST
ONLY POSSIBLE IN RATIOS OTHER THAN R1:1
RAPPORTI DISPONIBILI PER QUESTE FORME COSTRUTTIVE
AVAILABLE RATIOS FOR THESE CONSTRUCTIVE FORMS
R 1:1.5 - 1:2 - 1:3 - 1:4



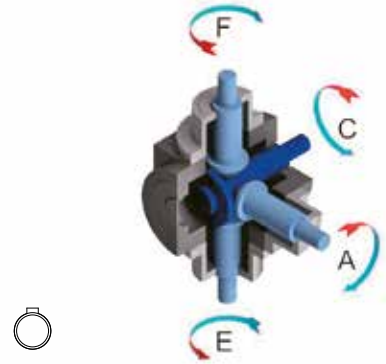
A F C **TIPO • TYPE 42**



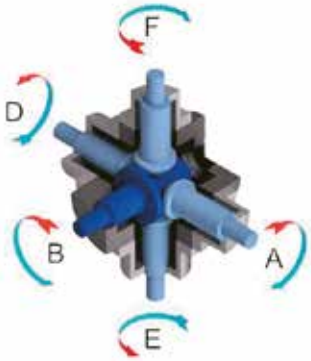
A D E B-C **TIPO • TYPE 43**



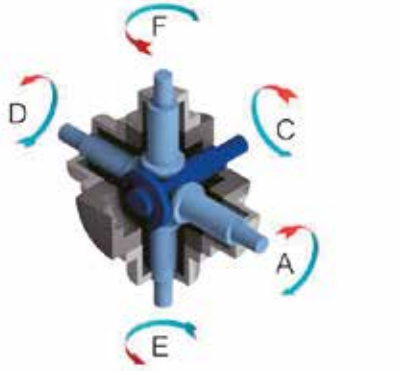
A E F B **TIPO • TYPE 44**



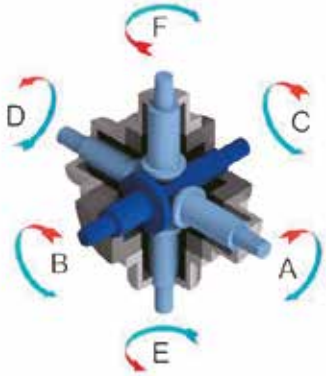
A E F C **TIPO • TYPE 45**



A D E F B **TIPO • TYPE 46**



A D E F C **TIPO • TYPE 47**



A D E F B-C **TIPO • TYPE 48**

Albero entrata cavo con linguetta
Hollow Input shaft with spline

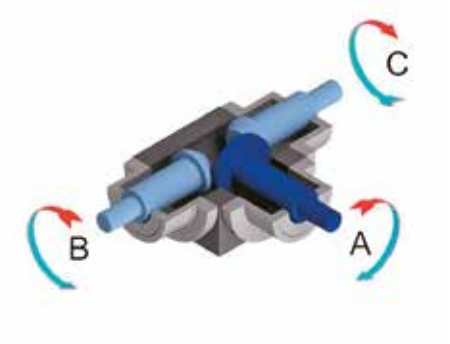
Albero maschio
Male shaft

Albero cavo con linguetta
Hollow shaft with spline

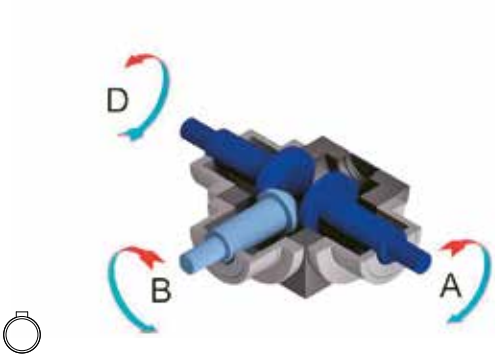
Albero cavo scanalato
Grooved hollow shaft

Albero cavo con calettatore
Hollow shaft with locking set

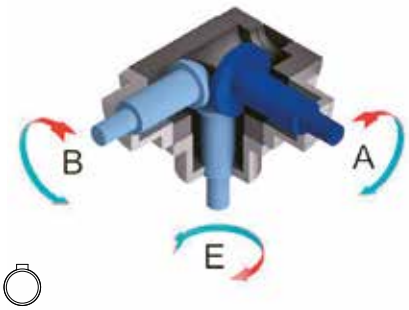
FORME COSTRUTTIVE IN MOLTIPLICA A RICHIESTA
CONSTRUCTIVE FORMS FORMS IN SPEED MULTIPLIER ON REQUEST
RAPPORTI DISPONIBILI PER QUESTE FORME COSTRUTTIVE
AVAILABLE RATIOS FOR THESE CONSTRUCTIVE FORMS
R1.5:1 - 2:1 - 3:1 - 4:1



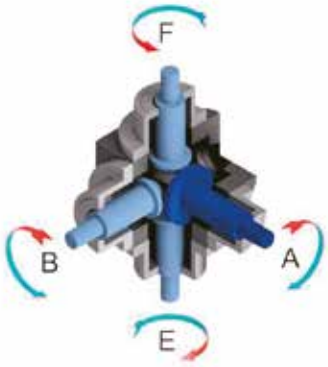
A B C **TIPO • TYPE 49**



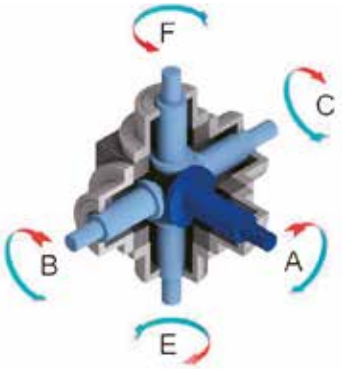
A D B **TIPO • TYPE 50 (*)**



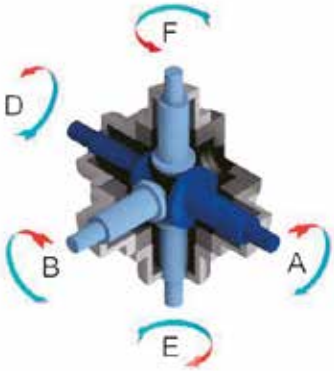
A B E **TIPO • TYPE 51**



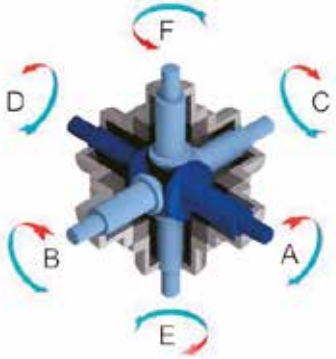
A BEF **TIPO • TYPE 52**



A BCEF **TIPO • TYPE 53**



AD BEF **TIPO • TYPE 54**



AD BCEF **TIPO • TYPE 55**

(*) Per questa tipologia che rappresentiamo per completezza fare riferimento al tipo 28-29-30 nei rapporti in riduzione e utilizzare come albero di ingresso “B” o “C”.
For this type, which is shown for completeness, refer to type 28-29-30 in reduction ratios and use “B” or “C” as input shaft.

Albero entrata cavo con linguetta
Hollow Input shaft with spline

Albero maschio
Male shaft

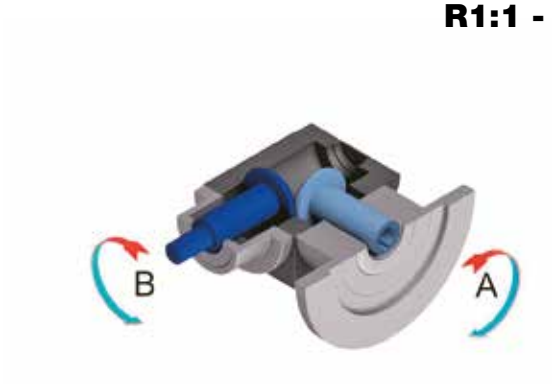
Albero cavo con linguetta
Hollow shaft with spline

Albero cavo scanalato
Grooved hollow shaft

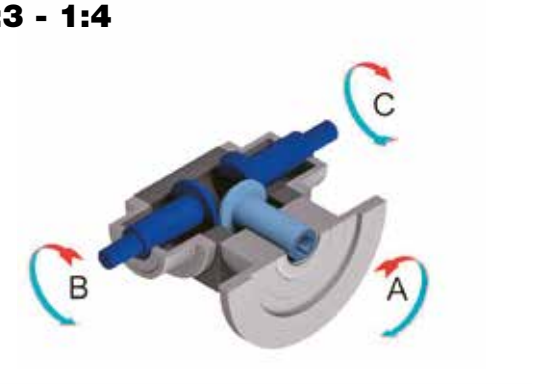
Albero cavo con calettatore
Hollow shaft with locking set

FORME COSTRUTTIVE PAM - TORRETTE A RICHIESTA
CONSTRUCTIVE FORMS ON REQUEST

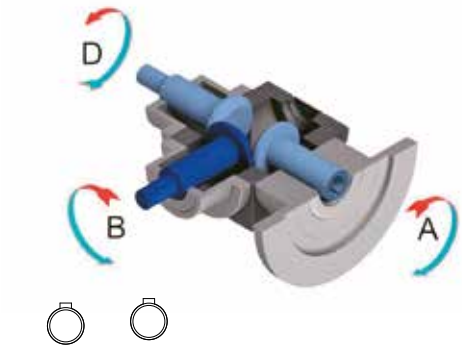
RAPPORTI DISPONIBILI - AVAILABLE RATIOS
R1:1 - 1:1.5 - 1:2 - 1:3 - 1:4



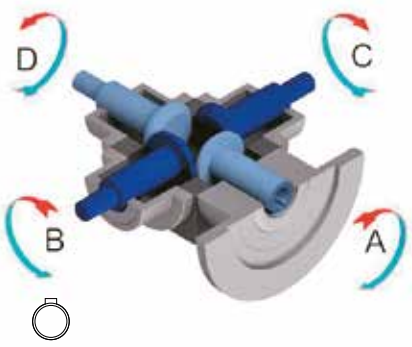
A B **TIPO • TYPE 56**



A B C **TIPO • TYPE 57**



A B D **TIPO • TYPE 58**



A B C D **TIPO • TYPE 59**

Albero entrata cavo con linguetta
Hollow Input shaft with spline

Albero maschio
Male shaft

Albero cavo con linguetta
Hollow shaft with spline

Albero cavo scanalato
Grooved hollow shaft

Albero cavo con calettatore
Hollow shaft with locking set

CONDIZIONI DI CARICO

Per scegliere il rinvio angolare più appropriato in base alla potenza o coppia che deve trasmettere, si dovranno fare alcune considerazioni. Per prima cosa si parte dal valore nominale che il rinvio dovrà garantire durante l'arco della sua vita. Nella tabella A che riportiamo vi sono indicazioni di potenze (KW) e momenti torcenti (Nm) massimi consigliati in rapporto al numero di giri di rotazione a cui verrà applicato il carico. Questi valori sono considerati con un fattore di sicurezza mai inferiore a 3 per il particolare più debole del rinvio, che esso sia riferito ai cuscinetti o agli ingranaggi o ancora ai trascinamenti di trazione come linguette o altro.
Il tutto è calcolato per una vita minima di 5000 ore per i particolari soggetti ad usura ad un regime di rotazione costante di 1000 giri/min. sull'asse lento. Questi parametri definiscono quello che può essere l'eventuale cadenza delle ispezioni del rinvio.

Si consideri che queste durate sono con condizioni di carico costante (Fattore di servizio =1) e al massimo del carico ammesso dal rinvio, con condizioni di lavoro comprese tra -20° e +80° C. Con condizioni di sovraccarico o di carichi ridotti la durata degli organi meccanici non ha una proporzionalità lineare.
Ad esempio con sovraccarico del 130 - 140% rispetto al carico nominale si può avere una durata molto inferiore. Così come se il carico ha un andamento non lineare e di conseguenza varierà il fattore di servizio.
Al contrario un uso a carico ridotto all' 80 - 90% allunga in modo esponenziale la durata, in particolar modo a pitting degli ingranaggi.
Nella tabella viene riassunto come individuare il fattore di servizio in base al tipo di carico applicato e di conseguenza di quanto può aumentare la gravosità del carico stesso.

Nelle **Tabelle A** e **B** nelle pagine seguenti, sono indicati per ciascuna **taglia** i 5 **rapporti** disponibili.
Nei rapporti 1:1 sono presenti per tutte le taglie due righe di valori.
Tale differenziazione è dovuta alle dimensioni degli alberi di entrata A o D che se "normali" sopportano meno coppia o potenza trasmissibile rispetto a quelli "rinforzati" R.

Questa distinzione non era presente nelle precedenti versioni e si è resa indispensabile dopo la **nuova progettazione** con l'impiego di **cuscinetti** e **ingranaggi più grandi** che, a parità di taglia, hanno consentito trasmissibilità di coppie e potenze maggiori, costringendoci a rivedere le differenze riscontrate tra alberi rinforzati/ profili scanalati e alberi piccoli standard, non più sufficienti a sfruttare tutto l'incremento di potenza del nuovo progetto.

LOAD CONDITIONS

You will have to make some considerations before choosing the most appropriate right-angle gear drive according to the power or torque it must transmit. First of all, begin from the nominal value that the right-angle gear drive must ensure during its lifespan. The table A indicates the max powers (kW) and torques (Mt) recommended in relation to the number of rpms at which the load is applied. These values are considered with a safety factor that is never less than 3 for the right-angle gear drive's weakest part, whether it refers to the bearings or gears or other drive gears such as splines or other. Everything is calculated for a minimum life of 5000 hours for parts subject to wear at a constant rotation speed of 1000 rpm on the slow axis. These parameters define what can be the rate of the right-angle gear drive inspections.

Consider that these rates are carried out with constant load conditions (Service Factor = 1) and with the maximum load allowed by the right-angle gear drive, with working conditions between -20° and +80° C. Under overload or low load conditions, the duration of the mechanical components does not have a linear proportionality. For example, it may last much less with an overload of 130 to 140% as compared to the nominal load. Likewise, if the load has a non-linear pattern the service factor will vary accordingly. On the contrary, a reduced load use of 80 to 90% lengthens the duration exponentially, especially the right-angle gear drive's pitting.
The table summarizes how to locate the service factor based on the type of load applied and consequently by how much you can increase the heaviness of the load itself.

Tables A and **B** on following pages show the 5 **ratios** available for each **size**.
There are two rows of values for all sizes in the 1:1 ratios.
This differentiation is due to the size of input shafts A or D which, even if "normal", withstand less transmissible torque or power as compared to the R "reinforced" ones.

This distinction was not present in the previous versions but became essential after the **new design** with the use of **larger bearings** and **gears** that, size being the same, have enabled the transmissibility of greater torques and powers, compelling us to review the differences found between reinforced shafts/grooved profiles and small standard shafts, no longer sufficient to exploit the entire power increase of the new project.



Potenza nominale Pn = Potenza effettiva Pe x Fs Rated Power Pn = Pe (Horsepower) x Fs				
FATTORE DI SERVIZIO Fs **SERVICE FACTOR Fs**				
	ore di funzionamento al giorno hours of operation per day			
	3	**8**	**12**	**24**
carico uniforme / uniform load	0.7	0.9	1	1.3
carico con urti modesti / load with moderate shocks	0.9	1	1.3	1.8
carico con urti / load with shocks	1.3	1.6	1.8	2.3

La tabella delle potenze e dei momenti torcenti riassume i valori massimi consigliati nelle varie dimensioni dei rinvii.
I valori compresi nelle sezioni di tabella di colore contrastante sono condizioni limite o non preferenziali: se si deve operare a tali condizioni di carico e giri, per maggior sicurezza contattare l'ufficio tecnico.

The powers and torques table summarizes the right-angle gear drives' max values recommended in the various sizes.
The values in the table with the darker colors stand for limit or non-preferential conditions. Hence, if you have to work in these load and rpm conditions, contact our technical department for greater safety.

Tab. A

POTENZE APPLICABILI (Pn) **Momento torcente max in uscita Mt** **(albero entrata contrassegnato A)**
APPLICABLE POWERS (Pn) Max output torque Mt (input shaft sign A)

Giri in uscita Output revs			50 rpm		100 rpm		200 rpm		400 rpm		800 rpm		1400 rpm		2000 rpm		3000 rpm	
Coppia in uscita Output torque			Mt	potenza power	Mt	potenza power	Mt	potenza power	Mt	potenza power	Mt	potenza power	Mt	potenza power	Mt	potenza power	Mt	potenza power
n. no.	Taglia Size	Rapporto - ØAsse A Ratio - A AxisØ	Nm	Kw	Nm	Kw	Nm	Kw	Nm	Kw	Nm	Kw	Nm	Kw	Nm	Kw	Nm	Kw
1	QB 54	R.1:1 - Ø18	33.8	0.18	28.5	0.30	23.9	0.50	20.1	0.84	16.9	1.42	14.7	2.16	13.5	2.82	12.2	3.82
2		R.1:1 - Ø11	25.4	0.13	21.3	0.22	17.9	0.38	15.1	0.63	12.7	1.06	11.0	1.62	10.1	2.11	9.1	2.86
3		R.1:1.5 - Ø11	31.7	0.17	26.7	0.28	22.4	0.47	18.9	0.79	15.9	1.33	13.8	2.02	12.6	2.64	11.4	3.58
4		R.1:2 - Ø11	27.5	0.14	23.1	0.24	19.4	0.41	16.3	0.68	13.7	1.15	12.0	1.75	10.9	2.29	9.9	3.10
5		R.1:3 - Ø11	27.5	0.14	23.1	0.24	19.4	0.41	16.3	0.68	13.7	1.15	12.0	1.75	10.9	2.29	9.9	3.10
6		R.1:4 - Ø11	19.0	0.10	16.0	0.17	13.5	0.28	11.3	0.47	9.5	0.80	8.3	1.21	7.6	1.58	6.8	2.15
7	QB 86	R.1:1 - Ø24	169.2	0.89	142.3	1.49	119.6	2.50	100.6	4.21	84.6	7.08	73.5	10.78	67.3	14.09	60.8	19.09
8		R.1:1 - Ø16	88.8	0.46	74.7	0.78	62.8	1.32	52.8	2.21	44.4	3.72	38.6	5.66	35.3	7.39	31.9	10.02
9		R.1:1.5 - Ø16	126.9	0.66	106.7	1.12	89.7	1.88	75.4	3.16	63.4	5.31	55.2	8.08	50.5	10.56	45.6	14.32
10		R.1:2 - Ø16	126.9	0.66	106.7	1.12	89.7	1.88	75.4	3.16	63.4	5.31	55.2	8.08	50.5	10.56	45.6	14.32
11		R.1:3 - Ø16	80.4	0.42	67.6	0.71	56.8	1.19	47.8	2.00	40.2	3.37	34.9	5.12	32.0	6.69	28.9	9.07
12		R.1:4 - Ø16	55.0	0.29	46.2	0.48	38.9	0.81	32.7	1.37	27.5	2.30	23.9	3.50	21.9	4.58	19.8	6.20
13	QB 110	R.1:1 - Ø26	306.6	1.61	257.9	2.70	216.8	4.54	182.3	7.64	153.3	12.84	133.3	19.54	121.9	25.53	110.2	34.60
14		R.1:1 - Ø20	169.2	0.89	142.3	1.49	119.6	2.50	100.6	4.21	84.6	7.08	73.5	10.78	67.3	14.09	60.8	19.09
15		R.1:1.5 - Ø20	264.3	1.38	222.3	2.33	186.9	3.91	157.2	6.58	132.2	11.07	114.9	16.84	105.1	22.01	95.0	29.83
16		R.1:2 - Ø20	253.8	1.33	213.4	2.23	179.4	3.76	150.9	6.32	126.9	10.63	110.3	16.17	100.9	21.13	91.2	28.64
17		R.1:3 - Ø20	164.9	0.86	138.7	1.45	116.6	2.44	98.1	4.11	82.5	6.91	71.7	10.51	65.6	13.73	59.3	18.61
18		R.1:4 - Ø20	120.5	0.63	101.4	1.06	85.2	1.78	71.7	3.00	60.3	5.05	52.4	7.68	47.9	10.04	43.3	13.60
19	QB 134	R.1:1 - Ø32	497.0	2.60	417.9	4.37	351.4	7.36	295.5	12.37	248.5	20.81	216.0	31.66	197.6	41.38	178.6	56.08
20		R.1:1 - Ø24	296.1	1.55	249.0	2.61	209.3	4.38	176.0	7.37	148.0	12.40	128.7	18.86	117.7	24.65	106.4	33.41
21		R.1:1.5 - Ø24	454.7	2.38	382.3	4.00	321.5	6.73	270.3	11.32	227.3	19.04	197.7	28.97	180.8	37.85	163.4	51.31
22		R.1:2 - Ø24	422.9	2.21	355.7	3.72	299.1	6.26	251.5	10.53	211.5	17.71	183.9	26.95	168.2	35.21	152.0	47.73
23		R.1:3 - Ø24	317.2	1.66	266.7	2.79	224.3	4.70	188.6	7.90	158.6	13.28	137.9	20.21	126.1	26.41	114.0	35.80
24		R.1:4 - Ø24	232.6	1.22	195.6	2.05	164.5	3.44	138.3	5.79	116.3	9.74	101.1	14.82	92.5	19.37	83.6	26.25
25	QB 166	R.1:1 - Ø45	993.9	5.20	835.8	8.75	702.8	14.72	591.0	24.75	497.0	41.62	432.1	63.33	395.2	82.75	357.1	112.16
26		R.1:1 - Ø32	803.6	4.21	675.7	7.07	568.2	11.90	477.8	20.01	401.8	33.65	349.3	51.20	319.5	66.91	288.7	90.68
27		R.1:1.5 - Ø32	888.2	4.65	746.9	7.82	628.0	13.15	528.1	22.12	444.1	37.19	386.1	56.59	353.2	73.95	319.1	100.23
28		R.1:2 - Ø32	803.6	4.21	675.7	7.07	568.2	11.90	477.8	20.01	401.8	33.65	349.3	51.20	319.5	66.91	288.7	90.68
29		R.1:3 - Ø32	676.7	3.54	569.0	5.96	478.5	10.02	402.4	16.85	338.4	28.34	294.2	43.12	269.1	56.34	243.1	76.37
30		R.1:4 - Ø32	507.5	2.66	426.8	4.47	358.9	7.51	301.8	12.64	253.8	21.25	220.6	32.34	201.8	42.26	182.4	57.27
31	QB 200	R.1:1 - Ø55	1501.5	7.86	1262.6	13.22	1061.7	22.23	892.8	37.39	750.7	62.88	652.7	95.67	597.0	125.01	539.5	169.44
32		R.1:1 - Ø42	1501.5	7.86	1262.6	13.22	1061.7	22.23	892.8	37.39	750.7	62.88	652.7	95.67	597.0	125.01	539.5	169.44
33		R.1:1.5 - Ø42	1311.1	6.86	1102.5	11.54	927.1	19.41	779.6	32.65	655.6	54.91	570.0	83.54	521.4	109.16	471.1	147.96
34		R.1:2 - Ø42	1184.3	6.20	995.8	10.43	837.4	17.53	704.2	29.49	592.1	49.59	514.8	75.46	470.9	98.60	425.5	133.64
35		R.1:3 - Ø42	1078.5	5.65	906.9	9.49	762.6	15.97	641.3	26.85	539.3	45.16	468.9	68.72	428.9	89.79	387.5	121.71
36		R.1:4 - Ø42	845.9	4.43	711.3	7.45	598.1	12.52	503.0	21.06	422.9	35.42	367.7	53.90	336.4	70.43	303.9	95.46
37	QB 250	R.1:1 - Ø70	3700.8	19.37	3112.0	32.58	2616.9	54.79	2200.5	92.15	1850.4	154.97	1608.8	235.80	1471.6	308.12	1329.7	417.62
38		R.1:1 - Ø55	3700.8	19.37	3112.0	32.58	2616.9	54.79	2200.5	92.15	1850.4	154.97	1608.8	235.80	1471.6	308.12	1329.7	417.62
39		R.1:1.5 - Ø55	3277.9	17.16	2756.3	28.86	2317.8	48.53	1949.0	81.62	1638.9	137.26	1425.0	208.85	1303.4	272.90	1177.7	369.89
40		R.1:2 - Ø55	2960.6	15.50	2489.6	26.06	2093.5	43.83	1760.4	73.72	1480.3	123.98	1287.1	188.64	1177.3	246.49	1063.8	334.10
41		R.1:3 - Ø55	2220.5	11.62	1867.2	19.55	1570.1	32.88	1320.3	55.29	1110.2	92.98	965.3	141.48	882.9	184.87	797.8	250.57
42		R.1:4 - Ø55	1607.2	8.41	1351.5	14.15	1136.5	23.80	955.6	40.02	803.6	67.30	698.7	102.40	639.1	133.81	577.5	181.37
43	QB 350	R.1:1 - Ø85	9939.3	52.03	8357.9	87.50	7028.1	147.16	5909.9	247.48	4969.6	416.22	4320.8	633.29	3952.2	827.52	3571.2	1121.62
44		R.1:1 - Ø65	7824.5	40.96	6579.6	68.88	5532.8	115.85	4652.5	194.83	3912.3	327.66	3401.5	498.54	3111.3	651.45	2811.4	882.97
45		R.1:1.5 - Ø65	8881.9	46.49	7468.8	78.19	6280.5	131.50	5281.2	221.16	4441.0	371.94	3861.2	565.91	3531.8	739.48	3191.3	1002.30
46		R.1:2 - Ø65	8459.0	44.28	7113.1	74.47	5981.4	125.24	5029.7	210.63	4229.5	354.23	3677.3	538.97	3363.6	704.27	3039.3	954.57
47		R.1:3 - Ø65	6978.7	36.53	5868.3	61.44	4934.7	103.32	4149.5	173.77	3489.3	292.24	3033.8	444.65	2775.0	581.02	2507.5	787.52
48		R.1:4 - Ø65	5075.4	26.57	4267.9	44.68	3588.8	75.14	3017.8	126.38	2537.7	212.54	2206.4	323.38	2018.2	422.56	1823.6	572.74

CARICHI ASSIALI E RADIALI

Una ulteriore verifica che si andrà ad aggiungere alle considerazioni già elencate, è quella relativa ai carichi assiali.

Questo tipo di carico, che il rinvio dovrà andare a sopportare, può derivare da alcune componenti delle forze che agiscono perpendicolarmente all'asse del rinvio spingendo o tirando l'albero.

L'esempio più comune è dato dal carico di tensione di una cinghia, dove, una parte della forza radiale, si ripercuote in modo assiale sull'albero, dove è alloggiata la puleggia.
Possono esserci svariate condizioni che competono alla creazione di forze assiali, gli stessi ingranaggi nella loro rotazione, essendo costruiti con dentatura spiroidale generano delle forze assiali.

Le condizioni di carico assiale massimo, che i vari rinvii possono sopportare, sono riassunte nella tabella B dei carichi assiali e radiali.
Tale tabella riporta, in base al regime di rotazione, la **forza radiale** (esempio 1) e quella **assiale** (esempi 2 - 3) che i vari rinvii possono sopportare, considerando il carico radiale, applicato ad una distanza pari alla metà della sporgenza dell'albero e per gli alberi cavi, uno sbalzo massimo del punto di applicazione, uguale a quello del modello rispettivo con albero maschio. Come per le precedenti, sono valori massimi consigliati.

I valori compresi nelle sezioni di tabella A e B colorate di colore contrastante sono condizioni limite o non preferenziali, se si deve operare a tali condizioni di carico e giri, per maggior sicurezza contattare l'ufficio tecnico.

AXIAL AND RADIAL LOADS

A further verification that will be added to the foregoing considerations is that related to axial loads.

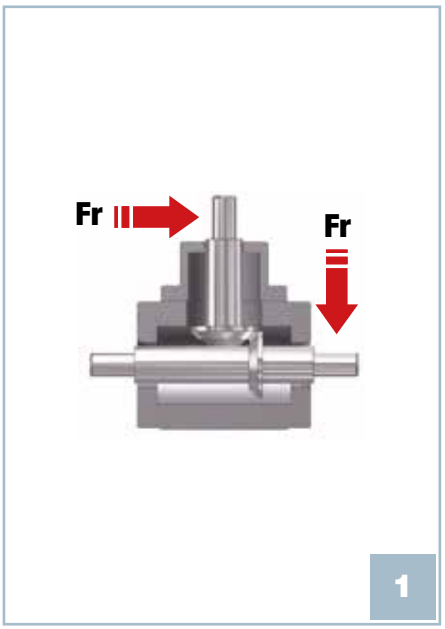
This type of load, that the right-angle gear drive will have to withstand, can result from certain components of the forces acting perpendicular to the right-angle gear drive's axis by pushing or pulling the shaft.

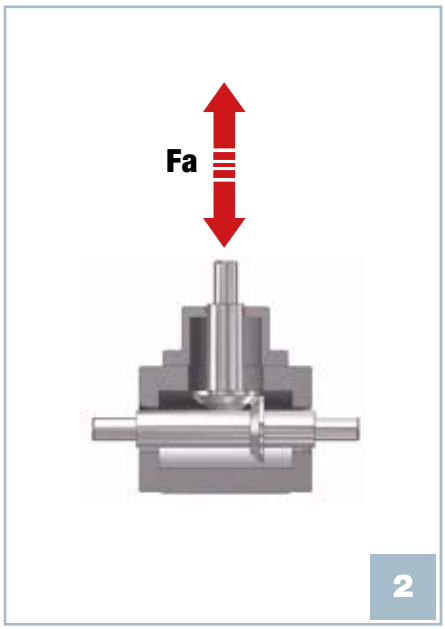
The most common example is given by a belt's tension load where a part of the radial force axially affects the shaft, which houses the pulley.
There may be several conditions involved in the creation of axial forces, even the gears that generate axial forces as they rotate, made with spiral toothing.

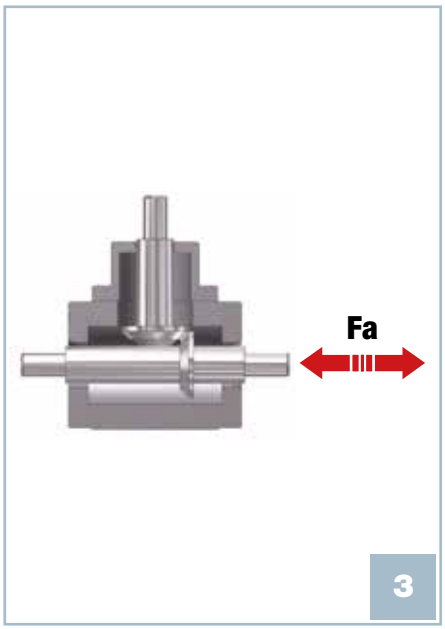
The conditions of maximum axial load that the various right-angle gear drives can withstand are summarized in the axial loads table.
This table shows, according to rotation speed, the **radial force** (example 1) and the **axial force** (examples 2 and 3) that the various right-angle gear drives can withstand, considering the radial load applied at a distance equal to half the protrusion of the shaft and, for hollow shafts, a maximum overhang of the point of application, the same as that of the respective model with the male shaft.
As in the previous cases, these are maximum recommended values.

The values in the tables A and B with the red color stand for limit or non-preferential conditions. Hence, if you have to work under these load and rpm conditions, contact our technical department for greater safety.

Esempi di carico
Load examples







Tab. B

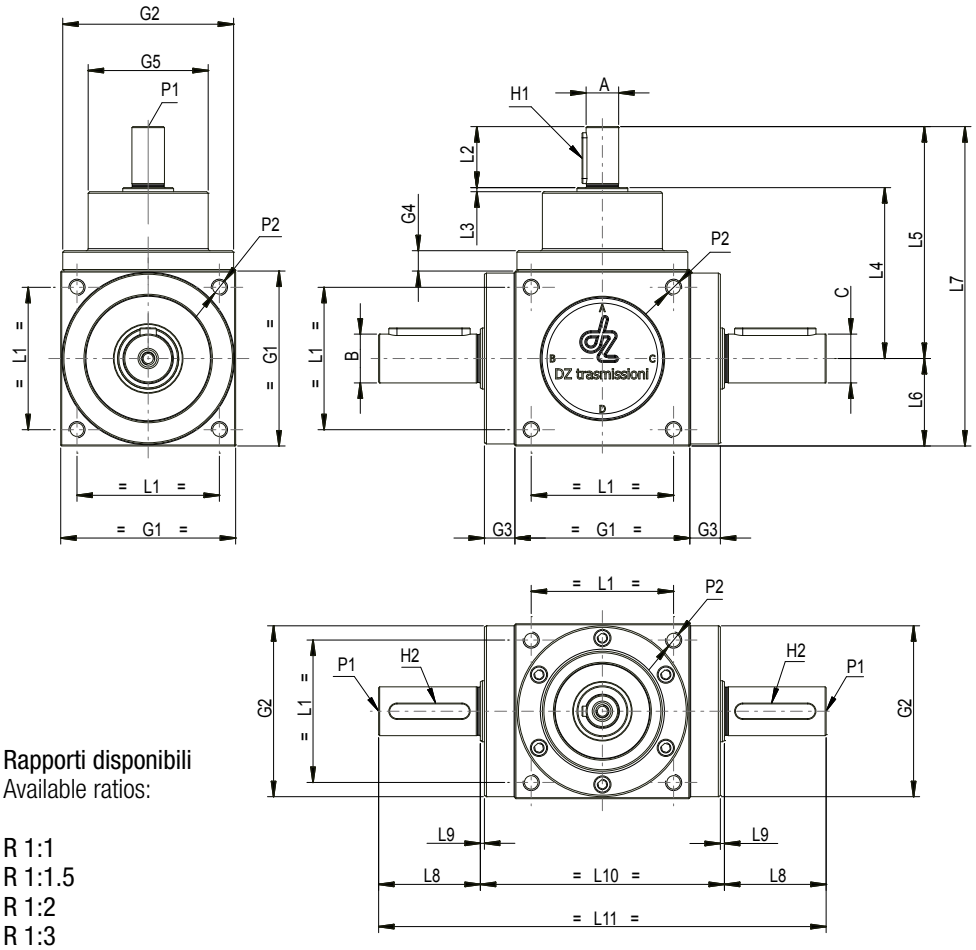
CARICHI ESTERNI APPLICABILI IN RELAZIONE ALLE VELOCITÀ
MAX RADIAL AND AXIAL LOAD RELATION rpm

Fr = forza radiale
Fr = radial load

Fa = forza assiale
Fa = axial load

Giri in uscita Output revs			50 rpm		100 rpm		200 rpm		400 rpm		800 rpm		1400 rpm		2000 rpm		3000 rpm	
Carichi radiali - assiali Radial - axial loads			Fr	Fa	Fr	Fa	Fr	Fa	Fr	Fa	Fr	Fa	Fr	Fa	Fr	Fa	Fr	Fa
n. no.	Taglia Size	Rapporto - ØAsse A Ratio - A AxisØ	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
1	QB 54	R.1:1 - Ø18	651	527	547	443	460	372	387	313	325	263	283	229	259	209	234	189
2		R.1:1 - Ø11	489	395	411	332	345	279	290	235	244	198	212	172	194	157	176	142
3		R.1:1.5 - Ø11	546	452	459	380	386	320	324	269	273	226	237	197	217	180	196	163
4		R.1:2 - Ø11	475	391	399	329	336	277	282	233	237	196	206	170	189	156	171	141
5		R.1:3 - Ø11	442	356	372	299	313	252	263	212	221	178	192	155	176	142	159	128
6		R.1:4 - Ø11	329	259	276	218	232	183	195	154	164	129	143	113	131	103	118	93
7	QB 86	R.1:1 - Ø24	2026	1640	1704	1379	1433	1160	1205	975	1013	820	881	713	806	652	728	589
8		R.1:1 - Ø16	1065	862	895	724	753	609	633	512	532	431	463	375	423	343	383	310
9		R.1:1.5 - Ø16	1522	1262	1280	1061	1076	892	905	750	761	631	662	549	605	502	547	453
10		R.1:2 - Ø16	1493	1232	1256	1036	1056	871	888	733	747	616	649	536	594	490	537	443
11		R.1:3 - Ø16	947	762	796	641	669	539	563	453	473	381	411	331	376	303	340	274
12		R.1:4 - Ø16	655	515	551	433	463	364	389	306	327	258	285	224	260	205	235	185
13	QB 110	R.1:1 - Ø26	2850	2306	2396	1939	2015	1631	1695	1371	1425	1153	1239	1003	1133	917	1024	829
14		R.1:1 - Ø20	1571	1271	1321	1069	1111	899	934	756	786	636	683	553	625	506	565	457
15		R.1:1.5 - Ø20	2403	1992	2020	1675	1699	1409	1429	1185	1201	996	1044	866	955	792	863	716
16		R.1:2 - Ø20	2332	1924	1961	1618	1649	1360	1386	1144	1166	962	1014	836	927	765	838	691
17		R.1:3 - Ø20	1507	1213	1268	1020	1066	858	896	721	754	607	655	527	599	482	542	436
18		R.1:4 - Ø20	1094	861	920	724	773	609	650	512	547	430	475	374	435	342	393	309
19	QB 134	R.1:1 - Ø32	3815	3088	3208	2596	2698	2183	2269	1836	1908	1544	1659	1342	1517	1228	1371	1109
20		R.1:1 - Ø24	2273	1839	1911	1547	1607	1301	1351	1094	1136	920	988	800	904	731	817	661
21		R.1:1.5 - Ø24	3305	2741	2779	2305	2337	1938	1965	1630	1653	1370	1437	1191	1314	1090	1188	985
22		R.1:2 - Ø24	3062	2526	2575	2124	2165	1786	1821	1502	1531	1263	1331	1098	1217	1004	1100	907
23		R.1:3 - Ø24	2307	1857	1940	1562	1632	1313	1372	1104	1154	928	1003	807	918	738	829	667
24		R.1:4 - Ø24	1689	1330	1421	1118	1195	940	1005	791	845	665	734	578	672	529	607	478
25	QB 166	R.1:1 - Ø45	5948	4813	5001	4048	4206	3404	3537	2862	2974	2407	2586	2092	2365	1914	2137	1729
26		R.1:1 - Ø32	4809	3892	4044	3273	3400	2752	2859	2314	2404	1946	2091	1692	1912	1548	1728	1398
27		R.1:1.5 - Ø32	4955	4109	4167	3455	3504	2905	2947	2443	2478	2054	2154	1786	1970	1634	1781	1476
28		R.1:2 - Ø32	4484	3699	3771	3111	3171	2616	2666	2200	2242	1850	1949	1608	1783	1471	1611	1329
29		R.1:3 - Ø32	3802	3060	3197	2573	2688	2164	2261	1819	1901	1530	1653	1330	1512	1217	1366	1099
30		R.1:4 - Ø32	2817	2217	2369	1865	1992	1568	1675	1318	1408	1109	1225	964	1120	882	1012	797
31	QB 200	R.1:1 - Ø55	6932	5610	5829	4717	4901	3967	4122	3335	3466	2805	3013	2439	2756	2231	2491	2016
32		R.1:1 - Ø42	6932	5610	5829	4717	4901	3967	4122	3335	3466	2805	3013	2439	2756	2231	2491	2016
33		R.1:1.5 - Ø42	6017	4989	5060	4195	4255	3528	3578	2967	3009	2495	2616	2169	2393	1984	2162	1793
34		R.1:2 - Ø42	5537	4568	4656	3841	3915	3230	3292	2716	2768	2284	2407	1986	2202	1816	1989	1641
35		R.1:3 - Ø42	4959	3991	4170	3356	3506	2822	2948	2373	2479	1995	2156	1735	1972	1587	1782	1434
36		R.1:4 - Ø42	3903	3072	3282	2583	2760	2172	2321	1827	1951	1536	1697	1335	1552	1221	1402	1104
37	QB 250	R.1:1 - Ø70	13735	11116	11550	9347	9712	7860	8167	6609	6868	5558	5971	4832	5462	4420	4935	3994
38		R.1:1 - Ø55	13735	11116	11550	9347	9712	7860	8167	6609	6868	5558	5971	4832	5462	4420	4935	3994
39		R.1:1.5 - Ø55	12017	9963	10105	8378	8497	7045	7145	5924	6009	4981	5224	4331	4778	3962	4318	3580
40		R.1:2 - Ø55	10930	9017	9191	7582	7729	6376	6499	5362	5465	4509	4751	3920	4346	3585	3927	3240
41		R.1:3 - Ø55	8201	6600	6896	5550	5799	4667	4876	3924	4101	3300	3565	2869	3261	2624	2947	2371
42		R.1:4 - Ø55	5919	4658	4977	3917	4185	3294	3519	2770	2959	2329	2573	2025	2353	1852	2127	1674
43	QB 350	R.1:1 - Ø85	25856	20925	21742	17596	18283	14796	15374	12442	12928	10463	11240	9097	10281	8321	9290	7518
44		R.1:1 - Ø65	20355	16473	17116	13852	14393	11648	12103	9795	10177	8237	8849	7161	8094	6550	7314	5919
45		R.1:1.5 - Ø65	21862	18125	18384	15242	15459	12817	12999	10777	10931	9063	9504	7880	8693	7207	7855	6513
46		R.1:2 - Ø65	20860	17209	17541	14471	14750	12168	12403	10232	10430	8604	9068	7481	8295	6843	7495	6183
47		R.1:3 - Ø65	17174	13822	14442	11622	12144	9773	10212	8218	8587	6911	7466	6009	6829	5496	6171	4966
48		R.1:4 - Ø65	12490	9830	10503	8266	8832	6951	7427	5845	6245	4915	5430	4273	4966	3909	4488	3532

Serie **QB** Series	Diametri prese di forza PTO diameters		Dimensioni forma costruttiva Tipo 1 Type 1 constructive form dimensions																	
Taglia Size G1	A Ø h7	B - C Ø h7	G2 Ø f7	G3	G4	G5	L1	L2	L3 L9	L4	L5	L6	L7	L8	L10	L11	H1	H2	P1	P2
54	11	18	53	8.5	10	52.8	44	23	1.5	72	95	27	122	35	74	144	4x4x20	6x6x30	M4x10	M4x12
	R 18							35			107		134				6x6x30			
86	16	24	84	15	10	59	70	30	2	84	114	43	157	50	120	220	5x5x25	8x7x40	M6x12	M8x20
	R 24							50			134		177				8x7x40			
110	20	26	100	15	13	68	90	40	2	110	150	55	205	55	144	254	6x6x35	8x7x45	M8x20	M10x25
	R 26							55			165		220				8x7x45			
134	24	32	122	18	15	80	114	50	2	132	182	67	249	65	174	304	8x7x45	10x8x55	M8x20	M10x25
	R 32							65			197		264				10x8x55			
166	32	45	156	21	16	107	144	65	2	152	217	83	300	90	212	392	10x8x60	14x9x80	M10x25	M12x30
	R 45							90			242		325				14x9x80			
200	42	55	185	23	16	120	174	85	2	182	267	100	367	110	250	470	12x8x80	16x10x100	M10x25	M14x35
	R 55							110			292		392				16x10x100			
250	55	70	230	22	18	152	216	100	3	218	318	125	443	140	300	580	16x10x90	20x12x120	M12x25	M16x40
	R 70							140			358		483				20x12x120			
350	65	85	345	30	15	240	320	120	5	330	450	175	625	170	420	760	18x11x110	22x14x160	M12x25	M20x60
	R 85							170			500		675				22x14x160			





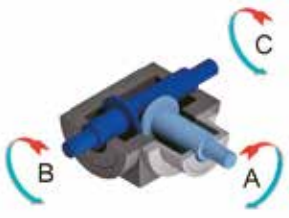


Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4

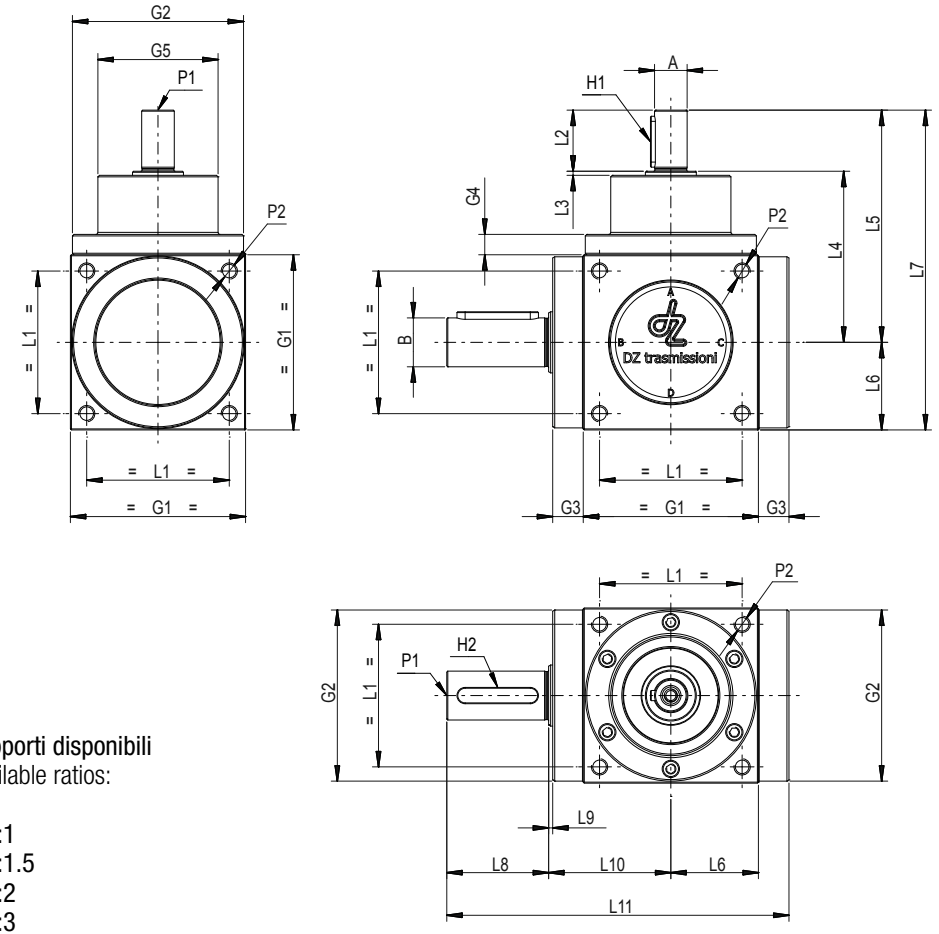
N.B. Il diametro delle prese di forza “B” e “C” è sempre uguale per taglia.
Per esigenze diverse consultare l’Uff. Tecnico.

NOTE: The diameter of PTO “B” and “C” is the same for size.
For any further information please contact our Technical Dept.



Rotazioni forma costruttiva TIPO 1
TYPE 1 constructive form revolutions

Serie **QB** Series	Diametri prese di forza PTO diameters		Dimensioni forma costruttiva Tipo 2 Type 2 constructive form dimensions																		
Taglia Size G1	A Ø h7	B Ø h7	G2 Ø f7	G3	G4	G5	L1	L2	L3 L9	L4	L5	L6	L7	L8	L10	L11	H1	H2	P1	P2
54	11	18	53	8.5	10	52.8	44	23	1.5	72	95	27	122	35	37	107.5	4x4x20	6x6x30	M4x10	M4x12
	R 18							35			107		134				6x6x30			
86	16	24	84	15	10	59	70	30	2	84	114	43	157	50	60	168	5x5x25	8x7x40	M6x12	M8x20
	R 24							50			134		177				8x7x40			
110	20	26	100	15	13	68	90	40	2	110	150	55	205	55	72	197	6x6x35	8x7x45	M8x20	M10x25
	R 26							55			165		220				8x7x45			
134	24	32	122	18	15	80	114	50	2	132	182	67	249	65	87	237	8x7x45	10x8x55	M8x20	M10x25
	R 32							65			197		264				10x8x55			
166	32	45	156	21	16	107	144	65	2	152	217	83	300	90	106	300	10x8x60	14x9x80	M10x25	M12x30
	R 45							90			242		325				14x9x80			
200	42	55	185	23	16	120	174	85	2	182	267	100	367	110	125	358	12x8x80	16x10x100	M10x25	M14x35
	R 55							110			292		392				16x10x100			
250	55	70	230	22	18	152	216	100	3	218	318	125	443	140	150	437	16x10x90	20x12x120	M12x25	M16x40
	R 70							140			358		483				20x12x120			
350	65	85	345	30	15	240	320	120	5	330	450	175	625	170	210	585	18x11x110	22x14x160	M12x25	M20x60
	R 85							170			500		675				22x14x160			







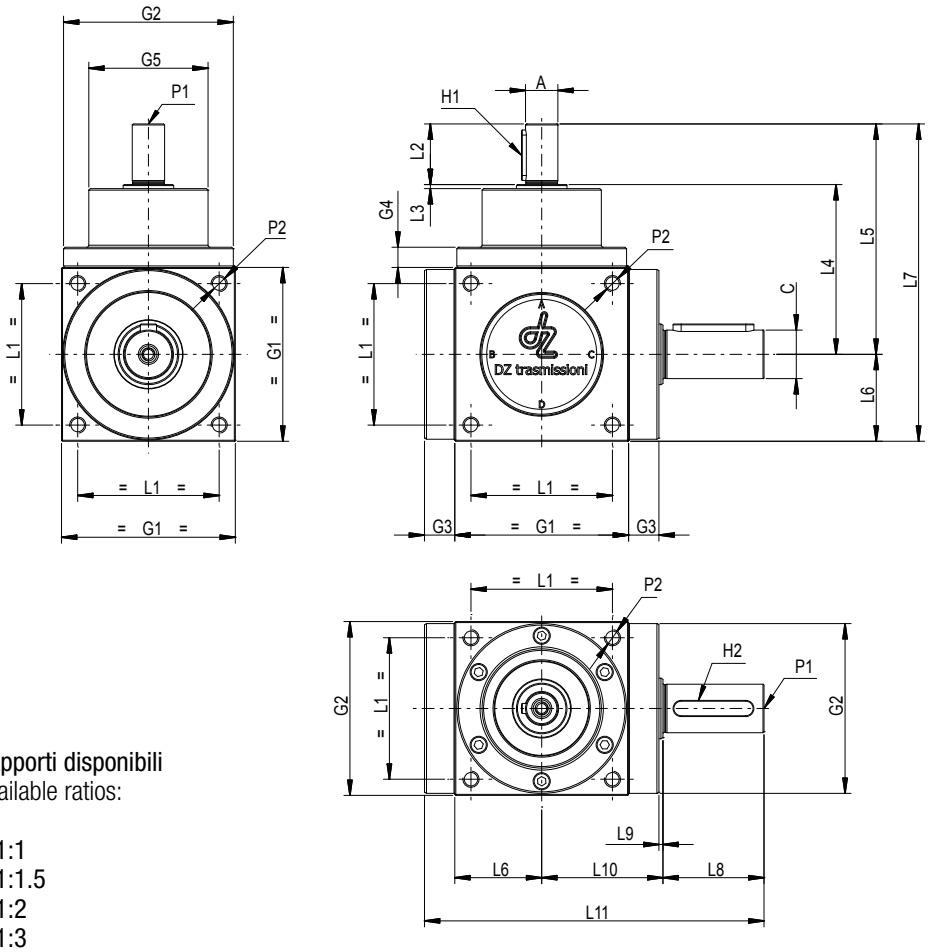
Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4



Rotazioni forma costruttiva TIPO 2
TYPE 2 constructive form revolutions

Serie **QB** Series	Diametri prese di forza PTO diameters		Dimensioni forma costruttiva Tipo 3 Type 3 constructive form dimensions																	
Taglia Size G1	A Ø h7	C Ø h7	G2 Ø f 7	G3	G4	G5	L1	L2	L3 L9	L4	L5	L6	L7	L8	L10	L11	H1	H2	P1	P2
54	11	18	53	8.5	10	52.8	44	23	1.5	72	95	27	122	35	37	107.5	4x4x20	6x6x30	M4x10	M4x12
	R 18							35			107		134				6x6x30			
86	16	24	84	15	10	59	70	30	2	84	114	43	157	50	60	168	5x5x25	8x7x40	M6x12	M8x20
	R 24							50			134		177				8x7x40			
110	20	26	100	15	13	68	90	40	2	110	150	55	205	55	72	197	6x6x35	8x7x45	M8x20	M10x25
	R 26							55			165		220				8x7x45			
134	24	32	122	18	15	80	114	50	2	132	182	67	249	65	87	237	8x7x45	10x8x55	M8x20	M10x25
	R 32							65			197		264				10x8x55			
166	32	45	156	21	16	107	144	65	2	152	217	83	300	90	106	300	10x8x60	14x9x80	M10x25	M12x30
	R 45							90			242		325				14x9x80			
200	42	55	185	23	16	120	174	85	2	182	267	100	367	110	125	358	12x8x80	16x10x100	M10x25	M14x35
	R 55							110			292		392				16x10x100			
250	55	70	230	22	18	152	216	100	3	218	318	125	443	140	150	437	16x10x90	20x12x120	M12x25	M16x40
	R 70							140			358		483				20x12x120			
350	65	85	345	30	15	240	320	120	5	330	450	175	625	170	210	585	18x11x110	22x14x160	M12x25	M20x60
	R 85							170			500		675				22x14x160			







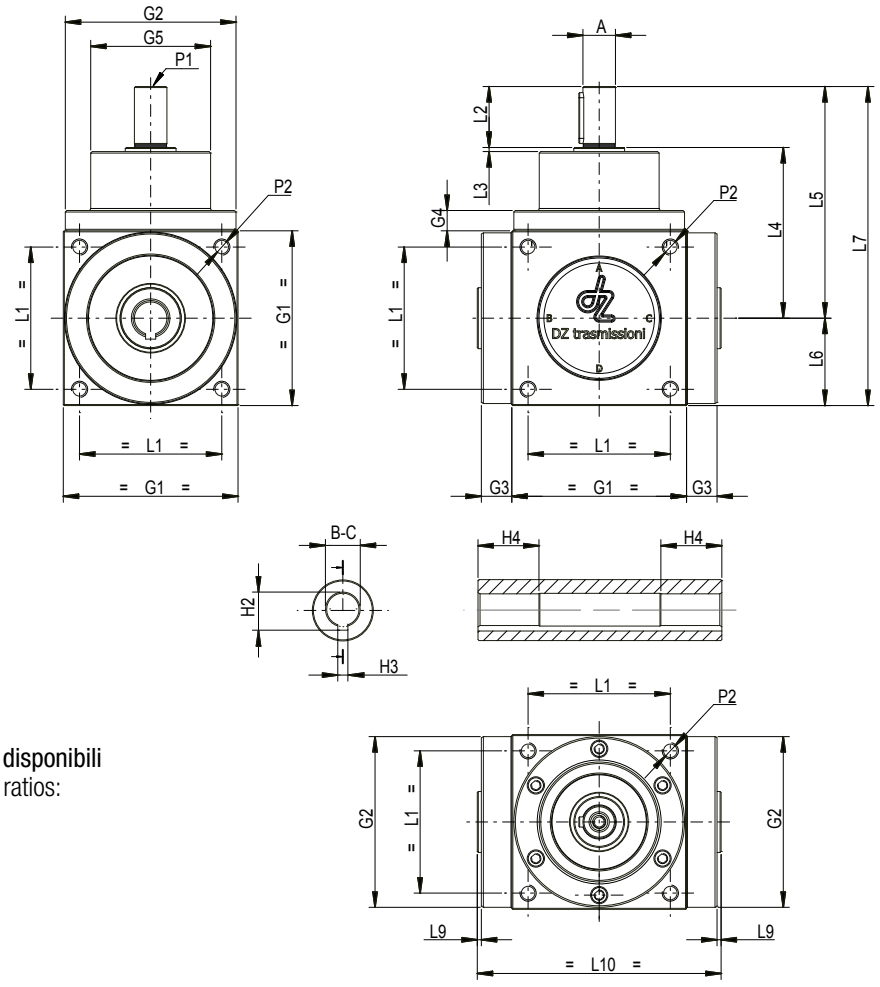
Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4



Rotazioni forma costruttiva TIPO 3
TYPE 3 constructive form revolutions

Serie **QB** Series	Diametri prese di forza PTO diameters		Dimensioni forma costruttiva Tipo 4 Type 4 constructive form dimensions																	
Taglia Size G1	A Ø h7	B - C Ø H7	G2 Ø f7	G3	G4	G5	L1	L2	L3 L9	L4	L5	L6	L7	L10	H1	H2	H3	H4	P1	P2
54	11	12	53	8.5	10	52.8	44	23	1.5	72	95	27	122	74	4x4x20	13.8	4	26	M4x10	M4x12
	R 18							35			107		134		6x6x30					
86	16	16	84	15	10	59	70	30	2	84	114	43	157	120	5x5x25	18.3	5	30	M6x12	M8x20
	R 24							50			134		177		8x7x40					
110	20	20	100	15	13	68	90	40	2	110	150	55	205	144	6x6x35	22.8	6	30	M8x20	M10x25
	R 26							55			165		220		8x7x45					
134	24	24	122	18	15	80	114	50	2	132	182	67	249	174	8x7x45	27.3	8	35	M8x20	M10x25
	R 32							65			197		264		10x8x55					
166	32	32	156	21	16	107	144	65	2	152	217	83	300	212	10x8x60	35.3	10	45	M10x25	M12x30
	R 45							90			242		325		14x9x80					
200	42	42	185	23	16	120	174	85	2	182	267	100	367	250	12x8x80	45.3	12	50	M10x25	M14x35
	R 55							110			292		392		16x10x100					
250	55	55	230	22	18	152	216	100	3	218	318	125	443	300	16x10x90	59.3	16	55	M12x25	M16x40
	R 70							140			358		483		20x12x120					
350	65	80	345	30	15	240	320	120	5	330	450	175	625	420	18x11x110	85.4	22	65	M12x25	M20x60
	R 85							170			500		675		22x14x160					

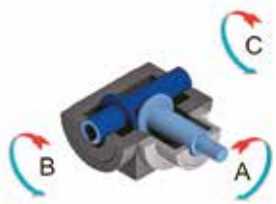






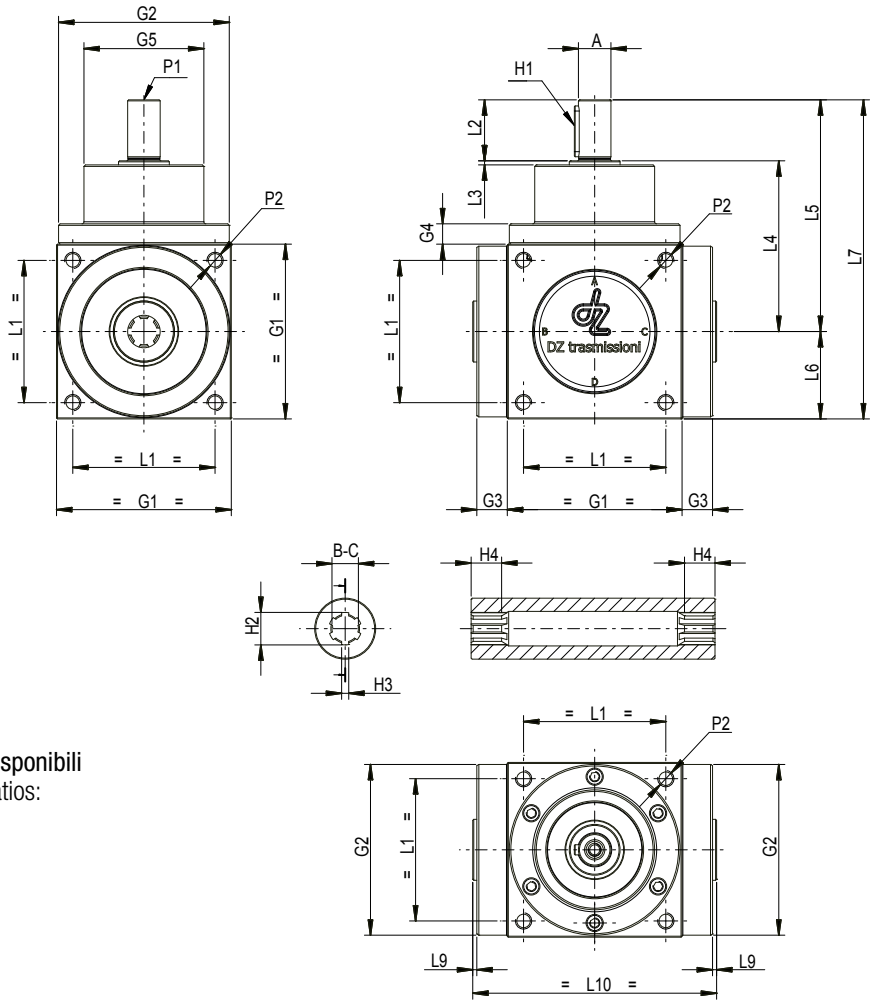
Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4



Rotazioni forma costruttiva TIPO 4
TYPE 4 constructive form revolutions

Serie QB Series	Diametri prese di forza PTO diameters		Dimensioni forma costruttiva Tipo 5 Type 5 constructive form dimensions																	
Taglia Size G1	A Ø h7	B - C scanalato UNI UNI grooved	G2 Ø f7	G3	G4	G5	L1	L2	L3 L9	L4	L5	L6	L7	L10	H1	H2	H3	H4	P1	P2
54	11	6x11x14	53	8.5	10	52.8	44	23	1.5	72	95	27	122	74	4x4x20	14 H10	3 H9	13	M4x10	M4x12
	R 18							35			107		134		6x6x30					
86	16	6x13x16	84	15	10	59	70	30	2	84	114	43	157	120	5x5x25	16 H10	3.5 H9	15	M6x12	M8x20
	R 24							50			134		177		8x7x40					
110	20	6x18x22	100	15	13	68	90	40	2	110	150	55	205	144	6x6x35	22 H10	5 H9	20	M8x20	M10x25
	R 26							55			165		220		8x7x45					
134	24	6x21x25	122	18	15	80	114	50	2	132	182	67	249	174	8x7x45	25 H10	5 H9	25	M8x20	M10x25
	R 32							65			197		264		10x8x55					
166	32	6x28x34	156	21	16	107	144	65	2	152	217	83	300	212	10x8x60	34 H10	7 H9	30	M10x25	M12x30
	R 45							90			242		325		14x9x80					
200	42	8x36x42	185	23	16	120	174	85	2	182	267	100	367	250	12x8x80	42 H10	7 H9	35	M10x25	M14x35
	R 55							110			292		392		16x10x100					
250	55	8x46x54	230	22	18	152	216	100	3	218	318	125	443	300	16x10x90	54 H10	9 H9	40	M12x25	M16x40
	R 70							140			358		483		20x12x120					
350	65	10x72x82	345	30	15	240	320	120	5	330	450	175	625	420	18x11x110	82 H10	10 H9	50	M12x25	M20x60
	R 85							170			500		675		22x14x160					

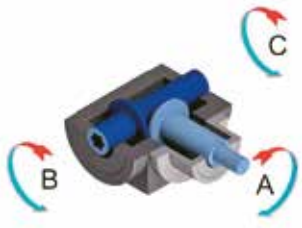






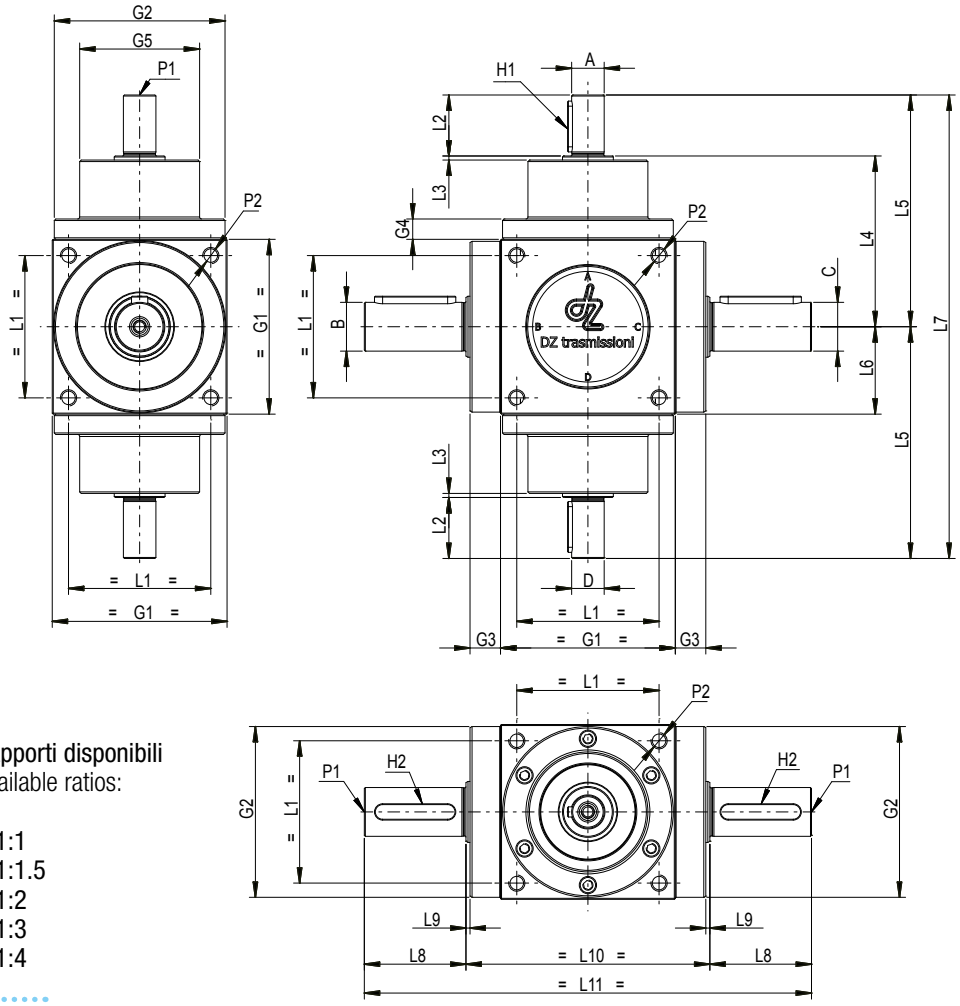
Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4

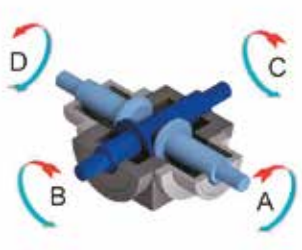


Rotazioni forma costruttiva TIPO 5
TYPE 5 constructive form revolutions

Serie **QB** Series	Diametri prese di forza PTO diameters		Dimensioni forma costruttiva Tipo 6 Type 6 constructive form dimensions																	
Taglia Size G1	A - D Ø h7	B - C Ø h7	G2 Ø f7	G3	G4	G5	L1	L2	L3 L9	L4	L5	L6	L7	L8	L10	L11	H1	H2	P1	P2
54	11	18	53	8.5	10	52.8	44	23	1.5	72	95	27	190	35	74	144	4x4x20	6x6x30	M4x10	M4x12
	R 18							35			107		214				6x6x30			
86	16	24	84	15	10	59	70	30	2	84	114	43	228	50	120	220	5x5x25	8x7x40	M6x12	M8x20
	R 24							50			134		268				8x7x40			
110	20	26	100	15	13	68	90	40	2	110	150	55	300	55	144	254	6x6x35	8x7x45	M8x20	M10x25
	R 26							55			165		330				8x7x45			
134	24	32	122	18	15	80	114	50	2	132	182	67	364	65	174	304	8x7x45	10x8x55	M8x20	M10x25
	R 32							65			197		394				10x8x55			
166	32	45	156	21	16	107	144	65	2	152	217	83	434	90	212	392	10x8x60	14x9x80	M10x25	M12x30
	R 45							90			242		484				14x9x80			
200	42	55	185	23	16	120	174	85	2	182	267	100	534	110	250	470	12x8x80	16x10x100	M10x25	M14x35
	R 55							110			292		584				16x10x100			
250	55	70	230	22	18	152	216	100	3	218	318	125	636	140	300	580	16x10x90	20x12x120	M12x25	M16x40
	R 70							140			358		716				20x12x120			
350	65	85	345	30	15	240	320	120	5	330	450	175	900	170	420	760	18x11x110	22x14x160	M12x25	M20x60
	R 85							170			500		1000				22x14x160			







Rotazioni forma costruttiva TIPO 6
TYPE 6 constructive form revolutions

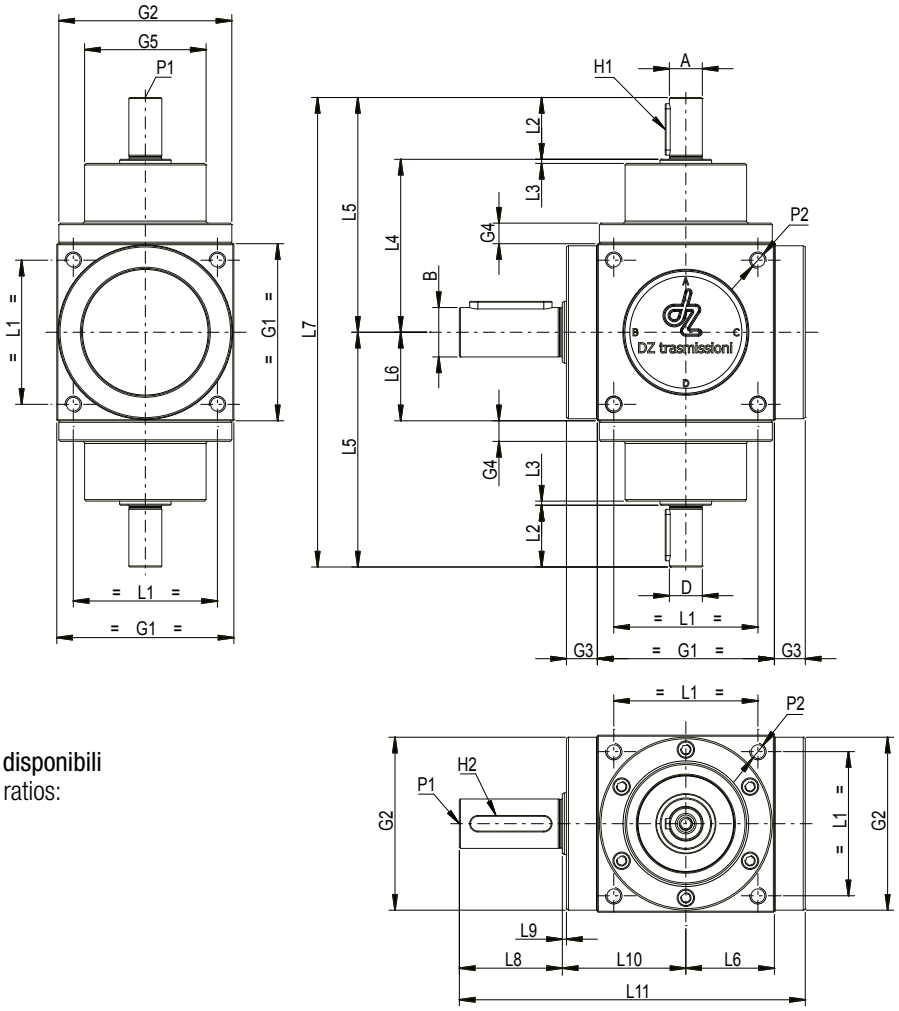
Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4

N.B. Il diametro delle prese di forza "A" - "D" e "B" - "C" è sempre uguale per taglia.
Per esigenze diverse consultare l'Uff. Tecnico.

NOTE: The diameter of PTO "A" - "D" and "B" - "C" is the same for size.
For any further information please contact our Technical Dept.

Serie QB Series	Diametri prese di forza PTO diameters		Dimensioni forma costruttiva Tipo 7 Type 7 constructive form dimensions																	
Taglia Size G1	A - D Ø h7	B Ø h7	G2 Ø f7	G3	G4	G5	L1	L2	L3 L9	L4	L5	L6	L7	L8	L10	L11	H1	H2	P1	P2
54	11	18	53	8.5	10	52.8	44	23	1.5	72	95	27	190	35	37	107.5	4x4x20	6x6x30	M4x10	M4x12
	R 18							35			107		214				6x6x30			
86	16	24	84	15	10	59	70	30	2	84	114	43	228	50	60	168	5x5x25	8x7x40	M6x12	M8x20
	R 24							50			134		268				8x7x40			
110	20	26	100	15	13	68	90	40	2	110	150	55	300	55	72	197	6x6x35	8x7x45	M8x20	M10x25
	R 26							55			165		330				8x7x45			
134	24	32	122	18	15	80	114	50	2	132	182	67	364	65	87	237	8x7x45	10x8x55	M8x20	M10x25
	R 32							65			197		394				10x8x55			
166	32	45	156	21	16	107	144	65	2	152	217	83	434	90	106	300	10x8x60	14x9x80	M10x25	M12x30
	R 45							90			242		484				14x9x80			
200	42	55	185	23	16	120	174	85	2	182	267	100	534	110	125	358	12x8x80	16x10x100	M10x25	M14x35
	R 55							110			292		584				16x10x100			
250	55	70	230	22	18	152	216	100	3	218	318	125	636	140	150	437	16x10x90	20x12x120	M12x25	M16x40
	R 70							140			358		716				20x12x120			
350	65	85	345	30	15	240	320	120	5	330	450	175	900	170	210	585	18x11x110	22x14x160	M12x25	M20x60
	R 85							170			500		1000				22x14x160			





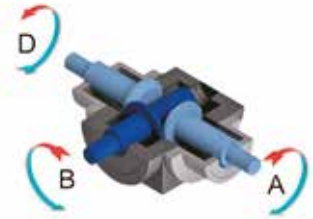


Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4

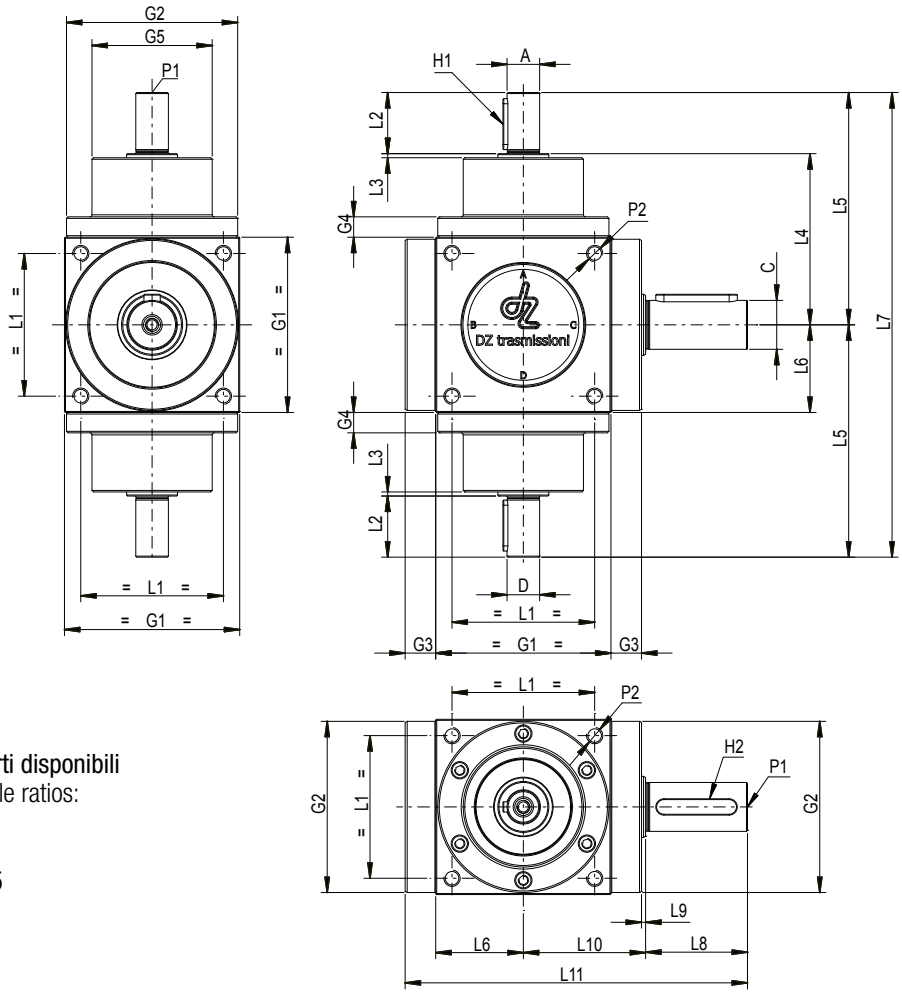
N.B. Il diametro delle prese di forza "A" e "D" è sempre uguale per taglia.
Per esigenze diverse consultare l'Uff. Tecnico.

NOTE: The diameter of PTO "A" and "D" is the same for size.
For any further information please contact our Technical Dept.



Rotazioni forma costruttiva TIPO 7
TYPE 7 constructive form revolutions

Serie **QB** Series	Diametri prese di forza PTO diameters		Dimensioni forma costruttiva Tipo 8 Type 8 constructive form dimensions																	
Taglia Size G1	A - D Ø h7	B Ø h7	G2 Ø f7	G3	G4	G5	L1	L2	L3 L9	L4	L5	L6	L7	L8	L10	L11	H1	H2	P1	P2
54	11	18	53	8.5	10	52.8	44	23	1.5	72	95	27	190	35	37	107.5	4x4x20	6x6x30	M4x10	M4x12
	R 18							35			107		214				6x6x30			
86	16	24	84	15	10	59	70	30	2	84	114	43	228	50	60	168	5x5x25	8x7x40	M6x12	M8x20
	R 24							50			134		268				8x7x40			
110	20	26	100	15	13	68	90	40	2	110	150	55	300	55	72	197	6x6x35	8x7x45	M8x20	M10x25
	R 26							55			165		330				8x7x45			
134	24	32	122	18	15	80	114	50	2	132	182	67	364	65	87	237	8x7x45	10x8x55	M8x20	M10x25
	R 32							65			197		394				10x8x55			
166	32	45	156	21	16	107	144	65	2	152	217	83	434	90	106	300	10x8x60	14x9x80	M10x25	M12x30
	R 45							90			242		484				14x9x80			
200	42	55	185	23	16	120	174	85	2	182	267	100	534	110	125	358	12x8x80	16x10x100	M10x25	M14x35
	R 55							110			292		584				16x10x100			
250	55	70	230	22	18	152	216	100	3	218	318	125	636	140	150	437	16x10x90	20x12x120	M12x25	M16x40
	R 70							140			358		716				20x12x120			
350	65	85	345	30	15	240	320	120	5	330	450	175	900	170	210	585	18x11x110	22x14x160	M12x25	M20x60
	R 85							170			500		1000				22x14x160			



Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4

N.B. Il diametro delle prese di forza "A" e "D" è sempre uguale per taglia.
Per esigenze diverse consultare l'Uff. Tecnico.

NOTE: The diameter of PTO "A" and "D" is the same for size.
For any further information please contact our Technical Dept.

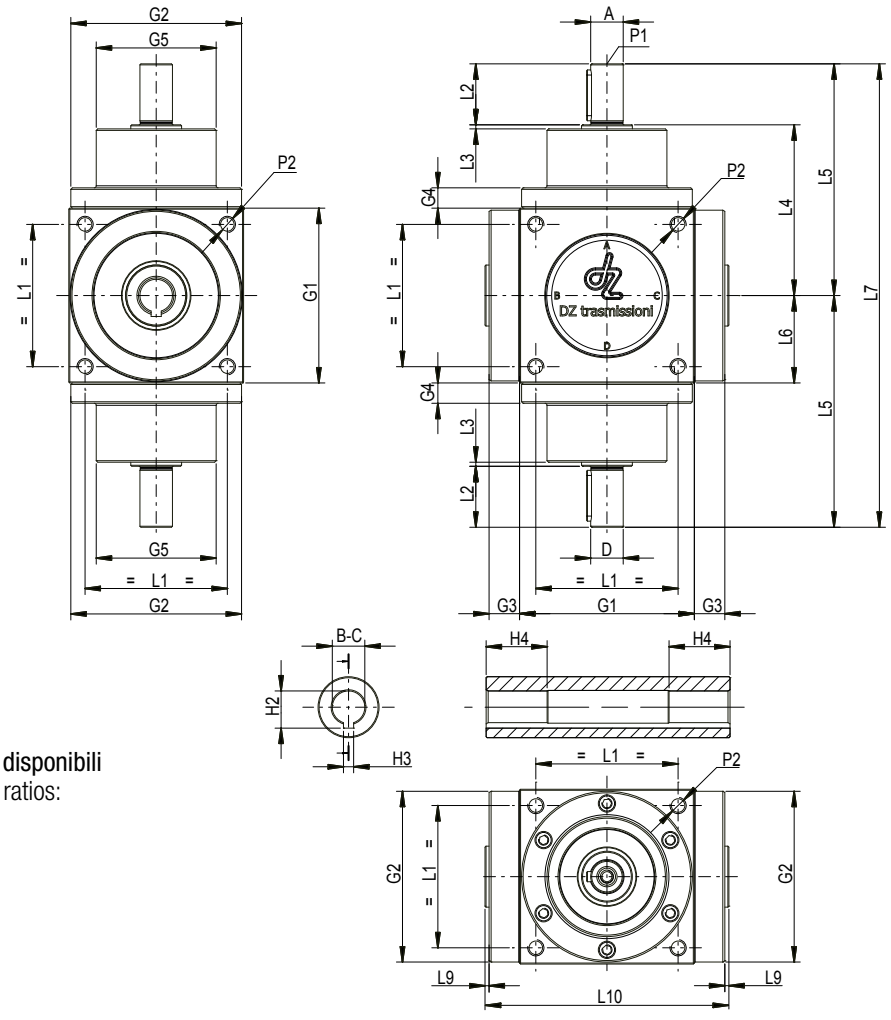






Rotazioni forma costruttiva TIPO 8
TYPE 8 constructive form revolutions

Serie QB Series	Diametri prese di forza PTO diameters		Dimensioni forma costruttiva Tipo 9 Type 9 constructive form dimensions																	
Taglia Size G1	A - D Ø h7	B - C Ø H7	G2 Ø f7	G3	G4	G5	L1	L2	L3 L9	L4	L5	L6	L7	L10	H1	H2	H3	H4	P1	P2
54	11	12	53	8.5	10	52.8	44	23	1.5	72	95	27	190	74	4x4x20	13.8	4	26	M4x10	M4x12
	R 18							35			107		214		6x6x30					
86	16	16	84	15	10	59	70	30	2	84	114	43	228	120	5x5x25	18.3	5	30	M6x12	M8x20
	R 24							50			134		268		8x7x40					
110	20	20	100	15	13	68	90	40	2	110	150	55	300	144	6x6x35	22.8	6	30	M8x20	M10x25
	R 26							55			165		330		8x7x45					
134	24	24	122	18	15	80	114	50	2	132	182	67	364	174	8x7x45	27.3	8	35	M8x20	M10x25
	R 32							65			197		394		10x8x55					
166	32	32	156	21	16	107	144	65	2	152	217	83	434	212	10x8x60	35.3	10	45	M10x25	M12x30
	R 45							90			242		484		14x9x80					
200	42	42	185	23	16	120	174	85	2	182	267	100	534	250	12x8x80	45.3	12	50	M10x25	M14x35
	R 55							110			292		584		16x10x100					
250	55	55	230	22	18	152	216	100	3	218	318	125	636	300	16x10x90	59.3	16	55	M12x25	M16x40
	R 70							140			358		716		20x12x120					
350	65	80	345	30	15	240	320	120	5	330	450	175	900	420	18x11x110	85.4	22	65	M12x25	M20x60
	R 85							170			500		1000		22x14x160					



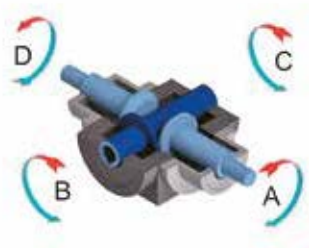


Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4

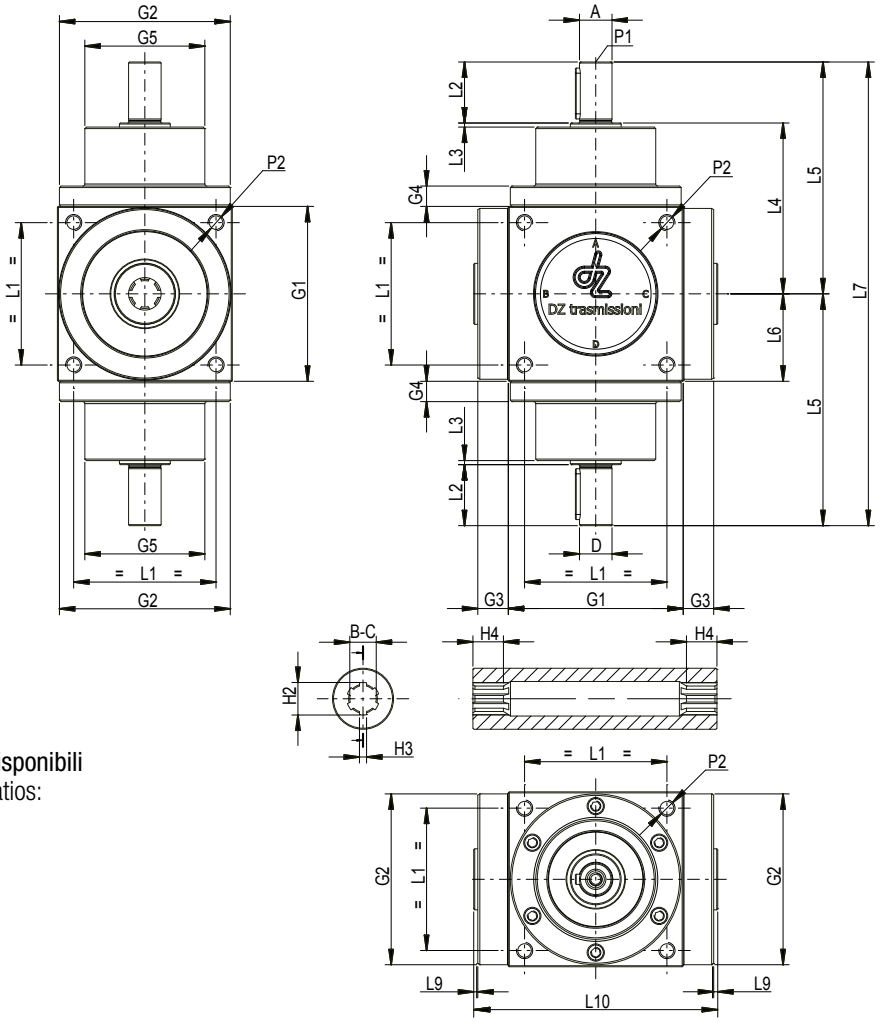
N.B. Il diametro delle prese di forza "A" e "D" è sempre uguale per taglia.
Per esigenze diverse consultare l'Ufficio Tecnico.

NOTE: The diameter of PTO "A" and "D" is the same for size.
For any further information please contact our Technical Dept.



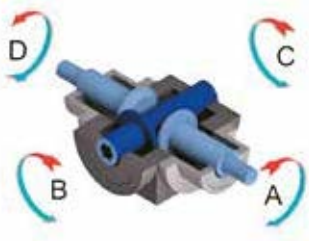
Rotazioni forma costruttiva TIPO 9
TYPE 9 constructive form revolutions

Serie **QB** Series	Diametri prese di forza PTO diameters		Dimensioni forma costruttiva Tipo 10 Type 10 constructive form dimensions																	
Taglia Size G1	A - D Ø h7	B - C scanalato UNI UNI grooved	G2 Ø f7	G3	G4	G5	L1	L2	L3 L9	L4	L5	L6	L7	L10	H1	H2	H3	H4	P1	P2
54	11	6x11x14	53	8.5	10	52.8	44	23	1.5	72	95	27	190	74	4x4x20	14 H10	3 H9	13	M4x10	M4x12
	R 18							35			107		214		6x6x30					
86	16	6x13x16	84	15	10	59	70	30	2	84	114	43	228	120	5x5x25	16 H10	3.5 H9	15	M6x12	M8x20
	R 24							50			134		268		8x7x40					
110	20	6x18x22	100	15	13	68	90	40	2	110	150	55	300	144	6x6x35	22 H10	5 H9	20	M8x20	M10x25
	R 26							55			165		330		8x7x45					
134	24	6x21x25	122	18	15	80	114	50	2	132	182	67	364	174	8x7x45	25 H10	5 H9	25	M8x20	M10x25
	R 32							65			197		394		10x8x55					
166	32	6x28x34	156	21	16	107	144	65	2	152	217	83	434	212	10x8x60	34 H10	7 H9	30	M10x25	M12x30
	R 45							90			242		484		14x9x80					
200	42	8x36x42	185	23	16	120	174	85	2	182	267	100	534	250	12x8x80	42 H10	7 H9	35	M10x25	M14x35
	R 55							110			292		584		16x10x100					
250	55	8x46x54	230	22	18	152	216	100	3	218	318	125	636	300	16x10x90	54 H10	9 H9	40	M12x25	M16x40
	R 70							140			358		716		20x12x120					
350	65	10x72x82	345	30	15	240	320	120	5	330	450	175	900	420	18x11x110	82 H10	10 H9	50	M12x25	M20x60
	R 85							170			500		1000		22x14x160					









Rotazioni forma costruttiva TIPO 10
TYPE 10 constructive form revolutions

Rapporti disponibili
Available ratios:

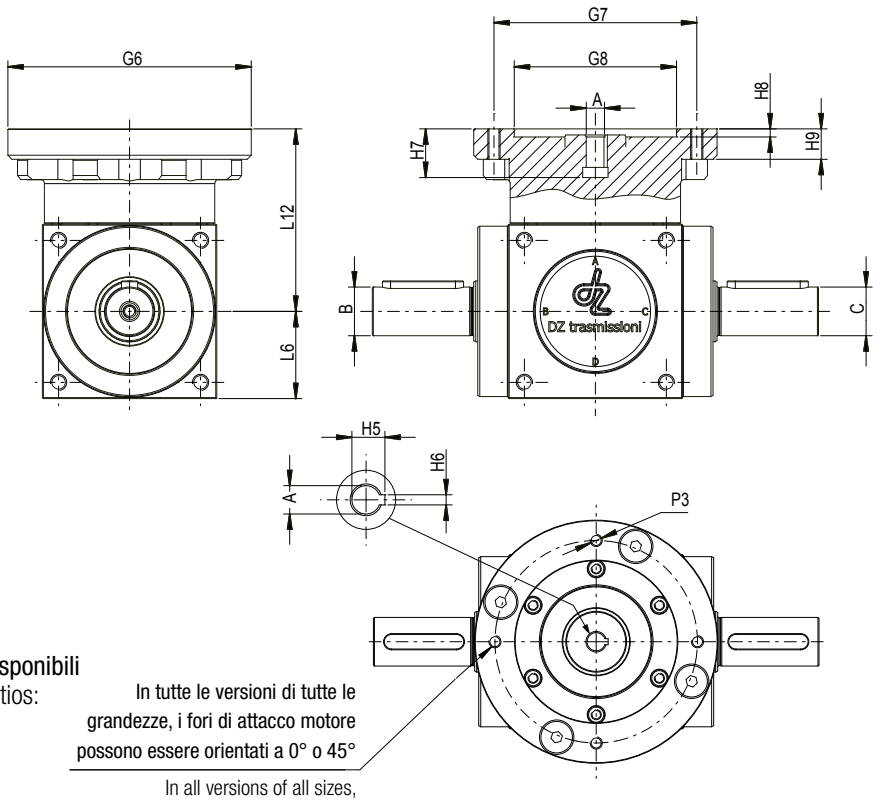
R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4

N.B. Il diametro delle prese di forza "A" e "D" è sempre uguale per taglia.
Per esigenze diverse consultare l'Ufficio Tecnico.

NOTE: The diameter of PTO "A" and "D" is the same for size.
For any further information please contact our Technical Dept.

Serie **QB** Series / Taglia Size G1	Flangia Flange	Diametri prese di forza PTO diameters		Dimensioni Flange PAM PAM Flanges dimensions										
		A Ø H7	B - C Ø h7	G6	G7	G8	L6	L12	H5	H6	H7	H8	H9	P3
86	56 B5	9	24	120	100	80	43	90	10.4	3	23	4	11	M6
	63 B5	11		140	115	95			12.8	4	23	4	11	M8
	71 B5	14		160	130	110			16.3	5	30	4	11	M8
	71 B14	14		105	85	70			16.3	5	30	4	10	7
	80 B5	19		200	165	130		100	21.8	6	40	5	11	M10
	80 B14	19		120	100	80			21.8	6	40	5	11	7
110	63 B5	11	26	140	115	95	55	105	12.8	4	23	4	11	M8
	71 B5	14		160	130	110			16.3	5	30	4	11	M8
	71 B14	14		105	85	70			16.3	5	30	4	11	7
	80 B5	19		200	165	130			21.8	6	40	5	11	M10
	80 B14	19		120	100	80			21.8	6	40	5	11	7
134	71 B5	14	32	160	130	110	67	125	16.3	5	30	4	13	M8
	80 B5	19		200	165	130			21.8	6	40	5	13	M10
	80 B14	19		120	100	80			21.8	6	40	5	13	7
	90 B5	24		200	165	130			27.3	8	50	5	13	M10
	90 B14	24		140	115	95			27.3	8	50	5	13	9
	100-112 B5	28		250	215	180		135	31.3	8	60	5	13	M12
	100-112 B14	28		160	130	110			31.3	8	60	5	13	9
166	71 B5	14	45	160	130	110	83	160	16.3	5	30	4	15	M8
	80 B5	19		200	165	130			21.8	6	40	5	15	M10
	90 B5	24		200	165	130			27.3	8	50	5	15	M10
	100-112 B5	28		250	215	180			31.3	8	60	5	15	M12
	100-112 B14	28		160	130	110			31.3	8	60	5	15	9
200	90 B5	24	55	200	165	130	100	220	27.3	8	50	5	23	M10
	100-112 B5	28		250	215	180			31.3	8	60	5	23	M12
	132 B5	38		300	265	230			41.3	10	80	6	23	M12
	132 B14	38		200	165	130			41.3	10	80	6	23	11
250	132 B5	38	70	300	265	230	125	250	41.3	10	80	6	25	M12
	132 B14	38		200	165	130			41.3	10	80	6	25	11
	160 B5	42		350	300	250			45.8	12	110	6	25	M16

Per tutte le dimensioni non quotate fare riferimento alle dimensioni dello schema Tipo 1.
For all non-quoted dimensions, please refer to those of the Type 1 table.





Rapporti disponibili
Available ratios:

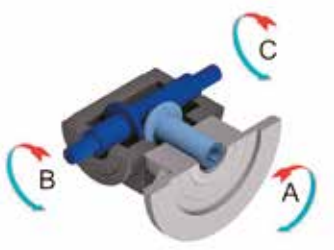
R 1:1
R 1:1.5
R 2
R 3
R 4

In tutte le versioni di tutte le grandezze, i fori di attacco motore possono essere orientati a 0° o 45°

In all versions of all sizes, the holes for mounting the motors can be oriented at 0° or 45°

N.B. Il diametro delle prese di forza "B" e "C" è sempre uguale per taglia.
Per esigenze diverse consultare l'Uff. Tecnico.

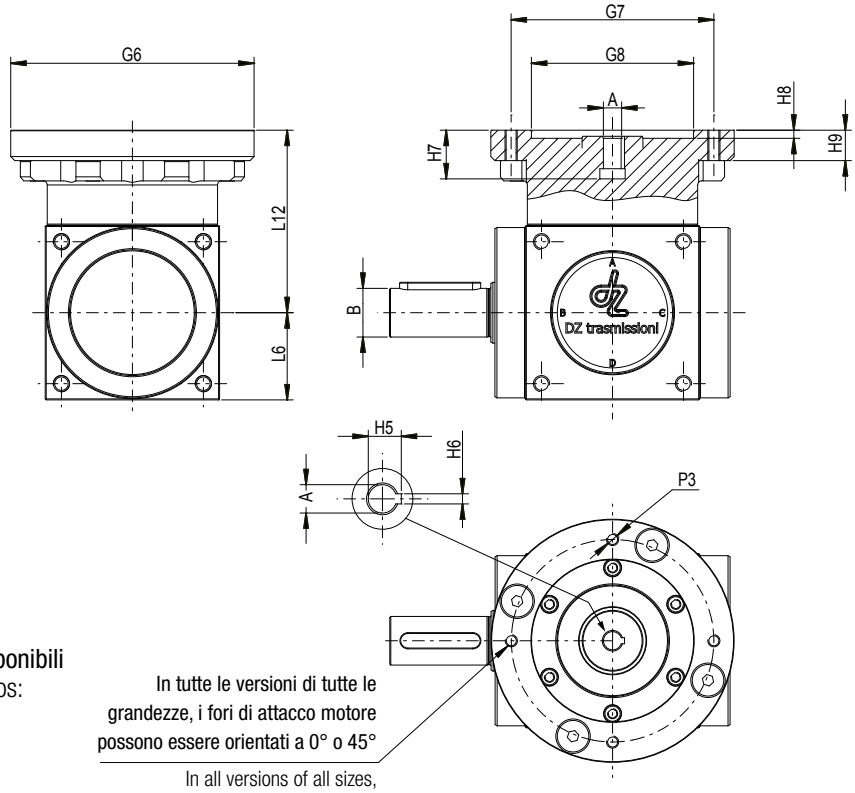
NOTE: The diameter of PTO "B" and "C" is the same for size.
For any further information please contact our Technical Dept.



Rotazioni forma costruttiva TIPO 11
TYPE 11 constructive form revolutions

Serie **QB** Series / Taglia Size G1	Flangia Flange	Diametri prese di forza PTO diameters		Dimensioni Flange PAM PAM Flanges dimensions										
		A Ø H7	B Ø h7	G6	G7	G8	L6	L12	H5	H6	H7	H8	H9	P3
86	56 B5	9	24	120	100	80	43	90	10.4	3	23	4	11	M6
	63 B5	11		140	115	95			12.8	4	23	4	11	M8
	71 B5	14		160	130	110			16.3	5	30	4	11	M8
	71 B14	14		105	85	70			16.3	5	30	4	10	7
	80 B5	19		200	165	130		100	21.8	6	40	5	11	M10
	80 B14	19		120	100	80			21.8	6	40	5	11	7
110	63 B5	11	26	140	115	95	55	105	12.8	4	23	4	11	M8
	71 B5	14		160	130	110			16.3	5	30	4	11	M8
	71 B14	14		105	85	70			16.3	5	30	4	11	7
	80 B5	19		200	165	130			21.8	6	40	5	11	M10
	80 B14	19		120	100	80			21.8	6	40	5	11	7
134	71 B5	14	32	160	130	110	67	125	16.3	5	30	4	13	M8
	80 B5	19		200	165	130			21.8	6	40	5	13	M10
	80 B14	19		120	100	80			21.8	6	40	5	13	7
	90 B5	24		200	165	130			27.3	8	50	5	13	M10
	90 B14	24		140	115	95			27.3	8	50	5	13	9
	100-112 B5	28		250	215	180		135	31.3	8	60	5	13	M12
	100-112 B14	28		160	130	110			31.3	8	60	5	13	9
166	71 B5	14	45	160	130	110	83	160	16.3	5	30	4	15	M8
	80 B5	19		200	165	130			21.8	6	40	5	15	M10
	90 B5	24		200	165	130			27.3	8	50	5	15	M10
	100-112 B5	28		250	215	180			31.3	8	60	5	15	M12
	100-112 B14	28		160	130	110			31.3	8	60	5	15	9
200	90 B5	24	55	200	165	130	100	220	27.3	8	50	5	23	M10
	100-112 B5	28		250	215	180			31.3	8	60	5	23	M12
	132 B5	38		300	265	230			41.3	10	80	6	23	M12
	132 B14	38		200	165	130			41.3	10	80	6	23	11
250	132 B5	38	70	300	265	230	125	250	41.3	10	80	6	25	M12
	132 B14	38		200	165	130			41.3	10	80	6	25	11
	160 B5	42		350	300	250			45.8	12	110	6	25	M16

Per tutte le dimensioni non quotate fare riferimento alle dimensioni dello schema Tipo 2.
For all non-quoted dimensions, please refer to those of the Type 2 table.



Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4

In tutte le versioni di tutte le grandezze, i fori di attacco motore possono essere orientati a 0° o 45°

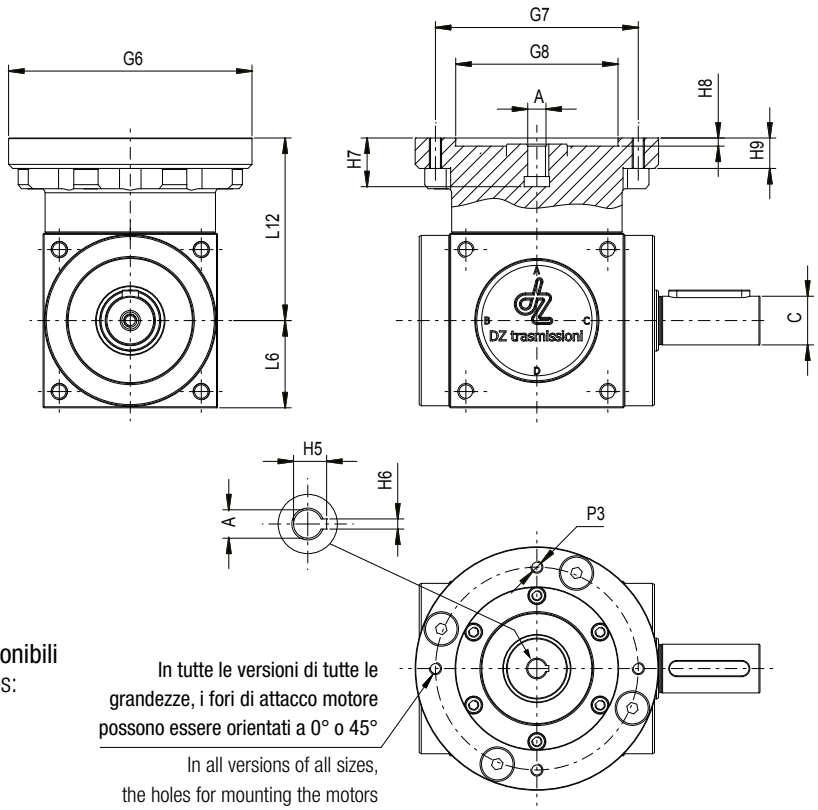
In all versions of all sizes, the holes for mounting the motors can be oriented at 0° or 45°



Rotazioni forma costruttiva TIPO 12
TYPE 12 constructive form revolutions

Serie **QB** Series / Taglia Size G1	Flangia Flange	Diametri prese di forza PTO diameters		Dimensioni Flange PAM PAM Flanges dimensions										
		A Ø H7	C Ø h7	G6	G7	G8	L6	L12	H5	H6	H7	H8	H9	P3
86	56 B5	9	24	120	100	80	43	90	10.4	3	23	4	11	M6
	63 B5	11		140	115	95			12.8	4	23	4	11	M8
	71 B5	14		160	130	110			16.3	5	30	4	11	M8
	71 B14	14		105	85	70			16.3	5	30	4	10	7
	80 B5	19		200	165	130		100	21.8	6	40	5	11	M10
	80 B14	19		120	100	80			21.8	6	40	5	11	7
110	63 B5	11	26	140	115	95	55	105	12.8	4	23	4	11	M8
	71 B5	14		160	130	110			16.3	5	30	4	11	M8
	71 B14	14		105	85	70			16.3	5	30	4	11	7
	80 B5	19		200	165	130			21.8	6	40	5	11	M10
	80 B14	19		120	100	80			21.8	6	40	5	11	7
134	71 B5	14	32	160	130	110	67	125	16.3	5	30	4	13	M8
	80 B5	19		200	165	130			21.8	6	40	5	13	M10
	80 B14	19		120	100	80			21.8	6	40	5	13	7
	90 B5	24		200	165	130			27.3	8	50	5	13	M10
	90 B14	24		140	115	95			27.3	8	50	5	13	9
	100-112 B5	28		250	215	180		135	31.3	8	60	5	13	M12
	100-112 B14	28		160	130	110			31.3	8	60	5	13	9
166	71 B5	14	45	160	130	110	83	160	16.3	5	30	4	15	M8
	80 B5	19		200	165	130			21.8	6	40	5	15	M10
	90 B5	24		200	165	130			27.3	8	50	5	15	M10
	100-112 B5	28		250	215	180			31.3	8	60	5	15	M12
	100-112 B14	28		160	130	110			31.3	8	60	5	15	9
200	90 B5	24	55	200	165	130	100	220	27.3	8	50	5	23	M10
	100-112 B5	28		250	215	180			31.3	8	60	5	23	M12
	132 B5	38		300	265	230			41.3	10	80	6	23	M12
	132 B14	38		200	165	130			41.3	10	80	6	23	11
250	132 B5	38	70	300	265	230	125	250	41.3	10	80	6	25	M12
	132 B14	38		200	165	130			41.3	10	80	6	25	11
	160 B5	42		350	300	250			45.8	12	110	6	25	M16

Per tutte le dimensioni non quotate fare riferimento alle dimensioni dello schema Tipo 3.
For all non-quoted dimensions, please refer to those of the Type 3 table.



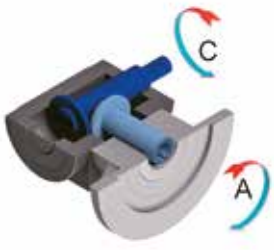


Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4

In tutte le versioni di tutte le grandezze, i fori di attacco motore possono essere orientati a 0° o 45°

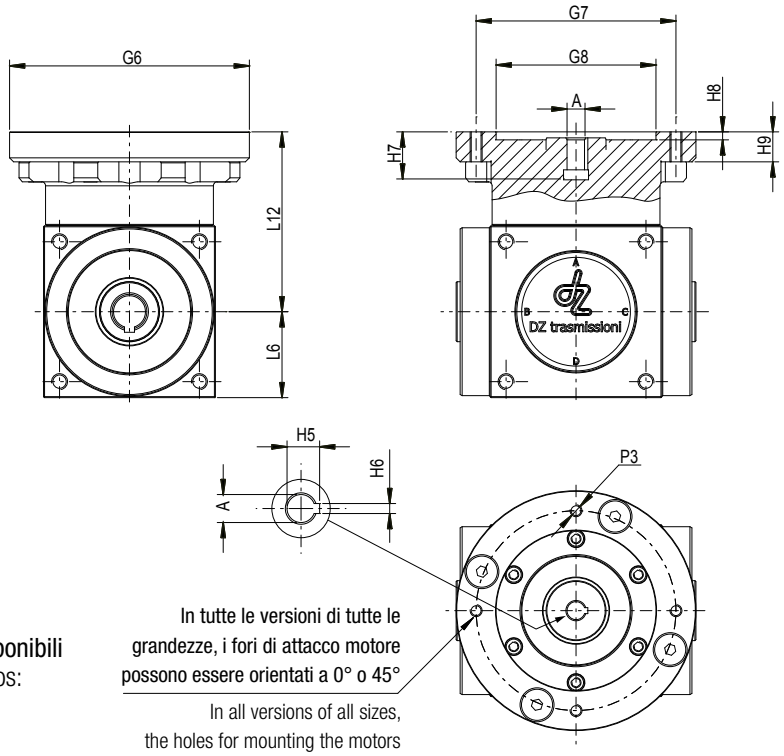
In all versions of all sizes, the holes for mounting the motors can be oriented at 0° or 45°



Rotazioni forma costruttiva TIPO 13
TYPE 13 constructive form revolutions

Serie **QB** Series / Taglia Size G1	Flangia Flange	Diametri prese di forza PTO diameters		Dimensioni Flange PAM PAM Flanges dimensions										
		A Ø H7	B - C Ø H7	G6	G7	G8	L6	L12	H5	H6	H7	H8	H9	P3
86	56 B5	9	16	120	100	80	43	90	10.4	3	23	4	11	M6
	63 B5	11		140	115	95			12.8	4	23	4	11	M8
	71 B5	14		160	130	110			16.3	5	30	4	11	M8
	71 B14	14		105	85	70			16.3	5	30	4	10	7
	80 B5	19		200	165	130		100	21.8	6	40	5	11	M10
	80 B14	19		120	100	80			21.8	6	40	5	11	7
110	63 B5	11	20	140	115	95	55	105	12.8	4	23	4	11	M8
	71 B5	14		160	130	110			16.3	5	30	4	11	M8
	71 B14	14		105	85	70			16.3	5	30	4	11	7
	80 B5	19		200	165	130			21.8	6	40	5	11	M10
	80 B14	19		120	100	80			21.8	6	40	5	11	7
134	71 B5	14	24	160	130	110	67	125	16.3	5	30	4	13	M8
	80 B5	19		200	165	130			21.8	6	40	5	13	M10
	80 B14	19		120	100	80			21.8	6	40	5	13	7
	90 B5	24		200	165	130			27.3	8	50	5	13	M10
	90 B14	24		140	115	95			27.3	8	50	5	13	9
	100-112 B5	28		250	215	180		135	31.3	8	60	5	13	M12
	100-112 B14	28		160	130	110			31.3	8	60	5	13	9
166	71 B5	14	32	160	130	110	83	160	16.3	5	30	4	15	M8
	80 B5	19		200	165	130			21.8	6	40	5	15	M10
	90 B5	24		200	165	130			27.3	8	50	5	15	M10
	100-112 B5	28		250	215	180			31.3	8	60	5	15	M12
	100-112 B14	28		160	130	110			31.3	8	60	5	15	9
200	90 B5	24	42	200	165	130	100	220	27.3	8	50	5	23	M10
	100-112 B5	28		250	215	180			31.3	8	60	5	23	M12
	132 B5	38		300	265	230			41.3	10	80	6	23	M12
	132 B14	38		200	165	130			41.3	10	80	6	23	11
250	132 B5	38	55	300	265	230	125	250	41.3	10	80	6	25	M12
	132 B14	38		200	165	130			41.3	10	80	6	25	11
	160 B5	42		350	300	250			45.8	12	110	6	25	M16

Per tutte le dimensioni non quotate fare riferimento alle dimensioni dello schema Tipo 4.
For all non-quoted dimensions, please refer to those of the Type 4 table.



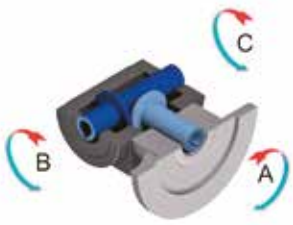
In tutte le versioni di tutte le grandezze, i fori di attacco motore possono essere orientati a 0° o 45°

In all versions of all sizes, the holes for mounting the motors can be oriented at 0° or 45°

Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4

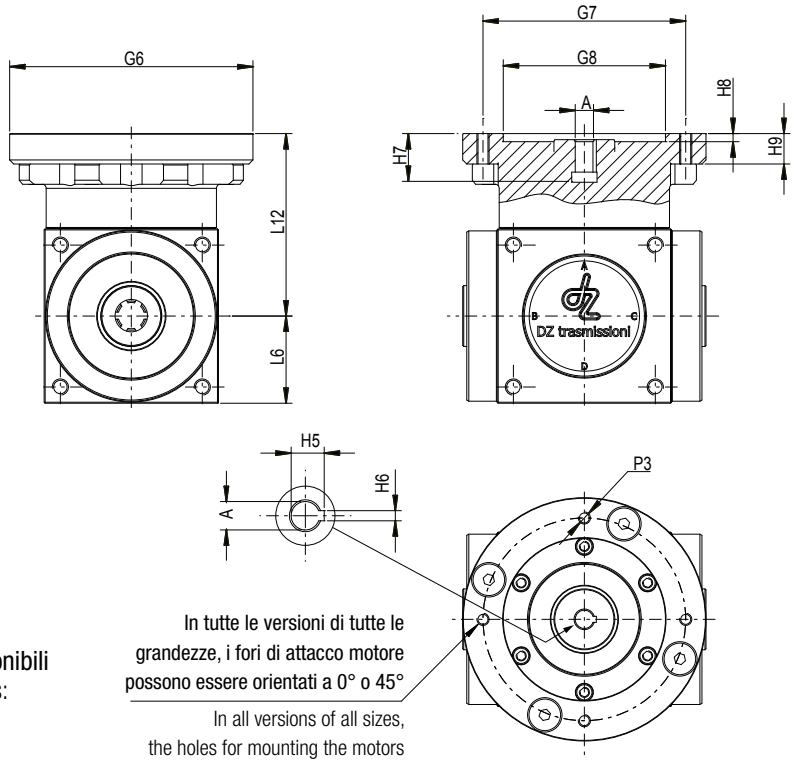




Rotazioni forma costruttiva TIPO 14
TYPE 14 constructive form revolutions

Serie **QB** Series / Taglia Size G1	Flangia Flange	Diametri prese di forza PTO diameters		Dimensioni Flange PAM PAM Flanges dimensions										
		A Ø H7	B - C scanalato UNI UNI grooved	G6	G7	G8	L6	L12	H5	H6	H7	H8	H9	P3
86	56 B5	9	6x13x16	120	100	80	43	90	10.4	3	23	4	11	M6
	63 B5	11		140	115	95			12.8	4	23	4	11	M8
	71 B5	14		160	130	110			16.3	5	30	4	11	M8
	71 B14	14		105	85	70			16.3	5	30	4	10	7
	80 B5	19		200	165	130		100	21.8	6	40	5	11	M10
	80 B14	19		120	100	80			21.8	6	40	5	11	7
110	63 B5	11	6x18x22	140	115	95	55	105	12.8	4	23	4	11	M8
	71 B5	14		160	130	110			16.3	5	30	4	11	M8
	71 B14	14		105	85	70			16.3	5	30	4	11	7
	80 B5	19		200	165	130			21.8	6	40	5	11	M10
	80 B14	19		120	100	80			21.8	6	40	5	11	7
134	71 B5	14	6x21x25	160	130	110	67	125	16.3	5	30	4	13	M8
	80 B5	19		200	165	130			21.8	6	40	5	13	M10
	80 B14	19		120	100	80			21.8	6	40	5	13	7
	90 B5	24		200	165	130			27.3	8	50	5	13	M10
	90 B14	24		140	115	95			27.3	8	50	5	13	9
	100-112 B5	28		250	215	180		135	31.3	8	60	5	13	M12
	100-112 B14	28		160	130	110			31.3	8	60	5	13	9
166	71 B5	14	6x28x34	160	130	110	83	160	16.3	5	30	4	15	M8
	80 B5	19		200	165	130			21.8	6	40	5	15	M10
	90 B5	24		200	165	130			27.3	8	50	5	15	M10
	100-112 B5	28		250	215	180			31.3	8	60	5	15	M12
	100-112 B14	28		160	130	110			31.3	8	60	5	15	9
200	90 B5	24	8x36x42	200	165	130	100	220	27.3	8	50	5	23	M10
	100-112 B5	28		250	215	180			31.3	8	60	5	23	M12
	132 B5	38		300	265	230			41.3	10	80	6	23	M12
	132 B14	38		200	165	130			41.3	10	80	6	23	11
250	132 B5	38	8x46x54	300	265	230	125	250	41.3	10	80	6	25	M12
	132 B14	38		200	165	130			41.3	10	80	6	25	11
	160 B5	42		350	300	250			45.8	12	110	6	25	M16

Per tutte le dimensioni non quotate fare riferimento alle dimensioni dello schema Tipo 5.
For all non-quoted dimensions, please refer to those of the Type 5 table.



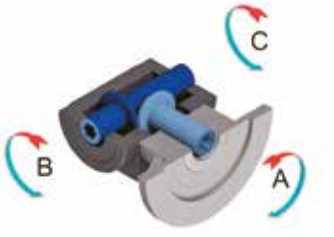
In tutte le versioni di tutte le grandezze, i fori di attacco motore possono essere orientati a 0° o 45°

In all versions of all sizes, the holes for mounting the motors can be oriented at 0° or 45°



Rapporti disponibili
Available ratios:

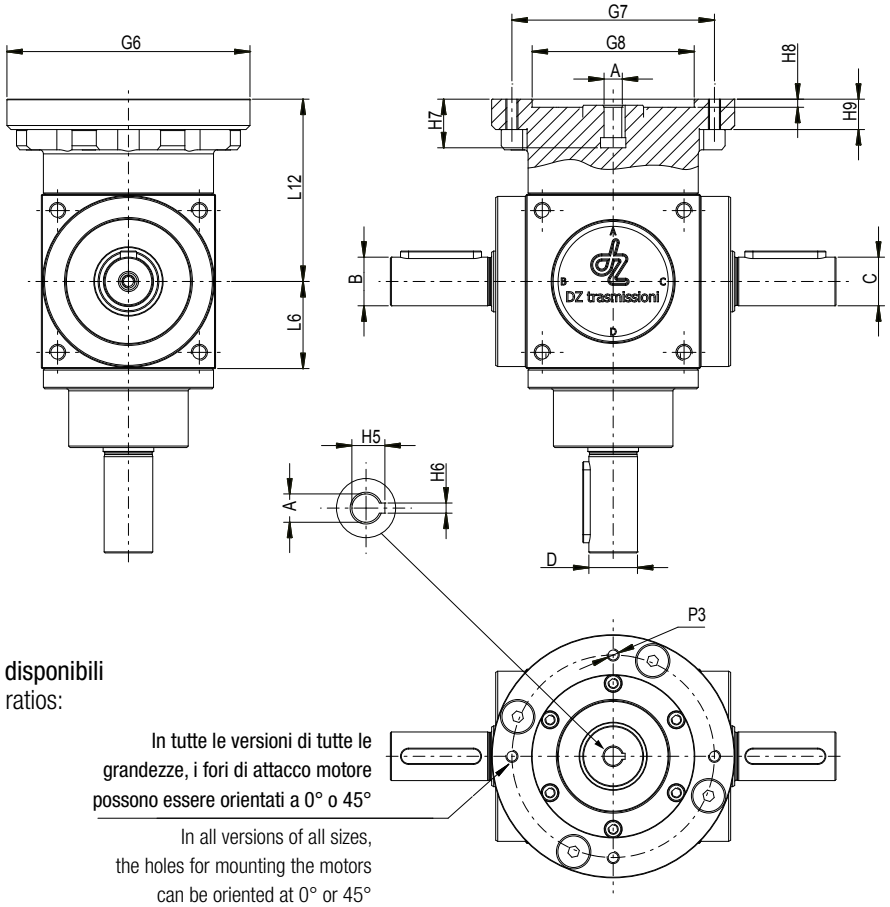
R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4



Rotazioni forma costruttiva TIPO 15
TYPE 15 constructive form revolutions

Serie **QB** Series / Taglia Size G1	Flangia Flange	Diametri prese di forza PTO diameters					Dimensioni Flange PAM PAM Flanges dimensions										
		A Ø H7	B - C Ø h7	D Ø h7	D Ø h7		G6	G7	G8	L6	L12	H5	H6	H7	H8	H9	P3
86	56 B5	9	24	16	24	R	120	100	80	43	90	10.4	3	23	4	11	M6
	63 B5	11					140	115	95			12.8	4	23	4	11	M8
	71 B5	14					160	130	110			16.3	5	30	4	11	M8
	71 B14	14					105	85	70			16.3	5	30	4	10	7
	80 B5	19					200	165	130		100	21.8	6	40	5	11	M10
	80 B14	19					120	100	80			21.8	6	40	5	11	7
110	63 B5	11	26	20	26	R	140	115	95	55	105	12.8	4	23	4	11	M8
	71 B5	14					160	130	110			16.3	5	30	4	11	M8
	71 B14	14					105	85	70			16.3	5	30	4	11	7
	80 B5	19					200	165	130			21.8	6	40	5	11	M10
	80 B14	19					120	100	80			21.8	6	40	5	11	7
134	71 B5	14	32	24	32	R	160	130	110	67	125	16.3	5	30	4	13	M8
	80 B5	19					200	165	130			21.8	6	40	5	13	M10
	80 B14	19					120	100	80			21.8	6	40	5	13	7
	90 B5	24					200	165	130			27.3	8	50	5	13	M10
	90 B14	24					140	115	95			27.3	8	50	5	13	9
	100-112 B5	28					250	215	180		135	31.3	8	60	5	13	M12
	100-112 B14	28					160	130	110			31.3	8	60	5	13	9
166	71 B5	14	45	32	45	R	160	130	110	83	160	16.3	5	30	4	15	M8
	80 B5	19					200	165	130			21.8	6	40	5	15	M10
	90 B5	24					200	165	130			27.3	8	50	5	15	M10
	100-112 B5	28					250	215	180			31.3	8	60	5	15	M12
	100-112 B14	28					160	130	110			31.3	8	60	5	15	9
200	90 B5	24	55	42	55	R	200	165	130	100	220	27.3	8	50	5	23	M10
	100-112 B5	28					250	215	180			31.3	8	60	5	23	M12
	132 B5	38					300	265	230			41.3	10	80	6	23	M12
	132 B14	38					200	165	130			41.3	10	80	6	23	11
250	132 B5	38	70	55	70	R	300	265	230	125	250	41.3	10	80	6	25	M12
	132 B14	38					200	165	130			41.3	10	80	6	25	11
	160 B5	42					350	300	250			45.8	12	110	6	25	M16

Per tutte le dimensioni non quotate fare riferimento alle dimensioni dello schema Tipo 6.
For all non-quoted dimensions, please refer to those of the Type 6 table.





Rapporti disponibili
Available ratios:

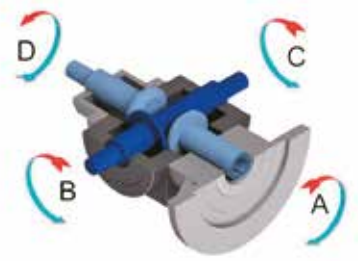
R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4

In tutte le versioni di tutte le grandezze, i fori di attacco motore possono essere orientati a 0° o 45°

In all versions of all sizes, the holes for mounting the motors can be oriented at 0° or 45°

N.B. Il diametro delle prese di forza "B", "C" e "D" è sempre uguale per taglia.
Per esigenze diverse consultare l'Uff. Tecnico.

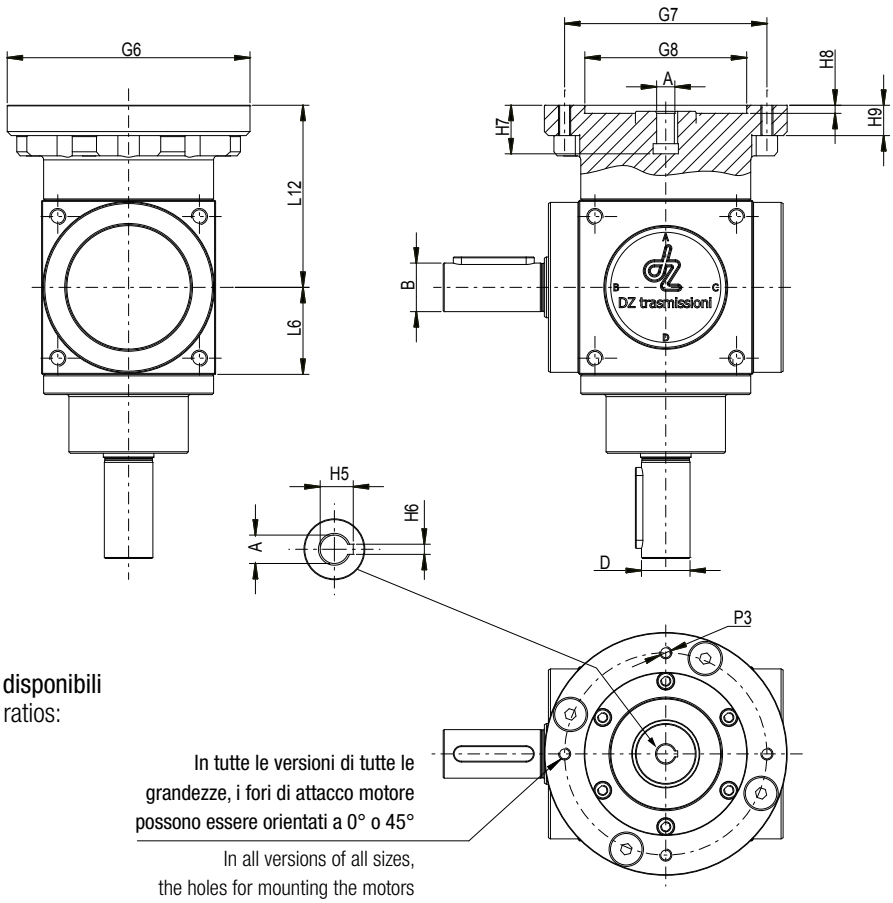
NOTE: The diameter of PTO "B", "C" and "D" is the same for size.
For any further information please contact our Technical Dept.



Rotazioni forma costruttiva TIPO 16
TYPE 16 constructive form revolutions

Serie QB Series / Taglia Size G1	Flangia Flange	Diametri prese di forza PTO diameters					Dimensioni Flange PAM PAM Flanges dimensions										
		A Ø H7	B Ø h7	D Ø h7	D Ø h7		G6	G7	G8	L6	L12	H5	H6	H7	H8	H9	P3
86	56 B5	9	24	16	24	R	120	100	80	43	90	10.4	3	23	4	11	M6
	63 B5	11					140	115	95			12.8	4	23	4	11	M8
	71 B5	14					160	130	110			16.3	5	30	4	11	M8
	71 B14	14					105	85	70			16.3	5	30	4	10	7
	80 B5	19					200	165	130		100	21.8	6	40	5	11	M10
	80 B14	19					120	100	80			21.8	6	40	5	11	7
110	63 B5	11	26	20	26	R	140	115	95	55	105	12.8	4	23	4	11	M8
	71 B5	14					160	130	110			16.3	5	30	4	11	M8
	71 B14	14					105	85	70			16.3	5	30	4	11	7
	80 B5	19					200	165	130			21.8	6	40	5	11	M10
	80 B14	19					120	100	80			21.8	6	40	5	11	7
134	71 B5	14	32	24	32	R	160	130	110	67	125	16.3	5	30	4	13	M8
	80 B5	19					200	165	130			21.8	6	40	5	13	M10
	80 B14	19					120	100	80			21.8	6	40	5	13	7
	90 B5	24					200	165	130			27.3	8	50	5	13	M10
	90 B14	24					140	115	95			27.3	8	50	5	13	9
	100-112 B5	28					250	215	180		135	31.3	8	60	5	13	M12
	100-112 B14	28					160	130	110			31.3	8	60	5	13	9
166	71 B5	14	45	32	45	R	160	130	110	83	160	16.3	5	30	4	15	M8
	80 B5	19					200	165	130			21.8	6	40	5	15	M10
	90 B5	24					200	165	130			27.3	8	50	5	15	M10
	100-112 B5	28					250	215	180			31.3	8	60	5	15	M12
	100-112 B14	28					160	130	110			31.3	8	60	5	15	9
200	90 B5	24	55	42	55	R	200	165	130	100	220	27.3	8	50	5	23	M10
	100-112 B5	28					250	215	180			31.3	8	60	5	23	M12
	132 B5	38					300	265	230			41.3	10	80	6	23	M12
	132 B14	38					200	165	130			41.3	10	80	6	23	11
250	132 B5	38	70	55	70	R	300	265	230	125	250	41.3	10	80	6	25	M12
	132 B14	38					200	165	130			41.3	10	80	6	25	11
	160 B5	42					350	300	250			45.8	12	110	6	25	M16

Per tutte le dimensioni non quotate fare riferimento alle dimensioni dello schema Tipo 7.
For all non-quoted dimensions, please refer to those of the Type 7 table.





Rapporti disponibili
Available ratios:

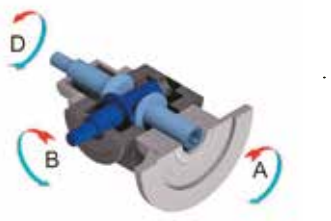
R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4

In tutte le versioni di tutte le grandezze, i fori di attacco motore possono essere orientati a 0° o 45°

In all versions of all sizes, the holes for mounting the motors can be oriented at 0° or 45°

N.B. Il diametro delle prese di forza "B" e "D" è sempre uguale per taglia.
Per esigenze diverse consultare l'Uff. Tecnico.

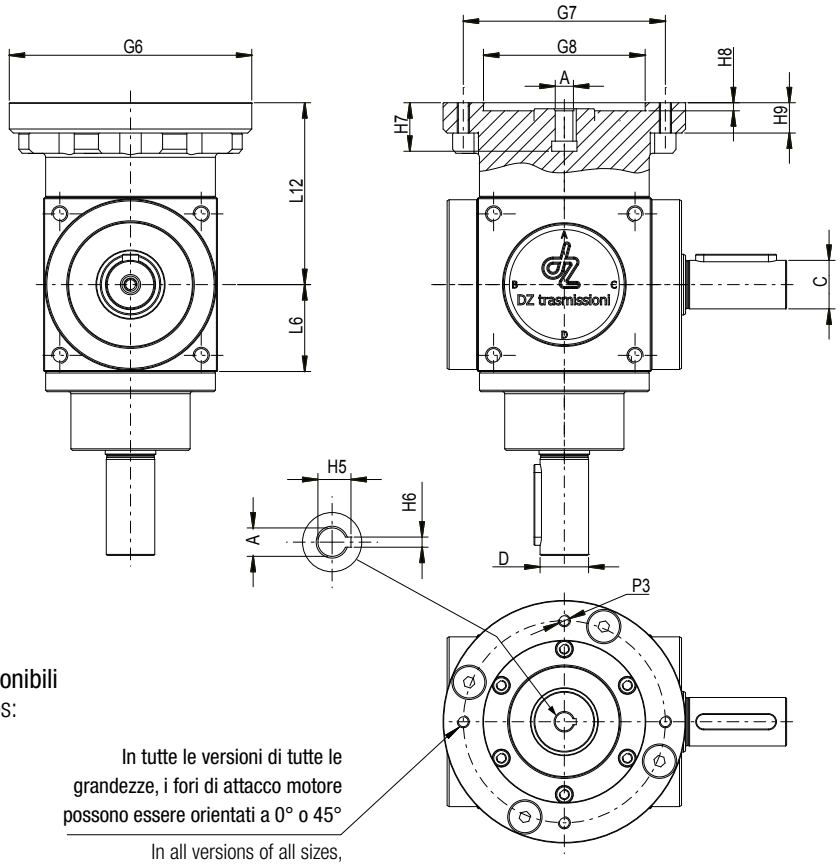
NOTE: The diameter of PTO "B" and "D" is the same for size.
For any further information please contact our Technical Dept.



Rotazioni forma costruttiva TIPO 17
TYPE 17 constructive form revolutions

Serie **QB** Series / Taglia Size G1	Flangia Flange	Diametri prese di forza PTO diameters					Dimensioni Flange PAM PAM Flanges dimensions										
		A Ø H7	C Ø h7	D Ø h7	D Ø h7		G6	G7	G8	L6	L12	H5	H6	H7	H8	H9	P3
86	56 B5	9	24	16	24	R	120	100	80	43	90	10.4	3	23	4	11	M6
	63 B5	11					140	115	95			12.8	4	23	4	11	M8
	71 B5	14					160	130	110			16.3	5	30	4	11	M8
	71 B14	14					105	85	70			16.3	5	30	4	10	7
	80 B5	19					200	165	130		100	21.8	6	40	5	11	M10
	80 B14	19					120	100	80			21.8	6	40	5	11	7
110	63 B5	11	26	20	26	R	140	115	95	55	105	12.8	4	23	4	11	M8
	71 B5	14					160	130	110			16.3	5	30	4	11	M8
	71 B14	14					105	85	70			16.3	5	30	4	11	7
	80 B5	19					200	165	130			21.8	6	40	5	11	M10
	80 B14	19					120	100	80			21.8	6	40	5	11	7
134	71 B5	14	32	24	32	R	160	130	110	67	125	16.3	5	30	4	13	M8
	80 B5	19					200	165	130			21.8	6	40	5	13	M10
	80 B14	19					120	100	80			21.8	6	40	5	13	7
	90 B5	24					200	165	130			27.3	8	50	5	13	M10
	90 B14	24					140	115	95			27.3	8	50	5	13	9
	100-112 B5	28					250	215	180		135	31.3	8	60	5	13	M12
	100-112 B14	28					160	130	110			31.3	8	60	5	13	9
166	71 B5	14	45	32	45	R	160	130	110	83	160	16.3	5	30	4	15	M8
	80 B5	19					200	165	130			21.8	6	40	5	15	M10
	90 B5	24					200	165	130			27.3	8	50	5	15	M10
	100-112 B5	28					250	215	180			31.3	8	60	5	15	M12
	100-112 B14	28					160	130	110			31.3	8	60	5	15	9
200	90 B5	24	55	42	55	R	200	165	130	100	220	27.3	8	50	5	23	M10
	100-112 B5	28					250	215	180			31.3	8	60	5	23	M12
	132 B5	38					300	265	230			41.3	10	80	6	23	M12
	132 B14	38					200	165	130			41.3	10	80	6	23	11
250	132 B5	38	70	55	70	R	300	265	230	125	250	41.3	10	80	6	25	M12
	132 B14	38					200	165	130			41.3	10	80	6	25	11
	160 B5	42					350	300	250			45.8	12	110	6	25	M16

Per tutte le dimensioni non quotate fare riferimento alle dimensioni dello schema Tipo 8.
For all non-quoted dimensions, please refer to those of the Type 8 table.





Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4

In tutte le versioni di tutte le grandezze, i fori di attacco motore possono essere orientati a 0° o 45°

In all versions of all sizes, the holes for mounting the motors can be oriented at 0° or 45°

N.B. Il diametro delle prese di forza "C" e "D" è sempre uguale per taglia.
Per esigenze diverse consultare l'Uff. Tecnico.

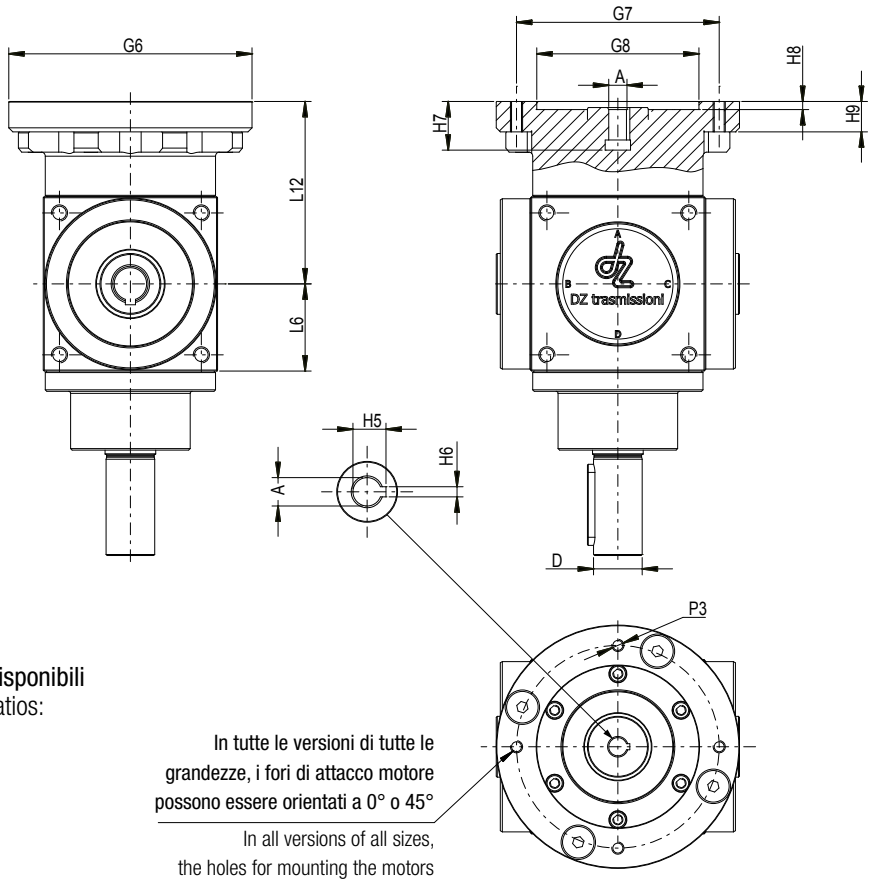
NOTE: The diameter of PTO "C" and "D" is the same for size.
For any further information please contact our Technical Dept.



Rotazioni forma costruttiva TIPO 18
TYPE 18 constructive form revolutions

Serie QB Series / Taglia Size G1	Flangia Flange	Diametri prese di forza PTO diameters					Dimensioni Flange PAM PAM Flanges dimensions										
		A Ø H7	B - C Ø H7	D Ø h7	D Ø h7		G6	G7	G8	L6	L12	H5	H6	H7	H8	H9	P3
86	56 B5	9	16	16	24	R	120	100	80	43	90	10.4	3	23	4	11	M6
	63 B5	11					140	115	95			12.8	4	23	4	11	M8
	71 B5	14					160	130	110			16.3	5	30	4	11	M8
	71 B14	14					105	85	70			16.3	5	30	4	10	7
	80 B5	19					200	165	130		100	21.8	6	40	5	11	M10
	80 B14	19					120	100	80			21.8	6	40	5	11	7
110	63 B5	11	20	20	26	R	140	115	95	55	105	12.8	4	23	4	11	M8
	71 B5	14					160	130	110			16.3	5	30	4	11	M8
	71 B14	14					105	85	70			16.3	5	30	4	11	7
	80 B5	19					200	165	130			21.8	6	40	5	11	M10
	80 B14	19					120	100	80			21.8	6	40	5	11	7
134	71 B5	14	24	24	32	R	160	130	110	67	125	16.3	5	30	4	13	M8
	80 B5	19					200	165	130			21.8	6	40	5	13	M10
	80 B14	19					120	100	80			21.8	6	40	5	13	7
	90 B5	24					200	165	130			27.3	8	50	5	13	M10
	90 B14	24					140	115	95			27.3	8	50	5	13	9
	100-112 B5	28					250	215	180		135	31.3	8	60	5	13	M12
	100-112 B14	28					160	130	110			31.3	8	60	5	13	9
166	71 B5	14	32	32	45	R	160	130	110	83	160	16.3	5	30	4	15	M8
	80 B5	19					200	165	130			21.8	6	40	5	15	M10
	90 B5	24					200	165	130			27.3	8	50	5	15	M10
	100-112 B5	28					250	215	180			31.3	8	60	5	15	M12
	100-112 B14	28					160	130	110			31.3	8	60	5	15	9
200	90 B5	24	42	42	55	R	200	165	130	100	220	27.3	8	50	5	23	M10
	100-112 B5	28					250	215	180			31.3	8	60	5	23	M12
	132 B5	38					300	265	230			41.3	10	80	6	23	M12
	132 B14	38					200	165	130			41.3	10	80	6	23	11
250	132 B5	38	55	55	70	R	300	265	230	125	250	41.3	10	80	6	25	M12
	132 B14	38					200	165	130			41.3	10	80	6	25	11
	160 B5	42					350	300	250			45.8	12	110	6	25	M16

Per tutte le dimensioni non quotate fare riferimento alle dimensioni dello schema Tipo 9.
For all non-quoted dimensions, please refer to those of the Type 9 table.



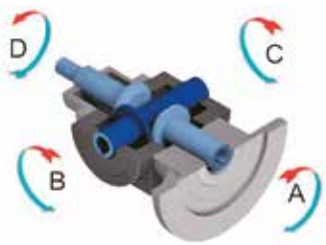


Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4

In tutte le versioni di tutte le grandezze, i fori di attacco motore possono essere orientati a 0° o 45°

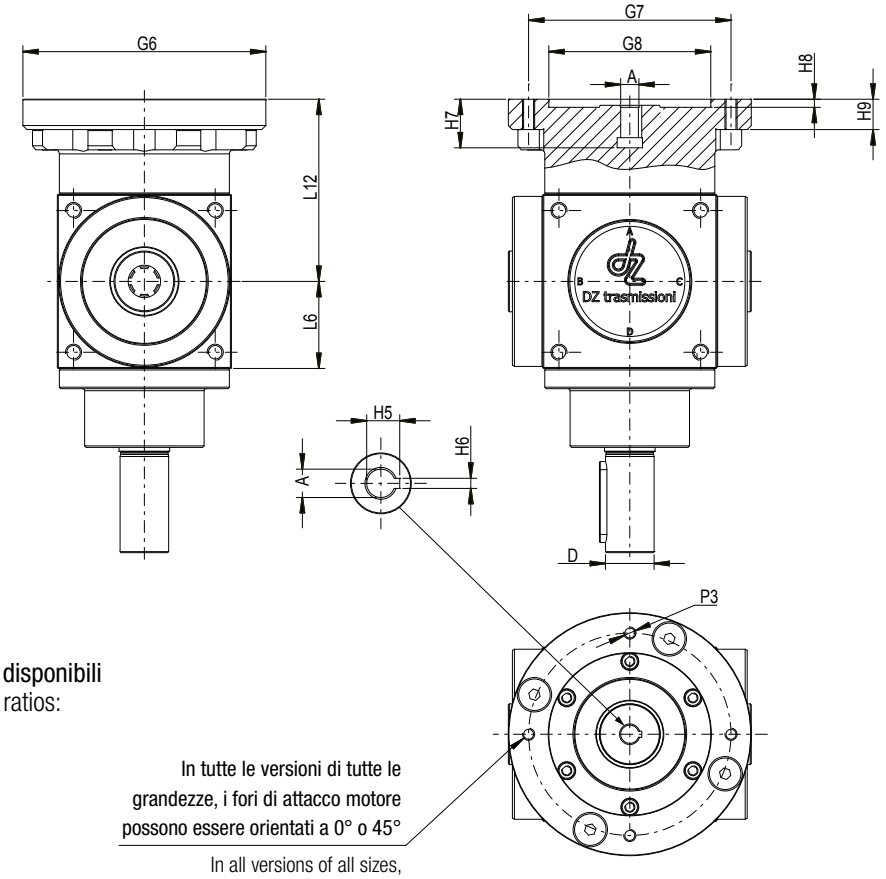
In all versions of all sizes, the holes for mounting the motors can be oriented at 0° or 45°



Rotazioni forma costruttiva TIPO 19
TYPE 19 constructive form revolutions

Serie **QB** Series / Taglia Size G1	Flangia Flange	Diametri prese di forza PTO diameters					Dimensioni Flange PAM PAM Flanges dimensions										
		A Ø H7	B - C scanalato UNI UNI grooved	D Ø h7	D Ø h7		G6	G7	G8	L6	L12	H2	H3	H7	H8	H9	P3
86	56 B5	9	6x13x16	16	24	R	120	100	80	43	90	10.4	3	23	4	11	M6
	63 B5	11					140	115	95			12.8	4	23	4	11	M8
	71 B5	14					160	130	110			16.3	5	30	4	11	M8
	71 B14	14					105	85	70			16.3	5	30	4	10	7
	80 B5	19					200	165	130		100	21.8	6	40	5	11	M10
	80 B14	19					120	100	80			21.8	6	40	5	11	7
110	63 B5	11	6x18x22	20	26	R	140	115	95	55	105	12.8	4	23	4	11	M8
	71 B5	14					160	130	110			16.3	5	30	4	11	M8
	71 B14	14					105	85	70			16.3	5	30	4	11	7
	80 B5	19					200	165	130			21.8	6	40	5	11	M10
	80 B14	19					120	100	80			21.8	6	40	5	11	7
134	71 B5	14	6x21x25	24	32	R	160	130	110	67	125	16.3	5	30	4	13	M8
	80 B5	19					200	165	130			21.8	6	40	5	13	M10
	80 B14	19					120	100	80			21.8	6	40	5	13	7
	90 B5	24					200	165	130			27.3	8	50	5	13	M10
	90 B14	24					140	115	95			27.3	8	50	5	13	9
	100-112 B5	28					250	215	180		135	31.3	8	60	5	13	M12
	100-112 B14	28					160	130	110			31.3	8	60	5	13	9
166	71 B5	14	6x28x34	32	45	R	160	130	110	83	160	16.3	5	30	4	15	M8
	80 B5	19					200	165	130			21.8	6	40	5	15	M10
	90 B5	24					200	165	130			27.3	8	50	5	15	M10
	100-112 B5	28					250	215	180			31.3	8	60	5	15	M12
	100-112 B14	28					160	130	110			31.3	8	60	5	15	9
200	90 B5	24	8x36x42	42	55	R	200	165	130	100	220	27.3	8	50	5	23	M10
	100-112 B5	28					250	215	180			31.3	8	60	5	23	M12
	132 B5	38					300	265	230			41.3	10	80	6	23	M12
	132 B14	38					200	165	130			41.3	10	80	6	23	11
250	132 B5	38	8x46x54	55	70	R	300	265	230	125	250	41.3	10	80	6	25	M12
	132 B14	38					200	165	130			41.3	10	80	6	25	11
	160 B5	42					350	300	250			45.8	12	110	6	25	M16

Per tutte le dimensioni non quotate fare riferimento alle dimensioni dello schema Tipo 10.
For all non-quoted dimensions, please refer to those of the Type 10 table.



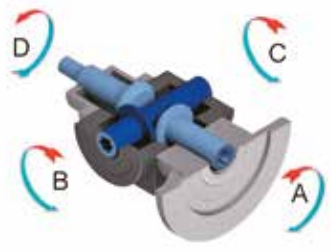


Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4

In tutte le versioni di tutte le grandezze, i fori di attacco motore possono essere orientati a 0° o 45°

In all versions of all sizes, the holes for mounting the motors can be oriented at 0° or 45°

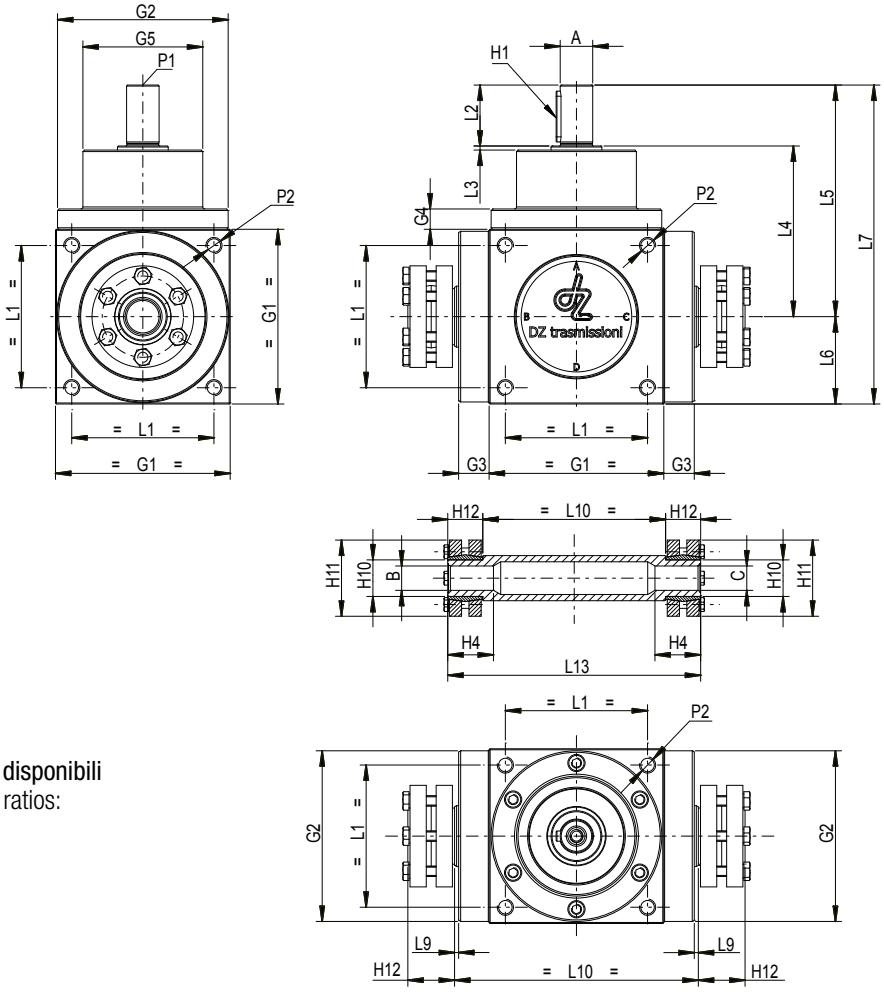


Rotazioni forma costruttiva TIPO 20
TYPE 20 constructive form revolutions

FORMA COSTRUTTIVA TIPO 21 _ TYPE 21 CONSTRUCTIVE FORM

Asse B - C con calettatore _ B - C Axis with locking set

Serie QB Series	Diametri prese di forza PTO diameters		Dimensioni forma costruttiva Tipo 21 Type 21 constructive form dimensions																		
Taglia Size G1	A Ø h7	B - C Ø H7	G2 Ø f7	G3	G4	G5	L1	L2	L3 L9	L4	L5	L6	L7	L10	L13	H1	H4	H10 Ø h7	H11	H12	P1	P2
54	11	12	53	8.5	10	52.8	44	23	1.5	72	95	27	122	74	104	4x4x20	22	14	38	15	M4x10	M4x12
	R 18							35			107		134			6x6x30						
86	16	16	84	15	10	59	70	30	2	84	114	43	157	120	166	5x5x25	30	24	50	23	M6x12	M8x20
	R 24							50			134		177			8x7x40						
110	20	20	100	15	13	68	90	40	2	110	150	55	205	144	190	6x6x35	30	24	50	23	M8x20	M10x25
	R 26							55			165		220			8x7x45						
134	24	24	122	18	15	80	114	50	2	132	182	67	249	174	224	8x7x45	35	30	60	25	M8x20	M10x25
	R 32							65			197		264			10x8x55						
166	32	32	156	21	16	107	144	65	2	152	217	83	300	212	272	10x8x60	45	44	80	30	M10x25	M12x30
	R 45							90			242		325			14x9x80						
200	42	42	185	23	16	120	174	85	2	182	267	100	367	250	314	12x8x80	50	50	90	32	M10x25	M14x35
	R 55							110			292		392			16x10x100						
250	55	55	230	22	18	152	216	100	3	218	318	125	443	300	370	16x10x90	55	68	115	35	M12x25	M16x40
	R 70							140			358		483			20x12x120						
350	65	80	345	30	15	240	320	120	5	330	450	175	625	420	520	18x11x110	65	100	170	50	M12x25	M20x60
	R 85							170			500		675			22x14x160						



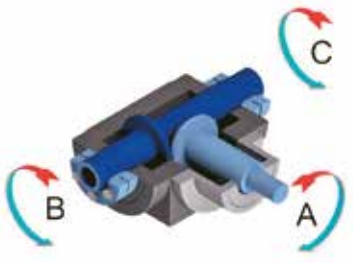


Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4

N.B. Il diametro delle prese di forza “B” e “C” è sempre uguale per taglia.
Per esigenze diverse consultare l’Uff. Tecnico.

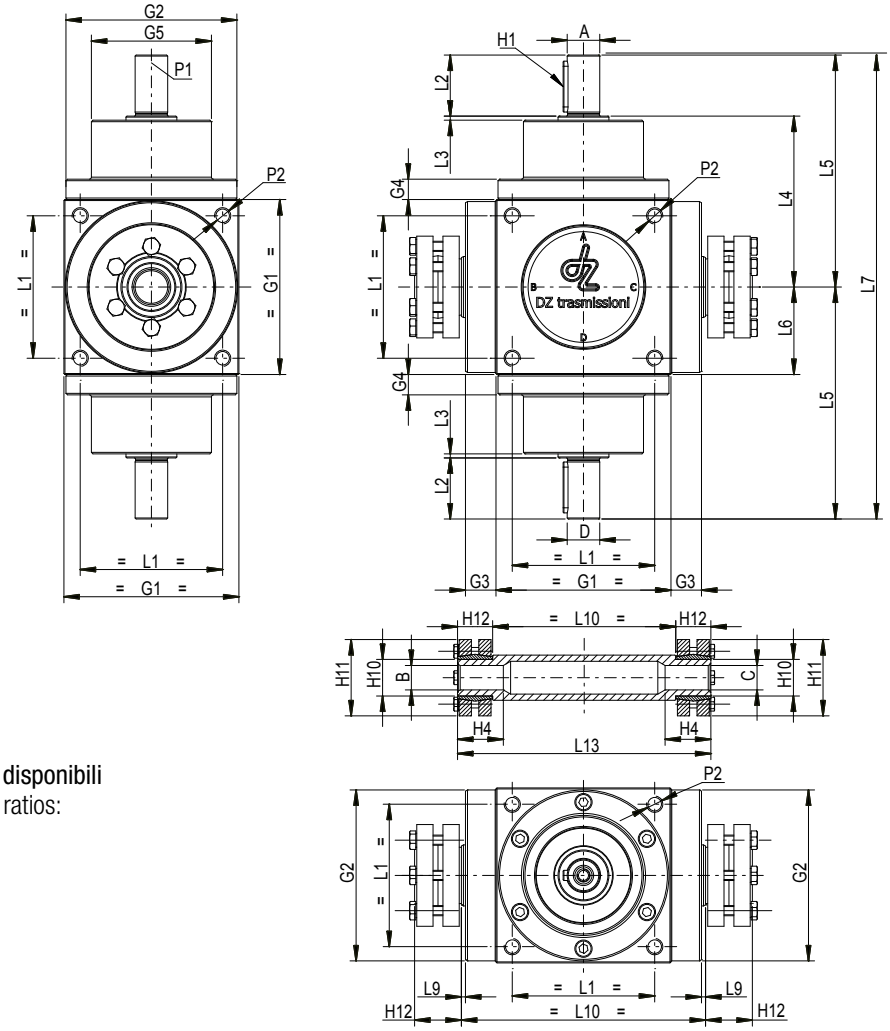
NOTE: The diameter of PTO “B” and “C” is the same for size.
For any further information please contact our Technical Dept.



Rotazioni forma costruttiva TIPO 21
TYPE 21 constructive form revolutions

Asse B - C con calettatore _ B - C Axis with locking set

Serie QB Series	Diametri prese di forza PTO diameters		Dimensioni forma costruttiva Tipo 22 Type 22 constructive form dimensions																		
Taglia Size G1	A - D Ø h7	B - C Ø H7	G2 Ø f7	G3	G4	G5	L1	L2	L3 L9	L4	L5	L6	L7	L10	L13	H1	H4	H10 Ø h7	H11	H12	P1	P2
54	11	12	53	8.5	10	52.8	44	23	1.5	72	95	27	190	74	104	4x4x20	22	14	38	15	M4x10	M4x12
	R 18							35			107		214			6x6x30						
86	16	16	84	15	10	59	70	30	2	84	114	43	228	120	166	5x5x25	30	24	50	23	M6x12	M8x20
	R 24							50			134		268			8x7x40						
110	20	20	100	15	13	68	90	40	2	110	150	55	300	144	190	6x6x35	30	24	50	23	M8x20	M10x25
	R 26							55			165		330			8x7x45						
134	24	24	122	18	15	80	114	50	2	132	182	67	364	174	224	8x7x45	35	30	60	25	M8x20	M10x25
	R 32							65			197		394			10x8x55						
166	32	32	156	21	16	107	144	65	2	152	217	83	434	212	272	10x8x60	45	44	80	30	M10x25	M12x30
	R 45							90			242		484			14x9x80						
200	42	42	185	23	16	120	174	85	2	182	267	100	534	250	314	12x8x80	50	50	90	32	M10x25	M14x35
	R 55							110			292		584			16x10x100						
250	55	55	230	22	18	152	216	100	3	218	318	125	636	300	370	16x10x90	55	68	115	35	M12x25	M16x40
	R 70							140			358		716			20x12x120						
350	65	80	345	30	15	240	320	120	5	330	450	175	900	420	520	18x11x110	65	100	170	50	M12x25	M20x60
	R 85							170			500		1000			22x14x160						



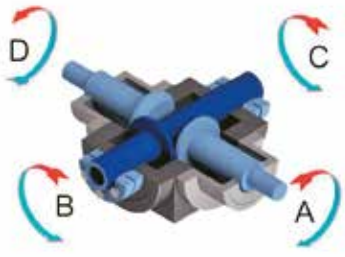


Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4

N.B. Il diametro delle prese di forza "A" - "D" e "B" - "C" è sempre uguale tra loro e per taglia.
Per esigenze diverse consultare l'Uff. Tecnico.

NOTE: The diameter of PTO "A" - "D" and "B" - "C" is always the same between one another and for size.
For any further information please contact our Technical Dept.

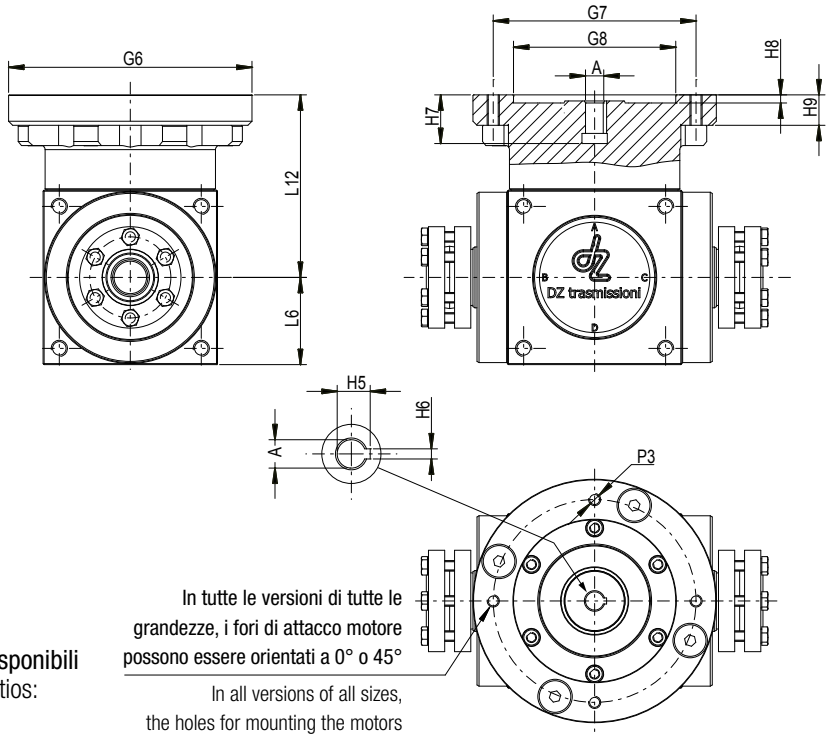


Rotazioni forma costruttiva TIPO 22
TYPE 22 constructive form revolutions

Asse B - C con calettatore _ B - C Axis with locking set

Serie **QB** Series	Flangia Flange	Diametri prese di forza PTO diameters	Dimensioni Flange PAM PAM Flanges dimensions										
Taglia Size G1		A Ø h7	G6	G7	G8	L6	L12	H5	H6	H7	H8	H9	P3
86	56 B5	9	120	100	80	43	90	10.4	3	23	4	11	M6
	63 B5	11	140	115	95			12.8	4	23	4	11	M8
	71 B5	14	160	130	110			16.3	5	30	4	11	M8
	71 B14	14	105	85	70			16.3	5	30	4	10	7
	80 B5	19	200	165	130		100	21.8	6	40	5	11	M10
	80 B14	19	120	100	80			21.8	6	40	5	11	7
110	63 B5	11	140	115	95	55	105	12.8	4	23	4	11	M8
	71 B5	14	160	130	110			16.3	5	30	4	11	M8
	71 B14	14	105	85	70			16.3	5	30	4	11	7
	80 B5	19	200	165	130			21.8	6	40	5	11	M10
	80 B14	19	120	100	80			21.8	6	40	5	11	7
134	71 B5	14	160	130	110	67	125	16.3	5	30	4	13	M8
	80 B5	19	200	165	130			21.8	6	40	5	13	M10
	80 B14	19	120	100	80			21.8	6	40	5	13	7
	90 B5	24	200	165	130			27.3	8	50	5	13	M10
	90 B14	24	140	115	95			27.3	8	50	5	13	9
	100-112 B5	28	250	215	180		135	31.3	8	60	5	13	M12
	100-112 B14	28	160	130	110			31.3	8	60	5	13	9
166	71 B5	14	160	130	110	83	160	16.3	5	30	4	15	M8
	80 B5	19	200	165	130			21.8	6	40	5	15	M10
	90 B5	24	200	165	130			27.3	8	50	5	15	M10
	100-112 B5	28	250	215	180			31.3	8	60	5	15	M12
	100-112 B14	28	160	130	110			31.3	8	60	5	15	9
200	90 B5	24	200	165	130	100	220	27.3	8	50	5	23	M10
	100-112 B5	28	250	215	180			31.3	8	60	5	23	M12
	132 B5	38	300	265	230			41.3	10	80	6	23	M12
	132 B14	38	200	165	130			41.3	10	80	6	23	11
250	132 B5	38	300	265	230	125	250	41.3	10	80	6	25	M12
	132 B14	38	200	165	130			41.3	10	80	6	25	11
	160 B5	42	350	300	250			45.8	12	110	6	25	M16

Per tutte le dimensioni non quotate fare riferimento alle dimensioni dello schema Tipo 21.
For all non-quoted dimensions, please refer to those of the Type 21 table.





In tutte le versioni di tutte le grandezze, i fori di attacco motore possono essere orientati a 0° o 45°

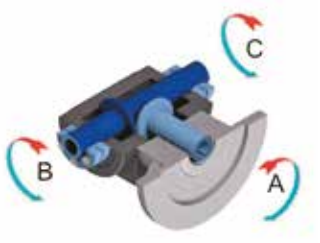
In all versions of all sizes, the holes for mounting the motors can be oriented at 0° or 45°

Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4

N.B. Il diametro delle prese di forza "B" e "C" è sempre uguale per taglia.
Per esigenze diverse consultare l'Uff. Tecnico.

NOTE: The diameter of PTO "B" and "C" is the same for size.
For any further information please contact our Technical Dept.

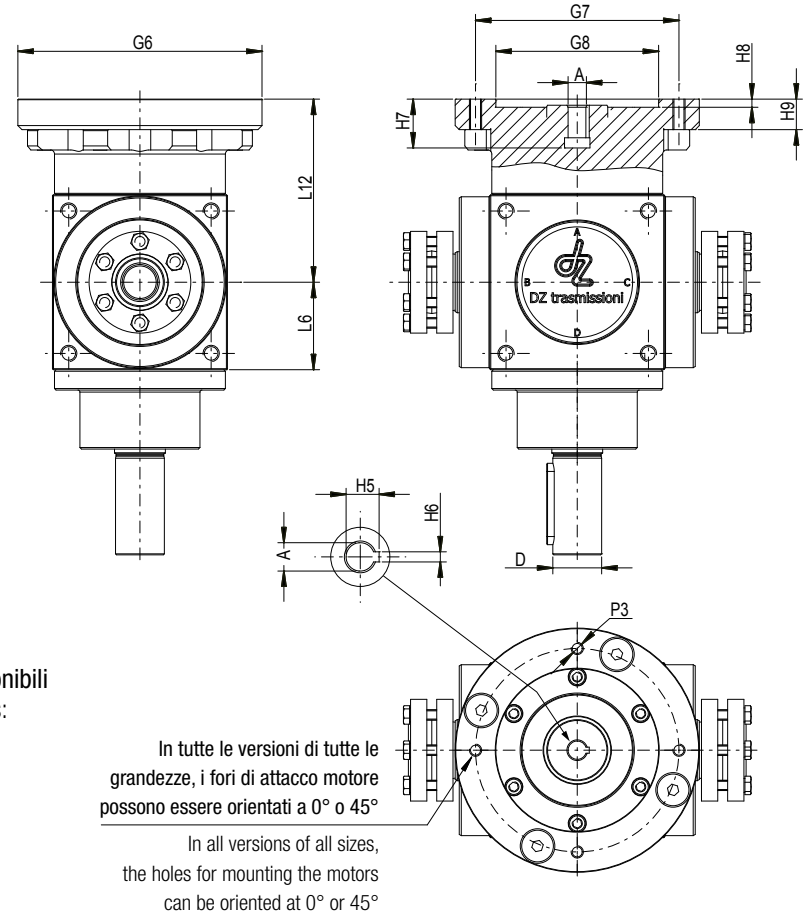


Rotazioni forma costruttiva TIPO 23
TYPE 23 constructive form revolutions

Asse B - C con calettatore _ B - C Axis with locking set

Serie **QB** Series	Flangia Flange	Diametri prese di forza PTO diameters	Dimensioni Flange PAM PAM Flanges dimensions										
Taglia Size G1		A Ø h7	G6	G7	G8	L6	L12	H5	H6	H7	H8	H9	P3
86	56 B5	9	120	100	80	43	90	10.4	3	23	4	11	M6
	63 B5	11	140	115	95			12.8	4	23	4	11	M8
	71 B5	14	160	130	110			16.3	5	30	4	11	M8
	71 B14	14	105	85	70			16.3	5	30	4	10	7
	80 B5	19	200	165	130		100	21.8	6	40	5	11	M10
	80 B14	19	120	100	80			21.8	6	40	5	11	7
110	63 B5	11	140	115	95	55	105	12.8	4	23	4	11	M8
	71 B5	14	160	130	110			16.3	5	30	4	11	M8
	71 B14	14	105	85	70			16.3	5	30	4	11	7
	80 B5	19	200	165	130			21.8	6	40	5	11	M10
	80 B14	19	120	100	80			21.8	6	40	5	11	7
134	71 B5	14	160	130	110	67	125	16.3	5	30	4	13	M8
	80 B5	19	200	165	130			21.8	6	40	5	13	M10
	80 B14	19	120	100	80			21.8	6	40	5	13	7
	90 B5	24	200	165	130			27.3	8	50	5	13	M10
	90 B14	24	140	115	95			27.3	8	50	5	13	9
	100-112 B5	28	250	215	180		135	31.3	8	60	5	13	M12
	100-112 B14	28	160	130	110			31.3	8	60	5	13	9
166	71 B5	14	160	130	110	83	160	16.3	5	30	4	15	M8
	80 B5	19	200	165	130			21.8	6	40	5	15	M10
	90 B5	24	200	165	130			27.3	8	50	5	15	M10
	100-112 B5	28	250	215	180			31.3	8	60	5	15	M12
	100-112 B14	28	160	130	110			31.3	8	60	5	15	9
200	90 B5	24	200	165	130	100	220	27.3	8	50	5	23	M10
	100-112 B5	28	250	215	180			31.3	8	60	5	23	M12
	132 B5	38	300	265	230			41.3	10	80	6	23	M12
	132 B14	38	200	165	130			41.3	10	80	6	23	11
250	132 B5	38	300	265	230	125	250	41.3	10	80	6	25	M12
	132 B14	38	200	165	130			41.3	10	80	6	25	11
	160 B5	42	350	300	250			45.8	12	110	6	25	M16

Per tutte le dimensioni non quotate fare riferimento alle dimensioni dello schema Tipo 22.
For all non-quoted dimensions, please refer to those of the Type 22 table.





Rapporti disponibili
Available ratios:

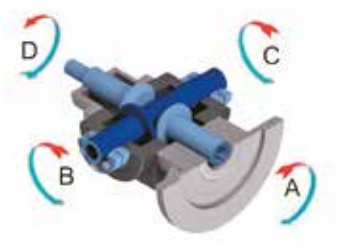
R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4

In tutte le versioni di tutte le grandezze, i fori di attacco motore possono essere orientati a 0° o 45°

In all versions of all sizes, the holes for mounting the motors can be oriented at 0° or 45°

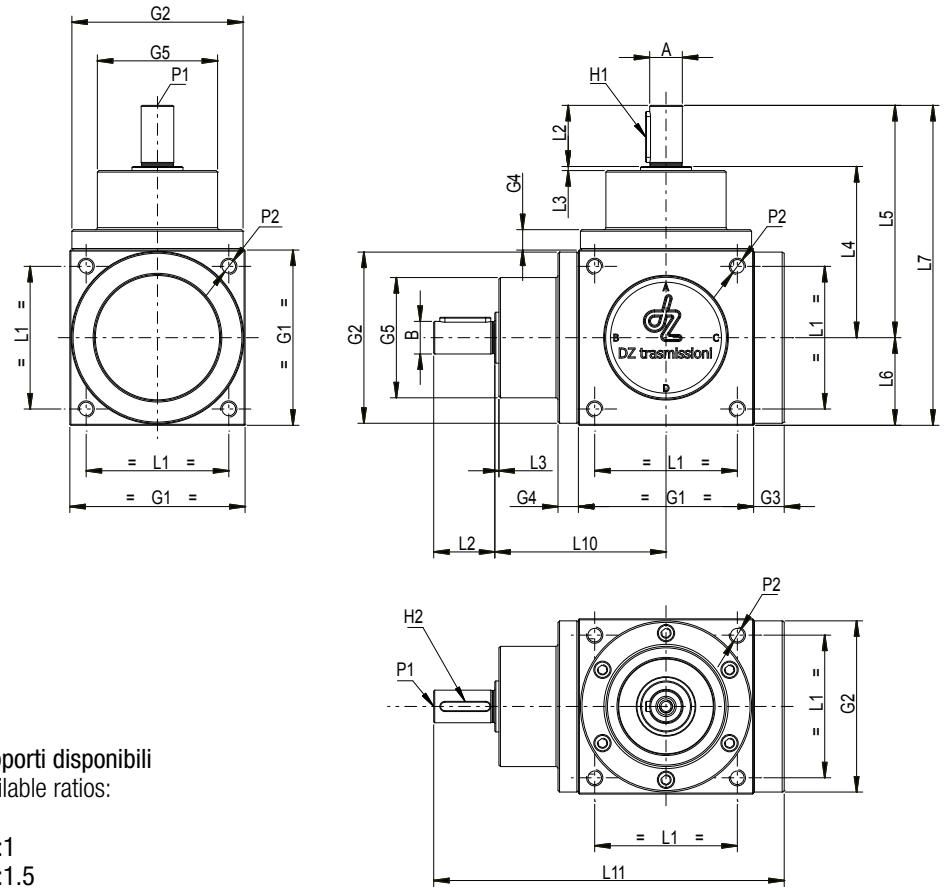
N.B. Il diametro delle prese di forza "B" e "C" è sempre uguale per taglia.
Per esigenze diverse consultare l'Uff. Tecnico.

NOTE: The diameter of PTO "B" and "C" is the same for size.
For any further information please contact our Technical Dept.



Rotazioni forma costruttiva TIPO 24
TYPE 24 constructive form revolutions

Serie QB Series	Diametri prese di forza PTO diameters	Dimensioni forma costruttiva Tipo 25 Type 25 constructive form dimensions														
Taglia Size G1	A - B Ø h7	G2 Ø f 7	G3	G4	G5	L1	L2	L3	L4 L10	L5	L6	L7	L11	H1 - H2	P1	P2
54	11	53	8.5	10	52.8	44	23	1.5	72	95	27	122	130.5	4x4x20	M4x10	M4x12
86	16	84	15	10	59	70	30	2	84	114	43	157	172	5x5x25	M6x12	M8x20
110	20	100	15	13	68	90	40	2	110	150	55	205	220	6x6x35	M8x20	M10x25
134	24	122	18	15	80	114	50	2	132	182	67	249	267	8x7x45	M8x20	M10x25
166	32	156	21	16	107	144	65	2	152	217	83	300	321	10x8x60	M10x25	M12x30
200	42	185	23	16	120	174	85	2	182	267	100	367	390	12x8x80	M10x25	M14x35
250	55	230	22	18	152	216	100	3	218	318	125	443	465	16x10x90	M12x25	M16x40
350	65	345	30	15	240	320	120	5	330	450	175	625	655	18x11x110	M12x25	M20x60





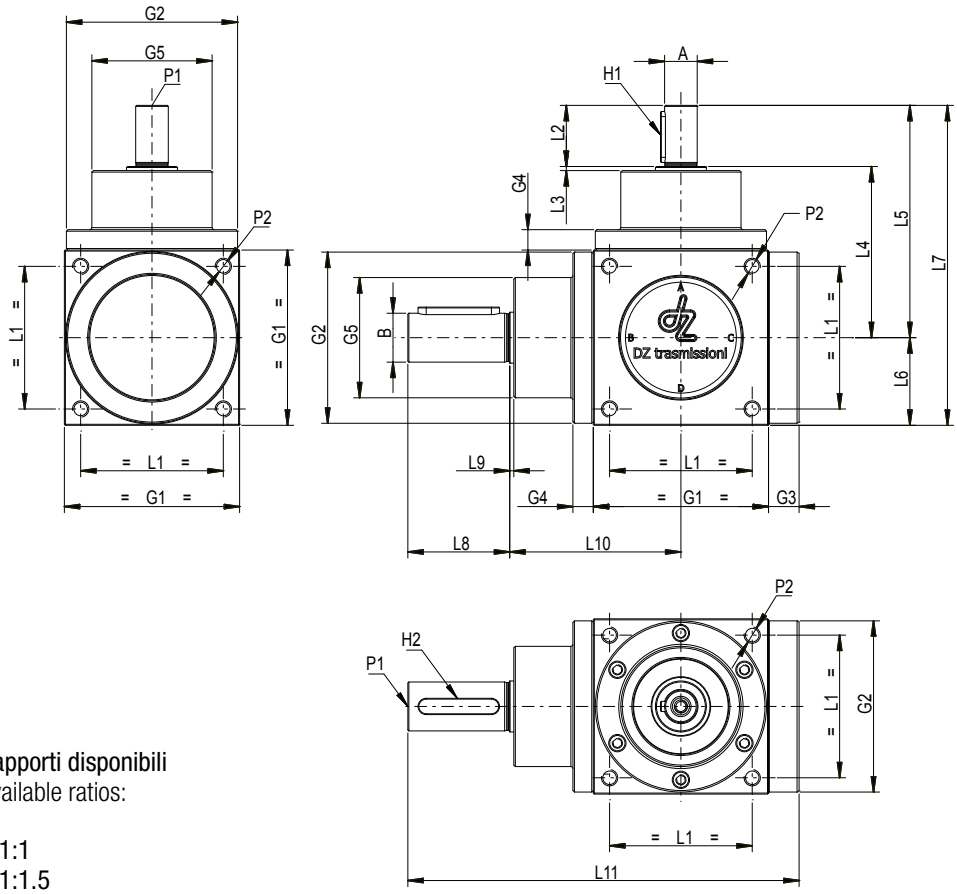
Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4



Rotazioni forma costruttiva TIPO 25
TYPE 25 constructive form revolutions

Serie **QB** Series	Diametri prese di forza PTO diameters		Dimensioni forma costruttiva Tipo 26 Type 26 constructive form dimensions																
Taglia Size G1	A Ø h7	B Ø h7	G2 Ø f 7	G3	G4	G5	L1	L2	L3 L9	L4 L10	L5	L6	L7	L8	L11	H1	H2	P1	P2
54	11	18	53	8.5	10	52.8	44	23	1.5	72	95	27	122	35	142.5	4x420	6x6x30	M4x10	M4x12
86	16	24	84	15	10	59	70	30	2	84	114	43	157	50	192	5x5x25	8x7x40	M6x12	M8x20
110	20	26	100	15	13	68	90	40	2	110	150	55	205	55	235	6x6x35	8x7x45	M8x20	M10x25
134	24	32	122	18	15	80	114	50	2	132	182	67	249	65	282	8x7x45	10x8x55	M8x20	M10x25
166	32	45	156	21	16	107	144	65	2	152	217	83	300	90	346	10x8x60	14x9x80	M10x25	M12x30
200	42	55	185	23	16	120	174	85	2	182	267	100	367	110	415	12x8x80	16x10x100	M10x25	M14x35
250	55	70	230	22	18	152	216	100	3	218	318	125	443	140	505	16x10x90	20x12x120	M12x25	M16x40
350	65	85	345	30	15	240	320	120	5	330	450	175	625	170	705	18x11x110	22x14x160	M12x25	M20x60





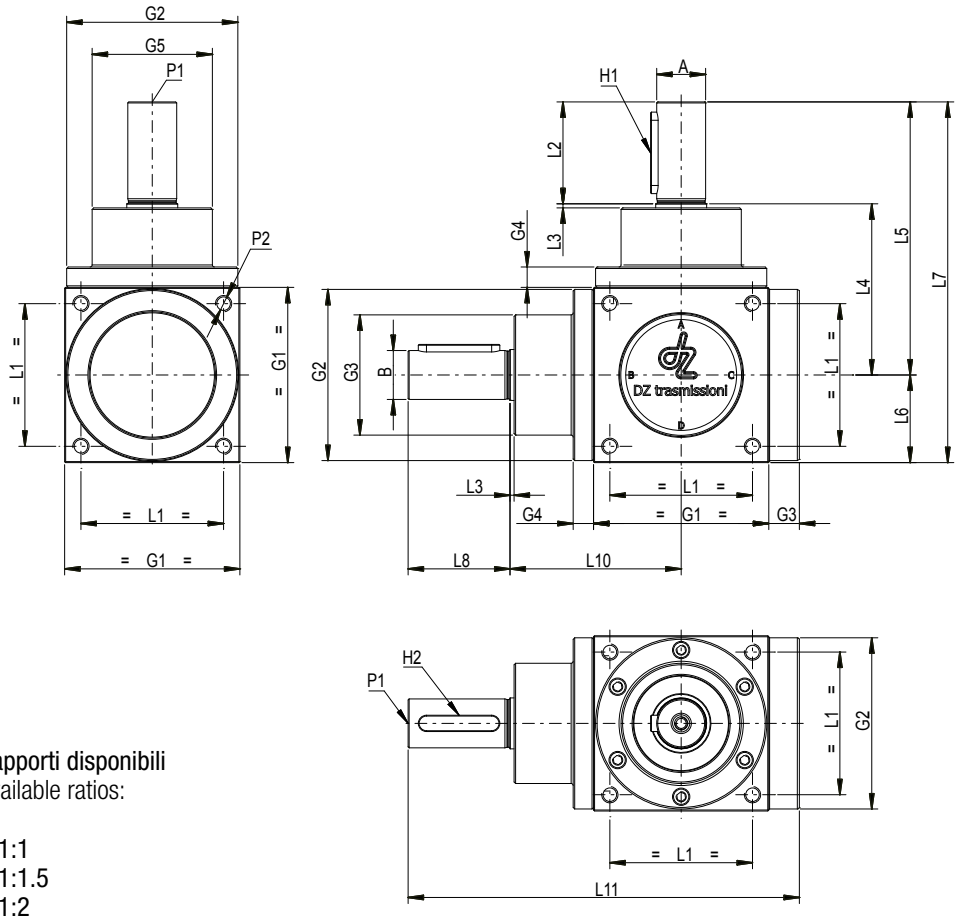
Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4



Rotazioni forma costruttiva TIPO 26
TYPE 26 constructive form revolutions

Serie QB Series	Diametri prese di forza PTO diameters	Dimensioni forma costruttiva Tipo 27 Type 27 constructive form dimensions															
Taglia Size G1	A - B Ø h7	G2 Ø f 7	G3	G4	G5	L1	L2	L3	L4 L10	L5	L6	L7	L8	L11	H1 - H2	P1	P2
54	18	53	8.5	10	52.8	44	35	1.5	72	107	27	134	35	142.5	6x6x30	M4x10	M4x12
86	24	84	15	10	59	70	50	2	84	134	43	177	50	192	8x7x40	M6x12	M8x20
110	26	100	15	13	68	90	55	2	110	165	55	220	55	235	8x7x45	M8x20	M10x25
134	32	122	18	15	80	114	65	2	132	197	67	264	65	282	10x8x55	M8x20	M10x25
166	45	156	21	16	107	144	90	2	152	242	83	325	90	346	14x9x80	M10x25	M12x30
200	55	185	23	16	120	174	110	2	182	292	100	392	110	415	16x10x100	M10x25	M14x35
250	70	230	22	18	152	216	140	3	218	358	125	483	140	505	20x12x120	M12x25	M16x40
350	85	345	30	15	240	320	170	5	330	500	175	675	170	705	22x14x160	M12x25	M20x60





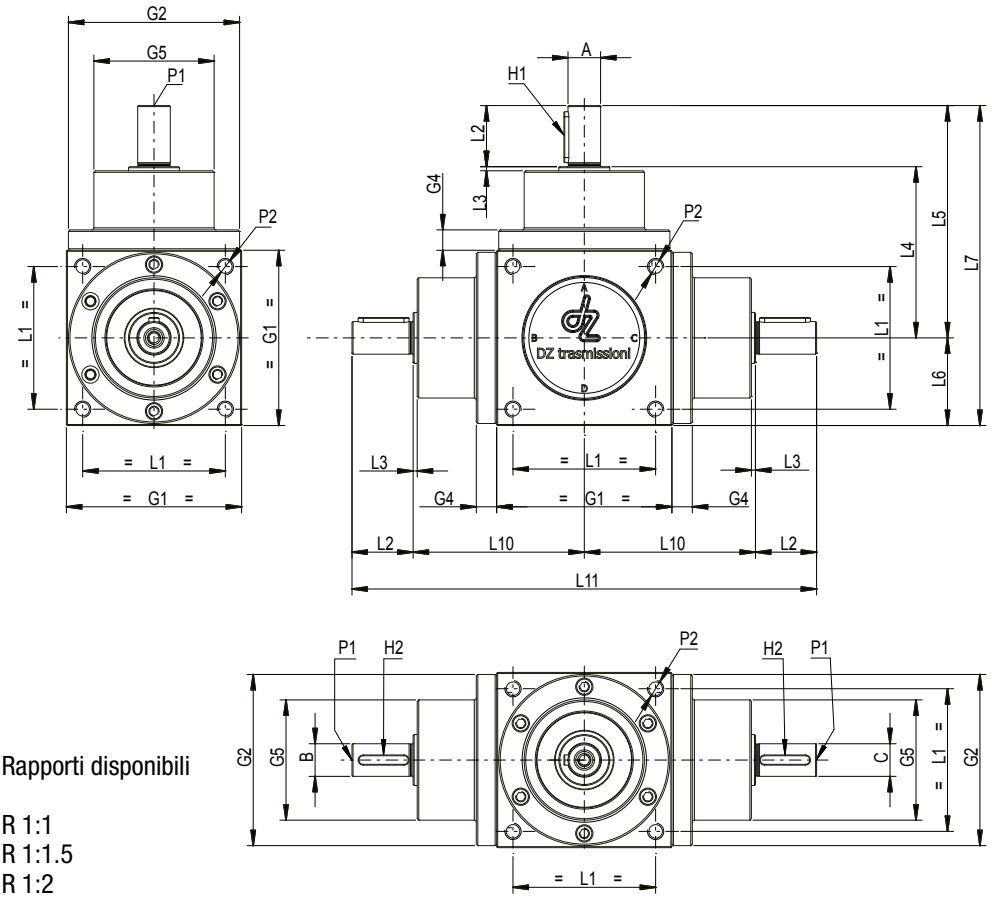
Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4



Rotazioni forma costruttiva TIPO 27
TYPE 27 constructive form revolutions

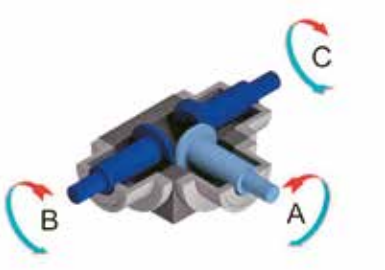
Serie **QB** Series	Diametri prese di forza PTO diameters		Dimensioni forma costruttiva Tipo 28 Type 28 constructive form dimensions													
Taglia Size G1	A Ø h7	B - C Ø h7	G2 Ø f 7	G4	G5	L1	L2	L3	L4 L10	L5	L6	L7	L11	H1 - H2	P1	P2
54	11	11	53	10	52.8	44	23	1.5	72	95	27	122	190	4x4x20	M4x10	M4x12
86	16	16	84	10	59	70	30	2	84	114	43	157	228	5x5x25	M6x12	M8x20
110	20	20	100	13	68	90	40	2	110	150	55	205	300	6x6x35	M8x20	M10x25
134	24	24	122	15	80	114	50	2	132	182	67	249	364	8x7x45	M8x20	M10x25
166	32	32	156	16	107	144	65	2	152	217	83	300	434	10x8x60	M10x25	M12x30
200	42	42	185	16	120	174	85	2	182	267	100	367	534	12x8x80	M10x25	M14x35
250	55	55	230	18	152	216	100	3	218	318	125	443	636	16x10x90	M12x25	M16x40
350	65	65	345	15	240	320	120	5	330	450	175	625	900	18x11x110	M12x25	M20x60





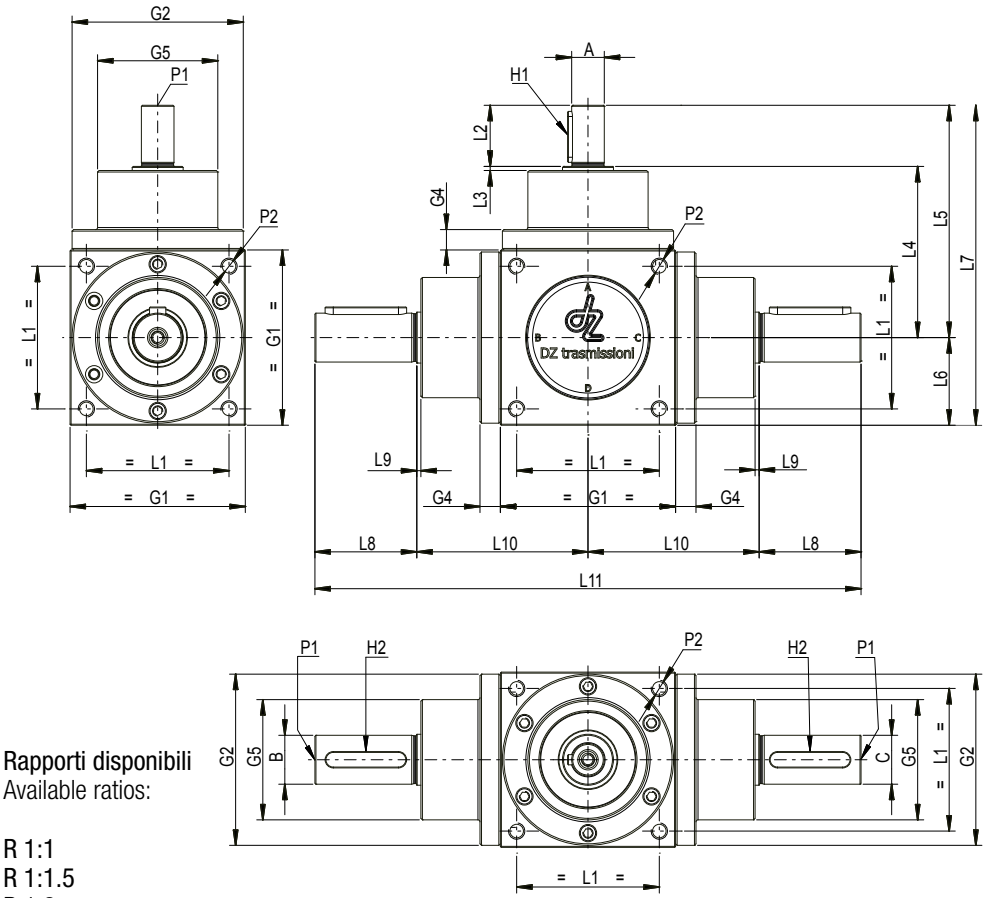
Rapporti disponibili

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4



Rotazioni forma costruttiva TIPO 28
TYPE 28 constructive form revolutions

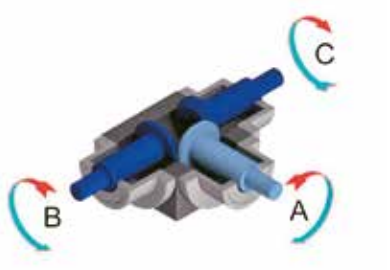
Serie **QB** Series	Diametri prese di forza PTO diameters		Dimensioni forma costruttiva Tipo 29 Type 29 constructive form dimensions															
Taglia Size G1	A Ø h7	B - C Ø h7	G2 Ø f 7	G4	G5	L1	L2	L3 L9	L4 L10	L5	L6	L7	L8	L11	H1	H2	P1	P2
54	11	18	53	10	52.8	44	23	1.5	72	95	27	122	35	214	4x4x20	6x6x30	M4x10	M4x12
86	16	24	84	10	59	70	30	2	84	114	43	157	50	268	5x5x25	8x7x40	M6x12	M8x20
110	20	26	100	13	68	90	40	2	110	150	55	205	55	330	6x6x35	8x7x45	M8x20	M10x25
134	24	32	122	15	80	114	50	2	132	182	67	249	65	394	8x7x45	10x8x55	M8x20	M10x25
166	32	45	156	16	107	144	65	2	152	217	83	300	90	484	10x8x60	14x9x80	M10x25	M12x30
200	42	55	185	16	120	174	85	2	182	267	100	367	110	584	12x8x80	16x10x100	M10x25	M14x35
250	55	70	230	18	152	216	100	3	218	318	125	443	140	716	16x10x90	20x12x120	M12x25	M16x40
350	65	85	345	15	240	320	120	5	330	450	175	625	170	1000	18x11x110	22x14x160	M12x25	M20x60





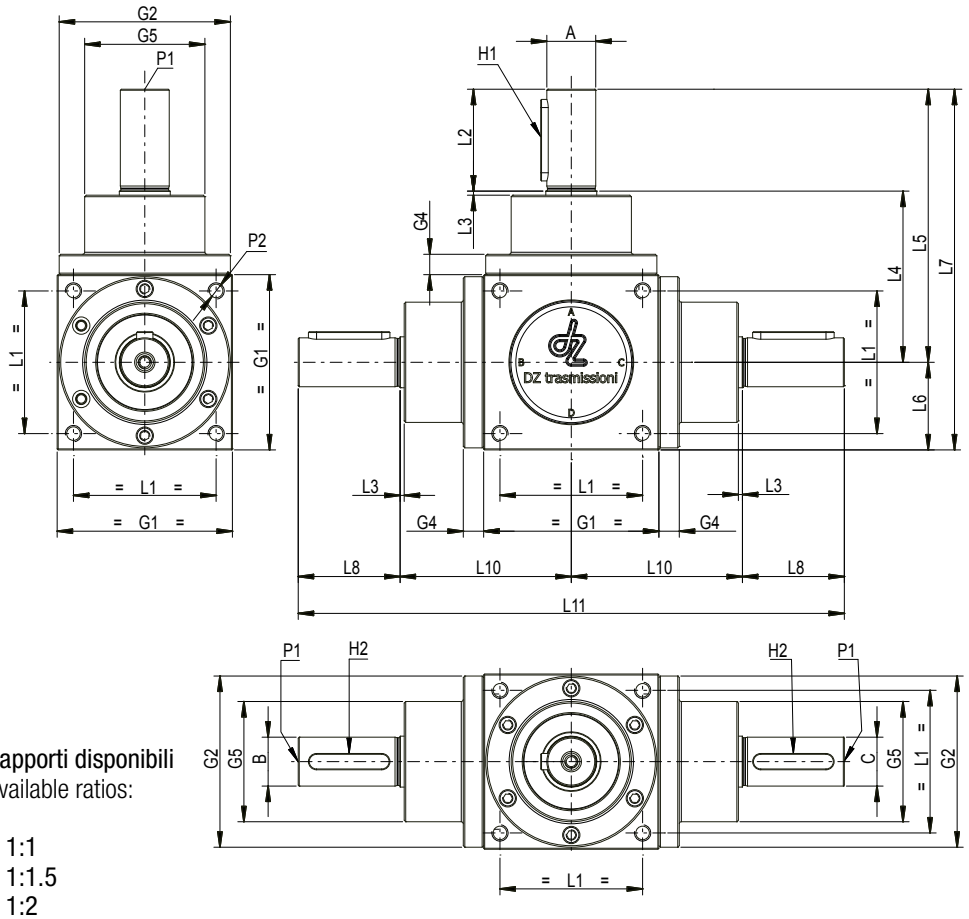
Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4



Rotazioni forma costruttiva TIPO 29
TYPE 29 constructive form revolutions

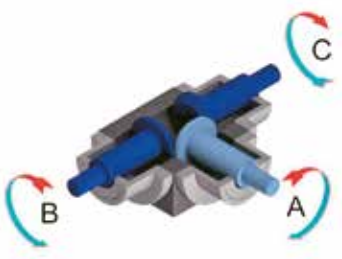
Serie **QB** Series	Diametri prese di forza PTO diameters	Dimensioni forma costruttiva Tipo 30 Type 30 constructive form dimensions														
Taglia Size G1	A - B - C Ø h7	G2 Ø f 7	G4	G5	L1	L2	L3	L4 L10	L5	L6	L7	L8	L11	H1 - H2	P1	P2
54	18	53	10	52.8	44	35	1.5	72	95	27	134	35	214	6x6x30	M4x10	M4x12
86	24	84	10	59	70	50	2	84	114	43	177	50	268	8x7x40	M6x12	M8x20
110	26	100	13	68	90	55	2	110	150	55	220	55	330	8x7x45	M8x20	M10x25
134	32	122	15	80	114	65	2	132	182	67	264	65	394	10x8x55	M8x20	M10x25
166	45	156	16	107	144	90	2	152	217	83	325	90	484	14x9x80	M10x25	M12x30
200	55	185	16	120	174	110	2	182	267	100	392	110	584	16x10x100	M10x25	M14x35
250	70	230	18	152	216	140	3	218	318	125	483	140	716	20x12x120	M12x25	M16x40
350	85	345	15	240	320	170	5	330	450	175	675	170	1000	22x14x160	M12x25	M20x60





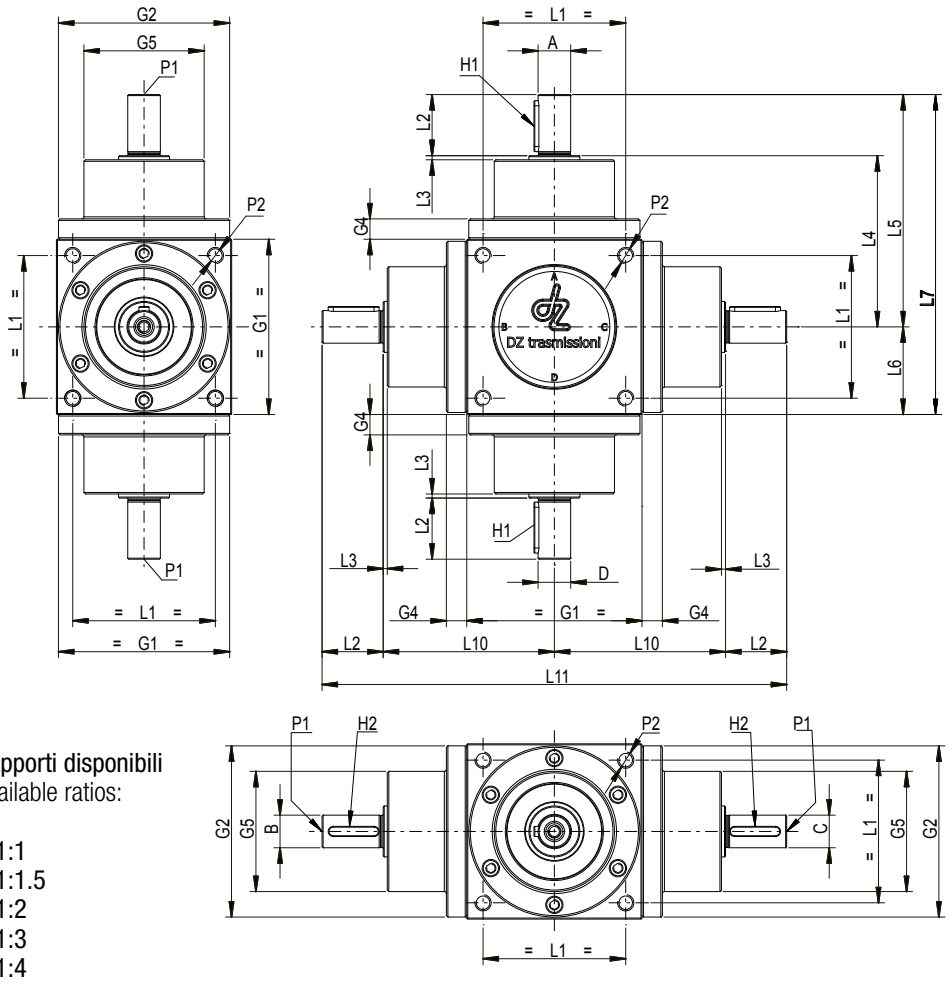
Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4



Rotazioni forma costruttiva TIPO 30
TYPE 30 constructive form revolutions

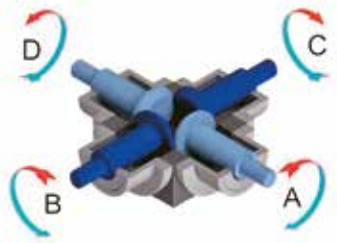
Serie QB Series	Diametri prese di forza PTO diameters	Dimensioni forma costruttiva Tipo 31 Type 31 constructive form dimensions													
Taglia Size G1	A - B - C - D Ø h7	G2 Ø f 7	G4	G5	L1	L2	L3	L4 L10	L5	L6	L7	L11	H1 - H2	P1	P2
54	11	53	10	52.8	44	23	1.5	72	95	27	122	190	4x4x20	M4x10	M4x12
86	16	84	10	59	70	30	2	84	114	43	157	228	5x5x25	M6x12	M8x20
110	20	100	13	68	90	40	2	110	150	55	205	300	6x6x35	M8x20	M10x25
134	24	122	15	80	114	50	2	132	182	67	249	364	8x7x45	M8x20	M10x25
166	32	156	16	107	144	65	2	152	217	83	300	434	10x8x60	M10x25	M12x30
200	42	185	16	120	174	85	2	182	267	100	367	534	12x8x80	M10x25	M14x35
250	55	230	18	152	216	100	3	218	318	125	443	636	16x10x90	M12x25	M16x40
350	65	345	15	240	320	120	5	330	450	175	625	900	18x11x110	M12x25	M20x60





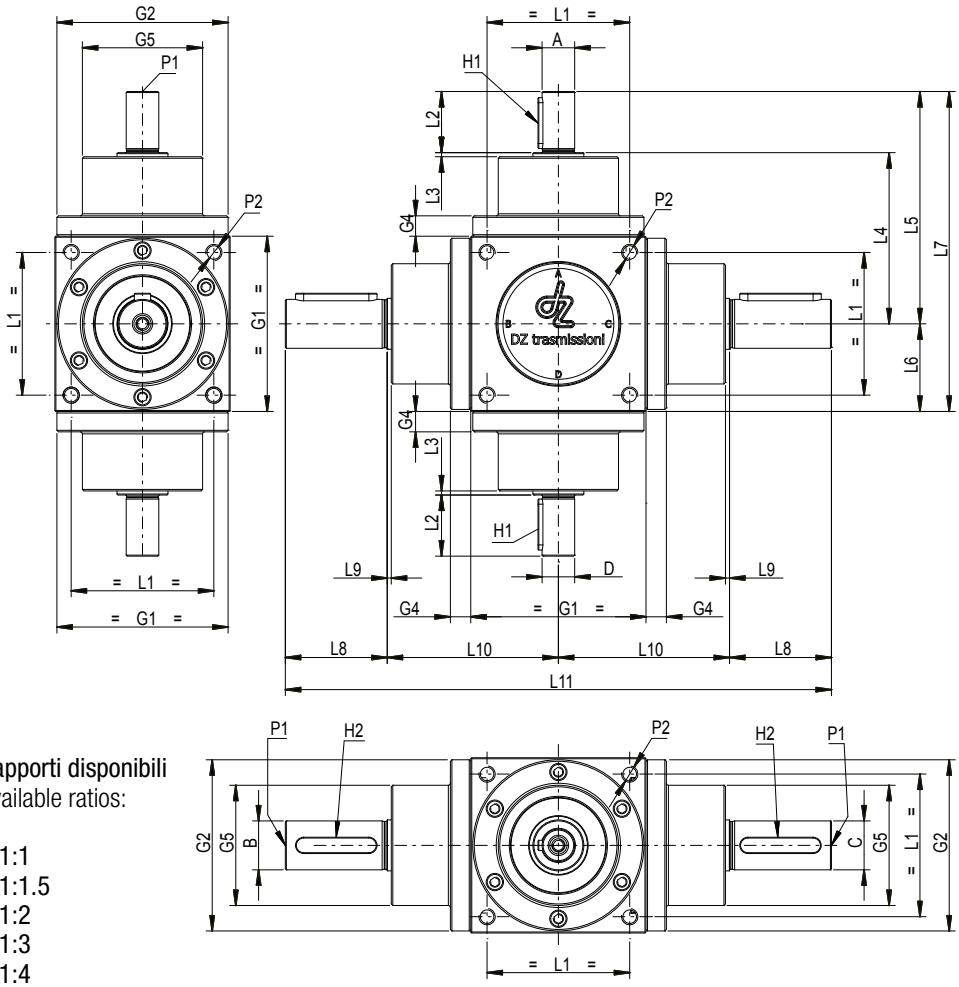
Rapporti disponibili
Available ratios:

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R 1:1.5
R 1:2
R 1:3
R 1:4



Rotazioni forma costruttiva TIPO 31
TYPE 31 constructive form revolutions

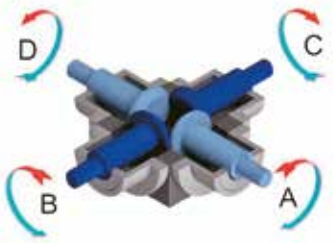
Serie **QB** Series	Diametri prese di forza PTO diameters		Dimensioni forma costruttiva Tipo 32 Type 32 constructive form dimensions															
Taglia Size G1	A - D Ø h7	B - C Ø h7	G2 Ø f 7	G4	G5	L1	L2	L3 L9	L4 L10	L5	L6	L7	L8	L11	H1	H2	P1	P2
54	11	18	53	10	52.8	44	23	1.5	72	95	27	122	35	214	4x4x20	6x6x30	M4x10	M4x12
86	16	24	84	10	59	70	30	2	84	114	43	157	50	268	5x5x25	8x7x40	M6x12	M8x20
110	20	26	100	13	68	90	40	2	110	150	55	205	55	330	6x6x35	8x7x45	M8x20	M10x25
134	24	32	122	15	80	114	50	2	132	182	67	249	65	394	8x7x45	10x8x55	M8x20	M10x25
166	32	45	156	16	107	144	65	2	152	217	83	300	90	484	10x8x60	14x9x80	M10x25	M12x30
200	42	55	185	16	120	174	85	2	182	267	100	367	110	584	12x8x80	16x10x100	M10x25	M14x35
250	55	70	230	18	152	216	100	3	218	318	125	443	140	716	16x10x90	20x12x120	M12x25	M16x40
350	65	85	345	15	240	320	120	5	330	450	175	625	170	1000	18x11x110	22x14x160	M12x25	M20x60





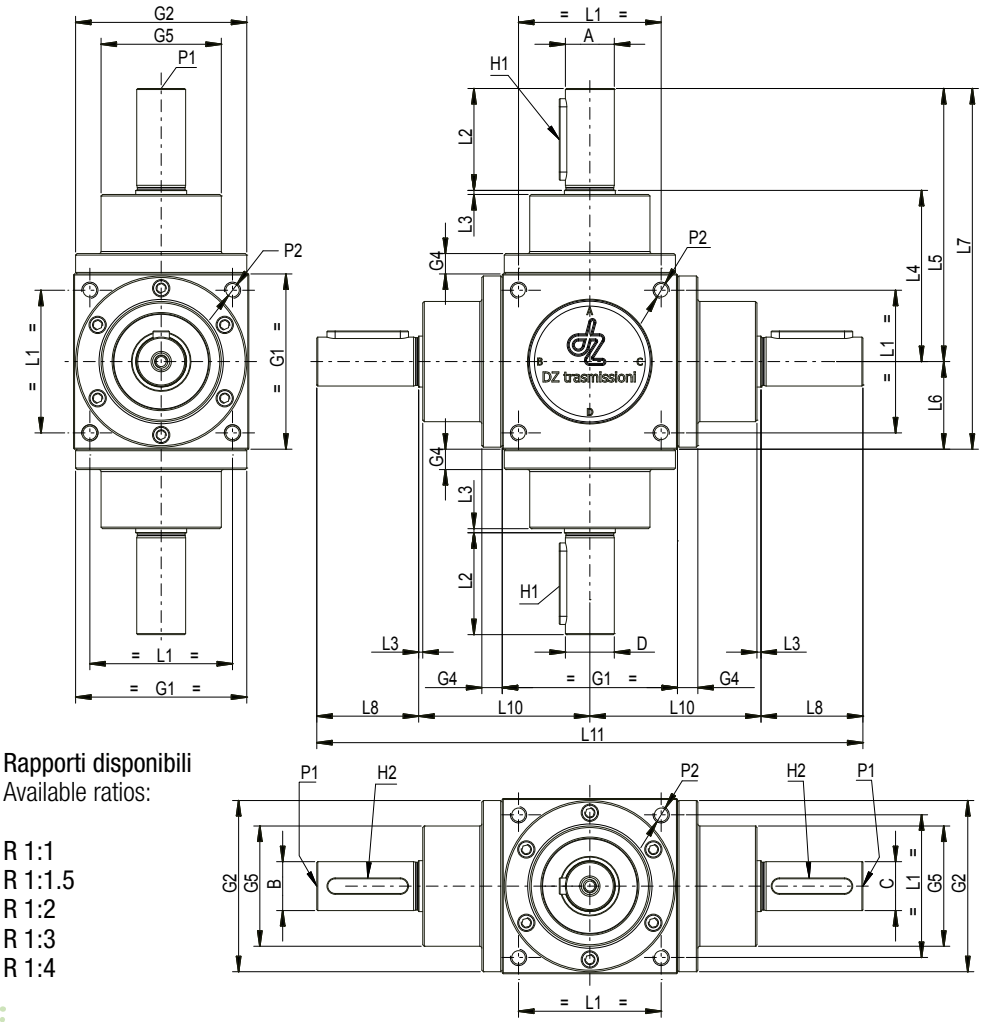
Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4



Rotazioni forma costruttiva TIPO 32
TYPE 32 constructive form revolutions

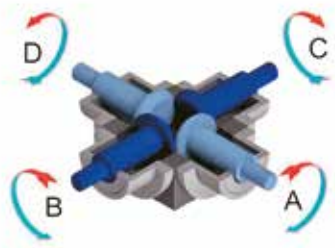
Serie QB Series	Diametri prese di forza PTO diameters	Dimensioni forma costruttiva Tipo 33 Type 33 constructive form dimensions														
Taglia Size G1	A - B - C - D Ø h7	G2 Ø f 7	G4	G5	L1	L2	L3	L4 L10	L5	L6	L7	L8	L11	H1 - H2	P1	P2
54	18	53	10	52.8	44	35	1.5	72	95	27	134	35	214	6x6x30	M4x10	M4x12
86	24	84	10	59	70	50	2	84	114	43	177	50	268	8x7x40	M6x12	M8x20
110	26	100	13	68	90	55	2	110	150	55	220	55	330	8x7x45	M8x20	M10x25
134	32	122	15	80	114	65	2	132	182	67	264	65	394	10x8x55	M8x20	M10x25
166	45	156	16	107	144	90	2	152	217	83	325	90	484	14x9x80	M10x25	M12x30
200	55	185	16	120	174	110	2	182	267	100	392	110	584	16x10x100	M10x25	M14x35
250	70	230	18	152	216	140	3	218	318	125	483	140	716	20x12x120	M12x25	M16x40
350	85	345	15	240	320	170	5	330	450	175	675	170	1000	22x14x160	M12x25	M20x60



Rapporti disponibili
Available ratios:

R 1:1
R 1:1.5
R 1:2
R 1:3
R 1:4





Rotazioni forma costruttiva TIPO 33
TYPE 33 constructive form revolutions



DZ trasmissioni



DZ trasmissioni

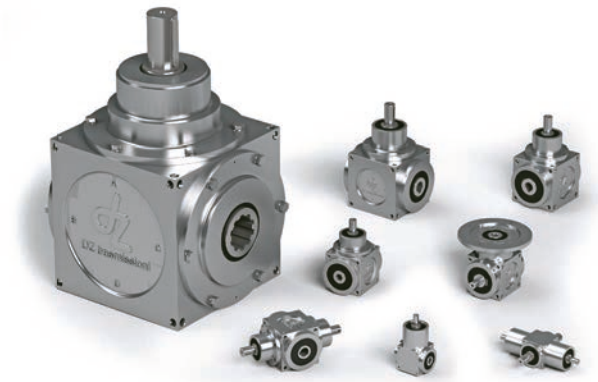
Via Salvator Allende 1/F
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E-mail: **info@dztrasmissioni.com**
Web: **www.dztrasmissioni.com**

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Li potete consultare online al sito:

For further information about cur product range, please consult cur catalogues.
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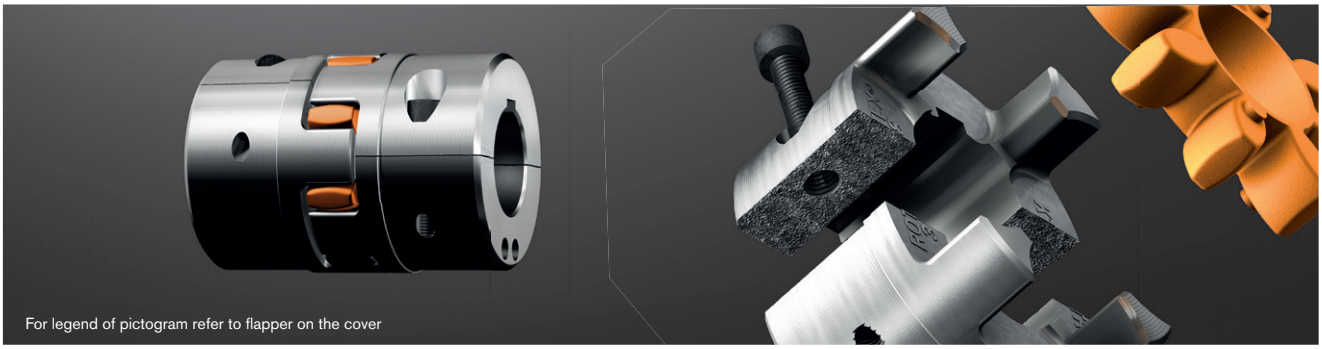


DZ trasmissioni

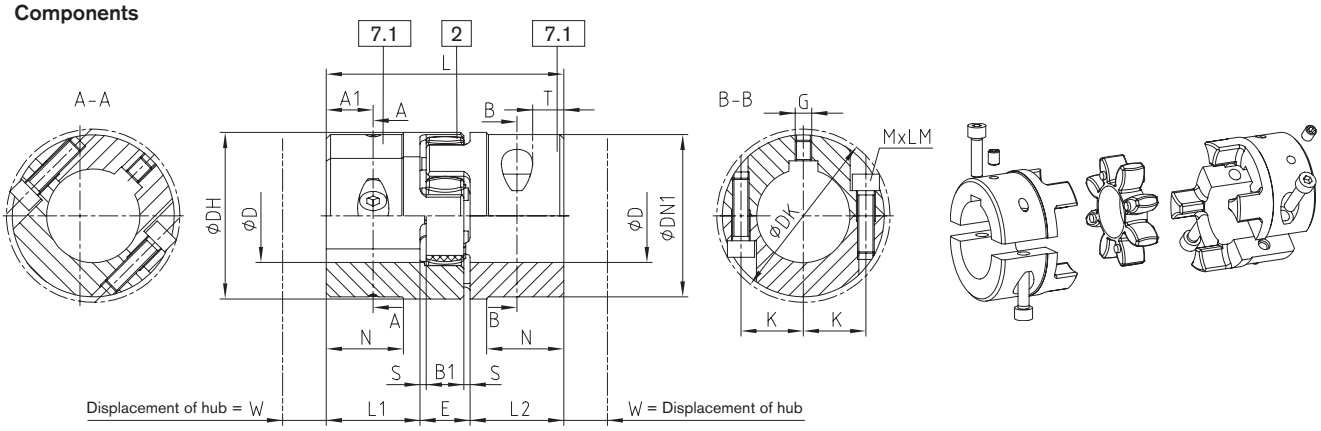
Via Salvator Allende 1/F
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Tel. +39 051/755.399 - Fax +39 051/753.903
E-mail: **info@dztrasmissioni.com**
Web: **www.dztrasmissioni.com**

16. Appendix 8 – Couplers

Drop-out center design coupling with SPLIT hubs



Components



Type SH

ROTEX® Type SH Sintered steel (Sinter)																		
Size	Finish bore D		Dimensions [mm]														Cap screws DIN EN ISO 4762	
	min.	Max.	L	L1, L2	E	B1	S	DH	DN1	DK	N	K	A1	T	G	W	MxLM	Tightening torque T_A [Nm]
24	0	28	78	30	18	14	2.0	55	-	57.5	-	20	15	10	M5	12	M6x20	14
28	0	38	90	35	20	15	2.5	65	-	73	-	25	17.5	15	M8	12	M8x25	34

ROTEX® Type SH Cast iron (GJL)																		
Size	Finish bore D		Dimensions [mm]														Cap screws DIN EN ISO 4762	
	min.	Max.	L	L1, L2	E	B1	S	DH	DN1	DK	N	K	A1	T	G	W	MxLM	Tightening torque T_A [Nm]
38	24	48	114	45	24	18	3.0	80	78	83.5	37	30	22.5	15		15	M8x30	34
42	24	55	126	50	26	20	3.0	95	94	97	40	30	25		M8	15	M10x35	67
48	24	60	140	56	28	21	3.5	105	104	108.5	45	35	28			15	M12x40	115
55	24	70	160	65	30	22	4.0	120	118	122	52	40	32.5	20		15	M12x45	115
65	28	70	185	75	35	26	4.5	135	115	123.5	61	45	37.5			15	M12x40	115
	70	80							135	132.5		50			M10		M12x45	
75	40	80	210	85	40	30	5.0	160	135	147	69	51	42.5	25		20	M16x50	290
	80	90							160	158		57						
90	40	90	245	100	45	34	5.5	200	160	176	81	60	50	30	M12	30	M20x60	560
	90	110							200	197		72						

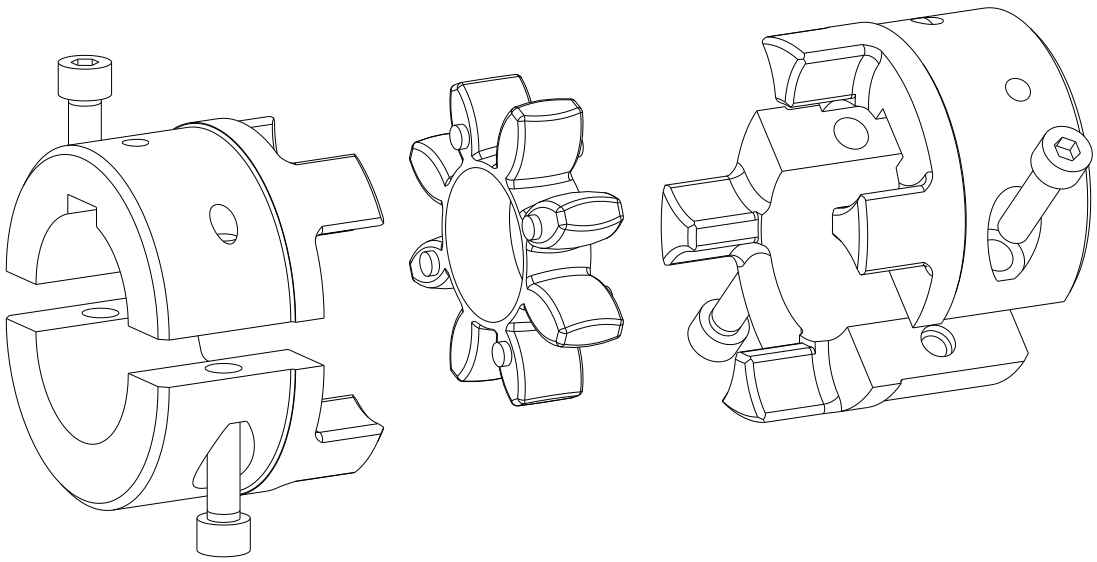
7.1 = SPLIT hub with feather keyway

Ordering example:	ROTEX® 38	SH	98 ShA	7.1	Ø38	7.1	Ø30
	Coupling size	Type	Spider hardness	Hub type	Finish bore	Hub type	Finish bore

ROTEX®

Torsionally flexible jaw couplings type SH
and their combinations

according to directive 2014/34/EU and UK directive SI 2016 No. 1107



Type SH

ROTEX® is a torsionally flexible jaw coupling. It is able to compensate for shaft misalignment, for example caused by manufacturing inaccuracies, thermal expansion, etc.
Type SH allows to replace a spider/coupling without having to disassemble the driving resp. driven machine.

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1 Technical data

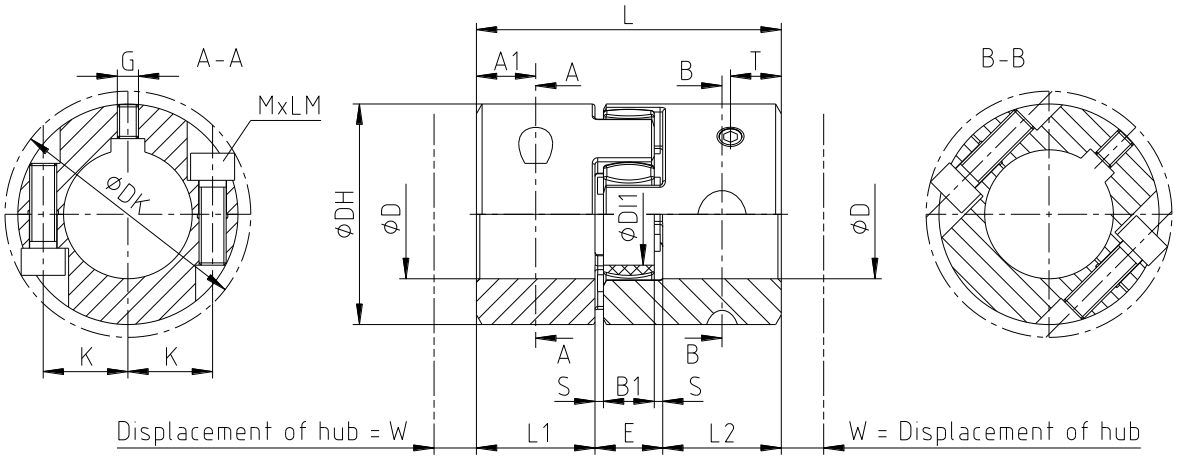


Illustration 1: ROTEX® type SH (material: Sint)

Table 1: Dimensions - Material sintered steel (Sint)

Size	Dimensions in mm														
	Finish bore D [1]		General										Cap screws DIN EN ISO 4762		
	min.	Max.	L	L1, L2	E	B1	S	DH	DI1	DK	K	W	MxLM	A1	T_A in Nm
24	0	28	78	30	18	14	2.0	55	27	57.5	20	12	M6x20	15.0	14
28	0	38	90	35	20	15	2.5	65	30	73.0	25	12	M8x25	17.5	35

1) Maximum torque of the coupling $T_{Kmax.}$ = Rated torque of the coupling T_{KN} x 2

Table 2: Torques and setscrews - Material sintered steel (Sint)

Size	Spider [2] (component 2) Rated torque in Nm			Setscrew DIN EN ISO 4029		
	92 ShA	98 ShA	64 ShD	G	T	T_A in Nm
24	35	60	-	M5	10	2
28	95	160	-	M8	15	10

2) Bores H7 with keyway to DIN 6885 sheet 1 [JS9] and setscrew

If used in potentially explosive atmospheres the setscrews to fasten the hubs as well as all screw connections must be secured against working loose additionally, e. g. conglutinating with Loctite (average strength).

With frictionally engaged connections the tolerance of the bore depends on the shaft. Respective fit pairs have to be calculated by KTR beforehand.

Clamping hubs (SPLIT hubs) without feather keyways may be used in category 3 only and are marked with category 3 accordingly.

1 Technical data

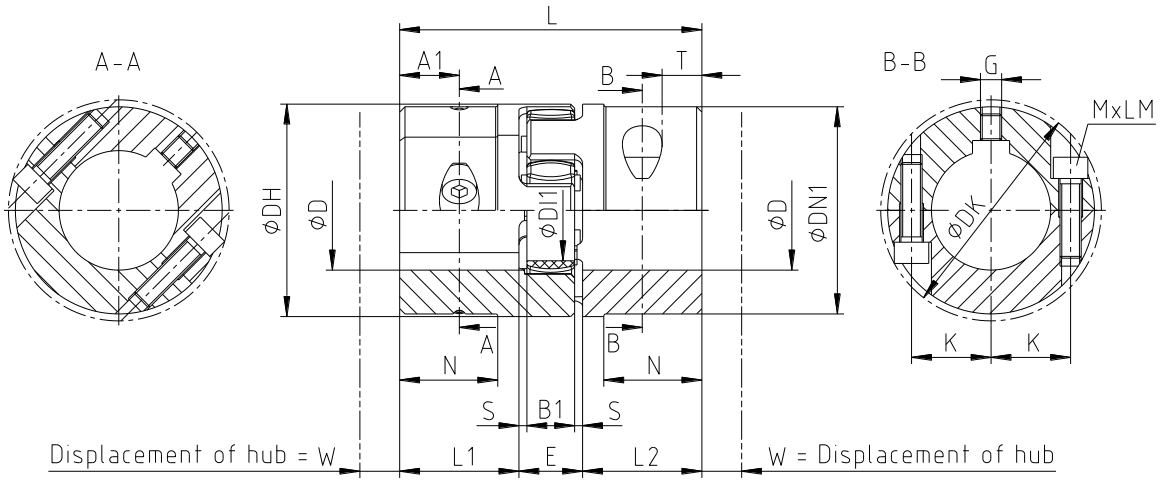


Illustration 2: ROTEX® type SH, size 38 - 55 (material: GJL)

Table 3: Dimensions - Material cast iron (GJL)

Size	Dimensions in mm																
	Finish bore D [1]		General												Cap screws DIN EN ISO 4762		
	min.	Max.	L	L1, L2	E	B1	S	DH	DI1	DN1	DK	N	K	W	MxLM	A1	T_A in Nm
38	24	45	114	45	24	18	3.0	80	38	78	83.5	37	30	15	M8x30	22.5	34
42	24	55	126	50	26	20	3.0	95	46	94	97.0	40	30	15	M10x35	25.0	67
48	24	60	140	56	28	21	3.5	105	51	104	108.5	45	35	15	M12x40	28.0	115
55	24	70	160	65	30	22	4.0	120	60	118	122.0	52	40	15	M12x45	32.5	115
65	24	70	185	75	35	26	4.5	135	68	115	123.5	61	45	15	M12x40	37.5	115
	70	80								135	132.5		50		M12x45		
75	40	80	210	85	40	30	5.0	160	80	135	147.0	69	51	20	M16x50	42.5	290
	80	90								160	158.0		57				
90	40	90	245	100	45	34	5.5	200	100	160	176.0	81	60	30	M20x60	50.0	560
	90	110								200	197.0		72				

1) Bores H7 with keyway to DIN 6885 sheet 1 [JS9] and setscrew

Table 4: Torques and setscrews - Material cast iron (GJL)

Size	Spider [2] (component 2) Rated torque in Nm			Setscrew DIN EN ISO 4029		
	92 ShA	98 ShA	64 ShD	G	T	T_A in Nm
38	190	325	405	M8	15	10
42	265	450	560		20	
48	310	525	655			
55	410	685	825	M10		17
65	625	940	1175			
75	1280	1920	2400		25	
90	2400	3600	4500	M12	30	40

2) Maximum torque of the coupling $T_{Kmax.}$ = Rated torque of the coupling T_{KN} x 2

If used in potentially explosive atmospheres the setscrews to fasten the hubs as well as all screw connections must be secured against working loose additionally, e. g. conglutinating with Loctite (average strength).

With frictionally engaged connections the tolerance of the bore depends on the shaft. Respective fit pairs have to be calculated by KTR beforehand.

Clamping hubs (SPLIT hubs) without feather keyways may be used in category 3 <u>only</u> and are marked with category 3 accordingly.

1 Technical data

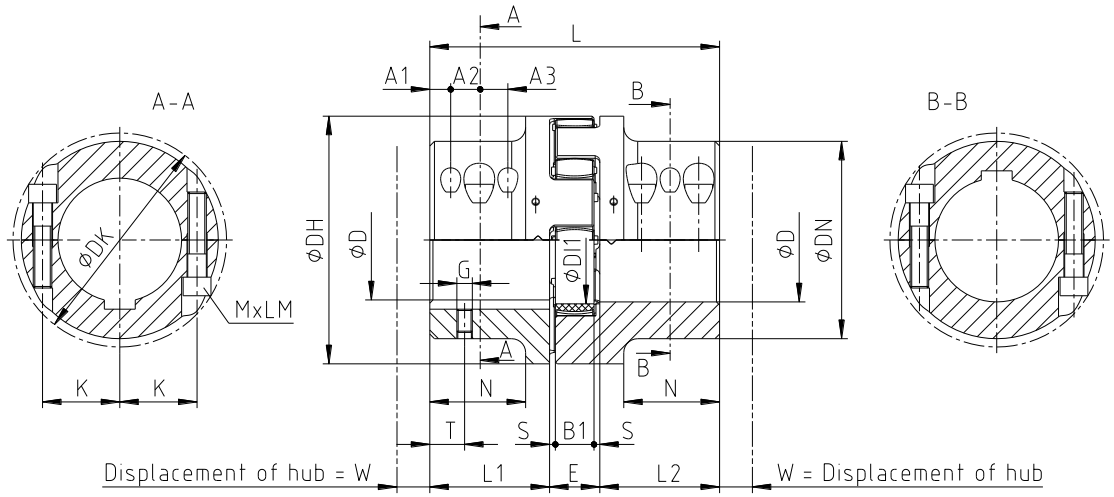


Illustration 3: ROTEX® type SH, size 100 - 180 (material: steel)

Table 5: Dimensions - Material steel

Size	Dimensions in mm																		
	Finish bore D [1]		General												Cap screws DIN EN ISO 4762				
	min.	Max.	L	L1, L2	E	B1	S	DH	DI1	DN	DK	N	K	W	MxLM	A1	A2	A3	T_A in Nm
100	0	110	270	110	50	38	6.0	225	113	180	199	89	70	35	M20x70	26	36	-	580
110	0	125	295	120	55	42	6.5	255	127	200	224	96	78	39	M24x80	28	40	-	1000
125	60	145	340	140	60	46	7.0	290	147	230	249	112	90	42	M24x90	40	46	-	1000
140	60	160	375	155	65	50	7.5	320	165	255	276	124	100	46	M24x110	27	37	37	1000
160	80	180	425	175	75	57	9.0	370	190	290	313	140	115	53	M27x120	31	42	42	1500
180	85	200	475	195	85	64	10.5	420	220	325	349	156	130	60	M27x140	35	44	44	1500

1) Bores H7 with keyway to DIN 6885 sheet 1 [JS9] and setscrew

Table 6: Torques and setscrews - Material steel

Size	Spider [2] (component 2) Rated torque in Nm			Setscrew DIN EN ISO 4029		
	92 ShA	98 ShA	64 ShD	G	T	T_A in Nm
100	3300	4950	6185	M12	30	40
110	4800	7200	9000	M16	35	80
125	6650	10000	12500	M16	40	80
140	8550	12800	16000	M20	45	140
160	12800	19200	24000	M20	50	140
180	18650	28000	35000	M20	50	140

2) Maximum torque of the coupling $T_{Kmax.}$ = Rated torque of the coupling T_{KN} x 2

If used in potentially explosive atmospheres the setscrews to fasten the hubs as well as all screw connections must be secured against working loose additionally, e. g. conglutinating with Loctite (average strength).

With frictionally engaged connections the tolerance of the bore depends on the shaft. Respective fit pairs have to be calculated by KTR beforehand.

Clamping hubs (SPLIT hubs) without feather keyways may be used in category 3 only and are marked with category 3 accordingly.

2 Advice

2.1 General advice

Please read through these operating/assembly instructions carefully before you start up the coupling.
Please pay special attention to the safety instructions!



The **ROTEX®** coupling is suitable and approved for the use in potentially explosive atmospheres. When using the coupling in potentially explosive atmospheres, observe the special advice and instructions regarding safety in enclosure A.

The operating/assembly instructions are part of your product. Please store them carefully and close to the coupling. The copyright for these operating/assembly instructions remains with KTR.

2.2 Safety and advice symbols

	**Warning of potentially explosive atmospheres**	This symbol indicates notes which may contribute to preventing bodily injuries or serious bodily injuries that may result in death caused by explosion.
	**Warning of personal injury**	This symbol indicates notes which may contribute to preventing bodily injuries or serious bodily injuries that may result in death.
	**Warning of product damages**	This symbol indicates notes which may contribute to preventing material or machine damage.
	**General advice**	This symbol indicates notes which may contribute to preventing adverse results or conditions.
	**Warning of hot surfaces**	This symbol indicates notes which may contribute to preventing burns with hot surfaces resulting in light to serious bodily injuries.

2.3 General hazard warnings



With assembly, operation and maintenance of the coupling it has to be made sure that the entire drive train is secured against accidental switch-on. You may be seriously hurt by rotating parts. Make absolutely sure to read through and observe the following safety indications.

- All operations on and with the coupling have to be performed taking into account "safety first".
- Make sure to switch off the power pack before you perform your work on the coupling.
- Secure the power pack against accidental switch-on, e. g. by providing warning signs at the place of switch-on or removing the fuse for current supply.
- Do not reach into the operating area of the coupling as long as it is in operation.
- Secure the coupling against accidental contact. Provide for the necessary protection devices and covers.

2 Advice

2.4 Intended use

You may only assemble, operate and maintain the coupling if you

- have carefully read through the operating/assembly instructions and understood them
- are technically qualified and specifically trained (e. g. safety, environment, logistics)
- are authorized by your company

The coupling may only be used in accordance with the technical data (see chapter 1). Unauthorized modifications on the coupling design are not admissible. We will not assume liability for any damage that may arise. In the interest of further development we reserve the right for technical modifications.
The **ROTEX®** described in here corresponds to the state of the art at the time of printing of these operating/assembly instructions.

2.5 Coupling selection



For a permanent and failure-free operation of the coupling it must be selected according to the selection instructions (according to DIN 740 part 2) for the particular application (see catalogue drive technology "ROTEX®").
If the operating conditions (performance, speed, modifications on engine and machine) change, the coupling selection must be reviewed.
Make sure that the technical data regarding torque refer to the spider only. The transmittable torque of the shaft-hub-connection must be reviewed by the customer and is subject to his responsibility.

For drives subjected to torsional vibrations (drives with cyclic stress due to torsional vibrations) it is necessary to perform a torsional vibration calculation to ensure a reliable selection. Typical drives subjected to torsional vibrations are e. g. drives with diesel engines, piston pumps, piston compressors etc. If requested, KTR will perform the coupling selection and the torsional vibration calculation.

2.6 Reference to EC Machinery Directive 2006/42/EC

The couplings supplied by KTR should be considered as components, not machines or partly completed machines according to EC Machinery Directive 2006/42/EC. Consequently KTR does not have to issue a declaration of incorporation. For details about safe assembly, start-up and safe operation refer to the present operating/assembly instructions considering the warnings.

3 Storage, transport and packaging

3.1 Storage

The coupling hubs are supplied in preserved condition and can be stored in a dry and roofed place for 6 - 9 months.
The features of the coupling spiders (elastomers) remain unchanged for up to 5 years with favourable storage conditions.

The storage rooms must not include any ozone-generating devices like e. g. fluorescent light sources, mercury-vapour lamps or electrical high-voltage appliances.
Humid storage rooms are not suitable.
Make sure that condensation is not generated. The best relative air humidity is less than 65 %.

3.2 Transport and packaging

In order to avoid any injuries and any kind of damage always make use of proper transport and lifting equipment.

The couplings are packed differently each depending on size, number and kind of transport. Unless otherwise contractually agreed, packaging will follow the in-house packaging specifications of KTR.

4 Assembly

The coupling is generally supplied in individual parts. Before assembly the coupling has to be inspected for completeness.

4.1 Components of the coupling

Components of ROTEX® type SH

Component	Quantity	Description
1	2	SPLIT hub
2	1	Spider
3	2/4/6 [1)]	Cap screws DIN EN ISO 4762
4	1 [1)]	Setscrews DIN EN ISO 4029

1) each SPLIT hub (quantity is depends on coupling size)

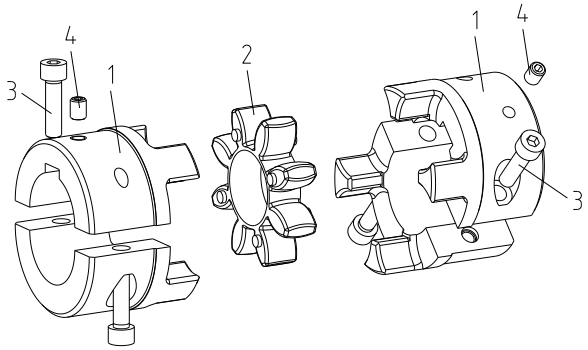


Illustration 4: ROTEX® type SH

Clamping hubs (SPLIT hubs) without feather keyways may be used in category 3 <u>only</u> and are marked with category 3 accordingly.

4 Assembly

4.1 Components of the coupling

Features of standard spiders

Spider hardness (Shore)	92 Shore A		98 Shore A		64 Shore D	
	T-PUR® (orange)	PUR (yellow)	T-PUR® (purple)	PUR (red)	T-PUR® (light green)	PUR (natural white 1))
Marking (colour)						

1) Natural white with green marking of teeth

4.2 Advice for finish bore

STOP

The maximum permissible bore diameters D (see chapter 1 - technical data) must not be exceeded. If these figures are disregarded, the coupling may tear. Rotating particles may cause danger to life.

- Hub bores machined by the customer have to observe concentricity resp. axial runout (see illustration 4).
- Make absolutely sure to observe the figures for ØD.
- Carefully align the hubs when the finish bores are drilled.
- Provide for a setscrew according to DIN EN ISO 4029 with a cup point or an end plate to fasten the hubs axially.

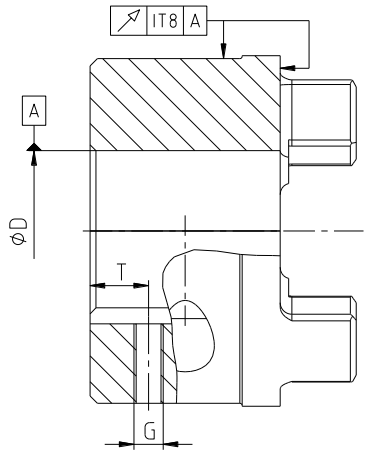


Illustration 5: Concentricity and axial runout

The customer bears the sole responsibility for all machining processes performed subsequently on unbored or pilot bored as well as finish machined coupling components and spare parts. KTR does not assume any warranty claims resulting from insufficient remachining.

KTR supplies unbored or pilot bored coupling components and spare parts only upon explicit request of the customer. These parts are additionally marked with the symbol Ⓤ.

<u>Reference to unbored resp. pilot bored coupling components with explosion protection marking:</u>
Basically the company KTR Systems GmbH supplies couplings resp. coupling hubs with explosion protection marking as an unbored or pilot bored type only on explicit request of the customer. The prerequisite is a declaration of exemption submitted by the customer assuming any responsibility and liability for respective remachining performed on the product of KTR Systems GmbH.

Table 7: Setscrew DIN EN ISO 4029

Size	24	28	38	42	48	55	65	75	90	100	110	125	140	160	180
Dimension G in mm	M5	M8	M8	M8	M8	M10	M10	M10	M12	M12	M16	M16	M20	M20	M20
Dimension T in mm	10	15	15	20	20	20	20	25	30	30	35	40	45	50	50
Tightening torque T_A in Nm	2	10	10	10	10	17	17	17	40	40	80	80	140	140	140

4 Assembly

4.3 Assembly of the coupling (general)

We recommend to inspect bores, shaft, keyway and feather key for dimensional accuracy before assembly.

The cracked surfaces of the ROTEX® SH SPLIT hub halves must be inspected for cleanliness before assembly.
If necessary, clean the cracked surfaces of the EN-GJL hubs with a wire bush to ensure an optimal fit.

When disassembling the ROTEX® SH SPLIT EN-GJL hubs, small casting particles may come loose from the cracked surface, but the function is not affected.

Please pay attention to the ignition risk in potentially explosive atmospheres!

With the assembly make sure that the distance dimension E (see table 1, 3 and 5) is observed to allow for axial clearance of the spider when in operation.
Disregarding this advice may cause damage to the coupling.

If used in potentially explosive atmospheres the setscrews to fasten the hubs as well as all screw connections must be secured against working loose additionally, e. g. conglutinating with Loctite (average strength).

4.4 Assembly of the hubs (axial assembly)

Heating the hubs lightly (approx. 80 °C) allows for an easier mounting on the shaft.

STOP

Touching the heated hubs causes burns.
Please wear safety gloves.

- Mount the SPLIT hubs on the shaft of driving and driven side (see illustration 6).
- The internal sides of the hubs must be flush with the front sides of the shafts.

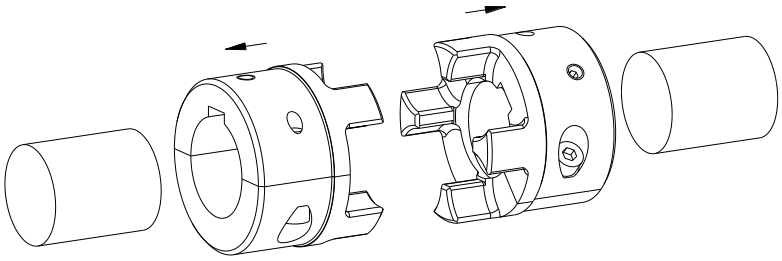


Illustration 6: Assembly of hubs

- Insert the spider in the cam section of the hubs on the driving or driven side (see illustration 7).

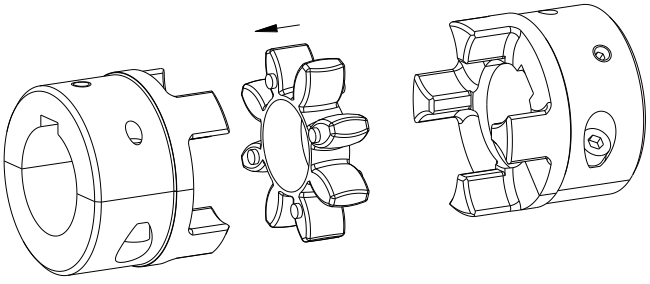


Illustration 7: Assembly of spider

4 Assembly

4.4 Assembly of the hubs (axial assembly)

- Shift the power packs in axial direction until the distance dimension E is achieved (see illustration 8).
- If the power packs are already firmly assembled, shifting the hubs axially on the shafts allows for setting the distance dimension E.
- Tighten the cap screws of the SPLIT hubs reciprocally by means of a suitable torque key to the tightening torques T_A mentioned in table 1, 3 or 5.
- Fasten the SPLIT hubs by tightening the setscrews DIN EN ISO 4029 with a cup point (tightening torque see table 7).

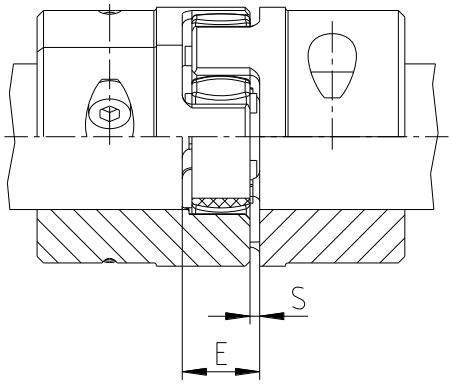


Illustration 8: Assembly of coupling

- Centre the spider between the SPLIT hubs and check the dimensions E and S (see illustration 8 and chapter 1).

☞ **If the shaft diameters with inserted feather key are smaller than dimension DI1 (see table 1, 3 and 5) of the spider, one or two shaft ends may protrude into the spider.**

⚠ **Having started up the coupling, the wear of spider has to be inspected at regular maintenance intervals and the spider has to be replaced, if necessary.**

⟨Ex⟩ **Clamping hubs (SPLIT hubs) without feather keyways may be used in category 3 only and are marked with category 3 accordingly.**

4.5 Assembly of the hubs (radial assembly)

- Remove the cap screws from the SPLIT hubs.

☞ **If the half shells cannot be separated from each other, the separation process must be initiated via a suitable tool (mounting hammer).**

- Put the upper shell of the first SPLIT hub with the cap screws installed on the shaft (see illustration 9).
- Align the lower shell of the first SPLIT hub with the upper shell under the shaft (see illustration 10). Screw in the cap screws over several pitches.
- Align the upper and lower half shell based on the outer shape so that the fracture surfaces fit exactly.

⚠ **The half shell pairs of the two SPLIT hubs must not be interchanged, since the fracture surfaces of the respective hubs only fit exactly.**

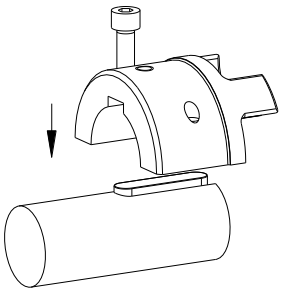


Illustration 9: Assembly of half shell

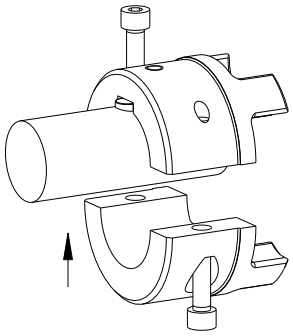


Illustration 10: Assembly of SPLIT hub on the shaft

4 Assembly

4.5 Assembly of the hubs (radial assembly)

- Hand-tighten the cap screws.
- Repeat the assembly of the first SPLIT hub described in here with the second SPLIT hub.
- Insert the spider in the cam section of the SPLIT hubs on the driving or driven side (see illustration 11).
- Shift the power packs in axial direction until the distance dimension E is achieved (see illustration 12).
- Tighten the cap screws of the SPLIT hubs reciprocally by means of a suitable torque key to the tightening torques T_A mentioned in table 1, 3 or 5.
- Fasten the SPLIT hubs by tightening the setscrews DIN EN ISO 4029 with a cup point (tightening torque see table 7).
- Centre the spider between the SPLIT hubs and check the dimensions E and S (see illustration 12 and chapter 1).

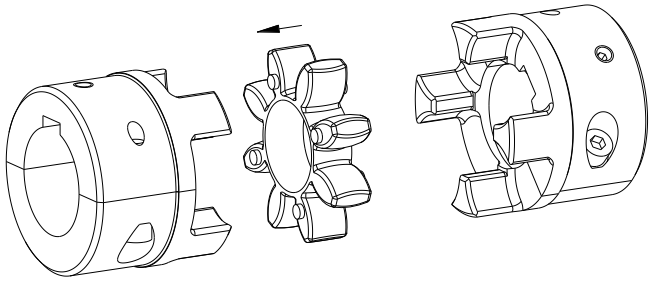


Illustration 11: Assembly of spider

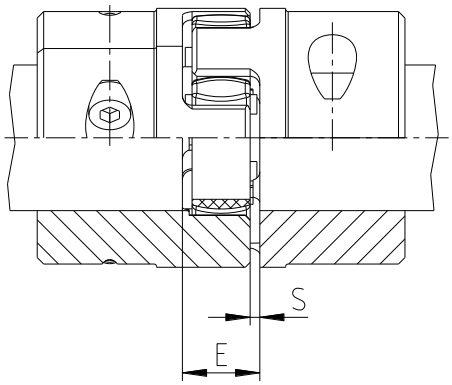


Illustration 12: Assembly of coupling

If the shaft diameters with inserted feather key are smaller than dimension DI1 (see table 1, 3 and 5) of the spider, one or two shaft ends may protrude into the spider.

Having started up the coupling, the wear of spider has to be inspected at regular maintenance intervals and the spider has to be replaced, if necessary.

Clamping hubs (SPLIT hubs) without feather keyways may be used in category 3 <u>only</u> and are marked with category 3 accordingly.

4.6 Disassembly of the hubs

- Unscrew the setscrew and the cap screws of the first SPLIT hub by about 1 - 2 revolutions.

If the half shells cannot be separated from each other, the separation process must be initiated via a suitable tool (mounting hammer).

- Push the unscrewed SPLIT hub out of the spider axially.
- Remove the cap screws and afterwards the half shells.
- Remove the spider from the second SPLIT hub.
- Repeat the disassembly described in here for the first SPLIT hub with the second SPLIT hub.

4 Assembly

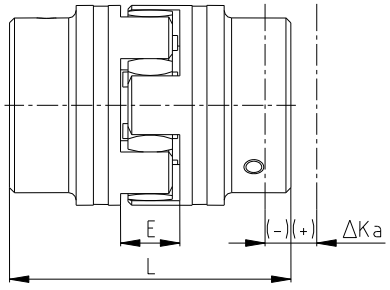
4.7 Displacements - alignment of the couplings

The displacement figures specified in tables 8 and 9 provide for sufficient safety to compensate for external influences like, for example, thermal expansion or foundation settling.

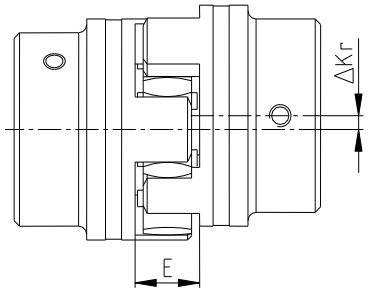
In order to ensure a long service life of the coupling and avoid hazards with the use in potentially explosive atmospheres, the shaft ends must be accurately aligned.
Please absolutely observe the displacement figures specified (see tables 8 and 9). If the figures are exceeded, the coupling will be damaged.
The more accurate the alignment of the coupling, the longer is its service life.
If used in potentially explosive atmospheres for explosion group IIC, only half of the displacement figures (see tables 8 and 9) is permissible.

Please note:

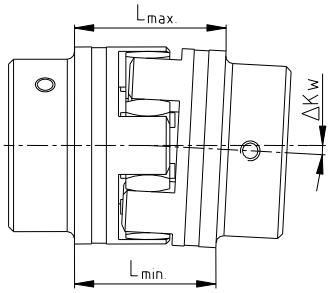
- The displacement figures specified in tables 8 and 9 are maximum figures which must not arise in parallel. If radial and angular displacements arise simultaneously, the permissible displacement figures may only be used proportionally (see illustration 14).
- Inspect with a dial gauge, ruler or feeler whether the permissible displacement figures of tables 8 and 9 can be observed.



Axial displacements



Radial displacements



Angular displacements

$L_{max} = L + \Delta K_a$ in mm

$\Delta K_w = L_{1max.} - L_{1min.}$ in mm

Illustration 13: Displacements

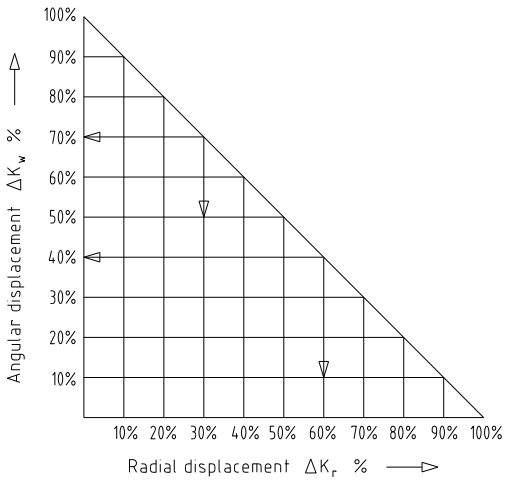
Examples of the displacement combinations specified in illustration 14:

Example 1:
$\Delta K_r = 30\ \%$
$\Delta K_w = 70\ \%$

Example 2:
$\Delta K_r = 60\ \%$
$\Delta K_w = 40\ \%$

$\Delta K_{total} = \Delta K_r + \Delta K_w \leq 100\ \%$

Illustration 14: Combinations of displacement



4 Assembly

4.7 Displacements - alignment of the couplings

Table 8: Displacement figures for 92 and 98 Shore A

Size		24	28	38	42	48	55	65	75	90	100	110	125	140	160	180
Max. axial displacement DKa in mm		-0.5	-0.7	-0.7	-1.0	-1.0	-1.0	-1.0	-1.5	-1.5	-1.5	-2.0	-2.0	-2.0	-2.5	-3.0
		+1.4	+1.5	+1.8	+2.0	+2.1	+2.2	+2.6	+3.0	+3.4	+3.8	+4.2	+4.6	+5.0	+5.7	+6.4
Max. radial displacement ΔKr in mm with n=	1500 rpm	0.22	0.25	0.28	0.32	0.36	0.38	0.42	0.48	0.50	0.52	0.55	0.60	0.62	0.64	0.68
	3000 rpm	0.15	0.17	0.19	0.21	0.25	0.26	0.28	0.32	0.34	0.36	0.38	-	-	-	-
Max. angular displacement ΔK_w with n=1500 rpm	in degree	0.9	0.9	1.0	1.0	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.2	1.2	1.2
	in mm	0.85	1.05	1.35	1.70	2.00	2.30	2.70	3.30	4.30	4.80	5.60	6.50	6.60	7.60	9.00
Max. angular displacement ΔK_w with n=3000 rpm	in degree	0.8	0.8	0.9	0.9	1.0	1.0	1.1	1.1	1.1	1.1	1.2	-	-	-	-
	in mm	0.75	0.85	1.10	1.40	1.60	2.00	2.30	2.90	3.80	4.20	5.00	-	-	-	-

Table 9: Displacement figures for 64 Shore D

Size		24	28	38	42	48	55	65	75	90	100	110	125	140	160	180
Max. axial displacement DKa in mm		-0.5	-0.7	-0.7	-1.0	-1.0	-1.0	-1.0	-1.5	-1.5	-1.5	-2.0	-2.0	-2.0	-2.5	-3.0
		+1.4	+1.5	+1.8	+2.0	+2.1	+2.2	+2.6	+3.0	+3.4	+3.8	+4.2	+4.6	+5.0	+5.7	+6.4
Max. radial displacement ΔKr in mm with n=	1500 rpm	0.15	0.18	0.21	0.23	0.25	0.27	0.30	0.34	0.36	0.37	0.40	0.43	0.45	0.46	0.49
	3000 rpm	0.10	0.13	0.15	0.16	0.18	0.19	0.21	0.24	0.25	0.26	0.28	-	-	-	-
Max. angular displacement ΔK_w with n=1500 rpm	in degree	0.8	0.8	0.9	0.9	1.0	1.0	1.1	1.1	1.1	1.1	1.2	1.2	1.1	1.1	1.1
	in mm	0.77	0.90	1.25	1.40	1.80	2.00	2.50	3.00	3.80	4.30	5.30	6.00	6.10	7.10	8.00
Max. angular displacement ΔK_w with n=3000 rpm	in degree	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0	1.0	1.0	1.1	-	-	-	-
	in mm	0.67	0.80	1.00	1.30	1.60	1.80	2.20	2.70	3.50	4.00	4.90	-	-	-	-

5 Start-up

Before start-up of the coupling, inspect the tightening of the setscrews in the hubs, the alignment and the distance dimension E and adjust, if necessary, and also inspect all screw connections for the tightening torques specified.

If used in potentially explosive atmospheres the setscrews to fasten the hubs as well as all screw connections must be secured against working loose additionally, e. g. conglutinating with Loctite (average strength).

Finally the coupling protection against accidental contact must be fitted. It is required in accordance with DIN EN ISO 12100 (Safety of Machinery) and directives 2014/34/EU and SI 2016 No. 1107 and must protect against

- access with a little finger
- falling down of solid foreign objects.

The coupling protection is not part of KTR's scope of delivery and is the customer's responsibility. It must have sufficient distance to the rotating components to avoid contact safely. Depending on the outside diameter DH of the coupling, we recommend the following minimum distance:
ØDH to 50 mm = 6 mm, ØDH 50 mm to 120 mm = 10 mm, ØDH from 120 mm = 15 mm.

Please check if a proper enclosure (ignition protection, coupling protection, contact protection) has been mounted and the operation of the coupling is not affected by the enclosure. The same applies for test runs and rotational direction inspections.

The cover may provide for openings intended for necessary heat dissipation. These openings have to comply with DIN EN ISO 13857.

5 Start-up

The cover must be electrically conductive and included in the equipotential bonding. Bellhousings (magnesium share below 7.5 %) made of aluminium and damping rings (NBR) can be used as connecting element between pump and electric motor. The cover may only be taken off with standstill of the unit.



If the couplings are used in locations subject to dust explosion and in mining the user must make sure that there is no accumulation of dust in a dangerous volume between the cover and the coupling. The coupling must not operate in an accumulation of dust.

For covers with unlocked openings on the top face no light metals must be used if the couplings are used as equipment of equipment group II (*if possible, from stainless steel*).
If the couplings are used in mining (equipment group I M2), the cover must not be made of light metal. In addition, it must be resistant to higher mechanical loads than with use as equipment of equipment group II.

During operation of the coupling, please pay attention to

- different operating noise
- vibrations occurring.



If you note any irregularities with the coupling during operation, the drive unit must be switched off immediately. The cause of the breakdown must be specified by means of the table „Breakdowns“ and, if possible, be eliminated according to the proposals. The potential breakdowns specified can be hints only. To find out the cause all operating factors and machine components must be considered.

Coating of coupling:



If coated (priming, paintings, etc.) couplings are used in potentially explosive atmospheres, the requirements on conductibility and coating thickness must be considered. With paintings up to 200 µm electrostatic load does not have to be expected. If thicker paintings resp. coatings up to a layer thickness of a maximum of 2.0 mm are applied, the couplings are not permissible for gases and vapours of category IIC in potentially explosive areas, but only for gases and vapours of category IIA and IIB.
This also applies for multiple coatings exceeding an overall thickness of 200 µm. Make sure with painting or coating that the coupling components are conductively connected with the device/devices to be connected so that the equipotential bonding is not impeded by the paint or coat applied. Basically painting of the spider is not admitted to ensure an equipotential bonding.
In addition, make sure that the marking of the coupling remains legible.

6 Breakdowns, causes and elimination

The below-mentioned failures can lead to a use of the **ROTEX®** coupling other than intended. In addition to the specifications given in these operating/assembly instructions make sure to avoid such failures.
The errors listed can only be clues to search for the failures. When searching for the failure the adjacent components must generally be considered.

The coupling can become a source of ignition with improper use.
Directive 2014/34/EU and UK directive SI 2016 No. 1107 require special care by the manufacturer and the user.

General failures with improper use:

- Important data for the coupling selection are not forwarded.
- The calculation of the shaft-hub-connection is not considered.
- Coupling components with damage occurred during transport are assembled.
- If the heated hubs are assembled, the permissible temperature is exceeded.
- The clearance of the components to be assembled is not coordinated with one another.
- Tightening torques are fallen below/exceeded.
- Components are mixed up by mistake/assembled incorrectly.
- A wrong or no spider is inserted in the coupling.
- No original **KTR** components (purchased parts) are used.
- Old/already worn out spiders or spiders stored for too long are used.
- Maintenance intervals are not observed.

Breakdowns	Causes	Hazard notes for potentially explosive atmospheres	Elimination
Different operating noise and/or vibrations occuring	Misalignment	Increased temperature on the spider surface; ignition risk by hot surfaces	1) Set the unit out of operation 2) Eliminate the reason for the misalignment (e. g. loose foundation bolts, breaking of the engine mount, heat expansion of unit components, modification of the installation dimension E of the coupling) 3) For inspection of wear see chapter 10.2
	Wear of spider, short-term torque transmission due to metal contact	Ignition risk due to sparking	1) Set the unit out of operation 2) Disassemble the coupling and remove residues of the spider 3) Inspect coupling components and replace coupling components that have been damaged 4) Insert spider, assemble coupling components 5) Inspect alignment, adjust if necessary
	Screws for axial fastening of hubs working loose	Ignition risk due to hot surfaces and sparking	1) Set the unit out of operation 2) Inspect alignment of coupling 3) Tighten the screws to fasten the hubs and secure against working loose 4) For inspection of wear see chapter 10.2
Breaking of cams	Wear of spider, torque transmission due to metal contact	Ignition risk due to sparking	1) Set the unit out of operation 2) Replace complete coupling 3) Inspect alignment
	Breaking of the cams due to high impact energy/overload		1) Set the unit out of operation 2) Replace complete coupling 3) Inspect alignment 4) Find out the reason for overload

6 Breakdowns, causes and elimination

Breakdowns	Causes	Hazard notes for potentially explosive atmospheres	Elimination
Breaking of cams	Operating parameters do not meet with the performance of the coupling	Ignition risk due to sparking	1) Set the unit out of operation 2) Review the operating parameters and select a bigger coupling (consider mounting space) 3) Assemble new coupling size 4) Inspect alignment
	Operating error of the unit		1) Set the unit out of operation 2) Replace complete coupling 3) Inspect alignment 4) Instruct and train the service staff
Early wear of spider	Misalignment	Increased temperature on the spider surface; ignition risk by hot surfaces	1) Set the unit out of operation 2) Eliminate the reason for the misalignment (e. g. loose foundation bolts, breaking of the engine mount, heat expansion of unit components, modification of the installation dimension E of the coupling) 3) For inspection of wear see chapter 10.2
	e. g. contact with aggressive liquids/oils, ozone influence, too high/low ambient temperatures etc. causing physical modification of the spider	Ignition risk due to sparking with metallic contact of the cams	1) Set the unit out of operation 2) Disassemble the coupling and remove residues of the spider 3) Inspect coupling components and replace coupling components that have been damaged 4) Insert spider, assemble coupling components 5) Inspect alignment, adjust if necessary 6) Make sure that further physical modifications of the spider are excluded
	Ambient/contact temperatures which are too high for the spider, max. permissible -30 °C/+90 °C		1) Set the unit out of operation 2) Disassemble the coupling and remove residues of the spider 3) Inspect coupling components and replace coupling components that have been damaged 4) Insert spider, assemble coupling components 5) Inspect alignment, adjust if necessary 6) Inspect and adjust ambient/contact temperature (correct by using other spider materials, if necessary)
Early wear of spider (liquefaction of material inside the spider cam)	Vibrations of drive		1) Set the unit out of operation 2) Disassemble the coupling and remove residues of the spider 3) Inspect coupling components and replace coupling components that have been damaged 4) Insert spider, assemble coupling components 5) Inspect alignment, adjust if necessary 6) Find out the reason for the vibrations (possibly corrective by spider with lower or higher Shore hardness)

When operating with a worn spider (see chapter 10.3) proper operation is not ensured.

7 Disposal

In respect of environmental protection we would ask you to dispose of the packaging resp. products on termination of their service life in accordance with the legal regulations resp. standards that apply.

- **Metal**
  Any metal components have to be cleaned and disposed of by scrap metal.
- **Nylon materials**
  Nylon materials have to be collected and disposed of by a waste disposal company.

8 Maintenance and service

ROTEX® is a low-maintenance coupling. We recommend to perform a visual inspection on the coupling **at least once a year**. Please pay special attention to the condition of the coupling spiders.

- Since the flexible machine bearings of the driving and driven side settle during the course of load, inspect the alignment of the coupling and re-align the coupling, if necessary.
- The coupling components have to be inspected for damages.
- The screw connections have to be inspected visually.

With the use in potentially explosive atmospheres observe chapter 10.2 "Inspection intervals for couplings in potentially explosive atmospheres".

9 Spares inventory, customer service addresses

We recommend to store major spare parts on site to ensure the readiness for use of the machine in case if a coupling fails.

Contact addresses of the KTR partners for spare parts and orders can be obtained from the KTR homepage at www.ktr.com.

KTR does not assume any liability or warranty for the use of spare parts and accessories which are not provided by KTR and for the damages which may incur as a result.

KTR Systems GmbH
Carl-Zeiss-Str. 25
D-48432 Rheine
Phone: +49 5971 798-0
E-mail: mail@ktr.com

10 Enclosure A

Advice and instructions regarding the use in potentially explosive atmospheres

Applicable hub designs/types:

a) Hubs that may be used in group II, category 2 and 3:
(hubs with feather keyway)
- 7.1 SPLIT hub with feather keyway

b) Hubs which may be used in group II, category 3 only:
(hubs without feather keyway)
- 7.0 SPLIT hub without feather keyway

Clamping hubs (SPLIT hubs) without feather keyways may be used in category 3 only and are marked with category 3 accordingly.

10 Enclosure A

Advice and instructions regarding the use in Ex potentially explosive atmospheres

10.1 Intended use in Ex potentially explosive atmospheres

Conditions of operation in Ex potentially explosive atmospheres

The **ROTEX®** couplings are suitable for the use according to directives 2014/34/EU and SI 2016 No. 1107.

- Protection against hazards arising from lightning must follow the lightning protection concept of the machine or plant. The relevant regulations and policy for lightning protection must be observed.
- The equipotential bonding of the couplings is made by metal contact between coupling hub and shaft. This equipotential bonding must not be affected.

1. Industry (with the exception of mining)

- Equipment group II of category 2 and 3 (*coupling is not approved/not suitable for equipment group 1*)
- Substance group G (*gases, fogs, vapours*), zone 1 and 2 (*coupling is not approved/not suitable for zone 0*)
- Substance group D (*dusts*), zone 21 and 22 (*coupling is not approved/not suitable for zone 20*)
- Explosion group IIC (*gases, fogs, vapours*) *(explosion groups IIA and IIB are included in IIC)* and explosion group IIIC (*dusts*) *(explosion groups IIIA and IIIB are included in IIIC)*

Temperature class:

Temperature class	PUR / T-PUR®	
	Ambient or operating temperature T_a 1)	Max. surface temperature 2)
T4	-30 °C to +90 °C	+110 °C
T5	-30 °C to +75 °C	+95 °C
T6	-30 °C to +60 °C	+80 °C

Explanation:
The maximum surface temperatures each result from the maximum permissible ambient or operating temperature T_a plus the maximum temperature increase ΔT of 20 K to be considered. For the temperature class a safety margin subject to standard of 5 K is added.

1) The ambient or operating temperature T_a is limited to +90 °C due to the permissible permanent operating temperature of the elastomers used.
2) The maximum surface temperature of +110 °C applies for the use in locations which are potentially subject to dust explosion.

In potentially explosive atmospheres

- the ignition temperature of dusts generated must at least be 1.5 times the surface temperature to be considered
- the glow temperature must at least be the surface temperature to be considered plus a safety distance of 75 K.
- the gases and vapours generated must amount to the temperature class specified.

2. Mining

Equipment group I of category M2 (*coupling is not approved/not suitable for equipment group M1*).
Permissible ambient temperature -30 °C to +90 °C.

10 Enclosure A

Advice and instructions regarding the use in potentially explosive atmospheres

10.2 Inspection intervals for couplings in potentially explosive atmospheres

Equipment category	Inspection intervals
3G 3D	For couplings operated in zone 2 or zone 22 the inspection and maintenance intervals of the usual operating/assembly instructions for standard operation apply. During the standard operation which has to be taken as a basis of the ignition risk analysis the couplings are free from any ignition source. For gases, vapours and dusts generated the permissible glow and ignition temperatures specified in chapter 10.1 have to be considered and observed.
M2 2G 2D No gases and vapours of explosion group IIC	An inspection of the torsional backlash and a visual inspection of the flexible spider must be performed after 3,000 operating hours for the first time, at the latest after 6 months after start-up of the coupling. If you note insignificant or no wear on the spider upon this initial inspection, further inspections can each be performed after 6,000 operating hours or at the latest after 18 months, provided that the operating parameters remain the same. If you note significant wear during the initial inspection so that it would be recommendable to replace the spider, please find out the cause according to the table „Breakdowns“, if possible. The maintenance intervals must be adjusted to the modified operating parameters without fail.
M2 2G 2D Gases and vapours of explosion group IIC	An inspection of the torsional backlash and a visual inspection of the flexible spider must be performed after 2,000 operating hours for the first time, at the latest after 3 months after start-up of the coupling. If you note insignificant or no wear on the spider upon this initial inspection, further inspections can each be performed after 4,000 operating hours or at the latest after 12 months, provided that the operating parameters remain the same. If you note significant wear during the initial inspection so that it would be recommendable to replace the spider, please find out the cause according to the table „Breakdowns“, if possible. The maintenance intervals must be adjusted to the modified operating parameters without fail.

Clamping hubs (SPLIT hubs) without feather keyways may be used in category 3 only and are marked with category 3 accordingly.

ROTEX® coupling

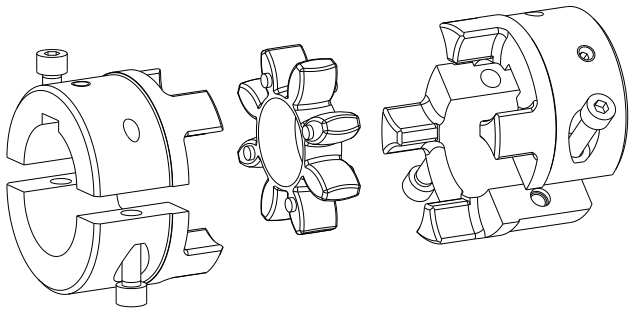


Illustration 15: ROTEX® type SH

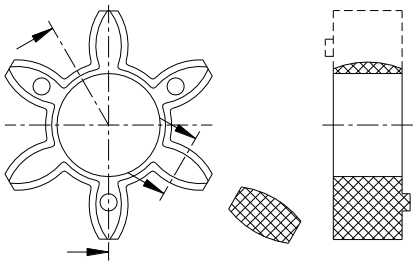


Illustration 16: ROTEX® spider

Here the backlash between the cams of the coupling and the flexible spider must be inspected by means of a feeler gauge.
When reaching the wear limit ***maximum friction***, the spider must be replaced immediately, irrespective of the inspection intervals.

10 Enclosure A

Advice and instructions regarding the use in potentially explosive atmospheres

10.3 Standard values of wear

In case of backlash > X mm, the flexible spider must be replaced.

Monitoring of the general condition of the coupling can be done both at standstill and during operation. If the coupling is tested during operation, the operator must ensure an appropriate and proven test procedure (e. g. stroboscopic lamp, high-speed camera, etc.) which is definitely comparable to testing at standstill. If any distinctive features occur, an inspection must be made with the machine stopped.

Reaching the limits for replacing depends on the operating conditions and the existing operating parameters.

In order to ensure a long service life of the coupling and avoid hazards with the use in potentially explosive atmospheres, the shaft ends must be accurately aligned.
Please absolutely observe the displacement figures specified (see tables 8 and 9). If the figures are exceeded, the coupling will be damaged.

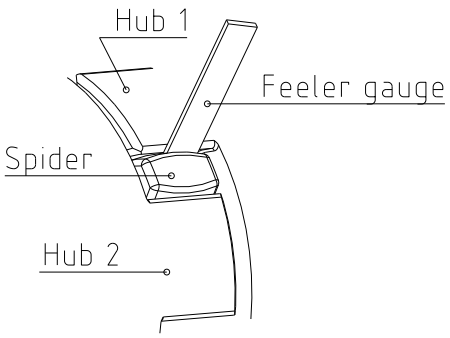


Illustration 17: Inspection of the limit of wear

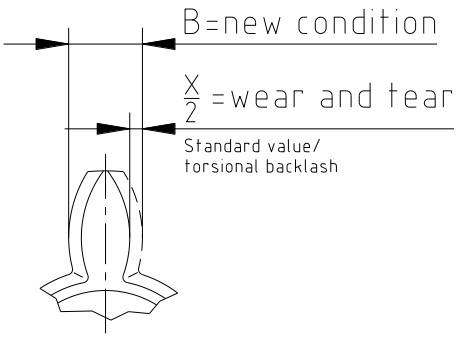


Illustration 18: Wear of spider

Table 10:

Size	Limits of wear (friction) X_{max} ín mm	Size	Limits of wear (friction) X_{max} in mm
24	3	90	8
28	3	100	9
38	3	110	9
42	4	125	10
48	4	140	12
55	5	160	14
65	5	180	14
75	6		

10 Enclosure A

Advice and instructions regarding the use in potentially explosive atmospheres

10.4 marking of coupling for potentially explosive atmospheres

The explosion protection marking of the ROTEX® coupling is applied on the outer sheath or on the front side. The flexible spider is excluded.

For the complete marking refer to the operating/assembly instructions and/or the delivery note/package.

The following marking applies for the products:

- Type without aluminium, with feather keyway (Category 2)

	I M2	Ex h	I				Mb	X
	II 2G	Ex h	IIC	T6	…	T4	Gb	X
	II 2D	Ex h	IIIC	T80 °C	…	T110 °C	Db	X
<Year>		-30 °C ≤ T_a ≤	+60 °C		…	+90 °C		

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- Type without aluminium, without feather keyway (Category 3)

	I M2	Ex h	I				Mb	X
	II 3G	Ex h	IIC	T6	…	T4	Gc	X
	II 3D	Ex h	IIIC	T80 °C	…	T110 °C	Dc	X
<Year>		-30 °C ≤ T_a ≤	+60 °C		…	+90 °C		

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Short marking:
(A short marking is only made if not possible differently for reason of space or functioning.)

ROTEX®
<Year>

Deviating marking applied until 31st October 2019:

Short marking: II 2GD c IIC T X/I M2 c X

Complete marking:
(valid for T-PUR® only)
II 2G c IIC T6, T5, T4 resp. T3 -50 °C ≤ T_a ≤ +65 °C, +80 °C, +115 °C resp. +120 °C
II 2D c T 140 °C/I M2 c -50 °C ≤ T_a ≤ +120 °C

Complete marking:
(valid for PUR only)
II 2G c IIC T6, T5 resp. T4 -30 °C ≤ T_a ≤ +65 °C, +80 °C resp. +90 °C
II 2D c T 110 °C/I M2 c -30 °C ≤ T_a ≤ +90 °C

10 Enclosure A

Advice and instructions regarding the use in potentially explosive atmospheres

10.4 marking of coupling for potentially explosive atmospheres

Comments on marking

Equipment group I	Mining
Equipment group II	Non-mining
Equipment category 2G	Equipment ensuring a high level of safety, suitable for zone 1
Equipment category 3G	Equipment ensuring a normal level of safety, suitable for zone 2
Equipment category 2D	Equipment ensuring a high level of safety, suitable for zone 21
Equipment category 3D	Equipment ensuring a normal level of safety, suitable for zone 22
Equipment category M2	Equipment ensuring a high level of safety must be able to be switched off when an explosive atmosphere occurs
D	Dust
G	Gases and vapours
Ex h	Nonelectrical explosion protection
IIC	Gases and vapours of class IIC (including IIA and IIB)
IIIC	Electrically conductive dusts of class IIIC (including IIIA and IIIB)
T6 … T4	Temperature class to be considered, depending on the ambient temperature
T80 °C … T110 °C	Maximum surface temperature to be considered, depending on the ambient temperature
-30 °C ≤ T_a ≤ +60 °C … +90 °C or -30 °C ≤ T_a ≤ +90 °C	Permissible ambient temperature from -30 °C to +60 °C resp. -30 °C to +90 °C
Gb, Db, Mb	Equipment protection level, high level of safety, analogous to the equipment category
Gc, Dc	Equipment protection level, normal level of safety, analogous to the equipment category
X	For a safe use of the couplings particular conditions apply

If the symbol Ⓑ was punched in addition to marking Ⓓ, the coupling component was supplied by KTR as an unbored or pilot bored version (see chapter 4.2 of the present operating/assembly instructions).

10 Enclosure A

Advice and instructions regarding the use in potentially explosive atmospheres

10.5 EU Certificate of conformity

EU Declaration of Conformity resp. Certificate of Conformity

corresponding to EU directive 2014/34/EU dated 26 February 2014
and to the legal regulations adopted for its implementation

The manufacturer - KTR Systems GmbH, Carl-Zeiss-Str. 25, D-48432 Rheine - states that the

flexible ROTEX® couplings

in an explosion-proof design described in these assembly instructions are equipment resp. components corresponding to article 2, 1. of directive 2014/34/EU and comply with the general safety and health specifications according to enclosure II of directive 2014/34/EU.
This declaration of conformity is issued under the sole responsibility of the manufacturers KTR Systems GmbH.

The coupling described in here complies with the specifications of the following standards/rules:

EN ISO 80079-36:2016-12
EN ISO 80079-37:2016-12
EN ISO/IEC 80079-38:2017-10
IEC/TS 60079-32-1:2020-01-24

The ROTEX® is in accordance with the specifications of directive 2014/34/EU.

According to article 13 (1) b) ii) of directive 2014/34/EU the technical documentation is deposited with the notified body (type examination certificate IBExU13ATEXB016 X):

IBExU
Institut für Sicherheitstechnik GmbH
Identification number: 0637
Fuchsmühlenweg 7

09599 Freiberg

Rheine, Place	2022-03-17 Date	i. V. Reinhard Wibbeling Engineering/R&D	i. V. Michael Brüning Product Manager

10 Enclosure A

Advice and instructions regarding the use in potentially explosive atmospheres

10.6 UK Declaration of conformity

UK Declaration of Conformity resp. Certificate of Conformity

corresponding to UK directive SI 2016 No. 1107 dated 26 February 2014
and to the legal provisions adopted for its implementation

The manufacturer - KTR Systems GmbH, Carl-Zeiss-Str. 25, D-48432 Rheine - states that the

flexible ROTEX® couplings

in an explosion-proof design described in these assembly instructions are equipment resp. components corresponding to directive SI 2016 No. 1107 and comply with the general safety and health requirements according to directive SI 2016 No. 1107.
This declaration of conformity resp. certificate of conformity is issued under the sole responsibility of the manufacturer KTR Systems GmbH.

The coupling described in here complies with the specifications of the following standards/rules:

EN ISO 80079-36:2016-12
EN ISO 80079-37:2016-12
EN ISO/IEC 80079-38:2017-10
IEC/TS 60079-32-1:2020-01-24

The ROTEX® is in accordance with the specifications respectively the applicable specifications of directive SI 2016 No. 1107.

According to directive SI 2016 No. 1107 the technical documentation is deposited with the notified body:

Eurofins CML
Identification number: 2503

Rheine,	2022-03-17	i. V.	i. V.
Place	Date	Reinhard Wibbeling Engineering/R&D	Michael Brüning Product Manager

17. Appendix 9 - Declaration

SERAPID
RIGID CHAIN TECHNOLOGY

DECLARATION D'INCORPORATION RELATIVE AUX MACHINES OU ELEMENTS DE MACHINES DESTINES A ETRE INCORPORES DANS UNE MACHINE OU A ETRE ASSEMBLES A D'AUTRES MACHINES SOLIDAIRES DANS LEUR FONCTIONNEMENT.

DECLARATION OF INCORPORATION CONCERNING MACHINES OR ELEMENTS OF MACHINES DESTINED TO BE INCORPORATED INTO A MACHINE OR TO BE ASSEMBLED WITH OTHER MACHINES AS AN INTEGRAL PART OF THEIR OPERATION.

Le fabriquant :
The manufacturer :

SERAPID France
4, rue des frères Robbe
ZA Eurochannel
FR - 76370 MARTIN-EGLISE

Déclare que la machine ou l'élément concerné désignés ci-après ne peuvent être mis en service tant que la machine dans laquelle ils sont destinés à être incorporés ou l'ensemble de machines solidaires auquel ils doivent être assemblés n'aura pas été déclaré conforme aux dispositions de la Directive DIR 2006 42CE ou aux dispositions nationales de transposition de cette directive dans le pays de mise en service.

Declares that the machine or part concerned hereafter designated cannot be put into operation until the machine into which it is destined to be incorporated, or the assemblage of integrated machinery into which it is destined to be integrated, is declared to be in compliance with the conditions of the Directive DIR 2006 42 CE or with the national arrangements for transposition of this same directive in the country where where the machinery is to be put into operation.

Référence interne / Internal reference: WL3 012070 403 2	
CATEGORIE / CATEGORY	UNIVERSITY OF OXFORD-NEW HUMANITIES BUILDING-2 O P+4 STAGE RISE
TYPE	
NUMERO DE TYPE - NUMERO DE LA SERIE / SERIAL NUMBER - TYPE NUMBER	**THE 20766**
DATE DE CONSTRUCTION / YEAR BUILT	**2024**
ORGANISME HABILITE INTERVENU AVANT LA MISE SUR LE MARCHE AUTHORISING AGENCY INTERVENING BEFORE THE SALE	NEANT / NONE
ADRESSE / ADDRESS	NEANT / NONE
NUMERO D'ATTESTATION / CERTIFICATE NUMBER	NEANT / NONE

Référentiels pris en compte, selon le cas, pour la conception de la machine ou de l'élément concerné :
System of reference or set of rules applied, in each case, to the design of the machine or the part concerned :

- Directive DIR 2006/42/CE
- Directive(s) complémentaire(s): Néant / Complementary directives: None
- Norme(s) complémentaire(s): Néant / Complementary standards: None

SIGNATAIRE / SIGNATORY :
Nom - Prénom / Name - First name : MONTALAN Sébastien Fonction : Responsable Qualité / Function - Position : Quality Manager
Date de la signature / Date of signature : 21/03/2024

Lieu de la / Place of / signature : Martin-Eglise - FRANCE

Signature:

SERAPID France
4, rue des frères Robbe - ZA Eurochannel
FR - 76370 MARTIN-EGLISE
Tel. +33(0)2 32 06 35 60
Fax. +33(0)2 32 06 35 61
e-m@il : info-fr@serapid.com

SIRET 32725003100066
NAF 2822Z - VAT FR10327250031
R.C.S. DIEPPE 327250031
SAS au capital de 600000 €

Accounting Department
4, rue des frères Robbe - ZA Eurochannel
76370 Martin-Eglise
IBAN : FR7630004001170002176547155
SWIFT-BIC : BNPAFRPPCRO

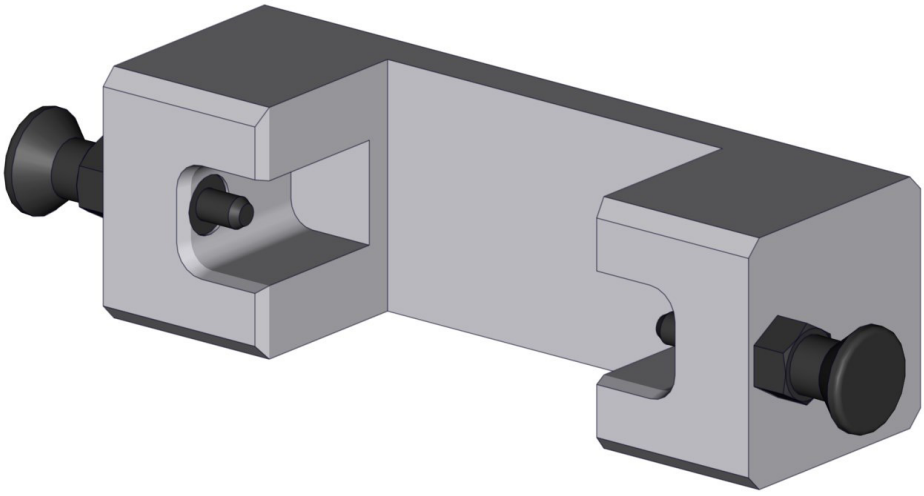
www.serapid.com

18. Appendix 10 – Maintenance Blocks

LINKLIFT® Maintenance Block

Installation and maintenance manual

Information and instructions for the optimal use of LinkLift Maintenance Block models 30, 50, 50R, 80, 80R, 100 and 100R



SER - 000LL - M005 - 2 - V01 - 2024 11

SERAPID

Manual Presentation

Thank you for choosing our SERAPID Product.

Please read this user guide carefully before putting the product into operation.

This manual has been designed to help you operate and maintain your product correctly.

The information contained in this manual is taken from technical data available at the time of print. In line with our policy of continually improving the quality of our products, this information may be amended without warning.

Read the safety instructions attentively in order to prevent any accidents, faults or damage. These instructions must always be followed.

This publication replaces all previous publications . No part of this publication may be reproduced, processed using electronic systems, replicated or distributed in any form, without prior written authorization. Subject to technical changes. All rights reserved. All due care has been taken in compiling this document. We accept no liability for errors or omissions.

This unit was subjected to comprehensive material, functional and quality checks. Please remember, however, that there is still a risk of danger if this unit is not used by trained personnel or for purposes other than those stipulated in these instructions.

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1 - Safety p. 4

1.1 Caution/Danger pictographs

1.2 Location of risks

2 - Product presentation p. 5 - 6

2.1 Description

2.2 System configuration

3 - Assembly and installation p. 7 - 11

3.1 Product receipt and handling

3.2 Safety instructions

3.3 Assembly and use guidelines

4 - Maintenance p. 12

4.1 Preventive maintenance

1 SAFETY

1.1 Caution/Danger pictographs

Throughout this manual, symbols are used to alert you to the safety risks and guide you through the correct operating procedures.

In addition to this information, always be very attentive to ensure your own safety.

The installation, use and maintenance of the Maintenance block must only be carried out by qualified, authorised personnel.

SERAPID cannot be held responsible in the event of non-compliance with the safety measures provided in this manual.

Symbols :


General obligation


General ban

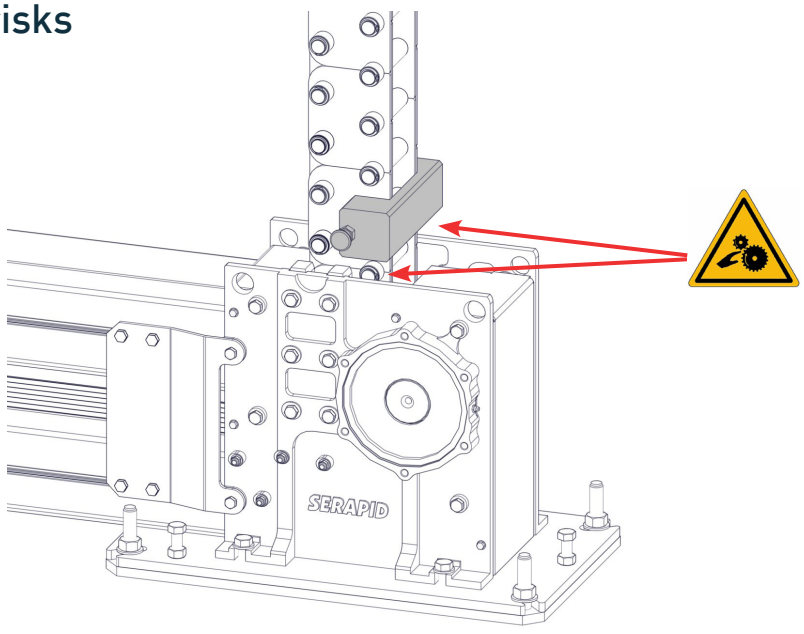

Obligation to wear gloves


Comments or information


General danger


Danger of hands being caught or crushed

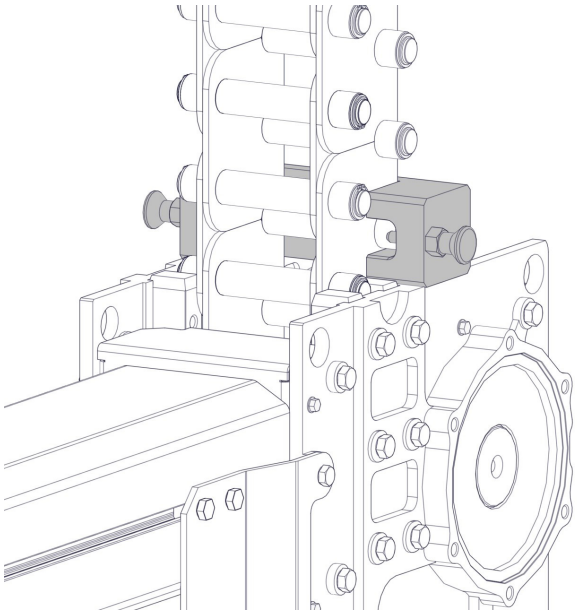
1.2 Location of risks



2 PRODUCT PRESENTATION

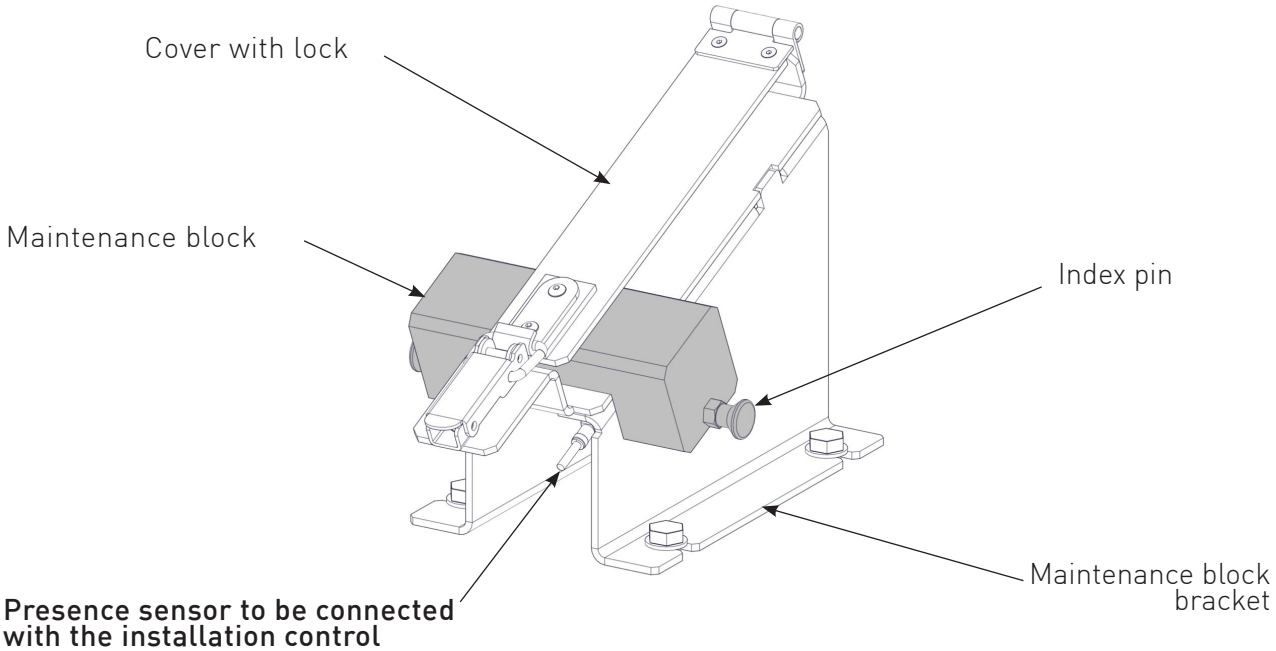
2.1 Description

The maintenance block is specially designed to secure the chain in an established position. This operation may be necessary during servicing or troubleshooting interventions.



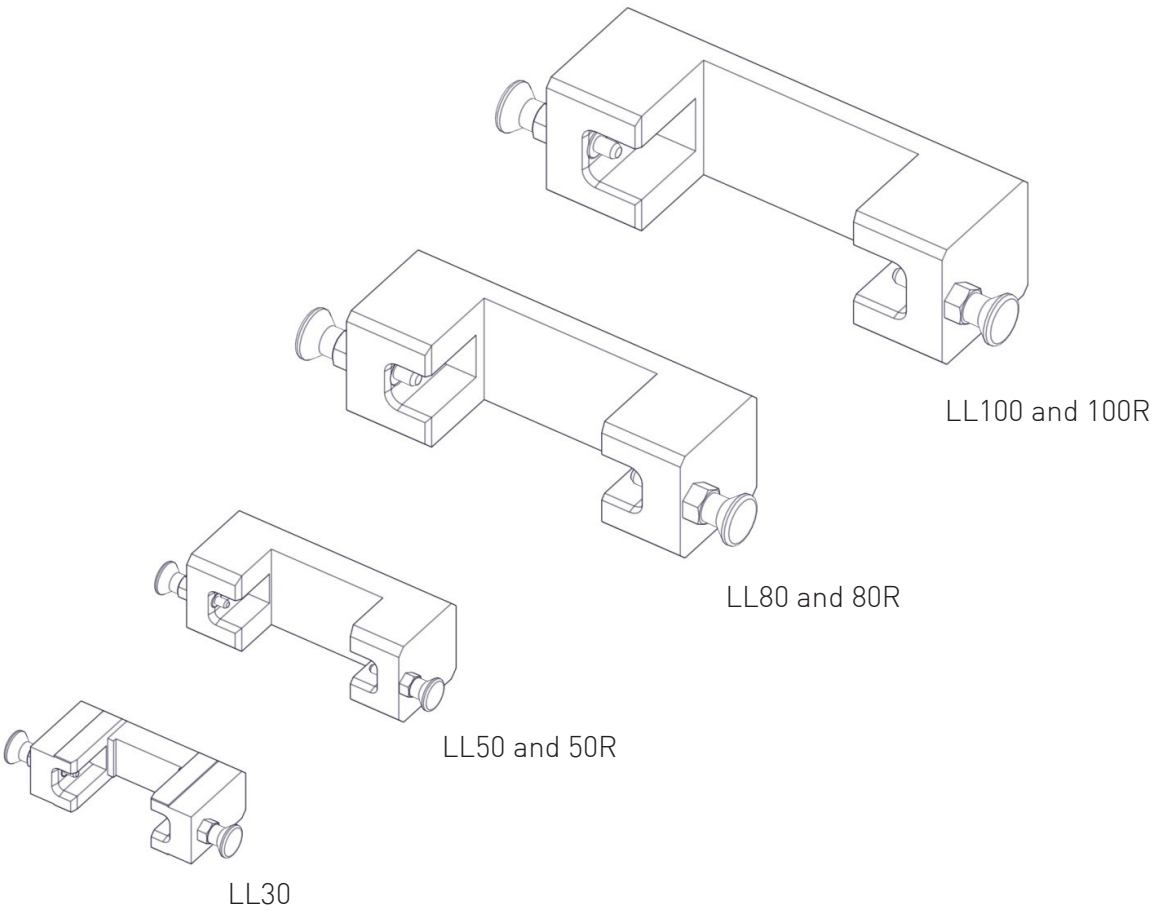
The maintenance block is positioned around the row of chain rollers. It sits on top of the drive housing to stop the platform descent.

Warning : When the intervention is finished, maintenance blocks must be removed and stored before the commissioning. Otherwise, there is a risk of block collision with the drive housing and deterioration.
The maintenance block bracket allows the blocks to be stored. If all the blocks are stored, the sensor detects their presence and allows the platform movement.
The bracket and its sensor must be mounted and used according to the instructions in this document.



2.2 System Configuration

There is one maintenance block for each LinkLift model:



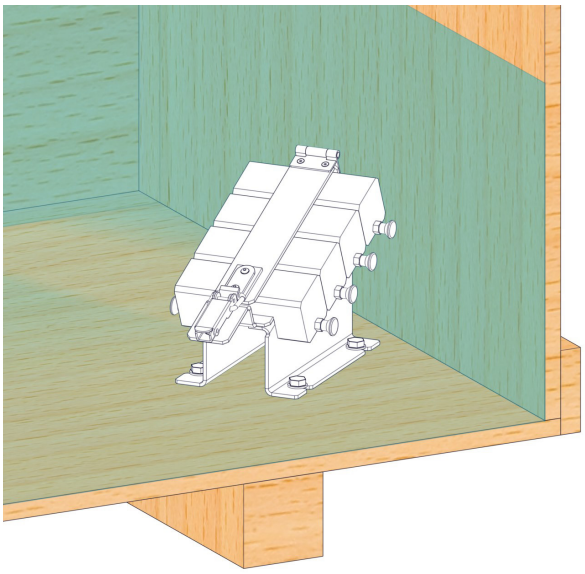
Admissible load values:

Block for	LL30	LL50 and 50R	LL80 and 80R	LL100 and 100R
Max.static load **(KN)**	10	15	50	75

3 ASSEMBLY AND INSTALLATION

3.1 Product receipt and handling

- Check the condition of the packaging
- Open the plastic film without damaging the product
- Check the condition of all the components

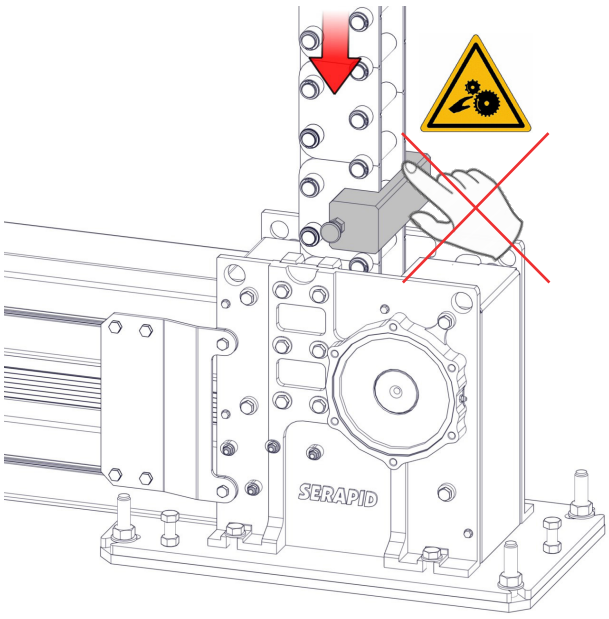


If any damage to the packaging and/or product is observed, it must be reported immediately to your SERAPID contact representative and it will be subject to a reservation concerning your transporter.

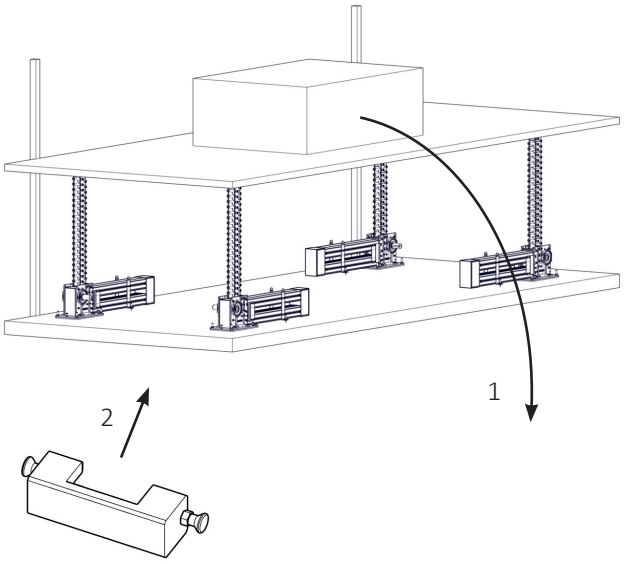
Recycle the packaging waste to respect environmental practices.

3.2 Safety instructions

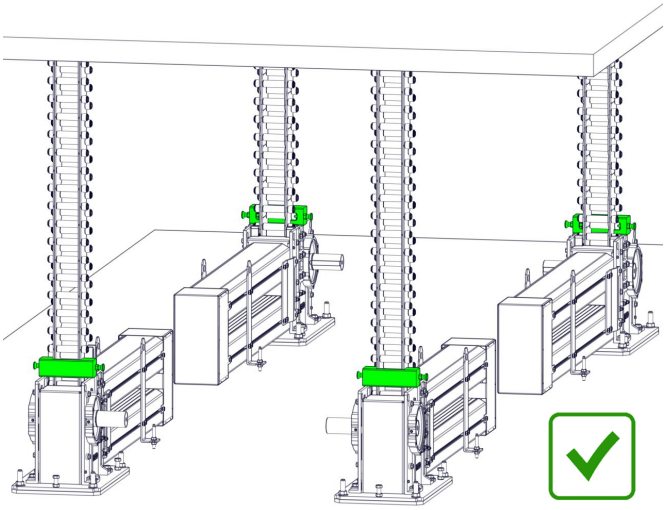
It is forbidden to hold the maintenance block during the lowering of the chain.



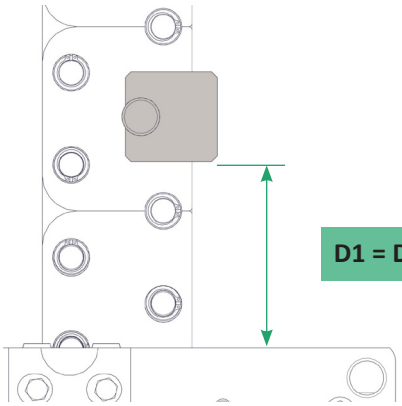
The maintenance block installation must be carried out on an unloaded platform.

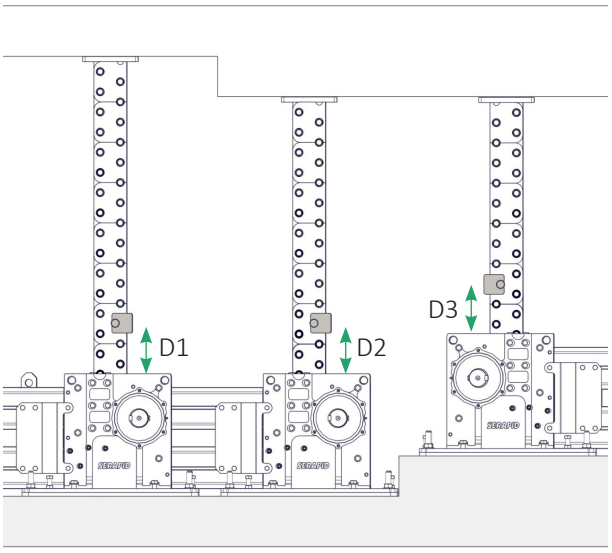


If the system has several LinkLift, **one maintenance block must be installed on each chain.**



Each block must be placed at equal distance from its drive housing to lean the same way.



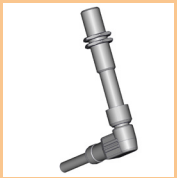


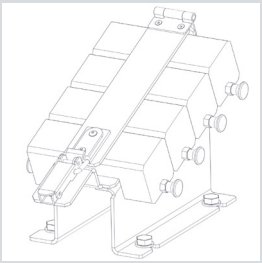
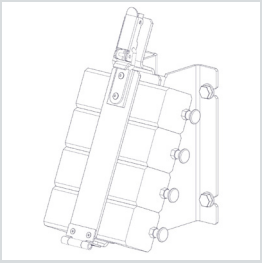
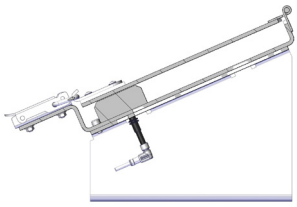
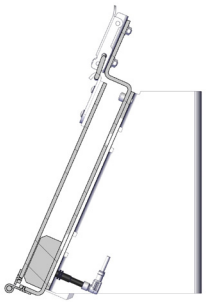
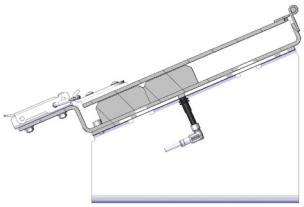
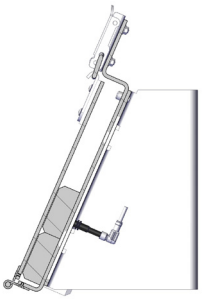
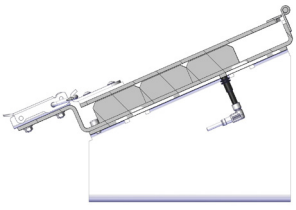
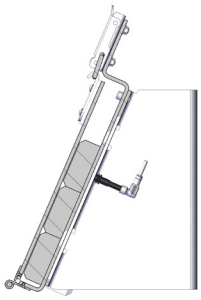
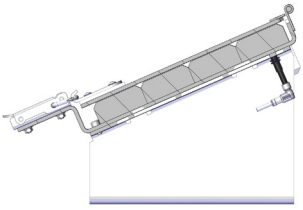
3.3 Assembly and use guidelines

Storage bracket and presence sensor

The assembly instructions for the presence sensor depend on the configurations and must be respected.

The N.O (Normally Open) sensor must be connected with the installation control.



Configuration	Horizontal	Vertical
		
1 Block		
2 Blocks		
3 Blocks		
4 Blocks		

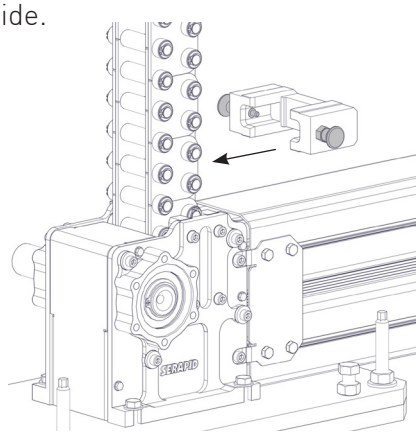
Installation on the chain

For this step, the presence sensor, motorisation and breaking system must be installed and operational.

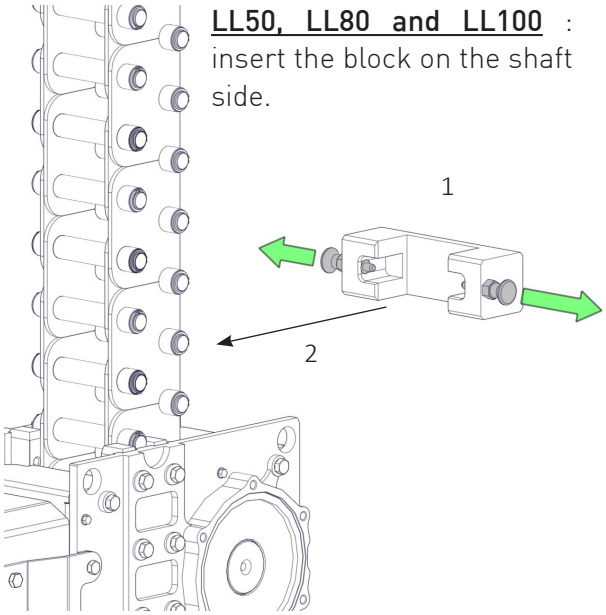
1 Pull both index pins by hands.

2 Insert the maintenance block around the row of chain rollers, respecting the direction depending on the LinkLift models.

LL30 : insert the block on the magazine side.

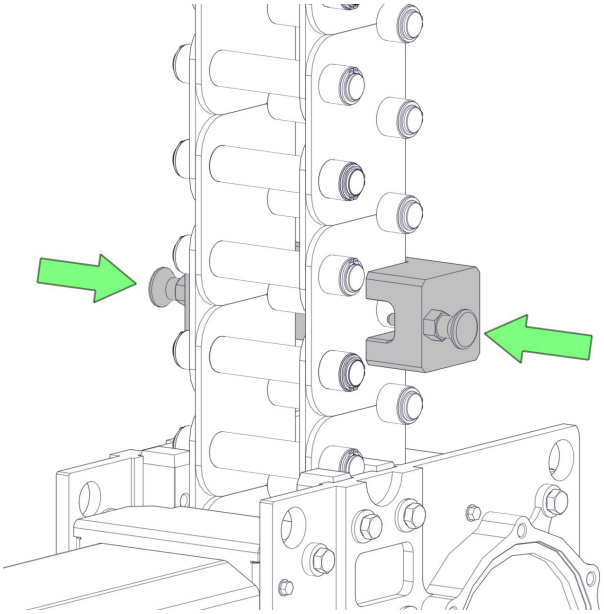


LL50, LL80 and LL100 : insert the block on the shaft side.

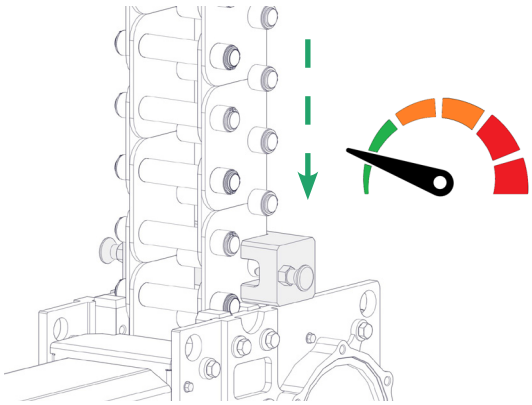


3 Release both index pins and verify the correct block lock.

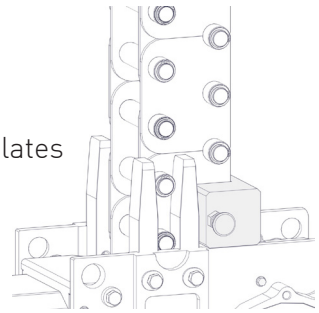
(Repeat the previous steps for each block)



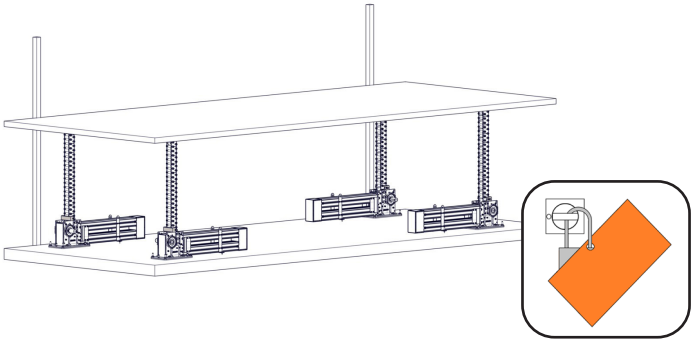
4 With the manual brake release, lower the platform **very slowly** until the maintenance block makes contact with the drive housing.



Long reaction plates version

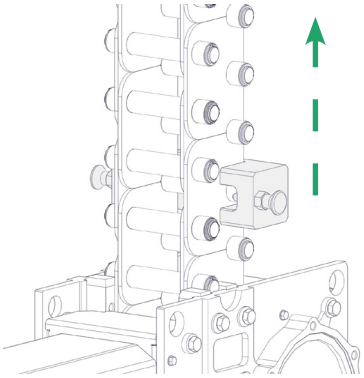


5 the system is mechanically secured but it is recommended to lock-out the installation.

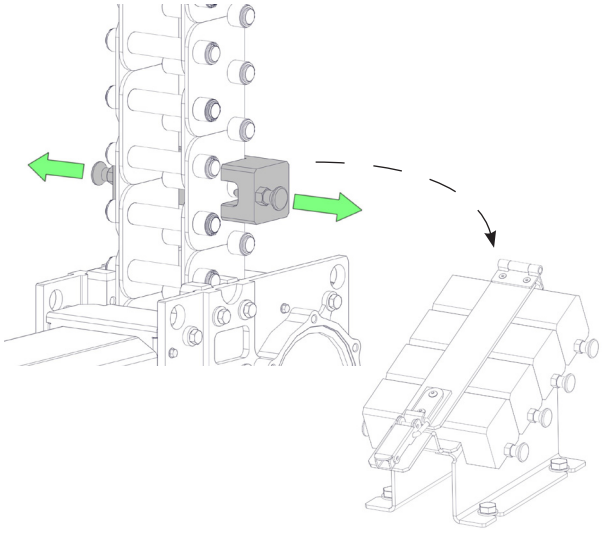


6 When the intervention is finished, **slowly** raise the platform a few cm.

Pay attention to the operating direction.



7 Pull both index pins and remove the block.



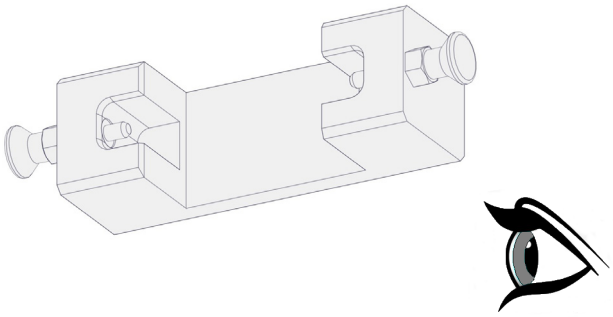
8 Store **all the blocks** on the braket.

Do not operate the system if one or more blocks are missing.

4 MAINTENANCE

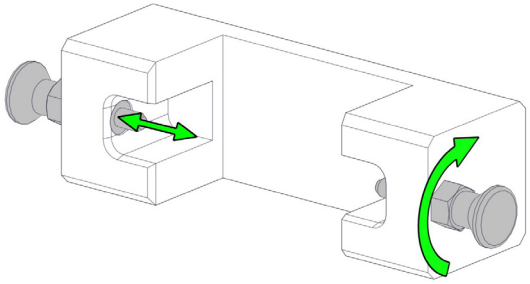
4.1 Preventive maintenance

- Inspect the block and check that there is no crack or deformation.

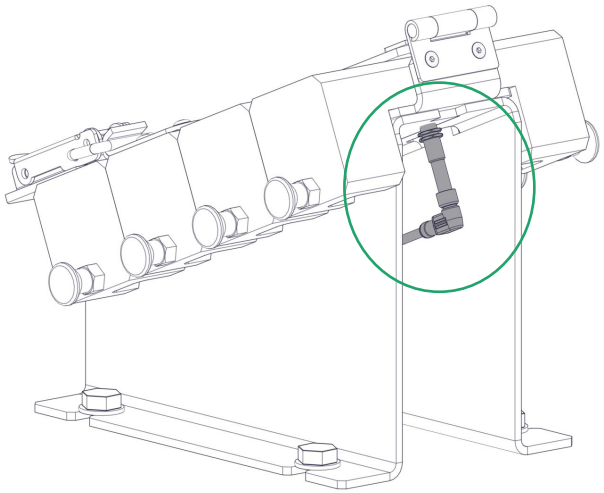


- Check that the index pins slide correctly and that they are correctly tightened.

The index pins are screwed with thread lock.



- Check the presence sensor and that it is correctly tightened.



It is recommended to do these inspections once a year.

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