

**Use and Maintenance**  
English

## **WARRANTY**

In accordance with section 1512 of the Civil Code, Rollon S.p.A. guarantees the good performance of products manufactured for one year after delivery, when their actual application is recommended by the Technical or Commercial Department of our company provided that the report of poor operation is made in writing within eight days of its discovery. The warranty does not cover damage or defects due to external agents, poor maintenance, overload, unsuitable lubricant, normal wear, inappropriate choice of the type, installation error or other causes traceable to incorrect use or not imputable to the manufacture of the article. The warranty is limited to repair and/or replacement, excluding major damage.

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## 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.

## > Tightening torque and traction vector values

Thread	Friction coefficient	Tightening torque [Nm]			Traction vector [Nm]		
		Resistance grade 8,8	Resistance grade 10,9	Resistance grade 12,9	Resistance grade 8,8	Resistance grade 10,8	Resistance grade 12,8
M3	0,15	1,21	1,21	2,09	2075	3048	3567
M4		2,78	4,09	4,79	3594	5279	6178
M5		5,5	8,1	9,5	5886	8645	10116
M6		9,5	14,0	16,4	8302	12194	14269
M8		23	34	40	15242	22388	226498
M10		46	67	79	24275	35655	41724
M12		79	116	136	35401	51995	60845
M14		127	187	219	46816	71408	83563
M16		1998	291	341	66955	98340	115079
M18		283	402	471	8346	119454	139787
M20		402	570	667	107941	153657	179811
M22		552	783	917	134806	192157	224865
M24		691	981	1148	155489	221266	258928
M27		1022	1452	1700	204577	291534	341157
M30		1387	1969	2305	248811	354209	414500

All the screws belong to the UNI-3740. Locking assemblies are provided with class 12.9 fastening screws.

### IMPORTANT!



All screws used for installing ROLLON modules have self-locking washers or semi-permanent threadlock fluid (blue, such as Loctite 243). We recommend that the user also employ these devices, both while setting up the partially assembled machine in this manual, and during the assembly

or maintenance phases: If this is not done, the manufacturer of the partially assembled machine declines all responsibility for any accidents, breakage, damage and the consequences of said events on people, animals and property, due to the failure of fixing elements.

## > 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
Aluminum alloys	Profiles, plates, 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
Lubrication 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.

## > Notes on lubrication

Keep the prismatic rail lubricated using oil type VACTRA 2 every 1 year or 2000 km of operations. Keep recirculating ball sliders and rails lubricated every 1 year or 2000 km of operations using greases between ISO VG 68 and ISO VG 100. In case of heavy loads it is necessary to use greases type ISO VG 220.

Never lubricate bearings type 2RS wherever they are present: the pressure exerted during the operation would get the side seals out of seat.



### IMPORTANT!

The machine rails are protected with a layer of rust-proof oil or specific grease. Use suitable gloves when handling.

## > 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 defined methods and schedule.

## > Note

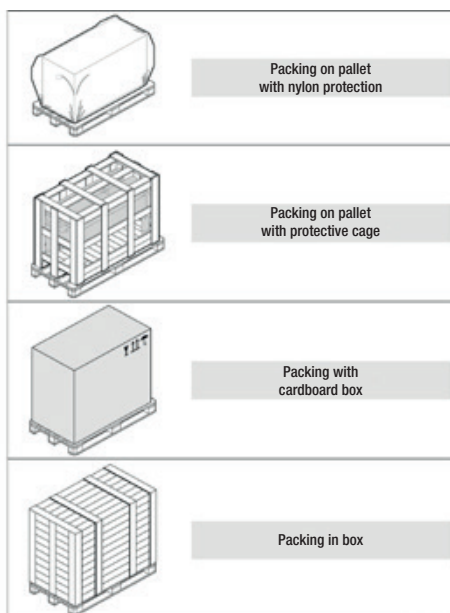
**Fitting out the established location in advance allows to avoid wasting the time of installation technicians.**

- 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.

## > Packaging

**The illustrations present the most common types of packaging used.**

- Packaging is done keeping in mind the bulk reduction and the type of transport chosen.
- Transport can be facilitated by shipping certain components dismantled and appropriately protected and packaged.
- Some parts, particularly electric, are protected with anti-humidity nylon.
- Packaging for maritime transport is the "overseas" type to guarantee preservation of the packaged elements.
- The packaging states all the necessary information for loading and unloading.
- Every shipment is accompanied by a document ("Packing list") with the list and description of the axes.
- For shipments via road transport or in "open top" containers, axes that are not covered by packaging are appropriately protected with a "barrier bag".
- Bulk components are appropriately placed along with the axes (with or without packaging) to avoid sudden and unexpected movements.
- Bulk components that cannot be put together in packages shall be deposited and appropriately secured to a pallet.
- The packaging material must be appropriately disposed of in compliance with the legislation in force.



### > 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.

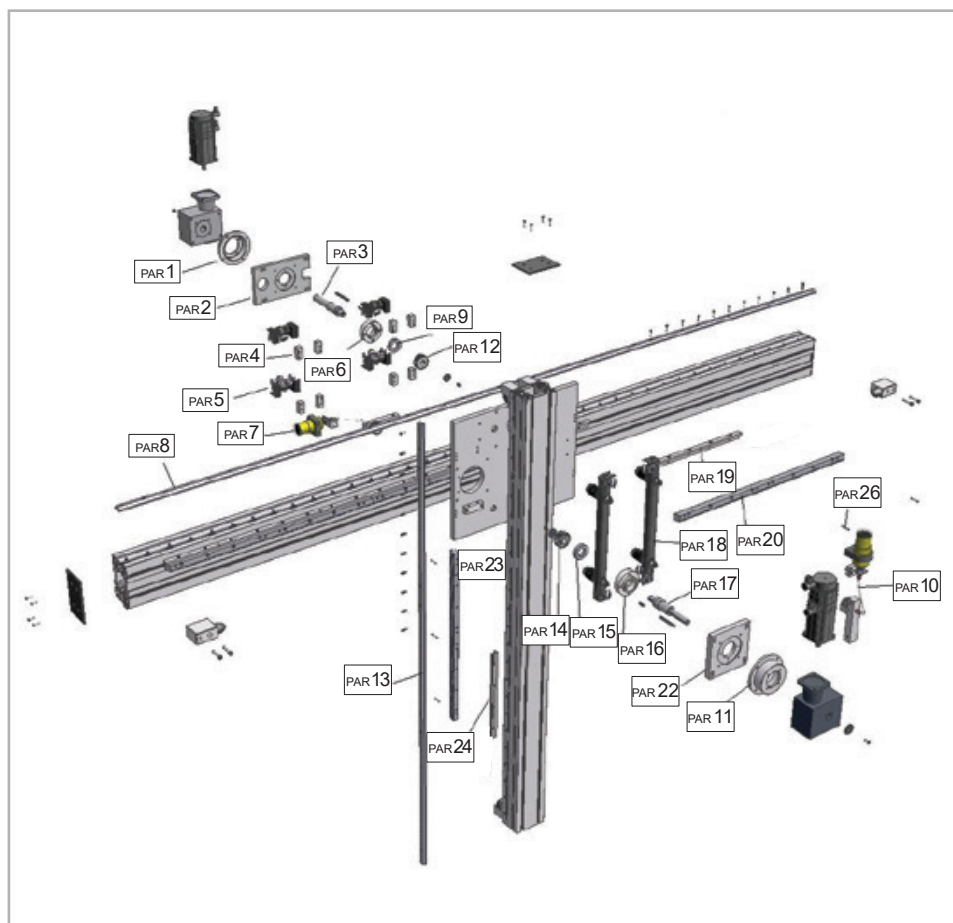
### > Check axis integrity after shipment

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.



► PAR - Main components list and spare parts

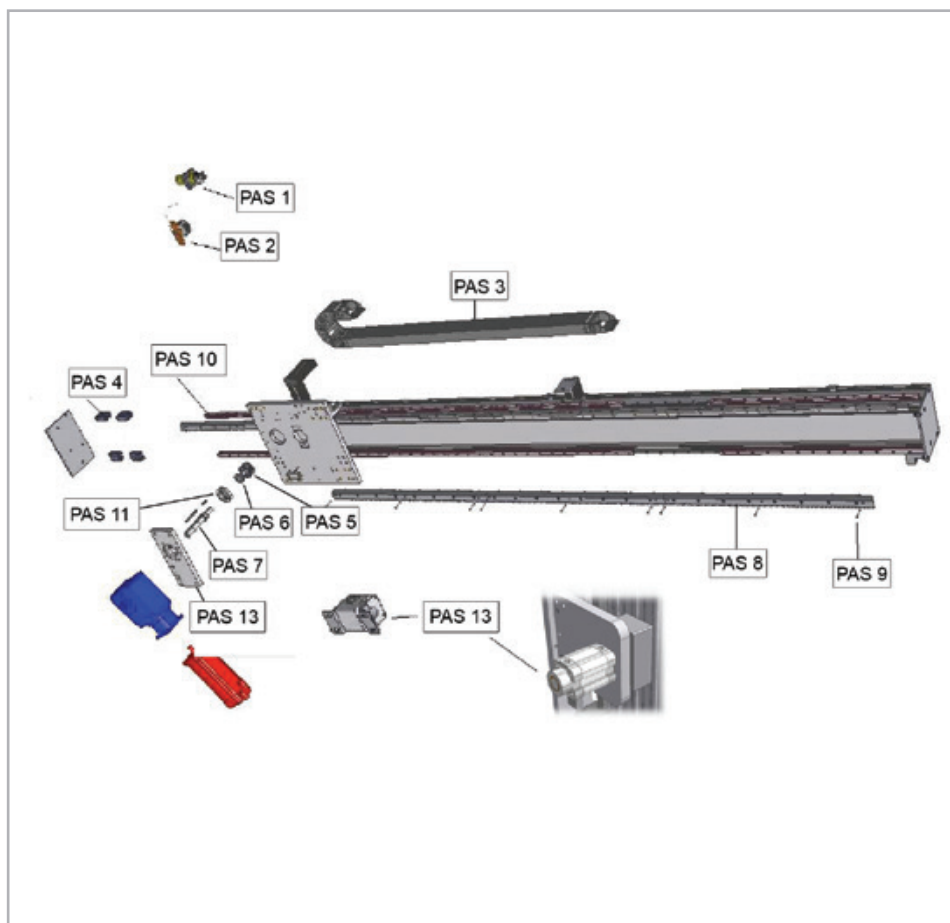


**IMPORTANT!**

Purely indicative picture, only to be taken as example.

Pos	Description
PAR1	Bell-shaped flange axis-Z
PAR2	Mounting plate and gear registration axis-Z
PAR3	Drive shaft axis-Z
PAR4	Spacer carriages axis-Y
PAR5	Carriages axis-Y
PAR6	Flange bearing axis-Z
PAR7	Lubrication group axis-Z
PAR8	Prismatic guide axis-Y
PAR9	Support bearing axis-Z
PAR10	Lubrication group axis-Z
PAR11	Bell-shaped flange axis-Y
PAR12	Pinion axis-Z
PAR13	Prismatic guide axis-Z
PAR14	Pinion axis-Y
PAR15	Support bearing axis-Y
PAR16	Flange bearing axis-Y
PAR17	Drive shaft axis-Y
PAR18	Carriages axis-Z
PAR19	Bead rack axis-Y
PAR20	Rack axis-Y
PAR22	Mounting plate and gear registration axis-Y
PAR23	Rack axis-Z
PAR24	Tallone cremagliera axis- Z
PAR26	Cylindrical pin

> PAS - Main components list and spare parts



**IMPORTANT!**

Purely indicative picture, only to be taken as example.

Pos	Description
PAS1	Lubrication cartridge
PAS2	Lubrication pinion
PAS3	Energy chain
PAS4	Recirculating ball slides
PAS5	Drive pinion
PAS6	Ball bearing
PAS7	Drive shaft
PAS8	Rack
PAS9	Cylindrical pin
PAS10	Recirculating slides guide
PAS11	Bearing holder flange
PAS12	Rod locking safety system
PAS13	Mounting plate and registration gearbox

**ATTENTION!**

If the “Rod Locking” safety system has been provided with the axis, the correct functioning of the fall-stop safety system must be ensured by a device that releases the pressurised air from the pneumatic system each time an emergency situation arises, due to either electrical, electronic, mechanical or pneumatic origin or human factors: the safety system can only brake the load's fall if this condition is met.

Rollon S.p.A. shall not be held responsible if these conditions are not met.

## Routine maintenance



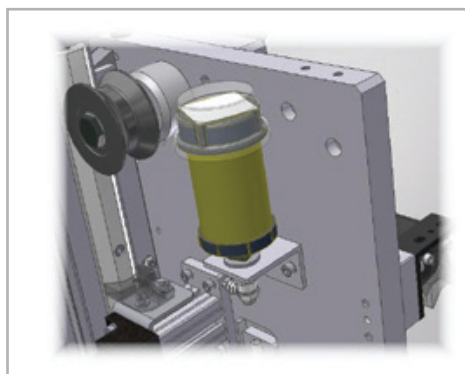
### > Manual greasing and lubrication

The scraper with felt (PAR axes) requires no special maintenance, it is sufficient its replacement every 12, 24 or 36 months according to the specific case. However, depending on the dynamics incurred by the system, it may be necessary to maintain the surface of the prismatic steel guides slightly moistened, injecting into the scraper with felt  $\text{cm}^3$  of grease such as "Purpose", consistency 2, every 500 hours or 10,000 km of operation.

The guides for the recirculating ball slides (PAS axes) must not be lubricated. Provide greasing the slides for every 500 hours or 10,000 km of operation, using grease ranging between ISO VG 68 and ISO VG-100. In the case of high loads must be used grease type ISO VG 220.

For both PAR and PAS axes, never lubricate bearings type 2RS wherever they are present: the pressure exerted during the operation would get the side seals out of seat. For axes equipped with "Rod Locking" safety system unit, never lubricate the sliding calibrated bar.

### > Automatic rack lubrication



Rack lubrication is provided by an automatic greasing system (optional), which can be operated by an on/off switch located in the rear part of the lubrication unit: this unit comprises a replaceable cartridge, a pinion made from Vulkollan and adjustable lubrication frequency, depending on the particular dynamic requirements.



#### **ATTENTION!**

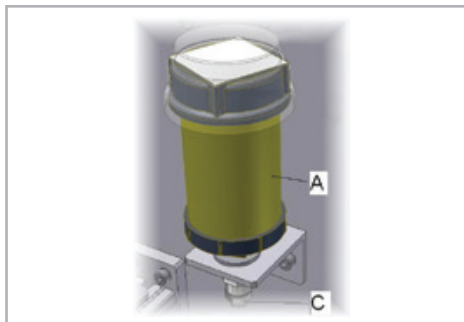
For instructions on routine and special maintenance and for the safety informations about the automatic greasing system of the rack, refer to the specific manual assembly of the accessory in question.



#### **ATTENTION!**

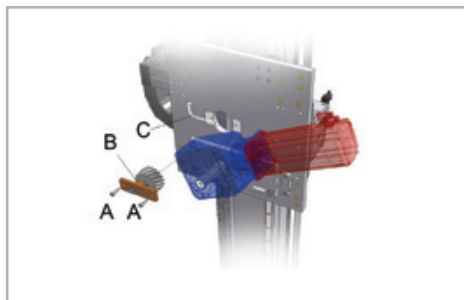
The lubricator cartridge unit must be replaced before having completely run out, otherwise abnormal consumption of the pinion or the rack may occur.

## ➤ Replacing the lubrication cartridge

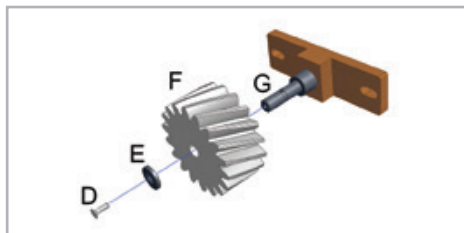


- a. open black plastic support "A", by working on the snap-in latch;
- b. undo the lubricator from the L-support without removing or damaging the grease pipe (C);
- c. release the transparent rear cover and remove the empty cartridge from the motor unit;
- d. replace the empty cartridge;
- e. perform the operations in reverse for refitting.

## ➤ Replacing the lubricator pinion



- a. undo the socket head cap screws (A) and remove greasing pipe (C) from the fitting so that unit (B) can be completely removed from the base plate;
- b. undo the countersunk hex head screws (D) and remove washer (E);
- c. remove the lubrication pinion from shaft (G) and replace it with a new one;
- d. perform the operations in reverse for refitting.

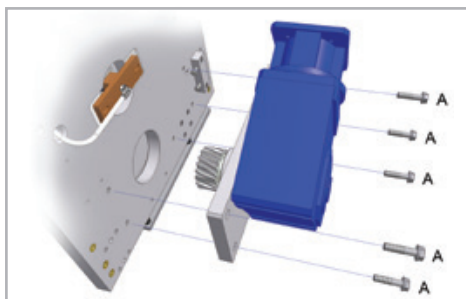


- e. Before axis commissioning, make sure that the lubrication pinion is soaked with grease again.

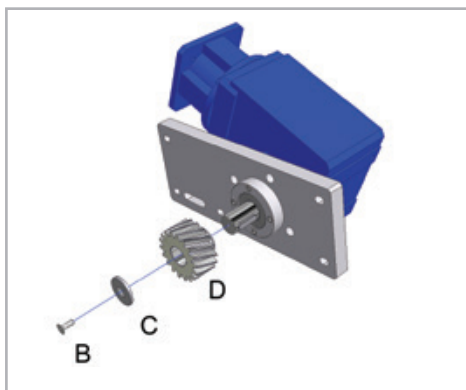
## Extraordinary maintenance



### > Removal and replacement of the rack pinion

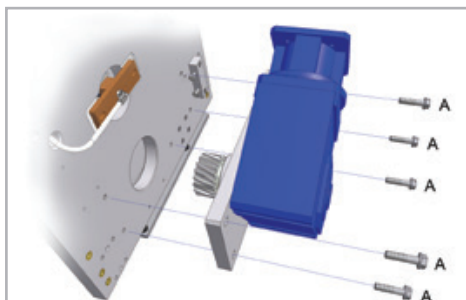


- a. remove the motor;
- b. remove the hex head screws (A) securing the plate and remove the plate;



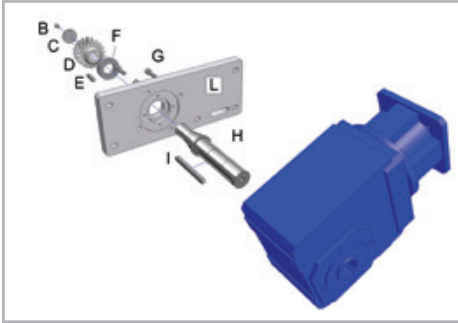
- c. undo countersunk hex head screws (B) securing the shaft with the washer (C) for pinion (D);
- d. remove pinion (D) and replace it with a new one;
- e. perform the operations in reverse for refitting.

### > Removal and replacement of the drive shaft



Proceed as follows to replace the drive shaft:

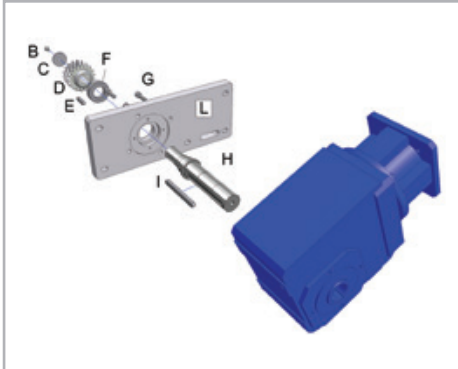
- a. Remove the motor;
- b. Remove the hex head screws (A) securing the plate and remove the plate;
- c. undo countersunk hex head screws (B) securing the shaft with the washer (C) for pinion (D);



Proceed as follows to replace the rack pinion:

- d. Remove the pinion (D).
- e. Remove tab (E) from shaft (H).
- f. Undo socket head cap screws (G) and remove the reduction gear with the shaft from the plate.
- g. Remove the head screw for connecting the shaft to the reduction gear.
- h. Remove the shaft from the reduction gear and remove key (I).
- i. Replace the drive shaft.
- j. Perform the operations in reverse for refitting.

## > Removal and replacement of the support bearing.



- a. Remove the motor.
- b. Remove the hex head screws (A) securing the plate and remove the plate.
- c. Undo countersunk hex head screws (B) securing the shaft with the washer (C) for pinion (D).
- d. Remove the pinion (D).
- e. Remove tab (E) from shaft (H).
- f. Undo socket head cap screws M10 (G) and remove the reduction gear with the shaft from the plate.
- g. Remove the support bearing (F) from the flange and replace it.
- h. Perform the operations in reverse for refitting.



## ➤ Removal and replacement of the rack

To replace one or more rack segments it is necessary to remove the axis from its vertical position and put it in horizontal position. After this, secure it firmly and proceed as follows:

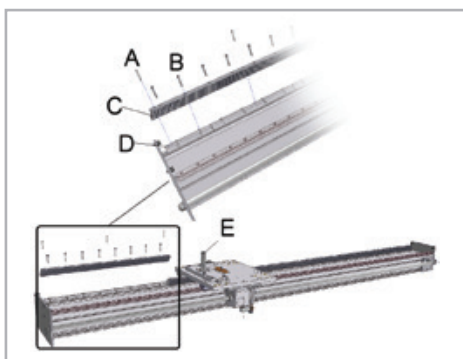
- a. Remove the motor and the reduction gear but leave the shaft and pinion fitted for the subsequent adjustment (refer to section "Removal and replacement of the drive shaft").
- b. Move the carriage into a position that does not interfere with the segment of rack to be replaced.
- c. Remove plugs (A) using the correct removal tool.
- d. Undo socket head cap screws (B).
- e. Remove the rack segment concerned (C)
- f. Check the positioning of the rack beads (D) and the M8 securing plugs inserted in the profile slot, and carefully arrange the new segment of rack without working on the grub screws mounted on the support beads (D)
- g. Tighten screws (B) in the respective threaded plugs without blocking them, to allow the subsequent adjustment of the rack.
- h. Insert plugs (A) in their housings, making sure they are

flush with the upper level of the rack. If one or more plugs get damaged during the removal, they must be replaced with equivalent plugs.

- i. By moving the carriage slowly, manually check that the pinion/rack clearance and the pitch on the joint of the replaced segment are the same as the area in which nothing has been worked on (for a starting reference do more tests along the said section). If the clearance is greater the rack needs to be brought closer to the pinion, where the clearance is lower the rack needs to be moved further away from the pinion. Once the clearance has been properly adjusted, proceed with the final tightening of the screws, at the end of which a new clearance check is recommended.

**If the clearance between the teeth is more than anticipated, it will result in noisy and inaccurate movement (especially for changes of direction). If the clearance is lower, there will be abnormal consumption of the teeth which would result in damage to the system. If the pitch between the rack segments is incorrect, it could cause serious damage to the teething.**

- j. Proceed with greasing the replaced segment. If the rack segments to be replaced total more than one, you must replace one segment at a time, to avoid losing the initial references.
- k. Perform the operation in reverse for refitting.

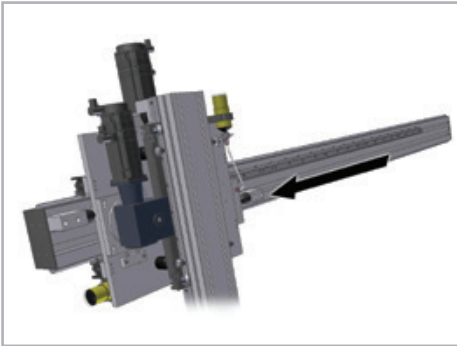


## PAR: carriage, sliders and guides replacement



### ➤ Removal and replacement of the Y-axis carriages

If replacing one or more carriages, it is recommended that the utmost care is taken when handling the axes and remember that is essential to work on one slider at a time.



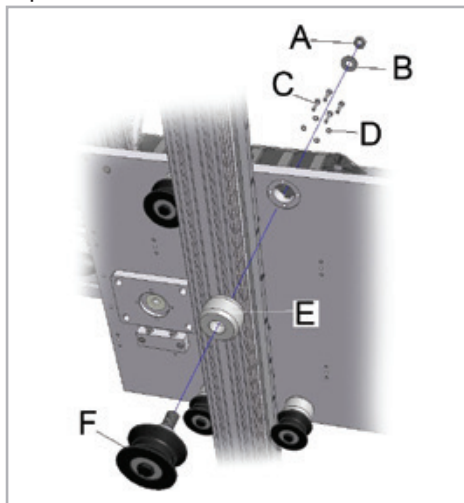
- a. Use any support to lock the plate.
- b. Remove elements that hold the roller or the carriage on the base plate (refer to the section dedicated to the type of carriages or rollers on the axis).
- c. Remove the carriage or the V-roller to be replaced.
- d. Perform the operation in reverse for refitting the cart.
- e. Check the preload setting of carriages (refer to the section dedicated to the type of carriages or rollers on the axis).

### ➤ Removal and replacement of the Z-axis carriages

- a. Use any support to lock the vertical profile.
- b. Remove the elements that fix the carriage or roller on the base plate (refer to the section dedicated to type of carriages or rollers on the axis).
- c. Remove the carriage or the roller to be replaced.
- d. Perform the operation in reverse for refitting the carriage and check the setting of the preloading of carriages (refer to the section dedicated to the type of carriages or rollers on the axis).

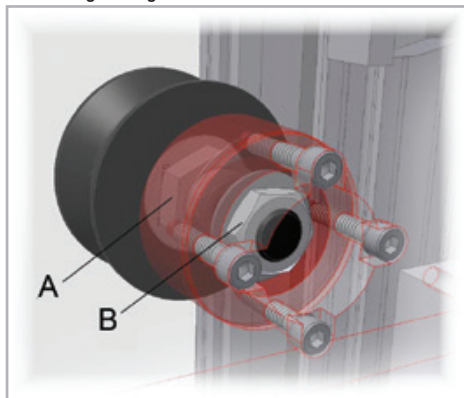
## > “V-shaped” rollers

### Replacement:



- a. Loosen (clockwise or counterclockwise) the eccentric rollers to retrieve the axial play on the axis on which it is intervening.
- b. Undo the screws (C) and remove the washer (D).
- c. Remove the spacer (E), with the roller (F) still mounted.
- d. Unscrew the nut (A) and remove the washer (B), then remove the roller (F) and replace it with a new one.
- e. Perform the operation in reverse for refitting.

### Preloading setting:

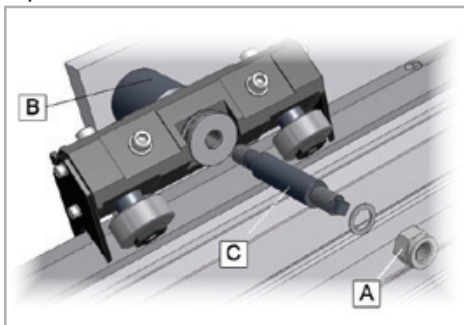


To ensure the proper alignment and to minimize the clearance during the translation, each axis is equipped with opposed concentric and eccentric sliding bearings. Proceed as follows to get the right preloading setting:

- a. Loosen the nut (B);
- b. Rotate the hexagonal pivot (A) until the roller will be completely in contact with the guide (up to when it will be possible to rotate the roller by hand).
- c. Proceed with the tightening of the nut while holding the exagonal pivot (A).

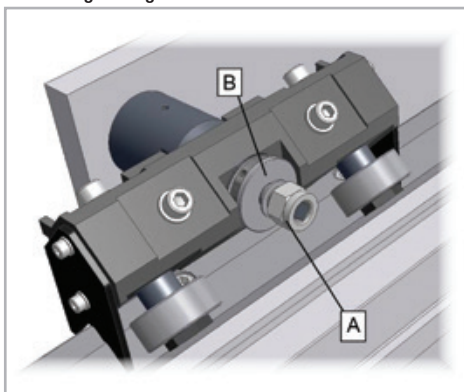
➤ **Roller oscillating slides  $\varnothing 30$  mm,  $\varnothing 40$  mm,  $\varnothing 52$  mm e  $\varnothing 62$  mm.**

**Replacement:**



- a. Unscrew the Ch24 self locking nut (A)
- b. Loosen the STEI M6 grain (B) upon the locking pivot (C)
- c. Unscrew (Ch10) and remove the locking pivot (C).
- d. Now the slide is loose and it is removable.
- e. Perform the operation in reverse for refitting, positioning with care the two fifth-wheel with the teflon side in direct contact with the slide replaced.

**Preloading setting:**

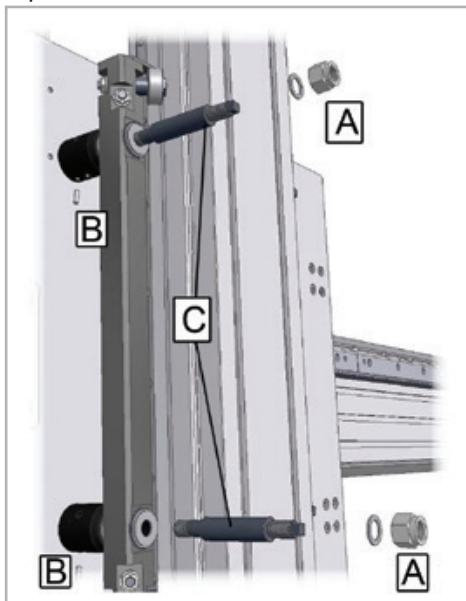


To ensure the proper alignment and to minimize the clearance during the translation, each axis is equipped with opposed concentric and eccentric sliding bearings. Proceed as follows to get the right preloading setting:

- a. Loosen the Ch17 nut (A) of eccentric pivots.
- b. Adjust the slide until all contact with the guide bearings, turning the eccentric bushing (B) towards right or left.
- c. Screw the Ch17 nut (A).

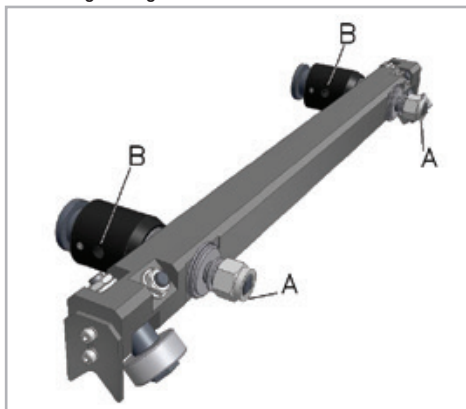
## 4 Rollers fixed slide $\varnothing 40$ mm, $\varnothing 52$ mm e $\varnothing 62$ mm

### Replacement:



- a. Unscrew the Ch24 self locking nut (A)
- b. Loosen the STEI M6 grain (B) upon the locking pivot (C)
- c. Unscrew (Ch10) and remove the locking pivot (C).
- d. Now the slide is loose and it is removable.
- e. Perform the operation in reverse for refitting, positioning with care the two fifth-wheel with the teflon side in direct contact with the slide replaced.

### Preloading setting:

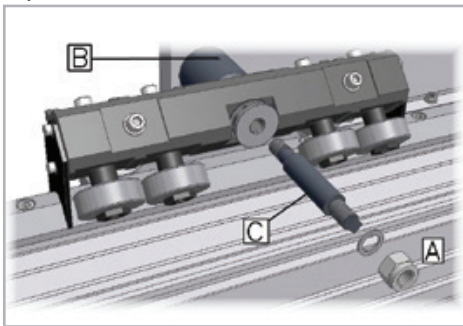


To ensure the proper alignment and to minimize the clearance during the translation, each axis is equipped with opposed concentric and eccentric sliding bearings. Proceed as follows to get the right preloading setting:

- a. Loosen the Ch17 nut (A) of eccentric pivots.
- b. Adjust the slide until all contact with the guide bearings, turning the eccentric bushing (B) towards right or left.
- c. Screw the Ch17 nut (A).

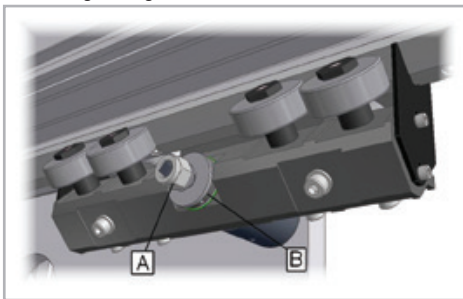
## ➤ 6 Rollers oscillating slides $\varnothing 52$ mm and $\varnothing 62$ mm

### Replacement:



- Unscrew the Ch24 self locking nut (A)
- Loosen the STEI M6 grain (B) upon the locking pivot (C)
- Unscrew (Ch10) and remove the locking pivot (C).
- Now the slide is loose and it is removable.
- Perform the operation in reverse for refitting, positioning with care the two fifth-wheel with the teflon side in direct contact with the slide replaced.

### Preloading setting:

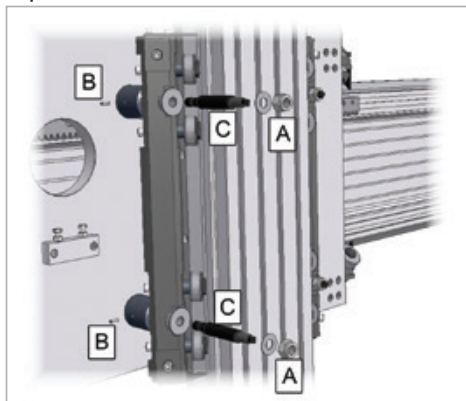


To ensure the proper alignment and to minimize the clearance during the translation, each axis is equipped with opposed concentric and eccentric sliding bearings. Proceed as follows to get the right preloading setting:

- Loosen the Ch17 nut (A) of eccentric pivots.
- Adjust the slide until all contact with the guide bearings, turning the eccentric bushing (B) towards right or left.
- Screw the Ch17 nut (A).

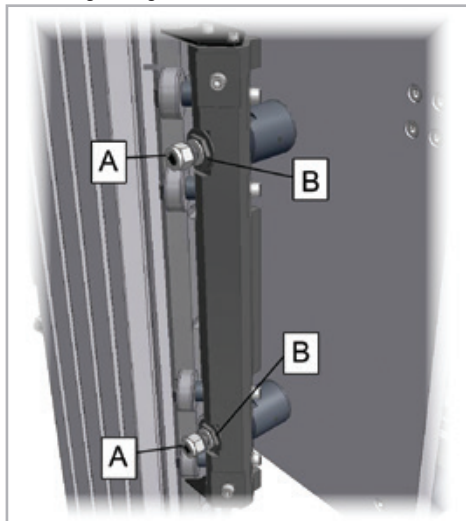
## > 6 Rollers Single Fixed Slide Ø52 Mm E Ø62 Mm

### Replacement:



- a. Unscrew the Ch24 self locking nut (A)
- b. Loosen the STEI M6 grain (B) upon the locking pivot (C)
- c. Unscrew (Ch10) and remove the locking pivot (C).
- d. Now the slide is loose and it is removable.
- e. Perform the operation in reverse for refitting, positioning with care the two fifth-wheel with the teflon side in direct contact with the slide replaced.

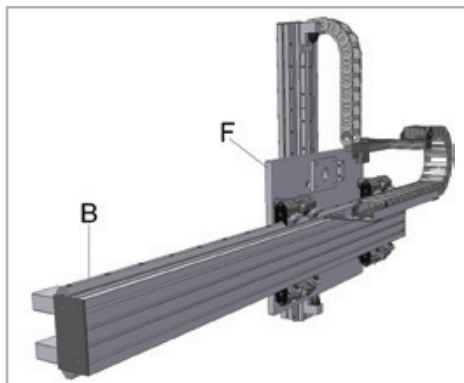
### Preloading setting:



To ensure the proper alignment and to minimize the clearance during the translation, each axis is equipped with opposed concentric and eccentric sliding bearings. Proceed as follows to get the right preloading setting:

- a. Loosen the Ch17 nut (A) of eccentric pivots.
- b. Adjust the slide until all contact with the guide bearings, turning the eccentric bushing (B) towards right or left.
- c. Screw the Ch17 nut (A).

## ➤ Removal and replacement of the prismatic guides

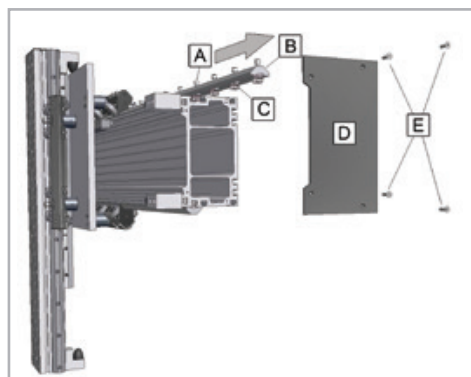


To replace a prismatic guide (B), ensure that the bearings which slide over them are discharged: for this reason, in the case of a guide on the horizontal axis, it is necessary to support the main plate or the carriage (F), so that its weight and all the equipment mounted on board, doesn't rest on bearings.



### **ATTENTION!**

The guides are protected by a layer of rust preventive oil or specific grease: use gloves for handling.



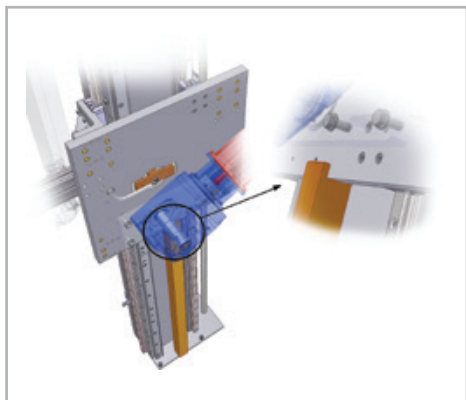
- a. Remove any lid (D) by unscrewing the screws (E). Loosen each of the screws (A) of the guide (B) that you want to replace and remove it sideways, as shown.
- b. Once extracted the guide, unscrew the screws (A), to free up the fixing rawplugs (C).
- c. Tighten the plugs (C) on the new guide without locking them, so that by sliding them inside the channels the guide can slide on the bracket profile, and perform the operation in reverse for refitting.
- d. With the guide inserted, make sure it is in the correct position before closing the fixing screws (A), making sure that the value of the measure "H" measure, correspond with the value previously detected.
- e. Lubricate the guide just replaced (refer to section Routine maintenance - Manual greasing and lubrication).
- f. Now it's possible to release the main plate.



## PAS: sliders and guides replacement

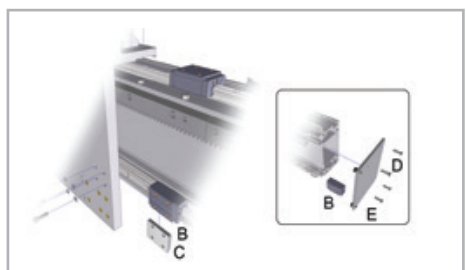
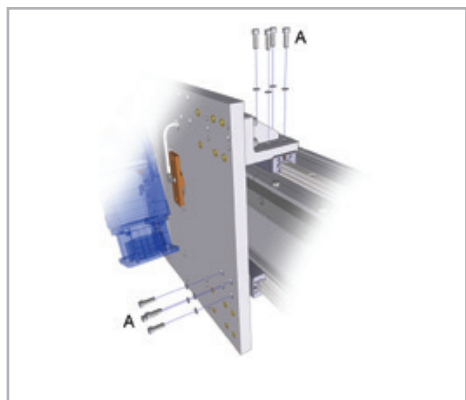


## ➤ Recirculating ball sliders

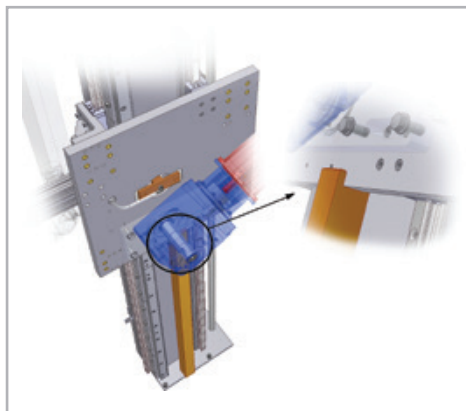
**ATTENTION!**

If replacing one or more slider, it is recommended that the utmost care is taken when handling the axes and remember that is essential to work on one slider at a time.

- a. Lock the plate as near as possible to the ground, removing pressure to the rod locking unit (optional). Also it is advisable to place a support, as shown in the figure, to restrict plate oscillations.
- b. Undo the 4 socket head cap screws M8 (A) securing the slider to its support.
- c. Undo the slider, making it run along the rail until extraction zone. If the axis is working in a vertical position and the slider to be replaced is the inferior one, it is necessary to dismount also the slider in the upper position.
- d. If slider (B) to be replaced is one of those directly fitted on the plate, in addition to undoing the screws as in point b), spacer (C) must be removed. Then remove the upper closing plate of profile (E) undoing the 4 countersunk hex head screws M10 (D).
- e. Replace the damaged slider/s.
- f. Perform the operation in reverse for refitting.



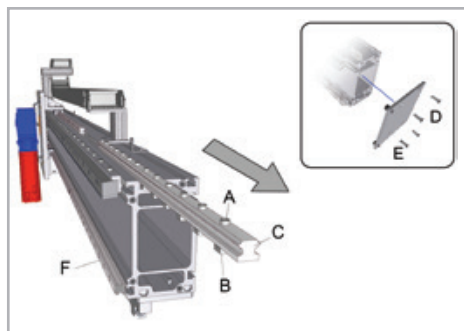
## ➤ Recirculating ball guides



### **ATTENTION!**

If replacing one or more guides, it is recommended that the utmost care is taken when handling the axes and remember that is essential to work on one guide at a time.

a. Lock the plate as near as possible to the ground, releasing pressure to rod locking unit (optional). Also it is advisable to place a support, as shown in the figure, to restrict plate oscillations.



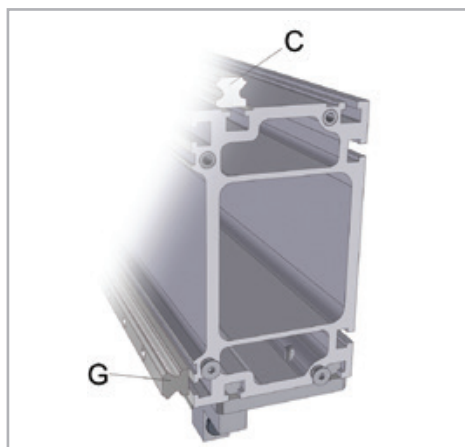
b. Remove the upper closing plate of profile (E) undoing the 4 countersunk hex head screws M10 (D).

c. Loosen the socket head cap screws M8 (A) securing guide (C), taking care not to completely unscrew them, so that the mounting plugs M8 (B) do not fall into the slot.

d. Remove the guide to be replaced upwards, paying particular attention to any resistance to extraction, which could be due to screws (A) not being sufficiently unscrewed.

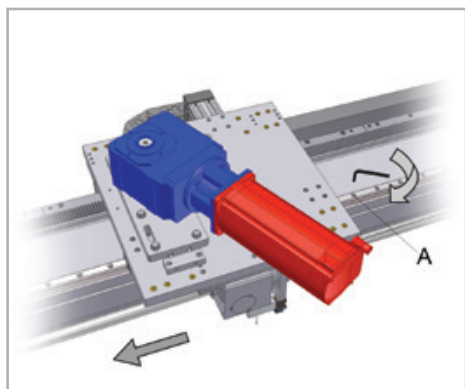
e. Remove screws (A) and plugs (B) from the guide to be replaced and refit them on the new guide

f. Perform the operations in reverse for refitting taking into account that the guides need to be adjusted again to ensure the carriage slides correctly



**g.** Guide adjustment

- h.** Guide (G) does not have an housing in tolerance on the profile, therefore it is necessary to use the carriage to ensure its proper alignment. Slide the carriage along the recently fitted guide: when the ball recirculation sliders have passed above, leaving screws (A) accessible to the operator, proceed with their tightening.



Guide (C) has a housing in tolerance, so its adjustment is much simpler. Simply put it in position and tighten the screws, with the same procedure used for the guide (G).

Once all the screws have been tightened, perform a final check before axis commissioning.



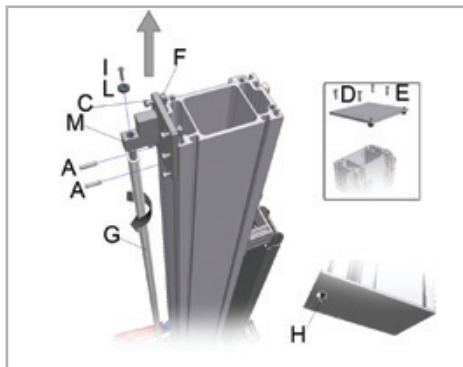
**ATTENTION!**

The recirculating ball guides should not be lubricated (refer to section "Routine maintenance - Manual greasing and lubrication").

## Accessories



➤ Removal and replacement of the “rod locking” safety system (optional)



a. Lock the plate (or the vertical profile) by placing it on its lower mechanical stop without removing pneumatic pressure to the rod locking unit (Q).

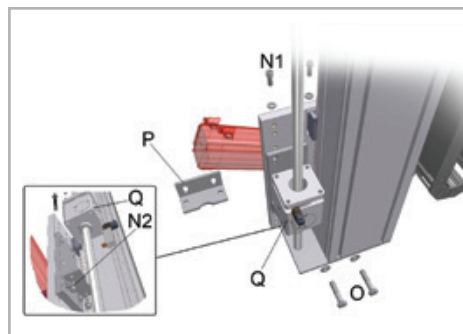
b. Remove the upper closing plate from profile (E) undoing the 4 countersunk head screws M10 (D) and loosen the self-locking nut M20 (H), on the lower part of the module. This nut is not tightened to torque and must remain loose even after intervention to ensure the correct sliding of the rod inside the rod locking safety system (Q).

c. Remove plugs (A) using the correct removal tool.

d. Unscrew socket head cap screws M10 (C) taking care not to completely unscrew them, so that mounting plugs M10 (F) do not fall in the slot.

e. Turn the side bar (G) as shown by the arrow in the figure, accompanying the support rod (M) upwards, until it has completely separated from the vertical profile.

f. Undo hex head screws M14 (O) that secure bracket (P) of the rod locking unit (Q) to the base plate and socket head cap screws M12 (N1) which secure the bracket to the upper part of the safety system.



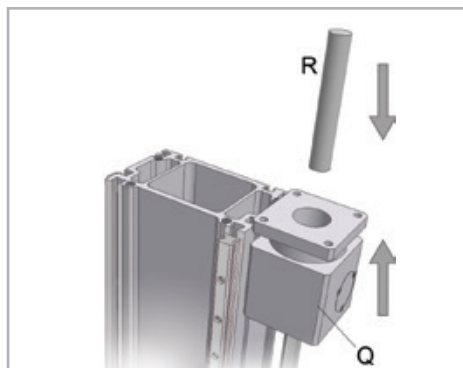
g. Remove bracket

h. Undo socket head cap screws M12 (N2) which secure bracket (P) to the lower part of the safety system (Q).

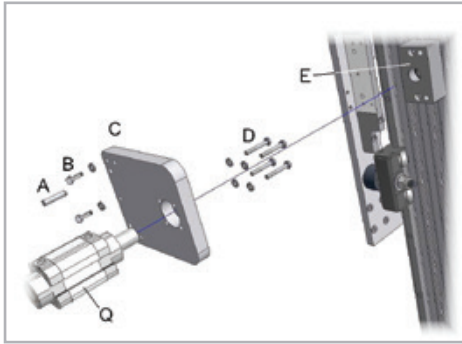
i. Without removing the pressure to the pneumatic system, slide the locking system upwards (Q). Before removing it completely insert a calibrated segment (R) of  $\varnothing 32$  mm, to prevent any damage to the internal locking system.

j. Replace the recently removed rod locking unit with a new one.

k. Perform the operation in reverse for refitting.



## > Removal and replacement of the stopper cylinder security system (optional)



- a. Lock the plate by placing it on its lower mechanical stop without removing pneumatic pressure to the rod locking unit (Q).
- b. Remove plugs (A) using the correct removal tool.
- c. Unscrew the fixing screws (B), and remove the plate (C) with the security system still mounted.
- d. Undo socket head cap screws (D) on the plate (C) opposite to the shutter.
- e. Extract the shutter (after removing its pneumatic component) and replace it with a new one.
- f. Perform the operation in reverse for refitting.



### ATTENTION!

For instructions on routine and special maintenance and for the safety informations about the "Stopper Cylinder" safety system, refer to the specific assembly manual of the accessory in question.



### ATTENTION!

For instructions on routine and special maintenance and for the safety informations about the "Rod Lock" safety system, refer to the specific assembly manual of the accessory in question.



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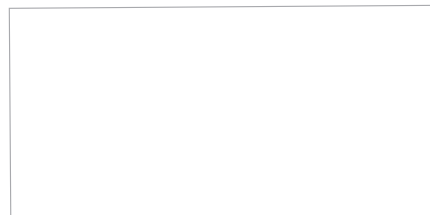
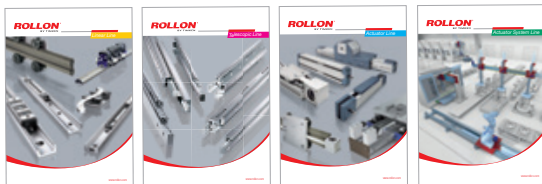
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