

# Installation Guide Linear Modules EM01-37

ENG



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## 1 General Information

### 1.1 Introduction

This manual includes instructions for the assembly, installation, maintenance, transport, and storage of linear guides / linear modules. The document is intended for electricians, mechanics, service technicians, and warehouse staff.

Read this manual before using the product and observe the general safety instructions and those in the relevant section at all times.

Keep these operating instructions in an accessible place and make them available to the personnel assigned.

### 1.2 Explanation of Symbols



Triangular warning signs warn of danger.



Round command symbols tell what to do.

### 1.3 Qualified Personnel

All work such as installation, commissioning, operation and service of the product may only be carried out by qualified personnel.

The personnel must have the necessary qualifications for the corresponding activity and be familiar with the installation, commissioning, operation and service of the product. The manual and in particular the safety instructions must be carefully read, understood and observed.

### 1.4 Liability

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## 2 Safety Instructions



### Contusions

Sliders contain neodymium magnets and have a strong attractive force. Careless handling could cause fingers or skin to become pinched between two sliders. This may lead to contusions, bruises, and bone fractures. When handling sliders, wear thick protective gloves and keep a minimum distance between sliders. Refer to the "Minimum distance from slider" section for minimum distance.

To reduce the risk of injury, never more than one slider should be held or transported by the same person without packaging.



### Pacemaker / Implanted Heart Defibrillator

Sliders could affect the functioning of pacemakers and implanted heart defibrillators. For the duration of a strong approach to a magnetic field, these devices switch into test mode and will not function properly.

- If you wear one of those devices keep the following minimum distances between the pacemaker / defibrillator and slider:
  - Min. 250 mm (10") for slider Ø 27 mm and 28 mm (PL01-27 / 28 / PL10-28)
  - Min. 150 mm (6") for slider Ø 19 mm and 20 mm (PL01-19 / 20)
  - Min. 100 mm (4") for slider Ø 12 mm (PL01-12)
- Inform others who wear these devices to comply with these minimum distances!



### Caution - Risk of Electric Shock !

Before working, make sure that there are no high voltages.



### Fast-moving Machine Parts

The sliders of LinMot linear motors are fast-moving machine parts. All necessary precautions must be taken to prevent persons approaching the moving elements during operation (provide covers, guards, etc.).



### Automatic Restart

The motors can start automatically under certain circumstances! If necessary, a corresponding warning symbol must be provided and protection against entering the hazardous area or a suitable safe electronic disconnection must be provided!



### Risk of Injury due to a Defect or Fault

For areas where a defect or fault can result in substantial property damage or even serious personal injury, additional external precautions must be taken or devices must be installed to ensure safe operation even if a defect or fault occurs (eg. suitable safe electronic disconnection, mechanical interlocks, barriers, etc.).



### Magnetic Field

Magnets integrated in the sliders produce a strong magnetic field. They could damage TVs, laptops, computer hard drives, credit and ATM cards, data storage media, mechanical watches, hearing aids, and speakers.

- Keep magnets away from devices and objects that could be damaged by strong magnetic fields.
- For the above mentioned objects, keep a minimum distance as described in the "Pacemaker / implanted defibrillator" section.
- For non-anti-magnetic watches, keep the double minimum distance.

**Combustibility**

When machining magnets, the drilling dust could easily ignite. Machining the sliders and the magnets they contain is not permitted.

**Burn Hazard**

During operation the slider can become hotter than 100 °C, which can cause burns if touched. All necessary precautions (e.g. covers, casing, etc.) must be taken to prevent contact with persons in the vicinity of the slider during operation.

**Grounding**

All metal parts that are exposed to contact during any user operation or servicing and likely to become energized shall be reliably connected to the means for grounding.

**Mechanical Handling**

Neodymium magnets are brittle and heat-sensitive.

Machining the sliders and the magnets they contain is not permitted.

- Colliding magnets could crack. Sharp splinters could be catapulted for several meters and cause eye injury.
- By machining the sliders, heat would result which demagnetizes the magnets.

**2S Stators**

Series 2S stators correspond mechanically to the respective standard stators and are to be handled in exactly the same way in terms of assembly.

For special features, please refer to the safety manual (Item-No. 0185-1174).

**Slider**

Linear motor sliders consist of a high-precision, thin-walled stainless steel tube in which the neodymium magnets are housed. The LinMot sliders should be handled with care.

Avoid contact with other sliders or iron parts as this can damage the magnets and the slider surface. Do not grip the sliders with pliers, as this can also damage the surface. Do not use sliders which are already damaged on the surface (scratches, deformation, etc.). This can cause further damage to the stator.

**Effects on People**

According to the current level of knowledge, magnetic fields of permanent magnets do not have a measurable positive or negative effect on people. It is unlikely that permanent magnets constitute a health risk, but it cannot be ruled out entirely.

- For your own safety, avoid constant contact with magnets.
- Store large magnets at least one meter away from your body.

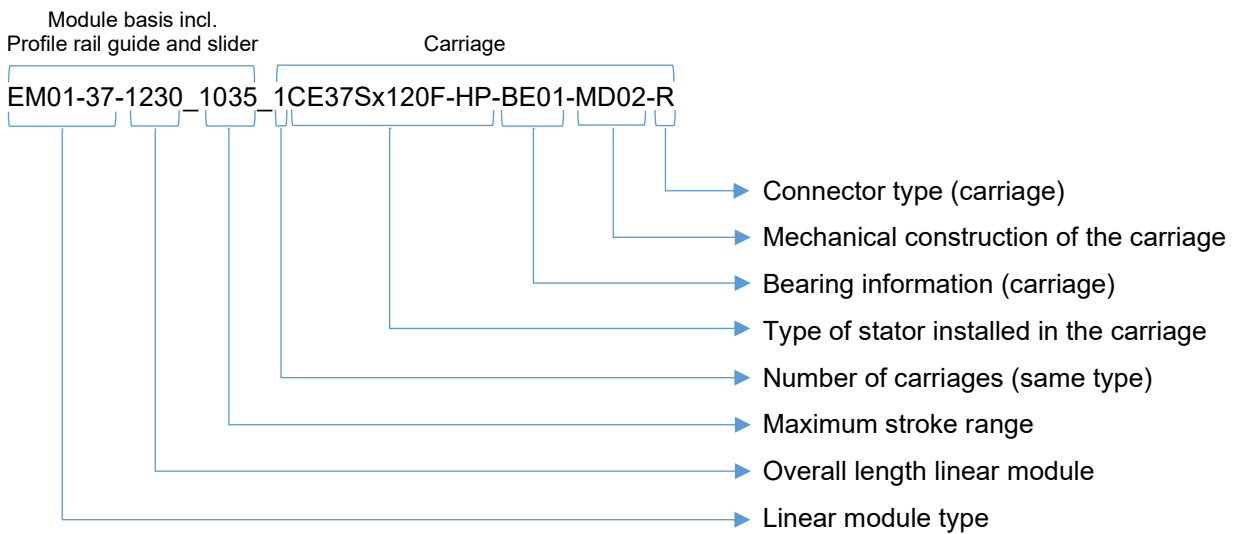
**Temperature Resistance**

Keep slider away from unshielded flame or heat.

Temperature above 120°C will cause demagnetization.

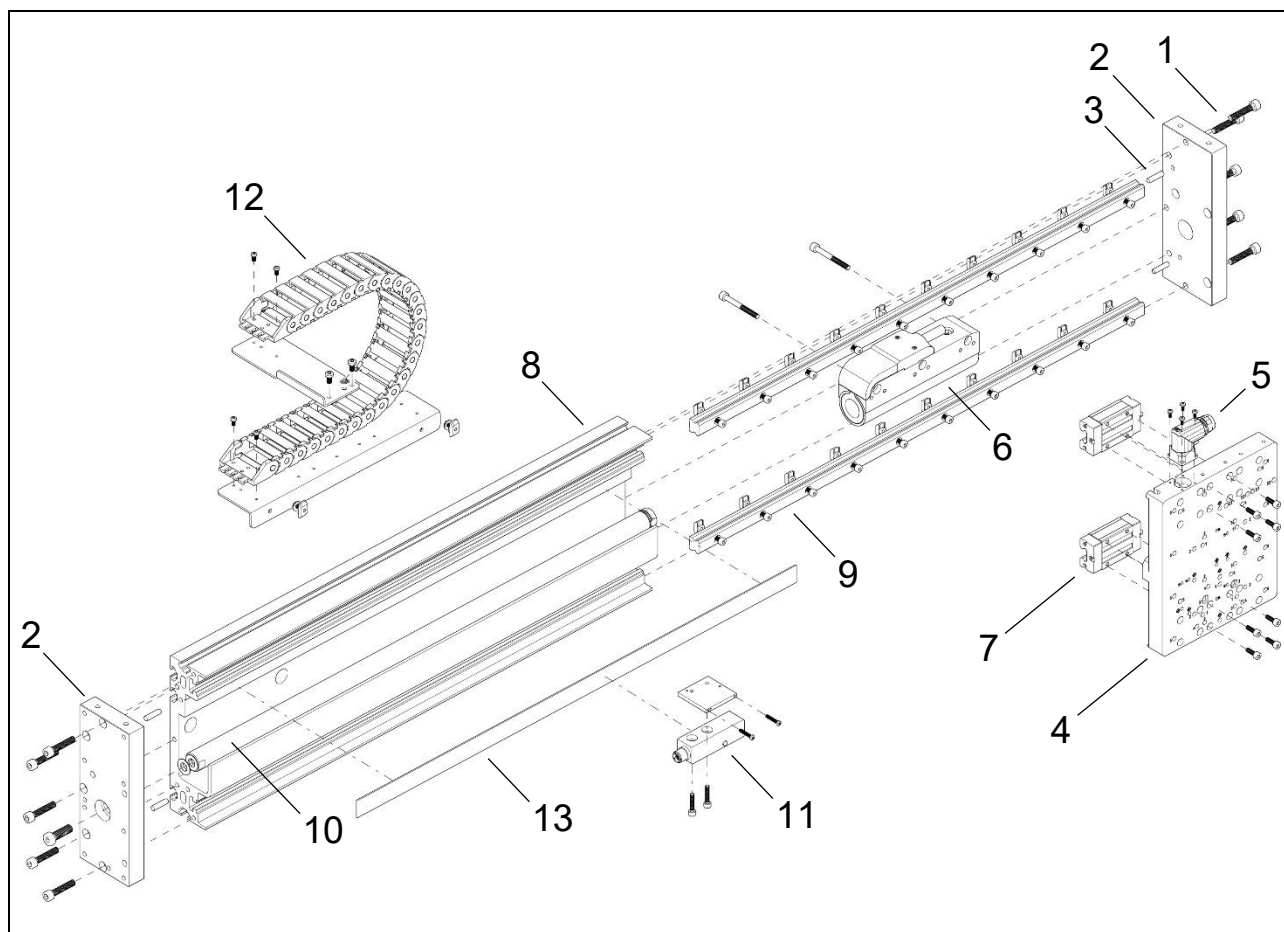
### 3 Intended Use

#### 3.1 Designation code



#### 3.2 EM01 Linear module

LinMot EM01 linear modules are movable stator applications with tubular linear motors for use in industrial and commercial installations. The mechanical construction is based on a special aluminium guide profile to which two high-precision profile rail guides are attached. The ball bearings used in the carriage guarantee reliable and smooth operation, and ensure the absorption of external forces, torques as well as bending moments. The EM01 linear modules offer high guiding accuracy and enable dynamic as well as precise positioning of the load. The modules can be assembled into a gantry or semi-gantry construction without additional adapters. It is also possible to operate several carriages on the same guide profile. With direct mechanical compatibility with other LinMot linear modules, linear rotary motors and other products, as well as the wide range of available strokes for all axes, the EM01 linear modules provide a powerful toolbox for any automation task.



| Number | Item                            |
|--------|---------------------------------|
| 1      | Cylinder screw                  |
| 2      | End plate                       |
| 3      | Parallel pin                    |
| 4      | Mounting plate                  |
| 5      | Round connector (angled)        |
| 6      | Stator                          |
| 7      | Bearing                         |
| 8      | Module basis                    |
| 9      | Profile rail guide              |
| 10     | Slider                          |
| 11     | External sensor (set, optional) |
| 12     | Trailing chain kit (optional)   |
| 13     | Magnetic strip                  |

### 3.3 Intended installation

The following provisions apply to the installation of the EM01 linear modules:



- When mounting the linear module, the module basis should be pressed onto the reference surface to achieve the best accuracy and alignment.
- To mount the EM01 linear modules, use the end plates on both sides with the holes provided.
- The module basis is provided with T-slots along the entire length at the bottom and back. These serve to provide additional support for the module and can be used for assembly. Depending on the length of the guide and the application, a sufficient number of slot nuts must be used.
- The mounting option "horizontal attachment" is only permitted up to a length of 1200 mm and only with cross table trailing chains.

### 3.4 Mechanical variants BE0x and MD0x

Depending on the version, linear modules EM01 have different bearings or different mechanical structures/variants. These are listed in the designation code of the linear modules EM01 as follows:



Bearing types (BExx):

- BE01 = Each carriage has 1 bearing per profile rail
- BE02 = Each carriage has 2 bearing per profile rail

Mechanical construction (MDxx):

- MD01 = Carriage with fixed stator (standard for stroke < 1000 mm)
- MD02 = Carriage with flexible stator (standard for stroke > 1000 mm)



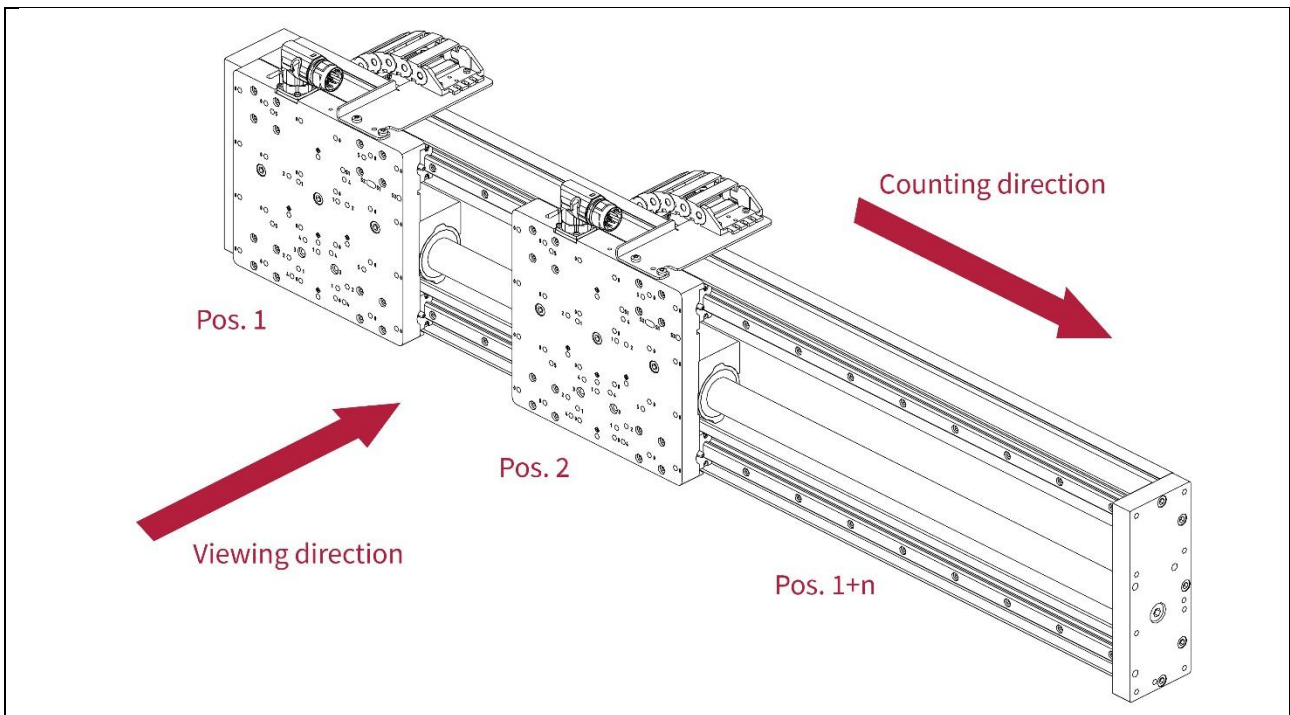
Variant "BE01": The carriage of the linear module (here EM01-37) is equipped with 1 bearing per profile rail.



Variant "BE02": The carriage of the linear module (here EM01-48) is equipped with 2 bearings per profile rail.

### 3.5 Arrangement for multi carriage guidance

Please note that for multiple carriage operation the carriage numbering is ascending from left to right. Each carriage has its own label showing the carriage position number (Axis 1, Axis 2, Axis 1+n). Important: The counting direction as well as the direction indications "right", "left" and "centre" are always to be understood from the front of the module (see illustration).

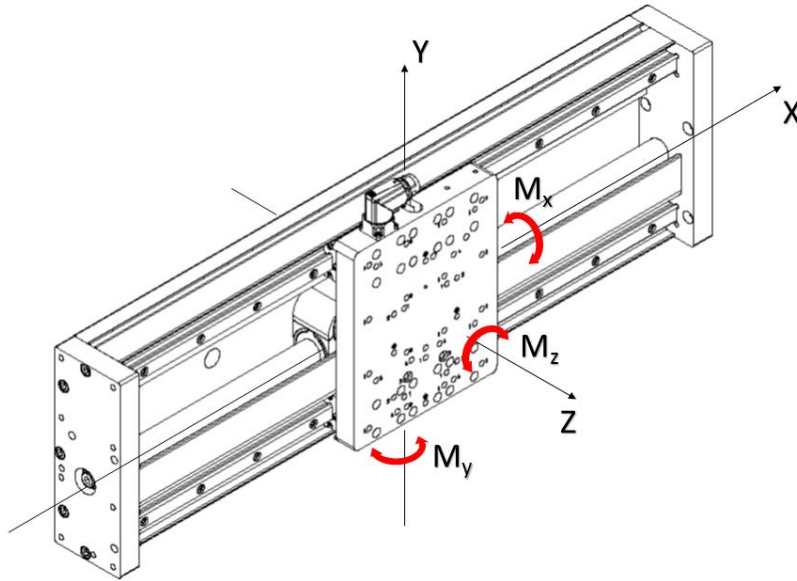


### 3.6 Option external sensor

Next to the LinMot linear stator's own integrated position sensors, both incremental and absolute external encoders are available as an option for the EM01 Guides (details in chapter 8). Together with a magnetic band, the external sensors provide a high-resolution linear measurement system.

### 3.7 Technical data carriage

The values for mass and friction are important for the configuration assistant of the LinMot-Talk software.



| EM01-...                                           | ...37Sx60...              |                 | ...37Sx120F...            |                           |
|----------------------------------------------------|---------------------------|-----------------|---------------------------|---------------------------|
|                                                    | Standard Version (BE01)   |                 | Heavy Duty Version (BE02) |                           |
| Static Load Rating (per bearing)                   | 15400 N                   | (3462.1 lbs)    | 15400 N                   | (3462.1 lbs)              |
| Dynamic Load Rating (per bearing)                  | 8400 N                    | (1888.4 lbs)    | 8400 N                    | (1888.4 lbs)              |
| Static Moment Load $M_{x0}$ (per bearing)          | cannot occur <sup>1</sup> |                 | cannot occur <sup>1</sup> |                           |
| Static Moment Load $M_{y0/z0}$ (per bearing)       | 196 Nm                    | (1734.5 lbf·in) | cannot occur <sup>1</sup> |                           |
| Dynamic Moment Loads $M_x$ (per bearing)           | cannot occur <sup>1</sup> |                 | cannot occur <sup>1</sup> |                           |
| Dynamic Moment Loads $M_{y/z}$ (per bearing)       | 98 Nm                     | (867.3 lbf·in)  | cannot occur <sup>1</sup> |                           |
| Friction (estimated)                               | 10 N                      | (2.25 lbs)      | 19 N                      | (4.27 lbs)                |
| Moving Mass                                        | 1140/1040 g               | (2.51/2.29 lb)  | 1780/1800/1912 /1930 g    | (3.92/3.97/4.22 /4.25 lb) |
| Number of Bearings per Carriage                    | 2                         |                 | 4                         |                           |
| Distance between Bearings on the same Profile Rail | -                         |                 | 78 mm                     | (3.07 in)                 |
| Distance between Profile Rail Guides               | 138 mm                    | (5.43 in)       | 138 mm                    | (5.43 in)                 |

<sup>1</sup> Due to the arrangement of the bearings, the moment can no longer occur. It is converted by the bearings into a force acting vertically on the bearings (see static and dynamic load capacity). The following applies:

Option BE01: One bearing per profile rail - a total of 2 profile rail guides:  $M_x$  is converted into forces.

Option BE02: Two bearings per profile rail - a total of 2 profile rail guides:  $M_y$ ,  $M_z$  and  $M_x$  are converted into forces.

## 4 Installation Instructions

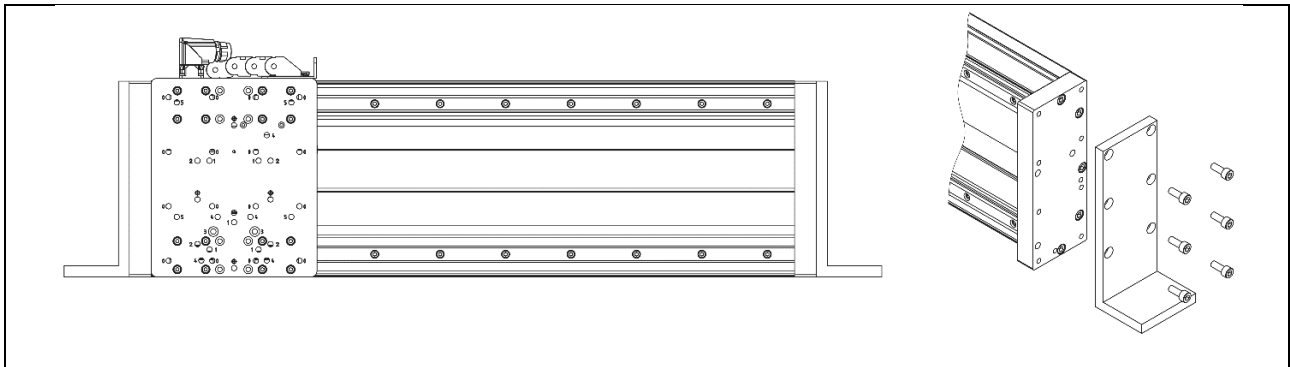
### 4.1 Installation options

There are several options available for mounting the EM01 linear modules.

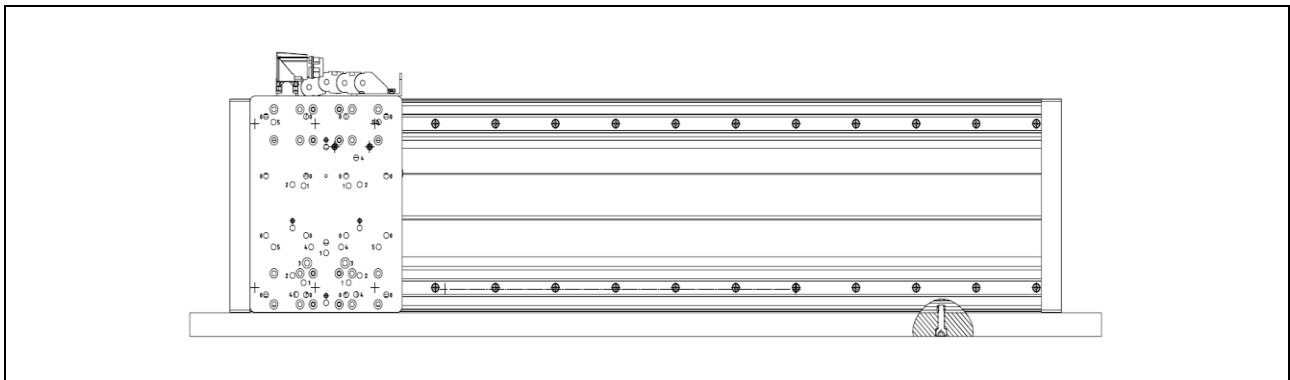
The module basis as well as the end plates are equipped with fits for parallel pins, bores and counterbores. Parallel pins may only be used to align the guide and are not intended for mounting. Mounting is done by using bores or counterbores. Additional brackets or adapters shown in examples may be required. These must be provided by the customer.

The following sketches show examples of different installation options. The detailed dimensions can be found in chapter 11 "Dimensions".

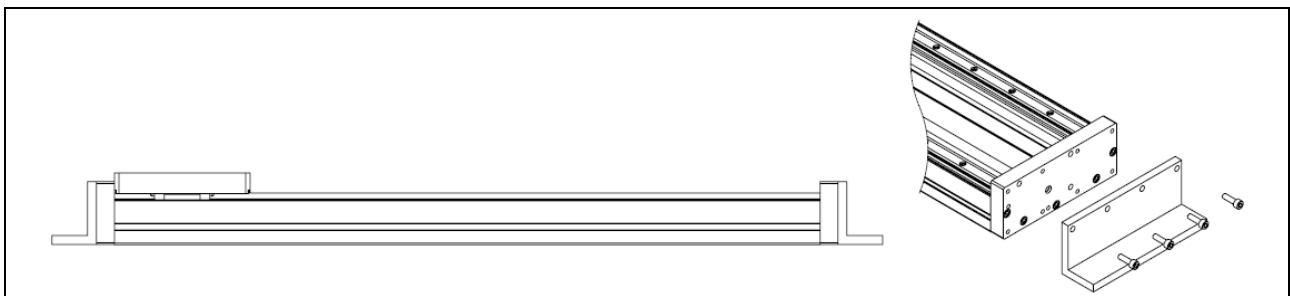
#### 4.1.1 Installation examples



Example 1: Upright fixing using end plates and brackets.



Example 2: Vertical fixing using T-nuts on the underside of the module basis.



Example 3: Lying attachment with end plates (lengths up to 1200 mm, only with cross table trailing chains).

#### Ordering information

| Item      | Description                         | Item-No.                  |
|-----------|-------------------------------------|---------------------------|
| Nut N8/M4 | Nut for 8 mm T-slots with M4 thread | <a href="#">0150-2189</a> |
| Nut N8/M6 | Nut for 8 mm T-slots with M6 thread | <a href="#">0150-2558</a> |

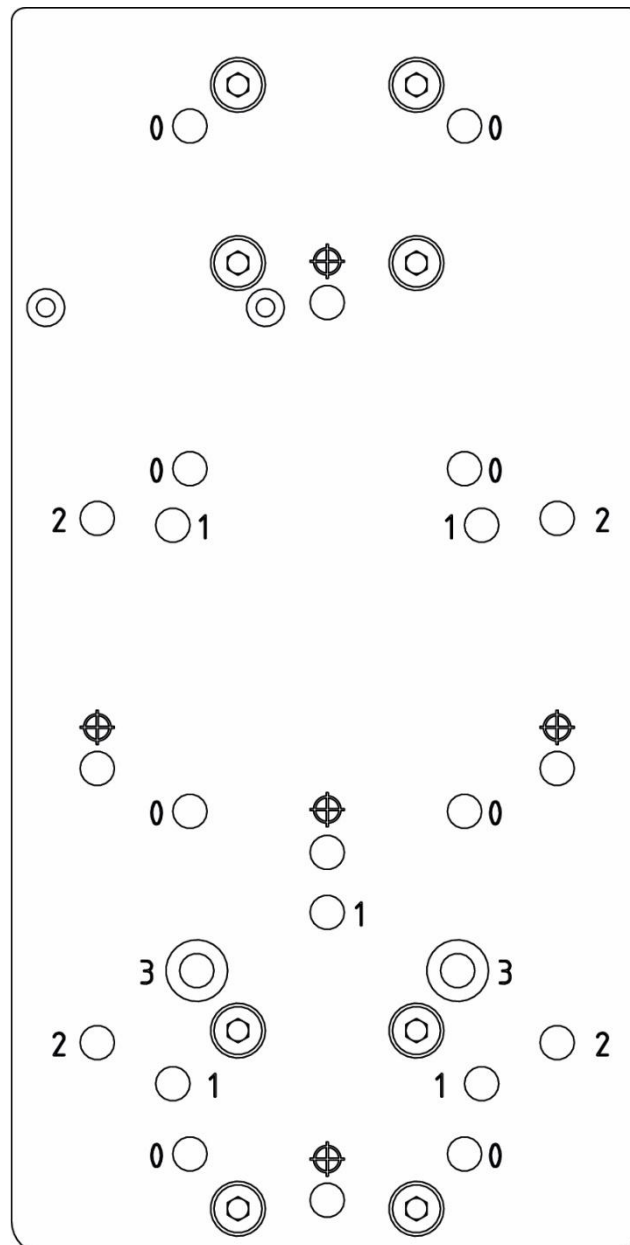
## 4.2 Installation of the load

The carriages of the linear module EM01 have an integrated mounting plate which is used to attach the load. The mounting plate is equipped with multiple bores and fittings for parallel pins. The centre of gravity of the load mass should be centred and as close as possible to the mounting plate to ensure an even distribution of the mass on the carriage.

For example, 8x M6 thru bores indexes with "0" that can be used for installation of the load. You can find complete dimensions in the chapter 11 "Dimensions".



Before performing installation of the load, all necessary precautions must be taken to prevent operation of this device, e. g. the device must be disconnected from the power supply.

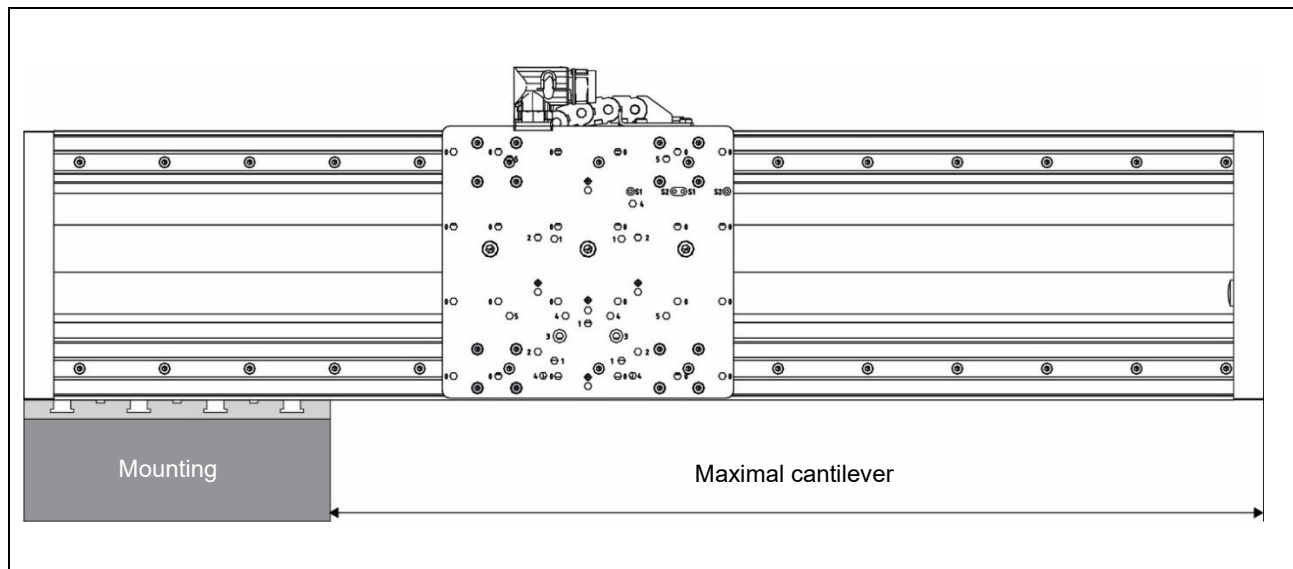


### 4.3 Cantilever linear modules

Use as a cantilever linear module is made possible by the high rigidity of the profile. The limiting factor for cantilever linear modules is deflection. The allowable deflection depends on, among other things, the load, the dynamics, the mounting position and the support.

#### 4.3.1 Cantilever linear modules with mounting on one side

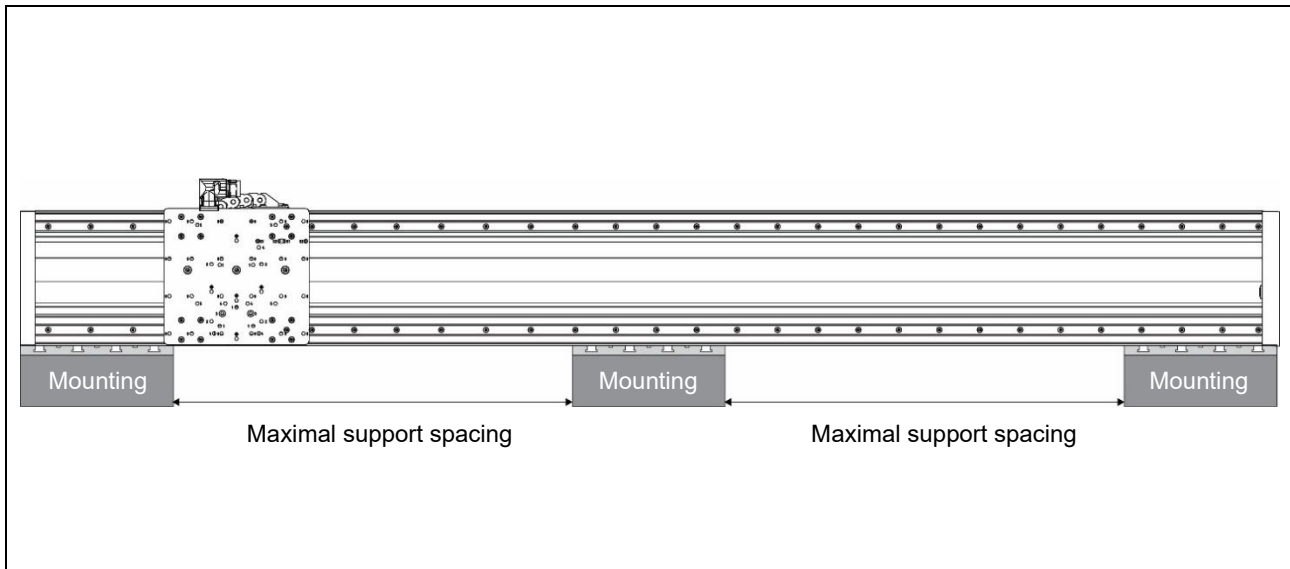
The installation position influences the deflection. With the same load, the "upright" installation position exhibits less deflection than the "lying" installation position. For this reason, the "upright" installation position is considered below.



- It is not sufficient to use only the end plate of the linear module for mounting. The mounting must be designed to provide the widest possible support for the linear module.
- As a guide, a cantilever of 500 mm with a load of 15 kg in the centre of the mounting plate is possible without consultation. Cantilevers greater than 500 mm or larger loads are possible but must be checked on a case-by-case basis ([support@linmot.com](mailto:support@linmot.com)).
- The dynamic design of the module must be checked using the LinMot Designer programme.

#### 4.3.2 Cantilever linear modules with double-sided or multiple mountings

The installation position influences the deflection. With the same load, the "upright" installation position exhibits less deflection than the "lying" installation position. For this reason, the "upright" installation position is considered below.



- The mounting must be designed to provide the widest possible support for the linear module.
- As a guideline, cantilever linear modules with a support spacing of 1000 mm and a load mass of 20 kg in the centre of the mounting plate are possible without consultation. Support distances greater than 1000 mm or larger loads are possible but must be checked on a case-by-case basis ([support@linmot.com](mailto:support@linmot.com)).
- The dynamic design of the module must be checked using the LinMot Designer programme.

## 5 Electrical Connection



Only connect or disconnect the motor connector and sensor cable if no voltage is applied to the servo drive! Only original LinMot cables may be used for wiring the motor and sensor! Even assembled cables may only be manufactured from the original LinMot accessories and must be checked carefully before commissioning!

Incorrect motor wiring can damage the motor and/or the servo drive!

All the connectors used are from different manufacturers, but they are all fully compatible with each other.

### 5.1 Motor cable

Two types of cables are available for the EM modules. Trailing chain cables are to be used for the moving part of the EM module (carriage incl. mounting plate). The standard motor cable is used as a stationary extension between the high-flex cable and the drive.

|                                                                       | Standard cable                                           | Trailing chain cable          |
|-----------------------------------------------------------------------|----------------------------------------------------------|-------------------------------|
| Cable type                                                            | K05                                                      | KS05                          |
| Min. bending radius stationary                                        | 25 mm<br>(1 in)                                          | 25 mm<br>(1 in)               |
| Min. bending radius moving                                            | Not suitable for applications<br>with moving motor cable | 55 mm<br>(2 in)<br>No torsion |
| Approval                                                              | UL / CSA 300V                                            | UL / CSA 300V                 |
| Material wire insulation                                              | TPE-U                                                    | TPE-E                         |
| Material cable sheath                                                 | PUR                                                      | PUR                           |
| Oil resistance                                                        | very good                                                | very good                     |
| Chemical resistance (to acids, alkalis,<br>solvents, hydraulic fluid) | good                                                     | good                          |
| Outdoor durability                                                    | very good                                                | very good                     |
| Flammability                                                          | flame retardant                                          | flame retardant               |

### 5.2 R-connector wiring

| Connector Type                     | R-Connector |              |
|------------------------------------|-------------|--------------|
|                                    | PIN         | Wire         |
| Phase1+                            | 1           | Red          |
| Phase1-                            | 2           | Pink         |
| Phase2+                            | 3           | Blue         |
| Phase2-                            | 4           | Grey         |
| +5V                                | A           | White        |
| GROUND*                            | B           | Inner shield |
| Sensor Sin                         | C           | Yellow       |
| Sensor Cos                         | D           | Green        |
| Temp sensor                        | E           | Black        |
| SHIELD* of stator and stator cable | Case        |              |
| Connector on the stator (-cables)  |             |              |



LinMot motor cables are double shielded. The two shields of the extension cables must not be connected together: the inner shield of the extension cables is used as GROUND and must be connected to GROUND\*; only the outer shield must be connected to SHIELD\* of the connector.

## 6 Start-up



It is recommended to use the newest version of LinMot-Talk software.

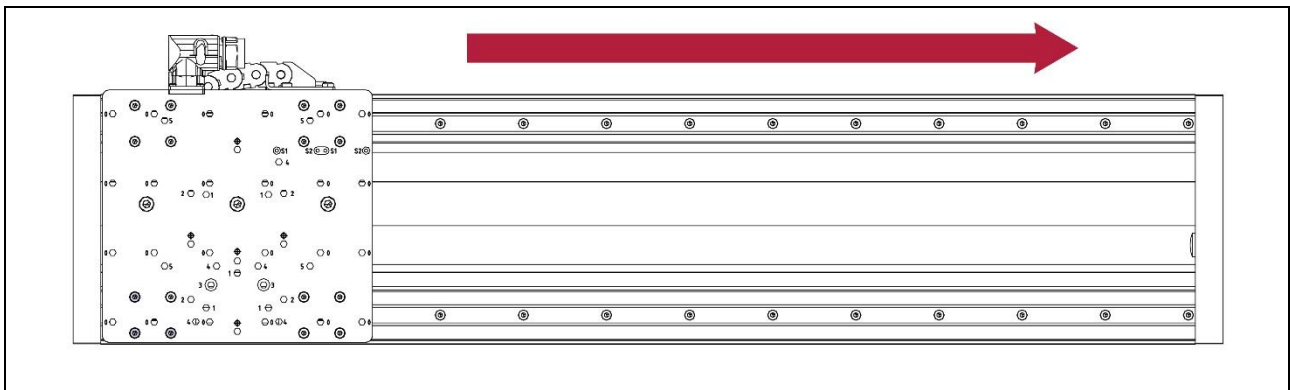
You can find more detailed information about LinMot-Talk software in LinMot-Talk User Manual that can be downloaded on [www.linmot.com](http://www.linmot.com).

### 6.1 LinMot drive setup

The various parameters for the linear motor are set on the drive side using the corresponding motor wizard in the LinMot-Talk configuration software. Each stator is electrically independent unit and if multiple stators are used on the same guide a specific commissioning order is not required.

### 6.2 Standard values of the coordinate system / standard installation stator

The positive direction of motion of the carriage is defined from left to right by default. This can be changed with the LinMot-Talk (Motor Wizard) software. Please note that the direction specifications "right", "left" and "centre" are always to be understood from the front of the module (see illustration).



- The carriage (and the stator installed in it) always points in the same direction. Under no circumstances may it be installed rotated by 180°.
- The position (angle of rotation) of the rotor is marked by a notch in the front plate. It must not be installed twisted under any circumstances.

### 6.3 Setting the parameters

Logged into the drive, you will find all the parameters to be set in the LinMot-Talk's software motor wizard. You can find the necessary information such as moving mass and friction of the carriage kits in the chapter "Technical data carriage".

Proceed through wizard step-by-step following more detailed instructions in LinMot-Talk user manual, which can be downloaded from [www.linmot.com](http://www.linmot.com).

#### 6.3.1 Defining payload

Together with the moving masses, the mass of the load must be counted in. In some applications, the mass of the cables must be considered.

#### 6.3.2 PID controller

Recommended values are higher than default values in the LinMot-Talk wizard. By heavier payload, increase the values if needed.

#### 6.3.3 Achieving full stroke length

To use the full mechanical stroke, it is necessary to change "Minimal Position" and "Maximal Position" values in Position Limits tab. These can be found under Motion Control SW. Alternatively, you can disable the "Maximal Position" detection in the Error Detection Mask.

## 6.4 Master-slave configuration

LinMot offers a master-slave function for parallel running carriages (motors), which takes over the synchronous control of several actuators. This is useful, among other things, in setups such as gantry constructions. Detailed instructions and supported drives can be found in the MasterSlave Application User Manual.

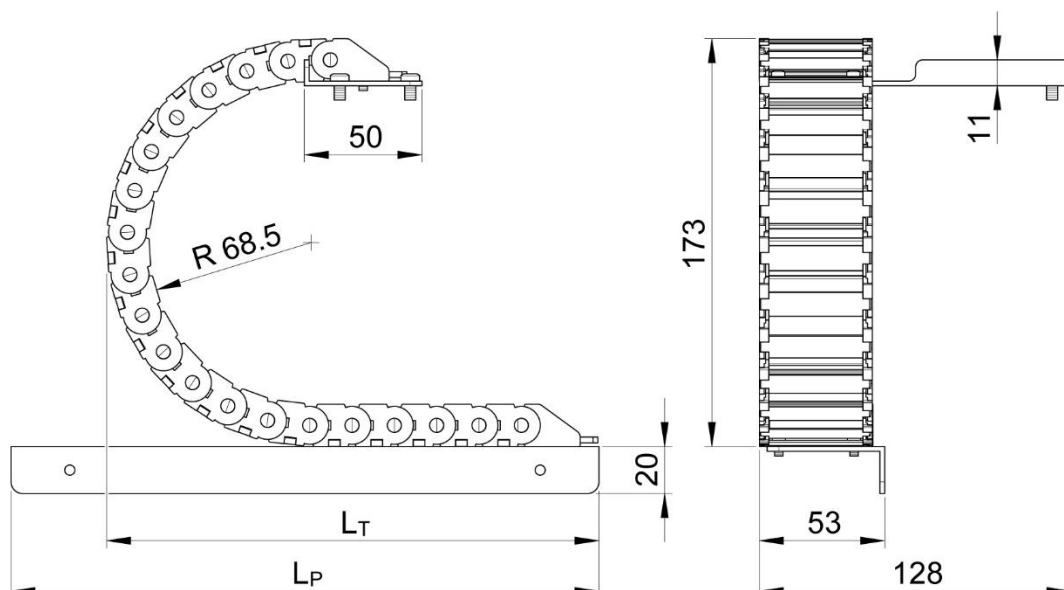
## 7 Accessories

### 7.1 Trailing chain kits



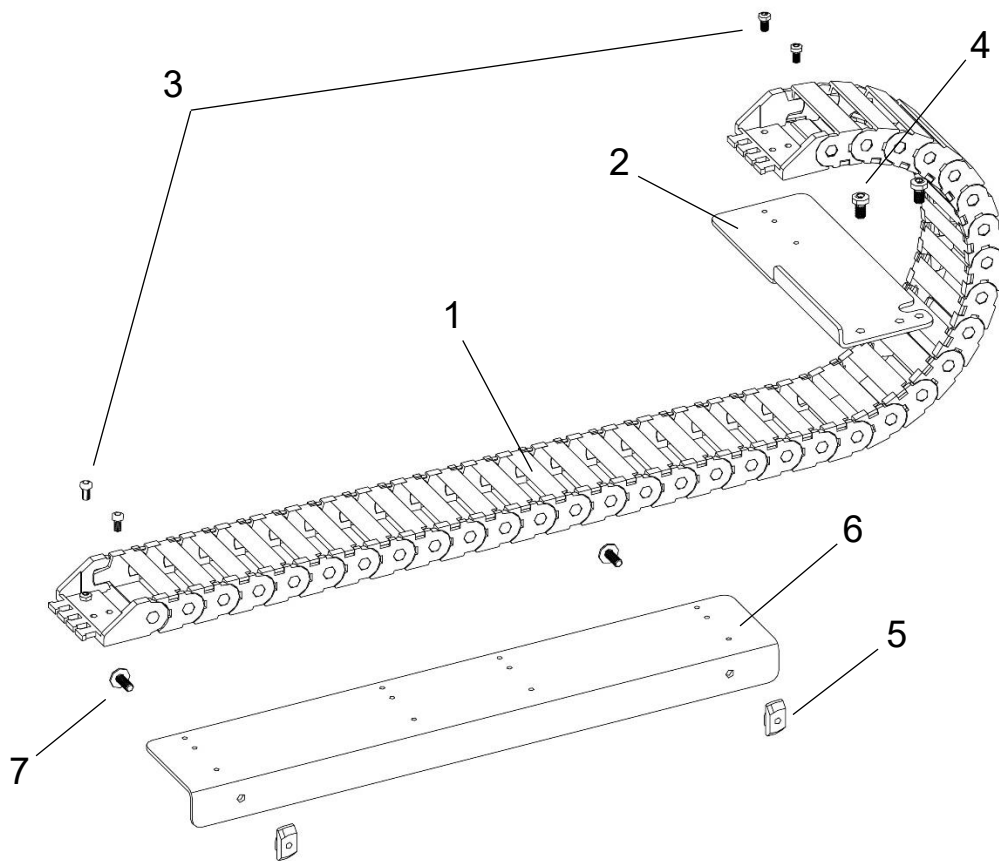
| Item              | Description                                                      | Item-No.                  |
|-------------------|------------------------------------------------------------------|---------------------------|
| EM01-TC300-48x18  | Trailing chain kit EM01-37 (for 0150-4856, 0150-4725, 0150-4736) | <a href="#">0150-4812</a> |
| EM01-TC400-48x18  | Trailing chain kit EM01-37 (for 0150-4857, 0150-4726, 0150-4737) | <a href="#">0150-4813</a> |
| EM01-TC500-48x18  | Trailing chain kit EM01-37 (for 0150-4858, 0150-4727, 0150-4738) | <a href="#">0150-4814</a> |
| EM01-TC600-48x18  | Trailing chain kit EM01-37 (for 0150-4859, 0150-4728, 0150-4739) | <a href="#">0150-4815</a> |
| EM01-TC800-48x18  | Trailing chain kit EM01-37 (for 0150-4860, 0150-4729, 0150-4740) | <a href="#">0150-4816</a> |
| EM01-TC1000-48x18 | Trailing chain kit EM01-37 (for 0150-4861, 0150-4731, 0150-4741) | <a href="#">0150-4817</a> |
| EM01-TC1200-48x18 | Trailing chain kit EM01-37 (for 0150-4862, 0150-4732, 0150-4742) | <a href="#">0150-4818</a> |
| EM01-TC1400-48x18 | Trailing chain kit EM01-37 (for 0150-4863, 0150-4733, 0150-4743) | <a href="#">0150-4819</a> |
| EM01-TC1600-48x18 | Trailing chain kit EM01-37 (for 0150-4864, 0150-4734, 0150-4744) | <a href="#">0150-4820</a> |
| EM01-TC2000-48x18 | Trailing chain kit EM01-37 (for 0150-4865, 0150-4735, 0150-4745) | <a href="#">0150-4821</a> |

#### 7.1.1 Dimensions



| Item              | Item-No.                  | Assumed Trailing chain radius R<br>[mm (inch)] | Lower angled-plate length $L_P$<br>[mm (inch)] | Trailing Chain kit total length $L_T$<br>[mm (inch)] |
|-------------------|---------------------------|------------------------------------------------|------------------------------------------------|------------------------------------------------------|
| EM01-TC300-48x18  | <a href="#">0150-4812</a> | 68.5 (2.69)                                    | 250 (9.84)                                     | 300 (11.81)                                          |
| EM01-TC400-48x18  | <a href="#">0150-4813</a> | 68.5 (2.69)                                    | 250 (9.84)                                     | 400 (15.75)                                          |
| EM01-TC500-48x18  | <a href="#">0150-4814</a> | 68.5 (2.69)                                    | 250 (9.84)                                     | 500 (19.69)                                          |
| EM01-TC600-48x18  | <a href="#">0150-4815</a> | 68.5 (2.69)                                    | 300 (11.81)                                    | 600 (23.62)                                          |
| EM01-TC800-48x18  | <a href="#">0150-4816</a> | 68.5 (2.69)                                    | 400 (15.75)                                    | 800 (31.50)                                          |
| EM01-TC1000-48x18 | <a href="#">0150-4817</a> | 68.5 (2.69)                                    | 500 (19.69)                                    | 1000 (39.37)                                         |
| EM01-TC1200-48x18 | <a href="#">0150-4818</a> | 68.5 (2.69)                                    | 500 (19.69)                                    | 1200 (47.24)                                         |
| EM01-TC1400-48x18 | <a href="#">0150-4819</a> | 68.5 (2.69)                                    | 700 (27.56)                                    | 1400 (55.12)                                         |
| EM01-TC1600-48x18 | <a href="#">0150-4820</a> | 68.5 (2.69)                                    | 800 (31.50)                                    | 1600 (63.00)                                         |
| EM01-TC2000-48x18 | <a href="#">0150-4821</a> | 68.5 (2.69)                                    | 1000 (39.37)                                   | 2000 (78.74)                                         |

### 7.1.2 Overview trailing chain kit



| Pos. | Item                                   |
|------|----------------------------------------|
| 1    | Trailing chain                         |
| 2    | Trailing chain angle plate             |
| 3    | Socket pan head screws ISO14583 M3x6   |
| 4    | Socket pan head screws ISO14583 M4x8   |
| 5    | Nut N8/M4                              |
| 6    | Trailing chain L-Profile               |
| 7    | Socket pan washer screws BN 5128 M4x10 |

## 7.2 Assembly of the trailing chains

There are various possibilities for mounting the trailing chains, depending on the type of installation of the module and the number of carriages.

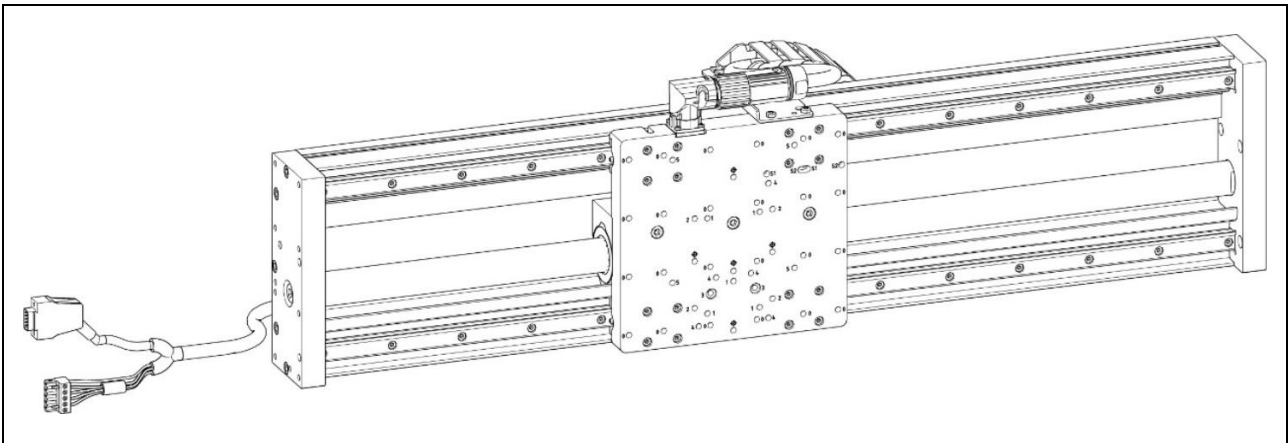


- Please note that the installation must always be carried out according to the ordered installation variant (e.g.: 0140-0051 cable connector bottom right).
- Please note that the directions "right", "left" and "centre" are always to be understood from the front of the module.

### Mounting variants for one carriage:

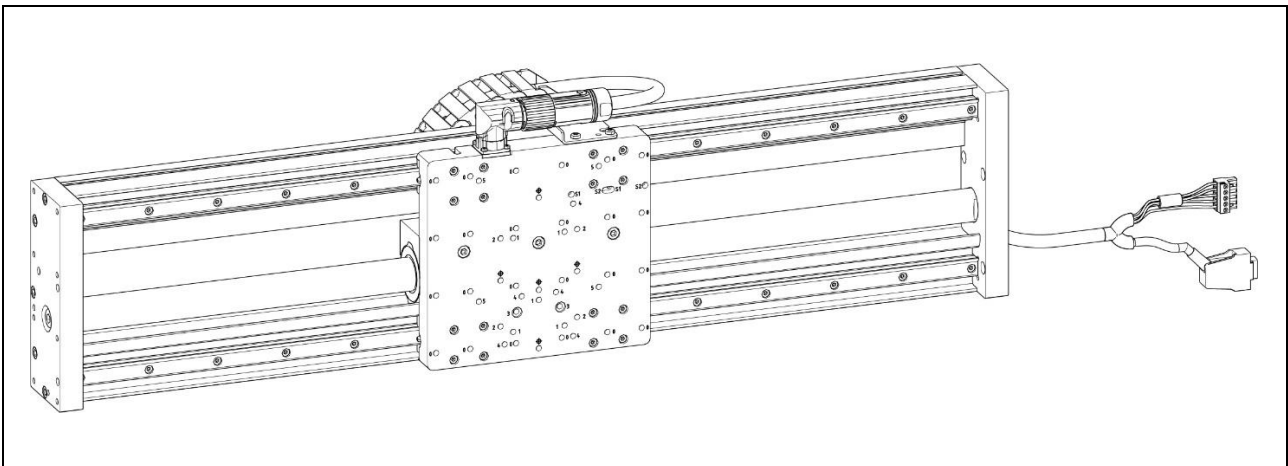
**Standard:** 0140-0050 option (default): Cable connector bottom left

The cable is routed towards the left-hand end plate.



**Inverted:** 0140-0051 option: Cable connector bottom right

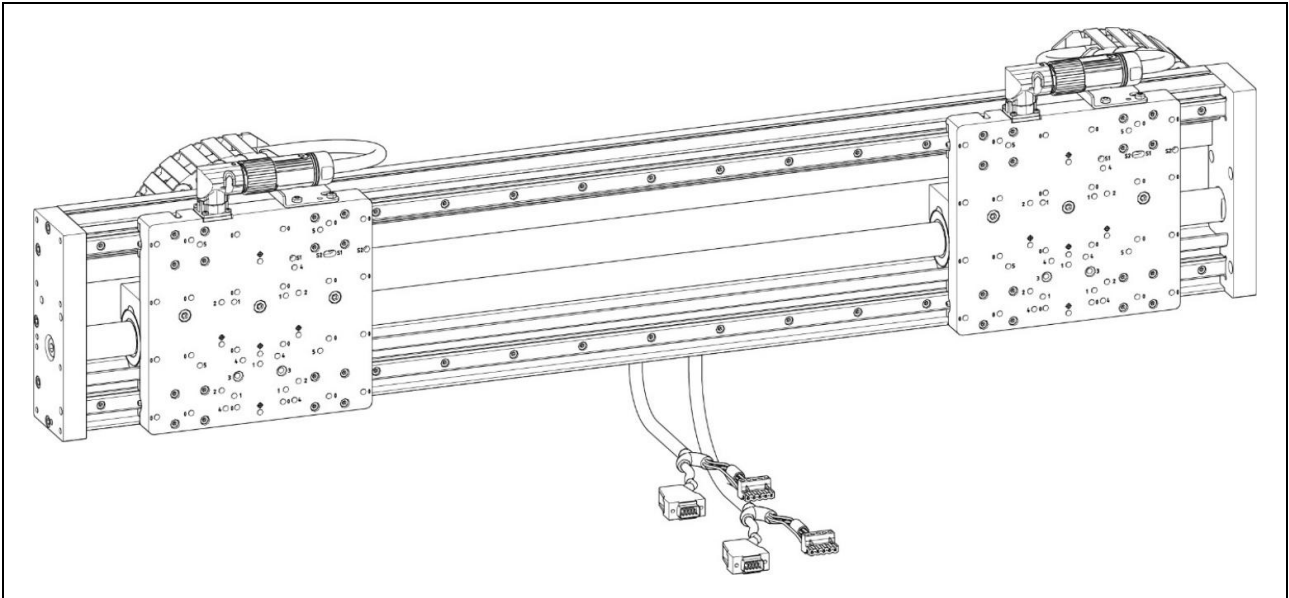
The cable is routed towards the right-hand end plate.



**Mounting variants for two carriages**

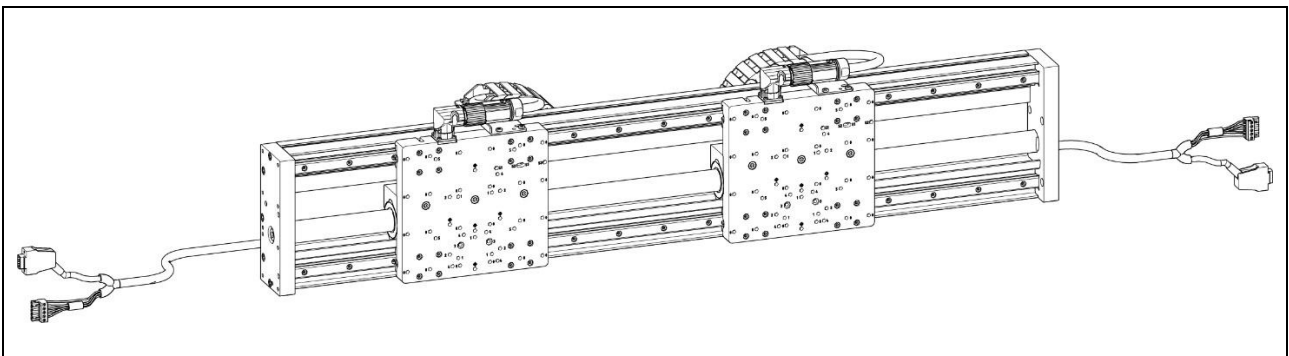
**Cable exit on the centre:** 0140-0052 option (default): Cable connector bottom centre

The cables are routed to the centre of the module.



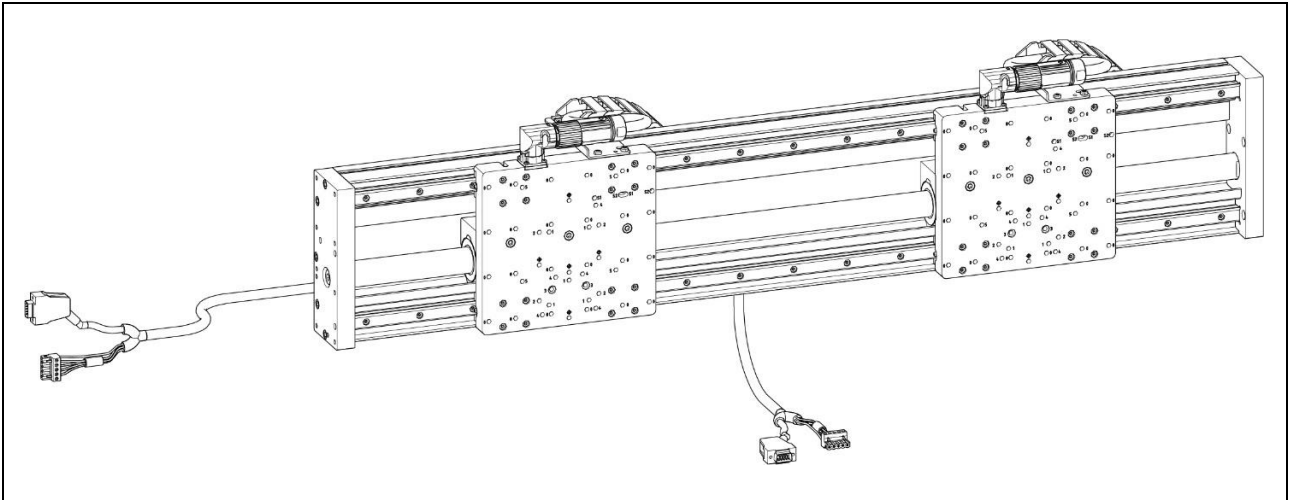
**Cable exit on the sides:** 0140-0053 option: Cable connector bottom left/right

The cable of the left carriage is routed towards the left end plate, the cable of the right carriage towards the right end plate.



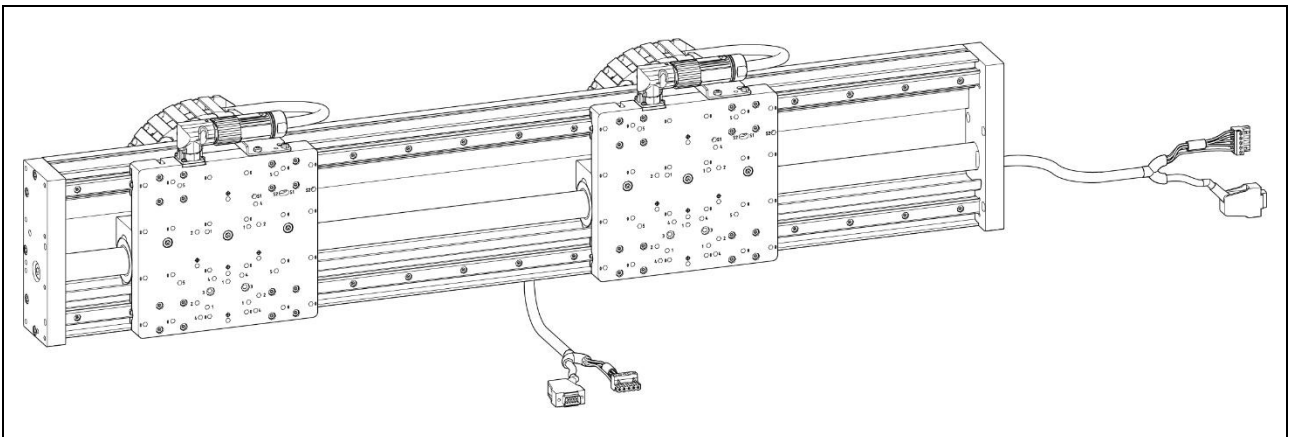
**Cable exit left/centre:** 0140-0054 option: Cable connector bottom left/centre.

The cable of the left carriage is routed towards the left end plate, the cable of the right carriage towards the centre of the module.

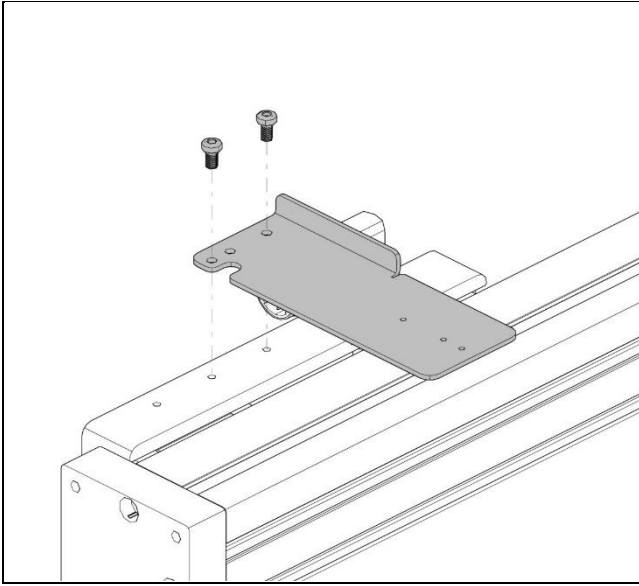


**Cable exit centre/right:** 0140-0055 option: Cable connector bottom centre/right.

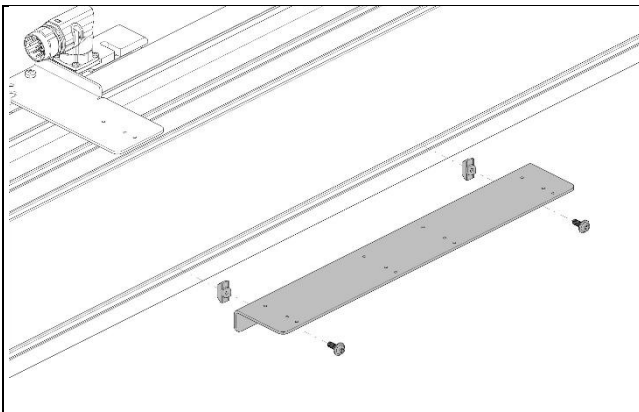
The cable of the left carriage is routed towards the centre of the module, the cable of the right carriage towards the right end plate.



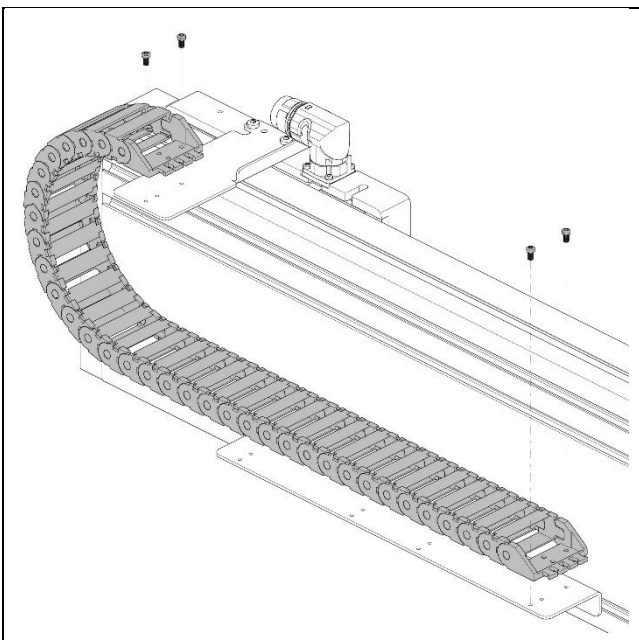
### 7.2.1 Standard installation of the trailing chain on one carriage (0140-0050 option (default): Cable connector bottom left)



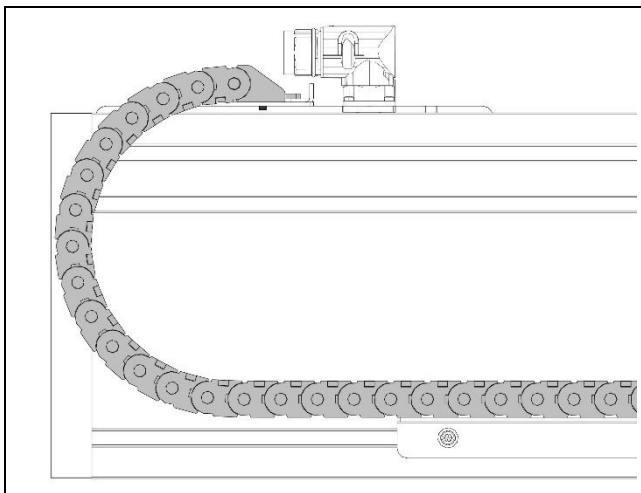
1. Mount the angle plate on the carriage. Use screw locking compound.



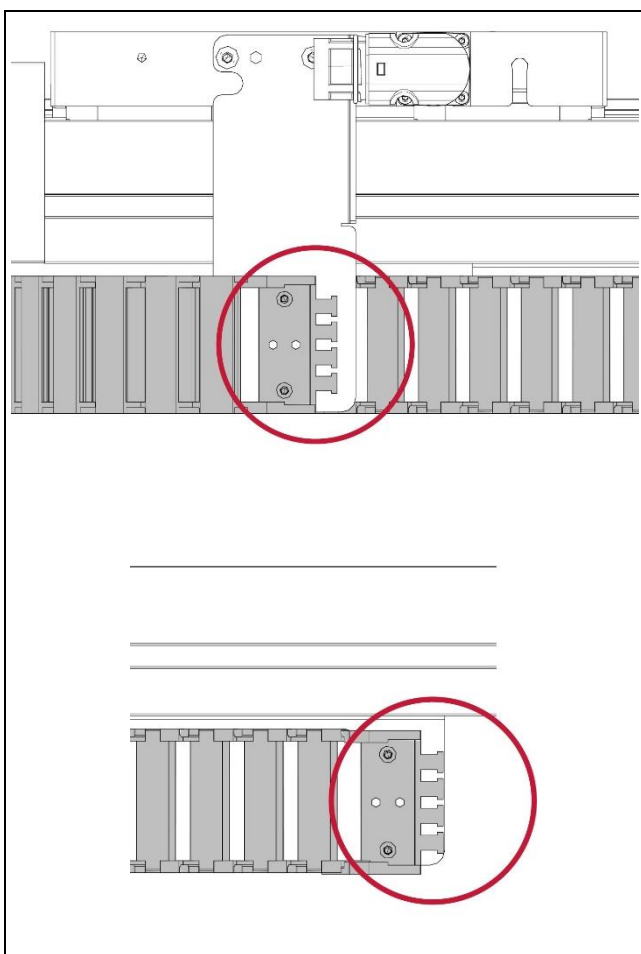
2. Mount the lower angle plate with T-nuts in the lower part of the module base. Longer lower angle plates have an additional fixing point in the centre.



3. Insert the cable into the trailing chain and fit the trailing chain to the plates. Use screw locking compound.

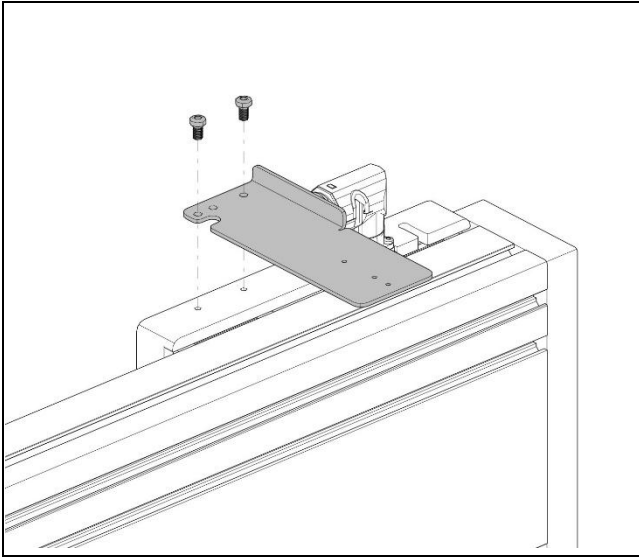


4. Align the lower angle plate so that the trailing chain with cable does not protrude from the module and the permissible cable bending radius is maintained. The carriage must be able to achieve the full required mechanical stroke.

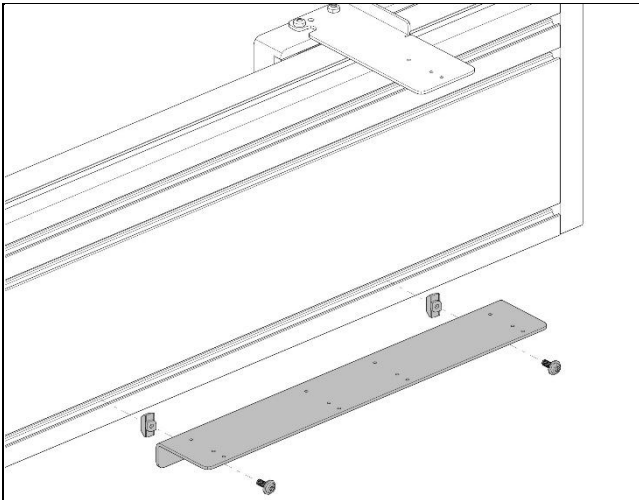


5. Fix the cable to the trailing chain on both sides with cable ties.

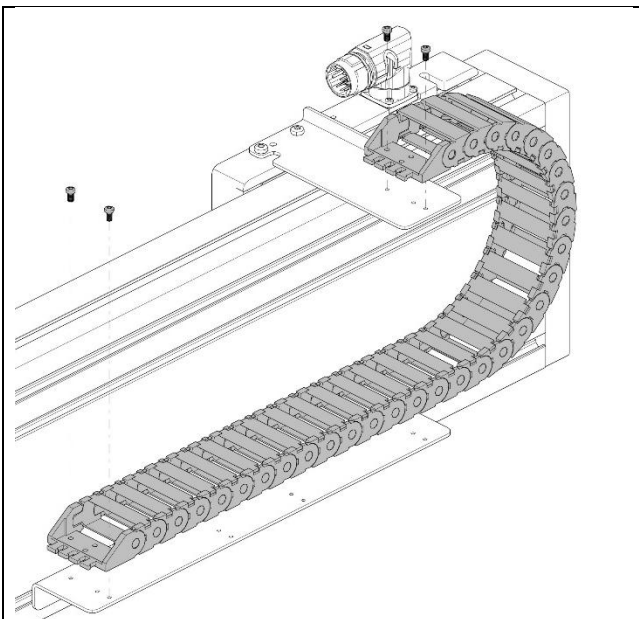
### 7.2.2 Inverted installation of the trailing chain on one carriage (0140-0051 option: Cable connector bottom right)



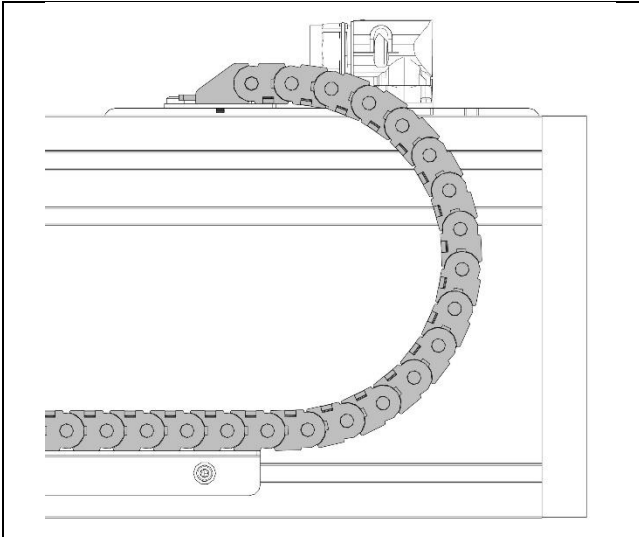
1. Mount the angle plate on the carriage. Use screw locking compound.



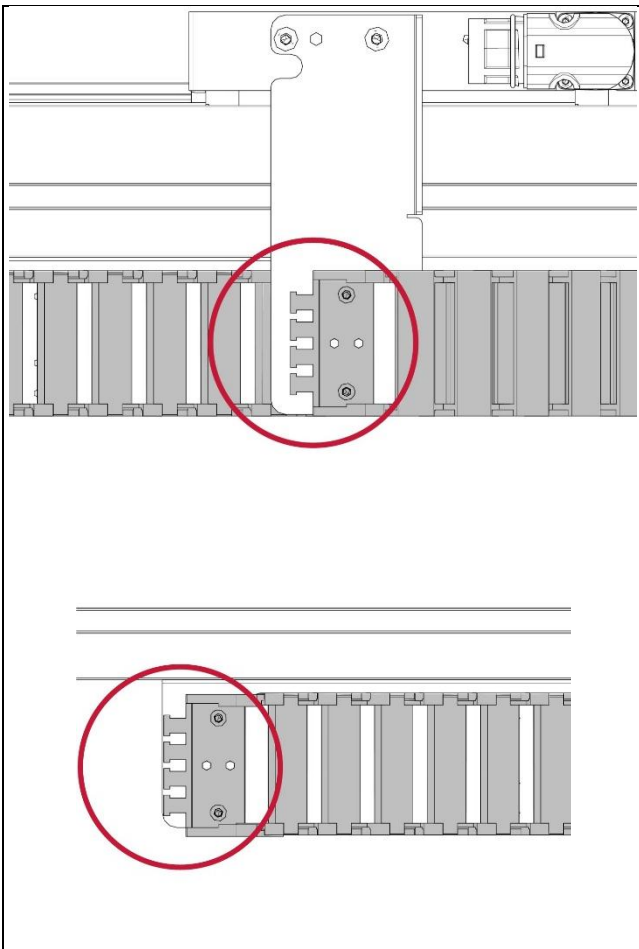
2. Mount the lower angle plate with T-nuts in the lower part of the module base. Longer lower angle plates have an additional fixing point in the centre.



3. Insert the cable into the trailing chain and fit the trailing chain to the plates. Use screw locking compound.

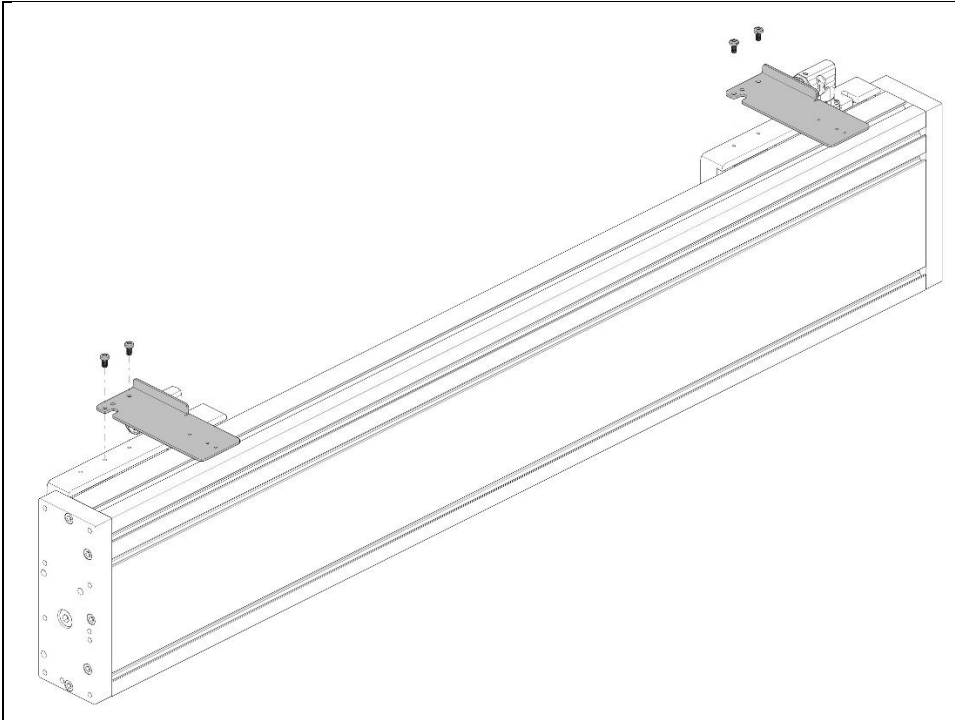


4. Align the lower angle plate so that the trailing chain with cable does not protrude from the module and the permissible cable bending radius is maintained. The carriage must be able to achieve the full required mechanical stroke.

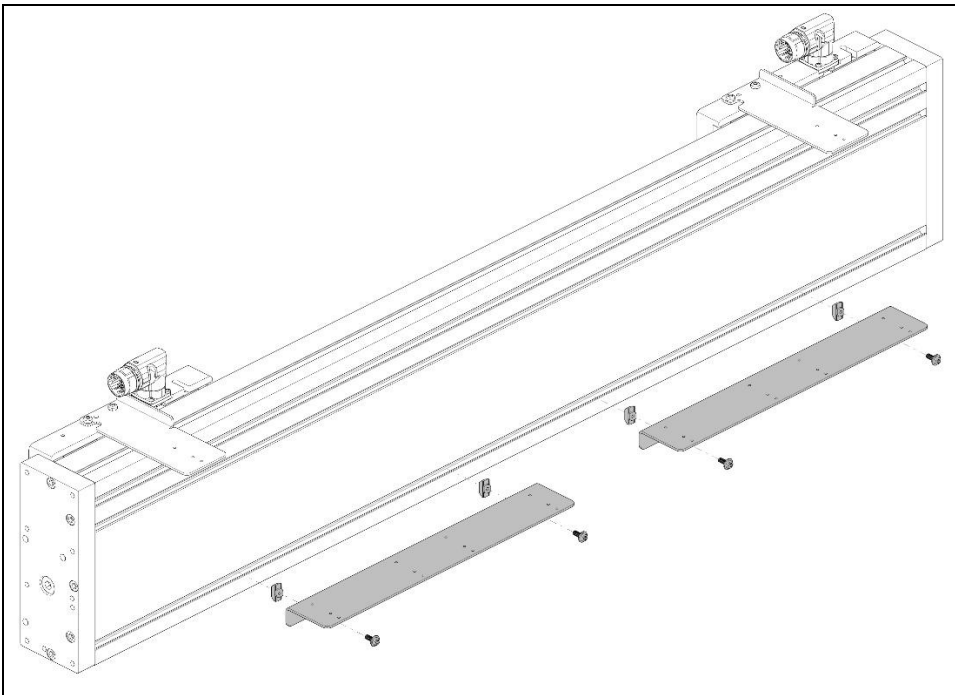


5. Fix the cable to the trailing chain on both sides with cable ties.

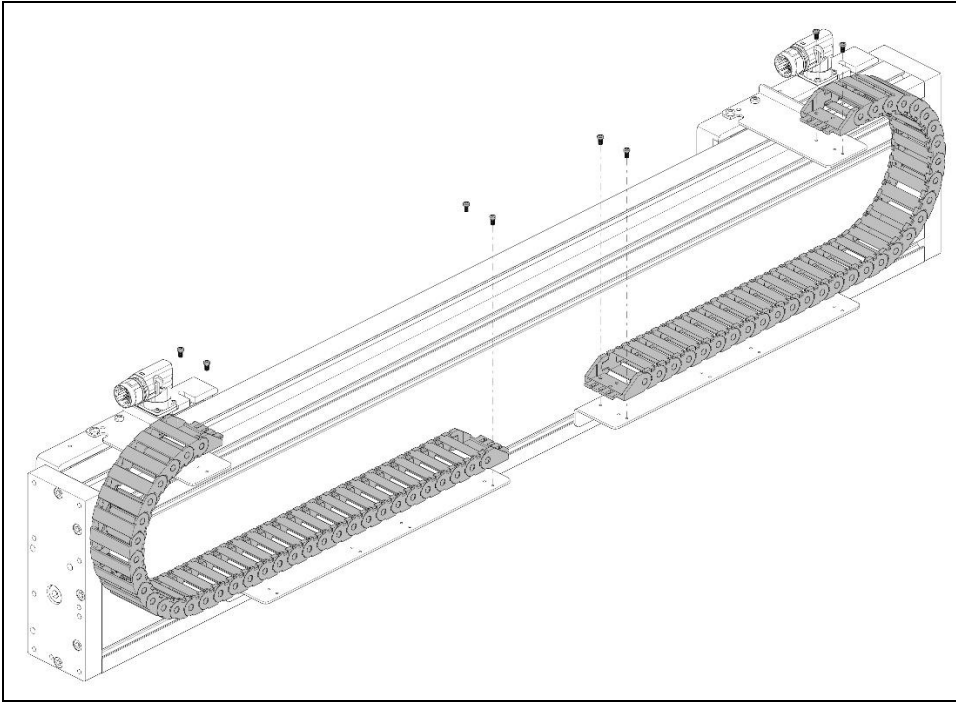
### 7.2.3 Cable exit on the centre with two carriages (0140-0052 option (default): Cable connector bottom center)



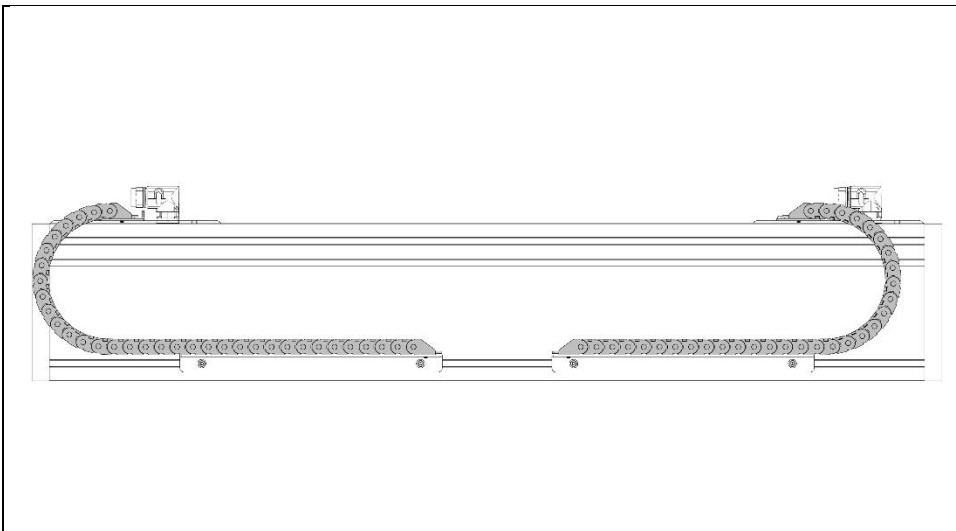
1. Mount the angle plates on the carriages. Use screw locking compound.



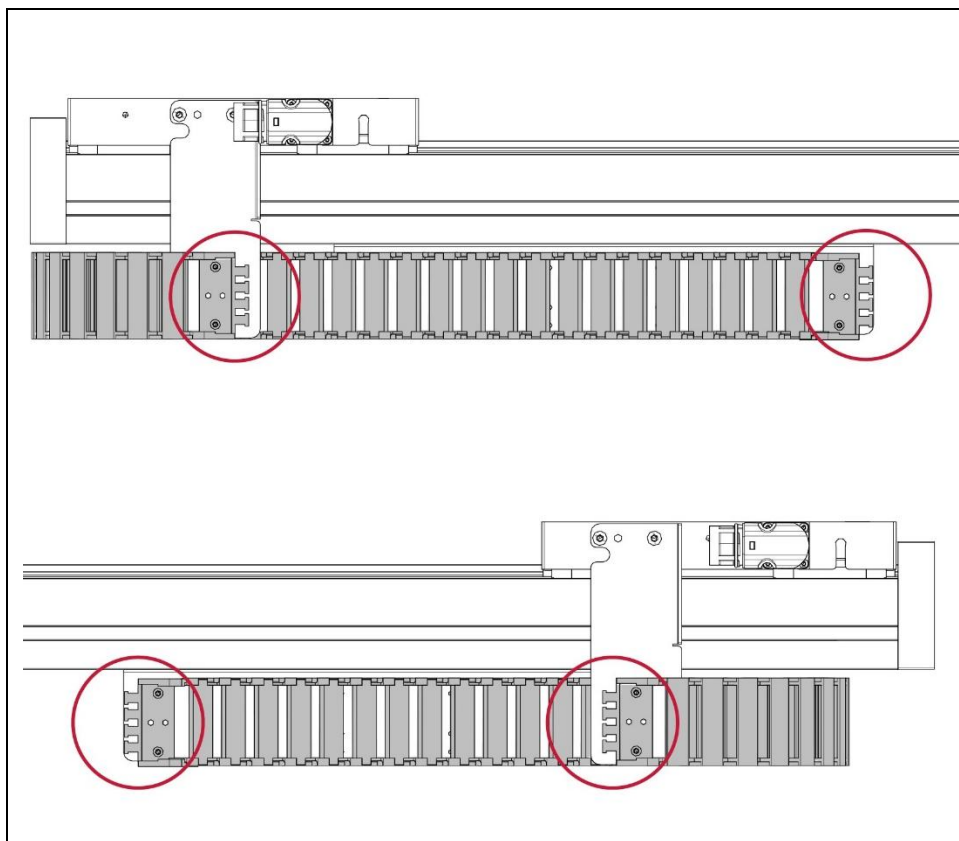
2. Mount the lower angle plates with T-nuts in the lower part of the module base. Longer lower angle plates have an additional fixing point in the centre.



3. Insert the cables into the trailing chains and fit the trailing chains to the plates. Use screw locking compound.

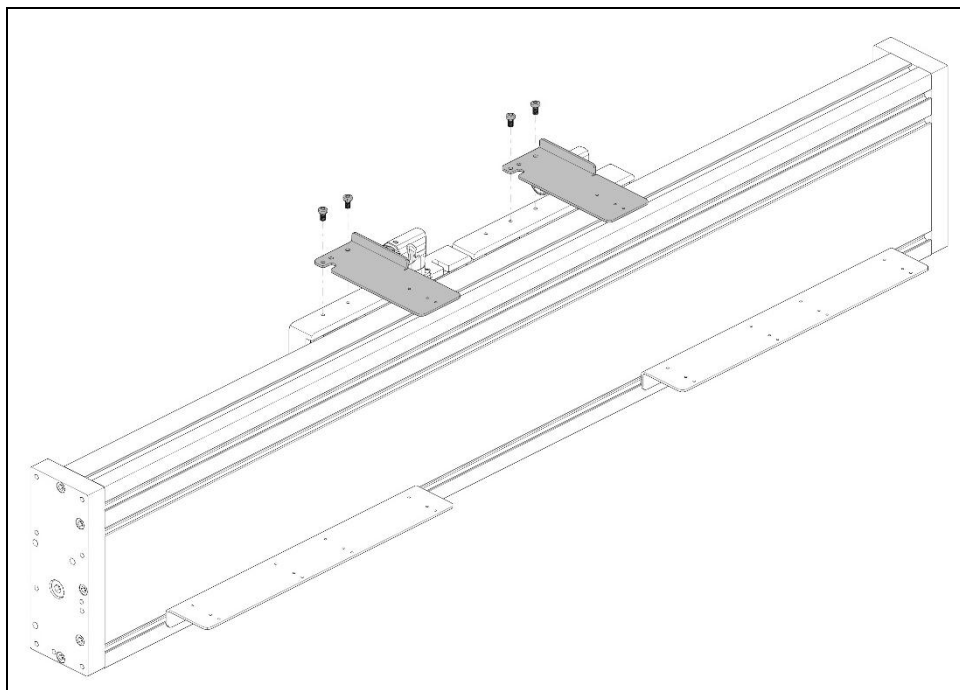


4. Align the lower angle plates so that the trailing chains with cable does not protrude from the module and the permissible cable bending radius is maintained. The carriages must be able to achieve the full required mechanical stroke.

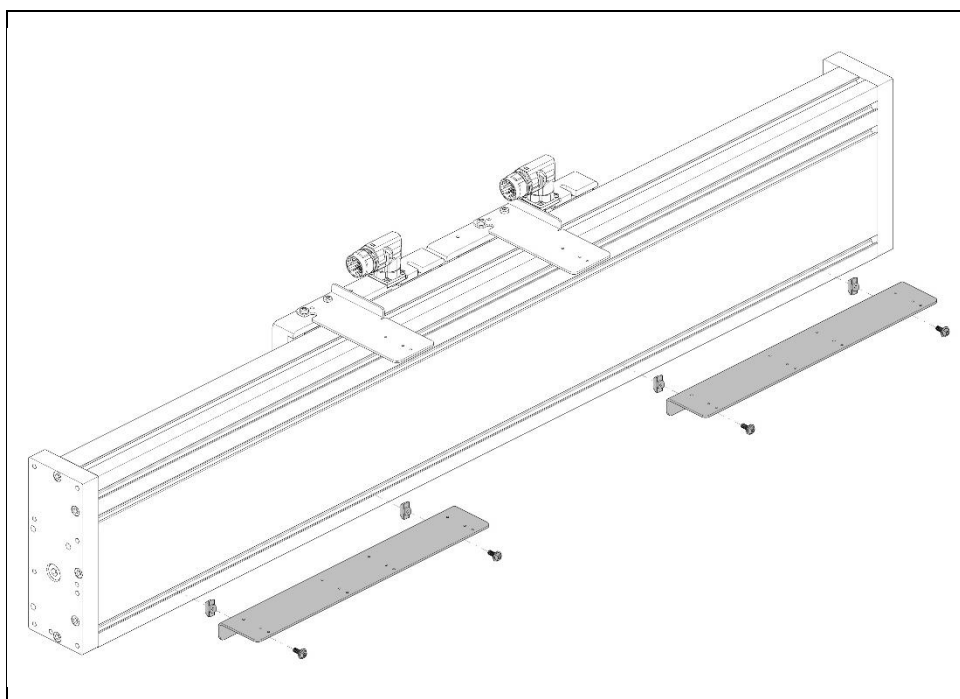


5. Fix the cables to the trailing chains on both sides with cable ties.

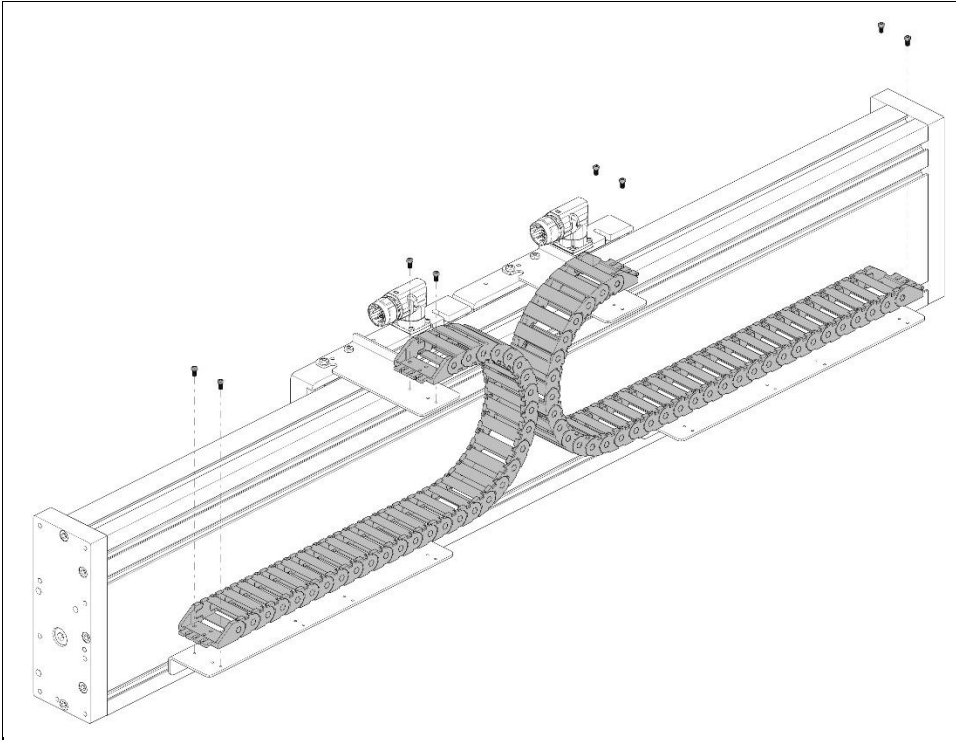
### 7.2.4 Cable exit on the sides with two carriages (0140-0053 option: Cable connector left/right)



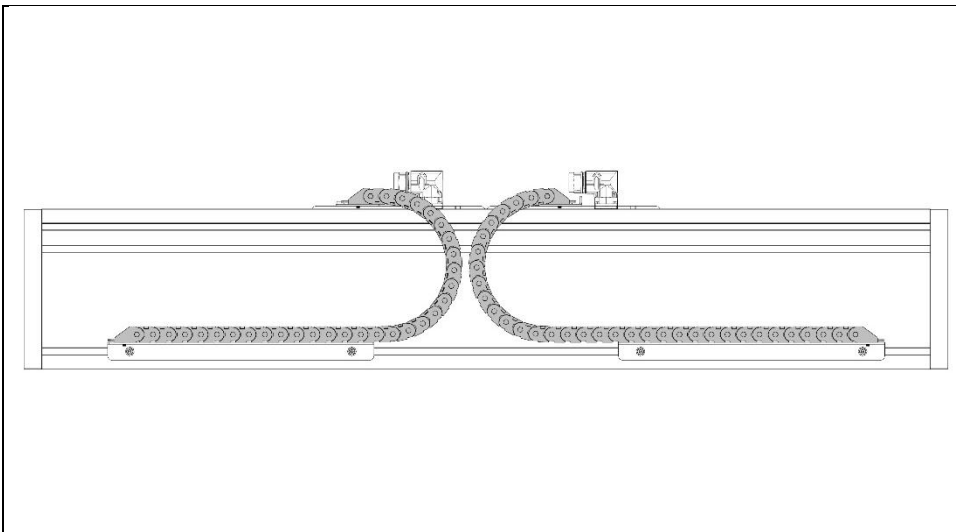
1. Mount the angle plates on the carriages. Use screw locking compound.



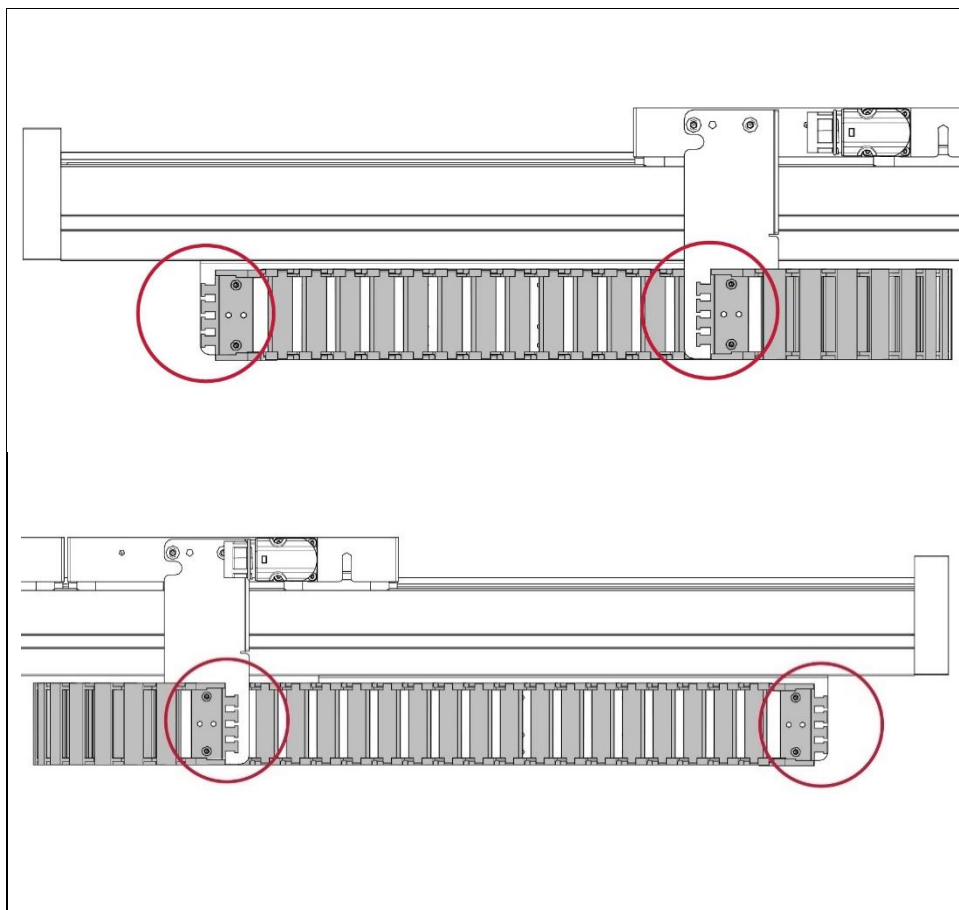
2. Mount the lower angle plates with T-nuts in the lower part of the module base. Longer lower angle plates have an additional fixing point in the centre.



3. Insert the cables into the trailing chains and fit the trailing chains to the plates. Use screw locking compound.

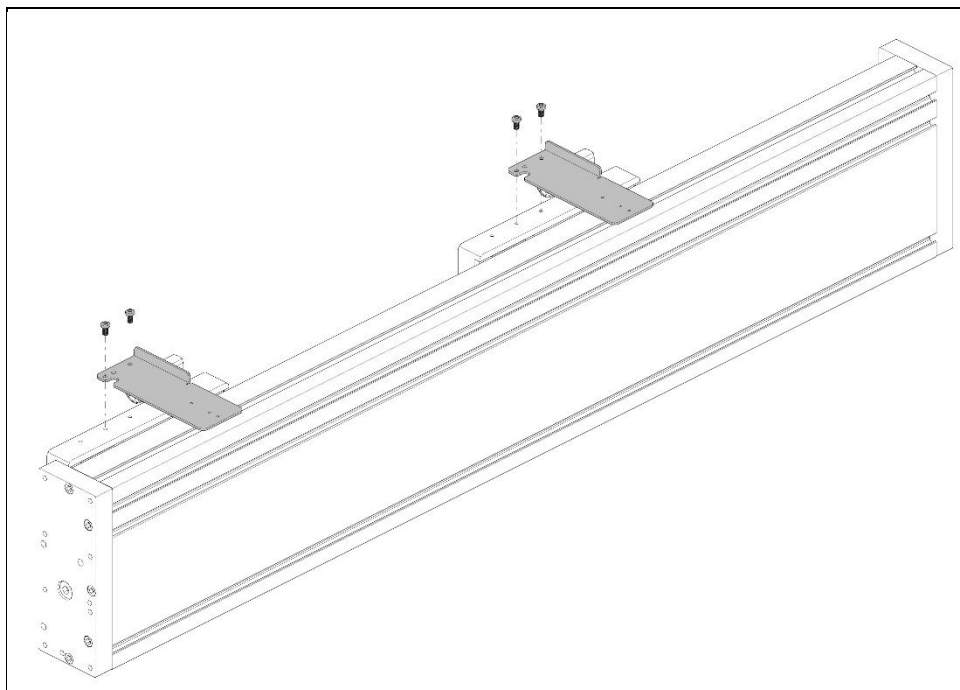


4. Align the lower angle plates so that the trailing chains with cable do not collide and the permissible cable bending radius is maintained. The carriages must be able to achieve the full required mechanical stroke.

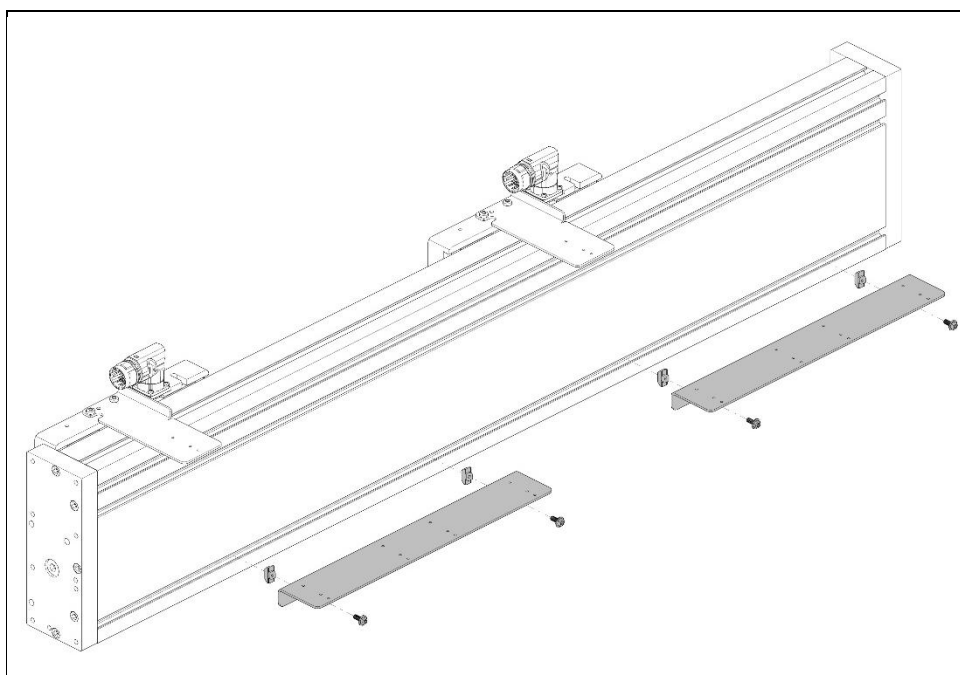


5. Fix the cables to the trailing chains on both sides with cable ties.

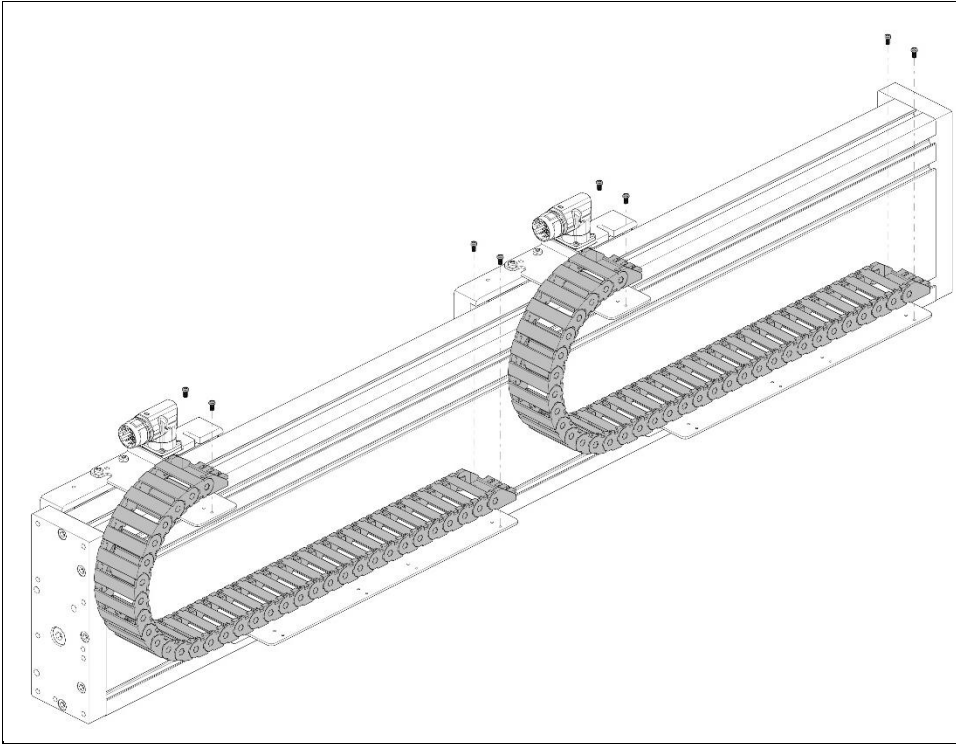
### 7.2.5 Cable exit left/centre with two carriages (0140-0054 option: Cable connector bottom left/centre)



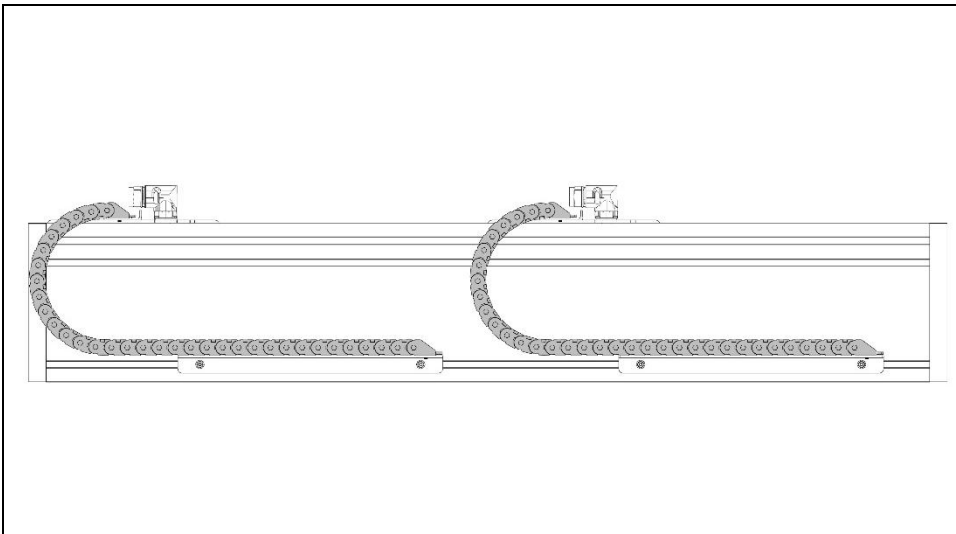
1. Mount the angle plates on the carriages. Use screw locking compound.



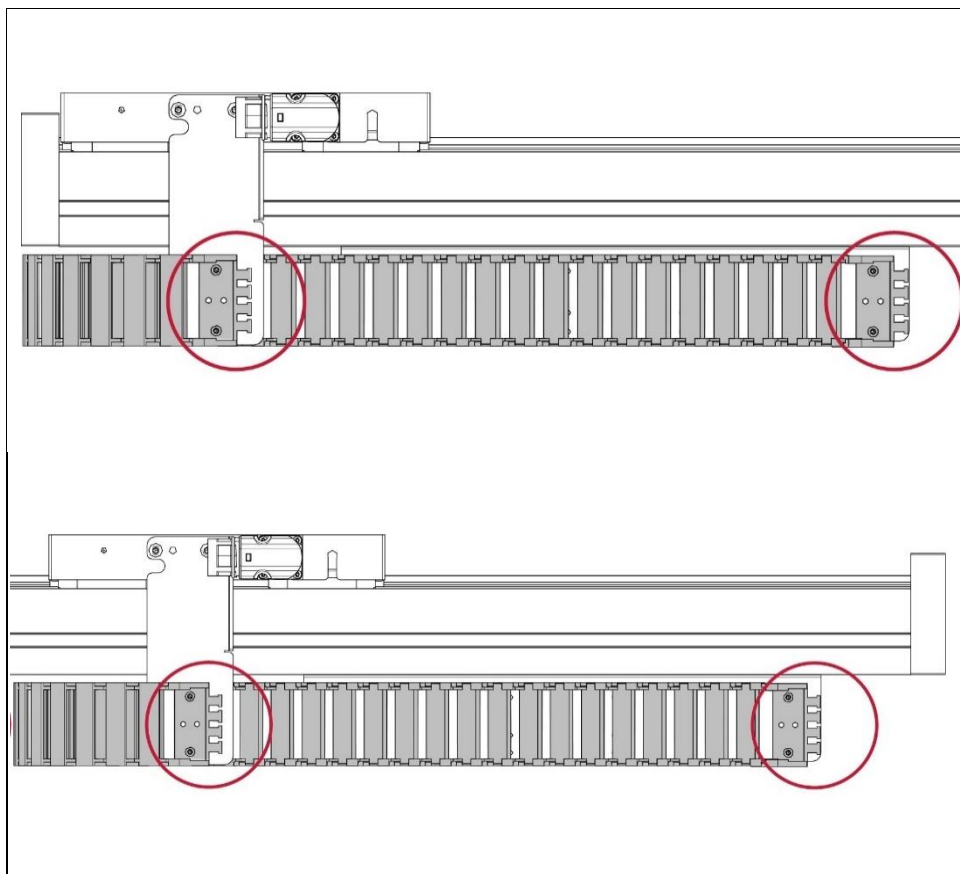
2. Mount the lower angle plates with T-nuts in the lower part of the module base. Longer lower angle plates have an additional fixing point in the centre.



3. Insert the cables into the trailing chains and fit the trailing chains to the plates. Use screw locking compound.

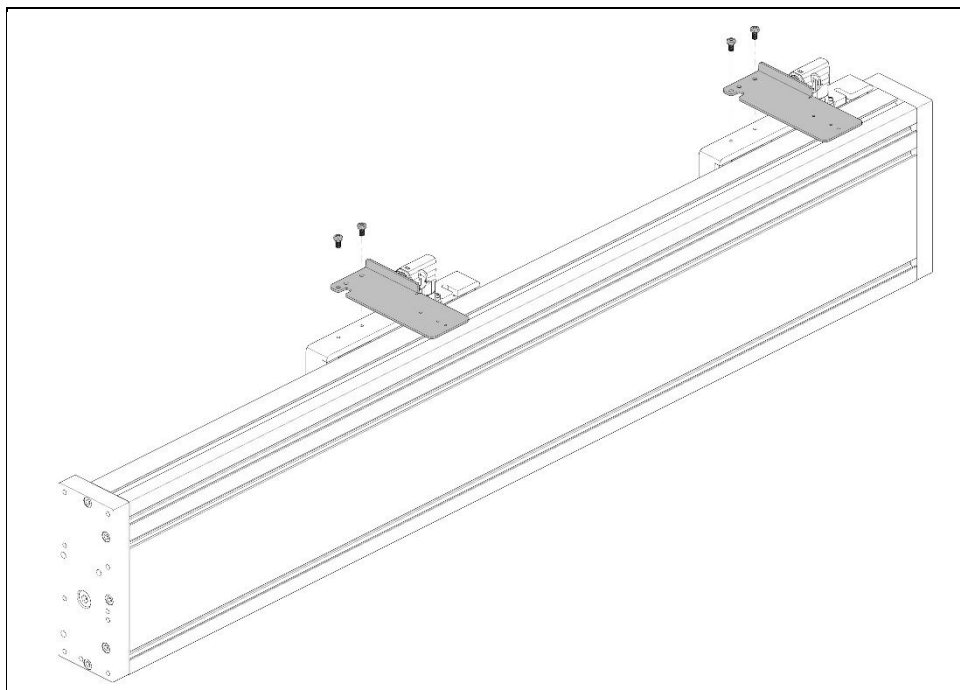


4. Align the lower angle plates so that the trailing chain (here on the left) with cable does not protrude from the module and the permissible cable bending radius is maintained. The carriages must be able to achieve the full required mechanical stroke.

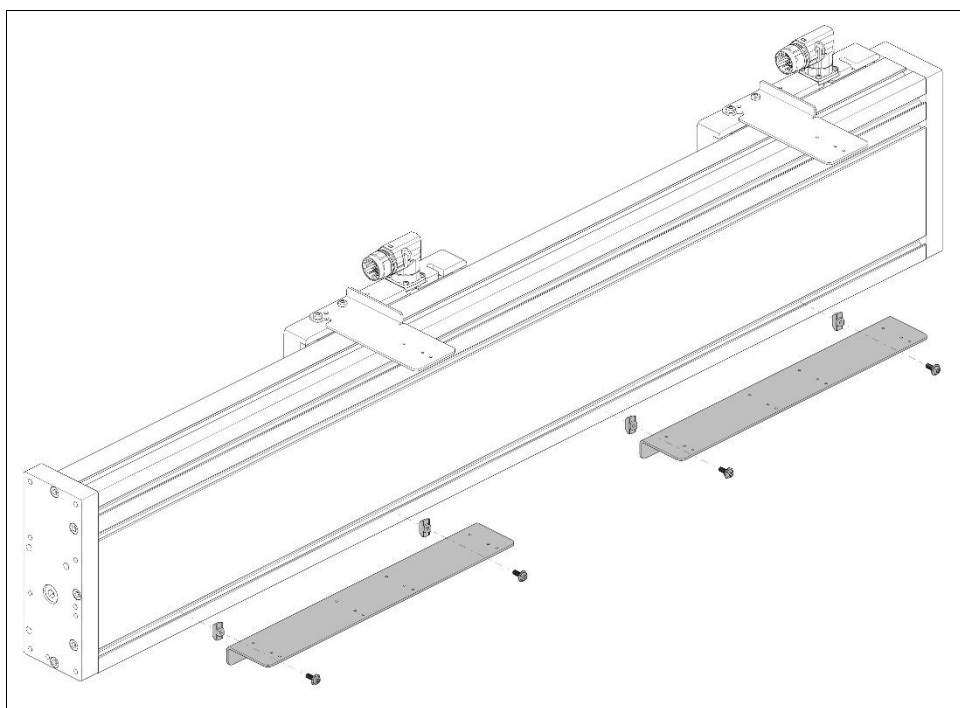


5. Fix the cables to the trailing chains on both sides with cable ties.

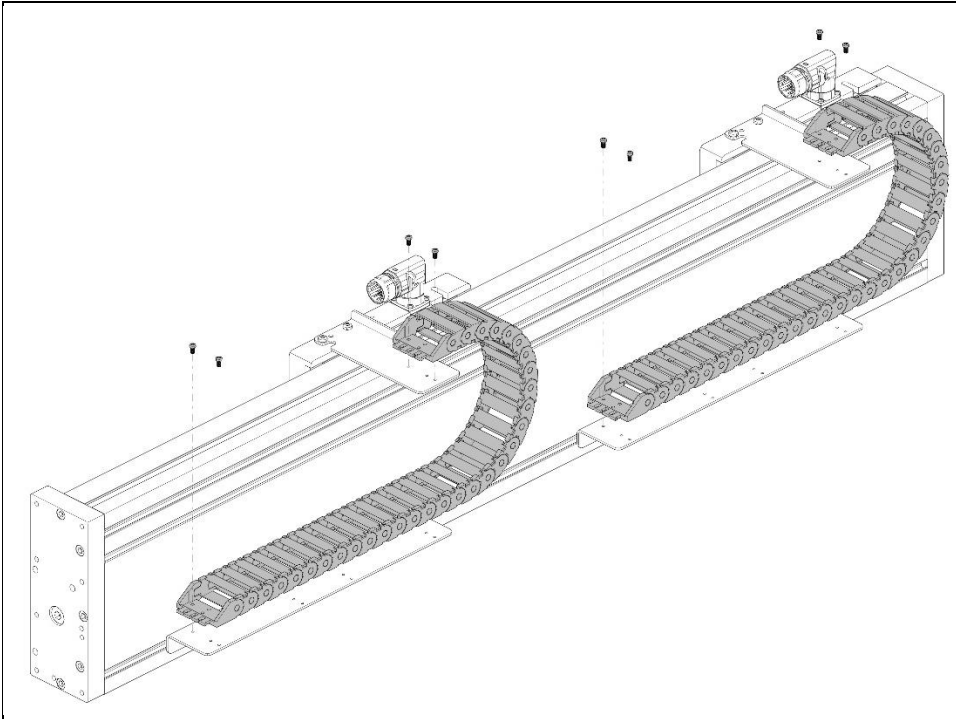
### 7.2.6 Cable exit centre/right with two carriages (0140-0055 option: Cable connector bottom centre/right)



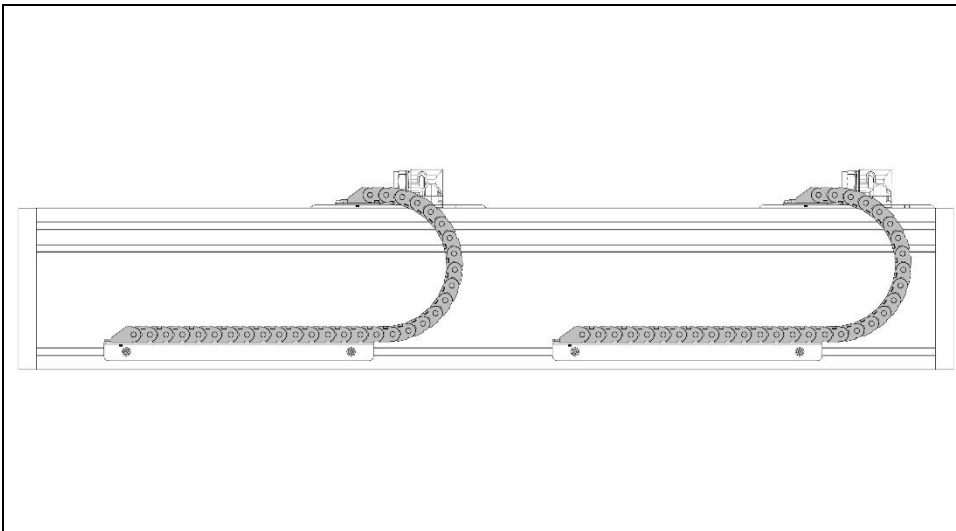
1. Mount the angle plates on the carriages. Use screw locking compound.



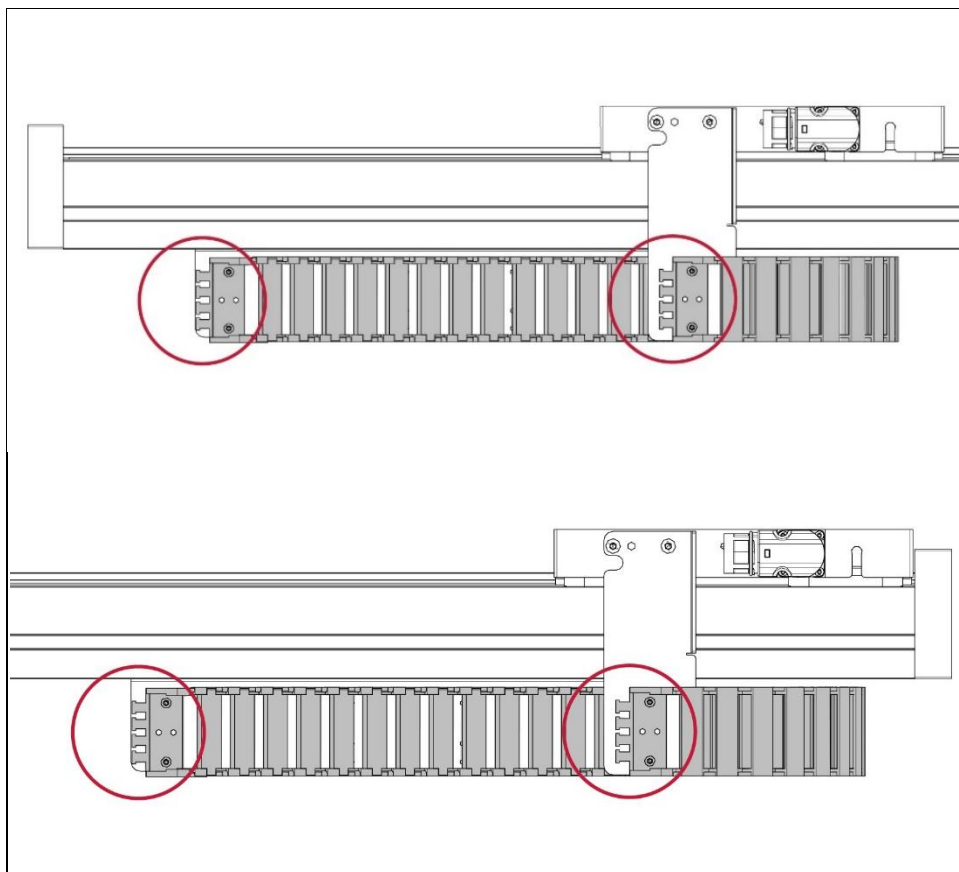
2. Mount the lower angle plates with T-nuts in the lower part of the module base. Longer lower angle plates have an additional fixing point in the centre.



3. Insert the cables into the trailing chains and fit the trailing chains to the plates. Use screw locking compound.



4. Align the lower angle plates so that the trailing chain (here on the right) with cable does not protrude from the module and the permissible cable bending radius is maintained. The carriages must be able to achieve the full required mechanical stroke.

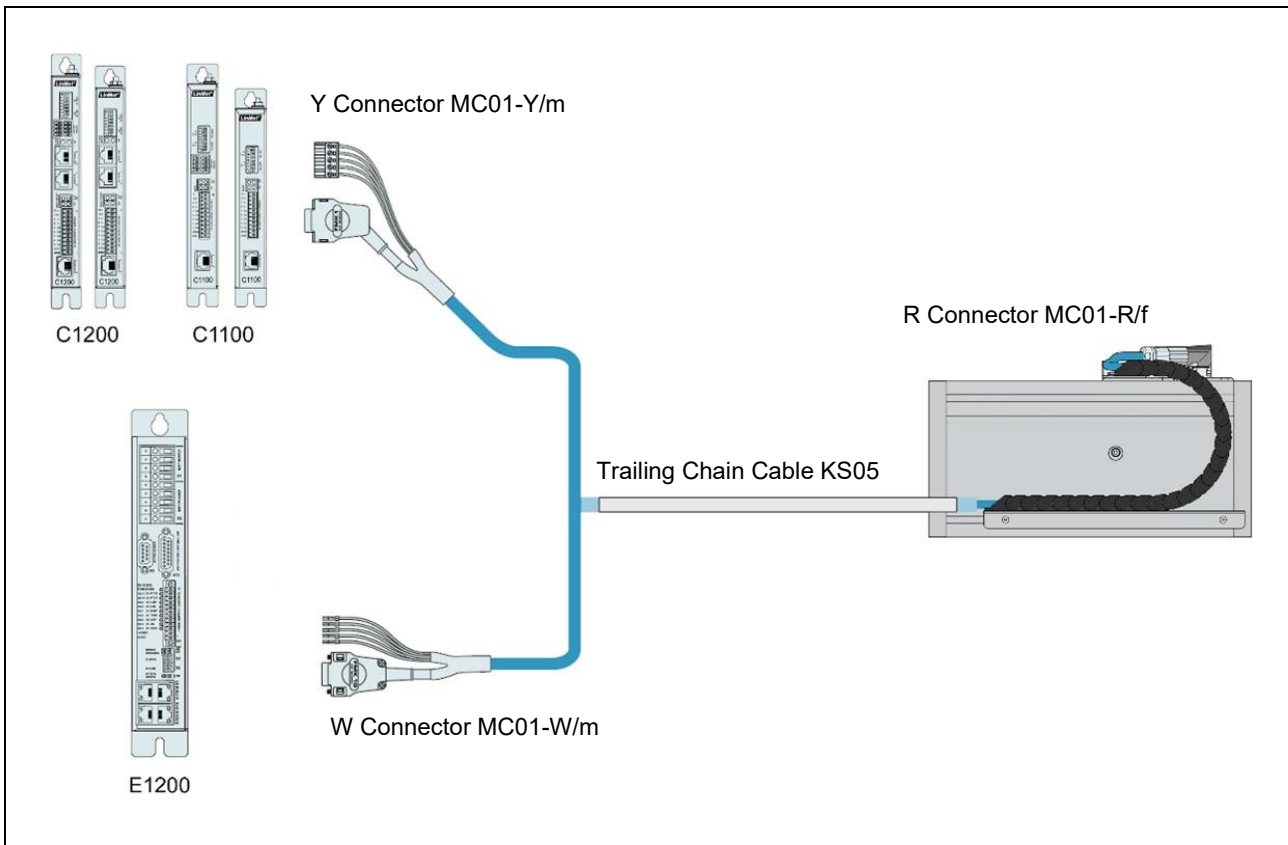


5. Fix the cables to the trailing chains on both sides with cable ties.

## 7.3 Motor cables

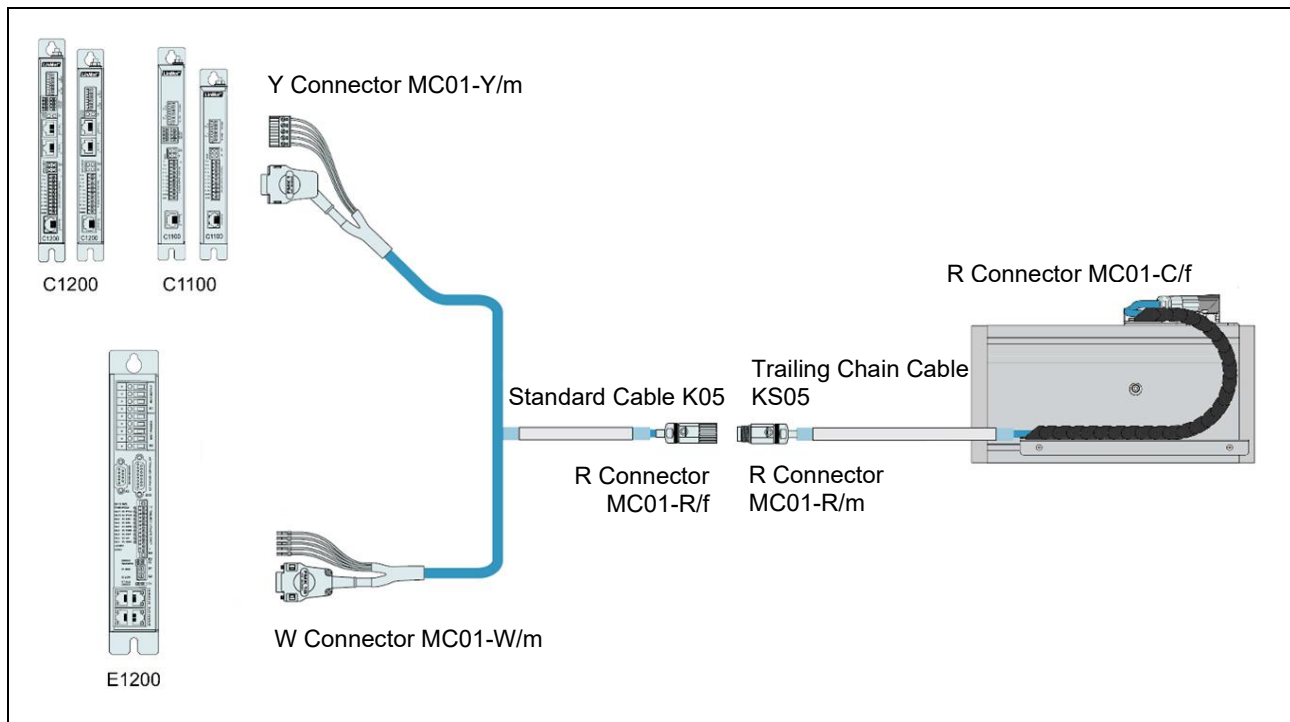


### 7.3.1 Motor cables for direct wiring



| Item       | Description                             | Item-No.                  |
|------------|-----------------------------------------|---------------------------|
| KS05-W/R-4 | Trailing Chain Cable W/R, 4 m           | <a href="#">0150-2106</a> |
| KS05-W/R-6 | Trailing Chain Cable W/R, 6 m           | <a href="#">0150-2131</a> |
| KS05-W/R-8 | Trailing Chain Cable W/R, 8 m           | <a href="#">0150-2107</a> |
| KS05-W/R-  | Trailing Chain Cable W/R, Custom length | <a href="#">0150-3256</a> |

| Item       | Description                             | Item-No.                  |
|------------|-----------------------------------------|---------------------------|
| KS05-Y/R-4 | Trailing Chain Cable Y/R, 4 m           | <a href="#">0150-2433</a> |
| KS05-Y/R-6 | Trailing Chain Cable Y/R, 6 m           | <a href="#">0150-2434</a> |
| KS05-Y/R-8 | Trailing Chain Cable Y/R, 8 m           | <a href="#">0150-2435</a> |
| KS05-Y/R-  | Trailing Chain Cable Y/R, Custom length | <a href="#">0150-3507</a> |

**7.3.2 Motor cables for indirect wiring with fixed extension cable****1st cable section: Motor to intermediate R connector (in trailing chain)**

| Item            | Description                                  | Item-No.                  |
|-----------------|----------------------------------------------|---------------------------|
| KS05-09-R/R-1.5 | Trailing chain cable R/R, 1.5 m (for guides) | <a href="#">0150-3883</a> |
| KS05-09-R/R-2   | Trailing chain cable R/R, 2 m (for guides)   | <a href="#">0150-3884</a> |
| KS05-09-R/R-3   | Trailing chain cable R/R, 3 m (for guides)   | <a href="#">0150-3885</a> |
| KS05-09-R/R-    | Trailing chain cable R/R, Custom length      | <a href="#">0150-3217</a> |

**2nd cable section: Intermediate R connector to C1100/C1200 series drives (fixed installation)**

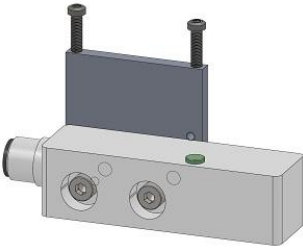
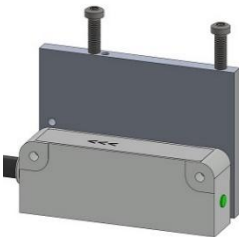
| Item         | Description                    | Item-No.                  |
|--------------|--------------------------------|---------------------------|
| K05-Y/R-2    | Motor Cable Y/R, 2 m           | <a href="#">0150-2421</a> |
| K05-Y/R-4    | Motor Cable Y/R, 4 m           | <a href="#">0150-2422</a> |
| K05-Y/R-6    | Motor Cable Y/R, 6 m           | <a href="#">0150-2423</a> |
| K05-Y/R-8    | Motor Cable Y/R, 8 m           | <a href="#">0150-2424</a> |
| K05-Y/-Fe/R- | Motor Cable Y/R, Custom length | <a href="#">0150-3501</a> |

**2nd cable section: Intermediate R connector to E1200 series drives (fixed installation)**

| Item      | Description                    | Item-No.                  |
|-----------|--------------------------------|---------------------------|
| K05-W/R-2 | Motor Cable W/R, 2 m           | <a href="#">0150-2119</a> |
| K05-W/R-4 | Motor Cable W/R, 4 m           | <a href="#">0150-2120</a> |
| K05-W/R-6 | Motor Cable W/R, 6 m           | <a href="#">0150-2121</a> |
| K05-W/R-8 | Motor Cable W/R, 8 m           | <a href="#">0150-2122</a> |
| K05-W/R-  | Motor Cable W/R, Custom length | <a href="#">0150-3262</a> |

## 8 External Sensors

For applications requiring maximum precision or absolute position measurement, LinMot offers direct integration of high quality position sensors.

| Sensor                                                                                                                                                                                              | Compatibility                                                                                                                       | Magnetic strip                                                                                                      | Compatible drives                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
|  <p><a href="#">0150-2942</a></p> <p>E01-37S-SK/D<br/>external sensor kit for EM01,<br/>incremental</p>            | <p>This sensor can be used with the following linear modules:</p> <p>EM01-37x60<br/>EM01-37x120<br/>EM01-48x150<br/>EM01-48x240</p> | <p><a href="#">0150-1963</a></p> <p>MB01-1000<br/>incremental magnetic strip<br/>for MS01-1/D (per cm)</p>          | <p>C11x0<br/>C12x0<br/>C1250-MI<br/>C1251-MI<br/>E12x0</p> |
|  <p><a href="#">0150-2943</a></p> <p>E01-37S-SK/D-SSI<br/>external sensor kit for EM01<br/>and FM01, absolute</p> | <p>This sensor can be used with the following linear modules:</p> <p>EM01-37x60<br/>EM01-37x120<br/>EM01-48x150<br/>EM01-48x240</p> | <p><a href="#">0150-2096</a></p> <p>MB01-1000-ABS/SSI<br/>absolute magnetic strip for<br/>MS01-1/D-SSI (per cm)</p> | <p>C11x0<br/>C12x0<br/>C1250-MI<br/>C1251-MI</p>           |
|  <p><a href="#">0150-4721</a></p> <p>E01-SK02/D-BiSS<br/>external sensor kit for EM01,<br/>absolute</p>          | <p>This sensor can be used with the following linear modules:</p> <p>EM01-37x60<br/>EM01-37x120<br/>EM01-48x150<br/>EM01-48x240</p> | <p><a href="#">0150-4730</a></p> <p>MB01-1000-ABS/BiSS<br/>absolute magnetic strip for<br/>E01-1/D-SSI (per cm)</p> | <p>C11x0<br/>C12x0<br/>C1250-MI<br/>C1251-MI</p>           |

## 8.1 Incremental sensor



Incremental sensor kit consists of external sensor, mounting brackets and screws. Magnetic strip and additional cables must be ordered separately.

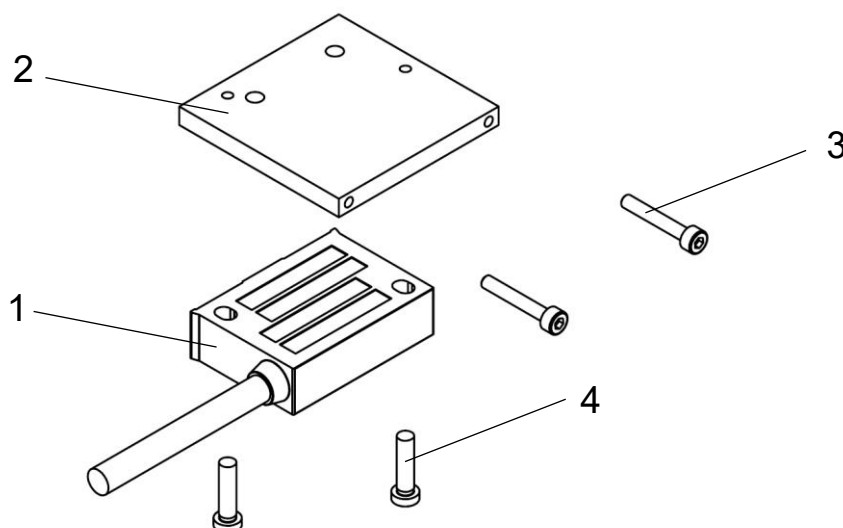
| Item         | Description                                         | Item-No.                  |
|--------------|-----------------------------------------------------|---------------------------|
| E01-37S-SK/D | External Sensor kit for EM-Module, 2m (incremental) | <a href="#">0150-2942</a> |



You can find more detailed information about external sensor such as detailed mechanical dimensions, counting directions, installation alignment and connector wiring in the external sensor data sheet.

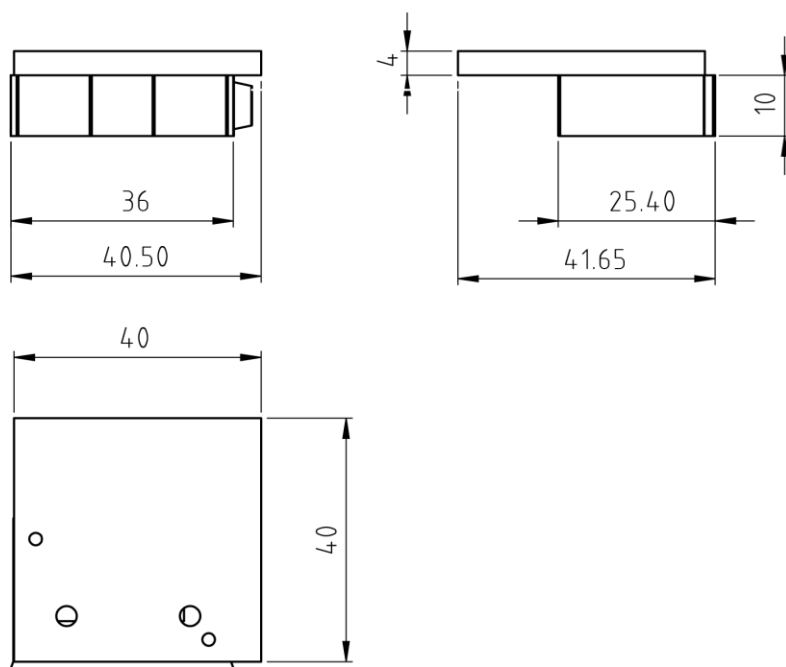
**Due to installation and alignment difficulty, it is highly recommended to order the external sensor kit together with the guide.**

### 8.1.1 Overview sensor kit (incremental)

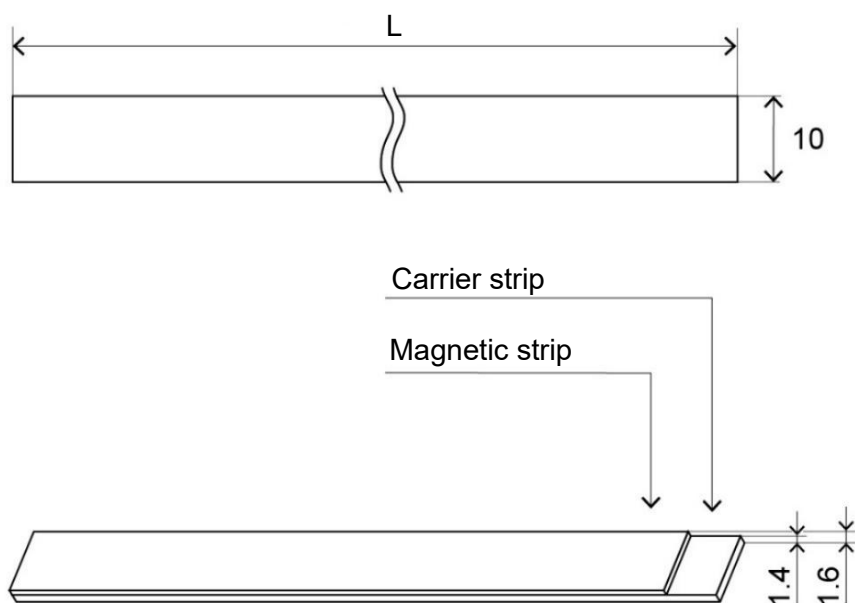


| Pos. | Item                               |
|------|------------------------------------|
| 1    | Magnet sensor MS01-1/D             |
| 2    | Sensor adapter                     |
| 3    | M2.5x16 / ISO 7046-2               |
| 4    | M2.5x10 / ISO 14583                |
| -    | Cable clamp (not pictured)         |
| -    | M2.5x6 / ISO 7046-2 (not pictured) |

### 8.1.2 Dimensions



### 8.1.3 Magnetic strips for incremental sensor



| Item       | Description                                | Strip length L<br>[mm (inch)] | Item-No.                  |
|------------|--------------------------------------------|-------------------------------|---------------------------|
| F01-MB300  | Magnetic strip for E/F-Guide (incremental) | 280 (11.02)                   | <a href="#">0150-5454</a> |
| F01-MB400  | Magnetic strip for E/F-Guide (incremental) | 380 (14.96)                   | <a href="#">0150-5451</a> |
| F01-MB500  | Magnetic strip for E/F-Guide (incremental) | 480 (18.9)                    | <a href="#">0150-5452</a> |
| F01-MB600  | Magnetic strip for E/F-Guide (incremental) | 580 (22.83)                   | <a href="#">0150-5431</a> |
| F01-MB800  | Magnetic strip for E/F-Guide (incremental) | 780 (30.71)                   | <a href="#">0150-5432</a> |
| F01-MB1000 | Magnetic strip for E/F-Guide (incremental) | 980 (38.58)                   | <a href="#">0150-5433</a> |
| F01-MB1200 | Magnetic strip for E/F-Guide (incremental) | 1180 (46.46)                  | <a href="#">0150-5434</a> |
| F01-MB1400 | Magnetic strip for E/F-Guide (incremental) | 1380 (54.33)                  | <a href="#">0150-5435</a> |
| F01-MB1600 | Magnetic strip for E/F-Guide (incremental) | 1580 (62.2)                   | <a href="#">0150-5436</a> |
| F01-MB2000 | Magnetic strip for E/F-Guide (incremental) | 1980 (77.95)                  | <a href="#">0150-5437</a> |

#### 8.1.4 Extender incremental sensor cable



| Item                | Description                             | Item-No.                  |
|---------------------|-----------------------------------------|---------------------------|
| KS025-D15/D-Encoder | Encoder Cable, High Flex, Custom length | <a href="#">0150-3168</a> |

## 8.2 Absolute sensor SSI



SSI absolute sensor kit consists of external sensor, mounting brackets and screws. Magnetic strip and cables must be ordered separately.

| Item              | Description                                  | Item-No.                  |
|-------------------|----------------------------------------------|---------------------------|
| EM01-37S-SK/D-SSI | External Sensor kit for EM-Module (absolute) | <a href="#">0150-2943</a> |

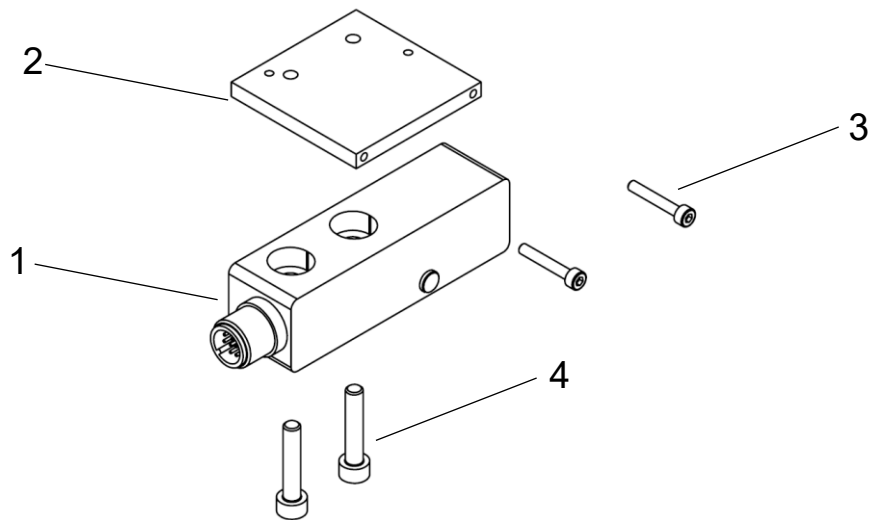


E12x0 series drives cannot evaluate SSI sensors. For these sensors, C11x0 or C12x0 series drives must be used.

You can find more detailed information about external sensor such as detailed mechanical dimensions, counting directions, installation alignment and connector wiring in the external sensor data sheet.

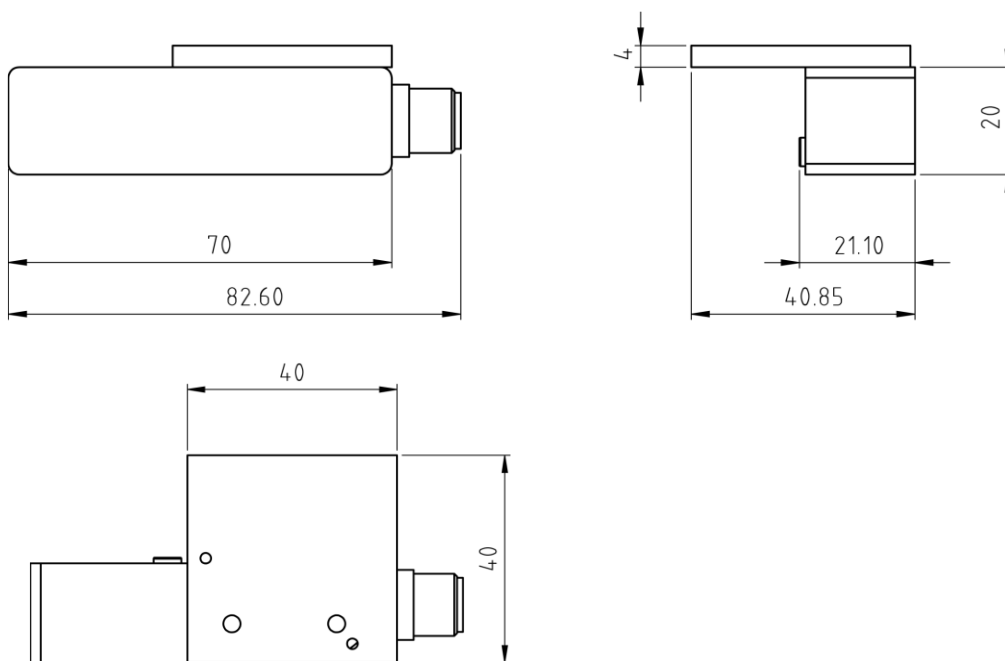
**Due to installation and alignment difficulty, it is highly recommended to order the external sensor kit together with the guide.**

### 8.2.1 Overview sensor kit (absolute sensor SSI)

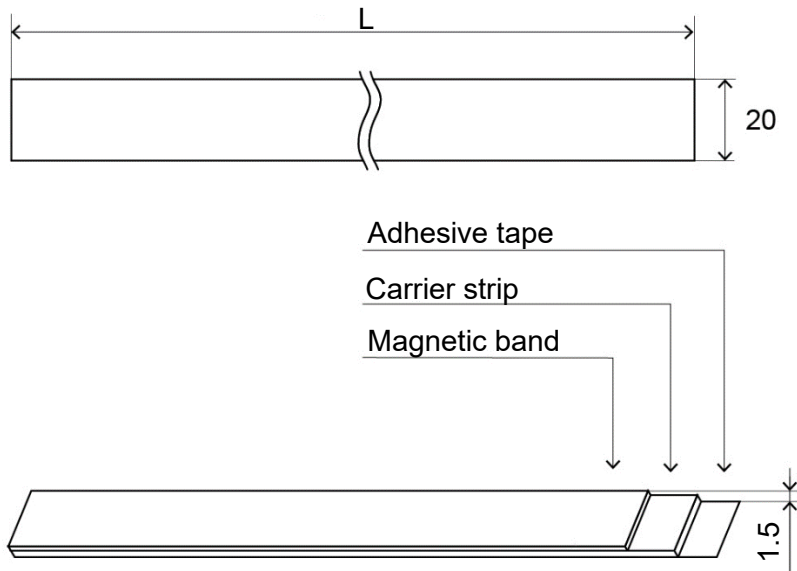


| Pos. | Item                               |
|------|------------------------------------|
| 1    | Magnet sensor MS01-1/D-SSI         |
| 2    | Sensor adapter                     |
| 3    | M2.5x16 / ISO 7046-2               |
| 4    | M2.5x10 / ISO 14583                |
| -    | Cable clamp (not pictured)         |
| -    | M2.5x6 / ISO 7046-2 (not pictured) |

### 8.2.2 Dimensions



### 8.2.3 Magnetic strips for absolute sensor SSI



| Item             | Description                             | Strip length L<br>[mm (inch)] | Item-No.                  |
|------------------|-----------------------------------------|-------------------------------|---------------------------|
| E01-MB300/D-SSI  | Magnetic strip for E/F-Guide (absolute) | 220 (8.66)                    | <a href="#">0150-2960</a> |
| E01-MB400/D-SSI  | Magnetic strip for E/F-Guide (absolute) | 320 (12.6)                    | <a href="#">0150-2961</a> |
| E01-MB500/D-SSI  | Magnetic strip for E/F-Guide (absolute) | 420 (16.54)                   | <a href="#">0150-2962</a> |
| E01-MB600/D-SSI  | Magnetic strip for E/F-Guide (absolute) | 520 (20.47)                   | <a href="#">0150-2963</a> |
| E01-MB800/D-SSI  | Magnetic strip for E/F-Guide (absolute) | 720 (28.35)                   | <a href="#">0150-2964</a> |
| E01-MB1000/D-SSI | Magnetic strip for E/F-Guide (absolute) | 920 (36.22)                   | <a href="#">0150-2965</a> |
| E01-MB1200/D-SSI | Magnetic strip for E/F-Guide (absolute) | 1120 (44.09)                  | <a href="#">0150-2966</a> |
| E01-MB1400/D-SSI | Magnetic strip for E/F-Guide (absolute) | 1320 (51.97)                  | <a href="#">0150-2967</a> |
| E01-MB1600/D-SSI | Magnetic strip for E/F-Guide (absolute) | 1520 (59.84)                  | <a href="#">0150-2968</a> |
| E01-MB2000/D-SSI | Magnetic strip for E/F-Guide (absolute) | 1920 (75.59)                  | <a href="#">0150-2969</a> |

### 8.2.4 Absolute sensor SSI cables



| Item                   | Description                                                                                                                    | Item-No.                  |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| KSS01-12.../ABS-ENC-10 | Cable for MS01-1/D-SSI/BiSS, 10 m, flying leads                                                                                | <a href="#">0160-3387</a> |
| KSS01-12-D15/ABS-ENC-  | Special Cable for MS01-1/D-SSI/BiSS, D-Sub 15, Custom length (max. 10 metres, can be extended with <a href="#">0150-3717</a> ) | <a href="#">0150-3652</a> |

### 8.3 Absolute sensor BiSS



BiSS absolute sensor kit consists of external sensor, mounting brackets and screws. Magnetic strip and additional cables must be ordered separately.

| Item            | Description                                      | Item-No.                  |
|-----------------|--------------------------------------------------|---------------------------|
| E01-SK02/D-BiSS | External Sensor kit for EM-Module, 2m (absolute) | <a href="#">0150-4721</a> |



You can find more detailed information about external sensor such as detailed mechanical dimensions, counting directions, installation alignment and connector wiring in the external sensor data sheet.

**Due to installation and alignment difficulty, it is highly recommended to order the external sensor kit together with the guide.**

#### 8.3.1 Magnetic strips for absolute sensor BiSS



| Item              | Description                             | Strip length L<br>[mm (inch)] | Item-No.                  |
|-------------------|-----------------------------------------|-------------------------------|---------------------------|
| MB01-ABS/BiSS-28  | Magnetic strip for E/F-Guide (absolute) | 280 (11.02)                   | <a href="#">0150-4910</a> |
| MB01-ABS/BiSS-38  | Magnetic strip for E/F-Guide (absolute) | 380 (14.96)                   | <a href="#">0150-4911</a> |
| MB01-ABS/BiSS-48  | Magnetic strip for E/F-Guide (absolute) | 480 (18.90)                   | <a href="#">0150-4912</a> |
| MB01-ABS/BiSS-58  | Magnetic strip for E/F-Guide (absolute) | 580 (22.83)                   | <a href="#">0150-4913</a> |
| MB01-ABS/BiSS-78  | Magnetic strip for E/F-Guide (absolute) | 780 (30.71)                   | <a href="#">0150-4914</a> |
| MB01-ABS/BiSS-98  | Magnetic strip for E/F-Guide (absolute) | 980 (38.58)                   | <a href="#">0150-4915</a> |
| MB01-ABS/BiSS-118 | Magnetic strip for E/F-Guide (absolute) | 1180 (46.46)                  | <a href="#">0150-4917</a> |
| MB01-ABS/BiSS-138 | Magnetic strip for E/F-Guide (absolute) | 1380 (54.33)                  | <a href="#">0150-4919</a> |
| MB01-ABS/BiSS-158 | Magnetic strip for E/F-Guide (absolute) | 1580 (62.20)                  | <a href="#">0150-4920</a> |
| MB01-ABS/BiSS-198 | Magnetic strip for E/F-Guide (absolute) | 1980 (77.95)                  | <a href="#">0150-4923</a> |

### 8.3.2 Absolute sensor BiSS cables



| Item                  | Description                                                                                                           | Item-No.                  |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------|
| KSS01-12-D15/ABS-ENC- | Special Cable for MS01-1/D-SSI/BiSS, Custom length, (max. 10 metres, can be extended with <a href="#">0150-3717</a> ) | <a href="#">0150-3652</a> |

## 9 Maintenance

### 9.1 Maintenance cycles

#### 9.1.1 Profile rail guide maintenance cycles

To avoid dirt from adhering to and embedding into the profile rail guides, the rails should be cleaned regularly with a “cleaning stroke”. SKF recommends a cleaning stroke over the entire length of the rails twice a day or at least every eight hours. Perform a cleaning stroke each time when switching the machine on or off. It is sufficient to clean the heavy soiled carriage rails only with a soft disposable paper.

The lubrication intervals for profile rail guides depend primarily on the average running speed, operating temperature and grease quality. Lubrication interval under normal operating condition ( $v < 1\text{ m/s}$ ) with travel under load  $F_m \leq 0.15\text{ C}$  is 5000 km and with travel under load  $F_m \leq 0.3\text{ C}$  is 1200 km.

**Where contamination, use of coolants, vibration, shock loads etc. form part of the environmental conditions, it is advisable to reduce relubrication intervals accordingly.**

$F_m$  determination and more information regarding maintenance can be found in SKF manual “Profile rail guides LLT 12942”.

#### 9.1.2 Linear motor (stator and slider) maintenance cycles

The stators are initially lubricated at the factory. Lubrication is only necessary if the linear motor run dry or is heavily soiled. Under normal industrial, central European conditions (5-day week with 8 hours of operation per day), a quarterly inspection is sufficient. It is advisable to check the stator together with the carriages.

**The inspection cycle must be shortened if there are heavy loads or deviating conditions. These are e.g.**

- Permanent soiling
- Direct sunlight
- Low humidity
- Outdoor operation
- Increased operating temperature
- Strong shocks or vibrations
- Other special environmental conditions

### 9.2 Inspection

When inspecting, the following points must be checked:

- a) Visual inspection of lubrication grease level (clean and re-lubricate if necessary)
- b) Visual inspection of all wearing parts (replace if necessary)

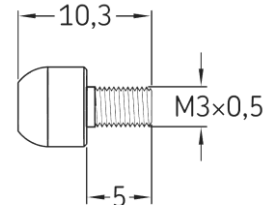
### 9.3 Cleaning and lubrication



Carriages and stator use different greases. Make sure that they are not exchanged or mixed!

#### 9.3.1 Profile rail guides and carriages cleaning and lubrication

1. Remove the accommodated soiling. Move the carriage to side to access all soiled parts. It is important that no paper residue is left anywhere on the guide.
2. Each carriage is equipped with a side grease nipple. Access the grease nipple with filler and grease each carriage with 0.4 cm<sup>3</sup> SKF LGEP 2. **Do not overlubricate!**
3. Move the carriage three times over the entire stroke. Remove any excessive grease and soil while moving the carriage.
4. If no lubricating film is visible on the rail, repeat step 2 and 3.



#### 9.3.2 Linear motor (stator and slider) cleaning and lubrication

1. Clean slider with disposable paper and LU06 cleaning spray. Move the stator to side to access all soiled parts.
2. By moving the stator over cleaned parts of the slider, a residual soil from the stator bore will be smeared out soiling the slider again. Repeat step 1 and 2 until entire remaining residual soil from stator and slider is removed.
3. Grease the slider with grease LU02 so, that the lubricating film of grease is visible. Move the stator through entire stroke on the slider. If no lubricating film is visible on the slider, repeat. **Do not overlubricate!** Remove any excessive grease while moving the stator.



The EM modules can be cleaned and lubricated without disassembly. However, if disassembly and/or assembly is required, it is recommended that the following trained companies be commissioned:

- LinMot
- Companies qualified by LinMot



However, assembly, disassembly and inspection can be carried out by the customer (see steps 1 to 6 below). The following points must be observed:

- Ensure that the radial alignment of the slider is the same before and after assembly.
- Only loosen enough screws so that no realignment of the carriage/bearing/rail etc. is required. Incorrect alignment can lead to premature wear and increased friction.
- Care must be taken to ensure that the balls do not fall out of the bearings, both when dismantling and when mounting the carriages on the profile rail.
- In modules with several carriages, the order of the carriages must not be changed.
- Incorrect inspection, assembly or disassembly may result in premature wear of wear parts and/or damage to the linear module and/or its components and may invalidate the warranty.

1. Remove the right end plate and slide off the carriage with stator.
2. Clean slider and the stator bore with disposable paper and LU06 cleaning spray. It is important that no paper residue is left anywhere on the guide.
3. Grease the slider with grease LU02 so that the lubricating film of grease is visible.
4. Slide the carriage with stator cautiously back onto the module basis. **Warning:** If the carriage is pushed on at an angle, there is a risk that the ball bearings will be damaged. If this is the case, the linear module must be returned and a repair case will occur.
5. Screw back removed end plate, use thread locking compound.
6. Move the stator through entire stroke on the slider. If no lubricating film is visible on the slider, lubricate the slider. Repeat until small film of grease is visible. **Warning:** Overgreasing can lead to gumming of the grease, especially at higher operating temperatures. Remove any excessive grease while moving the stator.

**Ordering information**

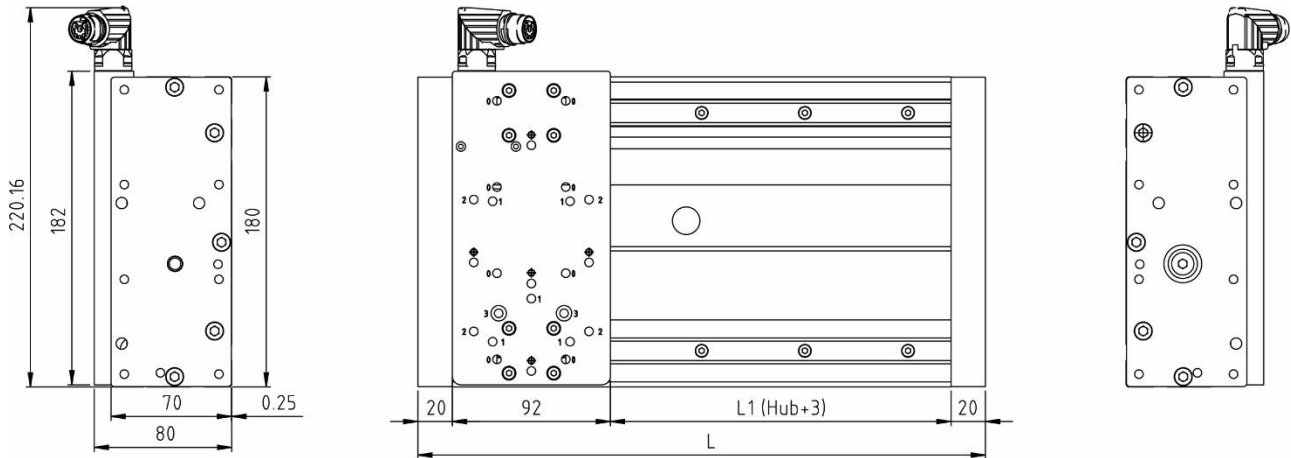
| Item      | Description                                 | Item-No.                  |
|-----------|---------------------------------------------|---------------------------|
| LU06-250  | Maintenance spray for linear motors (250ml) | <a href="#">0150-2394</a> |
| LU02-50   | Lubricant for linear motors (50ml)          | <a href="#">0150-1954</a> |
| LU02-1000 | Lubricant for linear motors (1000ml)        | <a href="#">0150-1955</a> |

**10 Storage and Transport**

- LinMot linear guides may only be transported and stored in their original packaging.
- The linear guides may only be removed from the packaging when they are installed.
- The storage room must be dry, dust-free, frost-free and vibration-free.
- The relative humidity should be below 60%.
- Recommended storage temperature: -15 °C...70 °C
- The linear guide must be protected from extreme weather conditions.
- The ambient air must not contain aggressive gases.

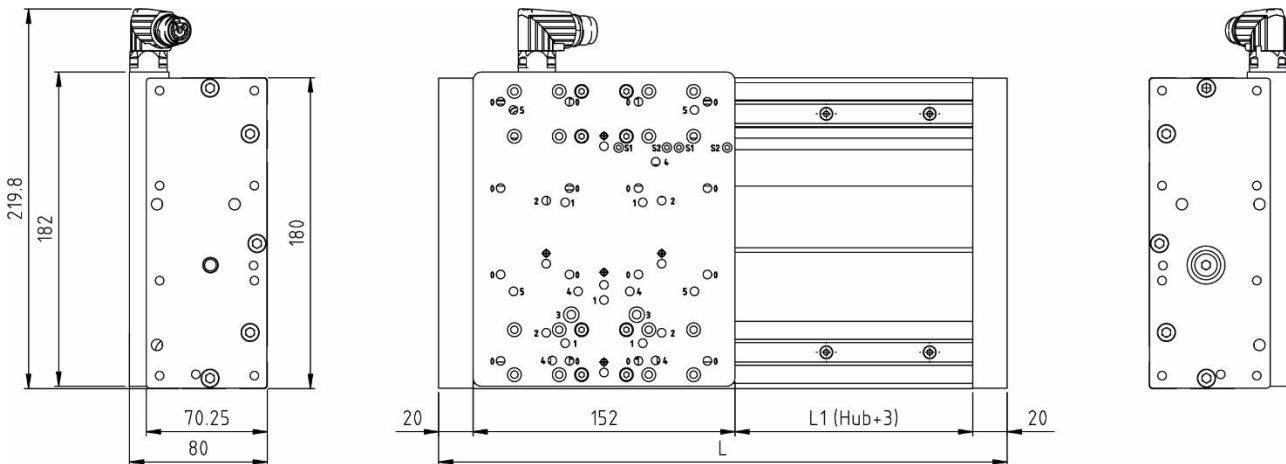
## 11 Dimensions & Weights

### 11.1 EM01-37-xxx\_xxx\_1CE37Sx60-HP



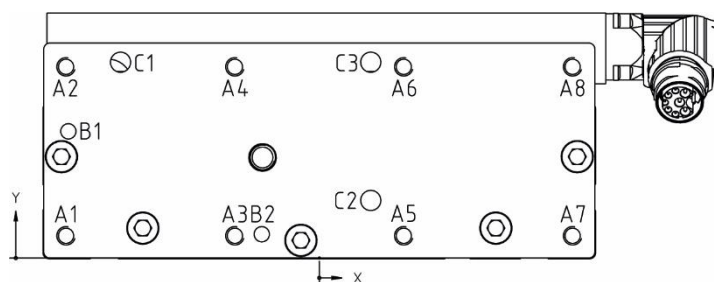
| Linear Module EM01-37...               | Stroke H <sup>1</sup><br>[mm (inch)] | Length L<br>[mm (inch)] | Moving mass <sup>1</sup><br>[g (lb)] | Total weight <sup>1</sup><br>[g (lb)] |
|----------------------------------------|--------------------------------------|-------------------------|--------------------------------------|---------------------------------------|
| ...-330_195_1CE37Sx60-HP-BE01-MD01-R   | 195 (7.68)                           | 330 (13.0)              | 1140 (2.51)                          | 8127 (17.92)                          |
| ...-430_295_1CE37Sx60-HP-BE01-MD01-R   | 295 (11.61)                          | 430 (16.93)             | 1140 (2.51)                          | 9712 (21.41)                          |
| ...-530_395_1CE37Sx60-HP-BE01-MD01-R   | 395 (15.55)                          | 530 (20.87)             | 1140 (2.51)                          | 11451 (25.25)                         |
| ...-630_495_1CE37Sx60-HP-BE01-MD01-R   | 495 (19.49)                          | 630 (24.80)             | 1140 (2.51)                          | 13061 (28.79)                         |
| ...-830_695_1CE37Sx60-HP-BE01-MD01-R   | 695 (27.36)                          | 830 (32.68)             | 1140 (2.51)                          | 16308 (35.95)                         |
| ...-1030_895_1CE37Sx60-HP-BE01-MD01-R  | 895 (35.24)                          | 1030 (40.55)            | 1140 (2.51)                          | 19520 (43.03)                         |
| ...-1230_1095_1CE37Sx60-HP-BE01-MD01-R | 1095 (43.11)                         | 1230 (48.43)            | 1040 (2.29)                          | 22785 (50.23)                         |
| ...-1430_1295_1CE37Sx60-HP-BE01-MD02-R | 1295 (50.98)                         | 1430 (56.30)            | 1040 (2.29)                          | 26027 (57.38)                         |
| ...-1630_1495_1CE37Sx60-HP-BE01-MD02-R | 1495 (58.86)                         | 1630 (64.17)            | 1040 (2.29)                          | 29341 (64.69)                         |
| ...-2030_1895_1CE37Sx60-HP-BE01-MD02-R | 1895 (74.61)                         | 2030 (79.92)            | 1040 (2.29)                          | 35955 (79.27)                         |

<sup>1</sup>Stroke, moving mass and total weight differ in the configuration with several carriages.

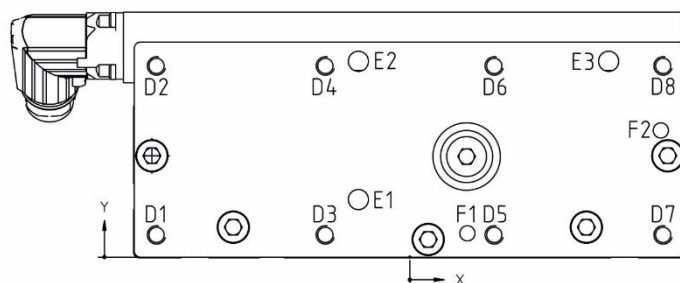
**11.2 EM01-37-xxx\_xxx\_1CE37x120F-HP**

| Linear Module EM01-37...                 | Stroke H <sup>1</sup><br>[mm (inch)] | Length L<br>[mm (inch)] | Moving mass <sup>1</sup><br>[g (lb)] | Total weight <sup>1</sup><br>[g (lb)] |
|------------------------------------------|--------------------------------------|-------------------------|--------------------------------------|---------------------------------------|
| ...-330_135_1CE37Sx120F-HP-BE01-MD01-R   | 135 (5.31)                           | 330 (13.0)              | 1812 (3.99)                          | 7834 (17.27)                          |
| ...-430_235_1CE37Sx120F-HP-BE01-MD01-R   | 235 (9.25)                           | 430 (16.93)             | 1812 (3.99)                          | 9419 (20.77)                          |
| ...-530_335_1CE37Sx120F-HP-BE01-MD01-R   | 335 (13.19)                          | 530 (20.87)             | 1812 (3.99)                          | 11158 (24.6)                          |
| ...-630_435_1CE37Sx120F-HP-BE01-MD01-R   | 435 (17.13)                          | 630 (24.80)             | 1812 (3.99)                          | 12768 (28.15)                         |
| ...-830_635_1CE37Sx120F-HP-BE01-MD01-R   | 635 (25.0)                           | 830 (32.68)             | 1812 (3.99)                          | 16015 (35.31)                         |
| ...-1030_835_1CE37Sx120F-HP-BE01-MD01-R  | 835 (32.87)                          | 1030 (40.55)            | 1812 (3.99)                          | 19227 (42.39)                         |
| ...-1230_1035_1CE37Sx120F-HP-BE01-MD02-R | 1035 (40.75)                         | 1230 (48.43)            | 1680 (3.70)                          | 22492 (49.59)                         |
| ...-1430_1235_1CE37Sx120F-HP-BE01-MD02-R | 1235 (48.62)                         | 1430 (56.30)            | 1680 (3.70)                          | 25734 (56.73)                         |
| ...-1630_1435_1CE37Sx120F-HP-BE01-MD02-R | 1435 (56.50)                         | 1630 (64.17)            | 1680 (3.70)                          | 29048 (64.04)                         |
| ...-2030_1835_1CE37Sx120F-HP-BE01-MD02-R | 1835 (72.24)                         | 2030 (79.92)            | 1680 (3.70)                          | 35662 (78.62)                         |
| ...-330_135_1CE37Sx120F-HP-BE02-MD01-R   | 135 (5.31)                           | 330 (13.0)              | 1830 (4.03)                          | 8140 (17.95)                          |
| ...-430_235_1CE37Sx120F-HP-BE02-MD01-R   | 235 (9.25)                           | 430 (16.93)             | 1830 (4.03)                          | 9725 (21.44)                          |
| ...-530_335_1CE37Sx120F-HP-BE02-MD01-R   | 335 (13.19)                          | 530 (20.87)             | 1830 (4.03)                          | 11464 (25.27)                         |
| ...-630_435_1CE37Sx120F-HP-BE02-MD01-R   | 435 (17.13)                          | 630 (24.80)             | 1830 (4.03)                          | 13074 (28.82)                         |
| ...-830_635_1CE37Sx120F-HP-BE02-MD01-R   | 635 (25.0)                           | 830 (32.68)             | 1830 (4.03)                          | 16321 (35.98)                         |
| ...-1030_835_1CE37Sx120F-HP-BE02-MD01-R  | 835 (32.87)                          | 1030 (40.55)            | 1830 (4.03)                          | 19533 (43.06)                         |
| ...-1230_1035_1CE37Sx120F-HP-BE02-MD02-R | 1035 (40.75)                         | 1230 (48.43)            | 1700 (3.75)                          | 22798 (50.26)                         |
| ...-1430_1235_1CE37Sx120F-HP-BE02-MD02-R | 1235 (48.62)                         | 1430 (56.30)            | 1700 (3.75)                          | 26040 (57.41)                         |
| ...-1630_1435_1CE37Sx120F-HP-BE02-MD02-R | 1435 (56.50)                         | 1630 (64.17)            | 1700 (3.75)                          | 29354 (64.71)                         |
| ...-2030_1835_1CE37Sx120F-HP-BE02-MD02-R | 1835 (72.24)                         | 2030 (79.92)            | 1700 (3.75)                          | 35968 (79.29)                         |

<sup>1</sup>Stroke, moving mass and total weight differ in the configuration with several carriages.

**11.3 End plates**

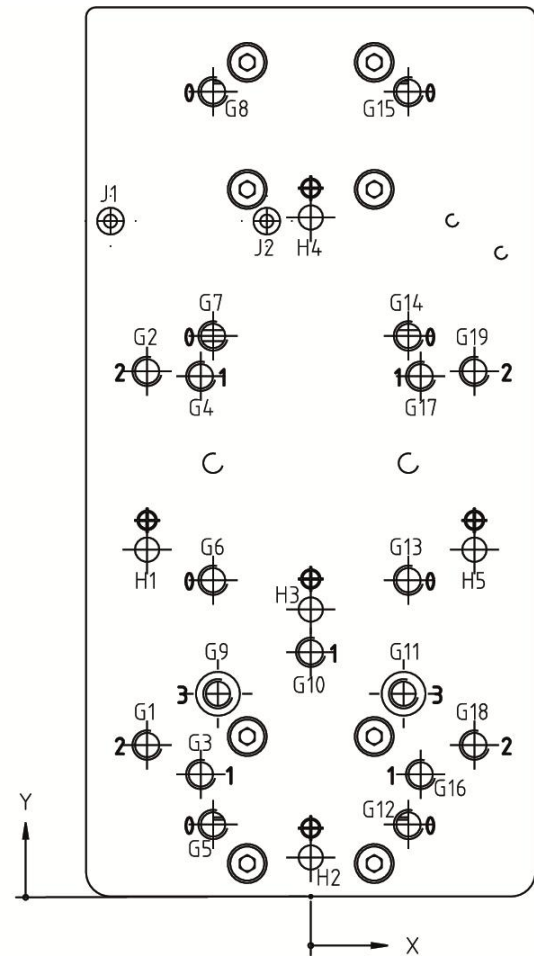
|    | X-POS. | Y-POS. |                                                                    |
|----|--------|--------|--------------------------------------------------------------------|
| A1 | -82.50 | 7.25   | $\varnothing 5 \text{ } \nabla 17$<br>$M6 - 6H \text{ } \nabla 12$ |
| A2 | -82.50 | 62.25  |                                                                    |
| A3 | -27.50 | 7.25   |                                                                    |
| A4 | -27.50 | 62.25  |                                                                    |
| A5 | 27.50  | 7.25   |                                                                    |
| A6 | 27.50  | 62.25  |                                                                    |
| A7 | 82.50  | 7.25   |                                                                    |
| A8 | 82.50  | 62.25  |                                                                    |
| B1 | -81.75 | 4.125  | $\varnothing 5 H7 \text{ } 0 \text{ } \nabla 12$                   |
| B2 | -18.75 | 7.75   |                                                                    |
| C1 | -64.75 | 63.75  | $\varnothing 6.6$<br>$\varnothing 10.5 \text{ } \nabla 6.4$        |
| C2 | 16.75  | 18.75  |                                                                    |
| C3 | 16.75  | 63.75  |                                                                    |



|    | X-POS. | Y-POS. |                                                                    |
|----|--------|--------|--------------------------------------------------------------------|
| D1 | -82.50 | 7.25   | $\varnothing 5 \text{ } \nabla 17$<br>$M6 - 6H \text{ } \nabla 12$ |
| D2 | -82.50 | 62.25  |                                                                    |
| D3 | -27.50 | 7.25   |                                                                    |
| D4 | -27.50 | 62.25  |                                                                    |
| D5 | 27.50  | 7.25   |                                                                    |
| D6 | 27.50  | 62.25  |                                                                    |
| D7 | 82.50  | 7.25   |                                                                    |
| D8 | 82.50  | 62.25  |                                                                    |
| E1 | -16.75 | 18.75  | $\varnothing 6.6$<br>$\varnothing 10.5 \text{ } \nabla 6.4$        |
| E2 | -16.75 | 63.75  |                                                                    |
| E3 | 64.75  | 63.75  |                                                                    |
| F1 | 18.75  | 7.75   | $\varnothing 5 H7 \text{ } 0 \text{ } \nabla 12$                   |
| F2 | 81.75  | 4.125  |                                                                    |

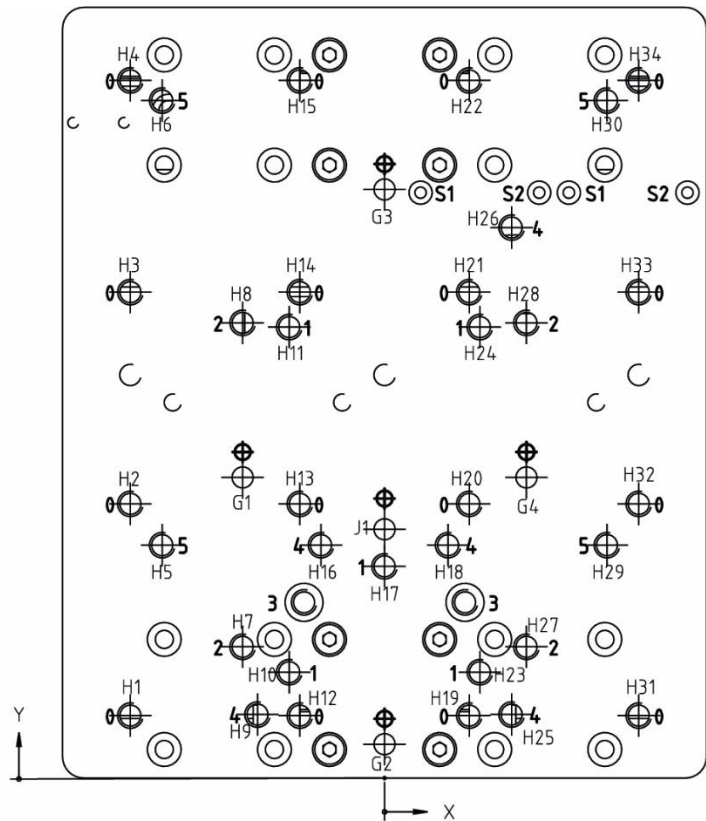
## 11.4 Mounting plate EM01-37-xxx\_xxx\_1CE37Sx60-HP

|     | X-POS. | Y-POS. |                                                                                        |
|-----|--------|--------|----------------------------------------------------------------------------------------|
| G1  | -33.50 | 31     | $\varnothing 5$<br>M6 - 6H                                                             |
| G2  | -33.50 | 107.50 |                                                                                        |
| G3  | -22.50 | 25     |                                                                                        |
| G4  | -22.50 | 106.50 |                                                                                        |
| G5  | -20    | 14.75  |                                                                                        |
| G6  | -20    | 64.75  |                                                                                        |
| G7  | -20    | 114.75 |                                                                                        |
| G8  | -20    | 164.75 |                                                                                        |
| G9  | -19    | 41.50  |                                                                                        |
| G10 | 0      | 50     |                                                                                        |
| G11 | 19     | 41.50  |                                                                                        |
| G12 | 20     | 14.75  |                                                                                        |
| G13 | 20     | 64.75  |                                                                                        |
| G14 | 20     | 114.75 |                                                                                        |
| G15 | 20     | 164.75 |                                                                                        |
| G16 | 22.50  | 25     |                                                                                        |
| G17 | 22.50  | 106.50 |                                                                                        |
| G18 | 33.50  | 31     |                                                                                        |
| G19 | 33.50  | 107.50 |                                                                                        |
| H1  | -33.50 | 71     | $\varnothing 5 \text{ H7 } \begin{smallmatrix} +0.012 \\ 0 \end{smallmatrix} \nabla 6$ |
| H2  | 0      | 8      |                                                                                        |
| H3  | 0      | 58.75  |                                                                                        |
| H4  | 0      | 139    |                                                                                        |
| H5  | 33.50  | 71     |                                                                                        |
| J1  | -41    | 138.25 | $\begin{smallmatrix} \varnothing 2.7 \\ \varnothing 5.5 \end{smallmatrix} \nabla 5$    |
| J2  | -9     | 138.25 |                                                                                        |



**11.5 Mounting plate EM01-37-xxx\_xxx\_1CE37x120F-HP**

|     | X-POSITION | Y-POSITION |                                                  |
|-----|------------|------------|--------------------------------------------------|
| G1  | -33.50     | 71         | $\varnothing 5 \text{ H7 } 0^{+0.012} \nabla 10$ |
| G2  | 0          | 8          |                                                  |
| G3  | 0          | 139        |                                                  |
| G4  | 33.50      | 71         |                                                  |
| H1  | -60        | 14.75      | $\varnothing 5$<br>M6 - 6H                       |
| H2  | -60        | 64.75      |                                                  |
| H3  | -60        | 114.75     |                                                  |
| H4  | -60        | 164.75     |                                                  |
| H5  | -52.50     | 55         |                                                  |
| H6  | -52.50     | 160        |                                                  |
| H7  | -33.50     | 31         |                                                  |
| H8  | -33.50     | 107.50     |                                                  |
| H9  | -30        | 15         |                                                  |
| H10 | -22.50     | 25         |                                                  |
| H11 | -22.50     | 106.50     |                                                  |
| H12 | -20        | 14.75      |                                                  |
| H13 | -20        | 64.75      |                                                  |
| H14 | -20        | 114.75     |                                                  |
| H15 | -20        | 164.75     |                                                  |
| H16 | -15        | 55         |                                                  |
| H17 | 0          | 50         |                                                  |
| H18 | 15         | 55         |                                                  |
| H19 | 20         | 14.75      |                                                  |
| H20 | 20         | 64.75      |                                                  |
| H21 | 20         | 114.75     |                                                  |
| H22 | 20         | 164.75     |                                                  |
| H23 | 22.50      | 25         |                                                  |
| H24 | 22.50      | 106.50     |                                                  |
| H25 | 30         | 15         |                                                  |
| H26 | 30         | 130        |                                                  |
| H27 | 33.50      | 31         |                                                  |
| H28 | 33.50      | 107.50     |                                                  |
| H29 | 52.50      | 55         |                                                  |
| H30 | 52.50      | 160        |                                                  |
| H31 | 60         | 14.75      |                                                  |
| H32 | 60         | 64.75      |                                                  |
| H33 | 60         | 114.75     |                                                  |
| H34 | 60         | 164.75     |                                                  |
| J1  | 0          | 58.75      | $\varnothing 5 \text{ H7 } 0^{+0.012} \nabla 6$  |



## 12 International Certificates

|                                                                                                 |                                                                |
|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| <p>Europe</p>  | <p>See chapter “EU Declaration of Conformity CE-Marking”</p>   |
| <p>UK</p>      | <p>See chapter “UK Declaration of Conformity UKCA-Marking”</p> |
| <p><b>IECEE<br/>CB SCHEME</b></p>                                                               | <p>Ref. Certif. Nr. CH-8521</p>                                |



Ref. Certif. No.

CH-8521

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE)  
CB SCHEME**CB TEST CERTIFICATE**

|                                                                           |                                                                                                                                                              |                     |                                  |
|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------------------|
| Product                                                                   | Linear motor                                                                                                                                                 |                     |                                  |
| Name and address of the applicant                                         | NTI AG                                                                                                                                                       | Bodenackerstrasse 2 | SWITZERLAND<br>8957 Spreitenbach |
| Name and address of the manufacturer                                      | NTI AG                                                                                                                                                       | Bodenackerstrasse 2 | SWITZERLAND<br>8957 Spreitenbach |
| Name and address of the factory                                           | NTI AG                                                                                                                                                       | Bodenackerstrasse 2 | SWITZERLAND<br>8957 Spreitenbach |
| <i>Note: When more than one factory, please report on page 2</i>          |                                                                                                                                                              |                     |                                  |
| Ratings and principal characteristics                                     | <input type="checkbox"/> Additional Information on page 2<br>supplied via servo drive, see TR 17-EL-0006.E02 for details                                     |                     |                                  |
| Trade mark (if any)                                                       | LinMot                                                                                                                                                       |                     |                                  |
| Customers's Testing Facility (CTF) Stage used                             | ---                                                                                                                                                          |                     |                                  |
| Model / Type Ref.                                                         | PR series<br>PS series<br>P04 series<br>P05 series<br>---                                                                                                    |                     |                                  |
| Additional information (if necessary may also be reported on page 2)      | <input type="checkbox"/> Additional Information on page 2<br>IEC 61000-6-2:2016<br>IEC 61000-6-4:2006,<br>IEC 61000-6-4:2006/AMD1:2010<br>IEC 61000-6-7:2014 |                     |                                  |
| A sample of product was tested and found to be in conformity with IEC     | EU Group Differences;<br>EU Special National Conditions;<br>EU A-Deviations                                                                                  |                     |                                  |
| National differences                                                      | 17-EL-0006.E01 + .E02 + .Z01                                                                                                                                 |                     |                                  |
| As shown in the Test Report Ref. No. which forms part of this Certificate |                                                                                                                                                              |                     |                                  |

This CB Test Certificate is issued by the National Certification Body

 Electrosuisse  
 Luppenstrasse 1  
 8320 Fehraltorf  
 SWITZERLAND

 Signed by: Martin Plüss  
 Date: 2017-03-13




page 1 of 1

### 13 EU Declaration of Conformity CE-Marking

NTI AG / LinMot ®  
Bodenaeckerstrasse 2  
8957 Spreitenbach

Switzerland

Tel.: +41 (0)56 419 91 91

Fax: +41 (0)56 419 91 92

declares under sole responsibility the compliance of the products:

- Linear modules with carriage series **CE37Sx60-HP-BE01-MD01-R**
- Linear modules with carriage series **CE37Sx60-HP-BE01-MD02-R**
- Linear modules with carriage series **CE37Sx120F-HP-BE01-MD01-R**
- Linear modules with carriage series **CE37Sx120F-HP-BE01-MD02-R**
- Linear modules with carriage series **CE37Sx120F-HP-BE02-MD01-R**
- Linear modules with carriage series **CE37Sx120F-HP-BE02-MD02-R**

with the EMC Directive 2014/30/EU.

Applied harmonized standards:

- **EN 61000-6-2: 2005 (Immunity for industrial environments)**
- **EN 61000-6-4: 2007 + A1: 2011 (Emission for industrial environments)**

According to the EMC directive, the listed devices are not independently operable products.

Compliance of the directive requires the correct installation of the product, the observance of specific installation guides and product documentation. This was tested on specific system configurations.

The safety instructions of the manuals are to be considered.

The product must be mounted and used in strict accordance with the installation instructions contained within the installation guide, a copy of which may be obtained from NTI AG.

Company: NTI AG  
Spreitenbach, 10/09/2026



Dr.-Ing. Ronald Rohner  
CEO NTI AG

## 14 UK Declaration of Conformity UKCA-Marking

NTI AG / LinMot ®  
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8957 Spreitenbach

Switzerland

Tel.: +41 (0)56 419 91 91

Fax: +41 (0)56 419 91 92

declares under sole responsibility the compliance of the products:

- Linear modules with carriage series **CE37Sx60-HP-BE01-MD01-R**
- Linear modules with carriage series **CE37Sx60-HP-BE01-MD02-R**
- Linear modules with carriage series **CE37Sx120F-HP-BE01-MD01-R**
- Linear modules with carriage series **CE37Sx120F-HP-BE01-MD02-R**
- Linear modules with carriage series **CE37Sx120F-HP-BE02-MD01-R**
- Linear modules with carriage series **CE37Sx120F-HP-BE02-MD02-R**

with the EMC Regulation S.I. 2016 No. 1091.

Applied designated standards:

- **EN 61000-6-2: 2005 (Immunity for industrial environments)**
- **EN 61000-6-4: 2007 + A1: 2011 (Emission for industrial environments)**

According to the EMC regulation, the listed devices are not independently operable products.

Compliance of the regulation requires the correct installation of the product, the observance of specific installation guides and product documentation. This was tested on specific system configurations.

The safety instructions of the manuals are to be considered.

The product must be mounted and used in strict accordance with the installation instructions contained within the installation guide, a copy of which may be obtained from NTI AG.

Company: NTI AG  
Spreitenbach, 10/09/2026



Dr.-Ing. Ronald Rohner  
CEO NTI AG

# ALL LINEAR MOTION FROM A SINGLE SOURCE

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