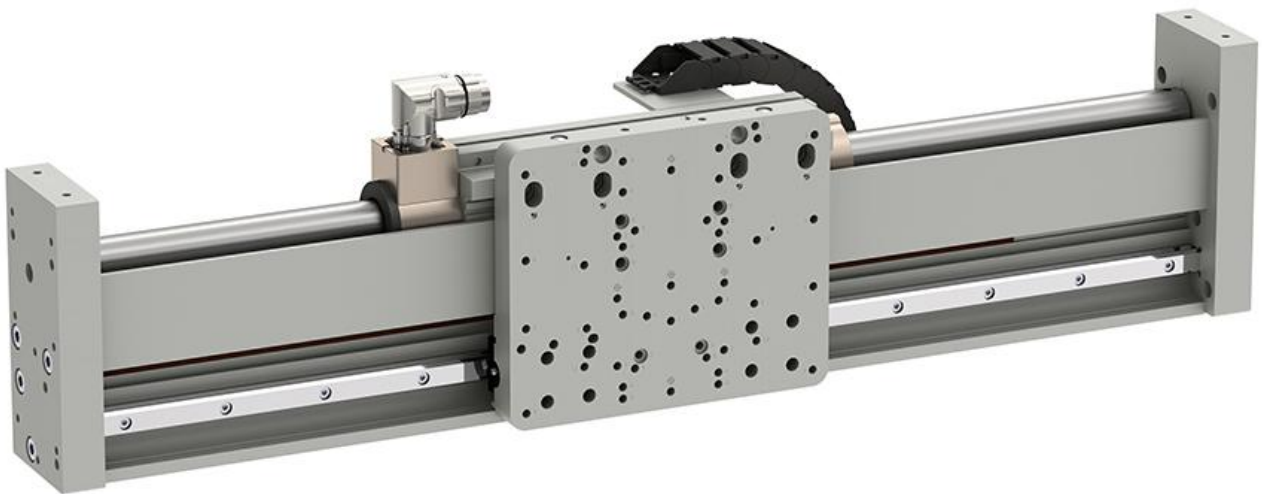


Installation Guide Linear Modules FM01-48

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

NTI AG (as manufacturer of LinMot and MagSpring products) excludes all liability for damages and expenses caused by incorrect use of the products. This also applies to false applications, which are caused by NTI AG's own data and notes, for example in the course of sales, support or application activities. It is the responsibility of the user to check the data and information provided by NTI AG for correct applicability in terms of safety. In addition, the entire responsibility for safety-related product functionality lies exclusively with the user. Product warranties are void if products are used with stators, sliders, servo drives or cables not manufactured by NTI AG unless such use was specifically approved by NTI AG.

NTI AG's warranty is limited to repair or replacement as stated in our standard warranty policy as described in our "terms and conditions" previously supplied to the purchaser of our equipment (please request copy of same if not otherwise available). Further reference is made to our general terms and conditions.

1.5 Copyright

This work is protected by copyright.

Under the copyright laws, this publication may not be reproduced or transmitted in any form, electronic or mechanical, including photocopying, recording, microfilm, storing in an information retrieval system, not even for training purposes, or translating, in whole or in part, without the prior written consent of NTI AG.

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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.

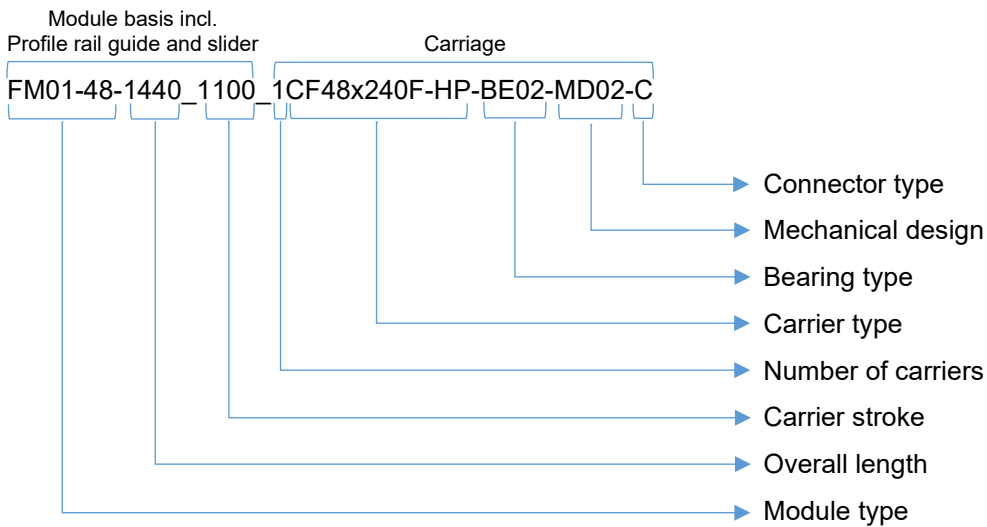
**Temperature Resistance**

Keep slider away from unshielded flame or heat.

Temperature above 120°C will cause demagnetization.

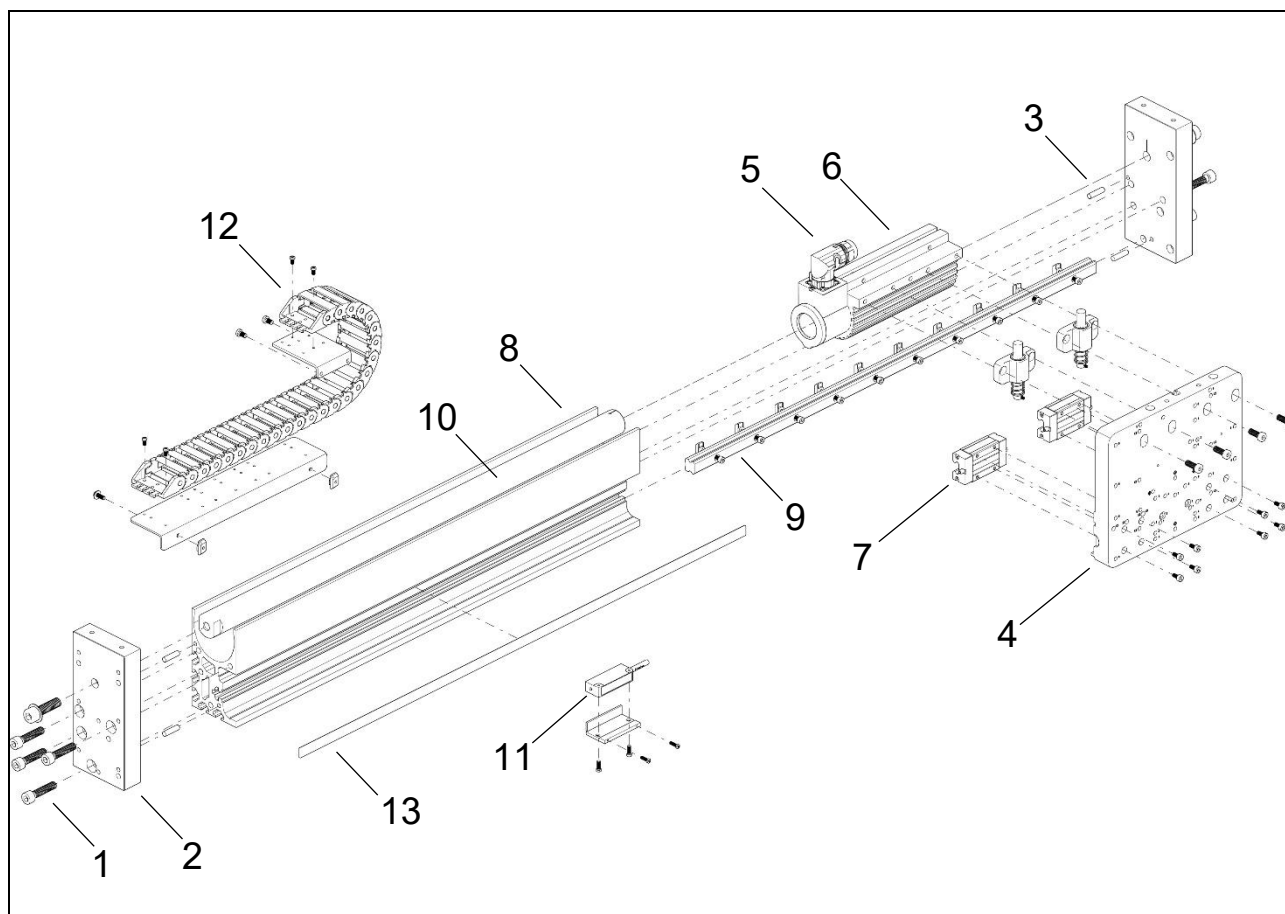
3 Intended Use

3.1 Designation code



3.2 FM01 Linear Module

LinMot FM01 linear modules are moving stator applications with tubular linear motors for use in industrial and commercial installations. The mechanical design is based on a special aluminium profile on which up to two high-precision profile rail guides are attached. Use of ball bearings in the carriages guarantee a reliable and smooth operation, support of external forces, torques and bending moments. These products offer high guidance accuracy, facilitate dynamic and precise positioning of load. FM01 modules can be mounted together into a gantry or semi gantry designs without any additional adapters. It is also possible to run multiple stators on the same guide. Direct mechanical compatibility with other LinMot linear modules for the vertical axis, linear rotary motors and other products, combined with the wide range of stroke availabilities for all axes, the moving stator guides offer a powerful toolbox for any automation task.



Number	Item
1	Cylinder screw
2	End plate
3	Parallel pin
4	Mounting plate
5	Connector
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 FM01 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 FM01 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:

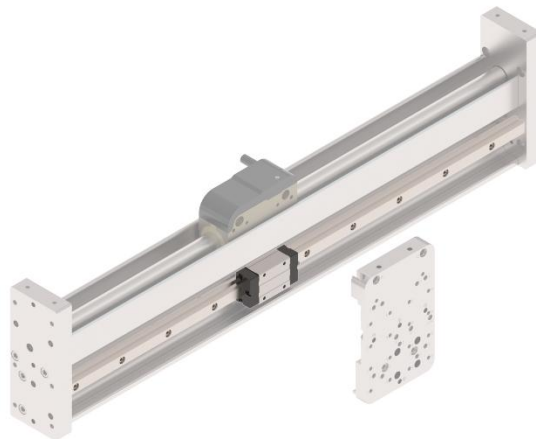


Bearing types (BExx):

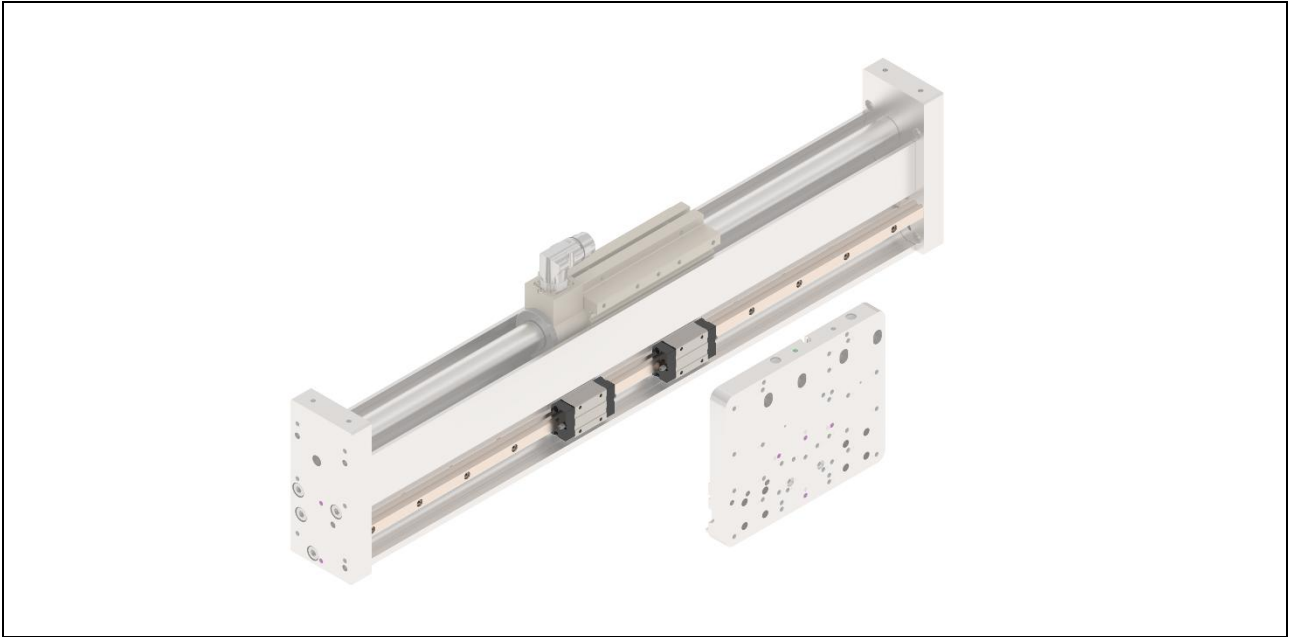
- BE01 = Each carriage has 1 bearing per profile rail
- BE02 = Each carriage has 2 bearing per profile rail

Mechanical construction (MDxx):

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



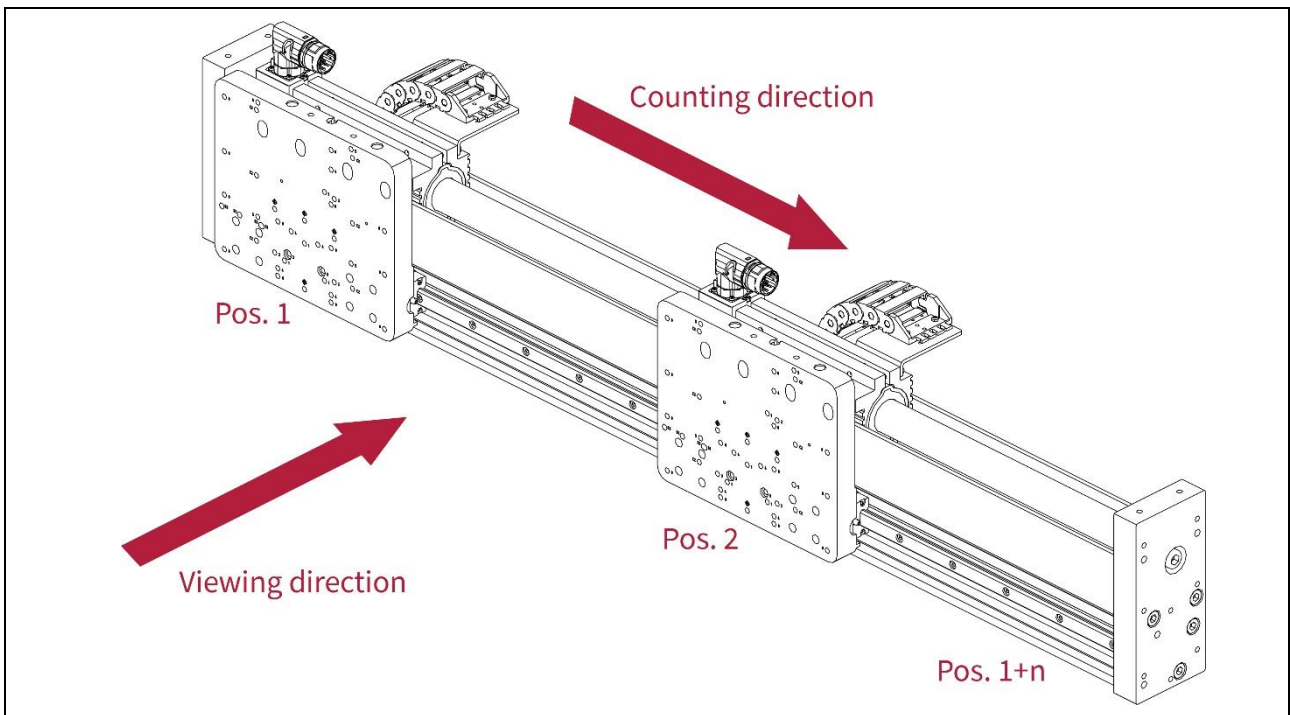
Variant "BE01": The carriage of the linear module (here FM01-37) is equipped with 1 bearing on the profile rail.



Variant "BE02": The carriage of the linear module (here FM01-48) is equipped with 2 bearings on the 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).

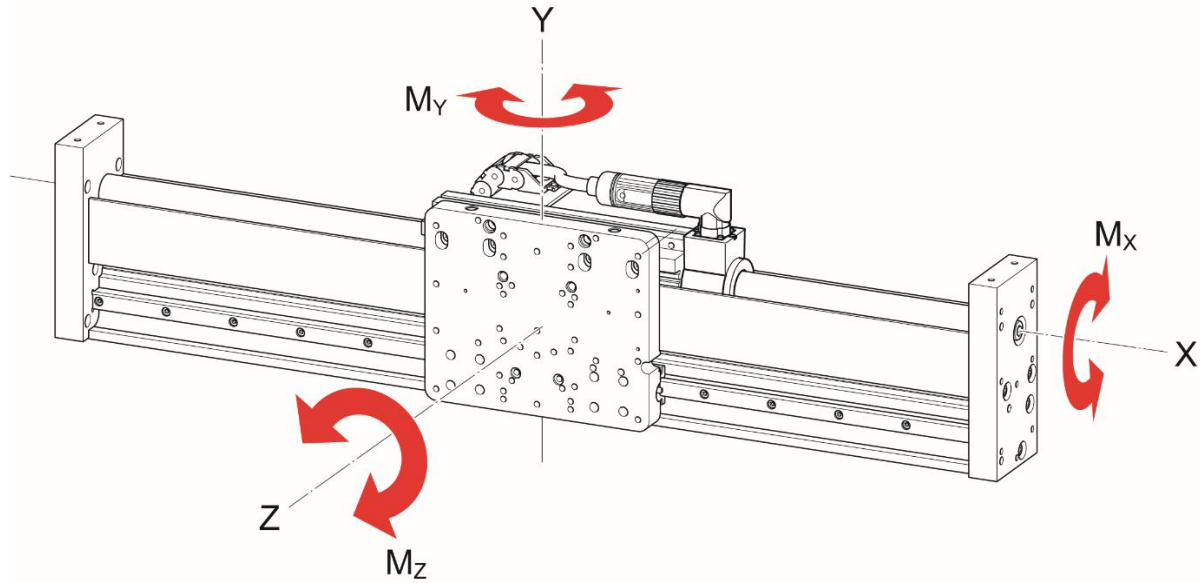


3.6 Option external sensor

Next to the LinMot linear stator's own integrated position sensors, both incremental and absolute external encoders are available as an option for the FM01 modules. Together with a magnetic band, the external sensors provide a high-resolution linear measurement system.

3.7 Technical data carriage kits

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



FM01-...	...48x150G...		...48x240F...		...48x360F...	
Static Load Rating (per bearing)	15400 N	(3462.1 lbs)	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)	8400 N	(1888.4 lbs)
Static Moment Load M_{x0} (per bearing)	103 Nm	(991.6 lbfin)	103 Nm	(991.6 lbfin)	103 Nm	(991.6 lbfin)
Static Moment Load $M_{y0/z0}$ (per bearing)	cannot occur ¹		cannot occur ¹		cannot occur ¹	
Dynamic Moment Loads M_x (per bearing)	56 Nm	(495.6 lbfin)	56 Nm	(495.6 lbfin)	56 Nm	(495.6 lbfin)
Dynamic Moment Loads $M_{y/z}$ (per bearing)	cannot occur ¹		cannot occur ¹		cannot occur ¹	
Friction (estimated)	10 N	(2.25 lbs)	10 N	(2.25 lbs)	24 N	(2.25 lbs)
Moving mass	4598 g	(10.14 lb)	5546 g	(12.23 lb)	6804 g	(15.00 lb)
Number of Carriages	2		2		2	
Distance between Bearings on the same Profile Rail	128 mm (5.04 in)		128 mm (5.04 in)		128 mm (5.04 in)	
Distance between profile rail and mounting surface	42 mm	(1.65 in)	42 mm	(1.65 in)	42 mm	(1.65 in)

¹ 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 BE02: Two bearings on one profile rail - a total of 1 profile rail guide: M_y and M_z are converted into forces.

4 Installation Instructions

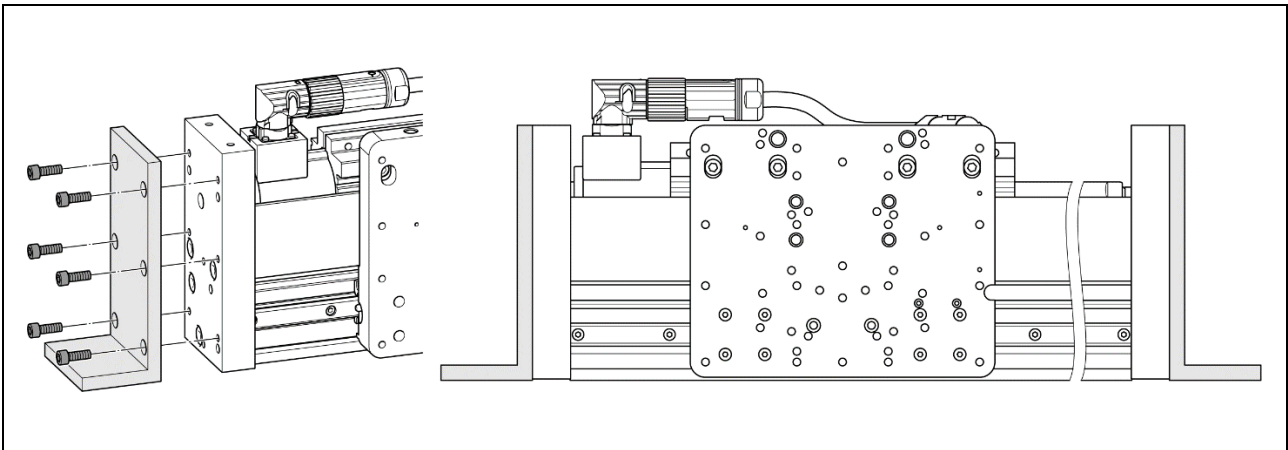
4.1 Installation options

There are several options available for mounting the FM01 linear modules.

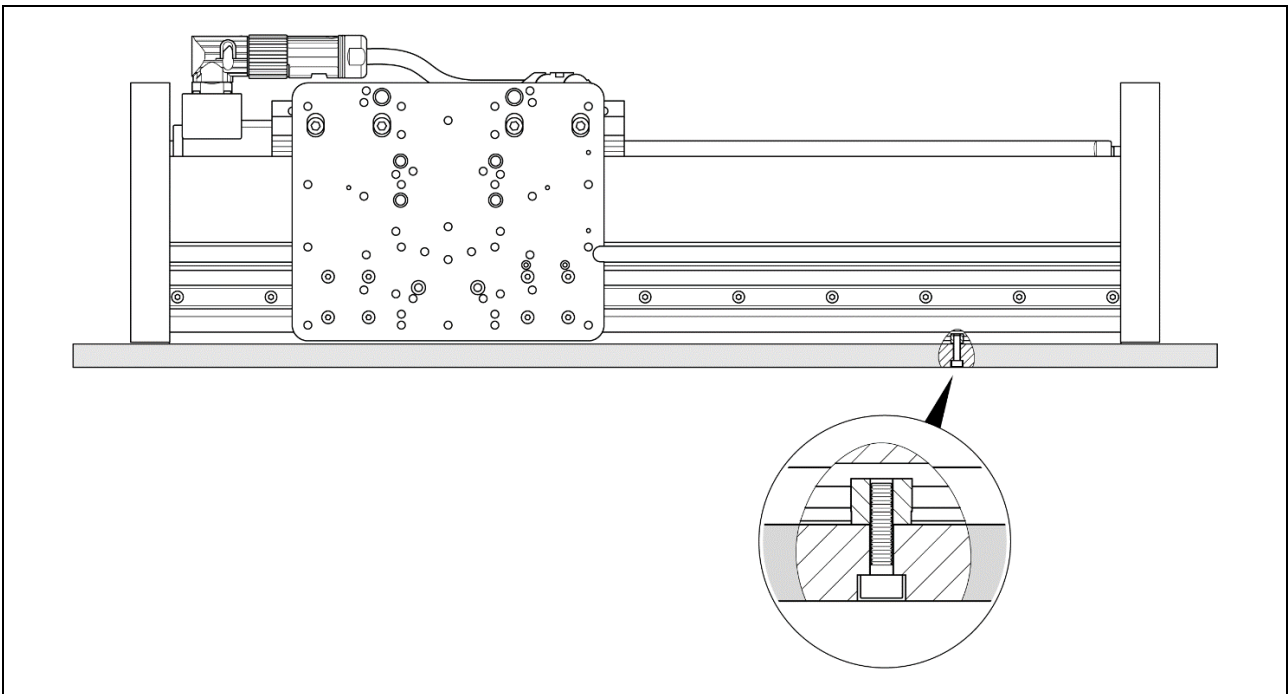
The module basis as well as the end plates are equipped with fits for parallel pins, bores and counterbores. Parallel pins may only be used to align the guide and are not intended for mounting. Mounting is done by using bores or counterbores. Additional brackets or adapters shown in examples may be required.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

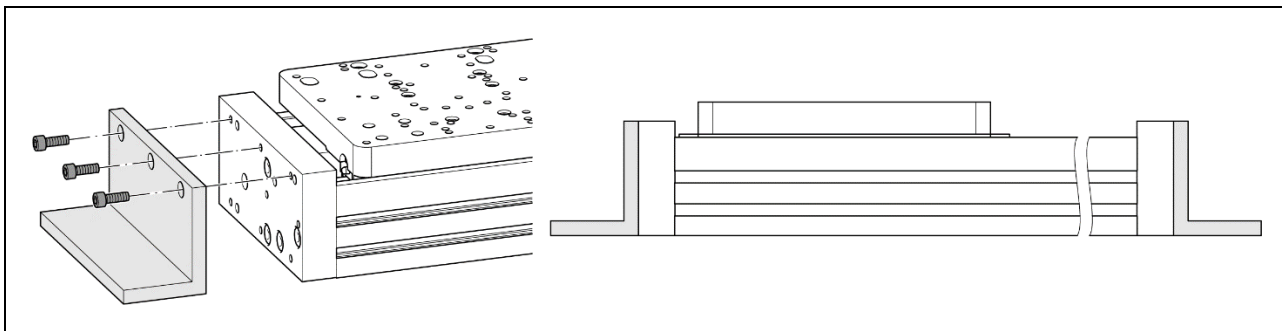
4.1.1 Installation examples



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	0150-2189
Nut N8/M6	Nut for 8 mm T-slots with M6 thread	0150-2558

4.2 Installation of the load

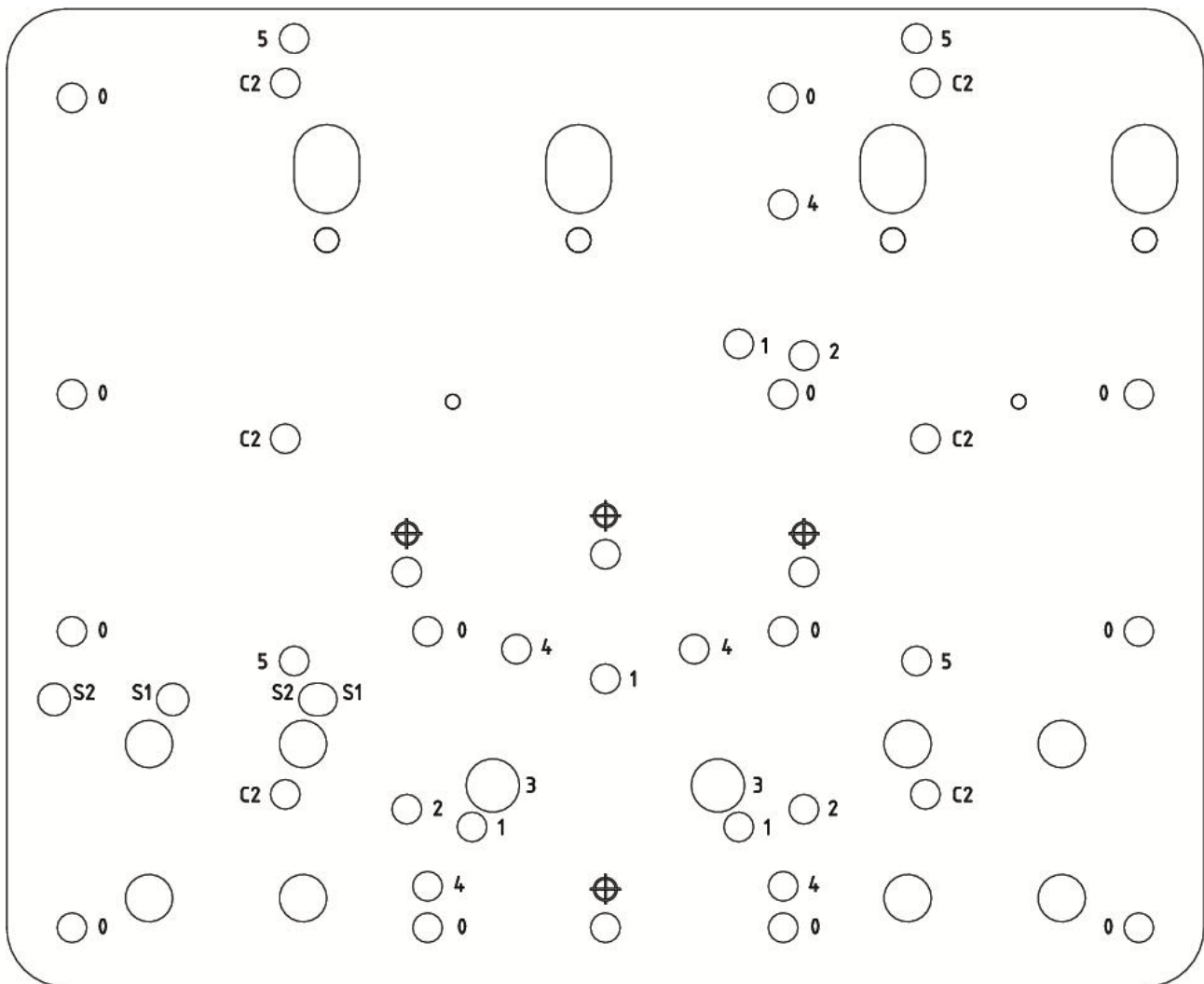
The carriages of the FM01 linear module have an integrated mounting plate, which is used to attach the load. The mounting plate is equipped with several bores and fittings for parallel pins. The centre of gravity of the load mass should be in the middle and as close as possible to the mounting plate to ensure even distribution of the mass on the carriage.

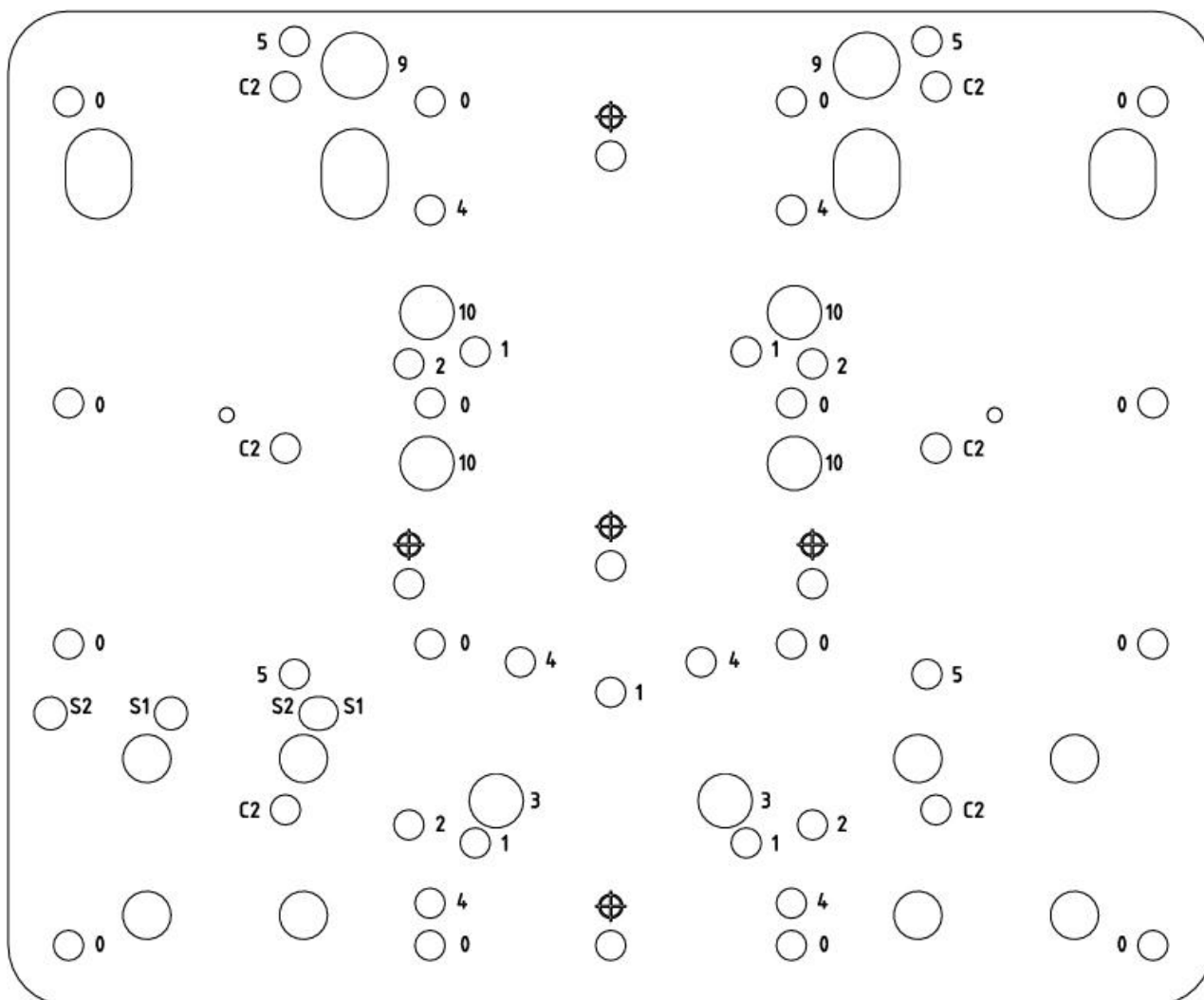
For example, 13 x (mounting plate 48x150G) or 16 x (mounting plate 48x240F and 48x360F) M6 through bores are indexed with '0', which can be used for mounting the load. The complete dimensions can be found in chapter 11 'Dimensions and weights'.



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.

4.2.1 Mounting plate FM01...48x150G...



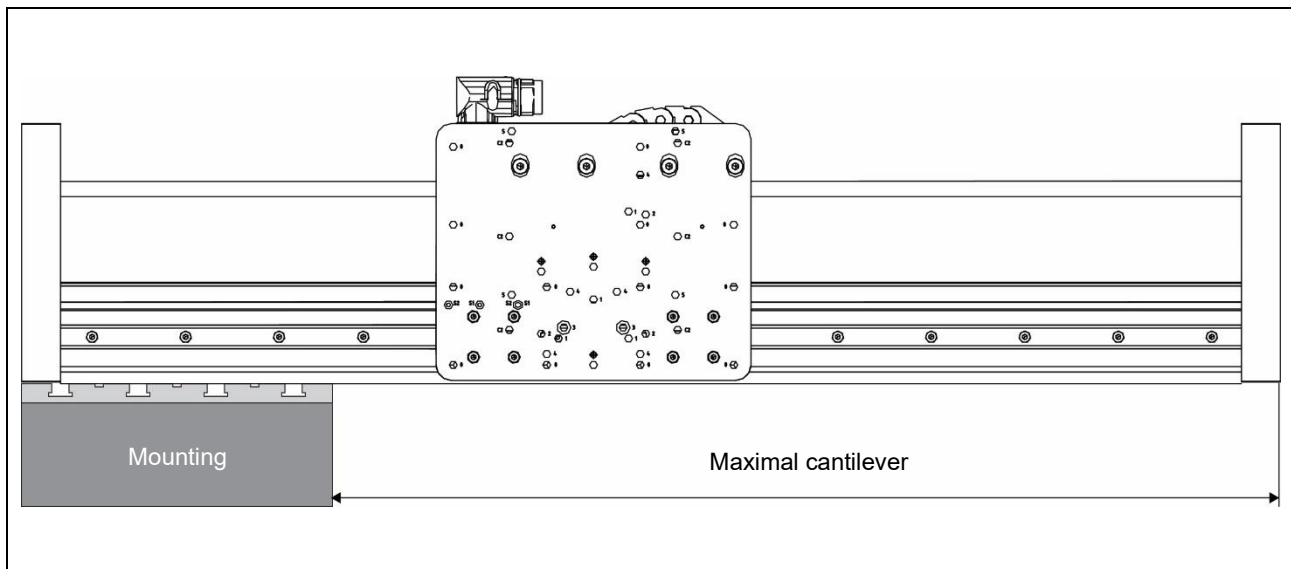
4.2.2 Mounting plate FM01...48x240F...

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

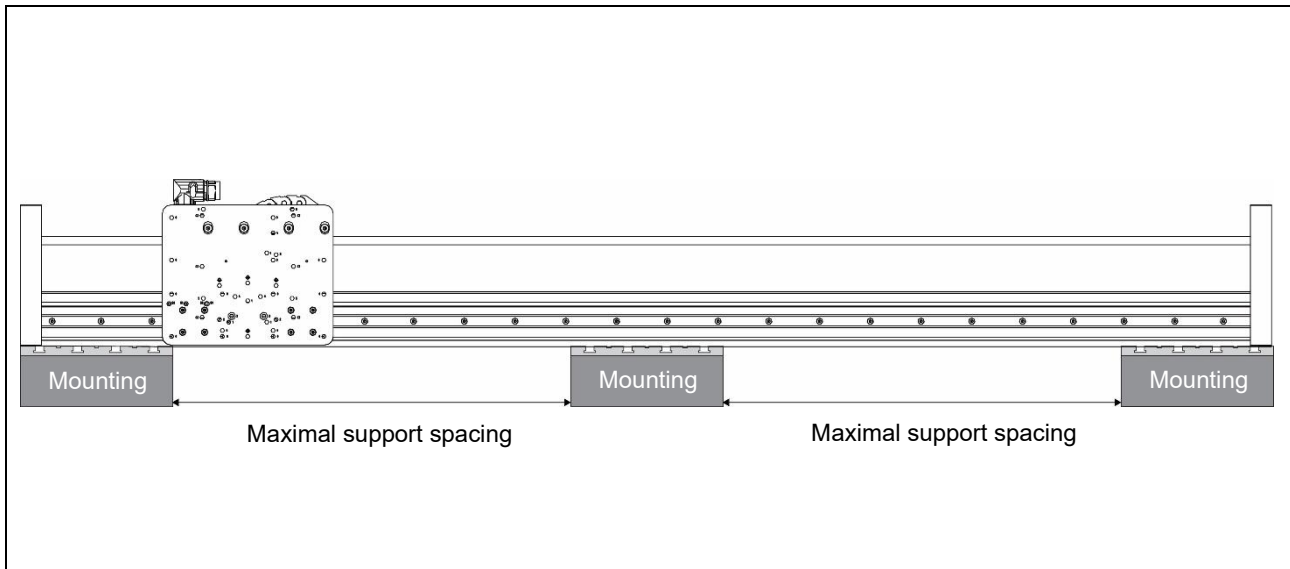
The installation position influences the deflection. With the same load, the "upright" installation position exhibits less deflection than the "lying" installation position. For this reason, the "upright" installation position is considered below.



- 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).
- 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).
- 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!

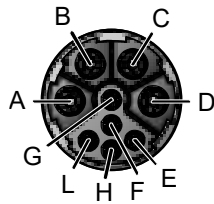
All the connectors used are from different manufacturers, but they are all fully compatible with each other.

5.1 Motor cable

Two types of cables are available for the FM-Modules. For the moving part of the FM-Module, only trailing chain cables are available. The standard motor cable is used as a stationary extension between high-flex cable and drive.

	Standard cable	Trailing chain cable
Cable type	K15-04/05	KS10-04/05
Min. bending radius stationary	50 mm (2 in)	50 mm (2 in)
Min. bending radius moving	Not suitable for applications with moving motor cable	100 mm (4 in) 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, solvents, hydraulic fluid)	good	good
Outdoor durability	very good	very good
Flammability	flame retardant	flame retardant

5.2 C-connector wiring

Connector type	C-connector	
	PIN	Wire
Phase1+	A	Red
Phase1-	B	Pink
Phase2+	C	Blue
Phase2-	D	Grey
+5V	E	White
GROUND*	F	Inner shield
Sensor Sin	G	Yellow
Sensor Cos	H	Green
Temp sensor	L	Black
SHIELD* of stator and stator cable	Case	
Connector on the stator (-cables)		



Extension 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



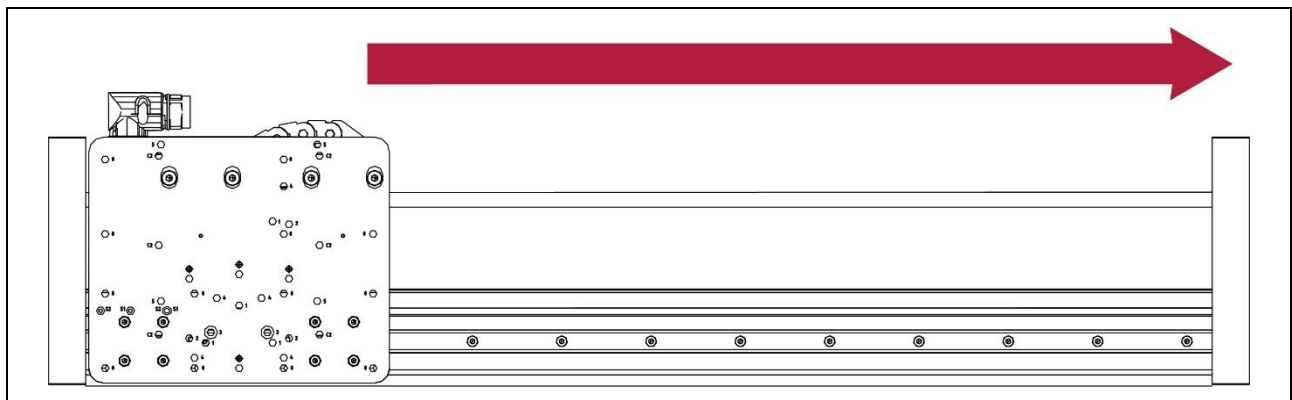
It is recommended to use the newest version of LinMot-Talk software. You can find more detailed information about LinMot-Talk software in LinMot Talk User Manual that can be downloaded on www.linmot.com.

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.

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

In gantry designs, the master-slave configuration is recommended on motors with parallel axes, that are moving the middle-axis. Refer to MasterSlave Application user manual for detailed instructions and supported drives.

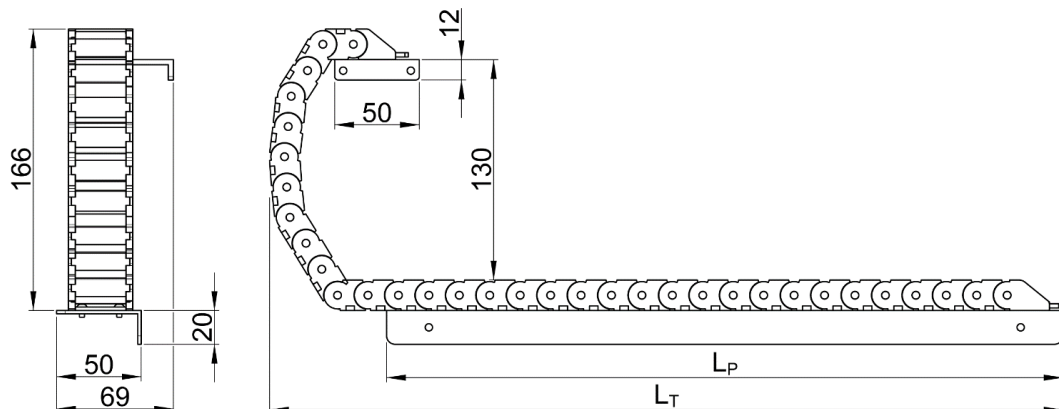
7 Accessories

7.1 Trailing chain kits



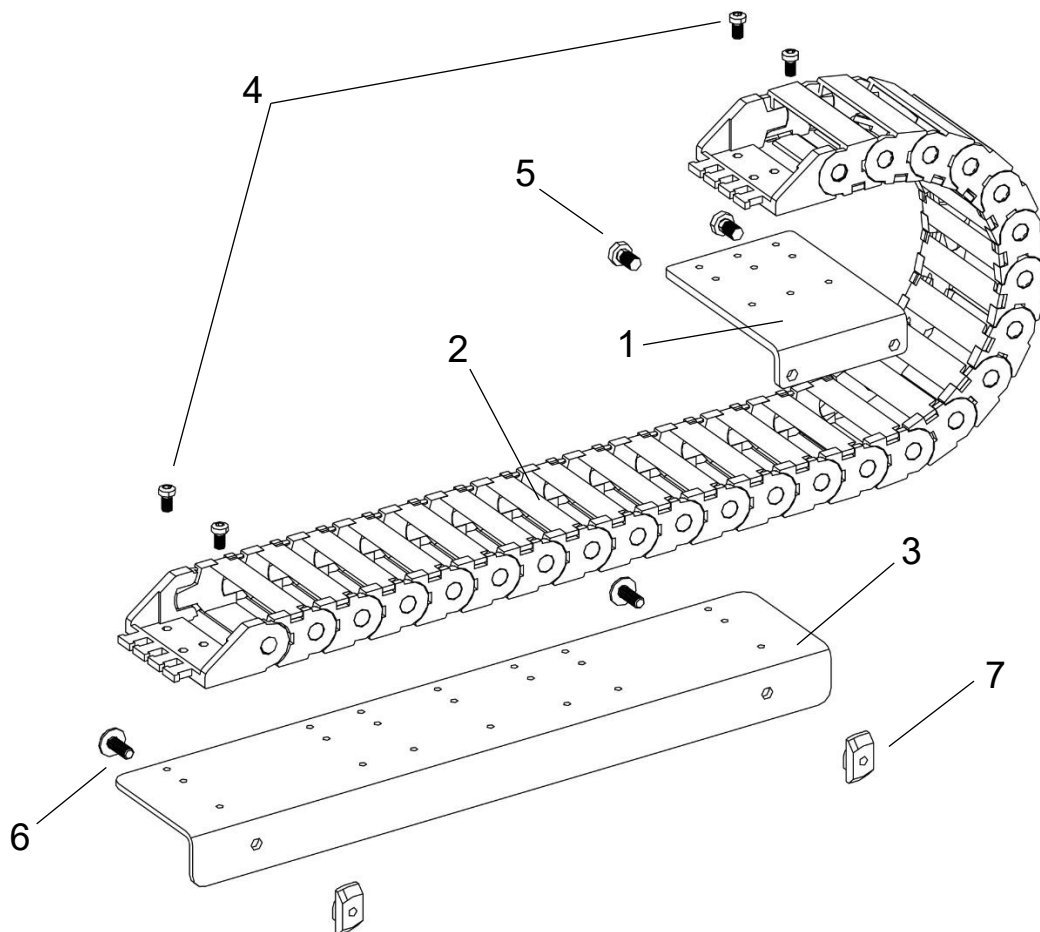
Item	Description	Item-No.
FM01-48-TC540-48x18	Trailing chain kit for FM01-48 (0150-5658, 0150-5321, 0150-5332)	0150-6143
FM01-48-TC660-48x18	Trailing chain kit for FM01-48 (0150-5659, 0150-5322, 0150-5342)	0150-6045
FM01-48-TC840-48x18	Trailing chain kit for FM01-48 (0150-5661, 0150-5323, 0150-5343, 0150-5888)	0150-6046
FM01-48-TC1050-48x18	Trailing chain kit for FM01-48 (0150-5662, 0150-5663, 0150-5551, 0150-5324, 0150-5553, 0150-5344)	0150-6047
FM01-48-TC1260-48x18	Trailing chain kit for FM01-48 (0150-5664, 0150-5708, 0150-5665, 0150-6812, 0150-5707, 0150-5325, 0150-5554, 0150-5709, 0150-5345, 0150-6210)	0150-6048
FM01-48-TC1440-48x18	Trailing chain kit for FM01-48 (0150-5666, 0150-5326, 0150-5346, 0150-6200)	0150-6049
FM01-48-TC1650-48x18	Trailing chain kit for FM01-48 (0150-5667, 0150-5327, 0150-5347)	0150-6051
FM01-48-TC1860-48x18	Trailing chain kit for FM01-48 (0150-5668, 0150-5328, 0150-5348)	0150-6052
FM01-48-TC2040-48x18	Trailing chain kit for FM01-48 (0150-5669, 0150-5329, 0150-5349, 0150-6425, 0150-6050)	0150-6053
FM01-48-TC2250-48x18	Trailing chain kit for FM01-48 (0150-5670, 0150-5330, 0150-5555)	0150-6054
FM01-48-TC2490-48x18	Trailing chain kit for FM01-48 (0150-5671, 0150-5331, 0150-5556, 0150-6207)	0150-6055

7.1.1 Dimensions



Item	Item-No.	Assumed trailing chain radius R [mm (inch)]	Lower angled-plate length L_P [mm (inch)]	Trailing chain kit total length L_T [mm (inch)]
FM01-TC500-48x18	0150-4987	68 (2.68)	400 (15.75)	570 (22.44)
FM01-TC600-48x18	0150-5056	68 (2.68)	500 (19.69)	670 (26.38)
FM01-TC800-48x18	0150-5057	68 (2.68)	600 (23.62)	770 (30.32)
FM01-TC1000-48x18	0150-5058	68 (2.68)	700 (27.56)	870 (34.25)
FM01-TC1200-48x18	0150-5059	68 (2.68)	800 (31.5)	970 (38.19)
FM01-TC1400-48x18	0150-5064	68 (2.68)	900 (35.43)	1070 (42.13)
FM01-TC1600-48x18	0150-5065	68 (2.68)	1000 (39.37)	1170 (46.06)
FM01-TC2000-48x18	0150-5235	68 (2.68)	1200 (47.24)	1370 (53.94)
FM01-TC2200-48x18	0150-6550	68 (2.68)	1300 (51.18)	1470 (57.87)
FM01-TC2400-48x18	0150-6551	68 (2.68)	1400 (55.12)	1570 (61.81)

7.1.2 Overview trailing chain kit



Nr.	Item
1	Trailing chain angle plate
2	Trailing chain
3	Trailing chain L-profile
4	Socket pan head screws ISO14583 M3x6
5	Socket pan head screws ISO 4762 M4x10
6	Socket pan washer screws M4x10
7	Nut N8/M4

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.

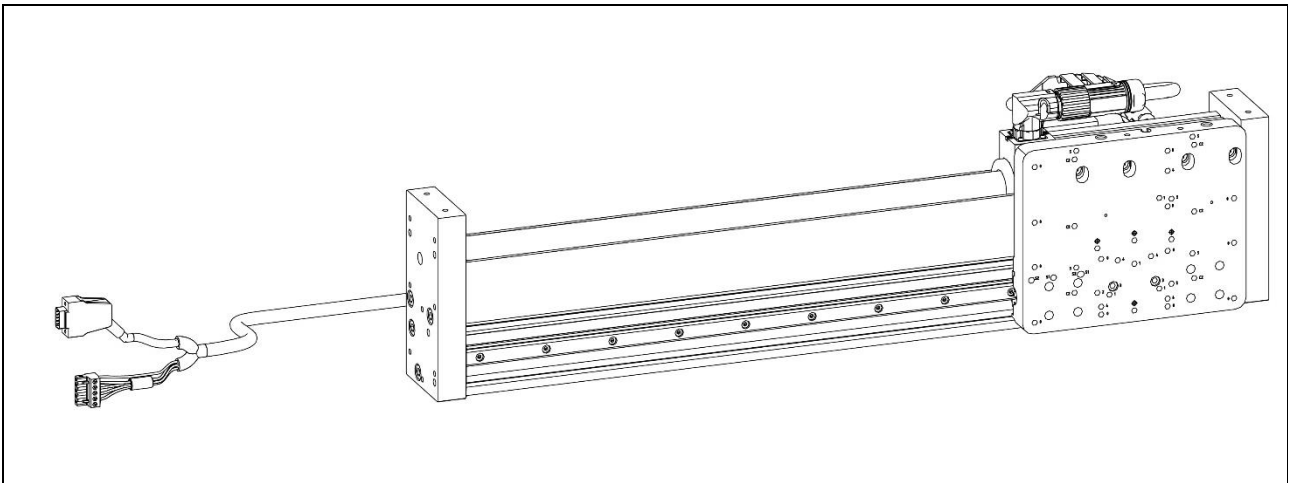


- Please note that the installation must always be carried out according to the ordered installation variant (e.g.: 0140-0051 cable connector bottom right).
- Please note that the directions "right", "left" and "centre" are always to be understood from the front of the module.

Mounting variants for one carriage:

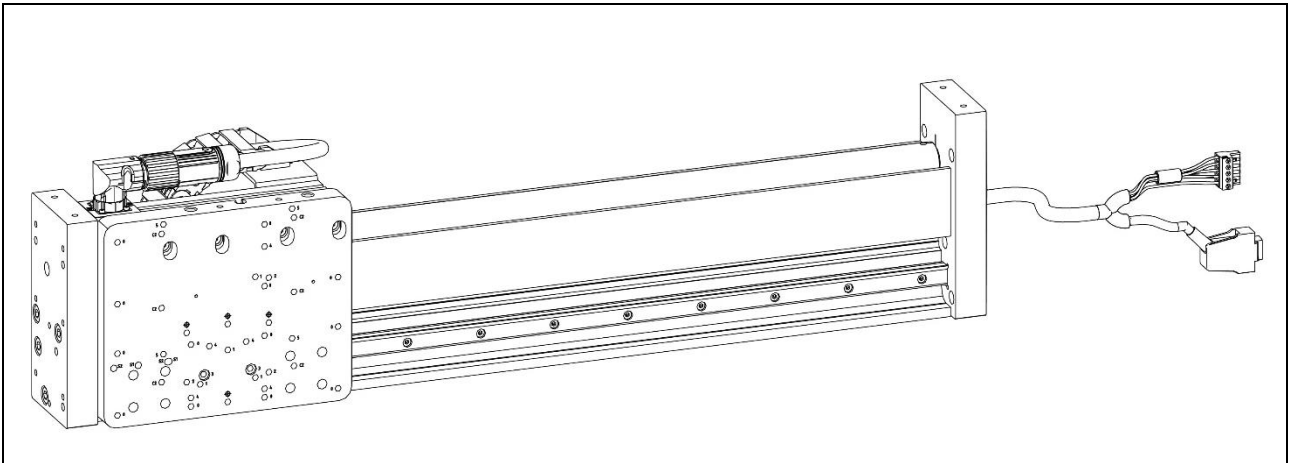
Standard: 0140-0050 option (default): Cable connector bottom left

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



Inverted: 0140-0051 option: Cable connector bottom right

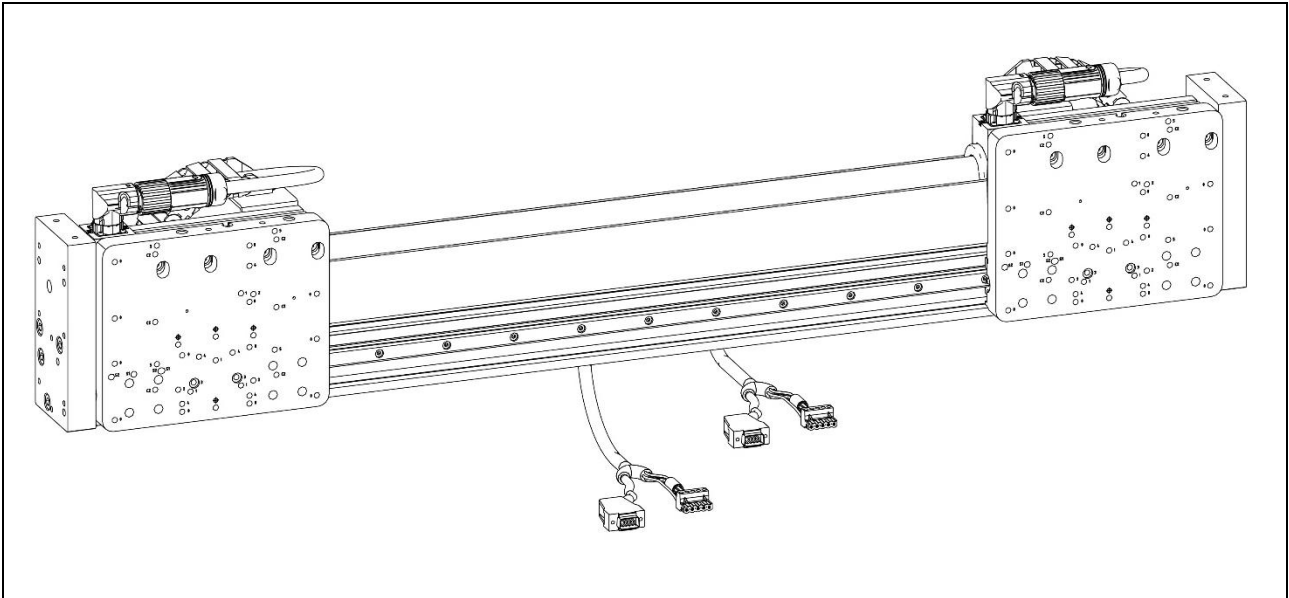
The cable is routed towards the right-hand end plate.



Mounting variants for two carriages

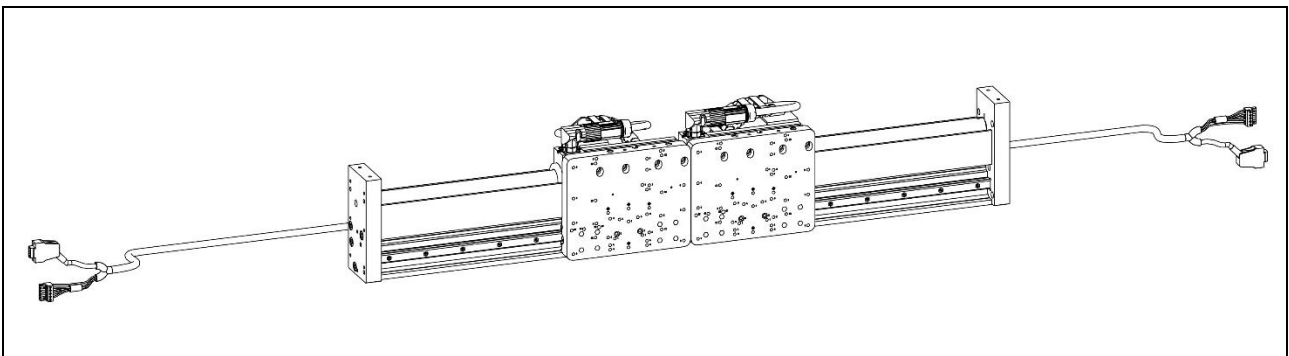
Cable exit on the centre: 0140-0052 option (default): Cable connector bottom centre

The cables are routed to the centre of the module.



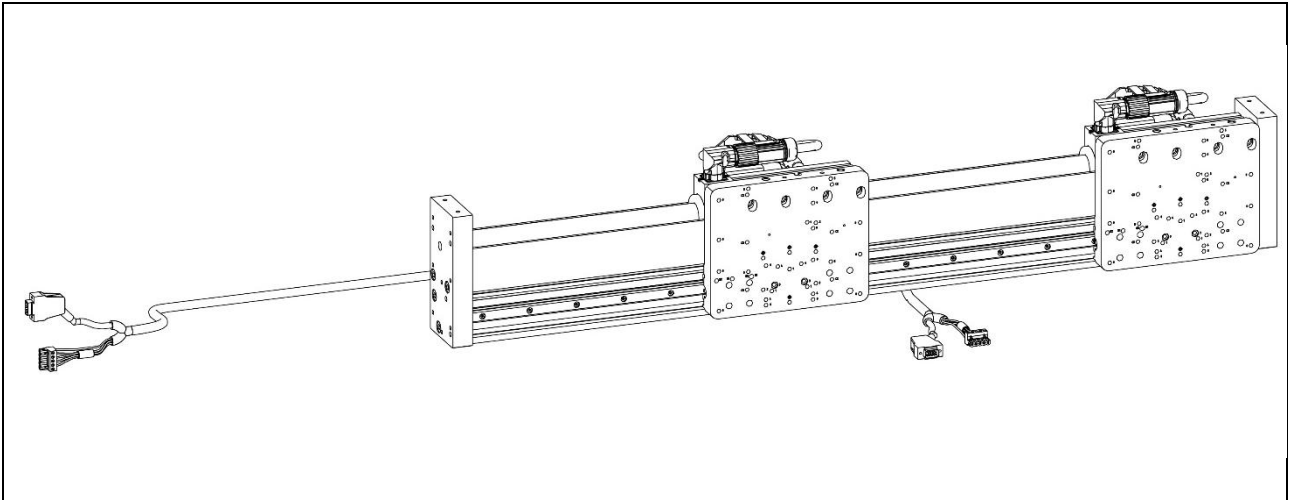
Cable exit on the sides: 0140-0053 option: Cable connector bottom left/right

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



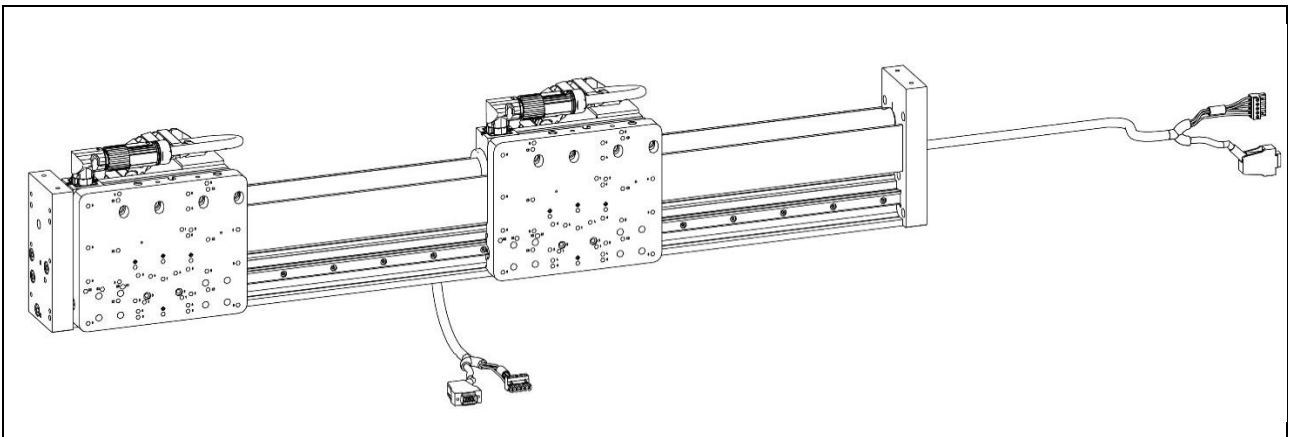
Cable exit left/centre: 0140-0054 option: Cable connector bottom left/centre.

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.

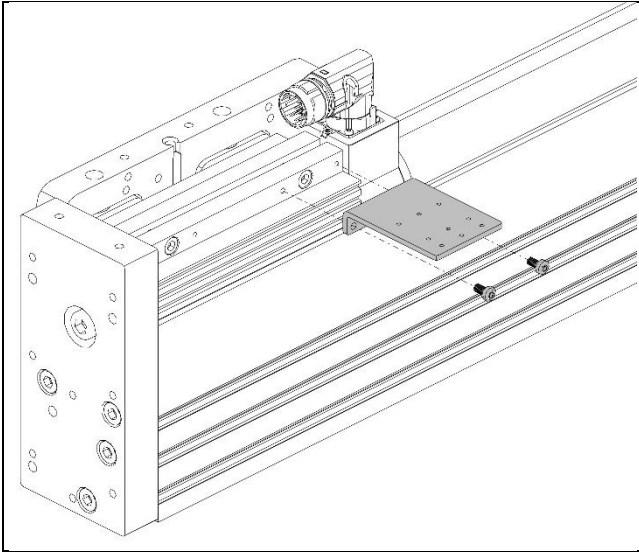


Cable exit centre/right: 0140-0055 option: Cable connector bottom centre/right.

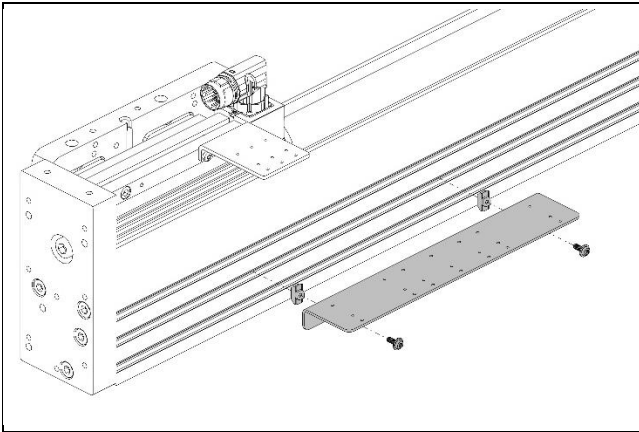
The cable of the left carriage is routed towards the centre of the module, the cable of the right carriage towards the right end plate.



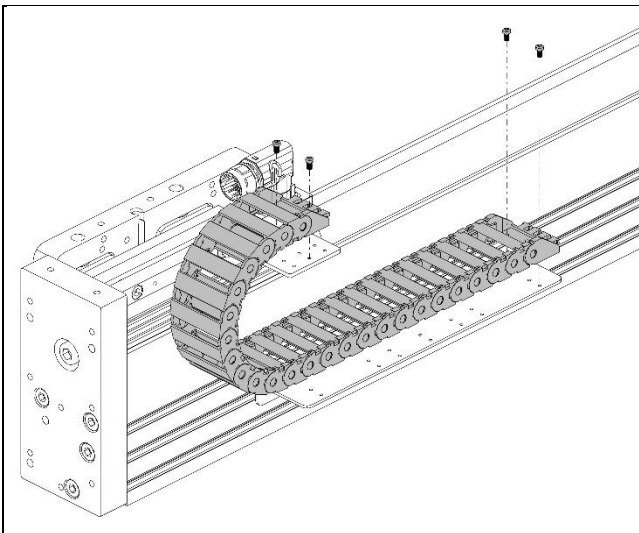
7.2.1 Standard installation of the trailing chain on one carriage (0140-0050 option (default): Cable connector bottom left)



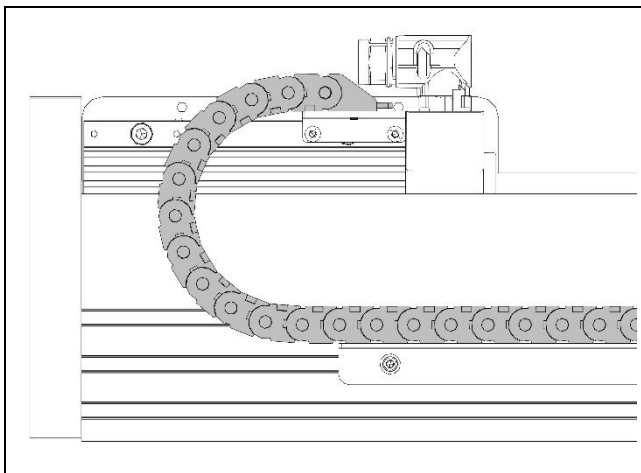
1. Mount the angle plate on the carriage. Use screw locking compound§.



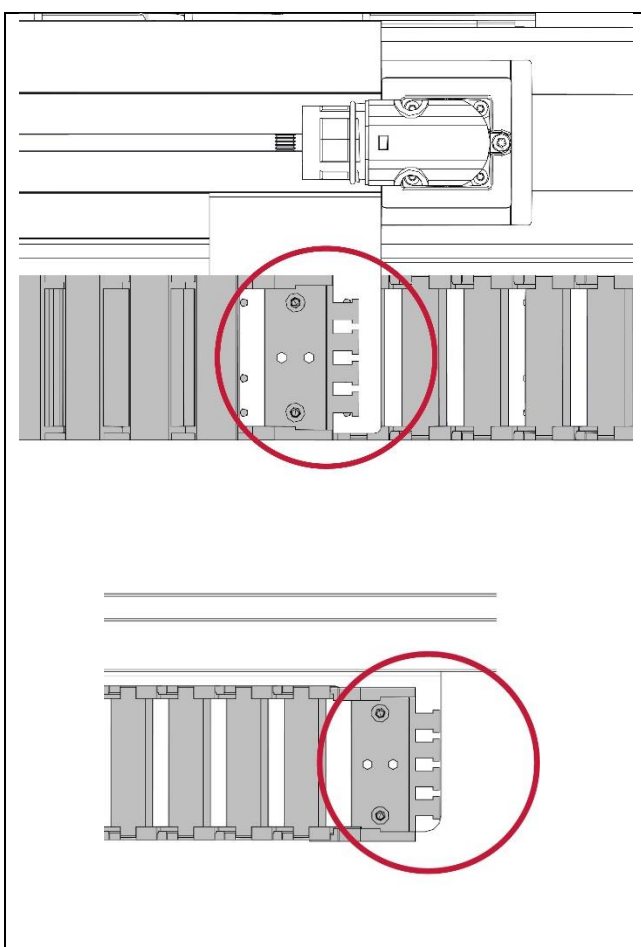
2. Mount the lower angle plate with T-nuts in the lower part of the module base. Longer lower angle plates have an additional fixing point in the centre.



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

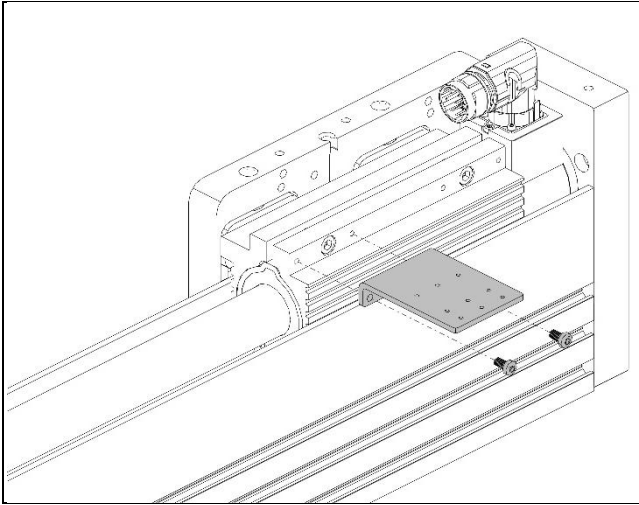


4. Align the lower angle plate so that the trailing chain with cable does not protrude from the module and the permissible cable bending radius is maintained. The carriage must be able to achieve the full required mechanical stroke.

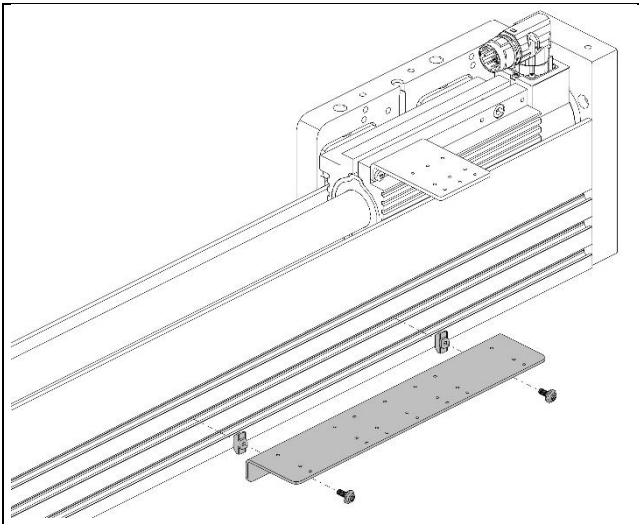


5. Fix the cable to the trailing chain on both sides with cable ties.

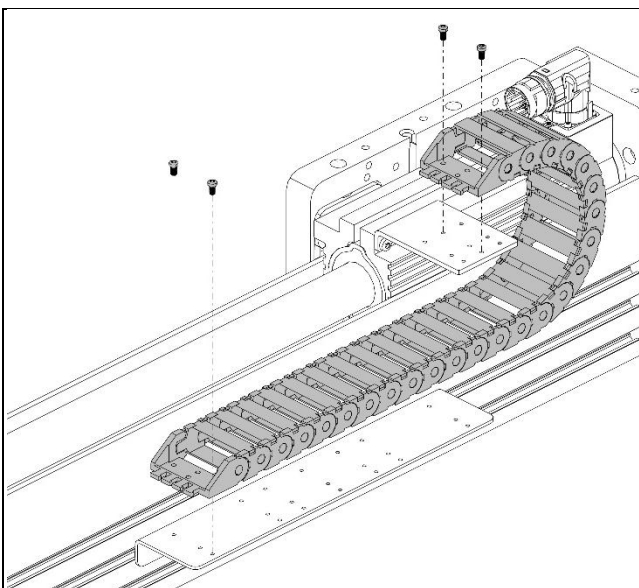
7.2.2 Inverted installation of the trailing chain on one carriage (0140-0051 option: Cable connector bottom right)



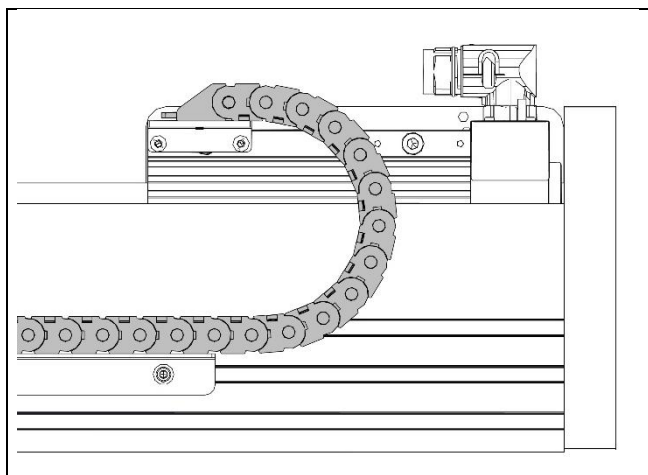
1. Mount the angle plate on the carriage. Use screw locking compound.



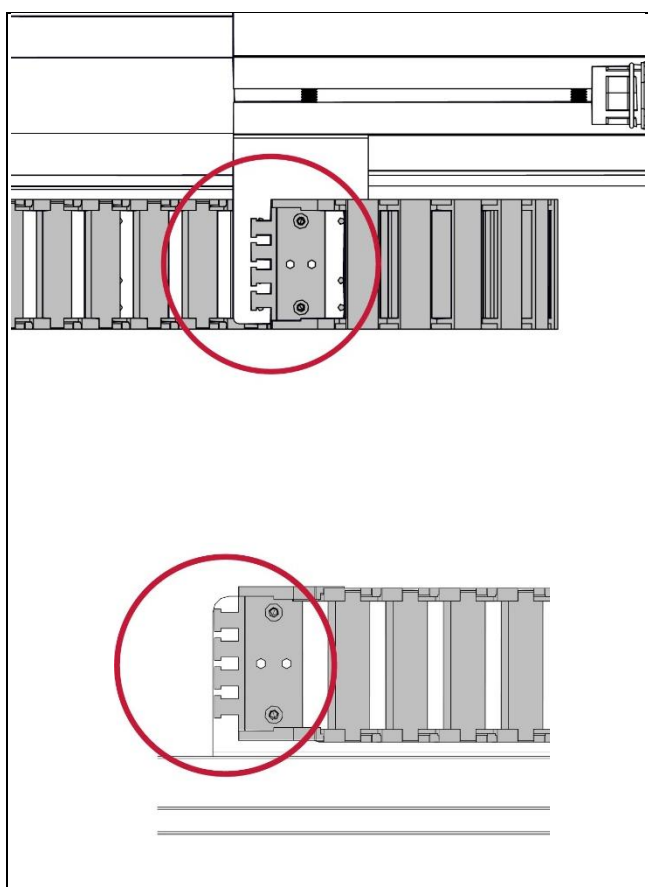
2. Mount the lower angle plate with T-nuts in the lower part of the module base. Longer lower angle plates have an additional fixing point in the centre.



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

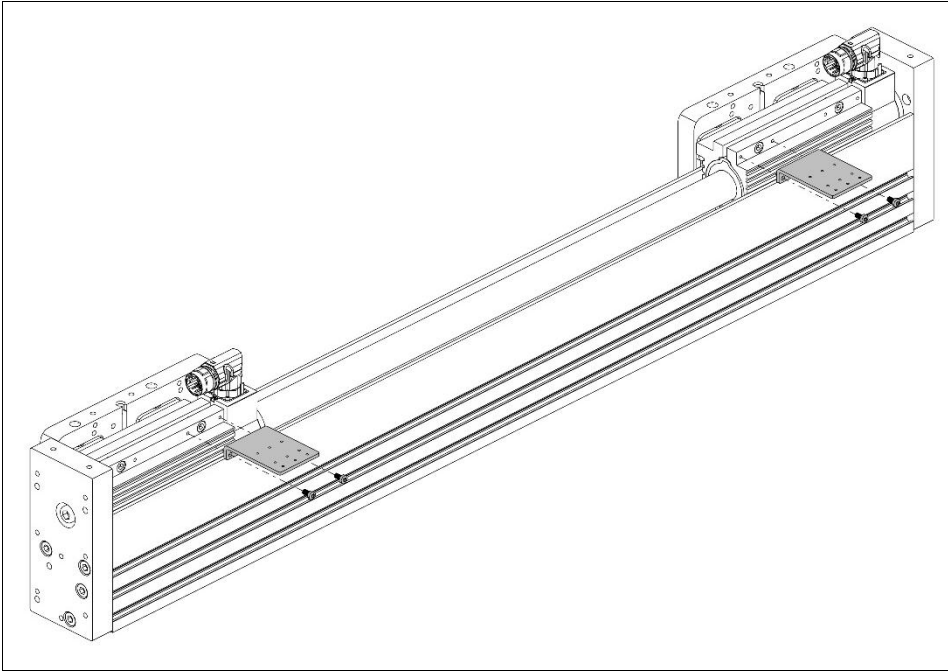


4. Align the lower angle plate so that the trailing chain with cable does not protrude from the module and the permissible cable bending radius is maintained. The carriage must be able to achieve the full required mechanical stroke.

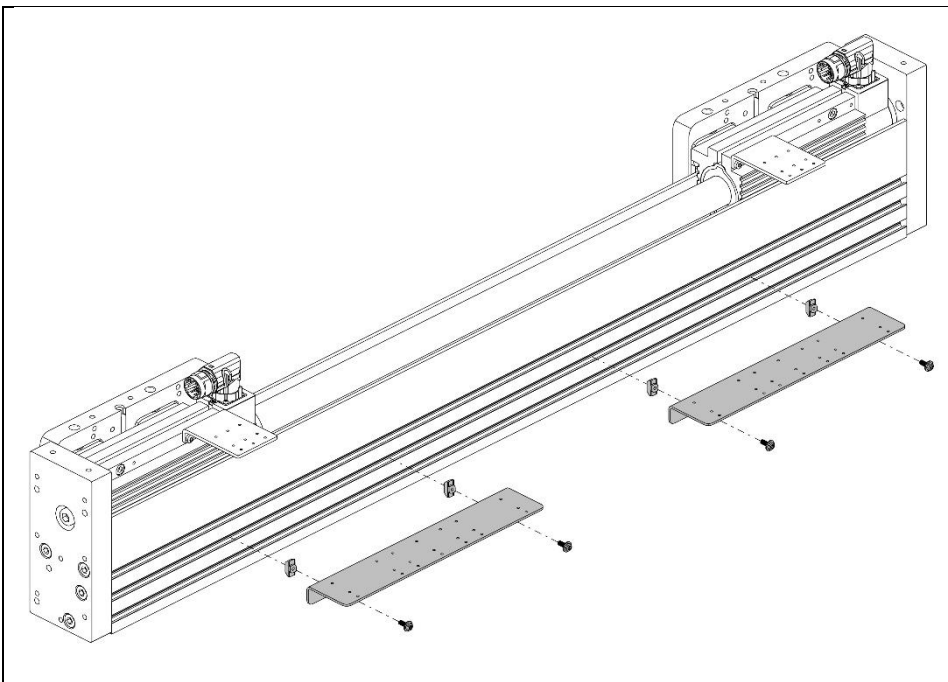


5. Fix the cable to the trailing chain on both sides with cable ties.

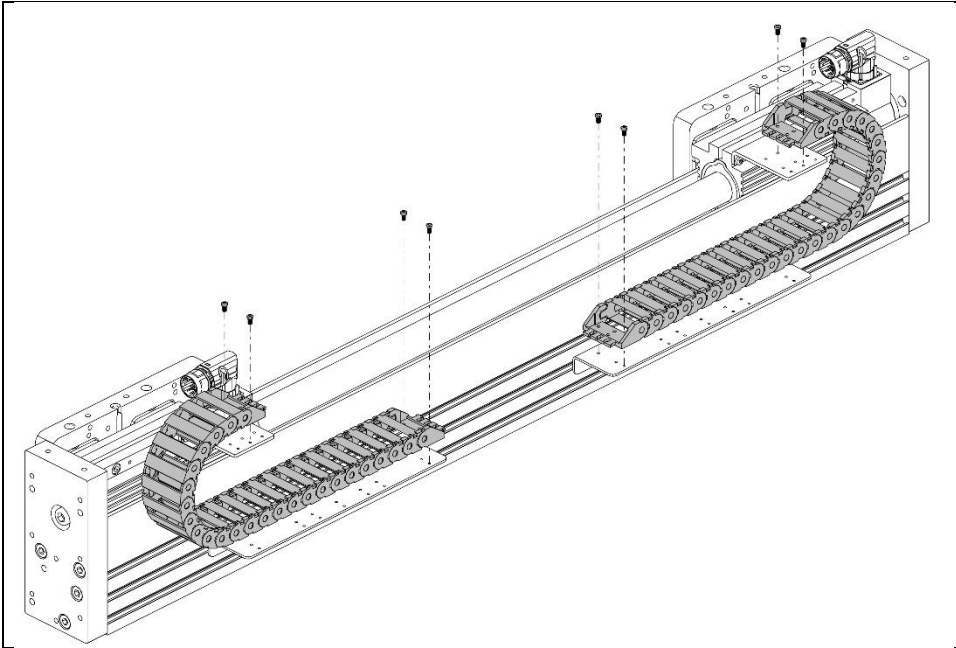
7.2.3 Cable exit on the centre with two carriages (0140-0052 option (default): Cable connector bottom center)



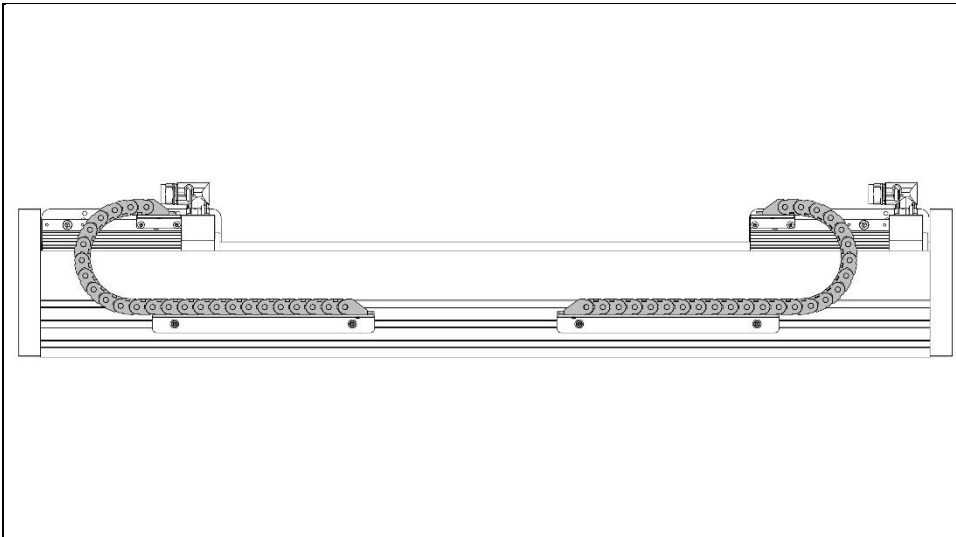
1. Mount the angle plates on the carriages. Use screw locking compound.



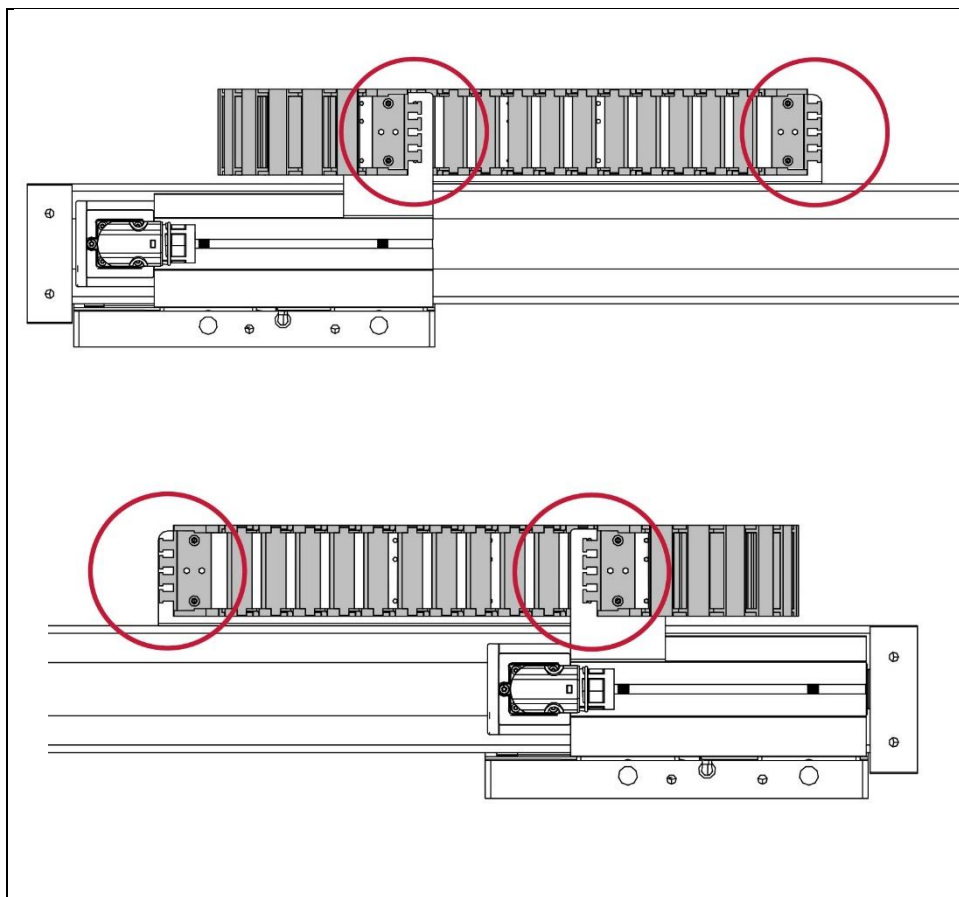
2. Mount the lower angle plates with T-nuts in the lower part of the module base. Longer lower angle plates have an additional fixing point in the centre.



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

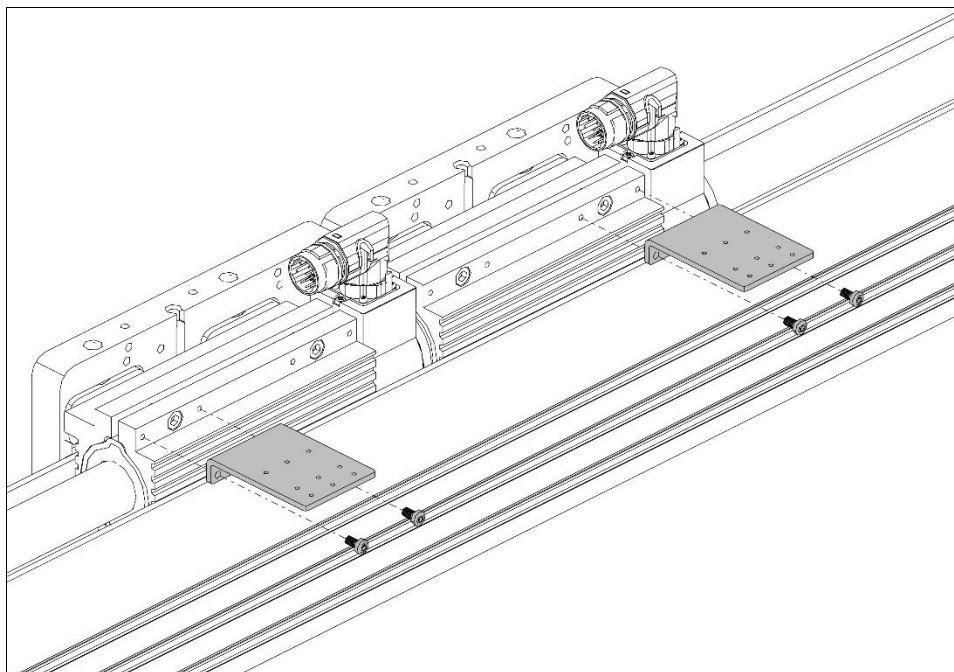


4. Align the lower angle plates so that the trailing chains with cable does not protrude from the module and the permissible cable bending radius is maintained. The carriages must be able to achieve the full required mechanical stroke.

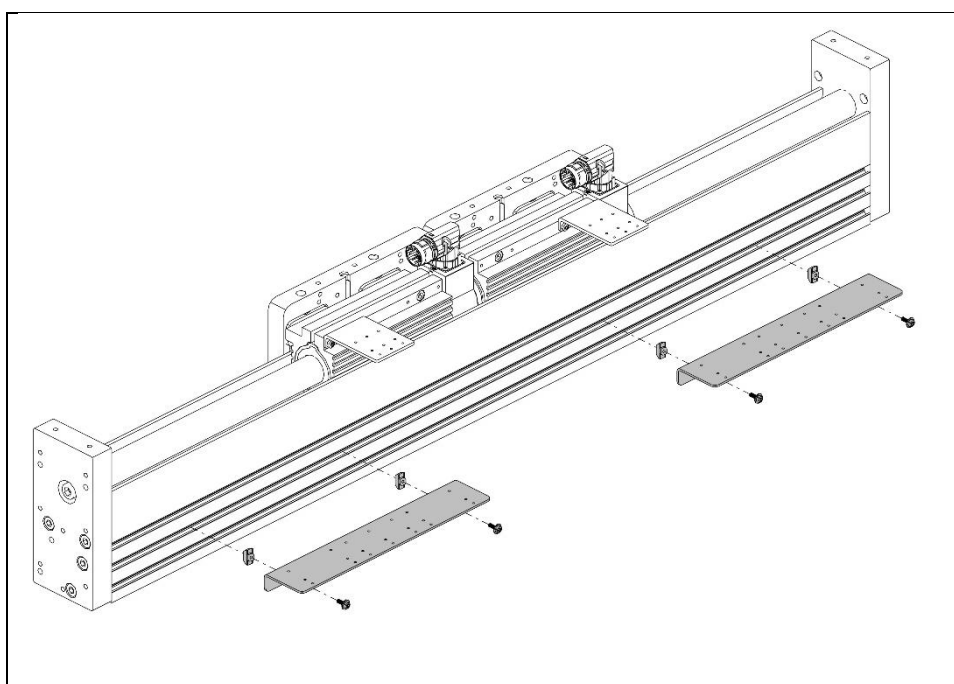


5. Fix the cables to the trailing chains on both sides with cable ties.

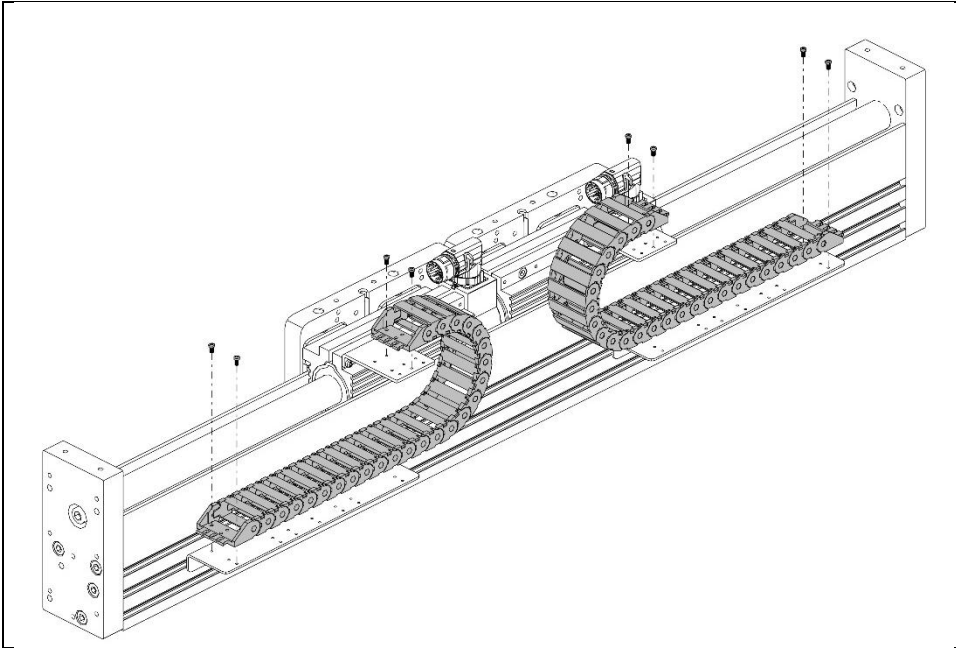
7.2.4 Cable exit on the sides with two carriages (0140-0053 option: Cable connector left/right)



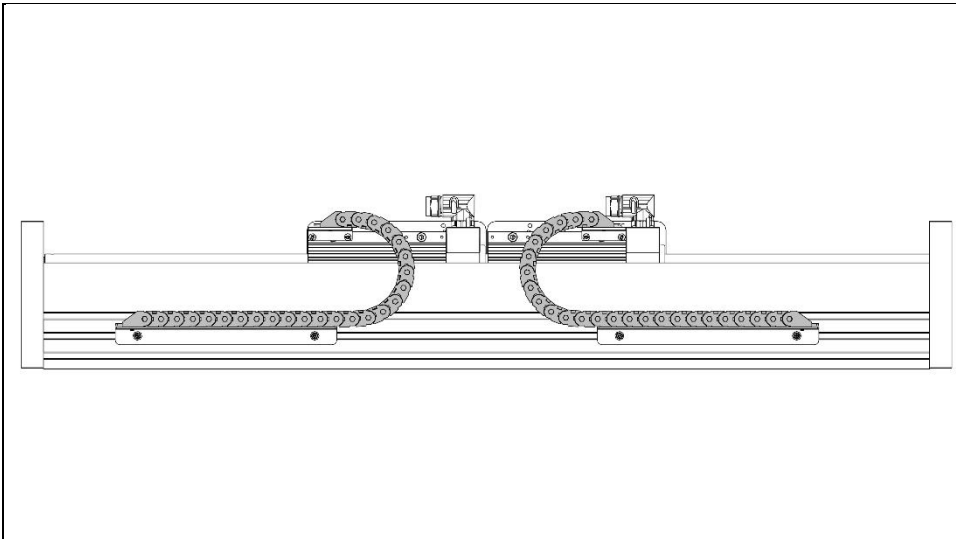
1. Mount the angle plates on the carriages. Use screw locking compound.



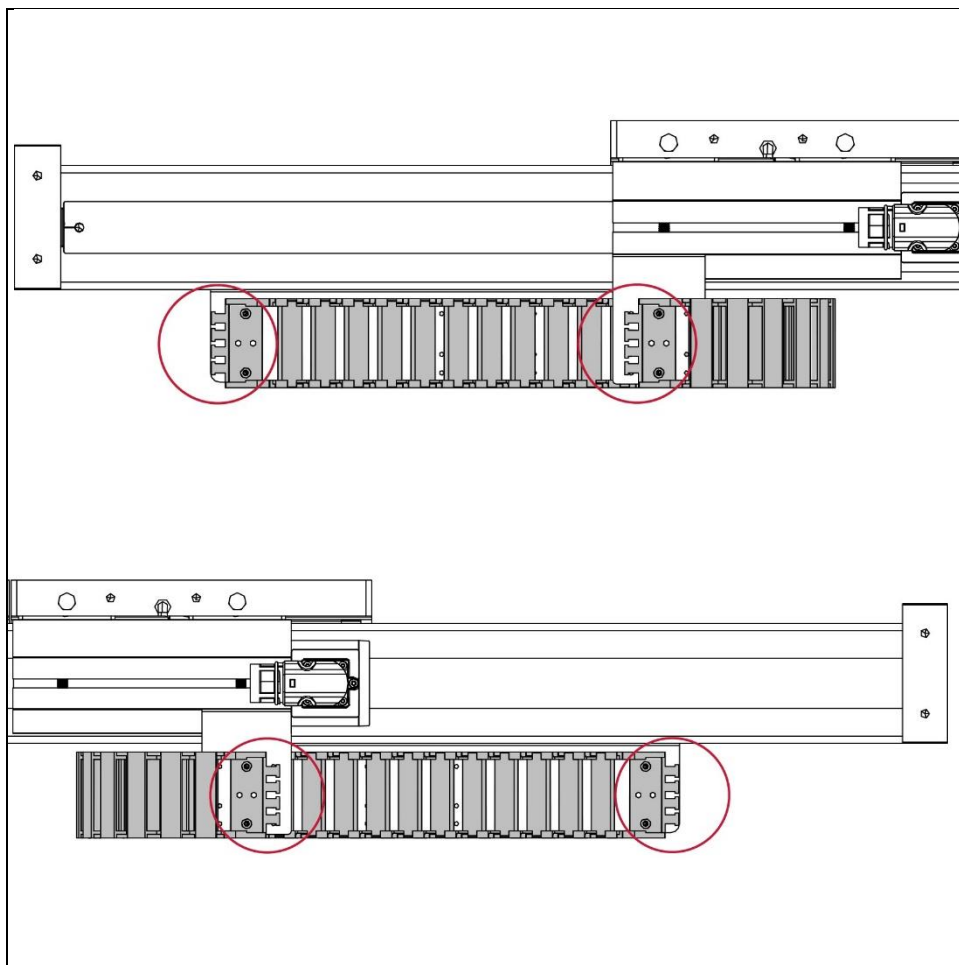
2. Mount the lower angle plates with T-nuts in the lower part of the module base. Longer lower angle plates have an additional fixing point in the centre.



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

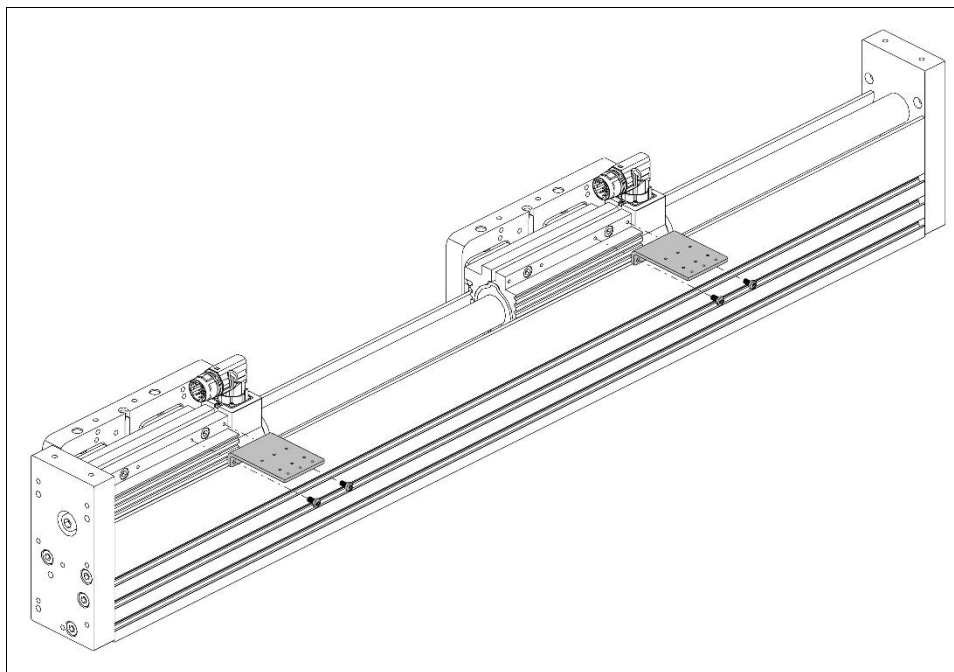


4. Align the lower angle plates so that the trailing chains with cable do not collide and the permissible cable bending radius is maintained. The carriages must be able to achieve the full required mechanical stroke.

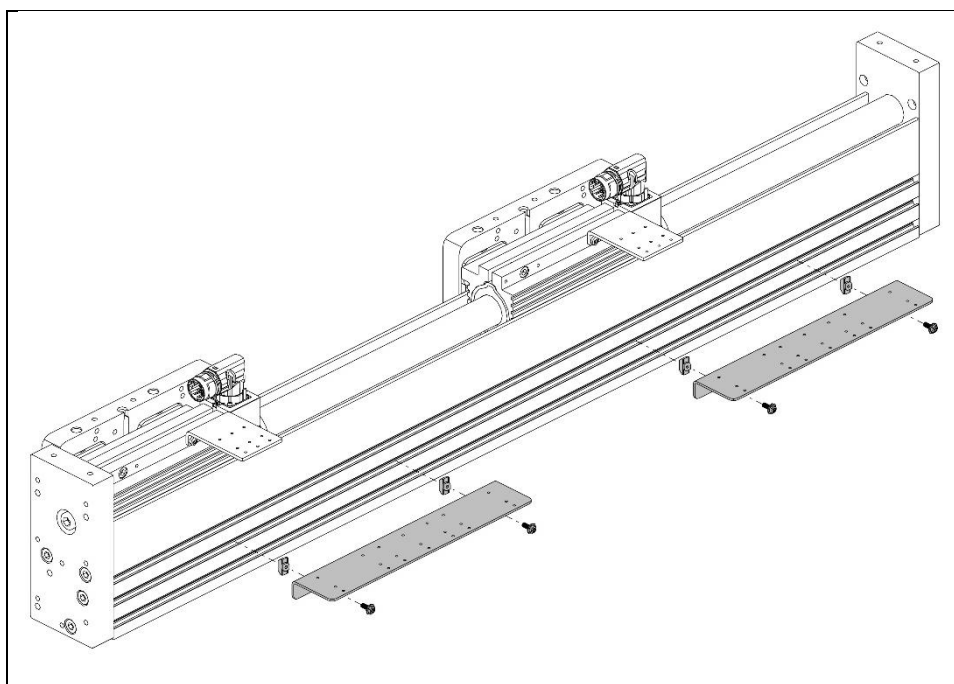


5. Fix the cables to the trailing chains on both sides with cable ties.

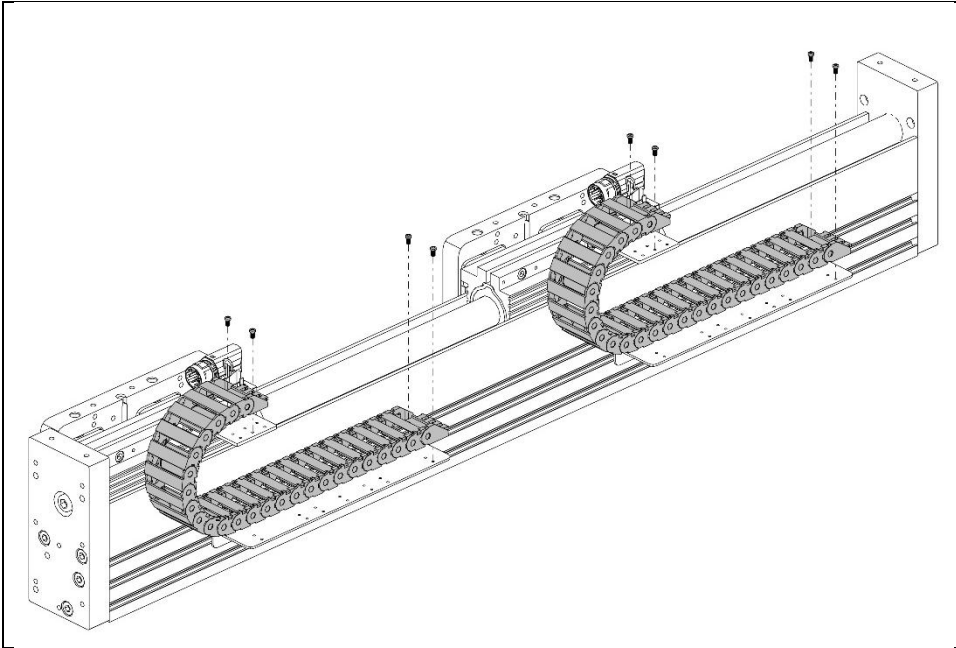
7.2.5 Cable exit left/centre with two carriages (0140-0054 option: Cable connector bottom left/centre)



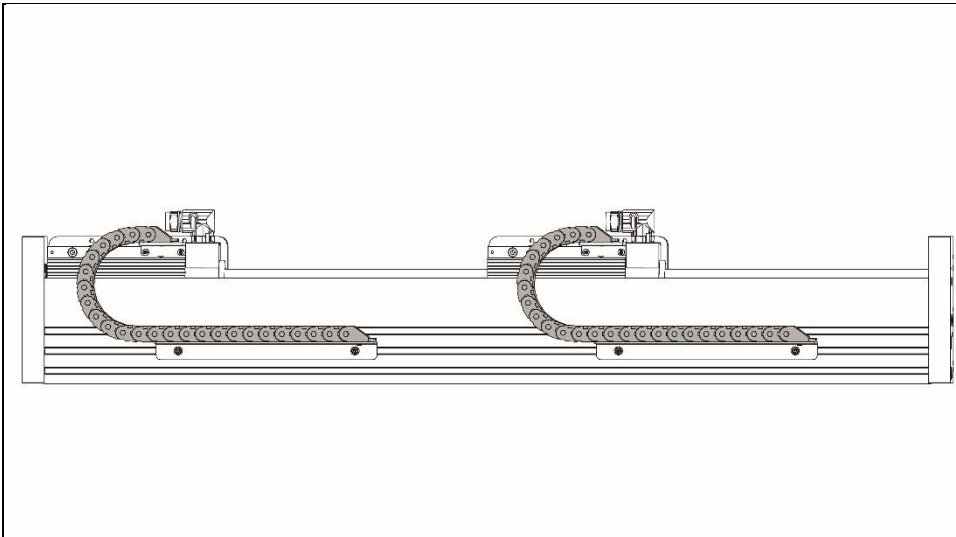
1. Mount the angle plates on the carriages. Use screw locking compound.



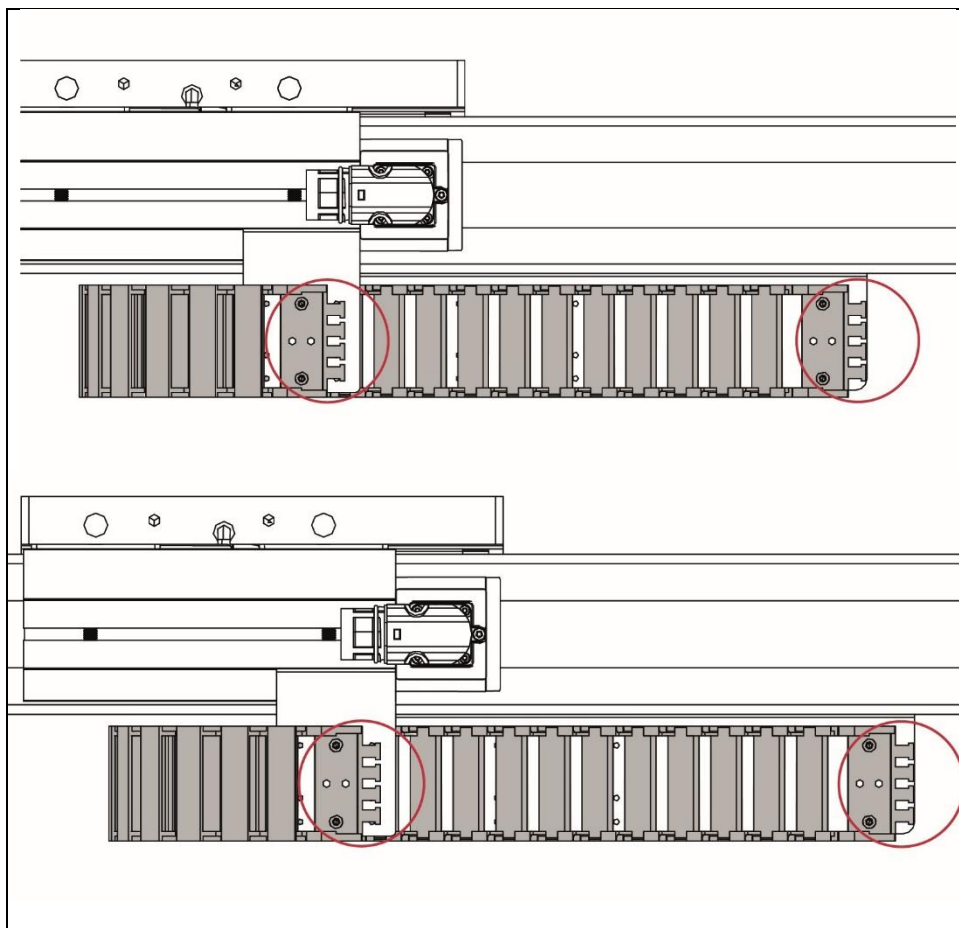
2. Mount the lower angle plates with T-nuts in the lower part of the module base. Longer lower angle plates have an additional fixing point in the centre.



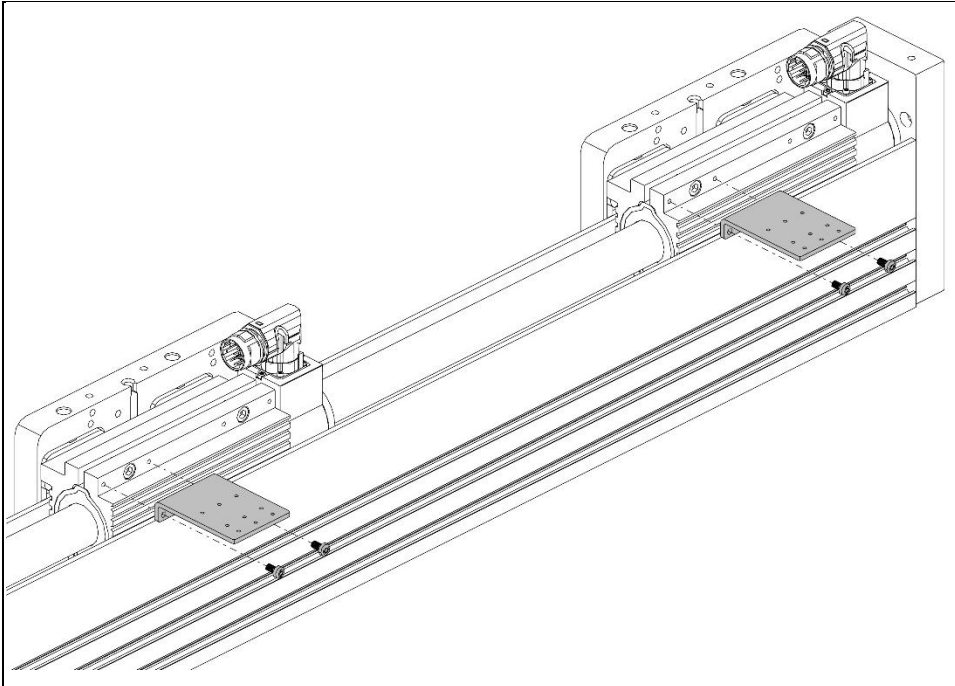
3. Insert the cables into the trailing chains and fit the trailing chains to the plates. Use screw locking compound.



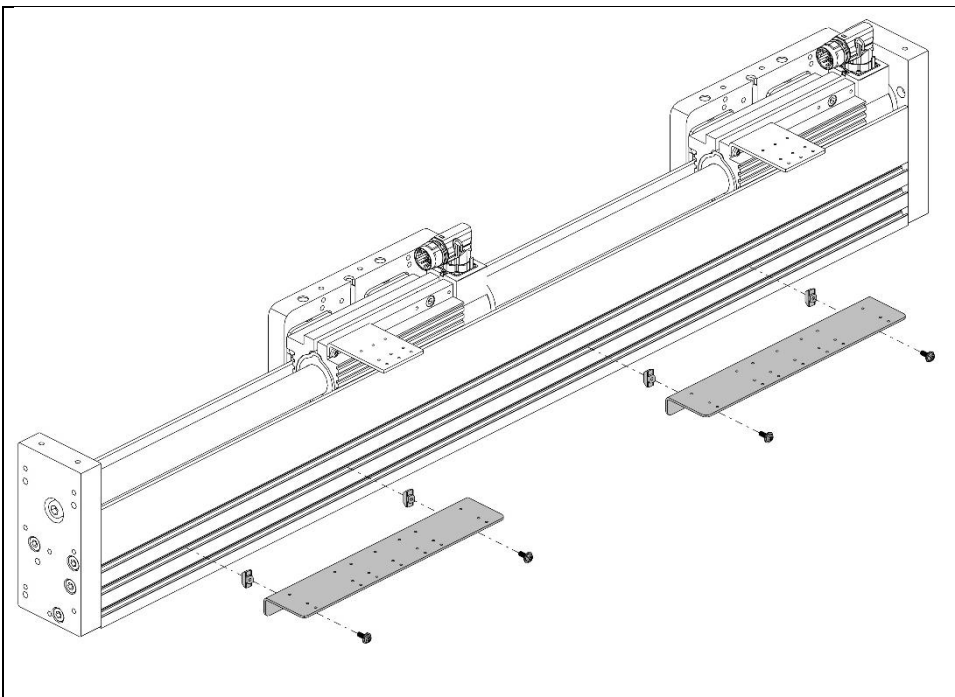
4. Align the lower angle plates so that the trailing chain (here on the left) with cable does not protrude from the module and the permissible cable bending radius is maintained. The carriages must be able to achieve the full required mechanical stroke.



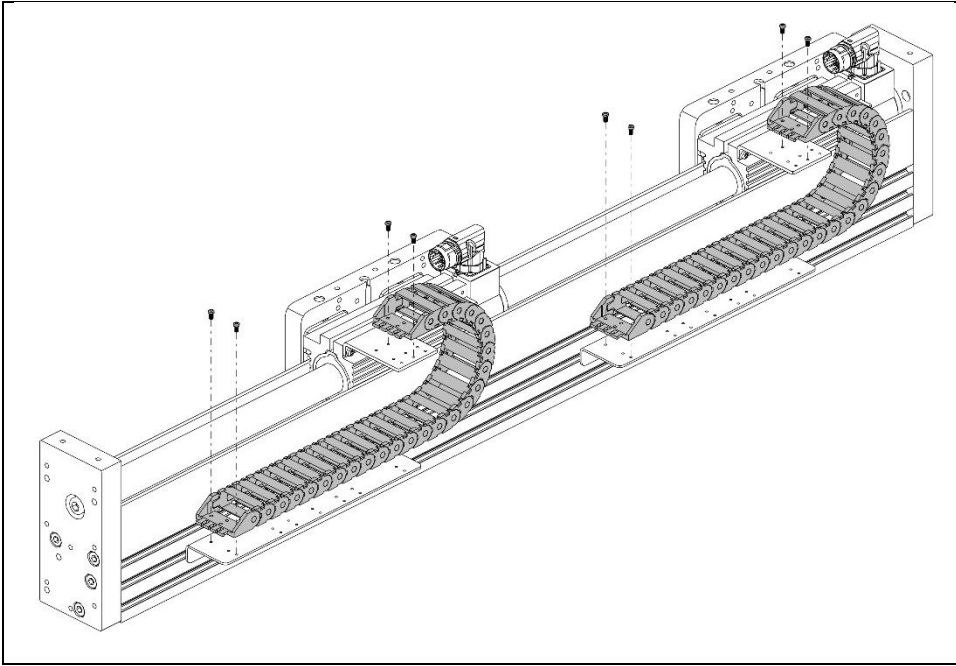
5. Fix the cables to the trailing chains on both sides with cable ties.

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

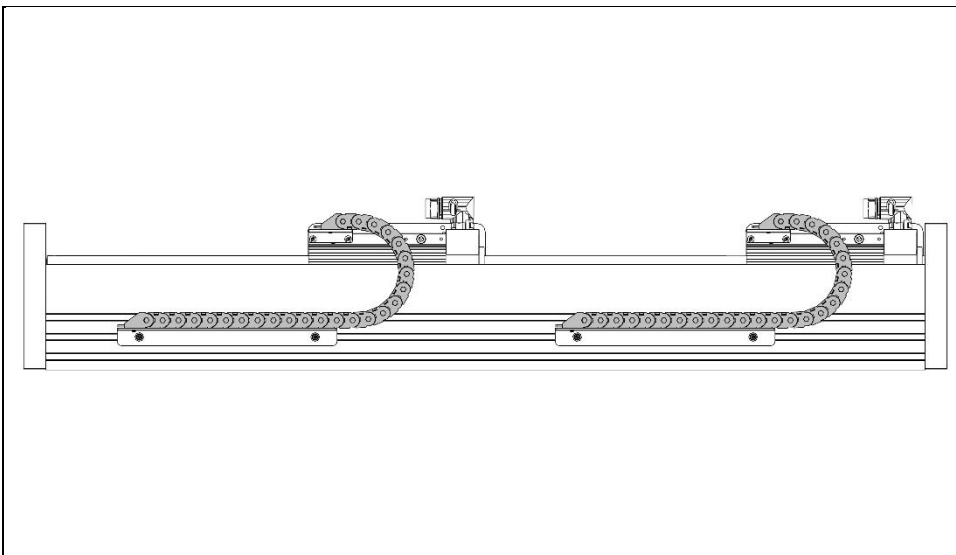
1. Mount the angle plates on the carriages. Use screw locking compound.



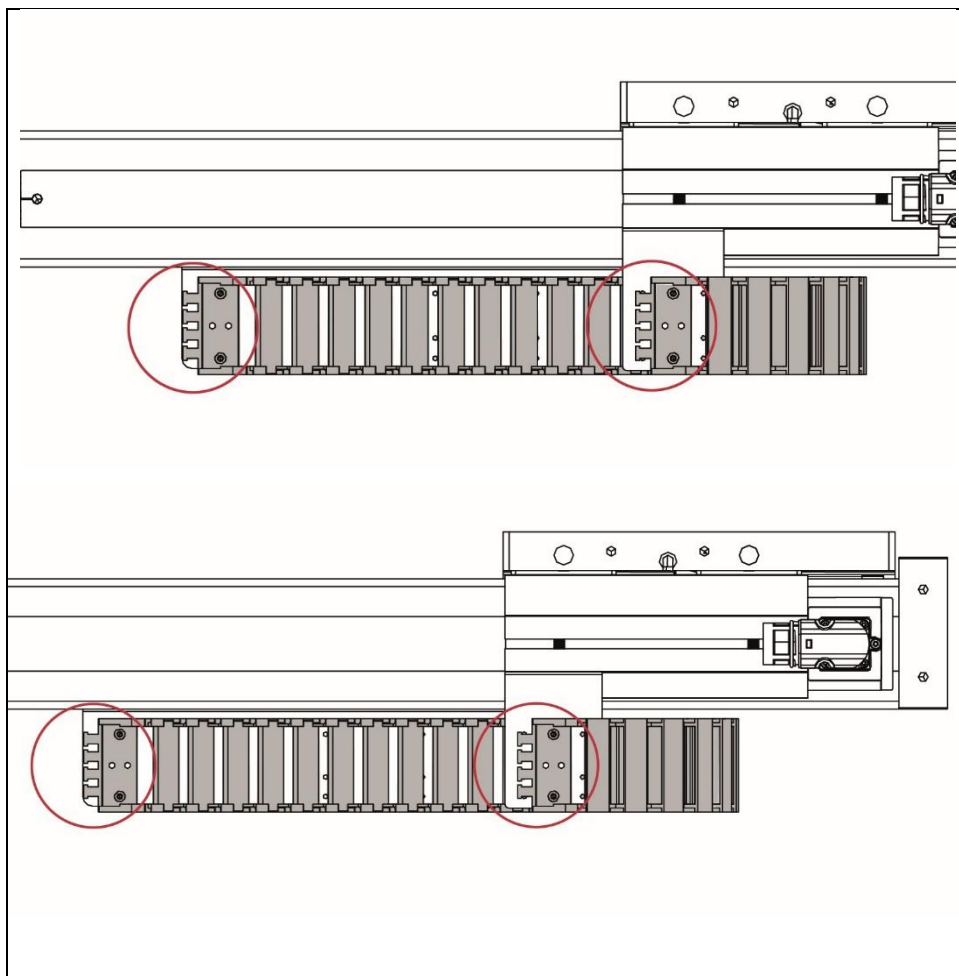
2. Mount the lower angle plates with T-nuts in the lower part of the module base. Longer lower angle plates have an additional fixing point in the centre.



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.

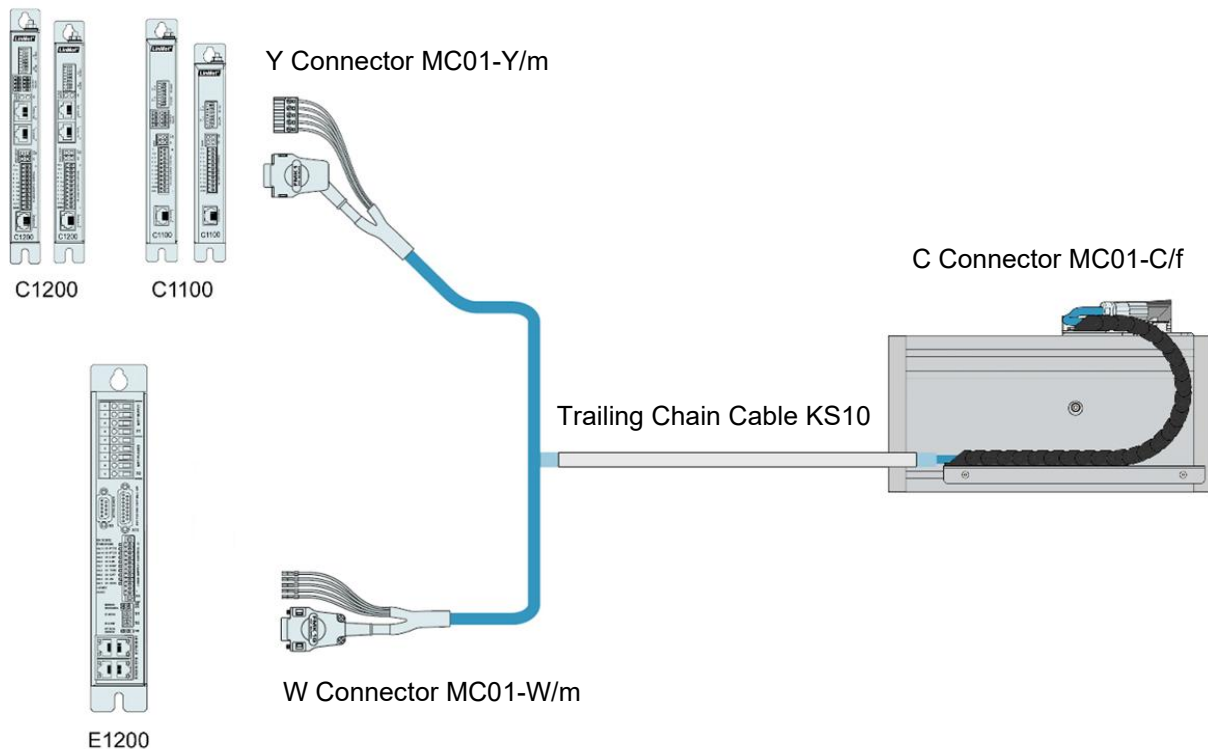


5. Fix the cables to the trailing chains on both sides with cable ties.

7.3 Motor cables



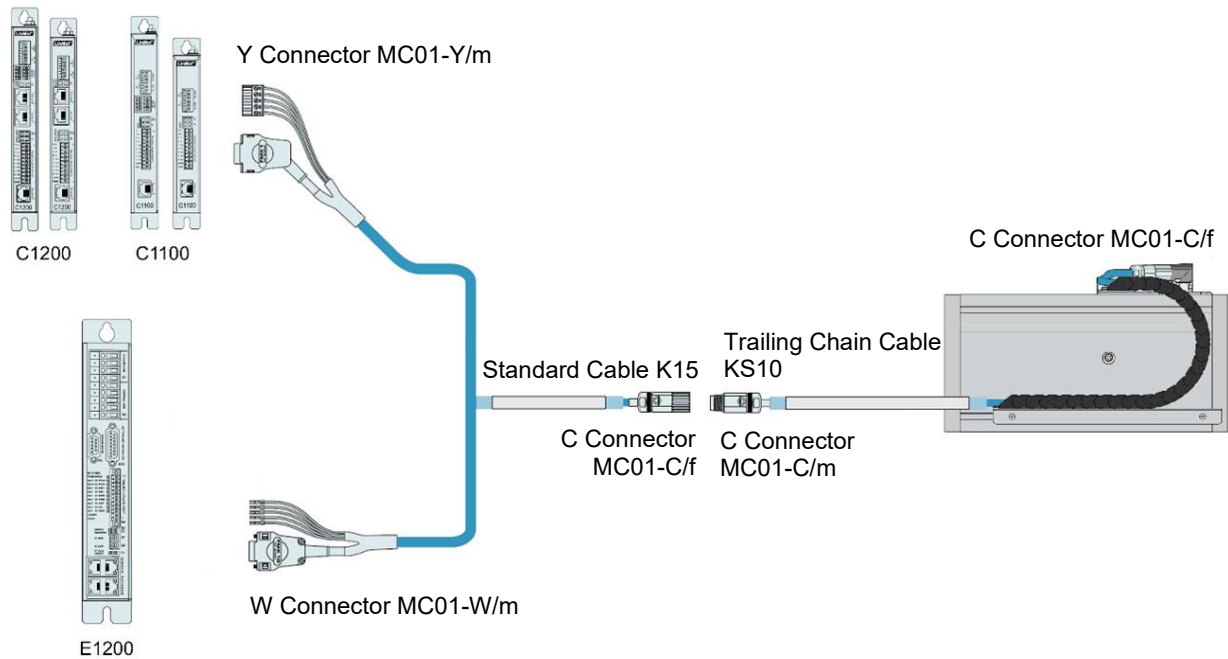
7.3.1 Motor cables for direct wiring



Item	Description	Item-No.
KS10-Y/C-4	Trailing chain cable Y/C, 4 m	0150-2439
KS10-Y/C-6	Trailing chain cable Y/C, 6 m	0150-2440
KS10-Y/C-8	Trailing chain cable Y/C, 8 m	0150-2441
KS10-Y/C-	Trailing chain cable Y-Fe/C, custom length	0150-3511

Item	Description	Item-No.
KS10-W/C-4	Trailing chain cable W/C, 4 m	0150-1807
KS10-W/C-6	Trailing chain cable W/C, 6 m	0150-1858
KS10-W/C-8	Trailing chain cable W/C, 8 m	0150-1808
KS10-W/C-	Trailing chain cable W/C, custom length	0150-3139

7.3.2 Motor cables for indirect wiring with fixed extension cable



1st cable section: Motor to intermediate -C connector (in trailing chain)

Item	Description	Item-No.
KS10-C/C-2	Trailing chain cable C/C, 2 m (for guides)	0150-1816
KS10-C/C-4	Trailing chain cable C/C, 4 m (for guides)	0150-1817
Special cable KS10-C/C-	Trailing chain cable C/C, custom length	0150-3206

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

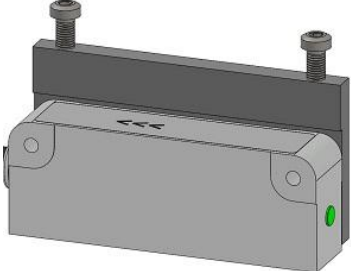
Item	Description	Item-No.
K15-Y/C-2	Motor cable Y/C, 2 m	0150-2429
K15-Y/C-4	Motor cable Y/C, 4 m	0150-2430
K15-Y/C-6	Motor cable Y/C, 6 m	0150-2431
K15-Y/C-8	Motor cable Y/C, 8 m	0150-2432
K15-Y-Fe/C-	Motor cable Y-Fe/C, custom length	0150-3506

2nd cable section: Intermediate -C connector to E1200 series drives (fixed installation)

Item	Description	Item-No.
K15-W/C-2	Motor cable W/C, 2 m	0150-1811
K15-W/C-4	Motor cable W/C, 4 m	0150-1801
K15-W/C-6	Motor cable W/C, 6 m	0150-1802
K15-W/C-8	Motor cable W/C, 8 m	0150-1803
K15-W/C-	Motor cable W/C, custom length	0150-3131

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
 0150-5625 FM01-37S/48-SK-D external sensor kit for FM01, incremental	This sensor can be used with the following linear modules: FM01-37x60 FM01-37x120 FM01-48x150 FM01-48x240 FM01-48x360	0150-1963 MB01-1000 incremental magnetic strip for MS01-1/D (per cm)	C11x0 C12x0 C1250-MI C1251-MI C1252-MI E12x0
 0150-5635 FM01-37/48-SK/02-D-BiSS external sensor kit for FM01, absolute	This sensor can be used with the following linear modules: FM01-37x60 FM01-48x150 FM01-48x240 FM01-48x360	0150-4730 MB01-1000-ABS/BiSS absolute magnetic strip for E01-1/D-SSI (per cm)	C11x0 C12x0 C1250-MI C1251-MI C1252-MI

8.1 Incremental sensor



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

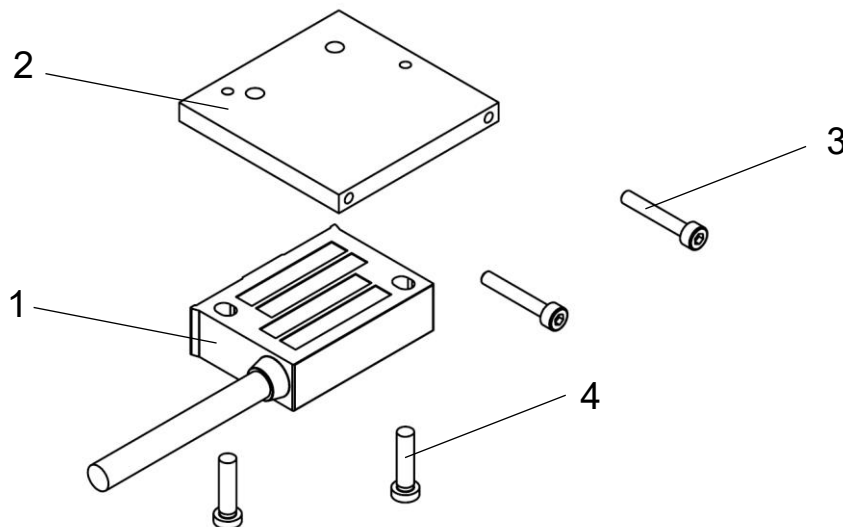
Item	Description	Item-No.
FM01-37S/48-SK-D	External Sensor kit for FM-Module, 2 m (incremental)	0150-5625



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.

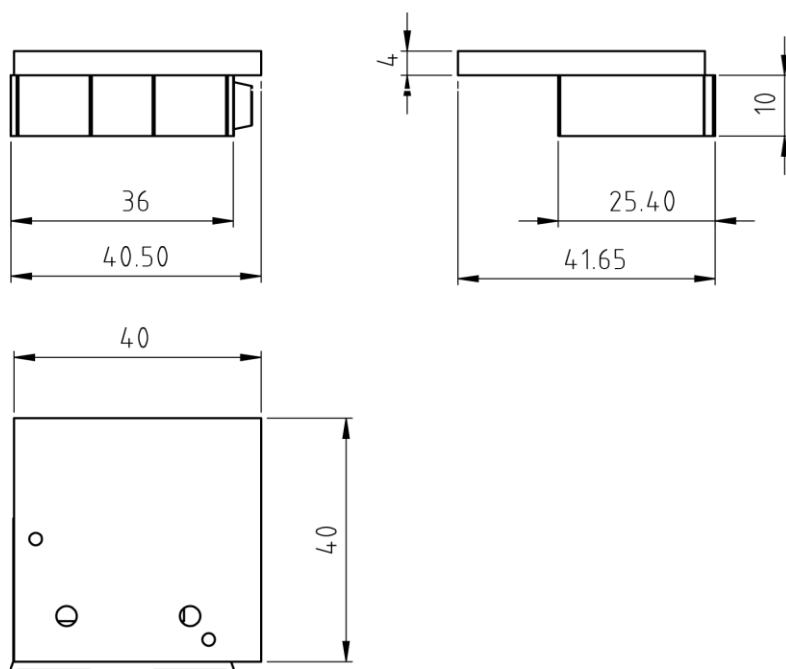
Due to installation and alignment difficulty, it is highly recommended to order the external sensor kit together with the guide.

8.1.1 Overview sensor kit (incremental)

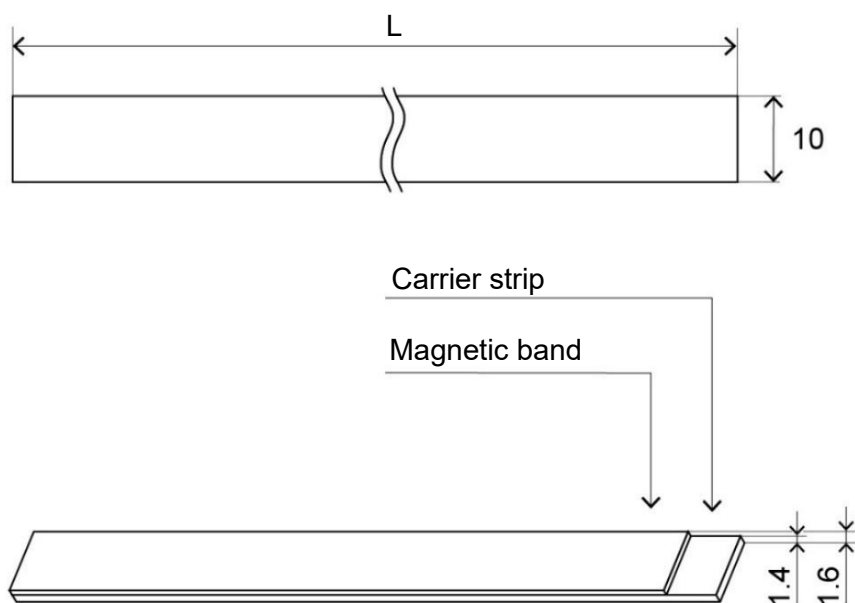


Pos.	Item
1	Magnet sensor MS01-1/D
2	Sensor adapter
3	M2.5x16 / ISO 7046-2
4	M2.5x10 / ISO 14583
-	Cable clamp (not pictured)
-	M2.5x6 / ISO 7046-2 (not pictured)

8.1.2 Dimensions



8.1.3 Magnetic strips for incremental sensor



Item	Description	Strip length L [mm (inch)]	Item-No.
F01-MB300	Magnetic strip for E/F-Guide (Item-No. 0150-4980, 0150-4990) incremental	280 (11.02)	0150-5454
F01-MB400	Magnetic strip for E/F-Guide (Item-No. 0150-4988, 0150-4947) incremental	380 (14.96)	0150-5451
F01-MB500	Magnetic strip for E/F-Guide (Item-No. 0150-4989, 0150-4948, 0150-5658, 0150-5321, 0150-5332) incremental	480 (18.9)	0150-5452
F01-MB600	Magnetic strip for E/F-Guide (Item-No. 0150-4991, 0150-4949, 0150-5659, 0150-5322, 0150-5342) incremental	580 (22.83)	0150-5431
F01-MB700	Magnetic strip for E/F-Guide (Item-No. 0150-5660, 0150-5550, 0150-5552) incremental	680 (27.77)	0150-6507
F01-MB800	Magnetic strip for E/F-Guide (Item-No. 0150-4992, 0150-4981, 0150-5661, 0150-5323, 0150-5343) incremental	780 (30.71)	0150-5432
F01-MB900	Magnetic strip for E/F-Guide (Item-No. 0150-5662, 0150-5551, 0150-5553) incremental	780 (30.71)	0150-5432
F01-MB1000	Magnetic strip for E/F-Guide (Item-No. 0150-4993, 0150-4982, 0150-5663, 0150-5324, 0150-5344) incremental	980 (38.58)	0150-5433
F01-MB1060	Magnetic strip for E/F-Guide (Item-No. 0150-5664, 0150-6812, 0150-5554) incremental	990 (38.97)	0150-5462
F01-MB1120	Magnetic strip for E/F-Guide (Item-No. 0150-5708, 0150-5707, 0150-5709) incremental	990 (38.97)	0150-5462
F01-MB1200	Magnetic strip for E/F-Guide (Item-No. 0150-4994, 0150-4983, 0150-5665, 0150-5325, 0150-5345) incremental	1180 (46.46)	0150-5434
F01-MB1400	Magnetic strip for E/F-Guide (Item-No. 0150-4995, 0150-4984, 0150-5666, 0150-5326, 0150-5346) incremental	1380 (54.33)	0150-5435
F01-MB1600	Magnetic strip for E/F-Guide (Item-No. 0150-4996, 0150-4985, 0150-5667, 0150-5327, 0150-5347) incremental	1580 (62.2)	0150-5436
F01-MB1820	Magnetic strip for E/F-Guide (Item-No. 0150-5668, 0150-5328, 0150-5348) incremental	1800 (70.86)	0150-5465
F01-MB2000	Magnetic strip for E/F-Guide (Item-No. 0150-4997, 0150-4986, 0150-5669, 0150-5329, 0150-5349) incremental	1980 (77.95)	0150-5437
F01-MB2210	Magnetic strip for E/F-Guide (Item-No. 0150-5670, 0150-5330, 0150-5555) incremental	2190 (86.22)	0150-5467
F01-MB2450	Magnetic strip for E/F-Guide (Item-No. 0150-5671, 0150-5331, 0150-5556) incremental	2430 (95.66)	0150-5468

8.1.4 Extender incremental sensor cable



Item	Description	Item-No.
KS025-D15/D-Encoder	Encoder Cable, High Flex, Custom length	0150-3168

8.2 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.
FM01-37/48-SK02-D-BiSS	External Sensor kit for FM-Module, 2m (absolute)	0150-5635



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 Magnetic strips for absolute sensor BiSS



Item	Description	Strip length L [mm (inch)]	Item-No.
MB01-ABS/BiSS-28	Magnetic strip for E/F-Guide (absolute)	280 (11.02)	0150-4910
MB01-ABS/BiSS-38	Magnetic strip for E/F-Guide (absolute)	380 (14.96)	0150-4911
MB01-ABS/BiSS-48	Magnetic strip for E/F-Guide (absolute)	480 (18.90)	0150-4912
MB01-ABS/BiSS-58	Magnetic strip for E/F-Guide (absolute)	580 (22.83)	0150-4913
MB01-ABS/BiSS-78	Magnetic strip for E/F-Guide (absolute)	780 (30.71)	0150-4914
MB01-ABS/BiSS-98	Magnetic strip for E/F-Guide (absolute)	980 (38.58)	0150-4915
MB01-ABS/BiSS-120	Magnetic strip for E/F-Guide (absolute)	1200 (47.24)	0150-4918
MB01-ABS/BiSS-138	Magnetic strip for E/F-Guide (absolute)	1380 (54.33)	0150-4919
MB01-ABS/BiSS-158	Magnetic strip for E/F-Guide (absolute)	1580 (62.20)	0150-4920
MB01-ABS/BiSS-180	Magnetic strip for E/F-Guide (absolute)	1800 (70.87)	0150-4922
MB01-ABS/BiSS-198	Magnetic strip for E/F-Guide (absolute)	1980 (77.95)	0150-4923
MB01-ABS/BiSS-219	Magnetic strip for E/F-Guide (absolute)	2190 (86.22)	0150-4924
MB01-ABS/BiSS-243	Magnetic strip for E/F-Guide (absolute)	2430 (95.67)	0150-4925

8.2.2 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 0150-3717)	0150-3652

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)

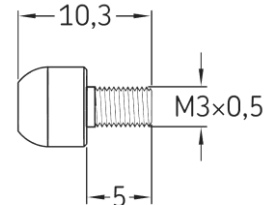
9.3 Cleaning and lubrication



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 cm³ 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 FM 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)	0150-2394
LU02-50	Lubricant for linear motors (50ml)	0150-1954
LU02-1000	Lubricant for linear motors (1000ml)	0150-1955

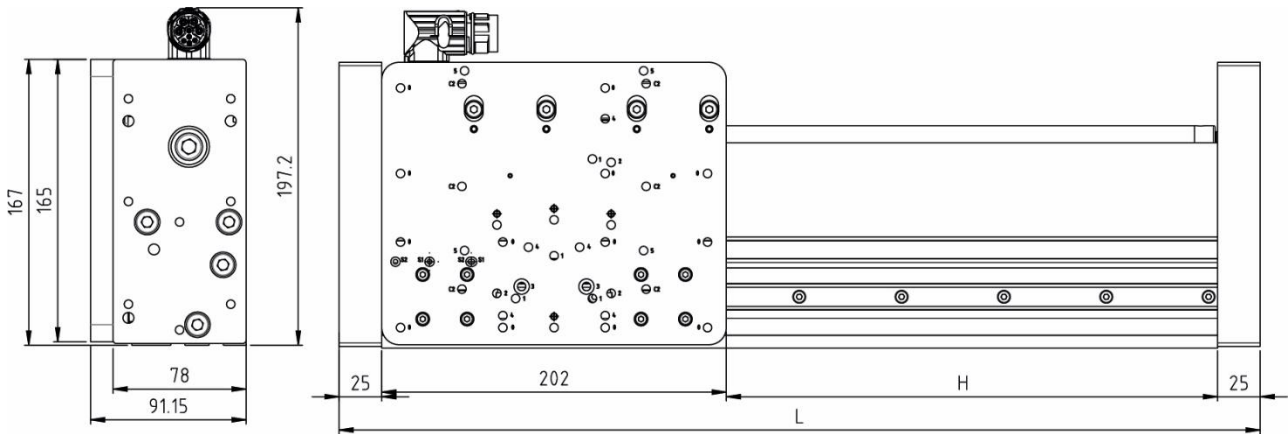
10 Storage and Transport

- 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

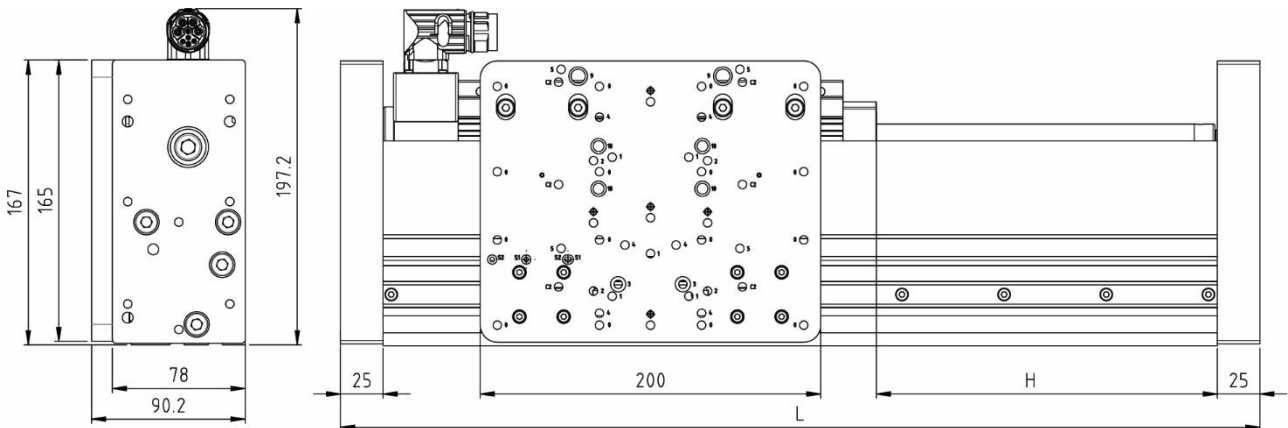
11.1 FM01-48 Module

11.1.1 FM01-48...48x150G...



Linear Module FM01-48...	Stroke H ¹ [mm (inch)]	Length L [mm (inch)]	Moving mass ¹ [g (lb)]	Total weight ¹ [g (lb)]
... 540_285_1CF48x150G-HP-BE02-MD01-C	285 (11.22)	540 (21.26)	4598 (10.14)	12267 (27.04)
... 660_405_1CF48x150G-HP-BE02-MD01-C	405 (15.94)	660 (25.98)	4598 (10.14)	13221 (29.15)
... 750_495_1CF48x150G-HP-BE02-MD01-C	495 (19.49)	750 (29.53)	4598 (10.14)	15044 (33.17)
... 840_585_1CF48x150G-HP-BE02-MD01-C	585 (23.03)	840 (33.07)	4598 (10.14)	14798 (32.62)
... 960_705_1CF48x150G-HP-BE02-MD01-C	705 (27.76)	960 (37.80)	4598 (10.14)	14494 (31.95)
... 1050_795_1CF48x150G-HP-BE02-MD01-C	795 (31.30)	1050 (41.34)	4598 (10.14)	16622 (36.65)
... 1110_855_1CF48x150G-HP-BE02-MD02-C	855 (33.66)	1110 (44.88)	4598 (10.14)	17451 (38.47)
... 1260_1005_1CF48x150G-HP-BE02-MD02-C	1005 (39.57)	1260 (49.61)	4598 (10.14)	18513 (40.81)
... 1440_1185_1CF48x150G-HP-BE02-MD02-C	1185 (45.65)	1440 (56.69)	4598 (10.14)	20051 (44.20)
... 1650_1395_1CF48x150G-HP-BE02-MD02-C	1395 (54.92)	1650 (64.96)	4598 (10.14)	21935 (48.36)
... 1860_1605_1CF48x150G-HP-BE02-MD02-C	1605 (63.19)	1860 (73.23)	4598 (10.14)	23635 (52.11)
... 2040_1785_1CF48x150G-HP-BE02-MD02-C	1785 (70.28)	2040 (80.31)	4598 (10.14)	25154 (55.46)
... 2250_1995_1CF48x150G-HP-BE02-MD02-C	1995 (78.54)	2250 (88.58)	4598 (10.14)	27050 (59.64)
... 2490_2235_1CF48x150G-HP-BE02-MD02-C	2235 (87.99)	2490 (98.03)	4598 (10.14)	29487 (65.01)

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

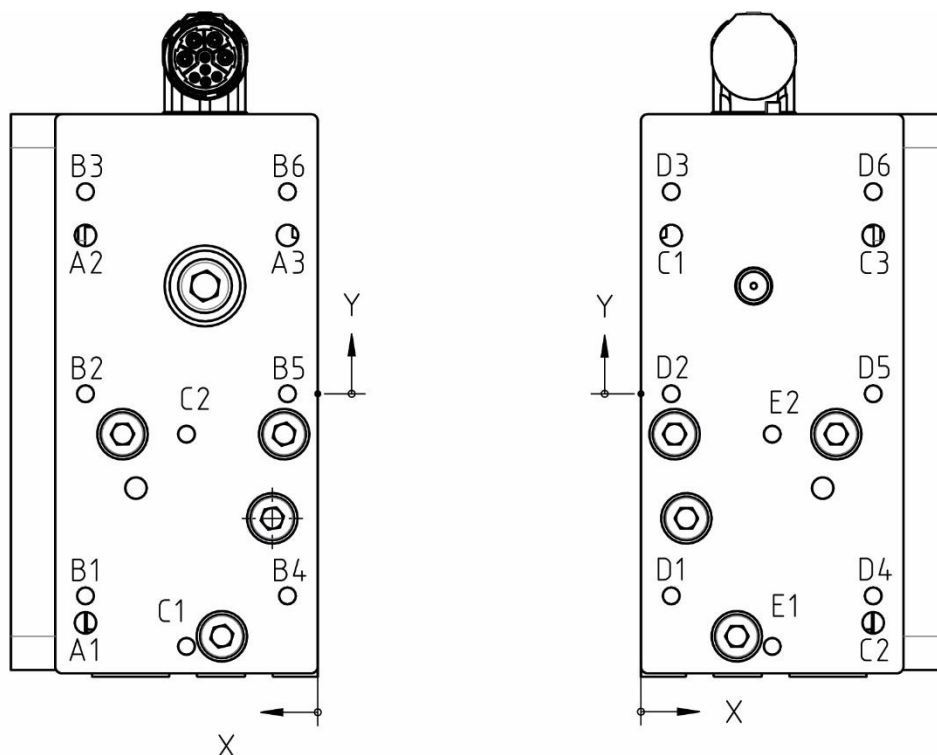
11.1.2 FM01-48...48x240F...

Linear Module FM01-48...	Stroke H ¹ [mm (inch)]	Length L [mm (inch)]	Moving mass ¹ [g (lb)]	Total weight ¹ [g (lb)]
... 540_200_1CF48x240F-HP-BE02-MD02-C	200 (7.57)	540 (21.26)	5546 (12.23)	13209 (29.12)
... 660_320_1CF48x240F-HP-BE02-MD02-C	320 (12.60)	660 (25.98)	5546 (12.23)	14164 (31.23)
... 750_410_1CF48x240F-HP-BE02-MD02-C	410 (16.14)	750 (29.53)	5546 (12.23)	15987 (35.26)
... 840_500_1CF48x240F-HP-BE02-MD02-C	500 (19.69)	840 (33.07)	5546 (12.23)	15740 (34.70)
... 960_620_1CF48x240F-HP-BE02-MD02-C	620 (24.41)	960 (37.80)	5546 (12.23)	15436 (34.03)
... 1050_710_1CF48x240F-HP-BE02-MD02-C	710 (27.95)	1050 (41.34)	5546 (12.23)	17565 (38.72)
... 1260_920_1CF48x240F-HP-BE02-MD02-C	920 (36.22)	1260 (49.61)	5546 (12.23)	19456 (42.89)
... 1440_1100_1CF48x240F-HP-BE02-MD02-C	1100 (43.31)	1440 (56.69)	5546 (12.23)	20994 (46.28)
... 1650_1310_1CF48x240F-HP-BE02-MD02-C	1310 (51.57)	1650 (64.96)	5546 (12.23)	22878 (50.44)
... 1860_1520_1CF48x240F-HP-BE02-MD02-C	1520 (59.84)	1860 (73.23)	5546 (12.23)	24578 (54.19)
... 2040_1700_1CF48x240F-HP-BE02-MD02-C	1700 (66.93)	2040 (80.31)	5546 (12.23)	26098 (57.54)
... 2250_1910_1CF48x240F-HP-BE02-MD02-C	1910 (75.20)	2250 (88.58)	5546 (12.23)	27993 (61.71)
... 2490_2150_1CF48x240F-HP-BE02-MD02-C	2150 (84.65)	2490 (98.03)	5546 (12.23)	30430 (67.09)

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

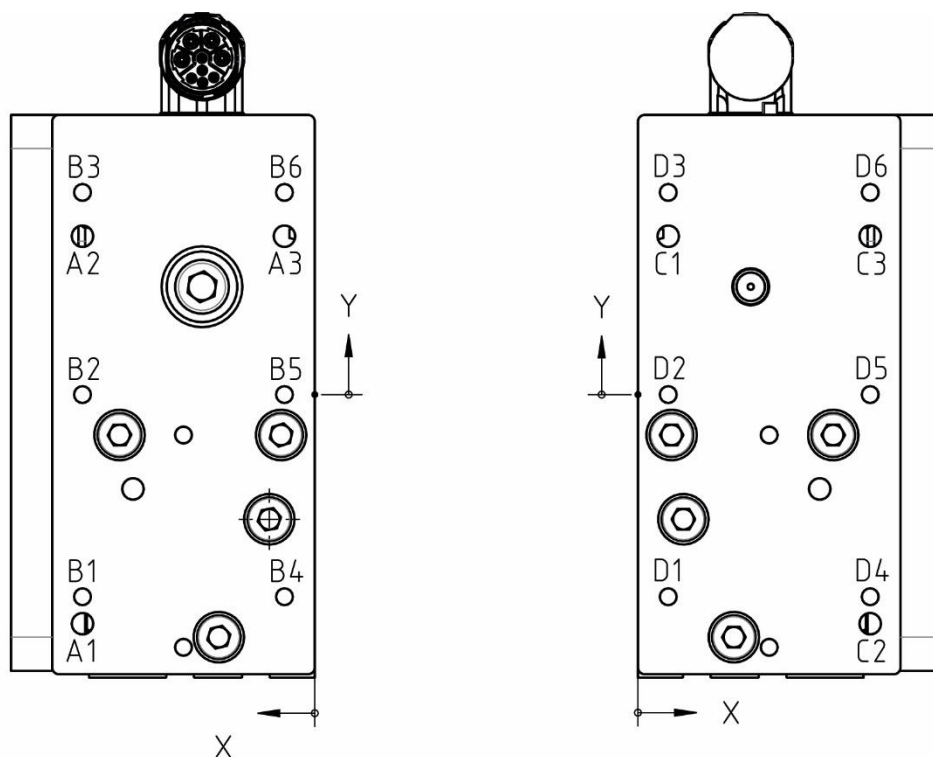
11.2 Side plates

11.2.1 FM01-48...48x150G...



	X-POS.	Y-POS.	
A1	69	-68	$\phi 6.4$ $\perp \phi 10.5 \nabla 6.4$
A2	69	47	
A3	9	47	
B1	69	-60	$\phi 5 \nabla 17$ $M6 - 6H \nabla 12$
B2	69	0	
B3	69	60	
B4	9	-60	
B5	9	0	
B6	9	60	
C1	39	-75	$+0.012$ $\phi 5 H7 \quad 0 \quad \nabla 12$
C2	39	-12	

	X-POS.	Y-POS.	
C1	9	47	$\phi 6.4$ $\perp \phi 10.5 \nabla 6.4$
C2	69	-68	
C3	69	47	
D1	9	-60	$\phi 5 \nabla 17$ $M6 - 6H \nabla 12$
D2	9	0	
D3	9	60	
D4	69	-60	
D5	69	0	
D6	69	60	
E1	39	-75	$+0.012$ $\phi 5 H7 \quad 0 \quad \nabla 12$
E2	39	-12	

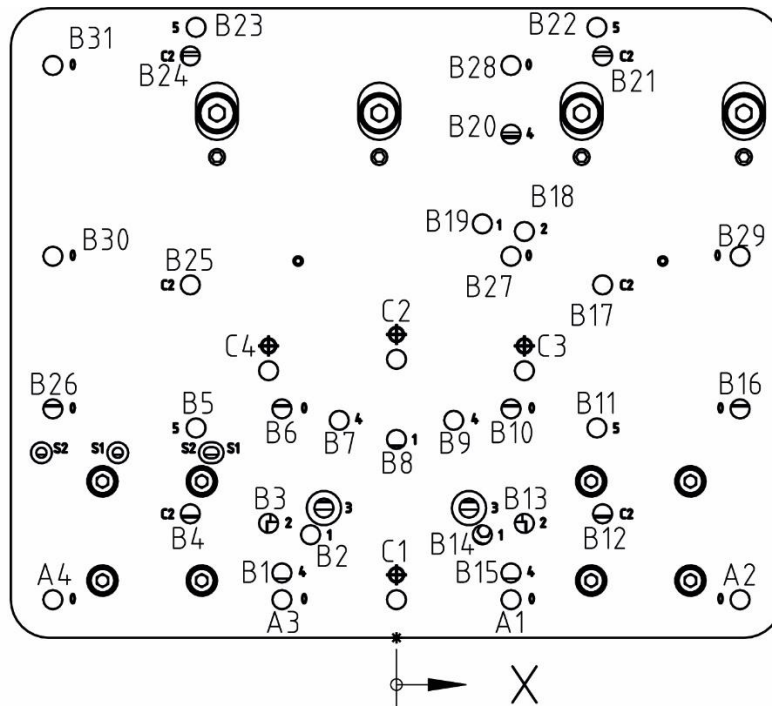
11.2.2 FM01-48...48x240F...

	X-POS.	Y-POS.	
A1	69	-68	$\phi 6.4$ $\perp \phi 10.5 \nabla 6.4$
A2	69	47	
A3	9	47	
B1	69	-60	$\phi 5 \nabla 17$ M6 - 6H $\nabla 12$
B2	69	0	
B3	69	60	
B4	9	-60	
B5	9	0	
B6	9	60	

	X-POS.	Y-POS.	
C1	9	47	$\phi 6.4$ $\perp \phi 10.5 \nabla 6.4$
C2	69	-68	
C3	69	47	
D1	9	-60	$\phi 5 \nabla 17$ M6 - 6H $\nabla 12$
D2	9	0	
D3	9	60	
D4	69	-60	
D5	69	0	
D6	69	60	

11.3 Mounting plate

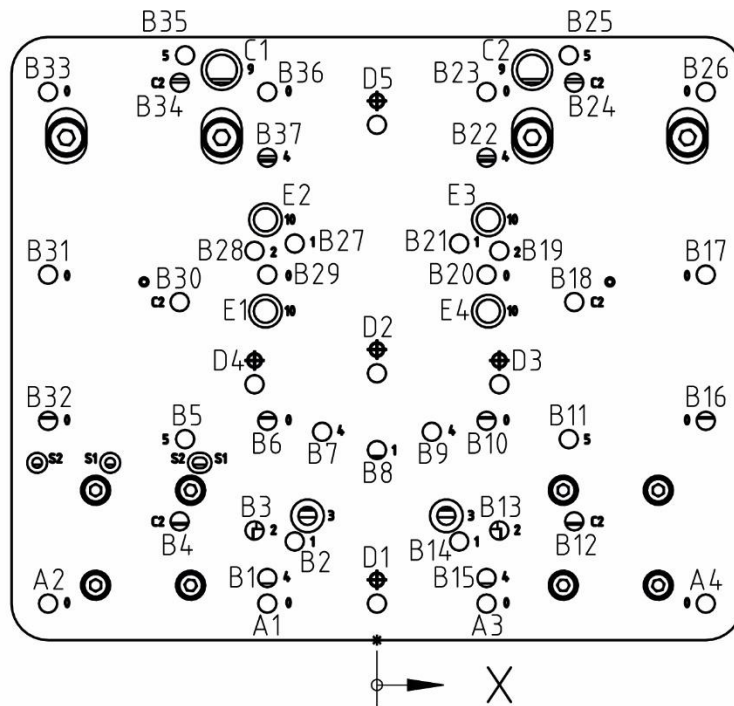
11.3.1 FM01-48...48x150G...



	X-POS.	Y-POS.	
A1	30	10	$\varnothing 5 \nabla 20$ M6 - 6H $\nabla 15$
A2	90	10	
A3	-30	10	
A4	-90	10	
B1	-30	17	$\varnothing 5$ M6 - 6H
B2	-22.50	27	
B3	-33.50	30	
B4	-54	32.50	
B5	-52.50	55	
B6	-30	60	
B7	-15	57	
B8	0	52	
B9	15	57	
B10	30	60	
B11	52.50	55	
B12	54	32.50	
B13	33.50	30	
B14	22.50	27	
B15	30	17	
B16	90	60	
B17	54	92.50	
B18	33.50	106.50	
B19	22.50	108.50	
B20	30	132	
B21	54	152.50	
B22	52.50	160	
B23	-52.50	160	

	X-POS.	Y-POS.	
B24	-54	152.50	$\varnothing 5$ M6 - 6H
B25	-54	92.50	
B26	-90	60	
B27	30	100	
B28	30	150	
B29	90	100	
B30	-90	100	
B31	-90	150	
C1	0	10	$\varnothing 5 \text{ H7 } 0^{+0.012} \nabla 12$
C2	0	73	
C3	33.50	70	
C4	-33.50	70	

11.3.2 FM01-48...48x240F...



	X-POS.	Y-POS.	
A1	-30	10	$\varnothing 5 \nabla 20$ M6 - 6H $\nabla 20$
A2	-90	10	
A3	30	10	
A4	90	10	
B1	-30	17	$\varnothing 5$ M6 - 6H
B2	-22.50	27	
B3	-33.50	30	
B4	-54	32.50	
B5	-52.50	55	
B6	-30	60	
B7	-15	57	
B8	0	52	
B9	15	57	
B10	30	60	
B11	52.50	55	
B12	54	32.50	
B13	33.50	30	
B14	22.50	27	
B15	30	17	
B16	90	60	
B17	90	100	
B18	54	92.50	
B19	33.50	106.50	
B20	30	100	
B21	22.50	108.50	
B22	30	132	
B23	30	150	

	X-POS.	Y-POS.	
B24	54	152.50	$\varnothing 5$ M6 - 6H
B25	52.50	160	
B26	90	150	
B27	-22.50	108.50	
B28	-33.50	106.50	
B29	-30	100	
B30	-54	92.50	
B31	-90	100	
B32	-90	60	
B33	-90	150	
B34	-54	152.50	
B35	-52.50	160	$\varnothing 11 \nabla 3$
B36	-30	150	
B37	-30	132	$\varnothing 5 \text{ H7 } \overset{+0}{0} \nabla 12$
C1	-42.50	156	
C2	42.50	156	
D1	0	10	
D2	0	73	
D3	33.50	70	$\varnothing 9 \nabla 2$
D4	-33.50	70	
D5	0	141	
E1	-30.50	90	
E2	-30.50	115	
E3	30.50	115	
E4	30.50	90	

12 International Certificates

Europe 	See chapter “EU Declaration of Conformity CE-Marking”
UK 	See chapter “UK Declaration of Conformity UKCA-Marking”
IECEE CB SCHEME	Ref. Certif. Nr. CH-8521



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 8957 Spreitenbach
Name and address of the manufacturer	NTI AG	Bodenackerstrasse 2 SWITZERLAND 8957 Spreitenbach
Name and address of the factory	NTI AG	Bodenackerstrasse 2 SWITZERLAND 8957 Spreitenbach
<i>Note: When more than one factory, please report on page 2</i>	☐ Additional Information on page 2	
Ratings and principal characteristics	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 PS series P04 series P05 series	
Additional information (if necessary may also be reported on page 2)	---	
A sample of product was tested and found to be in conformity with IEC	☐ Additional Information on page 2	
National differences	IEC 61000-6-2:2016 IEC 61000-6-4:2006, IEC 61000-6-4:2006/AMD1:2010 IEC 61000-6-7:2014 EU Group Differences; EU Special National Conditions; EU A-Deviations	
As shown in the Test Report Ref. No. which forms part of this Certificate	17-EL-0006.E01 + .E02 + .Z01	

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 **CF48x150-HP-BE02-MD01-C**
- Linear modules with carriage series **CF48x150-HP-BE02-MD01-C-2S**
- Linear modules with carriage series **CF48x150-HP-BE02-MD02-C**
- Linear modules with carriage series **CF48x150-HP-BE02-MD02-C-2S**
- Linear modules with carriage series **CF48x240-HP-BE02-MD01-C**
- Linear modules with carriage series **CF48x240-HP-BE02-MD01-C-2S**
- Linear modules with carriage series **CF48x240-HP-BE02-MD02-C**
- Linear modules with carriage series **CF48x240-HP-BE02-MD02-C-2S**
- Linear modules with carriage series **CF48x360-HP-BE02-MD01-C**
- Linear modules with carriage series **CF48x360-HP-BE02-MD02-C**

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®
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 **CF48x150-HP-BE02-MD01-C**
- Linear modules with carriage series **CF48x150-HP-BE02-MD01-C-2S**
- Linear modules with carriage series **CF48x150-HP-BE02-MD02-C**
- Linear modules with carriage series **CF48x150-HP-BE02-MD02-C-2S**
- Linear modules with carriage series **CF48x240-HP-BE02-MD01-C**
- Linear modules with carriage series **CF48x240-HP-BE02-MD01-C-2S**
- Linear modules with carriage series **CF48x240-HP-BE02-MD02-C**
- Linear modules with carriage series **CF48x240-HP-BE02-MD02-C-2S**
- Linear modules with carriage series **CF48x360-HP-BE02-MD01-C**
- Linear modules with carriage series **CF48x360-HP-BE02-MD02-C**

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



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