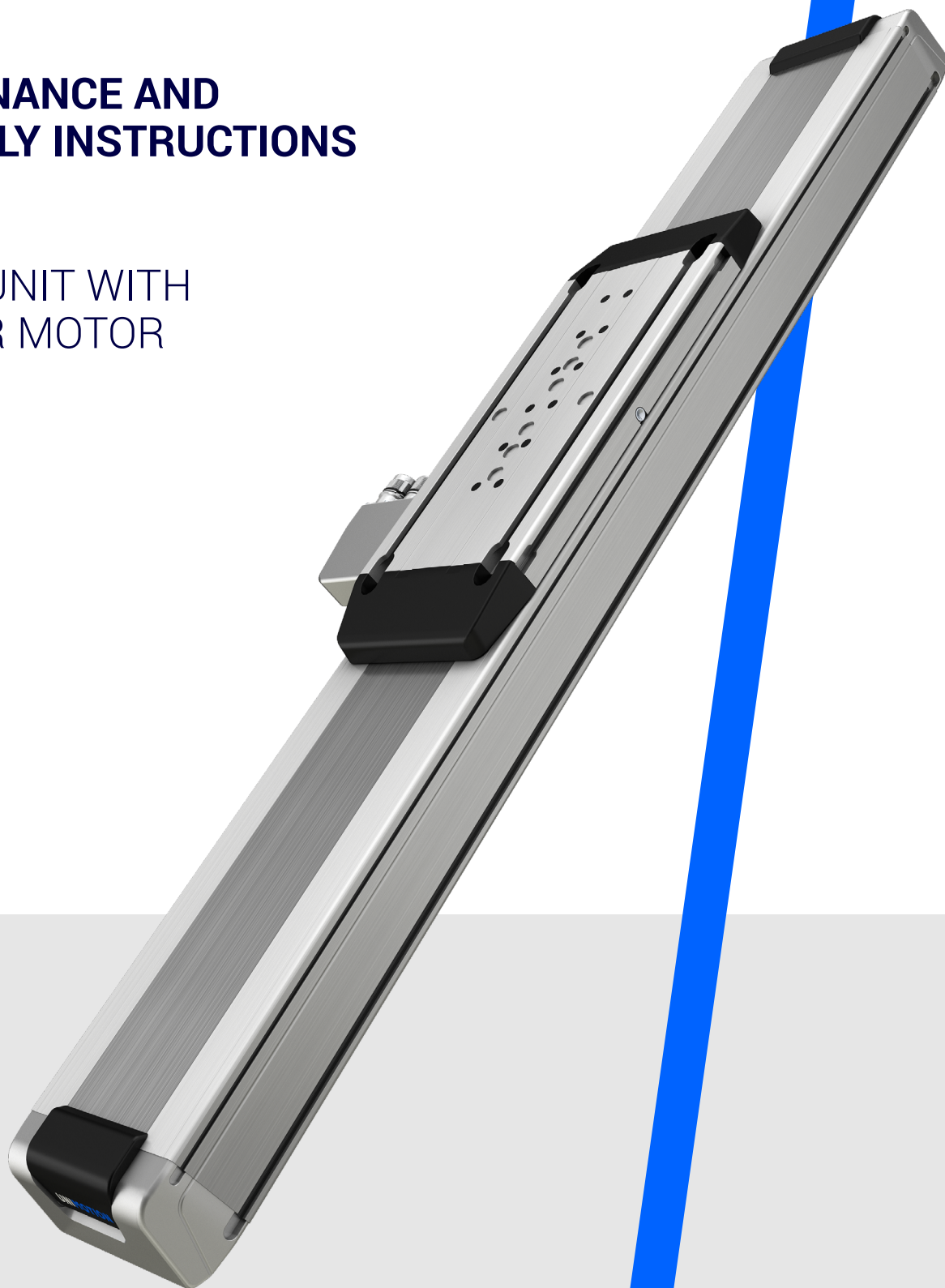


UNIMOTION

MAINTENANCE AND ASSEMBLY INSTRUCTIONS

CTL

LINEAR UNIT WITH
A LINEAR MOTOR



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GENERAL INFORMATION







It is important to read this instruction manual before handling the product. Otherwise, the product might get damaged.

In this instruction manual, the CTL linear unit (with or without the preassembled standard energy chain assembly) is designated as a product.

AVAILABLE DOCUMENTS FOR THE PRODUCT

CTL (linear unit with a linear motor)	Catalogue
LMCA (linear motors)	Catalogue

USED SYMBOLS

	Remark, note
	Warning!
	Danger! Risk of coming into contact with power conducting parts! The power supply must be disconnected!
	Danger! Strong magnetic field. Can be harmful to pacemaker wearers. Persons with implants that can be influenced by magnetic field must keep a safety distance of at least 1 m from the linear unit. Risk of injury or damage from metal parts or parts made of materials with magnetic characteristics.
	For more information, please refer to the specified documentation
	Use different tightening torque as it is presented in the section "Recommended tightening torques"

INTENDED USE

CTL linear unit combines rail guides and direct linear motor drive. It is used for accurate positioning of loads within an automated system. Because of the linear motor drive the CTL linear unit is especially suited for applications with high dynamics and precision.

RECOMMENDED TIGHTENING TORQUES

Recommended tightening torques of the screws

Tightening torque (8.8)	Thread size						
	M2	M2,5	M3	M4	M5	M6	M8
$M_{A, \max}$ [Nm]	0,4	0,7	1,3	2,8	5,6	9,6	23,0

Table 1: Recommended tightening torques of the screws of strength class 8.8.

GENERAL SAFETY INSTRUCTIONS

To ensure the right functionality of the product, it must be handled with care. It is not allowed to put any tools or any other items, which can cause damage to the product, on the product. The product must be protected from liquids.

For information on the conditions in which the product can operate, please see the section "Operating conditions" or contact us. If the product isn't in use, place it in a dry, clean environment and cover it to prevent damage.

SAFE OPERATION

The product must not be put into service until the final machinery, into which it is installed, has been declared in conformity with the appropriate machinery directives. Each operation of the product, that is not in compliance with its intended use, can lead to the product being damaged, or can cause accidents and at the same time stoppages in production. To ensure a safe operation, please refer to this instruction manual and the operating manuals of machinery, where the product is or will be integrated.

Requirements for personnel

The product may only be installed, operated, maintained, repaired or dismantled by appropriately qualified personnel. All qualified personnel must have read and understood this instruction manual.

Checking the product

In accordance with the safety directives, the operating company must subject the product to thorough checking prior to putting it into operation, after carrying out repairs, and after malfunctions have occurred.

MODIFICATION OF THE PRODUCT

The product must not be modified without our written consent. Any unauthorized modification will result in void warranty of the product. Only repair work detailed in this instruction manual may be carried out.

LABELS AND NOTICES

All notices and labels attached to the product must be fully visible, undamaged and must not be removed. Damaged or illegible labels and notices must be replaced.

WARRANTY

The warranty conditions are specified in the terms and conditions of delivery and payment issued at the time of order. Warranty cover will be annulled if:


- the product is not operated in accordance with the intended use,
- the instructions set out in this operating manual are not followed,
- the product is modified without the consent of the manufacturer,
- the screws sealed by locking varnish are unlocked.


The manufacturer's warranty remains valid only if original replacement parts are used for repair.

OPERATING CONDITIONS

Ambient temperature	0 °C ~ +50 °C
Ambient temperature without a preassembled standard motor	0 °C ~ +60 °C
Protection class	IP40
Duty cycle	100 %

Table 2: Operating conditions.

 In case of special operating conditions, please contact us.

 For the values of the maximum permissible axial load, lateral forces and moments, travel speed and acceleration, please refer to the product catalogue CTL (linear units with a linear motor).

 **Overloading**

Overloading the product can lead to the product being damaged.

 **Proximity of strong magnetic field**

Strong magnetic field from external source can damage magnetic linear scale of the measuring system.
Maximum magnetic field strength from external source around the CTL linear unit must not exceed 50 mT.

PRODUCT DESCRIPTION

STRUCTURAL DESIGN

Without a standard energy chain assembly

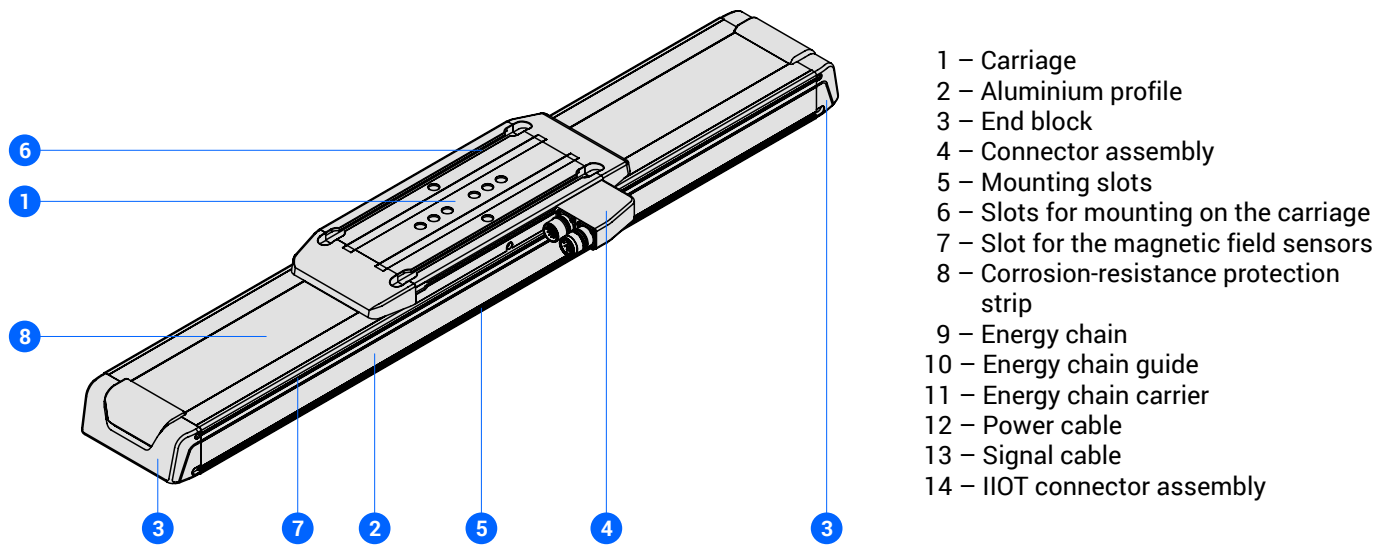


Figure 1: CTL linear unit.

With a standard energy chain assembly

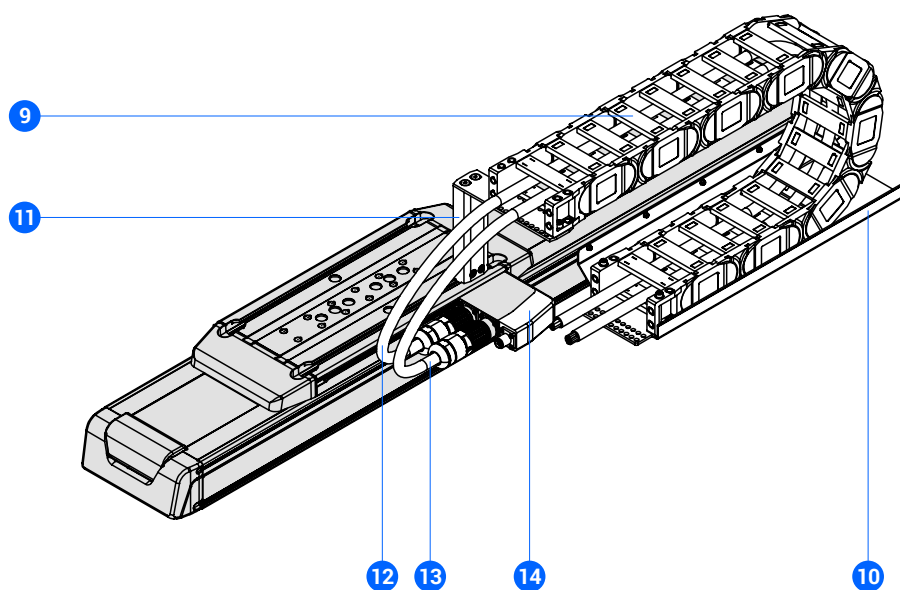
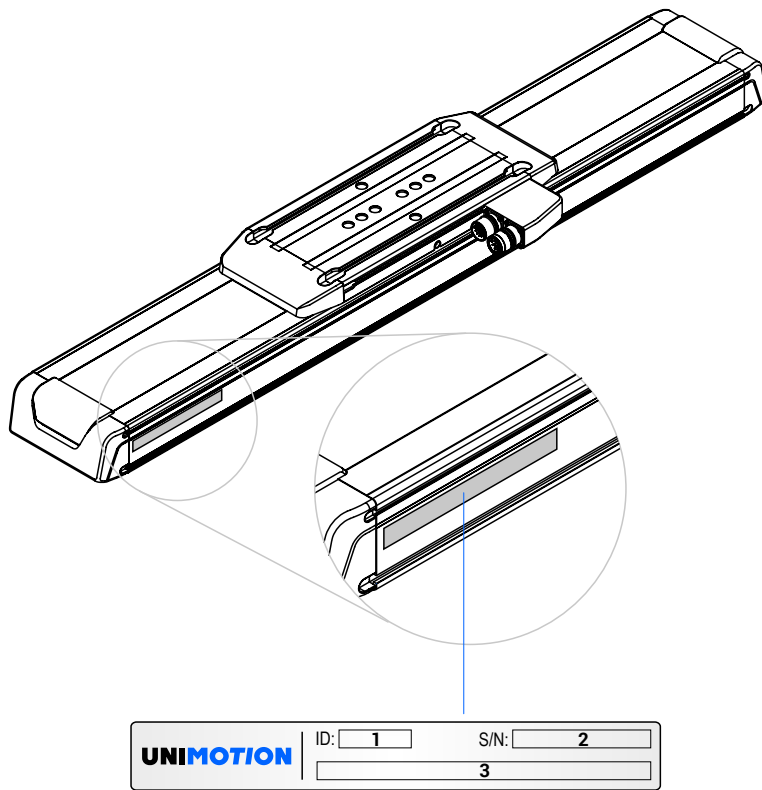


Figure 2: CTL linear unit with energy chain and I/IOT module.

IDENTIFICATION LABEL



- 1 – ID number
- 2 – Serial number
- 3 – Product ordering code

i The label attached to the product must be fully visible, undamaged and must not be removed. Damaged or illegible labels and notices must be replaced.

Figure 3: Identification label of the product.


TRANSPORT AND STORAGE

TRANSPORT


The product is carefully packed for its safe transportation.

To correctly move the product, please consider the following handling instructions:

- the CTL linear unit must only be lifted by the aluminium profile. The profile of the linear unit must be sufficiently supported so that it does not warp,
- the product must never be lifted by the carriage. The carriage is not fixed when linear unit is not powered,
- when transporting CTL linear unit in vertical or inclined position fix the carriage to the profile, or put the carriage into lowermost position,
- during carrying, the product must be prevented from swinging and dropping,
- the product weight must be taken into account.

 **Never stand under the product being carried or transported!**

Risk of serious injury or even death.

 For the product weight calculations, please refer to the product catalogue CTL (linear unit with a linear motor).

STORING THE PRODUCT

The product needs to be stored in a dry and roofed place and protected against corrosion and humidity. Make sure that there is no danger of the product getting damaged. Duration of storage should be as short as possible.

MOUNTING

MOUNTING OPTIONS

Mounting the product

i For the mounting accessories, please refer to the product catalogue CTL (linear unit with a linear motor).

i Accessories are not pre-assembled to the product in the factory before shipment.

⚠ Risk of coming into contact with power conducting parts!
During the mounting procedure, the power supply should be disconnected and secured against connection!

⚠ Unexpected movement of the components
Risk of serious injury or even death.
During the mounting procedure, prevent the carriage of the product from dropping due to the no self-locking effect of the linear motor drive of CTL linear unit.

⚠ Strong magnetic field.
Can be harmful to pacemaker wearers. Persons with implants that can be influenced by magnetic field must keep a safety distance of at least 1 m from the linear unit.
Risk of injury or damage from metal parts or parts made of materials with magnetic characteristics.
Strong magnetic field may influence or destroy electronic components in close proximity of the CTL linear unit.

⚠ Never use mounting points other than those presented
The product can be mounted only by the presented points (see Figure 4), otherwise the product may get damaged.

⚠ Avoid a collision of the mounting screws and the product
There must never be a collision between the mounting screws and the product, otherwise the product may get damaged. The length of the mounting screws must be selected properly.

i For the mounting slots' dimensions of the product please refer to the product catalogue CTL (linear unit with a linear motor).

- The product can be mounted as follows (see Figure 4):
- 1 – by the side slots of the aluminium profile (by using the clamping fixtures)
 - 2 – by the T slots on the bottom of the aluminium profile² (by using T-slot nuts)
 - 3 – by the T slots on the top of the carriage (by using T-slot nuts)
 - 4 – by the side slots on the carriage (by using the clamping fixtures)

¹ Clamping fixtures and T-slot nuts are the product accessories.
² Available on CTL 200 and CTL 250.

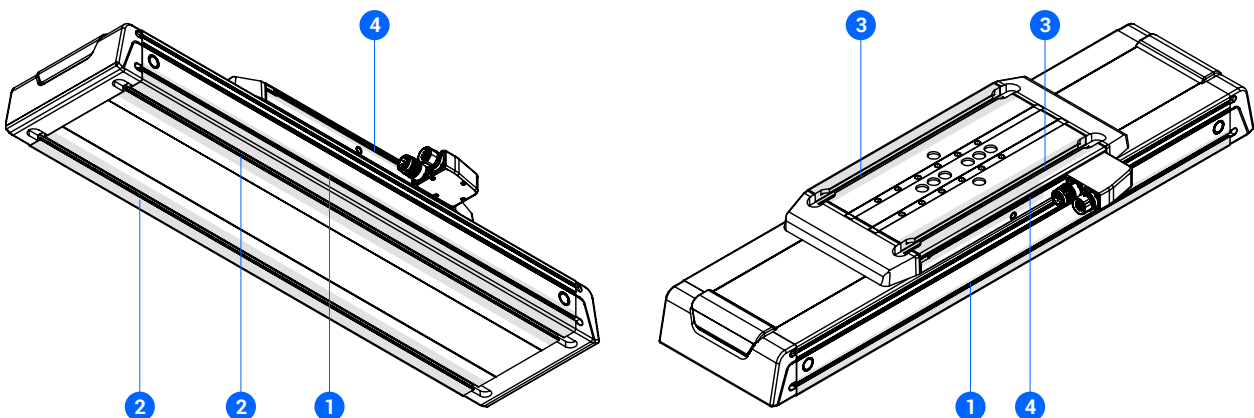


Figure 4: Mounting the CTL linear unit.

i Flatness of the mounting surface:

- below the aluminium profile: 0,1 mm / 500 mm of profile length,
- above the carriage: maximum 0,02 mm.

i For information on the deflections of the unsupported profile please refer to the product catalogue CTL (linear unit with a linear motor) section: Technical data.

Mounting an attachment

⚠ Never use other attachment points as it is presented

The attachments must only be mounted on the presented points (see Figure 4), otherwise the product may get damaged.

⚠ Avoid a collision of the mounting screws and the product

There must never be a collision between the mounting screws and the product, otherwise the product may get damaged. The length of the mounting screws must be selected properly.

📖 For the mounting holes dimensions of the product and accessories, please refer to the product catalogue CTL (linear unit with a linear motor).

⚠ Avoid collision between the attachment and the product

There must never be a collision between the mounted attachment and the product, otherwise the product may get damaged.

ORIENTATION

Linear unit CTL is intended to be mounted in a horizontal position. The carriage, when the linear unit is not powered, does not have brakes or enough friction to be held in place when mounted in inclined or vertical position.

Certain difficulties may also occur during initial start-up in inclined or vertical position. It is recommended that outside weight compensation or brake is used for inclined or vertical operation.

📖 For the mounting accessories, please refer to the product catalogue CTL (linear unit with a linear motor).

⚠ Unexpected movement of the components

The carriage may move unexpectedly when the CTL linear unit is in vertical or inclined position.

PERMISSIBLE LOADS

⚠ Overloading

Overloading the product can lead to the product being damaged.

📖 For the values of the maximum permissible axial load, lateral forces and moments, drive torque, travel and rotational speed and acceleration (of the product and the product accessories), please refer to the product catalogue CTL (linear unit with a linear motor).

⚠ The carriage or the aluminium profile must not be subjected to the loads causing its warping

The improper mounting of the attachment to the carriage or the aluminium profile can cause the carriage or the aluminium profile being warped (Figure 5), respectively. In such case, the service life of the product can be drastically decreased. The permissible flatness of the mounted or attached surface must be taken into consideration, please refer to the section regarding the mounting options.

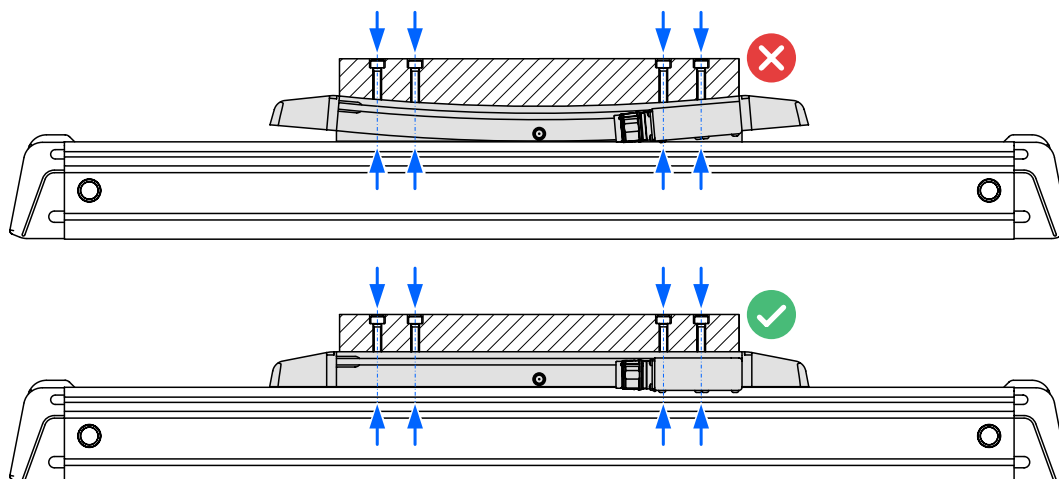


Figure 5: Warping of the carriage.

ACCESSORIES – OVERVIEW

i For information about materials, dimensions and the maximum permissible loads of the accessories, please refer to the product catalogue CTL (linear unit with a linear motor).

i Accessories are not pre-assembled before shipping.

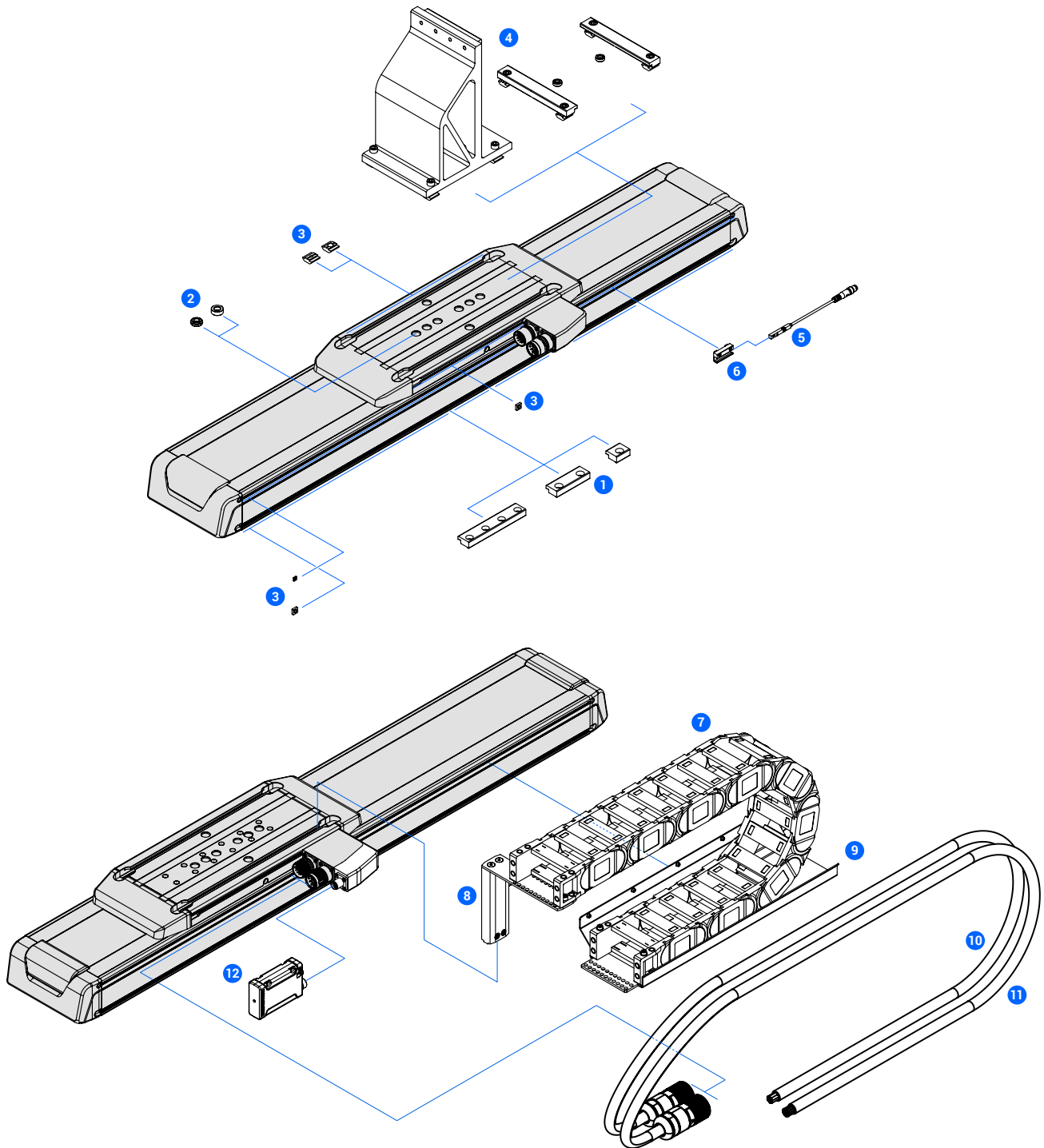


Figure 6: Overview of the CTL accessories.

#	Accessories	
1	Clamping fixtures	Mounting attachment accessories
2	Centering rings	
3	T-slot nuts	
4	Connection plates	
5	Magnetic field sensor ¹	Limit switches
6	HOM sensor holder ¹	
7	Energy chain	Energy chain accessories
8	Energy chain holder	
9	Energy chain profile	
10	Power cable	Cables
11	Signal Cable	
12	IIOT module	Industrial internet of things module

¹ For CTL size of 145, mounting of magnetic field sensor requires HOM sensor holder

Table 3: Overview of the CTL accessories.

MAGNETIC FIELD SENSOR

Position of the magnets

i The position of the magnets can be calculated using the absolute position or distance LP, see Figure 7 and Table 4.

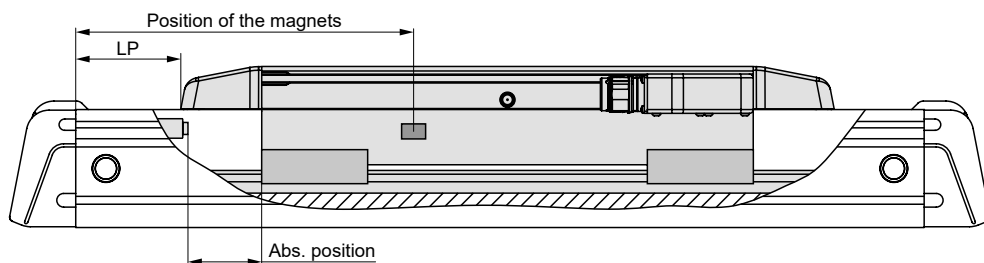


Figure 7: Position of the magnets on the CTL linear unit.

CTL	Position of the magnets [mm]		LP [mm]
145 S	Abs. position + 78	LP + 63,5	Abs. position + 14,5
145 L	Abs. position + 78	LP + 63,5	Abs. position + 14,5
200 S	Abs. position + 403	LP + 388,5	Abs. position + 14,5
200 L	Abs. position + 488	LP + 473,5	Abs. position + 14,5
250 S	Abs. position + 438	LP + 423,5	Abs. position + 14,5
250 L	Abs. position + 538	LP + 523,5	Abs. position + 14,5

Table 4: Position of the magnets.

i On CTL size 200 and 250 magnet is only on the side of the cable connectors. On size 145 magnets are on both sides of the linear unit.

Abs. position	Absolute position	[mm]
LP	Distance LP	[mm]

i It should be noted that the following condition must be taken into consideration:

$$0 \leq \text{Absolute position} \leq \text{Absolute stroke}$$

Assembly instructions

- i** Magnetic field sensor can be mounted:
 - 1 – directly to the appropriate slot on the side of the CTL 200 or CTL 250 profile
 - 2 – to the HOM sensor holder, which is mounted to the appropriate slot on either side of the CTL 145 profile.
- i** For information about the profile slots and the magnetic field sensors, please refer to the product catalogue CTL (linear unit with linear motor).

⚠ Avoid collision of the magnetic field sensors and the moving components
There must never be any collision of the mounted magnetic field sensors and the moving components of the product or structure, otherwise the product may get damaged.

⚠ Risk of coming into contact with power conducting parts!
The power supply should be disconnected and secured against reconnection!

STEP 1, CTL 145: The magnetic field sensor **1** must be placed in the slot of the HOM sensor **2** holder. Tighten the clamping screw of the magnetic field sensor to secure it.

⚠ Tighten the clamping screw of the magnetic field sensor with a tightening torque of max. 0,6 Nm.

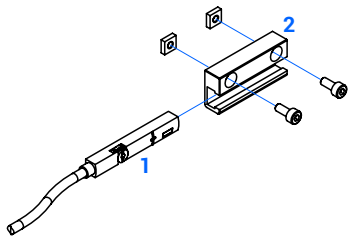


Figure 8: Mounting the sensor to CTL 145: step 1.

STEP 2, CTL 145: Place the HOM sensor holder with mounted magnetic field sensor **3** so that the square nuts lay in the uppermost slot on the profile. HOM sensor holder must be positioned so that the magnetic field sensor lays lower than the screws of the HOM.

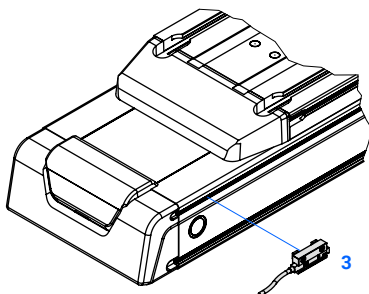


Figure 9: Mounting the sensor to CTL 145: step 2.



Figure 10: Correct orientation of HOM sensor holder.

STEP 3, CTL 145: Slide the HOM sensor holder with mounted magnetic field sensor to the desired position and tighten two screws. The position of the magnets can be found in Figure 7 and Table 4.

⚠ Tighten two screws of the HOM sensor holder with a tightening torque of max. 0,6 Nm.

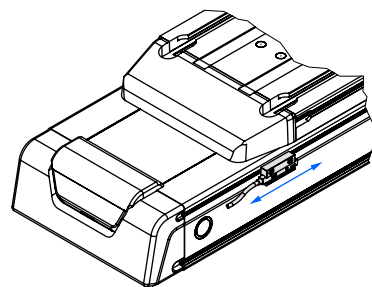


Figure 11: Mounting the sensor to CTL 145: step 3.

STEP 1, CTL 200 AND CTL 250: Place magnetic field sensor 1 in the slot of the CTL 200 or CTL 250 profile.

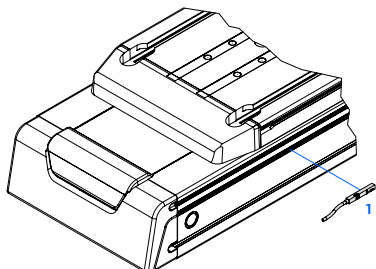


Figure 12: Mounting the sensor to CTL 200 and CTL 250: step 1.

STEP 2, CTL 200 AND CTL 250: Slide the magnetic field sensor 1 to the desired position in the slot and tighten the clamping screw to secure it. The position of the magnets can be found in Figure 7 and Table 4.

⚠ Tighten the clamping screw of the magnetic field sensor with a tightening torque of max. 0,6 Nm.

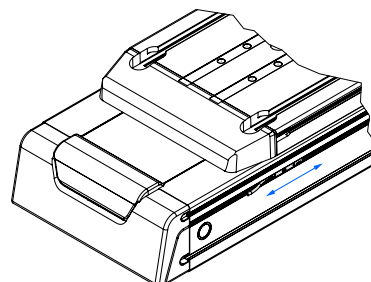


Figure 13: Mounting the sensor to CTL 200 and CTL 250: step 2.

ENERGY CHAIN

i Energy chain is mounted to energy chain profile which is mounted to appropriate T-slot on aluminium profile of the CTL linear unit. The energy chain assembly is oriented based on the configuration of the linear unit. The energy chain is intended to be mounted on the same side of the linear unit where the cable connectors are.

i For information about the profile slots, please refer to the product catalogue CTL (linear unit with linear motor).

i For information about maximum allowed load of the energy chain, please refer to the product catalogue CTL (linear unit with linear motor).

⚠ **Avoid collision of the energy chain assembly and the moving components**

There must never be any collision of the energy chain assembly and the moving components of the product or structure, otherwise the product (including energy chain assembly) may get damaged.

⚠ **Risk of coming into contact with power conducting parts!**

The power supply should be disconnected and secured against reconnection!

⚠ **Risk of injury**

Parts of the energy chain assembly are protruding from CTL linear unit. Serious injury may occur if a person is hit by protruding moving parts of the CTL linear unit.

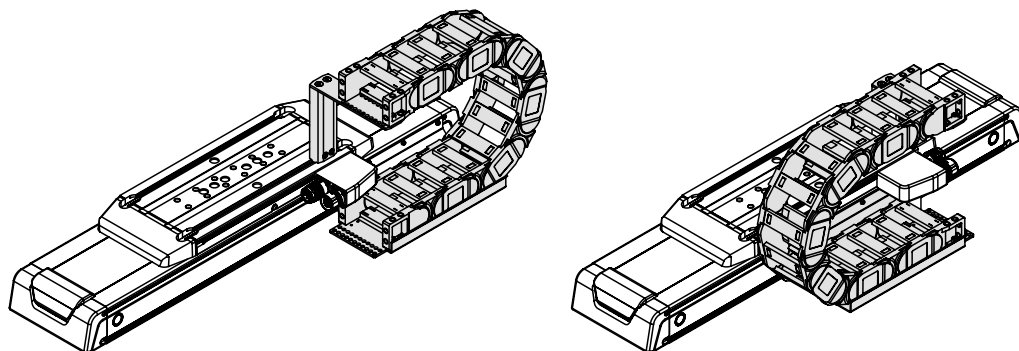


Figure 14: CTL with energy chain. Left: connector orientation: backward, right: connector orientation forward.

Assembly instructions

STEP 1: Mount energy chain holder 1 to the appropriate slot on the carriage. Insert it at the wide area of the slot and then slide it to the desired position. Tighten the mounting screws 2 at the bottom of the holder.

STEP 2: Mount energy chain profile 3 to the profile of the CTL linear unit with included screws 5 and nuts 4. Insert square nuts 4 at the wide area of the uppermost slot on the main profile and slide them to the desired position.

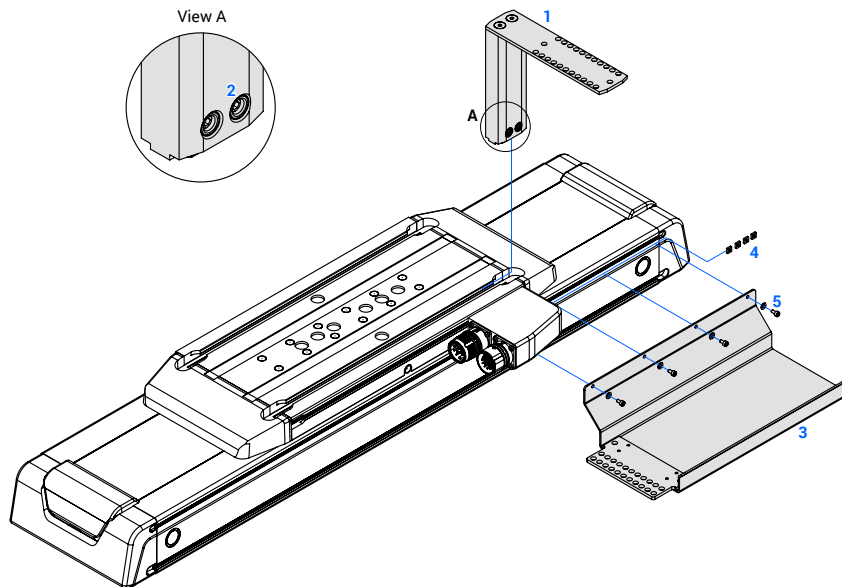


Figure 15: Mounting energy chain: step 1 and 2.

STEP 3: Attach the energy chain 7 to the energy chain holder and energy chain profile with the included screws 6.

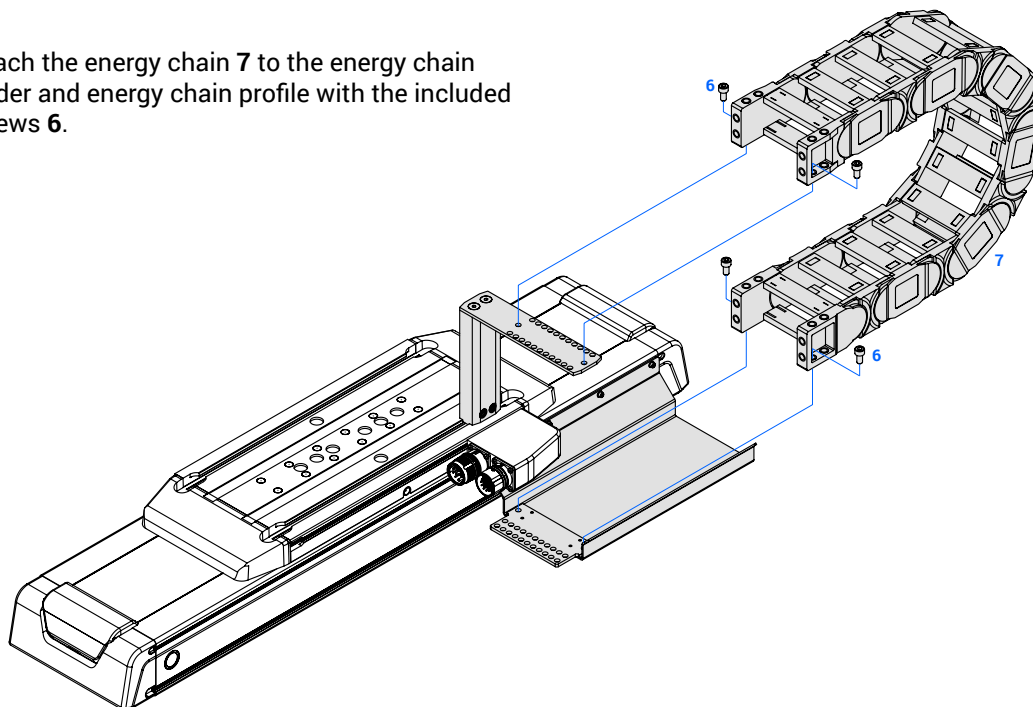


Figure 16: Mounting energy chain: step 3.

i Ends of the energy chain must be vertically aligned when the carriage of the linear unit is in the middle position.

CABLES

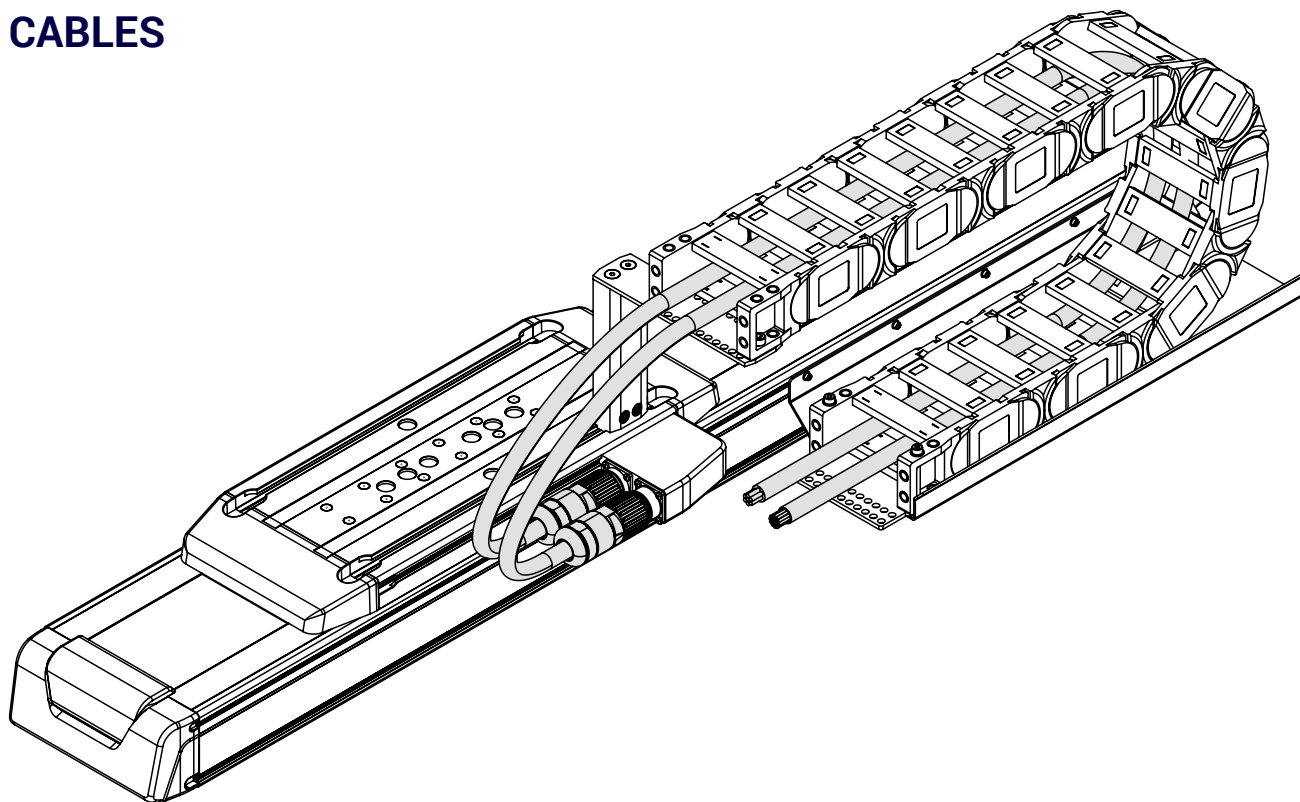



Figure 17: Cables presentation.

- i** Cables must be properly secured to the energy chain, energy chain holder and energy chain profile.
- i** For information on pin layout, colours and other cable properties please refer to the product catalogue CTL (linear unit with a linear motor).

INITIAL START-UP

Before the initial start-up, check the following:

- electrical wiring and connection of the system,
- mounted elements,
- tightened mounting screws,
- that there are no physical stop limits over the entire maximum permissible travel range,
- that the limit switches are correctly adjusted,
- that there is no overloading of the product,
- operating conditions,
- direction of the movement of the carriage,
- homing procedure (by the limit switch or physical end position, where the maximum permissible axial load of the product and homing travel speed of 10 mm/s are not exceeded),
- application requirements.

 For the values of the maximum permissible axial load, lateral forces and moments, drive torque, travel and rotational speed and acceleration, please refer to the product catalogue CTL (linear unit with a linear motor).

Overloading

Overloading the product can lead to the product being damaged.

Unexpected movement of the components

During the initial start-up, prevent the moving components of the product getting into the contact (within the entire travel range) with the foreign objects, machine structure or persons. Perform the initial operation of the product with low dynamic response (~ 10 mm/s).

Due to the no self-locking effect of the linear motor drive possible unexpected movement of the carriage must be taken into the consideration.

Avoid from collision caused by the incorrectly adjusted limit switches

Observe the maximum travel range of the CTL linear unit. Make sure that over the entire travel range there are no physical stop limits, otherwise the product might get damaged.

Short circuiting caused by improper electrical connection of the system

All the cable's connectors must be assigned and plugged in correctly, otherwise the product might get damaged.

Risk of burns from hot surfaces of the product

Note that, during the operating process, hot surfaces of the product may occur. Allow the product to cool down to the appropriate temperature before handling.

Loss of the reference when disconnected


When the cables are disconnected the reference position is lost if incremental measuring system is used. After the whole system is reconnected, it is important to perform homing procedure.


Risk of coming into contact with power conducting parts

During the mounting procedure, the power supply should be disconnected and secured against reconnection!

Safety and operating precautions

It is important to read the safety and operating precautions of the drive before connecting the whole system. Otherwise, the product might get damaged.

 For information about the electrical connection of the system with all necessary precautions please refer to the catalogue CTL (linear unit with a linear motor) and appropriate drive manual.

 Note that identical products can generate different running noises during the operation.


OPERATION

The product must not be put into operation until the final machinery, into which it is installed, has been declared in conformity with the provisions of the machinery directives, where appropriate.

The product is ready for operation process only after a successful test run was performed.

Overloading

Overloading the product can lead to the product being damaged.

 For the values of the maximum permissible axial load, lateral forces and moments, drive torque, travel and rotational speed and acceleration, please refer to the product catalogue CTL (linear unit with a linear motor).

Unexpected movement of the components

During the operation, prevent the moving components of the product getting into the contact (within the entire travel range) with the foreign objects, machine structure or persons.

Due to the no self-locking effect of the linear motor drive possible unexpected movement of the carriage must be taken into the consideration.

MAINTENANCE

Unexpected movement of the components

During the operation, prevent the moving components of the product getting into the contact (within the entire travel range) with the foreign objects, machine structure or persons.

Due to the no self-locking effect of the linear motor drive possible unexpected movement of the carriage must be taken into the consideration.

Risk of coming into contact with power conducting parts!

During the mounting procedure, the power supply should be disconnected and secured against reconnection!

LUBRICATION

Lubrication is done via the lubricating nipple DIN 3405 D on both sides of the carriage. Lubricating through one of the two lubrication ports is sufficient.

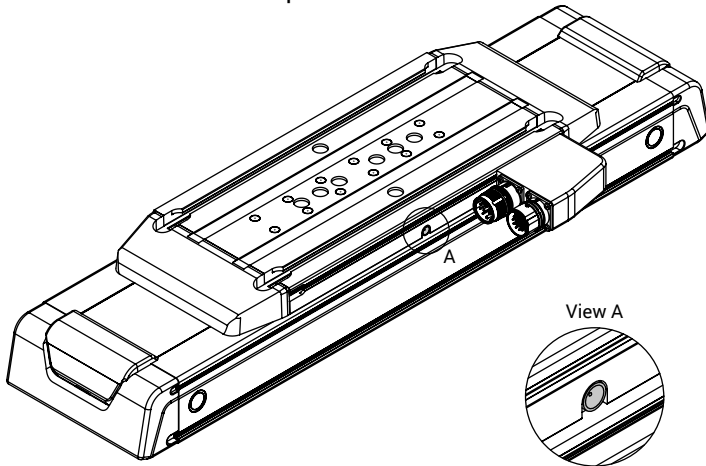


Figure 18: Lubrication ports are located on both sides of the CTL linear unit.

The lubrication intervals are every 500 operating hours or after the specified travel path, depending on which value is reached first. Specified travel path depends on mean load comparison factor $f_{vm,g}$ and stroke of the linear unit.

In the following diagram lubrication interval as a function of mean load comparison factor and stroke is presented.

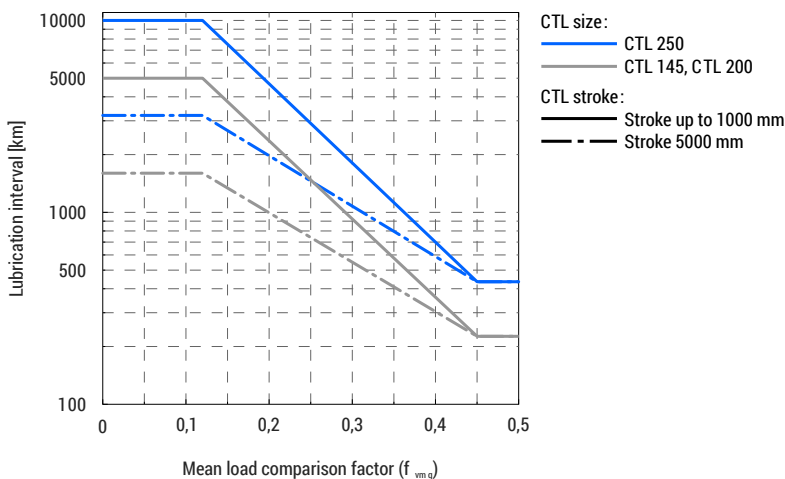


Figure 19: Lubrication interval as a function of mean load comparison factor and stroke.

For information on calculation of mean load comparison factor $F_{vm,g}$ please refer to product catalogue CTL (linear unit with a linear motor), section Service life.

The product is lubricated for the duration of first operating interval. In case of the air transport the linear unit must be lubricated with half of the specified quantity before the start of the operation!

During the lubrication the carriage needs to be in motion so that the grease is distributed evenly on the whole length of the guide rails.

Recommended grease for the lubrication: Lubcon TURMOGREASE LC 802 EP (K HC P 2/3 n -30).

⚠ Risk of damage due to unsuitable lubricant

Using the unsuitable lubricant may damage the linear unit or cause premature failure.

For the grease quantities please refer to the table below.

CTL	Carriage version	Grease quantities
		[cm ³]
145	S	2,4 + (stroke [mm] x 0,00407)
	L	3,2 + (stroke [mm] x 0,00407)
200	S	4,2 + (stroke [mm] x 0,00508)
	L	5,6 + (stroke [mm] x 0,00508)
250	S	8,4 + (stroke [mm] x 0,0061)
	L	11,2 + (stroke [mm] x 0,0061)

Table 5: Grease quantities.

CLEANING

The product can be cleaned only with a clean, soft and dry (or slightly damp) cloth.

⚠ Risk of coming into contact with power conducting parts!
During the cleaning procedure, the power supply should be disconnected and secured against reconnection!

⚠ Do not use aggressive cleaning agents
Aggressive cleaning agents can lead to the product being damaged.

PROTECTION STRIP

⚠ Protection strip must be clean and dry for best operation. Remove any dirt and debris with clean, soft and dry cloth.

⚠ When cleaning protection strip with degreasing agent take care not to apply it to the plastic end blocks of the carriage.

i If protection strip becomes dirty with greasy substance clean it with small amount of degreasing agent and wipe it dry before running the CTL linear unit.

REPAIR

Certain parts of the CTL linear unit can be replaced. Please refer to the section "Replacement".

DISASSEMBLY AND REPLACEMENT

⚠ Risk of coming into contact with power conducting parts!
During the disassembly or replacing procedure, the power supply should be disconnected and secured against reconnection!

⚠ Risk of burns from hot surfaces of the product
It should be noted, that during the operating process hot surfaces of the product may occur. Before the disassembly procedure, allow the product to cool down to the appropriate temperature.

⚠ Unexpected movement of the components
Risk of serious injury or even death.
During the disassembly or replacing procedure, prevent the carriage of the product from dropping due to the no self-locking effect of the linear motor drive of CTL linear unit.

DISASSEMBLY

Dismounting procedure:

- disconnect the drive from the power supply,
- disconnect all the electrical installation,
- dismount the attachments,
- dismount the mounting accessories,
- dismount the accessories (magnetic field sensors, energy chain ...).

i For dismounting the product properly, please refer to the mounting procedure.

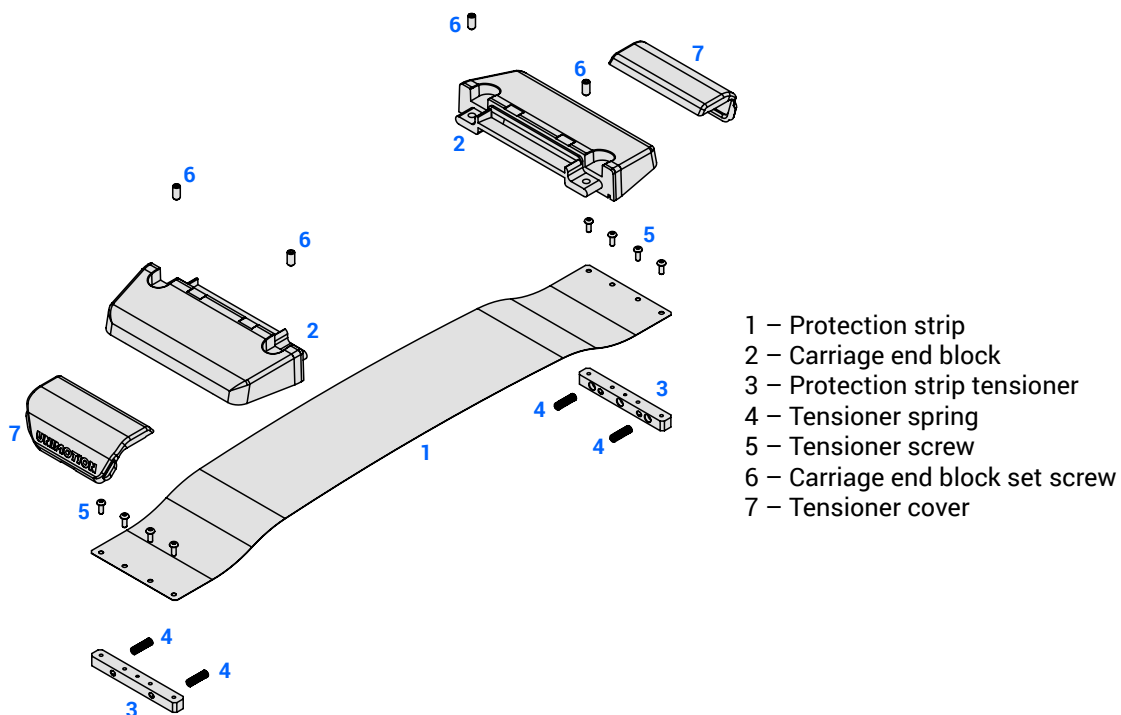
REPLACEMENT

i For replacement procedure, please refer to the dismounting and mounting procedure of the product first.

In the following sections parts of the product, which can be replaced, are presented. For more information, please contact us.

Protection strip

i Replacement of protection strip includes replacement of the protection strip together with the carriage end blocks and protection strip tensioning system. See the following figure:



- 1 – Protection strip
- 2 – Carriage end block
- 3 – Protection strip tensioner
- 4 – Tensioner spring
- 5 – Tensioner screw
- 6 – Carriage end block set screw
- 7 – Tensioner cover

Figure 20: Parts for replacement of protection strip.

i When protection strip is replaced by the customer, the product warranty is annulled.

STEP 1: Remove the tensioner covers 7 by sliding the screwdriver into the slot at the bottom of the covers and push them upwards.
Remove carriage end block set screws 6.

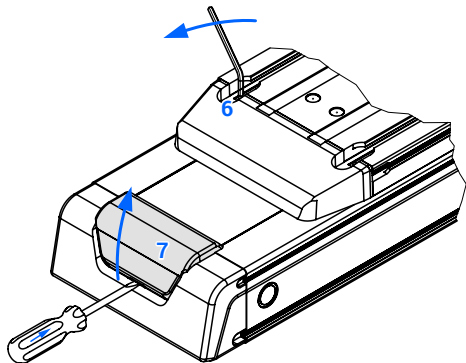


Figure 21: Replacement of protection strip: step 1.

STEP 2: Remove tensioner screws 5. Remove carriage end blocks 2 by sliding them away from the carriage.

- i** Protection strip tensioners are pushed away from CTL end block with springs. When loosening the tensioning screws push tensioner towards the carriage of the linear unit.
- i** Protection strip 1 runs through the carriage end blocks 2.

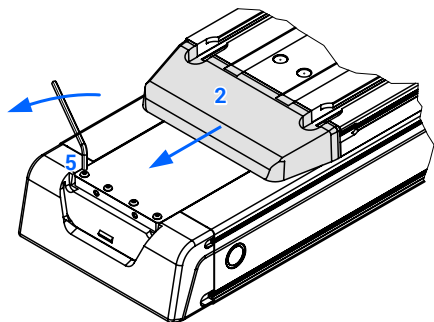


Figure 22: Replacement of protection strip: step 2.

STEP 3: Remove protection strip 1 from the carriage.
Remove protection strip tensioners 3 and springs 4.

⚠ Strong magnets inside of the profile

In the profile are magnet plates with very strong magnets. Any metal part for example screws, tools or protection strip may get attached to the magnets. This may cause the parts to be extremely difficult to remove without damaging them or magnet plates.

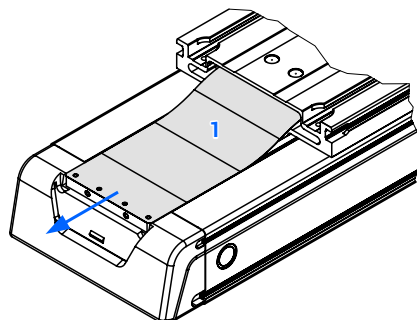


Figure 23: Replacement of protection strip: step 3, part 1.

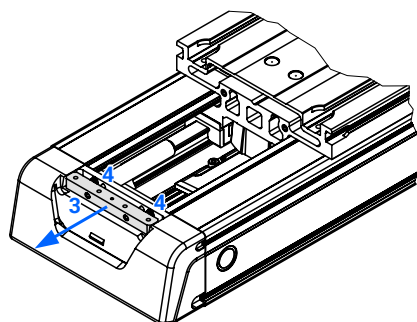


Figure 24: Replacement of protection strip: step 3, part 2.

STEP 4: Slide a new protection strip 1 through the carriage.
Up/down and left/right are not relevant as the protection strip is symmetrical.

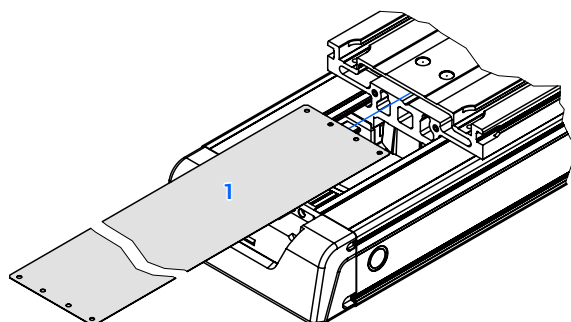


Figure 25: Replacement of protection strip: step 4.

STEP 5: Slide carriage end blocks **2** onto the protection strip **1** and attach them to the carriage with carriage end block set screws **6**.

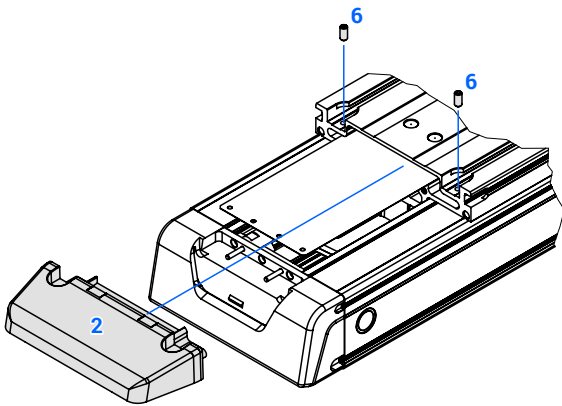


Figure 26: Replacement of protection strip: step 5.

STEP 7: Attach the tensioner covers **7** to the CTL end blocks.

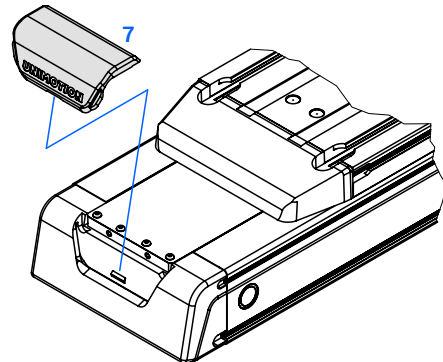


Figure 28: Replacement of protection strip: step 7.

STEP 6: Place the protection strip tensioners **3** and tensioner springs **4** to the appropriate spot. The springs must lay in the appropriate holes in the CTL end block and tensioner. Attach protection strip **1** to the tensioners **3** with tensioner screws **5**.

i Protection strip tensioners are pushed away from CTL end block with springs. When tightening the tensioning screws push tensioner towards the carriage of the linear unit.

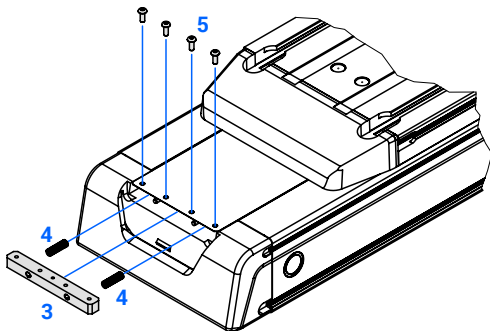


Figure 27: Replacement of protection strip: step 6.

Tensioner covers

- i** Replacement of tensioner covers includes replacement of both tensioner covers. The procedure for replacement is the same on both sides of the CTL linear unit.

For exact steps of the procedure please refer to the section Replacement – Protection strip in this manual. Refer to first part of step 1 and step 7.

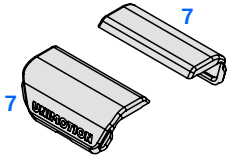


Figure 29: Replacement of tensioner covers.

Carriage end blocks

- i** Replacement of carriage end blocks includes replacement of both carriage end blocks and carriage end block set screws. The procedure for replacement is the same on both sides of the CTL linear unit.

For exact steps of the procedure please refer to the section Replacement – Protection strip in this manual. Refer to steps 1, 2, 5, 6 and 7.

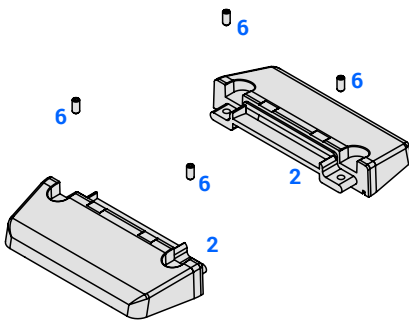



Figure 30: Replacement of carriage end blocks.

DISPOSAL


At the end of the product service life the product and its components must be disposed in accordance with the applicable national and international directives.

The product is assembled from different materials such as aluminium, steel, plastic, grease and electronic components.

 For more information about the materials, please contact us.

TECHNICAL DATA

Technical data together with the characteristic curves can be found in the product catalogue.

 For information about the technical data, please refer to the product catalogue CTL (linear unit with a linear motor).

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