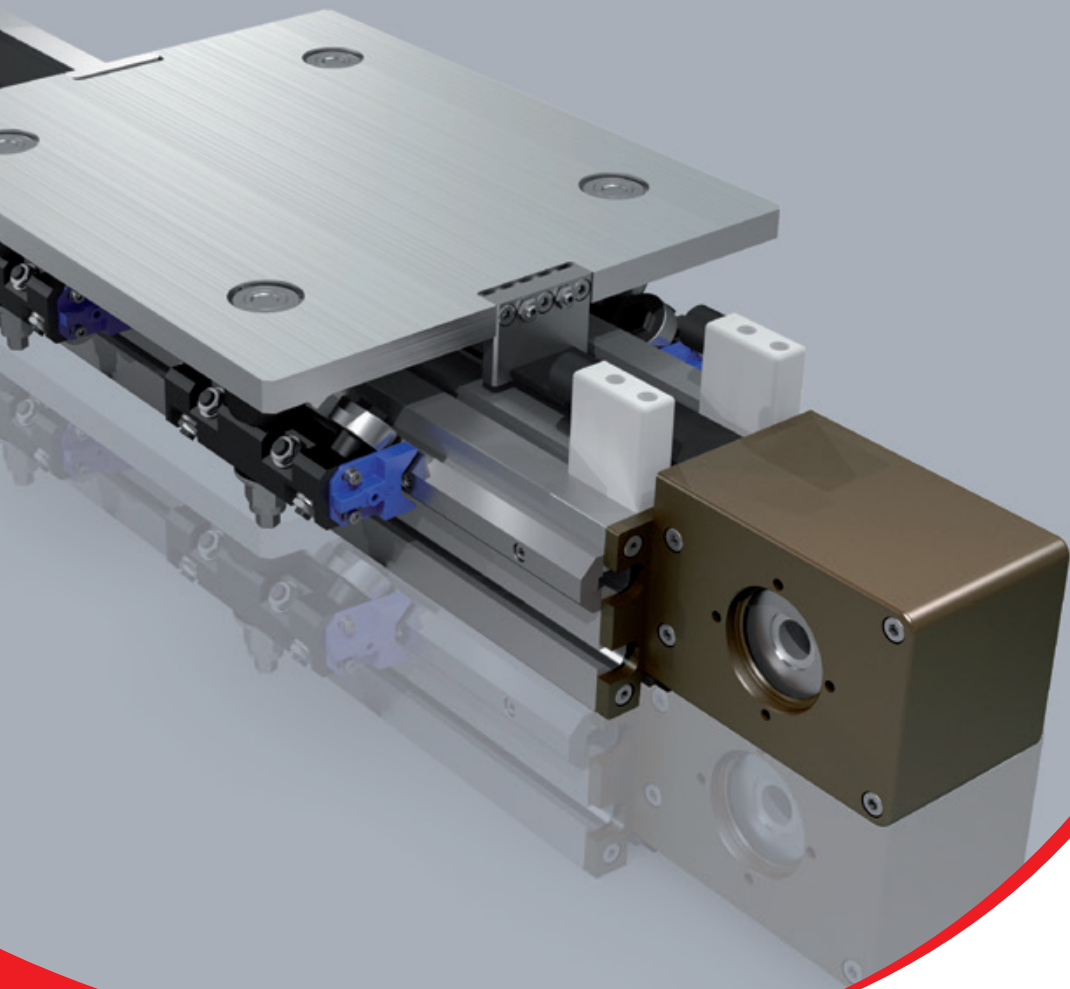


ROLLON®
BY TIMKEN

Modline



Use and Maintenance
English

Interactive catalogs 
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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 of 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 protection	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

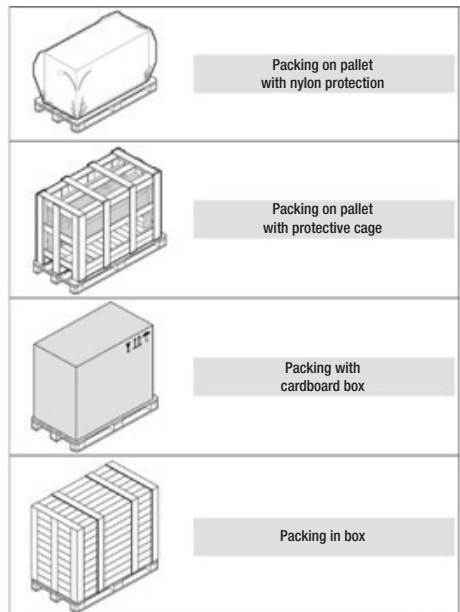
Fitting out the established location in advance allows to avoid wasting the time of installation technicians.

- 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.

Reduction units assembly

**CAUTION!**

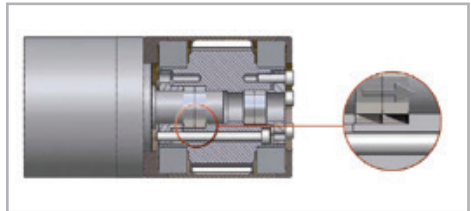
For those modules or parts of the system modules with vertical movement (Z-axis) **is required to mount brake motors** to neutralize the risk of falling axis.

CAUTION!

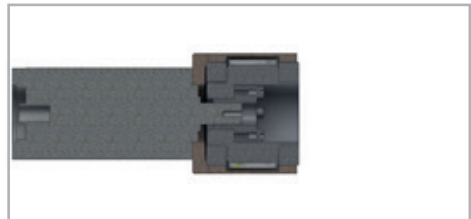
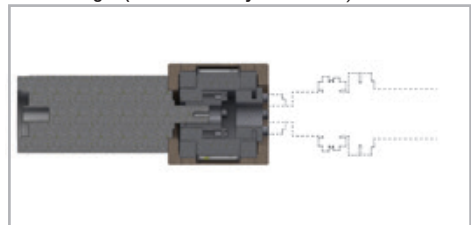
Before mounting it on the gearbox, it is suggested to pre-test the motor separately.

> MCR/MCH 65-80 and ZCR/ZCH 60-90-100

When removing the flanges shrink fit, it is possible that the clamping rings inside assume an irregular position.. Therefore, before inserting the gearbox shaft, it is necessary to verify the proper position, as they are not self-centring. The figure below shows the proper position of the shrink disc rings based upon the entering direction of the shaft.

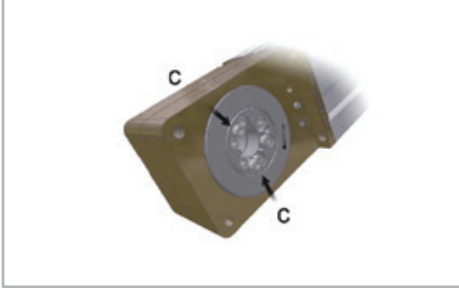
**> MCR/MCH 105 and TCR/TCH 170-280**

When, upon assembling the gearbox one of the shrink disc flange is removed it is possible the rings inside the shrink disc move. Therefore, before inserting the gearbox shaft, it is necessary to verify the proper position, as they are not self-centring.

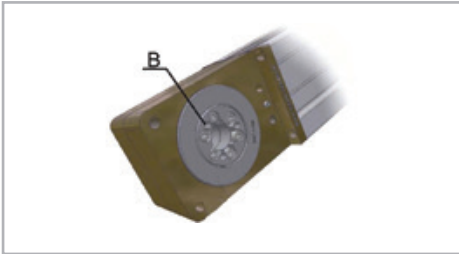
Assembling 1**Assembling 2 (with secondary shrink disc)**

> MCR/MCH 105 and TCR/TCH 170-280

a. The shrink disc is despatched axially locked by "C" screws.



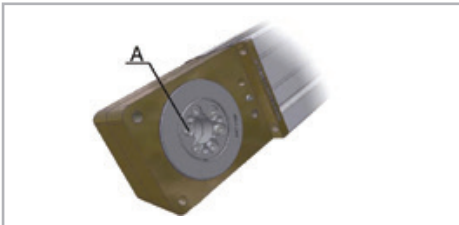
b. Open at maximum the shrink disc by screwing 2 or more TCEI 12.9 screws (provided with the module) in "B" holes.



c. Insert the gearbox.

d. Remove the TCEI 12.9 screws from "B" holes and "C" screws.

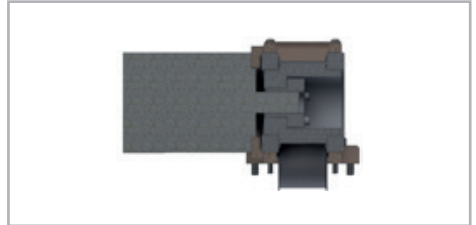
e. Block the shrink disc using TCEI 12.9 screws through "A" holes. See table on page 5 with reference to 12.9 screws.



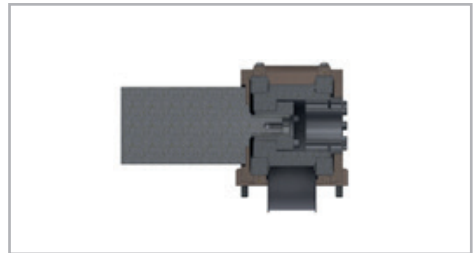
> ZCR/ZCH 100-170-220 (assembling 1 and 2)

When, upon assembling the gearbox one of the shrink disc flange is removed it is possible the rings inside the shrink disc move. Therefore, before inserting the gearbox shaft, it is necessary to verify the proper position, as they are not self-centring.

Assembling 1

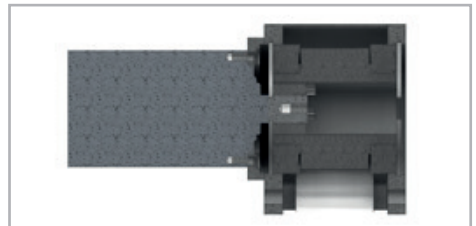


Assembling 2 (with secondary shrink disc)



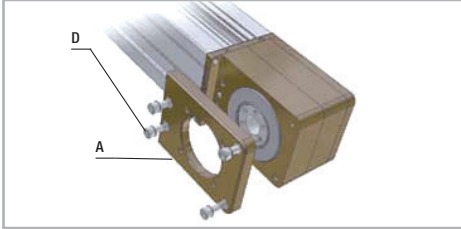
> ZMCH 105

When, upon assembling the gearbox one of the shrink disc flange is removed it is possible the rings inside the shrink disc move. Therefore, before inserting the gearbox shaft, it is necessary to verify the proper position, as they are not self-centring.

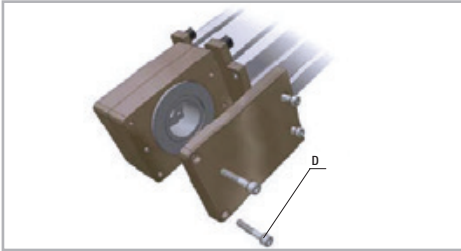


> MCR/MCH 80-105

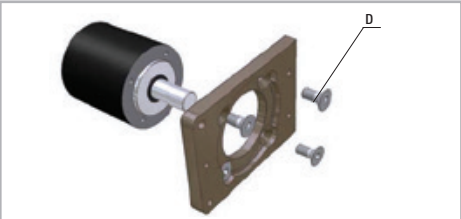
- a. Loosen TCEI screws "D" blocking the adapting plate "A" and remove it.



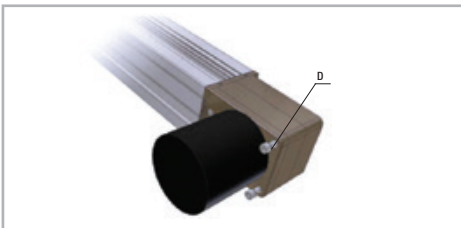
- b. Loosen TCEI screws "D" to remove the cover plate on the opposite side.



- c. Assemble the gearbox tightening it with TCEI screws "D" as shown in the picture below.



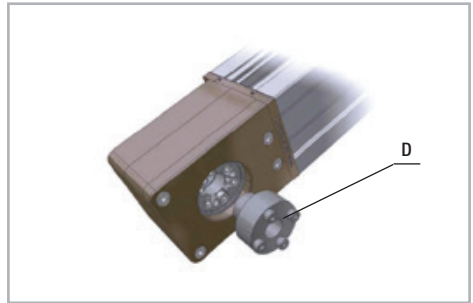
- d. Insert the assembly plate/gearbox onto the drive head and lock the TCEI screws "D".



- e. Lock the gearbox shaft by tightening the shrink disc as shown in the previous paragraphs. Remount the cover plate.

> MCR/MCH 80-105

- a. Remove the motor adapting plate as shown in the previous paragraphs. Remove the secondary shrink disc onto the opposite side of the head to have access to the screws of the primary shrink disc.



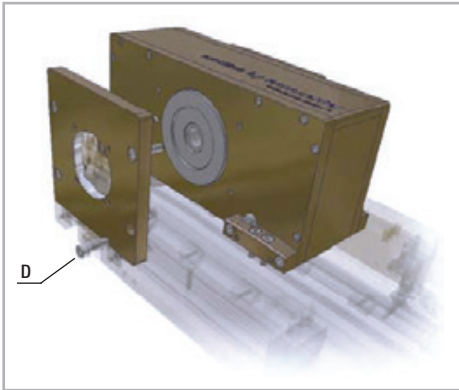
- b. Assemble the gearbox using TCEI screws as shown in the previous paragraphs.

- c. Place the assembly tapping plate/gearbox onto the motor head and close the TCEI screws "D" as shown in the previous paragraphs.

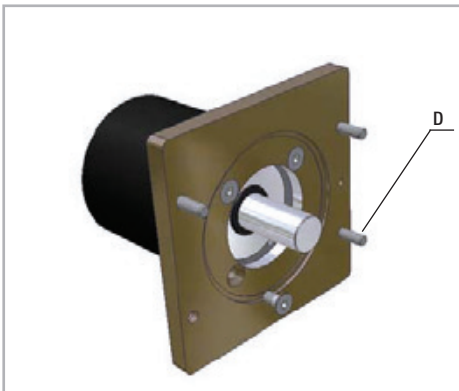
- d. Block the gearbox shaft by tightening the shrink disc, as shown in the previous paragraphs.

- e. Insert again the second shrink disc and block the connecting shaft.

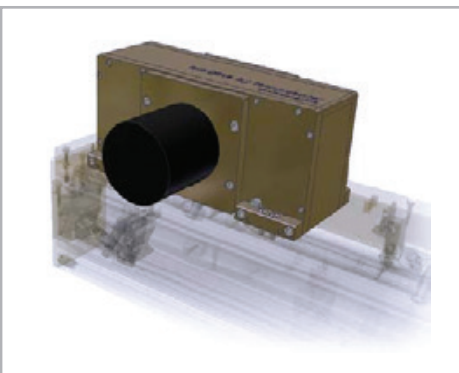
> ZCR/ZCH – 32, 50 and 75 belt



- a. Take tension away from the belt as shown on page 18.
- b. Unscrew the TCEI screws "D" to remove the gearbox tightening flange, as shown on the side picture.
In assembly 1 remove the rear shutting plate in the same way, while in assembly 2 it is required to remove the secondary shrink disc too.



- c. Assemble the gearbox tightening it using TCEI screws "D".



- d. Place the assembly tapping plate/gearbox onto the motor head and close the TCEI screws as shown in the side picture.
- e. Block the gearbox shaft by tightening the shrink disc, as shown in the previous paragraphs.
- f. Pre-tension the belt (see page 18).

Belt pre-tensioning



CAUTION!

It is suggested to check the pre-tensioning of the belt every 3000 hours/work (mandatory upon each replacement). It is suggested verifying by tensiometer as said in the following para-graph. (Universal control tool belt tension, which was adopted for test-ing is SM4).

For the proper belt pre-tensioning in application subject to strong stress (high accelerations, emergency decelerations, collisions and cycles with swift reversal of movements), ask our technical assistance service for the checking.



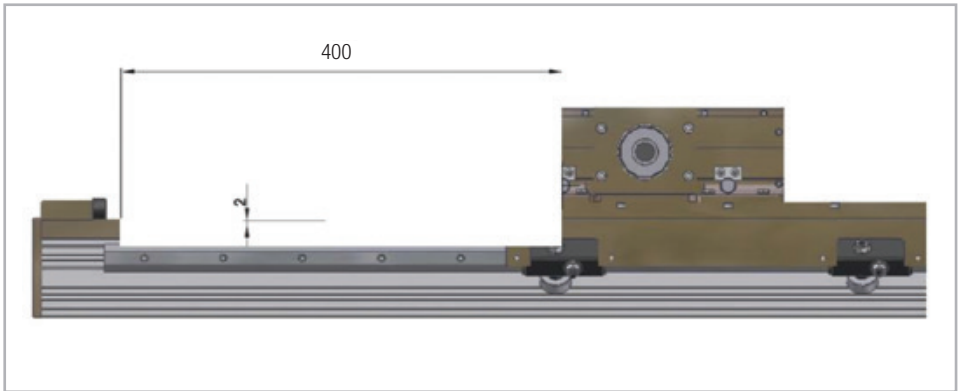
CAUTION!

It is suggested to replace the belt of the vertical mounted axes (Z axes) every 2 (two) years, and that of the horizontal mounted axes (X or Y axes) every 3 (three) years. For belt replacement, please follow instructions at page 19 and following. The new belt must be identical to the one originally provided by the supplier of Partly Completed Machine to avoid any malfunction. **If not, the supplier of the Partly Completed Machine is not to be held responsible for eventual accidents, break-age or damages and their consequences on people, animals or goods related to a non-compliant replacement.** After the replacement, it is suggested to set the correct belt pre-tensioning. This verification must be done by means of an electronic tensiometer, as shown in the next paragraph.

The values shown in the table are indicative, it is suggested to verify them by means of electronic tensioning as shown on page 17 and following. (Universal tool adopted for testing the belt tension: SM4).

For the proper belt pre-tensioning in application subject to strong stress (high accelerations, emergency decelerations, collisions and cycles with swift reversal of movements) please contact our technical department for verification.

> Belt tension verification with tensiometer



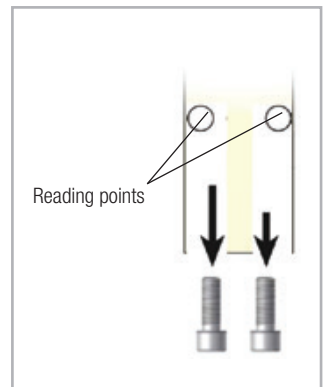
For the proper reading, place the carriage to have 400 mm of free belt as shown in the picture. Place the tool probe in the middle at about 2 mm from the belt back. Strike with a key the back of the belt and read the vibration frequency. The resulting value must be as reported in the table below, depending on the type of axis and belt. We recommend repeating the mea-

surement several times to get an average value. The belt pre-tensioning occurs through n° 2 screws, and therefore, make sure that both values are equal. Any difference between the screws would cause the belt side skid and possible precocious damages.

Verification with frequency meter [hz]

Axis type	Belt	Width	Clear section	50%	70%
MC 65	32AT5	32 mm	400 mm	62	74
MC80 - ZC60	32AT10 - 32AT10 HF	32 mm	400 mm	75	89
MC105	40AT10	40 mm	400 mm	75	89
ZC100	50 AT10 HPF	50 mm	400 mm	75	89
TC170/200	50 AT10 HP	50 mm	400 mm	88	104
TC220/360 - ZC170/220	75 AT10 HP - HPF	75 mm	400 mm	88	104
TC280/360	100 AT10 HP	100 mm	400 mm	88	104
TC280/360	150 AT10 HP	150 mm	400 mm	88	104

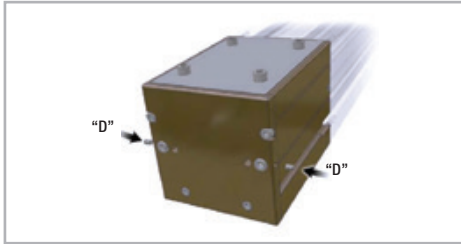
When non specified, please stick to intermediate values between 50% and 70%.



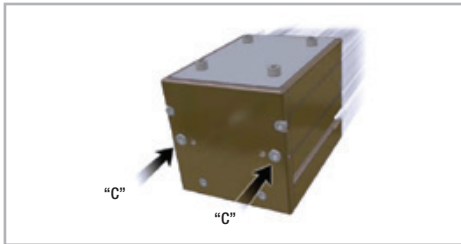
Should the tool indicate a lower value, increase the belt pre-tensioning until the given value is reached. Similarly,

reduce belt pre-tensioning should the value be higher.

> Belt tensioning - MCR/MCH



a. Loosen the two security STEI dowels "D".



b. Loosen the two indicated TCEI screws "C" until the belt is loosened. Subsequently, screw them until "tension 0" is reached (for "tension 0" is intended the traction before the belt starts tensioning).

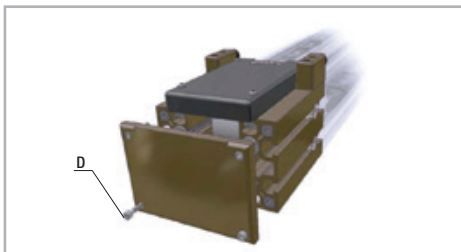
c. Screw in parallel the two TCEI screws "C" for 1/2 turn each time until the belt pre-tensioning is reached (see page 14).



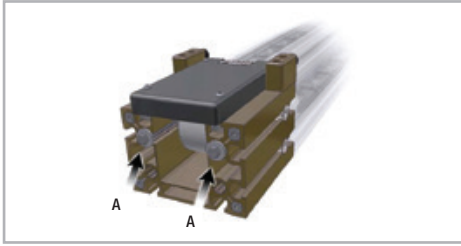
d. After tensioning, bring back the "D" screws in contact with the end plate.

e. Tighten again the security STEI dowels "D".

> Belt tensioning - TCR/TCS



a. Remove the cover from the side opposite to the start up unscrewing the screws "D".



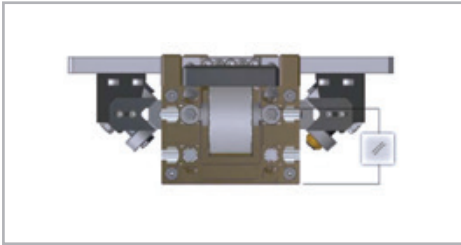
b. Loosen the two "A" (TE) screws until the belt is loosened. Subsequently, screw them until "tension 0" is reached (for "tension 0" is intended the traction before the belt starts tensioning).

c. Screw in parallel the two "A" screws for 1/2 turn each time until the belt pre-tensioning is reached (see page 15)

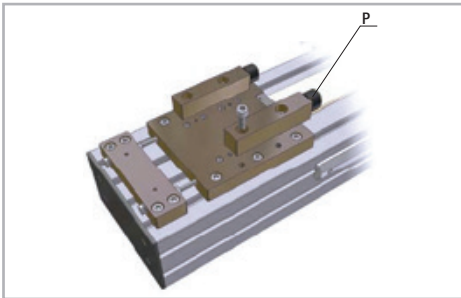
d. At the end of the adjustment place the "A" screws with two faces of the hexagon parallel to the greater side of the section bar as shown in the picture so that they may enter the specific anti-loosening housing on the inside of the cover.

e. Reassemble the cover.

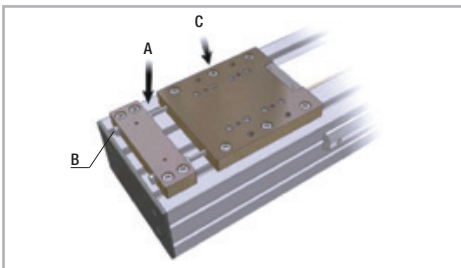
f. Tighten again the security STEI dowels "D".



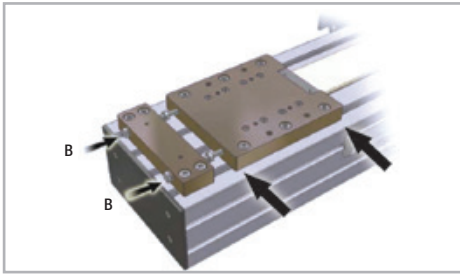
> Modules equipped with intermediate transmission pulley



a. Remove the end of stroke buffers "P" and related supports (Only in case they are directly taken back to the pre-tensioning plate)

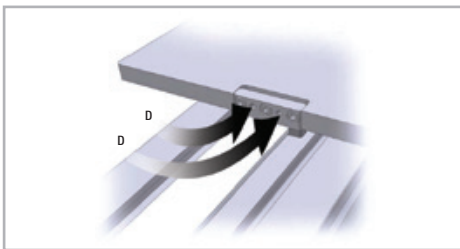


b. Loosen the 6 TCEI screws "C" onto the main plate and then loosen the nuts "A".

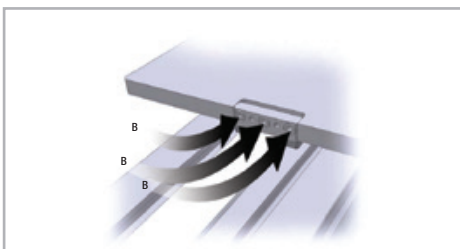


- c. Fully loosen the two highlighted "B" screws and then screw them until "tension 0" is reached (for "tension 0" is intended the traction before the belt starts tensioning). Screw in parallel the two "B" screws for 1/2 turn each time until the belt pre-tensioning is reached (see pg. 15).
- d. Block the "A" lock nut onto the pre-tensioning screws and, subsequently, tighten the 6 "C" screws.

> Modules with pre-tensioning on plate (Double motor head)

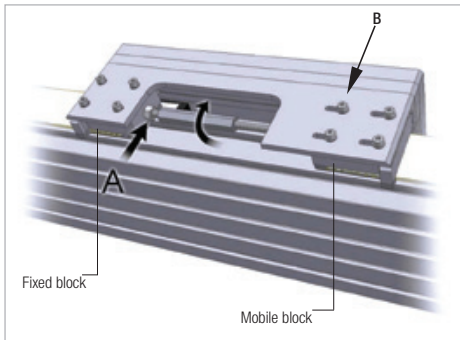


- a. Remove the TCEI screws "D".



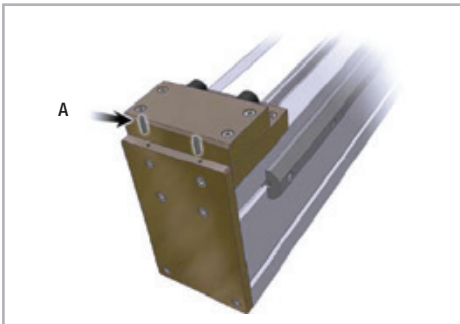
- b. Screw the three TCEI screws "B" to increase the belt pre-tensioning. Apply 1/4 turn to every screw, working in sequence, to give the same pre-tensioning value to each of them. (At the same manner, loosen any time it is wanted to take the pre-tension to the belt).
- c. Reassemble the TCEI screws "D" and block.

> Modules equipped with heads supporting pulleys rotated by 90°

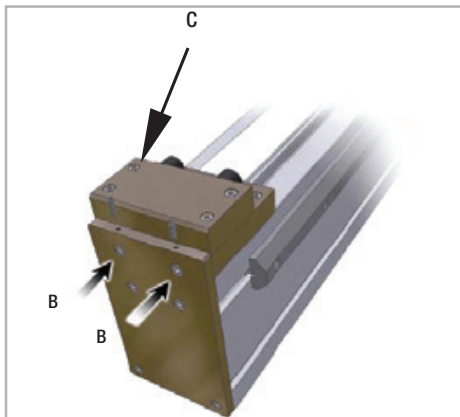


- a. Loosen the TCEI screws "B" without removing them.
- b. Loosen the tightening lock nut "A".
- c. Screw the hexagonal threaded bar to increase the belt pre-tensioning (hourly wise referring the fixed block as shown in the picture, see page 14 for the values).
- d. Once reached the correct pre-tensioning value close the blocking nut (A) and perform the checking as indicated on page 15.

> Belt tensioning - ZCR/ZCH



- a. Loosen the two security STEI dowels "A".

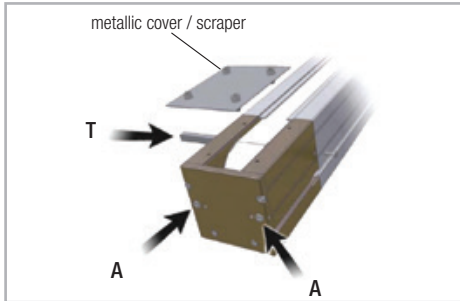


- b. Fully loosen the two TCEI screws "B" indicated and, then, screw them until **"tension 0"** is reached (for "tension 0" is intended the traction before the belt starts tensioning).
- c. Screw in parallel the two TCEI screws "B" for 1/2 turn each time until the belt pre-tensioning is reached (see pag. 15).
- d. When the correct pre-tensioning is reached, tighten the TCEI screws "C" and than the security STEI dowels "A".

Belt replacement

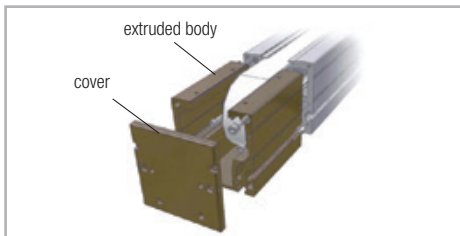


MCR/MCH

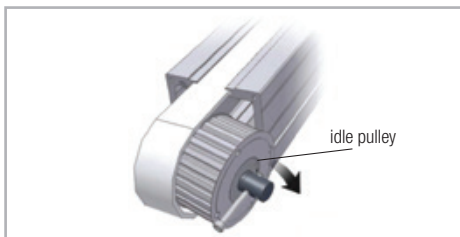


a. Reduce belt tension according to page 15, by fully loosening the two TCEI screws "A". In case of module equipped with security strap or linen-faced security ribbon, first follow the indications given in the next paragraph.

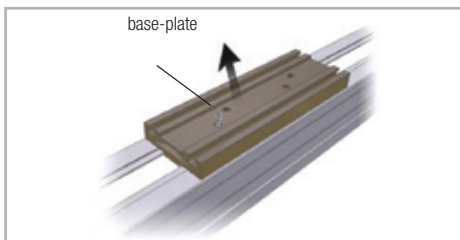
b. Remove the metallic cover/scraper and the extractable end stopper of the carriage "T".



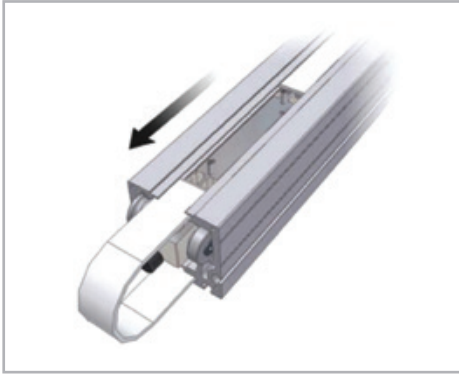
c. Remove the cover and the extruded body.



d. Remove the idle pulley extracting it laterally.

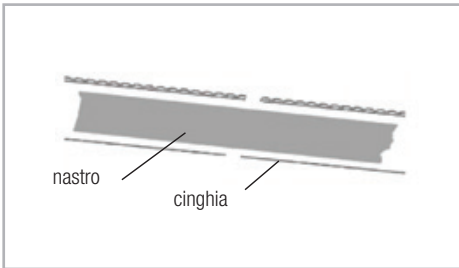


e. Remove the base-plate.



f. Push the carriage up to the free end to release the first end of the belt. After it, extract the carriage fully to free also the second end.

g. Join one end of the old belt with one end of the new belt by fixing them with adhesive tape on the back as shown on the side figure.



h. Pulling delicately, to avoid the detachment of the two ends, have the belt sliding through the motor head and the section bar until the used one is fully outside the module.

i. Reassemble the module following, in reverse order, the operations described in this paragraph, and finally pre-tension the belt as stated in the previous paragraph.



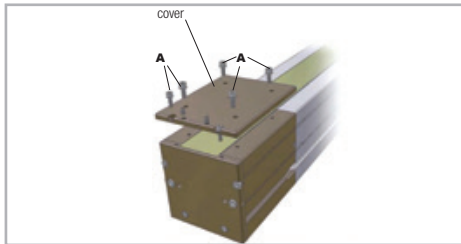
It is suggested to replace the belt of the vertical mounted axes (Z axes) every 2 (two) years, and that of the horizontal mounted axes (X or Y axes) every 3 (three) years. For belt replacement, please follow instructions at page 19 and following. The new belt must be identical to the one originally provided by the supplier of Partly Completed Machine to avoid any malfunction. **If not, the supplier of the Partly Completed Machine is not to be held responsible for eventual accidents, breakage or damages and their consequences on people, animals or goods related to a non-compliant replacement.** After the re-

placement, it is suggested to set the correct belt pre-tensioning. This verification must be done by means of an electronic tensiometer, as shown in the next paragraph.

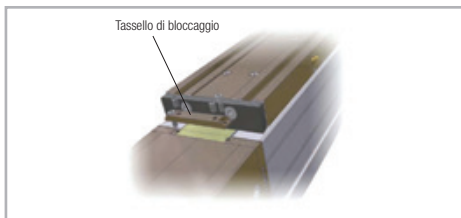
The values shown in the table are indicative, it is suggested to verify them by means of electronic tensioning as shown on page 17 and following. (Universal tool adopted for testing the belt tension: SM4).

For the proper belt pre-tensioning in application subject to strong stress (high accelerations, emergency decelerations, collisions and cycles with swift reversal of movements) please contact our technical department for verification.

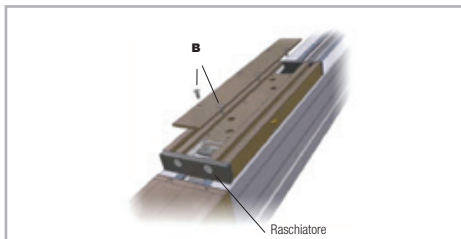
> Protection strip replacement (stainless steel and/or linen-faced strip) - MCR/MCH



- a. Loosen the screws "A" and de-assemble the upper cover of the idle head to free the first side of the protection strip.

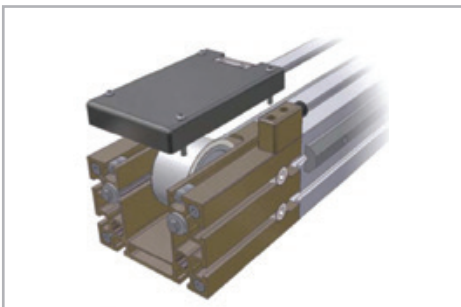


- b. Loosen the screws "B" and de-assemble the small block on the side of the head to free the second end of the protection strip.

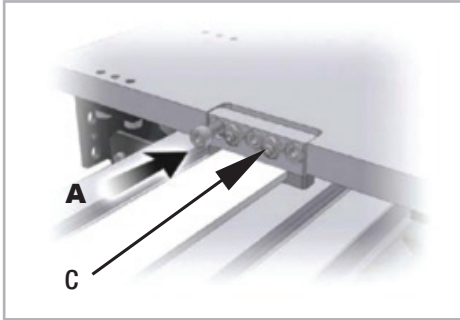


- c. Extract the strip.
d. Repeat steps in reverse to replace the protection strip.

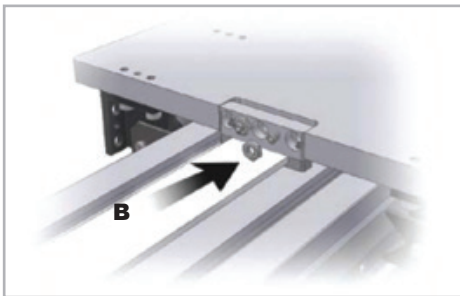
> TCR/TCS and version with middle pre-tensioning.



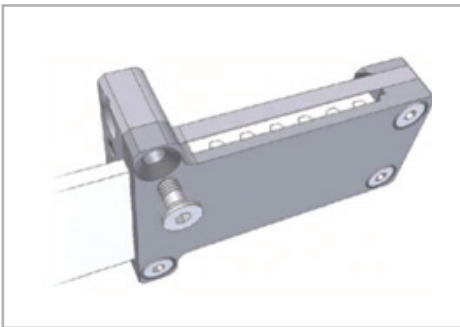
- a. Remove the covers and take the tension away from the belt according to page 15. (Follow the instructions given in paragraph 5D in case of intermediate pre-tensioning).



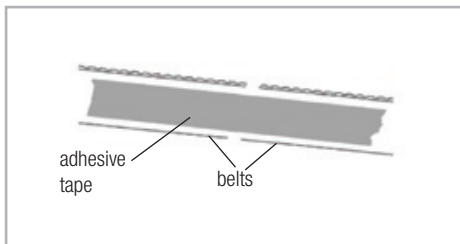
- b. Loosen the dowels "C" and remove the TCEI screws "A" onto the two belt fastening blocks.



- c. Loosen the nuts and the STEI screws "B" until the two belt fastening blocks are free.

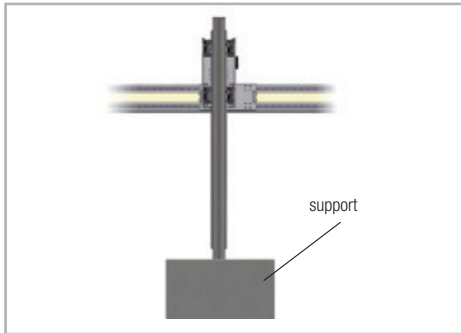


- d. Free the belt ends from the fastening assemblies.
- e. Join one end of the old belt with one end of the new belt by fixing them with adhesive tape on the back as shown on the side figure.
- f. Pulling delicately, to avoid the detachment of the two ends, have the belt sliding through the motor head and the section bar until the used one is fully outside the module.



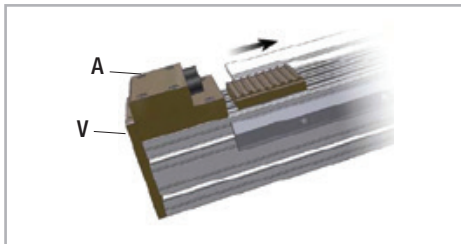
- g. Reassemble the module following, in reverse order, the instructions given in this paragraph, and finally pre-tension the belt as stated on page 15 (page 16 in case of intermediate pre-tensioning).

> ZCR/ZCH

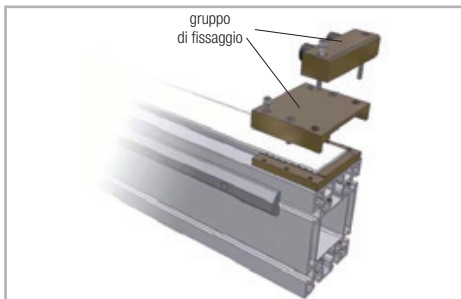


a. Take tension away from the belt according to page 18.

(CAUTION - if the ZC module is positioned vertically, before starting any intervention it is necessary supporting the vertical axis from the bottom).

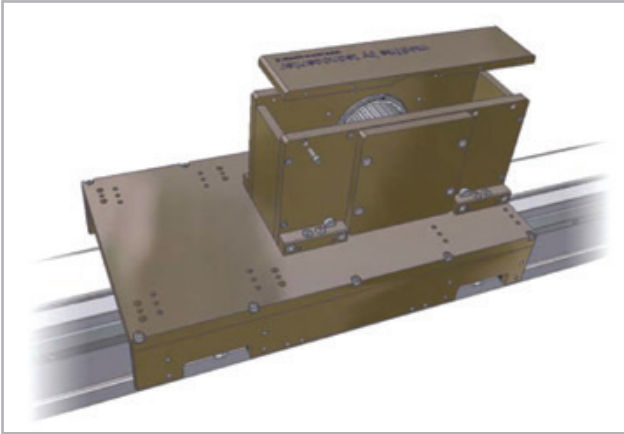


b. Fully loosen the TCEI screws "A" without removing them. Then loosen the TCEI pre-tensioning screws "V" and extract the toothed small block to free the first end of the belt.

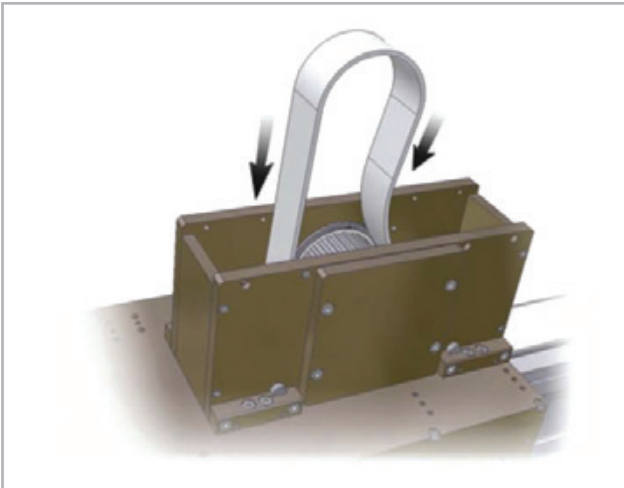


c. Free the second end by unscrewing the fastening assembly as shown in the picture aside.

d. Extract the belt.



- e. Remove the upper cover of the motor head to access the pulleys.

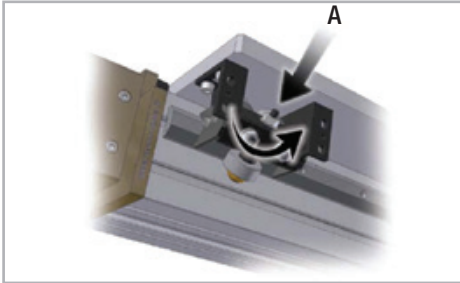


- f. Put a new belt and reassemble the module following, in reverse order, the instructions given in this paragraph.
- f. Pre-tension the belt according to the instructions on page 18.

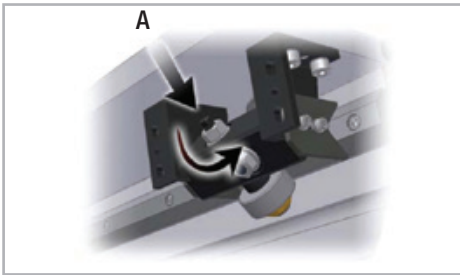
Pre-loading rollers adjustment



> 2 and 3 roller sliders (TCR / ZCR).

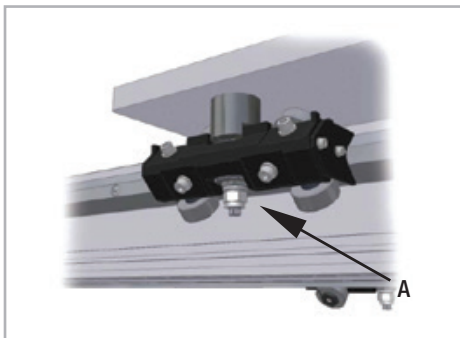


- a. Loosen the clamping nut "A". Verify the contact between the concentric rollers and the guide raceways.

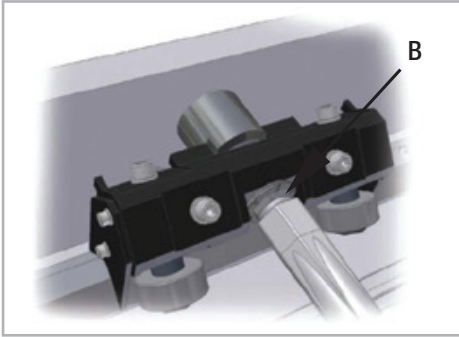


- b. Register the eccentric rollers with a dedicated CH.6 key until the perfect contact between rollers and rails allows absence of any clearance and free sliding of the slider on the rail.
- c. Block by closing the nut again.

> Tilting sliders (TCR)

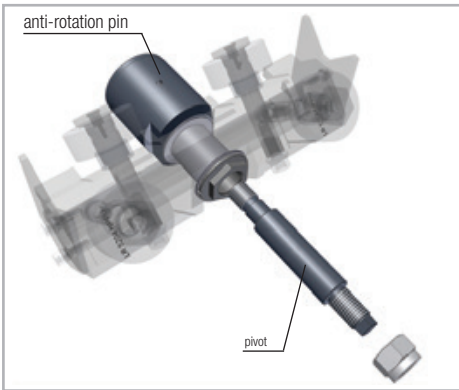


- a. Loosen the clamping nut "A".



b. Rotate the eccentric bushing "B" through the specific exagonal key CH.30 until the perfect contact between rollers and rails allows absence of any clearance and free sliding of the slider on the rail.

c. Block by closing the nut again.



Notes for assembly:

In case it is necessary to replace a roller, remove the slider from the pin body. To do this, follow these instructions:

- Remove the locking nut;
- Loosen the anti-rotation;
- Remove the bolt by turning the shear key.

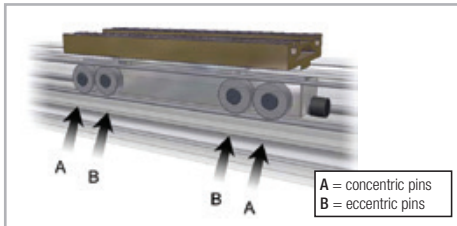
At this point you can remove the slider body, complete with bushing.



WARNING!

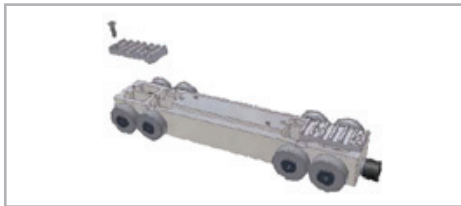
Removing the slider body, will make unstable the movable carriage of the linear axis. It is therefore mandatory to block it in advance.

> Roller carriages (MCR)



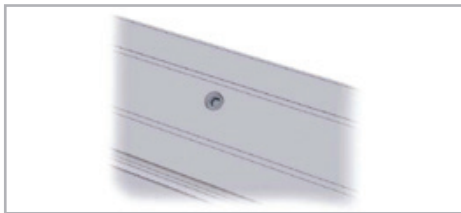
IMPORTANT!

The rollers under letter **A** are assembled onto concentric pins while those under letter **B** onto cam pins.

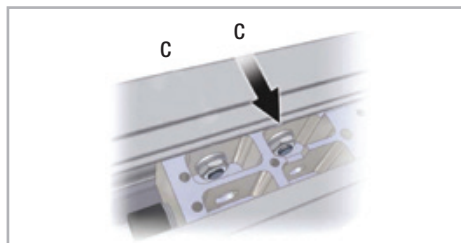


a. Extract the belt as shown on page 19.

b. Remove the toothed platelets on both ends of the plate.



c. Remove the plastic caps on the sides of the profile and push the carriage until the eccentric pins "B" inside the hole can be seen.



d. Loosen with a CH.13 key the clamping nuts "C" pointed by the arrow (only for eccentric pins).

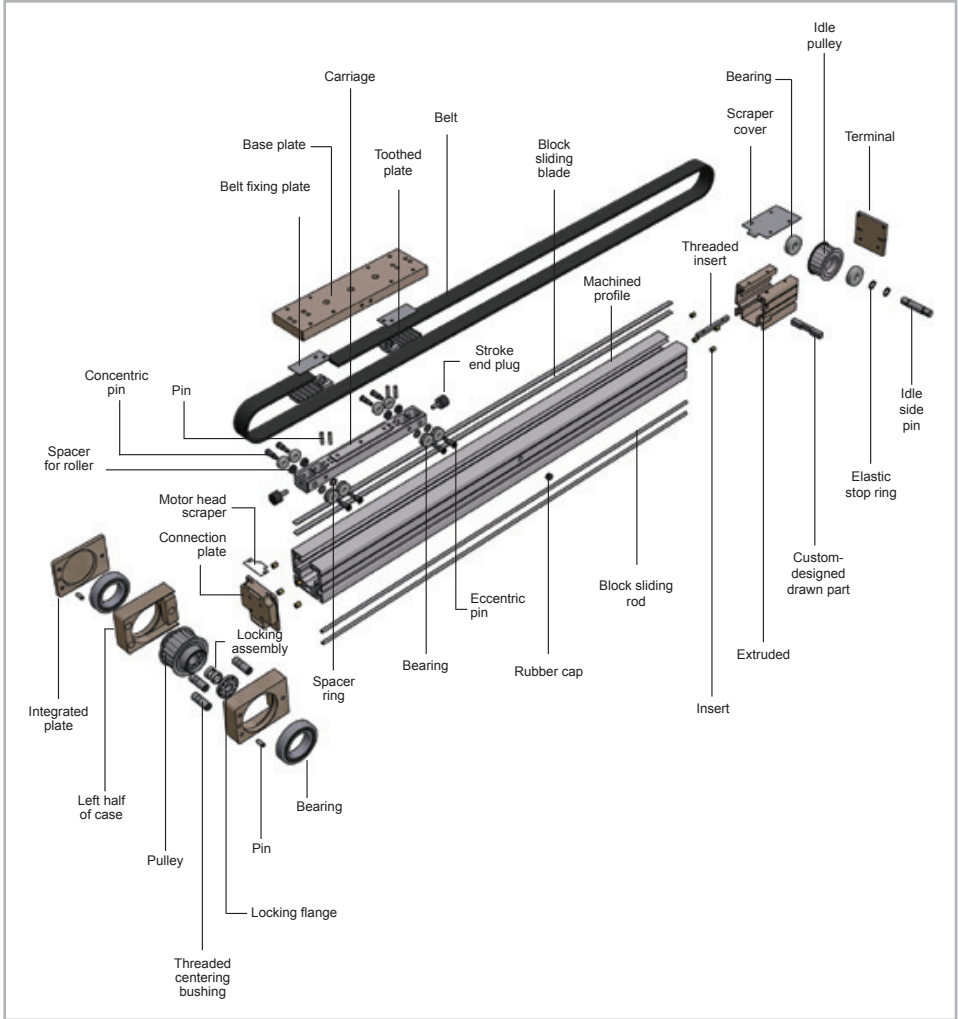


e. Using a CH.5 key rotate the eccentric pins to reach a light pre-loading, going through the side holes of the profile.

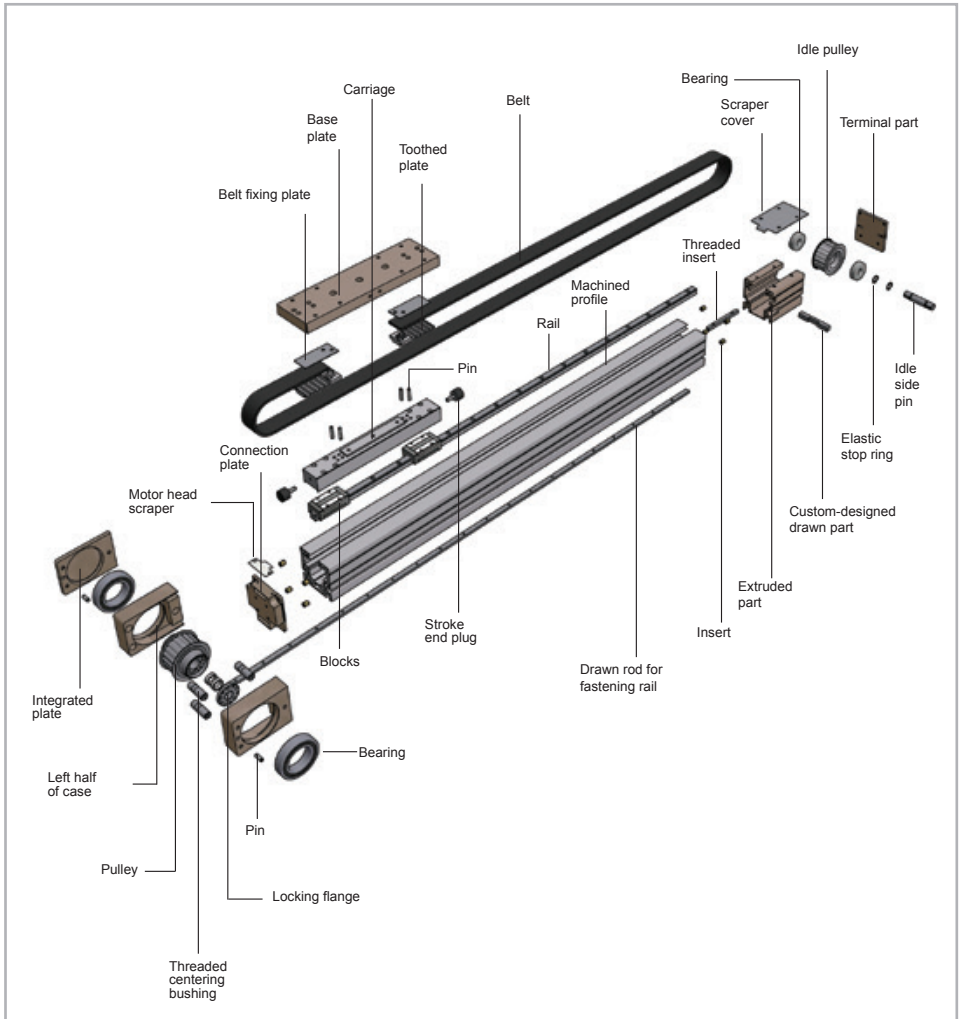
f. Once the adjustment is over, block and re-assemble following the instruction in reverse order.

List of spare parts 

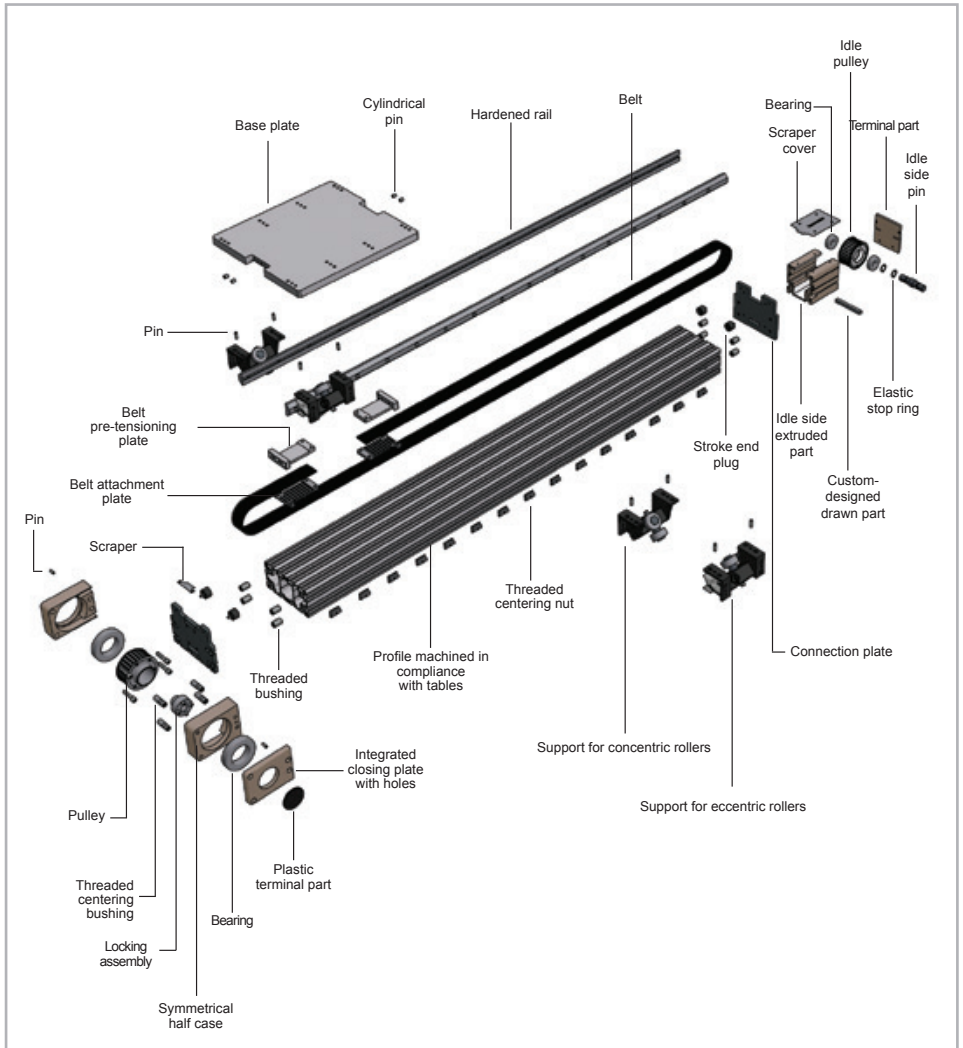
> MCR

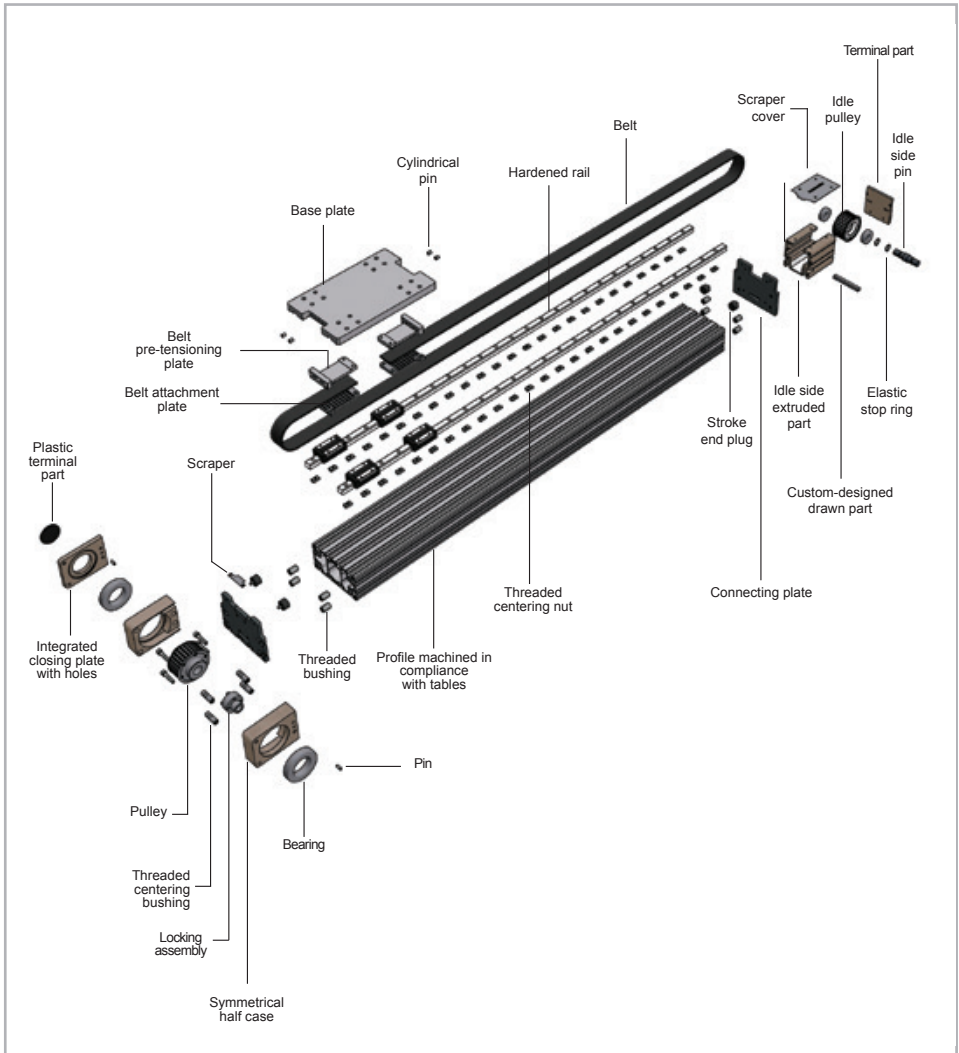


> MCH

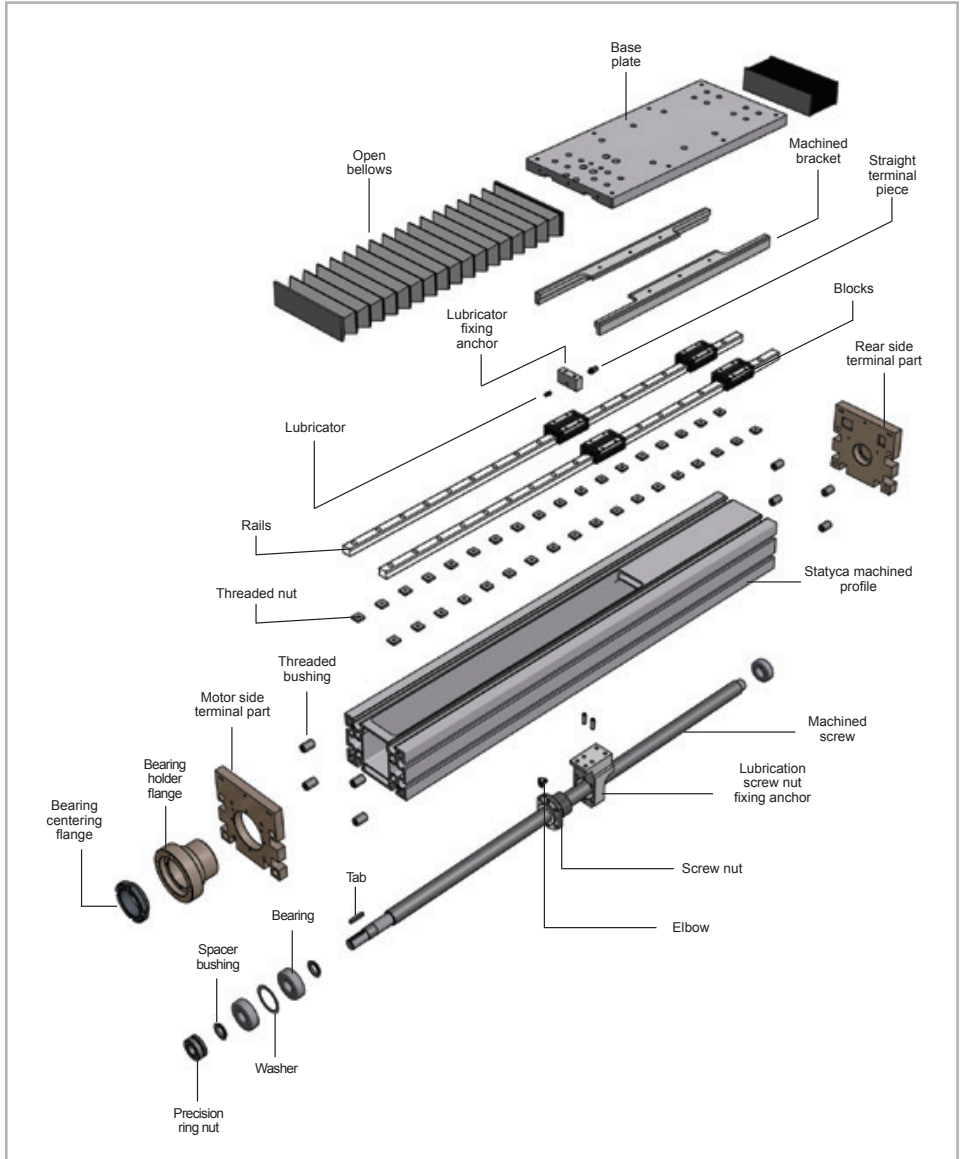


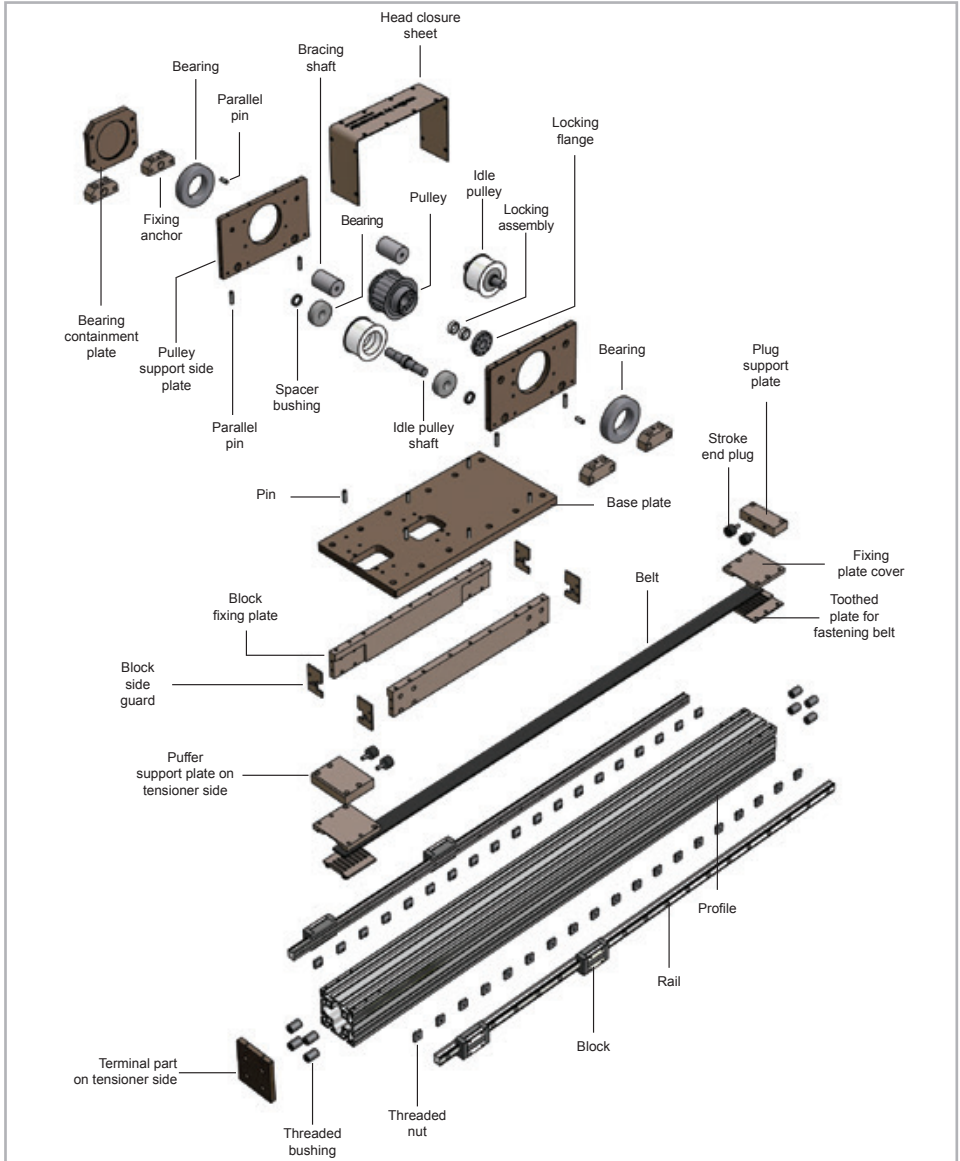
► TCR



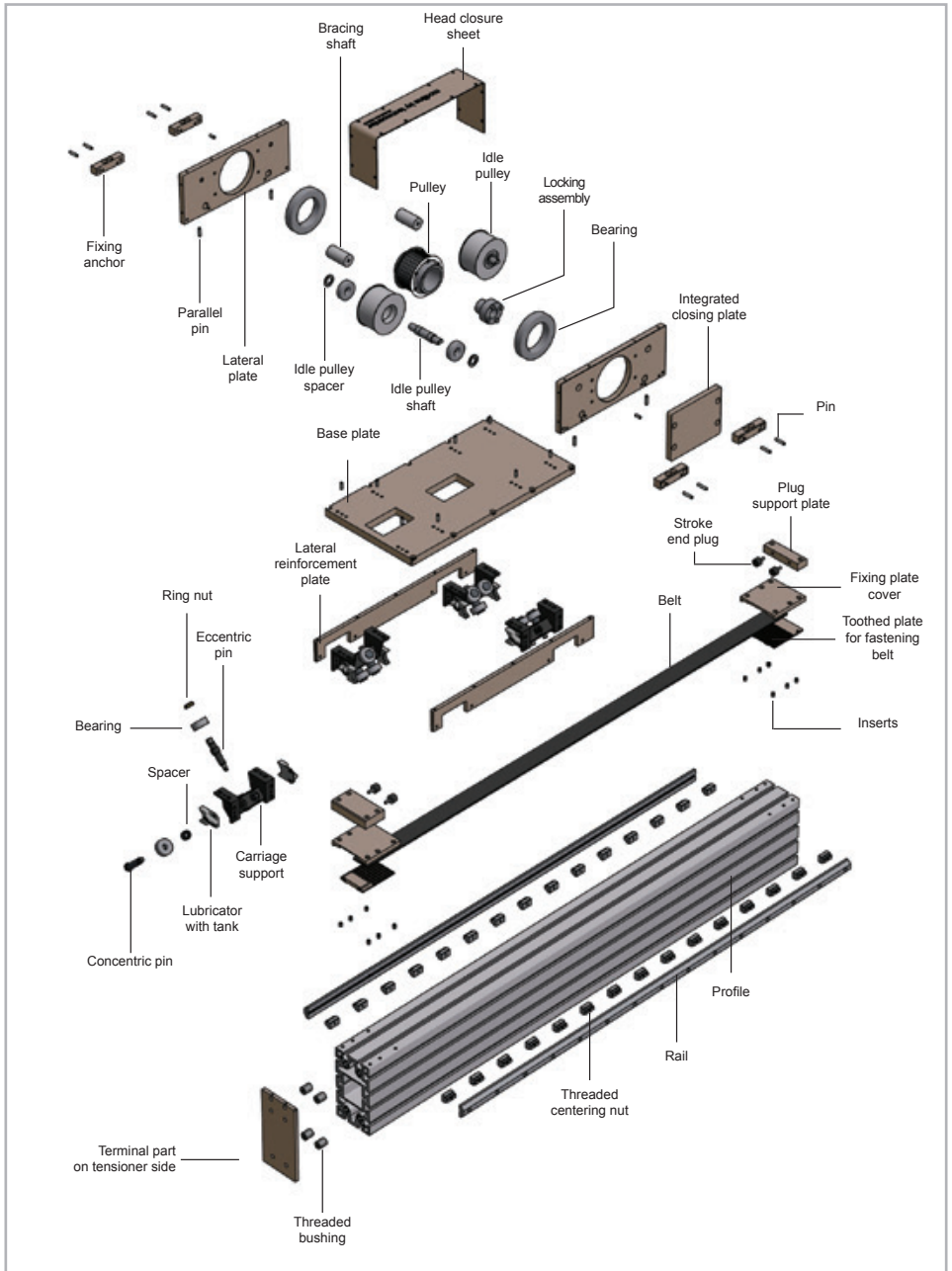


> TVS





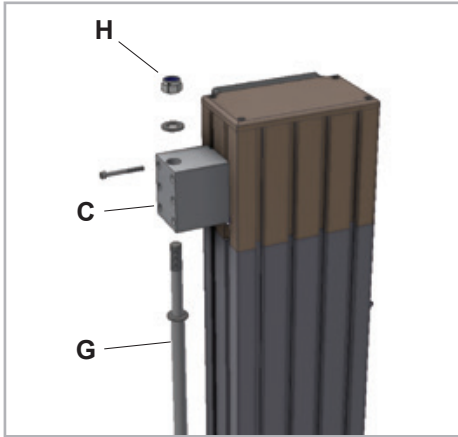
> ZCR



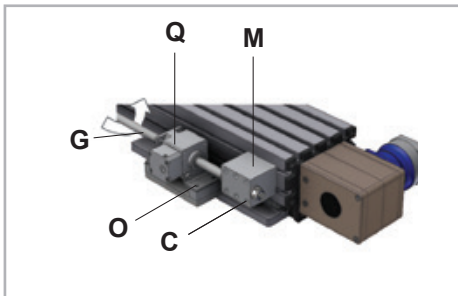
Assembling and de-assembling



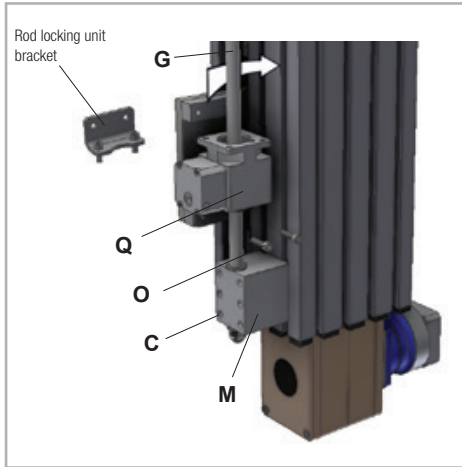
> Disassembly and replacement of the rod locking unit safety system (optional)



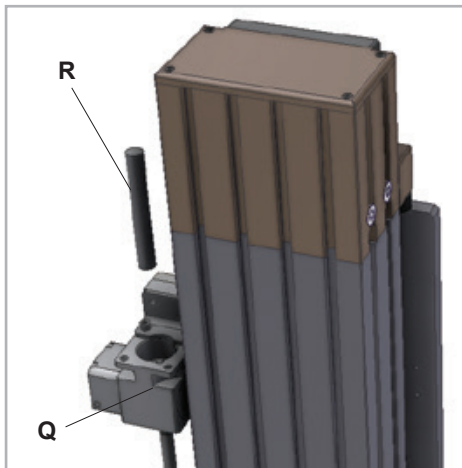
- a. Block the component subject to movement (plate or vertical profile, depending on the assembly) by positioning it at its lowest stroke end position, without removing pneumatic pressure from the "Q" rod locking unit.
- b. Loosen the "H" self-blocking nut, on the opposite side of the axis. This nut is not tightened with torque, and must remain loose even after the replacement work is finished to guarantee that the rod can slide inside the "Q" rod locking safety system.

**IMPORTANT!**

Consult the specific user and maintenance manual of the rod locking unit described in this document for complete maintenance instructions and safety information about this rod locking unit anti-fall safety system.

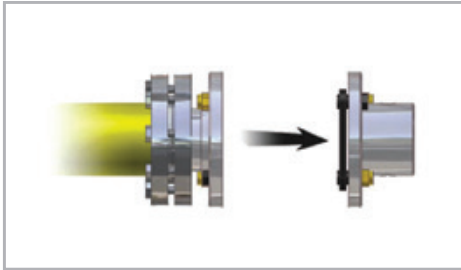


- c. Loosen the fixing screws “C”, and be careful to not un screw them completely, so that the assembly anchors will not fall into the hollow part of the machine.
- d. Rotate the lateral bar “G” as shown by the arrow in the figure, accompanying the “M” support bracket towards the end, until it comes completely out of the vertical profile.



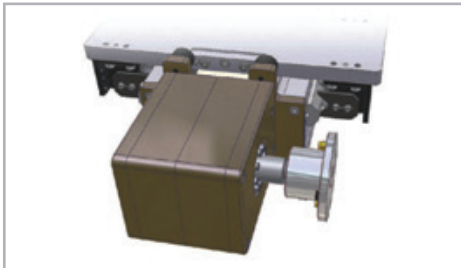
- e. Unscrew the “O” screws holding the “Q” rod locking unit bracket on the base plate and that fasten this bracket to the upper part of the safety system.
- f. Remove the bracket of the “Q” rod locking unit
- g. Raise the pressure in the pneumatic system to cause the “Q” rod locking unit to slide towards the end of the profile. Before extracting it completely, insert a piece of rod the same size as the part being removed to prevent damage to the internal blocking system.
- i. Replace the old rod locking unit with a new one.
- l. Perform the steps in reverse order to mount the new part.

> Connecting shafts



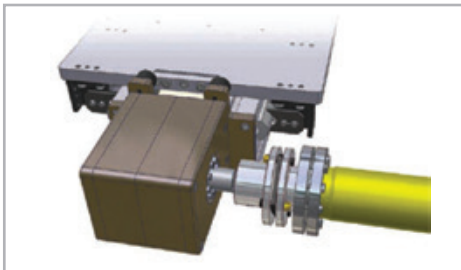
For all the assembling

De-assemble the two ends of the shaft at the joint by blades.

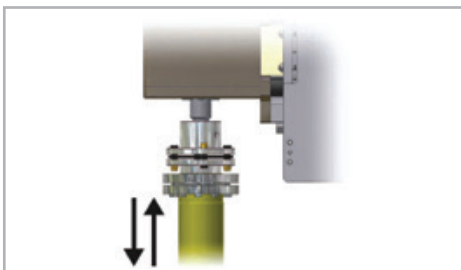


Insert the first end of the shaft into the motor head of the motor-equipped module.

Insert the second end of the shaft in the motor head of the duct module.



Reassemble the half-joint connecting pipe, place the blades with the utmost care, enter the bolts, insert the self-blocking nuts (replace them if worn) and block.

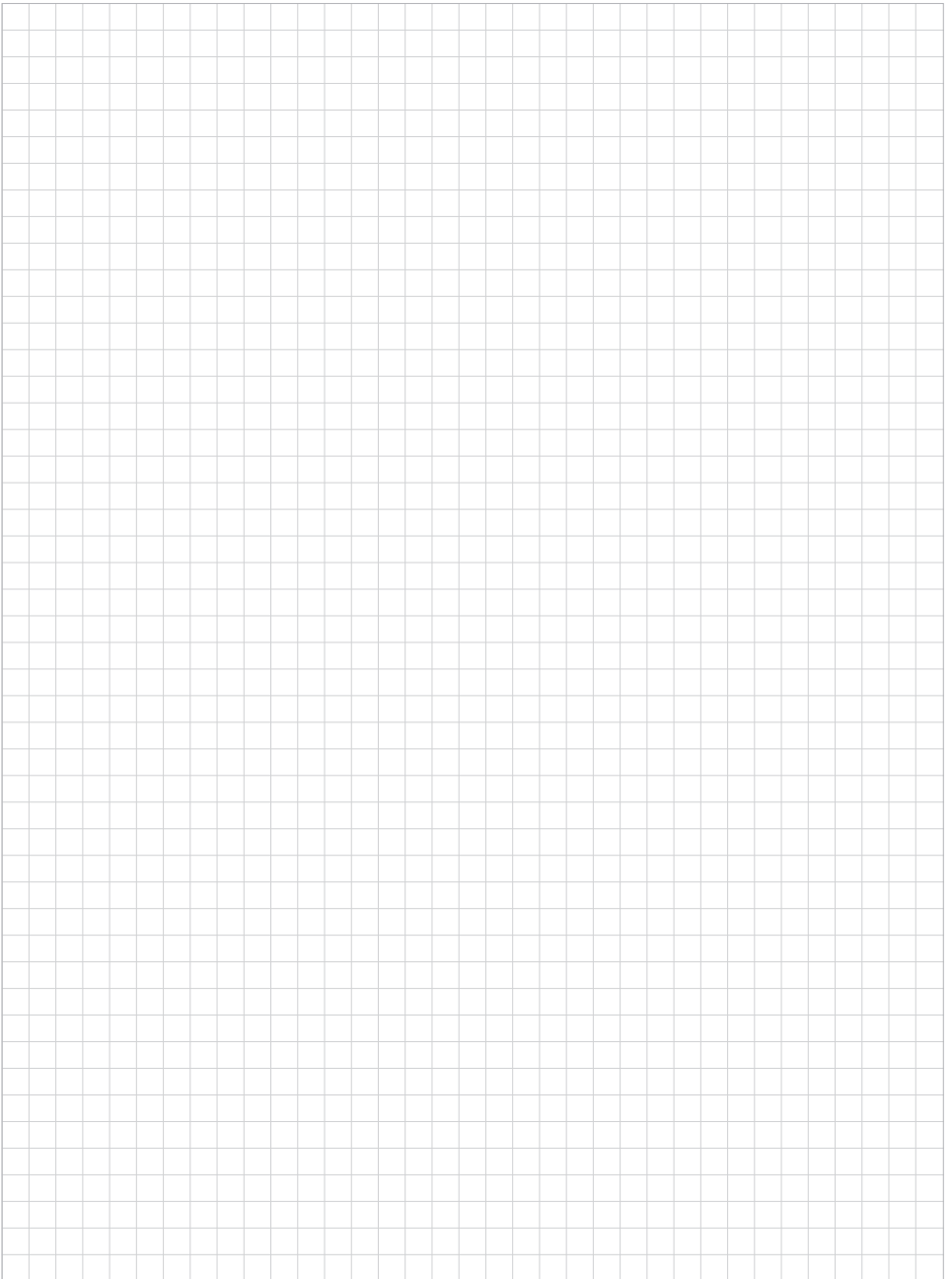


Place the assembly in a way as to keep a distance of about 35-mm so to block the shrink disc screws of the main module.

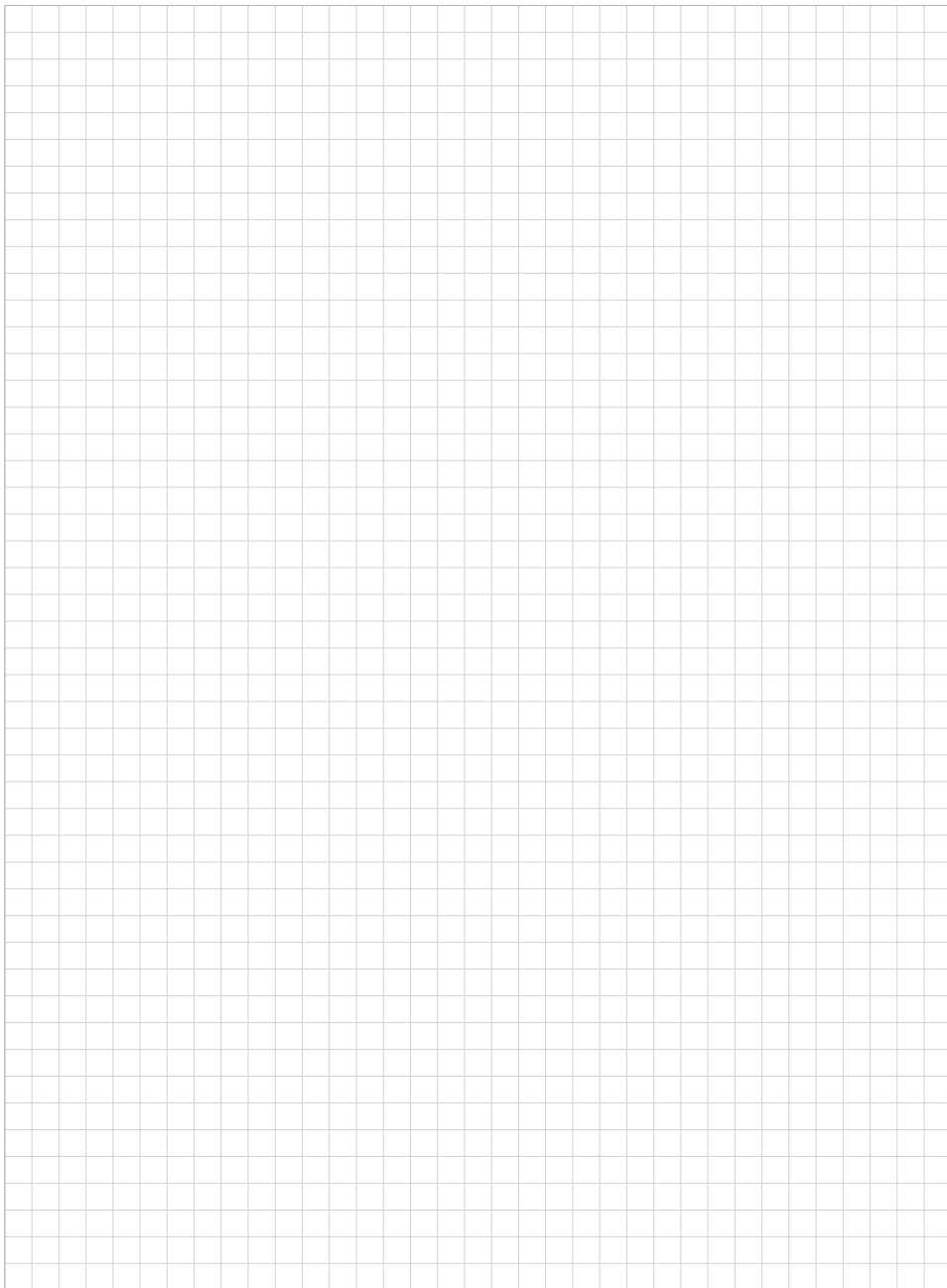
Align the modules and, finally, block the shrink disc:

- Motive head side
- Block the head side pipe shrink disc

Notes 



Notes





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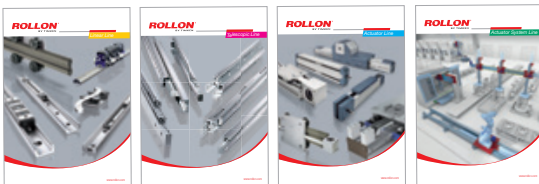
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