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Use and maintenance

✓

Linear units with linear ball guides

SC Linear units are equipped with self lubricating linear ball guides. On the front plates of the linear blocks special lu-be-units are mounted which are continuously providing the necessary quantity of grease to the ball rows under load.

This system guarantees a long interval between maintenances: every 5000 km or 1 year of use, based on the value reached first. If a longer service life is required or in case of high dynamic or high loaded applications please contact our offices for further verification.

> Lubrication

Insert the tip of the grease gun in the specific grease blocks. For lubrication of linear units use lithium soap grease NLGI 2. For specially stressed applications or difficult enviromental condi-

tions, lubrication should be carried out more frequently. Apply to Rollon for futher advice.

Quantity of lubricant for each block

Type	Unit [cm³]
SC 100	0.7
SC 130	0.7
SC 160	1.4

Tab. 1

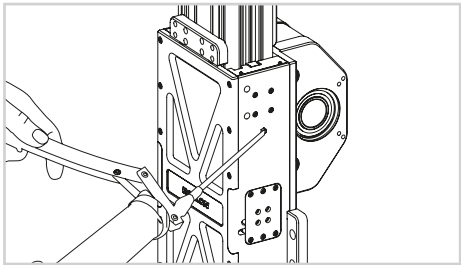


Fig. 1

> Drive belt replacement

- 1) Untight the 4 screws which fix the upper belt clamp (Fig. 2).
- 2) Remove the cap which covers the tensioning screw, untight the set-screw. Remove the tensioning screw (see Fig. 3).

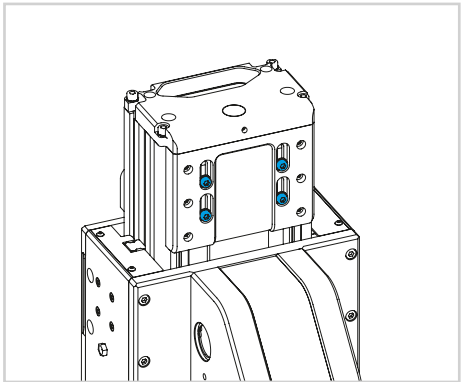


Fig. 2

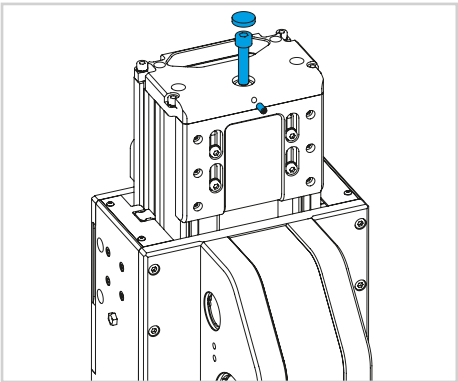


Fig. 3

- 3) Untight the 4 screws and remove the upper plate at the end of the aluminum profile (see Fig.4).

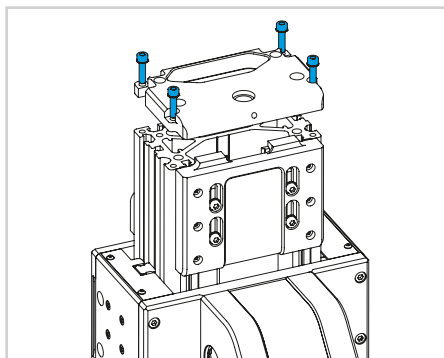


Fig. 4

- 4) Remove the screws of the belt clamp plate and separate it from the actuator (see Fig. 5, Fig. 6 and Fig. 7).

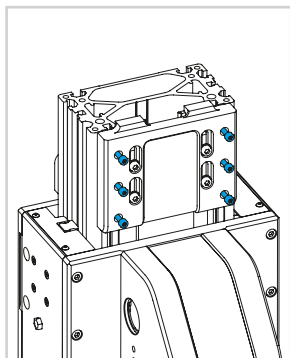


Fig. 5

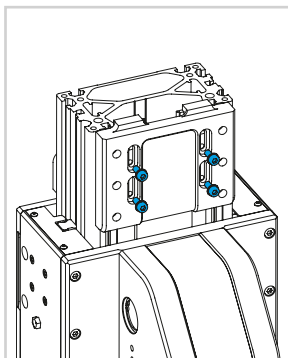


Fig. 6

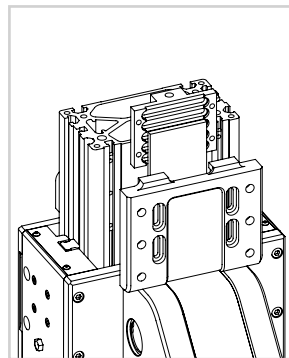


Fig. 7

- 5) Remove the screws of the lower end plate and separate the plate from the actuator (see Fig. 8 and Fig. 9).

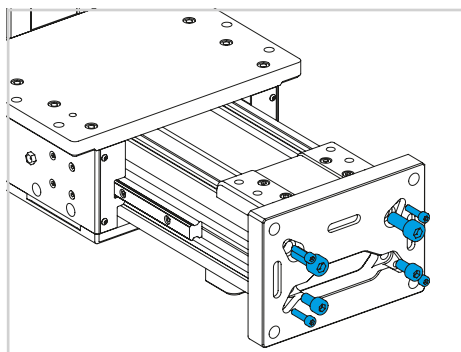


Fig. 8

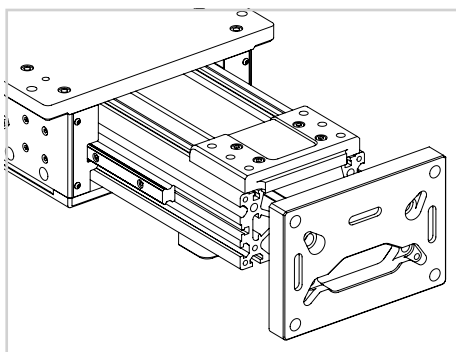


Fig. 9

- 6) Remove all the screws of the lower belt clamp plate and separate it from the actuator (see Fig. 10, Fig. 11 and Fig. 12).

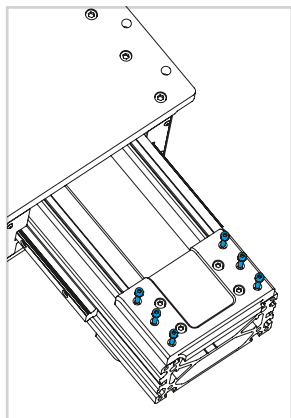


Fig. 10

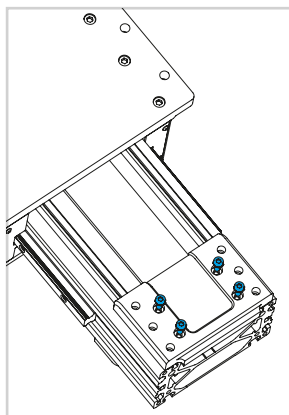


Fig. 11

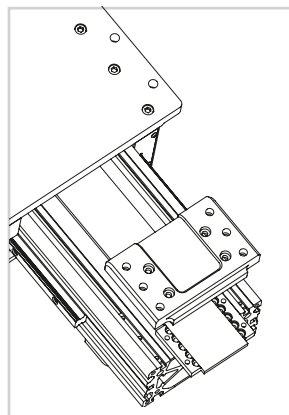


Fig. 12

- 7) Untight the screws which fix the driving head plate and remove the head from the actuator. Remove the old belt from the driving head (see Fig. 13 and Fig. 14).

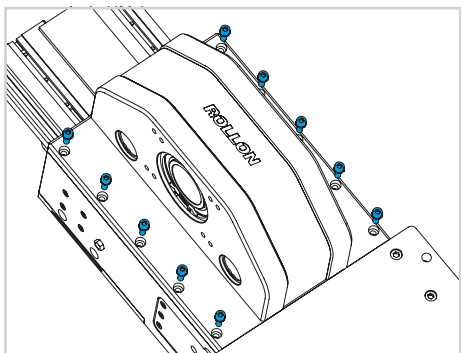


Fig. 13

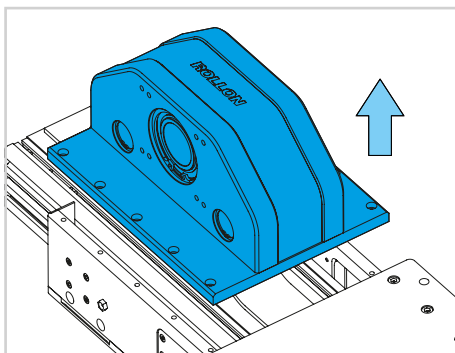


Fig. 14



- 8) Insert the new belt inside the driving head taking care about the orientation of the teeth which must engage with the driving pulley (see Fig. 15).
- 9) Re-assembly the driving head plate (see Fig. 16).

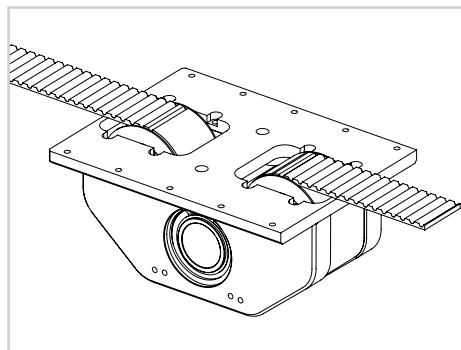


Fig. 15

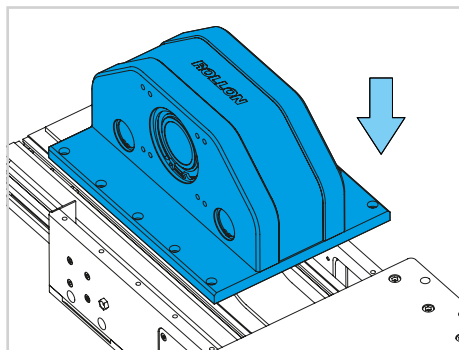


Fig. 16

- 10) Place the new belt on the lower belt clamp.
Re-assembly the belt clamp plate.
Re-assembly the lower plate, take care about the reference step (see Fig. 17).

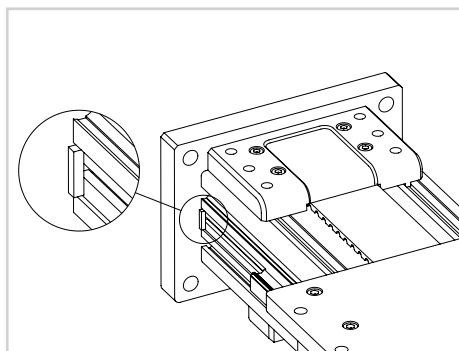


Fig. 17

- 11) Re-assembly the belt clamp plate without completely fixing the screws.
Re-assembly the upper plate at the end of the profile.
Tension the belt by acting on the tensioning screw, when the tension is reached tight the set-screw and then tight all the screws blocking the belt and the ones blocking the belt tension plate.

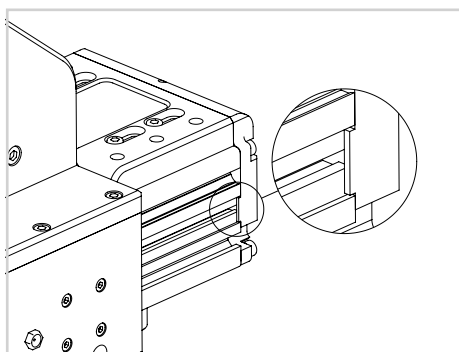


Fig. 18

► Replacement of the ball re-circulation sliding blocks

- 1) Remove the cover plate on top or lower side of the carriage depending where the sliding block has to be replaced. Unscrew the two screws (see Fig.19).
- 2) Loosen and remove the sliding block screws.
- 3) Slide out the sliding block. In case the seal OR is removed during this operation, it must be re-positioned when re-assembling the sliding block (see Fig. 21).

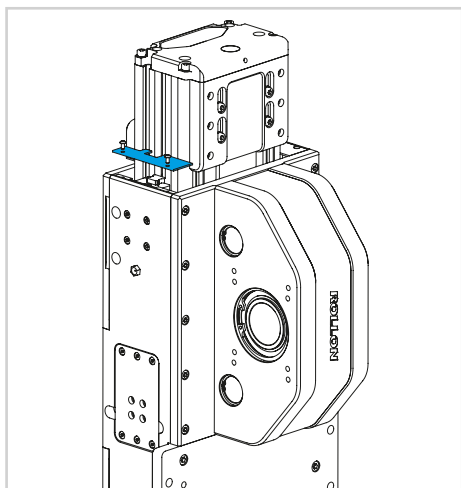


Fig. 19

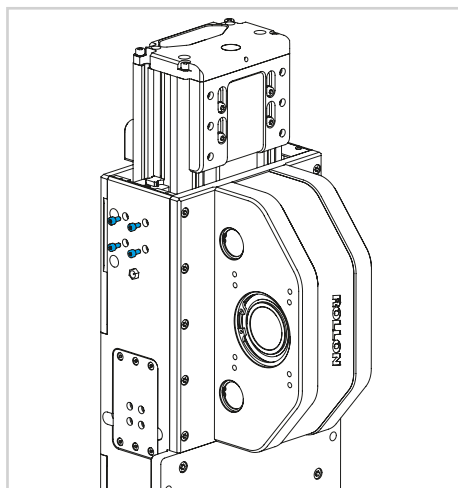


Fig. 20

- 4) Before re-assembling the new sliding block be sure that the original lubricating nipples are not assembled. Take care about the orientation of the sliding block. The side of the lubrication tank must be on the outer side.

For re-assembly, reverse the operations described above. During insertion, the new sliding block will be inserted automatically in the fast disconnect of the grease block.

- 5) Fix the sliding block with its 4 screws.
- 6) Re-assembly the cover plate.

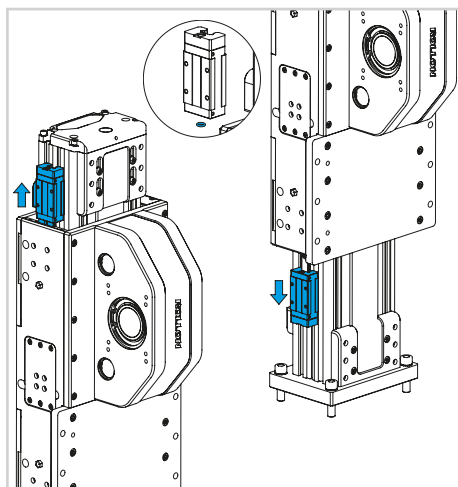


Fig. 21



> Assembly of clamp/brake unit (only for SC130 and SC160)

- 1) Remove the screws and the plates on both sides of the carriage (see Fig. 22).
- 2) Assembly the clamp/brake on the plate taking care about the right orientation as shown in the picture. Before tightening completely the screws push the clamp/brake against the reference sides on the plate. Assembly the air plug on the clamp/brake as shown in the picture (see Fig. 23).
- 3) Connect the air tube to the plug.
Give pressure in order to unlock the clamp/brake.

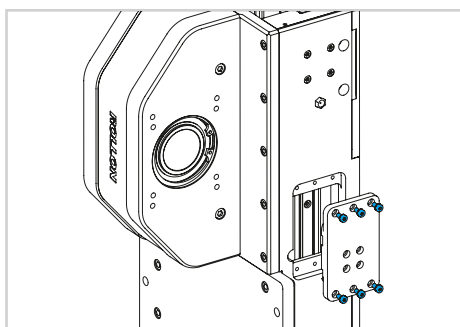


Fig. 22

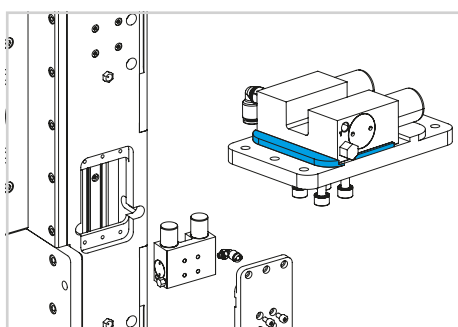


Fig. 23

- 4) While assembling the plate with the clamp/brake mounted on it take care to put the reference of the plate in contact with the carriage (see Fig. 24).
- 5) Re-assemble the plate to the actuator without firmly tightening the screws.
- 6) Cut air pressure, the clamp/brake is now clamping on the rail.
- 7) Tight all the screws of the plate.
- 8) Give air pressure so that the brake is released and check that the actuator is free to move.

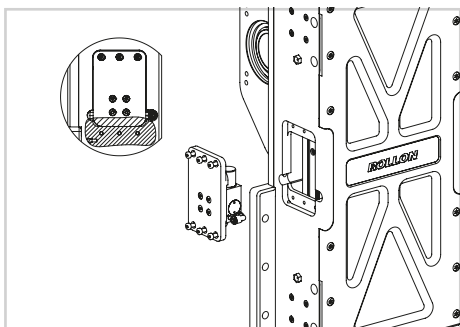
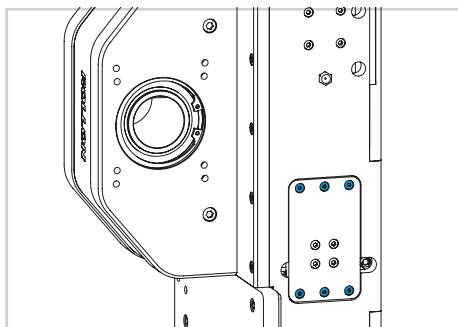


Fig. 24

Fig. 25
UM-7

> Proximity switch adjustment

- 1) Identify the position along the actuator where the limit switch must work, there the sensor dog must be fixed.
- 2) Insert the fixing nuts in the profile slot accessing through the upper plate. Repeat the operation also for the sensor dog to be installed in the lower side of the profile (Fig.26).
- 3) Fasten the sensor dog in place (Fig.27).
- 4) Insert the proximity switch on the carriage plate, and tighten it until it gets in contact with the sensor dog. Then loosen it for 1/2 turn to bring it to the correct distance (Fig. 28).
- 5) Tighten the proximity switch in position by tightening the lock nut (Fig. 28).

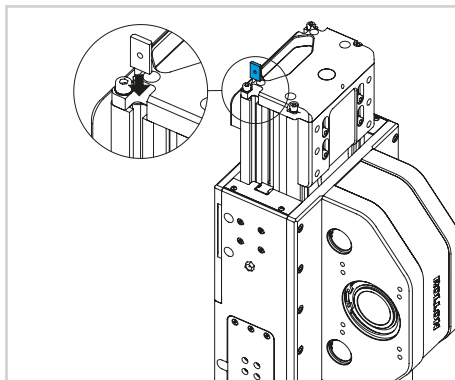


Fig. 26

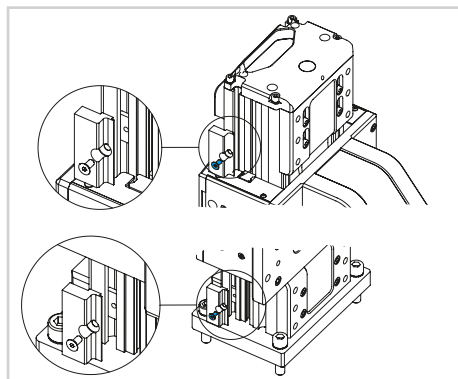


Fig. 27

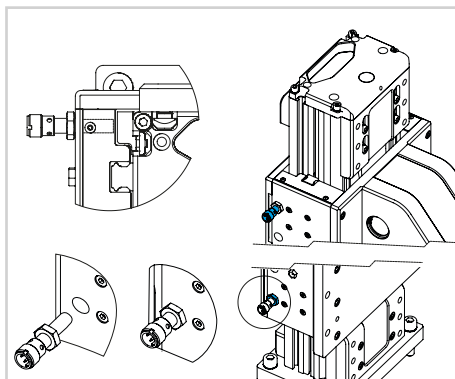


Fig. 28

> Warnings

WARNING: the safety block must NEVER be used as an operational end stop of the stroke.

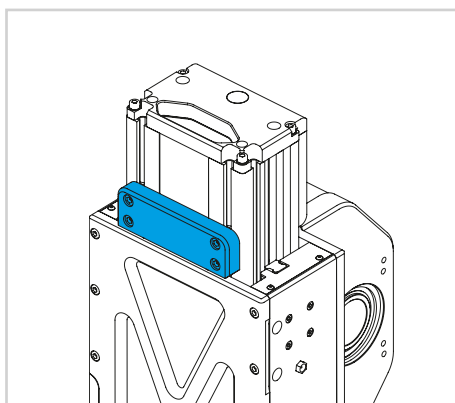


Fig. 29



> Gearbox assembly

- Place the axis as shown in the figure with the gear assembly component facing upwards.
- Assemble the flange (1) on the gear and tighten the screws (2) until the torques shown in Table 2 are reached.
- Place the gearbox complete with flange on the unit without locking it.
- Insert the spacer (3) from below and then insert the Shrink disk (4) without locking it.
- Tighten the flange fixing screws (5).
- **Tightening sequence of the shrink disc screws:**
 - Tighten the two diametrically opposite screws until the surfaces are in contact with the shaft and hub.
 - Tighten all the screws to 50% of the value of the tightening torque indicated in Tab. 3 in a crossed sequence.
 - Repeat the same operation at 100% of the tightening torque indicated in Tab. 3.
 - Check, in continuous sequence, that the tightening torque has been reached.
- Loosen and then tighten the gear fixing screws (5) until the torques shown in Table 2 are reached.

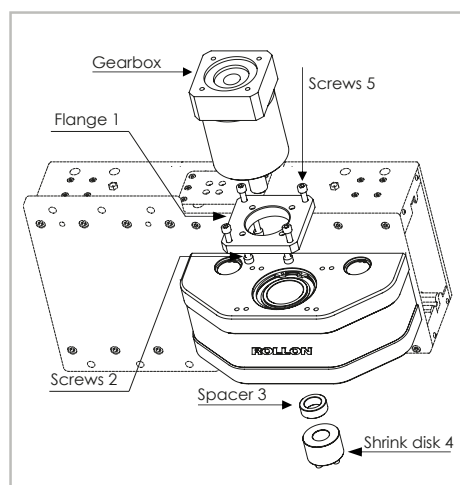


Fig. 30

Screw 8.8	Tightening torque [Nm]
M2	0.4
M2.5	0.7
M3	1.3
M4	2.8
M5	5.6
M6	9.6
M8	23
M10	46

Tab. 2

Code*	Hollow shaft [mm]	Shrink disc dxD [mm]	Screw	Tightening torque [Nm]
6005737	34	14x34	M4	3.1
6005738		16x34	M4	3.1
6005739		19x34	M4	3.1
6005733	41	16x41	M4	4.3
6005734		19x41	M4	4.3
6005735		22x41	M4	4.3
6005736		25x41	M4	4.3
6005730	50	22x50	M5	8.5
6005731		25x50	M5	8.5
6005732		32x50	M5	8.5

* The code refers to the purchasing of the single shrink disk. In case of purchasing a gearbox assembly KIT (flange, shrink disc and screws), please refer to the dxD dimensions to identify the shrink disk.

Tab. 3

RIGHT POSITION OF THE ELEMENTS

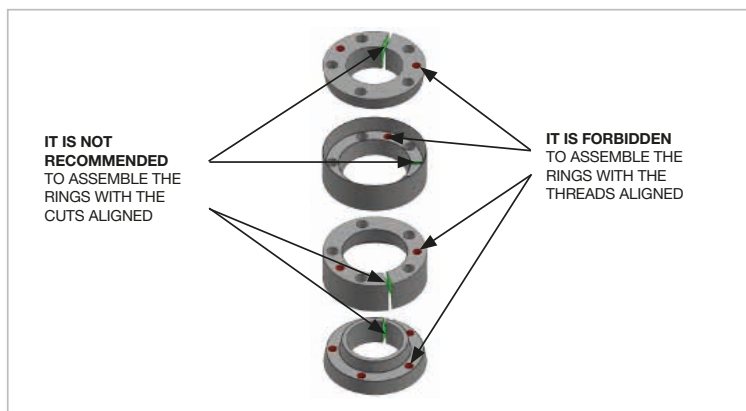


Fig. 31

> Components

SC Linear unit

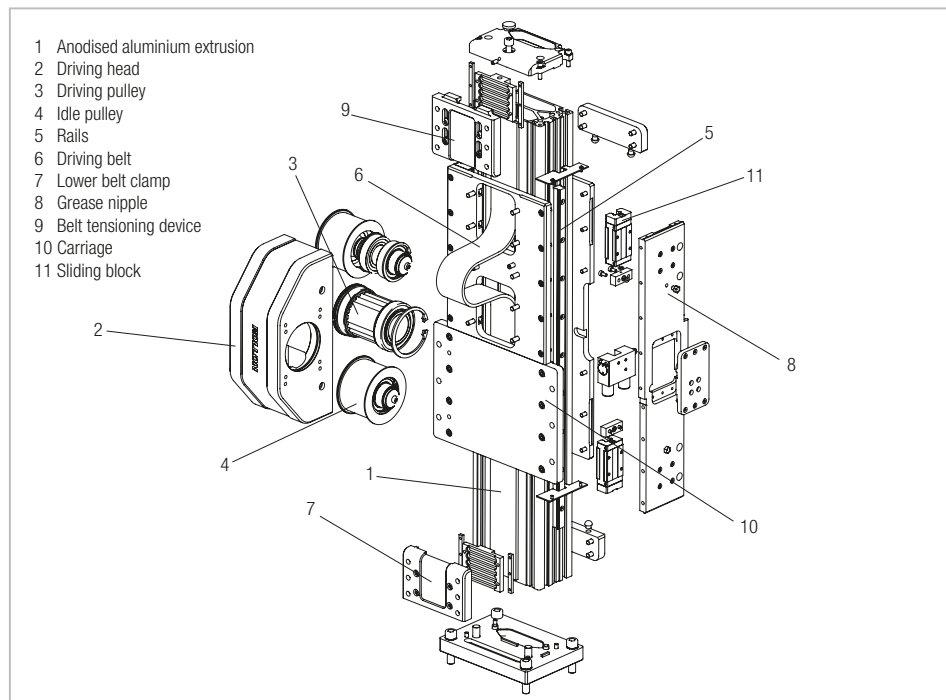


Fig. 32



Warnings and legal notes



Before incorporating the partly completed machinery, we recommend consulting this chapter carefully, in addition to the assembly manual supplied with the individual modules. The information contained in this chapter and in the manuals for the individual modules, is provided by highly qualified and certified personnel, possessing adequate competence in incorporating the partly completed machinery.



Precaution in installation and handling operations. Significantly heavy equipment.



When handling the axis or system of axes, always make sure that the support or anchoring surfaces do not leave room for bending.



In order to stabilize the axis or system of axes, before handling it is mandatory to securely block the mobile parts. When moving axes with vertical translation (Z AXES) or combination systems (horizontal X and/or more than one vertical Z), it is mandatory to use the vertical movement to put all of the axes at the corresponding lower limit switch.



Do not overload. Do not subject to torsion stress.



Do not leave exposed to atmospheric agents.



Before mounting the motor on the gearbox, it is advisable to perform a pre-test of the motor itself, without connection to the gear unit. The testing of this component was not carried out by the manufacturer of the machine. It will therefore be the responsibility of the customer of Rollon to perform the testing of the same, in order to verify its correct operation.



The manufacturer cannot be considered responsible for any consequences derived from improper use or any use other than the purpose the axis or system of axes was designed for, or derived from failure to comply, during incorporation phases, with the rules of Good Technique and with what is indicated in this manual.



Avoid damage. Do not operate with inadequate tools



Warning: moving parts. Do not leave objects on the axis



Special installations: check the depth of the threads on moving elements



Make sure that the system has been installed on a level floor surface.



In use, accurately comply with the specific performance values declared in the catalog or, in particular cases, the load and dynamic performance characteristics requested in the phase prior to design.



For modules or parts of modular systems with vertical movement (Z axis), it is mandatory to mount self-braking motors to neutralize the risk of the axis dropping.



The images in this manual are to be considered merely an indication and not binding; therefore, the supply received could be different from the images contained in this manual, and Rollon S.p.A has deemed it useful to insert only one example.



Systems supplied by Rollon S.p.A. were not designed/envisaged to operate in ATEX environments.

> Residual risks

- Mechanical risks due to the presence of moving elements (X, Y axes).
- Risk of fire resulting from the flammability of the belts used on the axes, for temperatures in excess of 250 °C in contact with the flame.
- The risk of the Z axis dropping during handling and installation operations on the partly completed machinery, before commissioning.
- Risk of the Z axis dropping during maintenance operations in the case of a drop in the electrical power supply voltage.
- Crushing hazard near moving parts with divergent and convergent motion.
- Shearing hazard near moving parts with divergent and convergent motion.
- Cutting and abrasion hazards.

> Basic components



The Partly Completed Machinery shown in this catalog is to be considered a mere supply of simple Cartesian axes and their accessories agreed when the contract is stipulated with the client. The following are therefore to be considered excluded from the contract:

1. Assembly on the client's premises (direct or final)
 2. Commissioning on the client's premises (direct or final)
 3. Testing on the client's premises (direct or final)
- It is therefore understood that the aforementioned operations in points 1., 2., and 3. are not chargeable

to Rollon. Rollon is the supplier of Partly Completed Machinery, the (direct or final) client is responsible for testing and safely checking all equipment which, by definition, cannot be theoretically tested or checked at our facilities where the only movement possible is manual movement (for example: motors or reduction gears, cartesian axes movements that are not manually operated, safety brakes, stopper cylinders, mechanical or induction sensors, decelerators, mechanical limit switches, pneumatic cylinders, etc.). The partly completed machine must not be commissioned until the final machine, in which it is to be incorporated, has been declared compliant, if necessary, with the instructions in Machinery Directive 2006/42/CE.

> Instructions of an environmental nature

Rollon operates with respect for the environment, in order to limit environmental impact. The following is a list of some instructions of an environmental nature for correct management of our supplies. Our products are mainly composed of:

Material	Details of the supply
Alluminum alloys	Profiles, pleates, various details
Steel with various composition	Screws, racks and pinions, and rails
Plastic	PA6 – Chains PVC – Covers and sliding block scrapers
Rubber of various types	Plugs, seals
Lubrification of various types	Used for the lubrication of sliding rails and bearings
Rust proof protectione	Rust proof protection oil
Wood, polyethylene, cardboard	Transport packaging

At the end of the product's life cycle, it is therefore possible to recover the various elements, in compliance with current regulations on waste issues.

> Safety warnings for handling and transport



- The manufacturer has paid the utmost attention to packaging to minimize risks related to shipping, handling and transport.
- Transport can be facilitated by shipping certain components dismantled and appropriately protected and packaged.
- Handling (loading and unloading) must be carried out in compliance with information directly provided on the machine, on the packing and in the user manuals.
- Personnel authorized to lift and handle the machine and its components shall possess acquired and acknowledged skills and experience in the specific sector, besides having full control of the lifting devices used.
- During transport and/or storage, temperature shall remain within the allowed limits to avoid irreversible damage to electric and electronic components.
- Handling and transport must be carried out with vehicles presenting adequate loading capacity, and the machines shall be anchored to the established points indicated on the axes.
- DO NOT attempt to bypass handling methods and the established lifting points in any way.
- During handling and if required by the conditions, make use of one or more assistants to receive adequate warnings.
- If the machine has to be moved with vehicles, ensure that they are adequate for the purpose, and perform loading and unloading without risks for the operator and for people directly involved in the process.
- Before transferring the device onto the vehicle, ensure that both the machine and its components are adequately secured, and that their profile does not exceed the maximum bulk allowed. Place the necessary warning signs, if necessary.
- DO NOT perform handling with an inadequate visual field and when there are obstacles along the route to the final location.
- DO NOT allow people to either transit or linger within the range of action when lifting and handling loads.
- Download the axes just near the established location and store them in an environment protected against atmospheric agents.
- Failure to comply with the information provided might entail risks for the safety and health of people, and can cause economic loss.
- The Installation Manager must have the project to organize and monitor all operative phases.
- The Installation Manager shall ensure that the lifting devices and equipment defined during the contract phase are available.
- The Manager of the established location and the Installation Manager shall implement a "safety plan" in compliance with the legislation in force for the workplace.
- The "safety plan" shall take into account all surrounding work-related activities and the perimeter spaces indicated in the project for the established location.
- Mark and delimit the established location to prevent unauthorized personnel from accessing the installation area.
- The installation site must have adequate environmental conditions (lighting, ventilation, etc.).
- Installation site temperature must be within the maximum and minimum range allowed.
- Ensure that the installation site is protected against atmospheric agents, does not contain corrosive substances and is free of the risk of explosion and/or fire.
- Installation in environments presenting a risk of explosion and/or of fire must ONLY be carried out if the machine has been DECLARED COMPLIANT for such use.
- Check that the established location has been correctly fitted out, as defined during the contract phase and based on indications in the relative project.
- The established location must be fitted out in advance to carry out complete installation in compliance with the define methods and schedule.

> Note

- Evaluate in advance whether the machine must interact with other production units, and that integration can be implemented correctly, in compliance with standards and without risks.
- The manager shall assign installation and assembly interventions ONLY to authorized technicians with acknowledged know-how.
- State of the art connections to power sources (electric, pneumatic, etc.) must be ensured, in compliance with relevant regulatory and legislative requirements.
- "State of the art" connection, alignment and leveling are essential to avoid additional interventions and to ensure correct machine function.
- Upon completion of the connections, run a general check to ascertain that all interventions have been correctly carried out and compliance with requirements.
- Failure to comply with the information provided might entail risks for the safety and health of people, and can cause economic loss.

Transport

- Transport, also based on the final destination, can be done with different vehicles.
- Perform transport with suitable devices that have adequate loading capacity.
- Ensure that the machine and its components are adequately anchored to the vehicle.

Handling and lifting

- Correctly connect the lifting devices to the established points on the packages and/or on the dismantled parts.
- Before handling, read the instructions, especially safety instructions, provided in the installation manual, on the packages and/or on the dismantled parts.
- DO NOT attempt, in any way, to bypass handling methods and the established lifting, moving and handling points of each package and/or dismantled part.
- Slowly lift the package to the minimum necessary height and move it with the utmost caution to avoid dangerous oscillations.
- DO NOT perform handling with an inadequate visual field and when there are obstacles along the route to reach the final location.
- DO NOT allow people to either transit or linger within the range of action when lifting and handling loads.
- Do not stack packages to avoid damaging them, and reduce the risk of sudden and dangerous movements.
- In case of prolonged storage, regularly ensure that there are no variations in the storage conditions of the packages.

Check axis integrity after shipment

Every shipment is accompanied by a document ("Packing list" with the list and description of the axes.

- Upon receipt check that the material received corresponds to specifications in the delivery note.
- Check that packaging is perfectly intact and, for shipments without packaging, check that each axis is intact.
- In case of damages or missing parts, contact the manufacturer to define the relevant procedures.



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