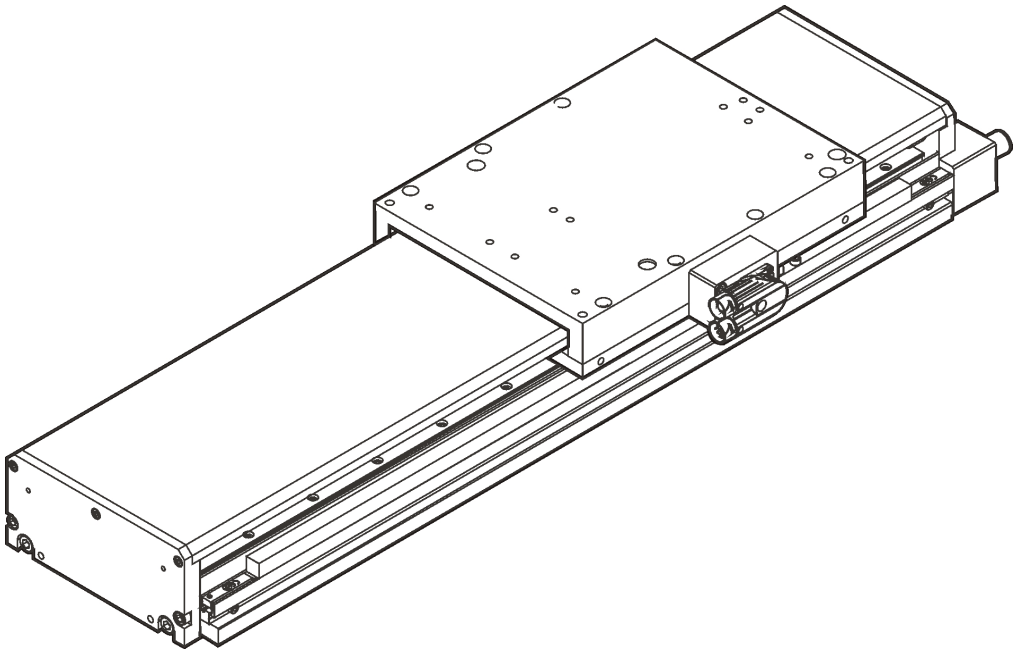
Mounting Instructions

Product name: euroLINE 170
Product-ID: 1131235



Translation (EN) of the original instructions (DE)

IEF-Werner GmbH | Wendelhofstraße 6 | DE-78120 Furtwangen | www.ief.de

Use

- The operating instructions must be available at the device at all times.
- The operating instructions are an integral part of the component/device.
- Always use the complete original (or the original translation) of these operating instructions.

Supplier & Manufacturer

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Service

Find your IEF service station on our website:

- http://www.ief.de

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Change History

Document Code	Date	Modification
MAN_EN_1131235_euroLINE170_R1a.doc	2014-09-25	New generation of this (English) document
MAN_EN_1131235_euroLINE170_R1b.doc	2014-10-15	Formal changes, standard clamping element removed
MAN_EN_1131235_euroLINE170_R1c.doc	2015-02-06	Changing lubricant into Dynalub (see section 6.2, 🗎 36). Section "Compensation of encoder" added (see section 5, 🗎 27 onwards). Section "Precautions by replacing the carriage" added (see section 6.3, 🗎 37).
MAN_EN_1131235_euroLINE170_R1d.doc	2016-01-14	Add parts in part list for standard carriage with current graphic (see chapter 8.2, 🗎 45) Add parts in part list for long carriage with current graphic (see chapter 8.3, 🗎 49)
MAN_EN_1131235_euroLINE170_R1e.doc	2016-01-27	Exchange of Guide carriage with accuracy class P in standard and long carriage positon 60 (see chapter 8.2, 🗎 45 and 8.3, 🗎 49)
MAN_EN_1131235_euroLINE170_R1f.doc	2019-08-29	Technical data as well as parts list and drawings changed.
MAN_EN_1131235_euroLINE170_R1g.doc	2019-08-29	Parts lists and drawing updated referring to slides 1308694 and 1308694.
MAN_EN_1131235_euroLINE170_R1h.doc	2021-11-18	Supplemented the attachment of the danger sticker "Prohibition pacemaker"
MAN_EN_1131235_euroLINE170_R1i.doc	2024-02-13	Type plate and technical data "400V VDC" changed to "400 VAC"

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We are always grateful for suggestions for improvements and information about errors.

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1 Declaration of Incorporation

EC declaration of incorporation in the sense of the EC directive 2006/42/EC (machinery), Annex II B

The manufacturer:
IEF-Werner GmbH
Wendelhofstraße 6
78120 Furtwangen - Germany

hereby declares that the following products (the incomplete machine/device):

Designation	IEF-Werner parts group number
euroLINE 170	TG1002431

where possible based on the scope of delivery, corresponds to the following basic requirements of the directive on Machinery (2006/42/EC):
Annex I, item: 1.1.2; 1.1.3; 1.1.5; 1.3.2; 1.3.4; 1.5.1; 1.7.3; 1.7.4.

The incomplete machine also corresponds to the following further directives:

- Directive 2014/30/EU of the European parliament and of the council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility
- Directive 2014/35/EU of the European parliament and of the council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.

The technical documents were generated according to Annex VII part B and may be electronically submitted to the national authorities upon justified request.
List of some applied harmonised standards:

- DIN EN ISO 12100-1,-2 / DIN EN ISO 13857 / DIN EN ISO 13850 / DIN EN 60204-1

Commissioning of the incomplete machine delivered by us is not permitted until it has been determined that the overall system into which the incomplete machine is installed meets the basic safety and health protection requirements according to Annex I of the above EC directive 2006/42/EC.

Name and address of the documentation officer: IEF-Werner GmbH, Furtwangen

Furtwangen, August 2019

Stefan Deck (managing director)

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2 Safety

2.1 Definition of Warning Notes

⚠ DANGER

Indicates danger.

Non-observance of the safety provisions causes death.

⚠ WARNING

Indicates potential danger.

Non-observance of the safety provisions may cause death or severe injury.

⚠ CAUTION

Indicates potential danger.

Non-observance of the safety provisions may cause injury.

NOTE

Indicates potential danger. Non-observance of the safety provisions may cause property damage.

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2.2 General Warning Notes

The linear unit euroLINE 170 must only be commissioned by specialists who have received safety-technical instruction and are able to assess potential dangers. Furthermore, all chapters of these operating instructions must have been read and understood completely.

⚠ WARNING

Warning of dangerous electrical voltage.

The system must be powered down for all assembly, disassembly or repair work. Non-observance of the safety provisions may cause death.

⚠ WARNING

Linear modules must only be operated with their protective device/s.

Linear modules always have to be operated in connection with suitable safety devices (e.g., safety cell, protective room, protective housing, light curtain).

⚠ CAUTION

Do not remove plugs or clamps when live.

Motor connectors or clamps must not be inserted or disconnected when live. Risk of burning of the contacts and risk of flying sparks.

⚠ CAUTION

Warning of hot surface.

During operation, the heated drive may cause skin burns when touched. Install a protective device, if possible! Do not touch the marked areas or wait for an adequate cooling time.

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2.3 Special Hazard Warnings

In addition, this operating instructions also contains the following special hazard warnings:

⚠ DANGER

Danger to persons with pacers.

There are considerable dangers for persons with pacers or other electronic implants. Strong magnetic fields may impair implants, which may influence the pulse of wearers of pacers in extreme cases. Persons with the above impairments must not stay close to the component.
The supplied danger stickers "Prohibit pacemakers" must be attached to the installed component by the operator in such a way that they are not covered and are clearly visible.

⚠ DANGER

Warning of electric shock.

The linear unit euroLINE 170 with motor and encoder connections is live. You may suffer fatal electric shock when touching a component.

⚠ WARNING

Warning of shearing off of limbs.

These points of the components pose the danger of shearing off of limbs in operation.

⚠ WARNING

Warning of crushing of limbs.

These points of the components pose the danger of crushing of limbs in operation.

NOTE

There are strong permanent magnets in the basic body that may damage magnetic data carriers (e.g. credit cards).

NOTE

The linear unit euroLINE 170 must not be used in the proximity of magnetic dusts and small parts!

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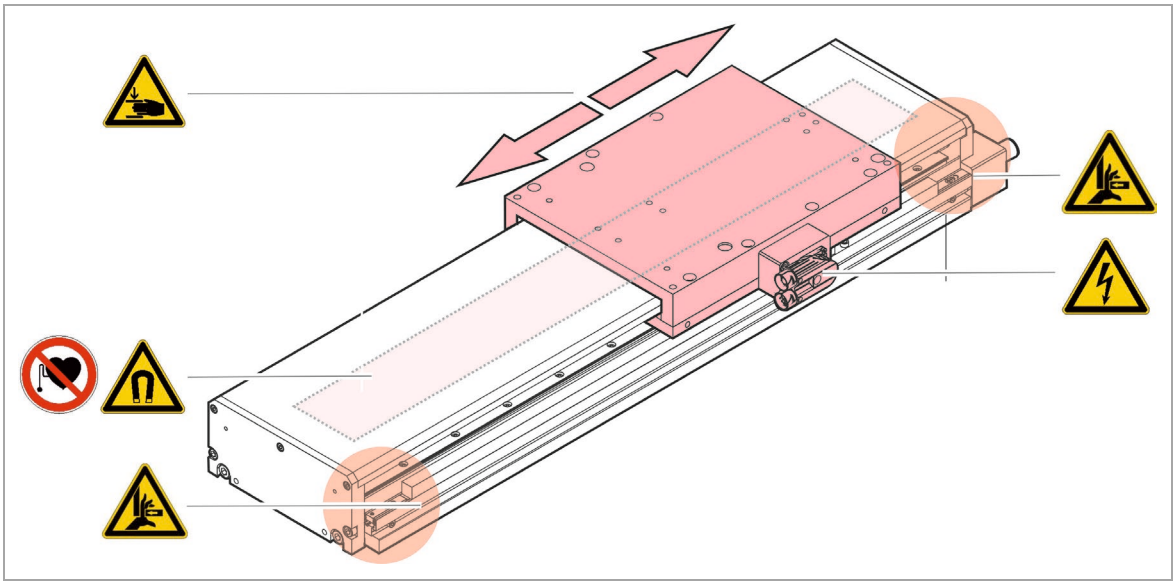

Figure 1 Dangers at the euroLINE 170

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3 Intended Use

The linear unit euroLINE 170 is a precise, linear adjustment unit with an iron-applied linear motor that is used in the commercial area as an attachment part in connection with other components. In combination with many standardised assembly elements, as well as the other linear units of IEF-Werner GmbH, it can be used to build complex multi-axis positioning systems as well.

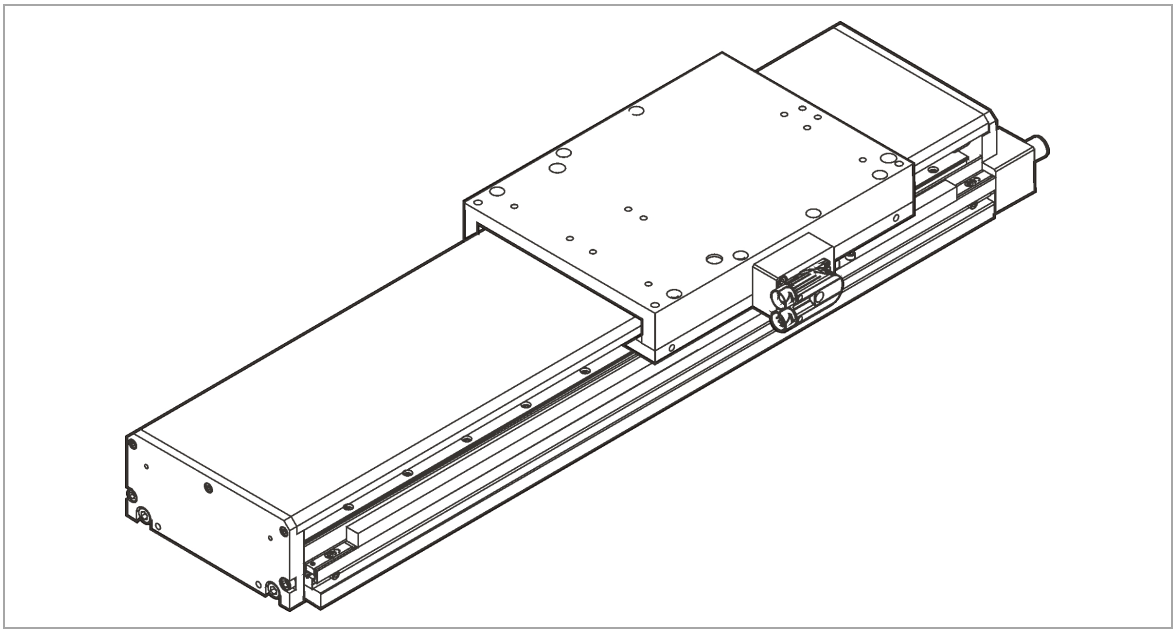

Figure 2 Linear unit euroLINE 170

Areas of use of the euroLINE 170 include:

- Component insertion systems
- Handling of small parts
- Loading and unloading stations
- Measuring and test technology
- etc.

3.1 Reasonably Foreseeable Misuse

The linear unit euroLINE 170 is not to be used for certain applications such as the transport of persons and animals or as a pressing/bending device for cold working of metal.

Use of the linear unit without additional measures is also not possible in special fields of application, such as the chemical or food industry or in explosive atmospheres.

In case of doubt, consult the manufacturer.

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4 Assembly Instructions

⚠ DANGER

Danger to persons with pacers.

There are considerable dangers for persons with pacers or other electronic implants. Strong magnetic fields may impair implants, which may influence the pulse of wearers of pacers in extreme cases. Persons with the above impairments must not stay close to the component.
The supplied danger stickers "Prohibit pacemakers" must be attached to the installed component by the operator in such a way that they are not covered and are clearly visible.

4.1 Installation Position

The linear unit euroLINE 170 is only intended for horizontal use. The carriage movement must be horizontal. Vertical use is not intended.

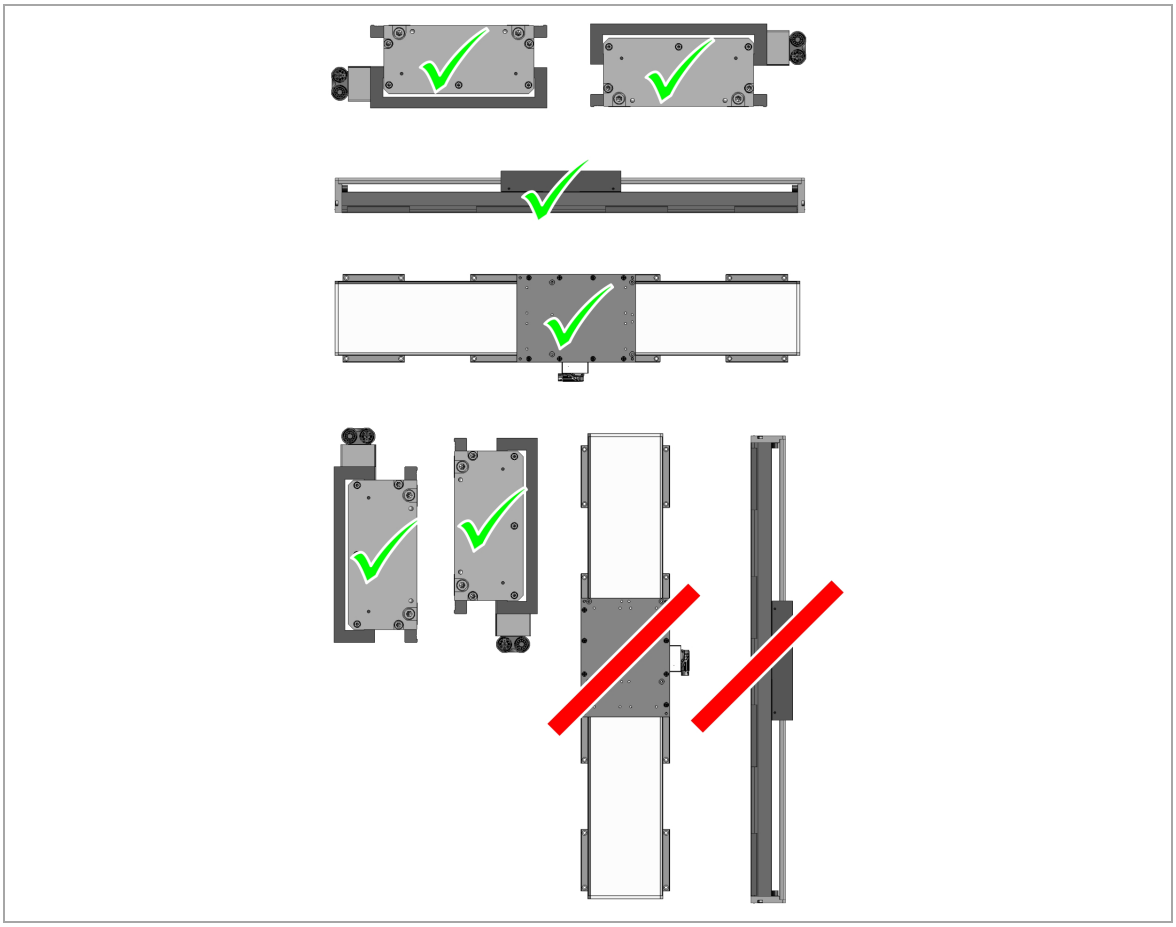

Figure 3 Linear unit euroLINE 170 horizontal use

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4.2 Transverse Installation

For cross installation of the linear units euroLINE 170, there are clamping elements in standard lengths (centering ring, clamping elements).

Many axle combinations can be implemented.

Examples:

- Multiple axle carriage systems
- X/Y system
- X/Y portal system

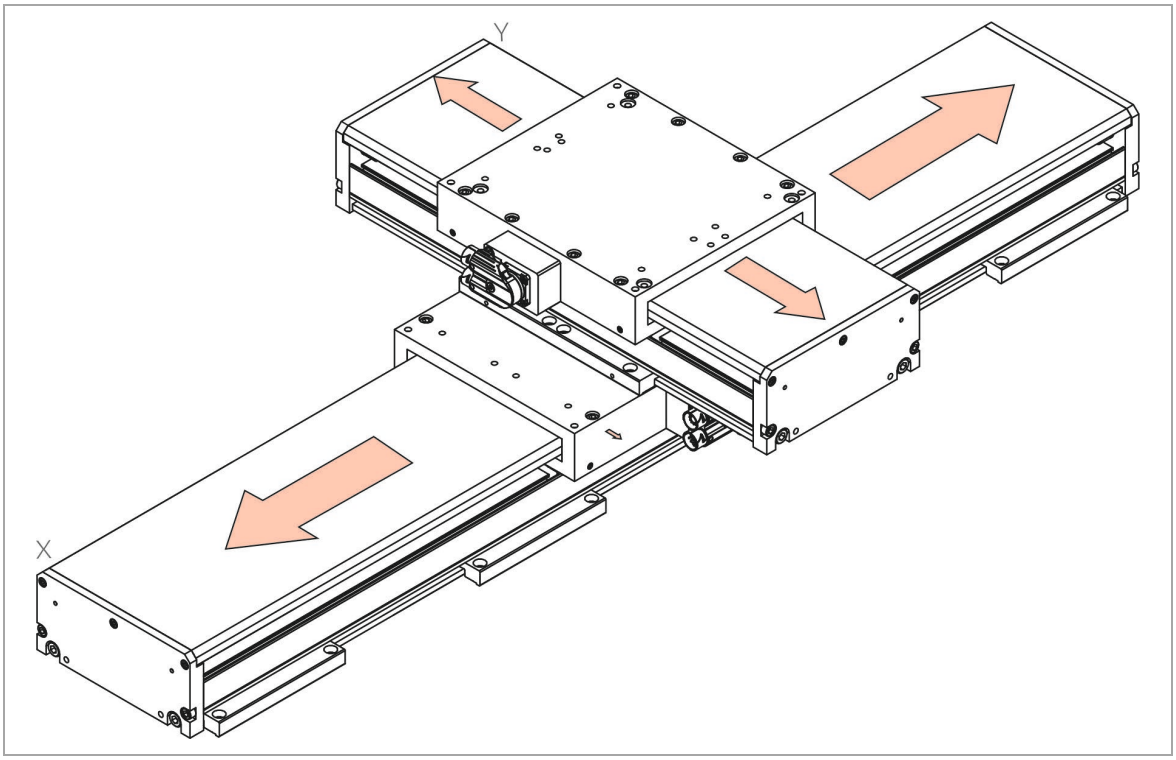

Figure 4 X/Y system

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4.3 Attachment

The euroLINE 170 can be attached to the basic body with clamping elements or to the carriage via the 2 x 8 M6-threaded bores (see Figure 5).

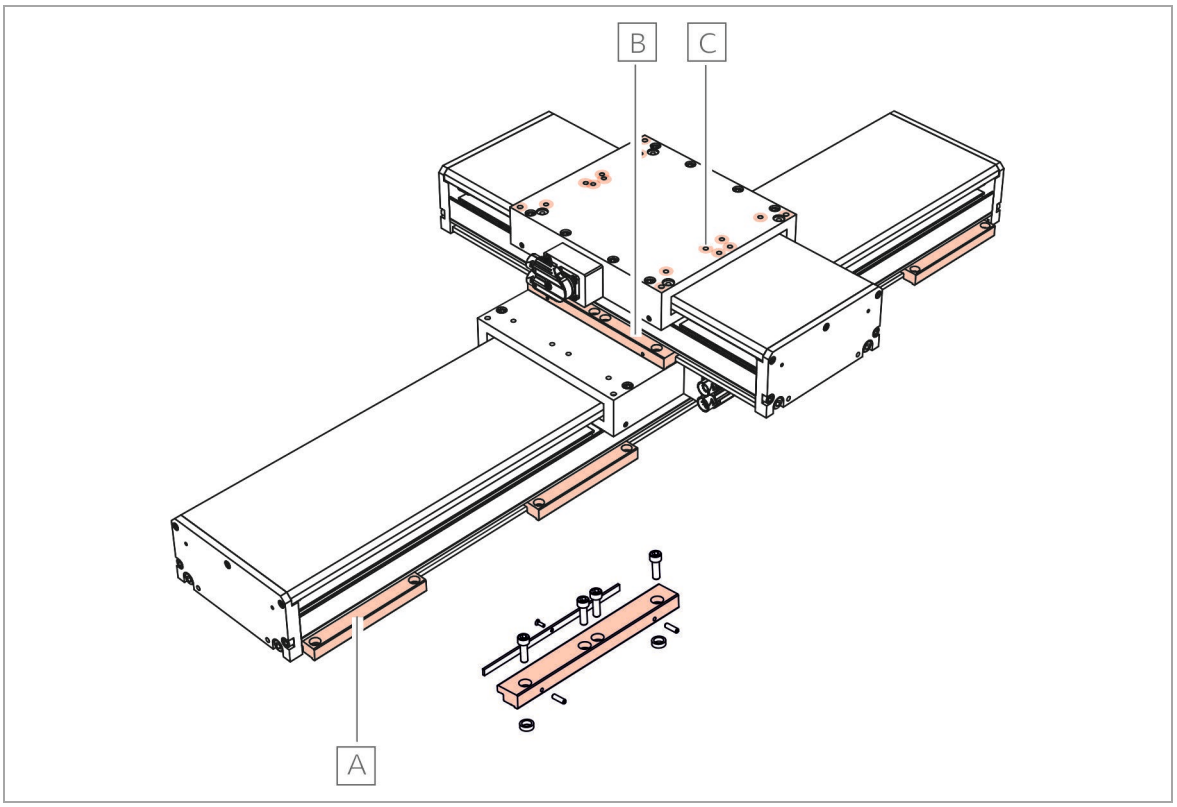

Figure 5 Attachment to the basic body with the help of clamping elements

A Type 140 clamping element

B Clamping element with supply (for cross installation)

C M6 threaded bores, 2 x 8 (also see Figure 6 and Figure 7, 18)

The installation area has to be a flat surface. Any deviations from an ideal flat plane directly affect the processing precision.

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4.3.1 Installation of Actuators

The actuators (cylinders, pick-up modules, etc.) that are to be installed on the euroLINE 170 linear unit can be attached via the drilling pattern on the carriage.

The corresponding drilling templates are available for the two possible carriage sizes.

The position tolerance of the centering bores 12^{H7} is specified at ± 0.01 mm.

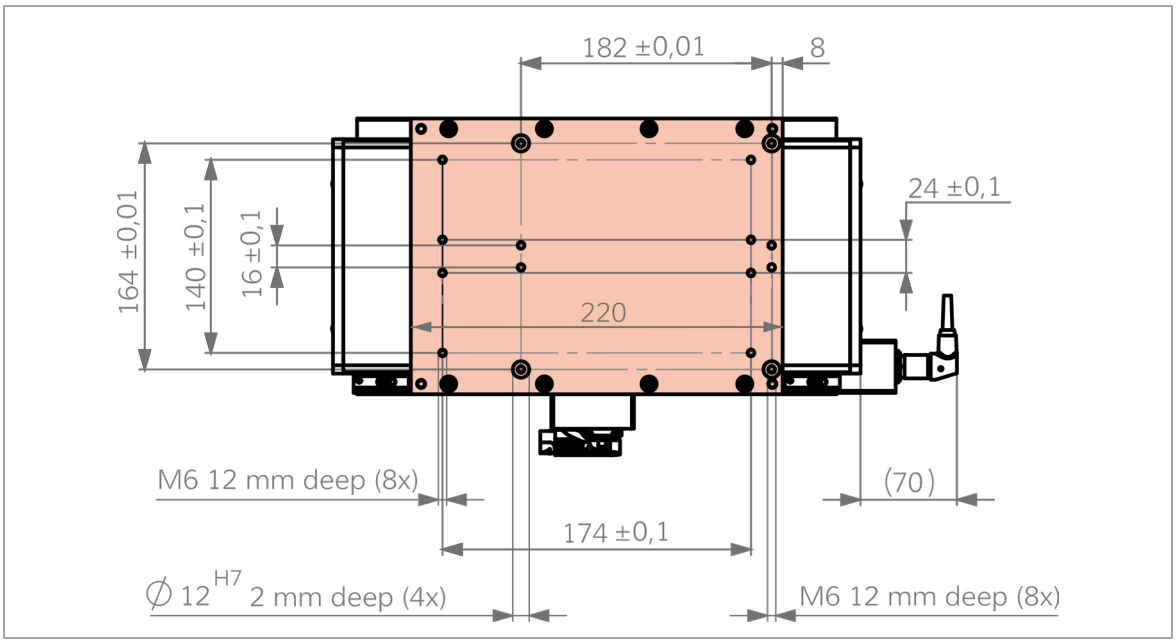

Figure 6 euroLINE 170, standard carriage, length 220 mm

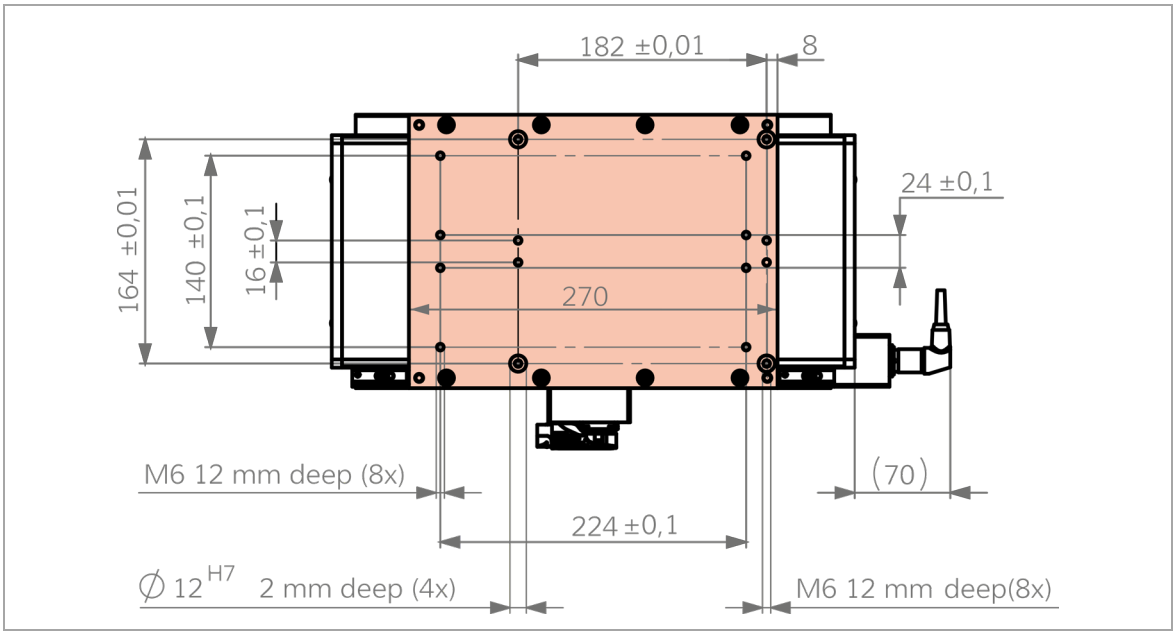

Figure 7 euroLINE 170, long carriage, length 270 mm

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4.4 Wiring

There are a motor plug and an encoder plug at the terminal box:

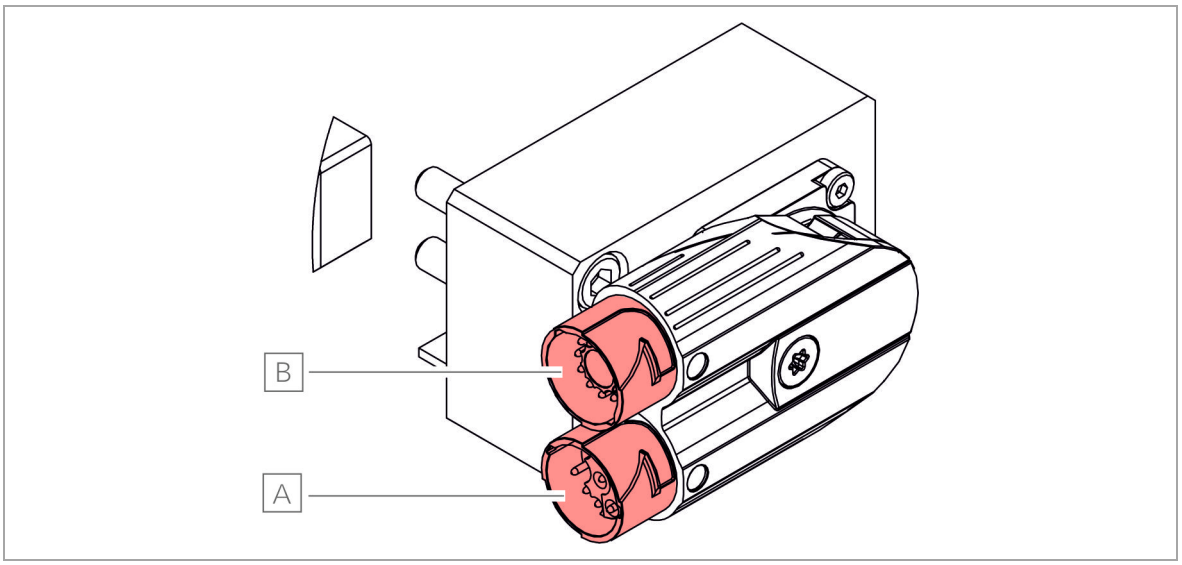

Figure 8 Motor plug and encoder plug

A Motor plug B Encoder plug

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4.4.1 Motor Cable

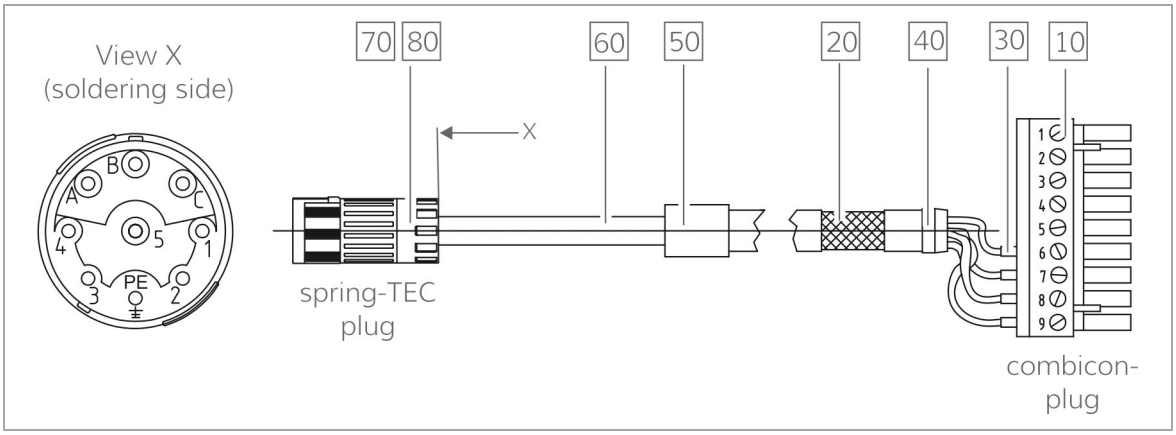

Figure 9 Motor cable with spring-TEC- and combicon plug

Parts list for motor cable with spring-TEC plug (item no.: 1119851).

Drawing item	Article no.	Designation
10	1068946	Plug-in unit, type: PC5/9-ST1-7.62
20	733086	Copper adhesive type, conductive 0.09 x 19 mm
30	726875	Wire-end sleeve, yellow, type 1.0/8 yellow
40	730076	Shrink hose, black, CGPT 12.7/6.4-0
50	1017996	Cable marker, type: KMT-07323V-9
60	730790	Motor line 5 x 1.00 mm² shielded
70	1113957	Plug 915, press-on sleeve orange 9-pin, type: ESTA202NN00320500000
80	1113999	Contact sleeve Ø 1 mm, crimp area 0.5 – 1.5 mm², type : 60.251.11

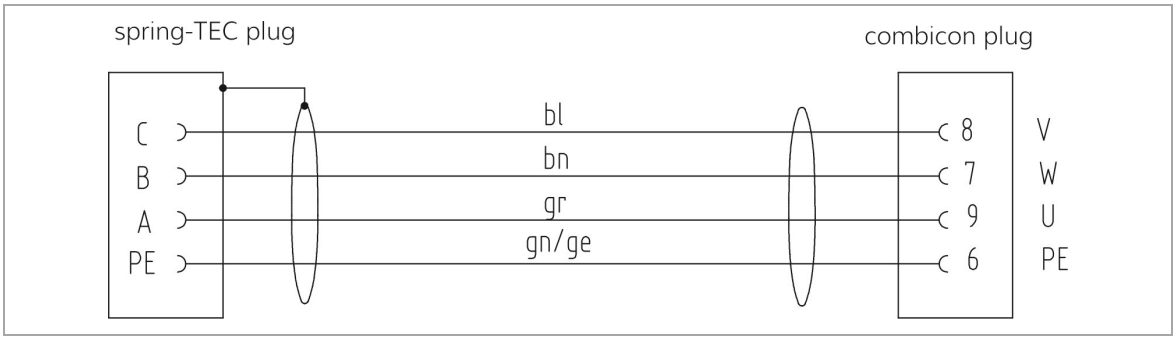

Figure 10 Motor cable connections

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4.4.2 Encoder Cable

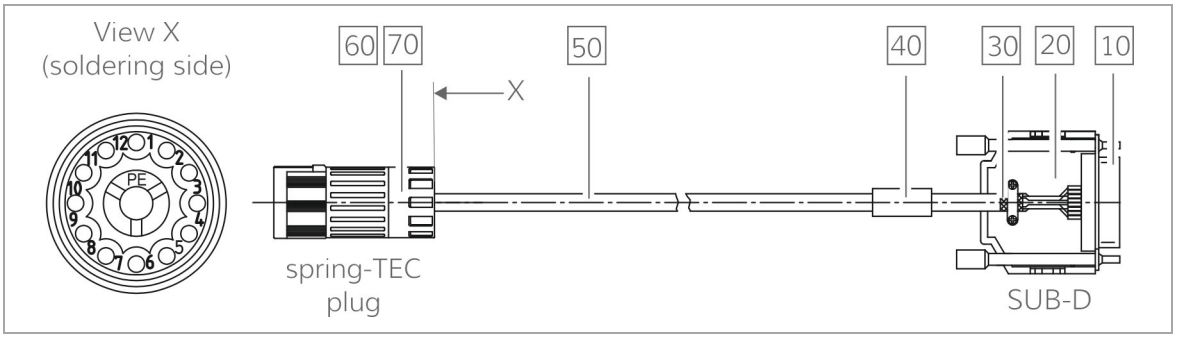

Figure 11 Encoder cable with spring-TEC- and SUB-D plug

Parts list for encoder cable (EnDAT) with spring-TEC plug (item no.: 1119854).

Drawing item	Article no.	Designation
10	725692	Pin strip Sub-D-15 solder cup
20	731798	Housing Sub-D-15 metallised
30	733964	Copper adhesive type, conductive 0.09 x 9 type: 1181
40	1017996	Cable marker, type: KMT-07323V-9
50	1023746	Cable EnDat 7 x 2 x 0.25 mm², C-UL orange, type: servoTEC
60	1113994	Plug 615, press-on sleeve green; 12-pin, type: ESTA002NN00320001000
70	1114000	Contact sleeve Ø 1mm, crimp area 0.5 – 0.75 mm², type : 60.252.11

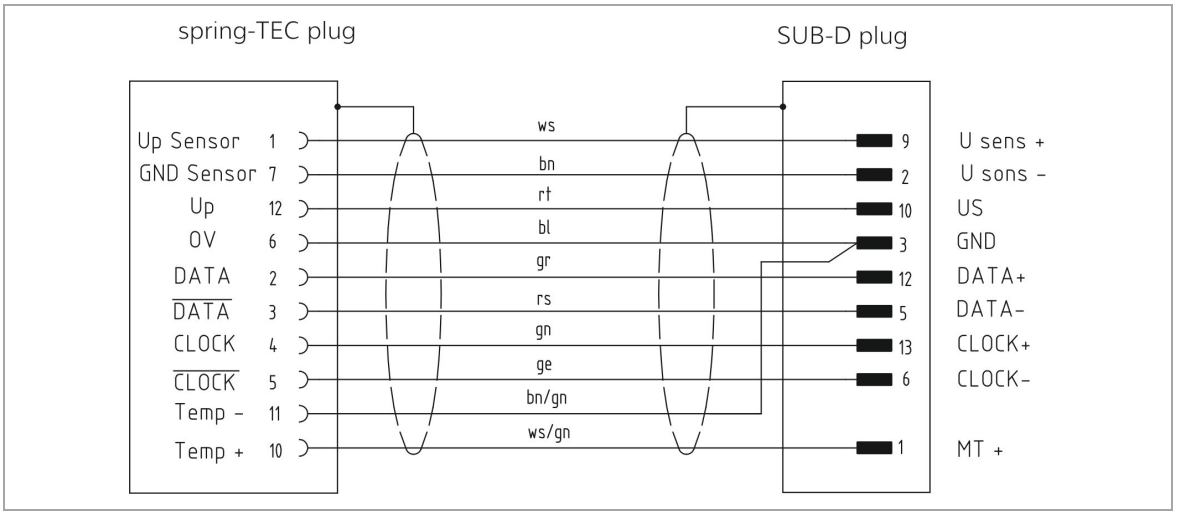

Figure 12 Connections encoder cable

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4.4.3 Cable Routing

For all moving cables, suitable cable routing has to be used to effectively prevent cable breaks. The minimum radius r_{min} for cable routing chains is calculated for IEF-Werner cables according to the following formula:

$$r_{min} \geq 10 \times \text{cable diameter}$$

When different cables are used, EN 60204 must be observed. In addition, it must be ensured that a space reserve of 30% is kept free within the routing chains. A strain relief for the cables has to be attached at the outlet of the cable routing chain.

We recommend purchasing genuine cables and energy chains from IEF-Werner GmbH. Please contact us. We will gladly advise you.

4.4.4 Measuring System

Absolute measuring system EnDAT 2.2 (Heidenhain)

4.4.5 Temperature Sensor

PTC thermistor with the following characteristics:

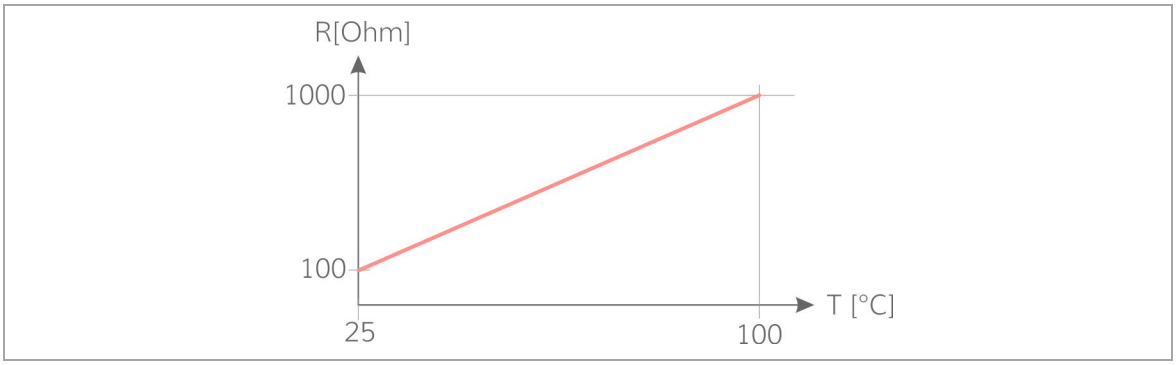

Figure 13 Chart PTC

The resistance increases roughly linear with the temperature.

4.4.6 Installation Situation Measuring System

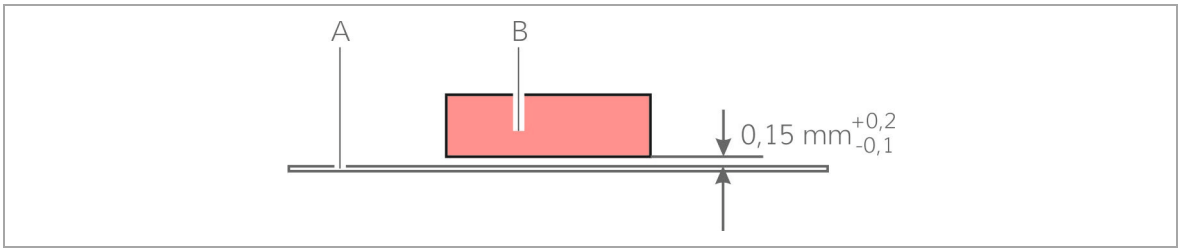

Figure 14 Distance measuring tape to measuring head

A Measuring tape B Measuring head

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4.5 Technical Data

4.5.1 Tightening Torques for Screw Connection [Nm]

Strength class	M2.5	M3	M4	M5	M6	M8
8.8	0.5	1.28	2.7	5.5	9.5	23
10.9	0.8	1.8	3.8	8	13	32
12.9	1.0	2.1	4.6	9.5	16	39

4.5.2 Technical Data of the Linear Unit euroLINE 170

		Carriage type (carriage length)							
Designation	Unit	Type standard carriage 220 mm				Type long carriage 270 mm			
Length	[mm]	383	479	575	...3935	383	479	575	...3935
Stroke down	[mm]	107	203	299	...3659	57	153	249	...3609
Stroke graduation	[mm]	96							
Max. speed	[m/s]	5				3.5			
Rated feed force	[N]	300				400			
Peak force	[N]	600				800			
Pole separation	[mm]	24							
Basic weight basic body	[kg]	6.7							
Weight basic body per 96 mm	[kg]	1.62							
Weight carriage	[kg]	6.50				7.70			
Measuring tape (floating, fastened)		visual, steel							
Rated current (at ambient temperature of 20 °)	[A]	6.45				4.30			
Peak current	[A]	15				10			
Magnetic tightening force	[N]	1325				1700			
Max. voltage (phase-phase)	[V/AC]	400							
Connections rotating		Y-TEC							
Measuring system absolute		EnDAT 2.2							
Resolution measuring system, nominal	[µm]	0.001							
Hopper lubrication nipple per guide carriage		1							
Coil max. operating temperature	[° C]	110				110			

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4.5.3 Type plate

The type plates are attached in the following positions (carriage, basic body):

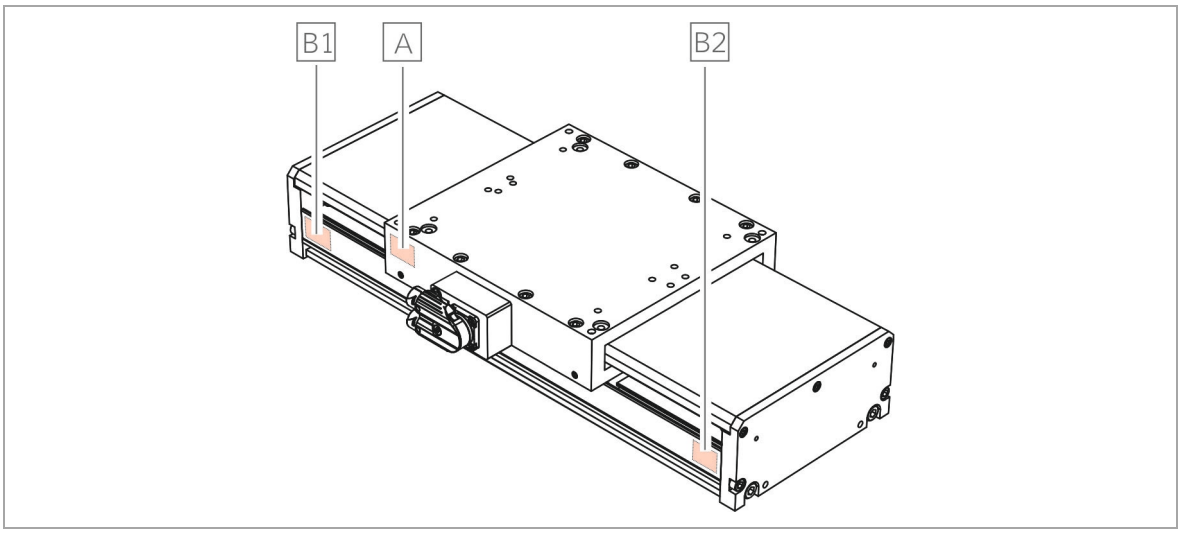

Figure 15 Positions of the type plates

A Type plate at the carriage

B Type plate at the basic body (B1 or B2)

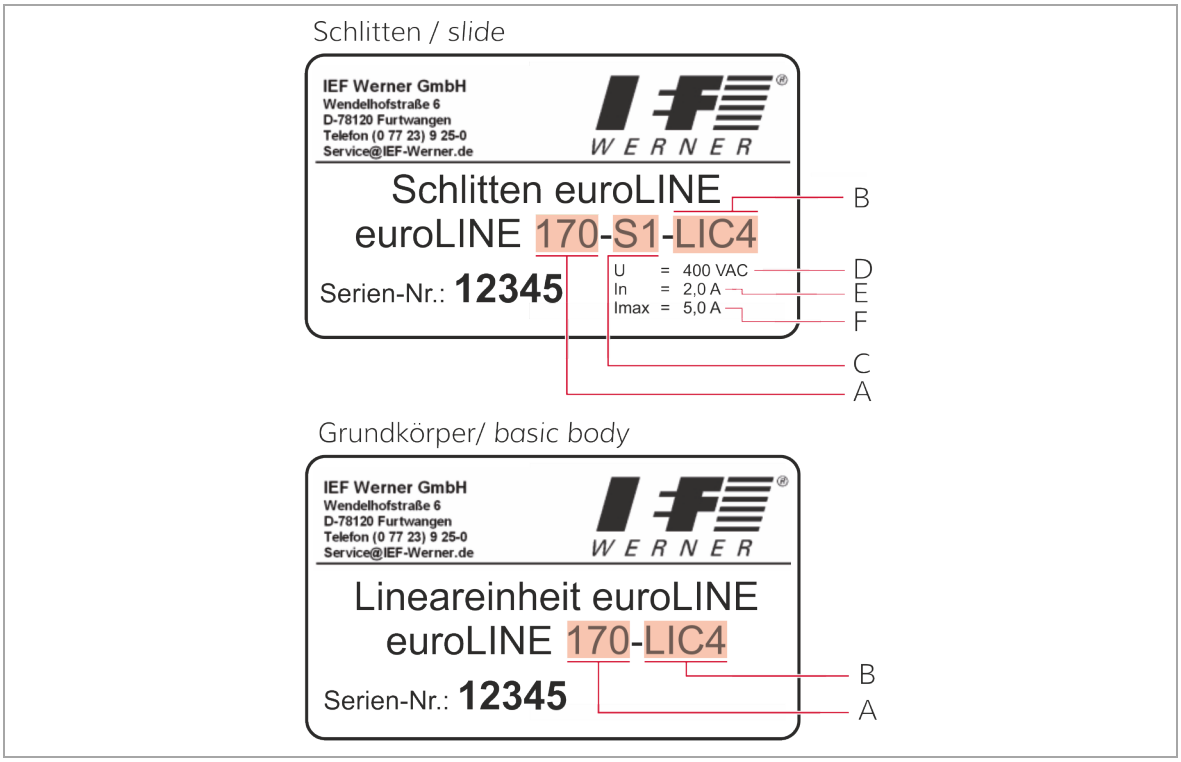

Figure 16 Type Plates

A Size 170

B Type measuring system

C Coil type: S1=Standard-, S2=Long carriage

D Supply voltage servo amplifier (U)

E Rated current (I_N)

F Peak current (I_{max})

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4.5.4 Load Information

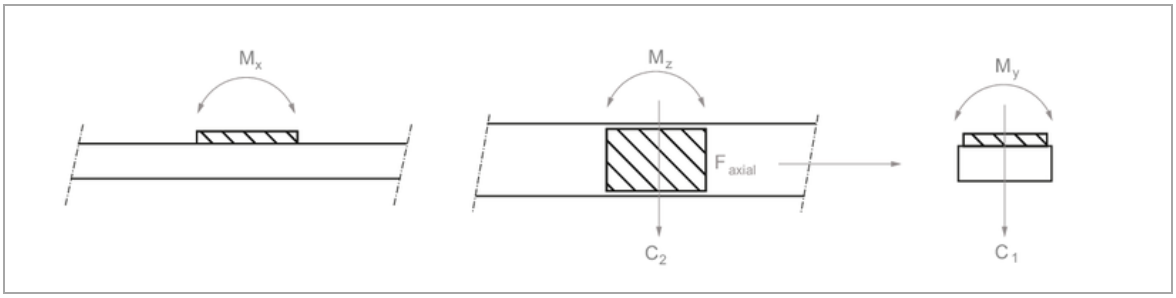

Figure 17 Torques

Parameter	Short carriage	Long carriage
Max. torque Mx (theoretic)	250 Nm	280 Nm
Max. torque My	200 Nm	200 Nm
Max. torque Mz	280 Nm	280 Nm

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5 Compensation of encoder

If you install the first time a carriage with integrated measuring head and with a measuring tape, which is applied on the basic body, it should be done a so-called compensation of encoder.

For this purpose the software "S2-Commander" has to be installed on your PC and the PC has to be connected via an interface with the servo amplifier.

5.1 Define angle encoder

Proceed as follows, to load the motor specific parameter setting inside the measuring head (encoder):

(1) Choose the icon „Encoder " ( ) in the icon line of the S2 Commander.

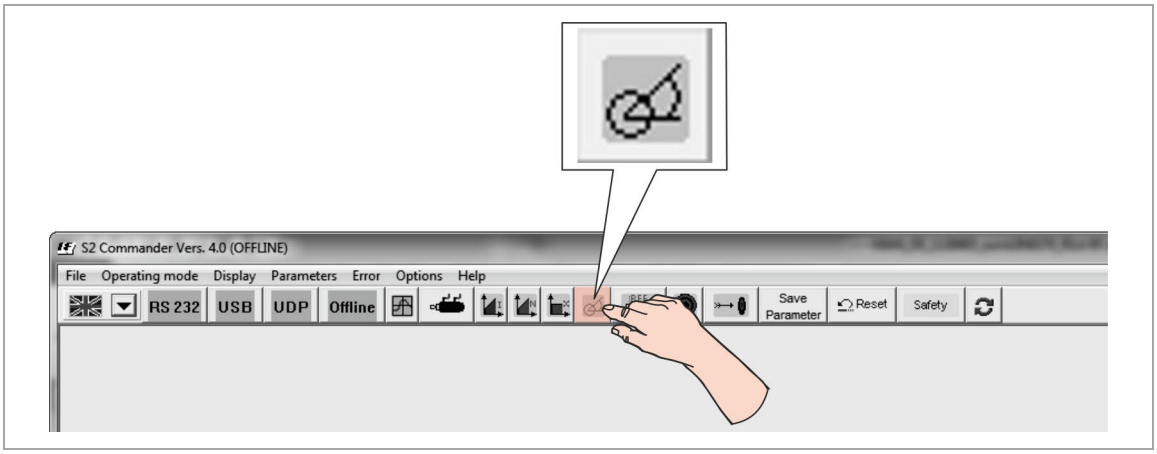

Figure 18 Select "Encoder" icon

(2) Select the button "Auto detect" ( ).
Note: The controller release must be switched off!

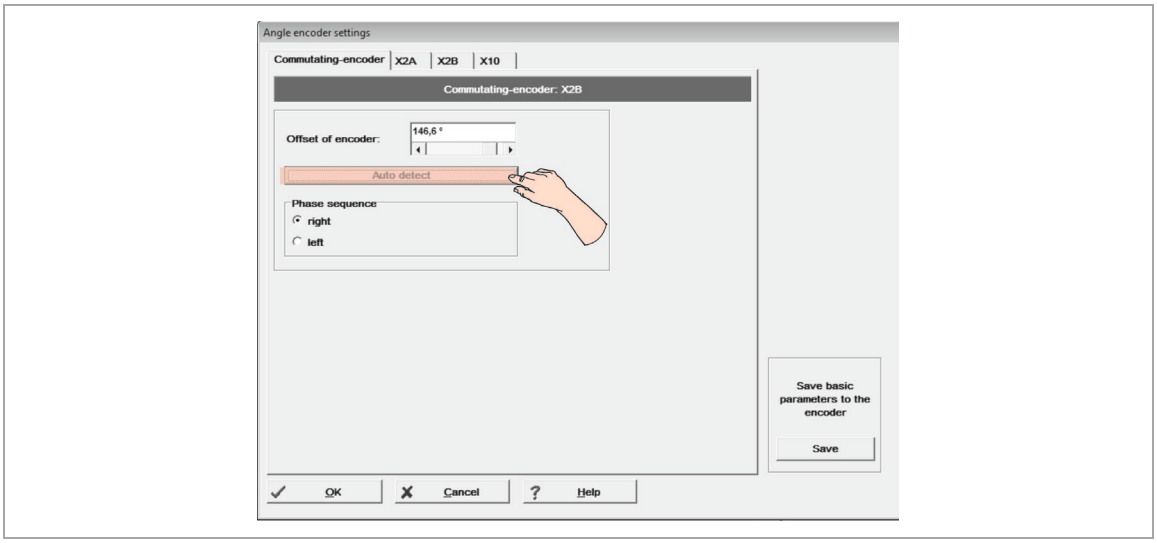

Figure 19 Select button "Auto detect"

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(3) Select the button "OK " in *Motor identification* window.
Note: The motor shaft must turn freely!

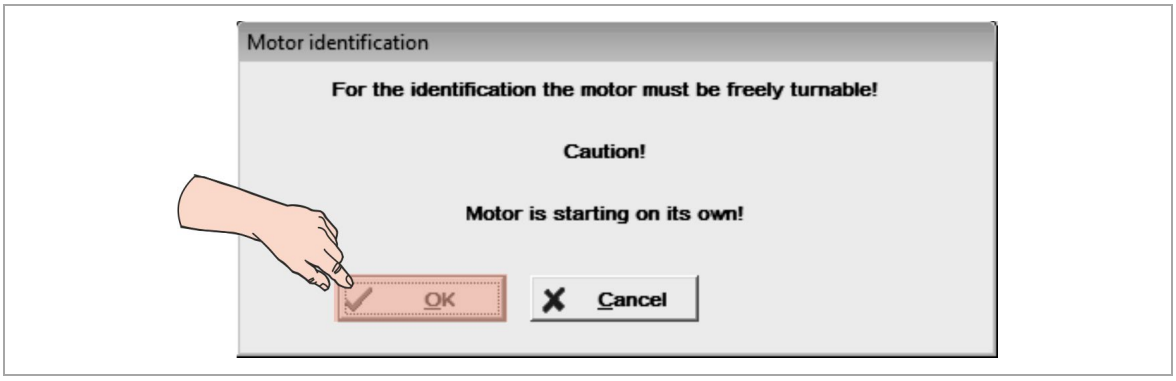

Figure 20 Select button "OK"

The axis starts moving.
The commutation (the automatically determination of the transducer angle) is running.

After successful commutation the following window will be displayed:

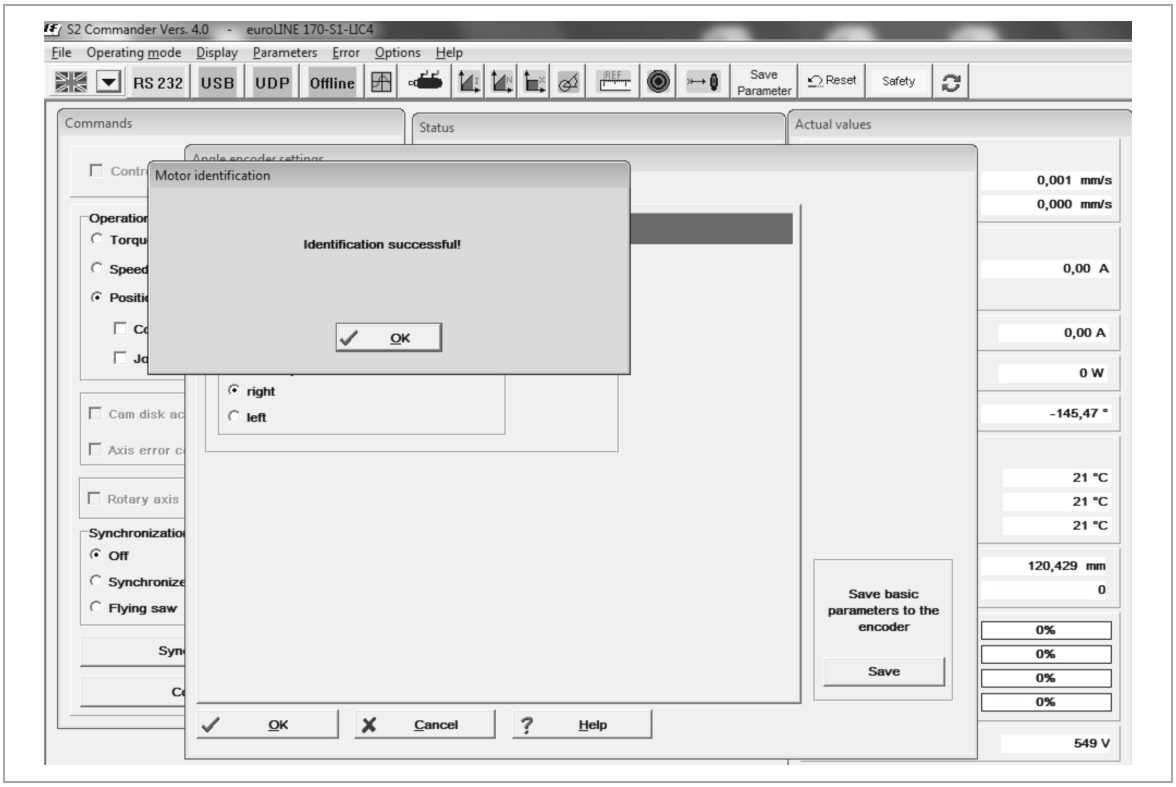

Figure 21 Displaying "Identification successful!"

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(4) Select the button "OK" in the *Motor identification* window (Identification successful!)

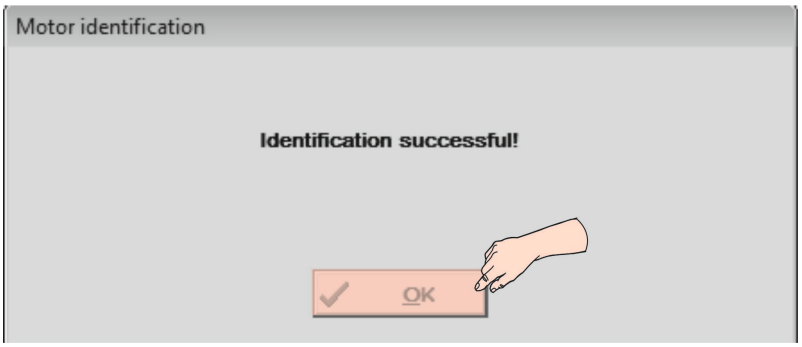

Figure 22 Select button "OK"

(5) Select the button "Save" in the *Angle encoder settings* window.

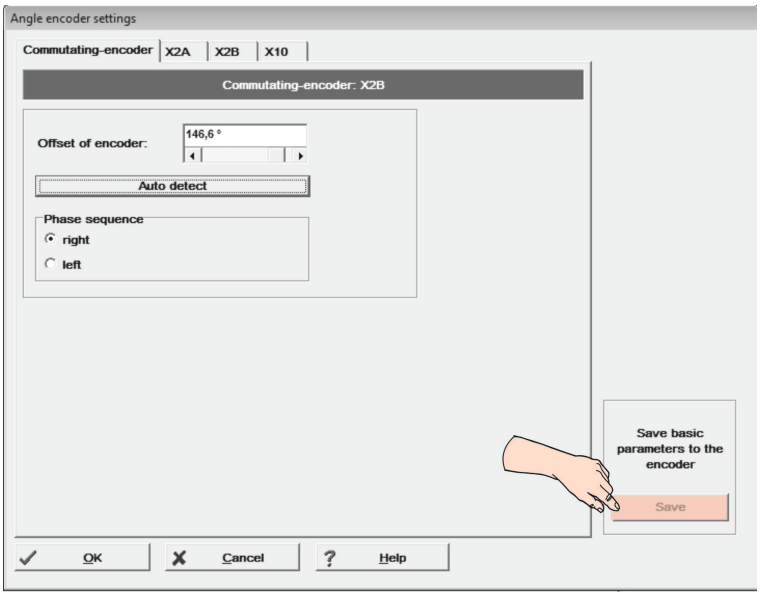

Figure 23 Select button "Save"

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(6) Select the "OK" button in the *Save to encoder* window.
Note: The power amplifier must be switched off!

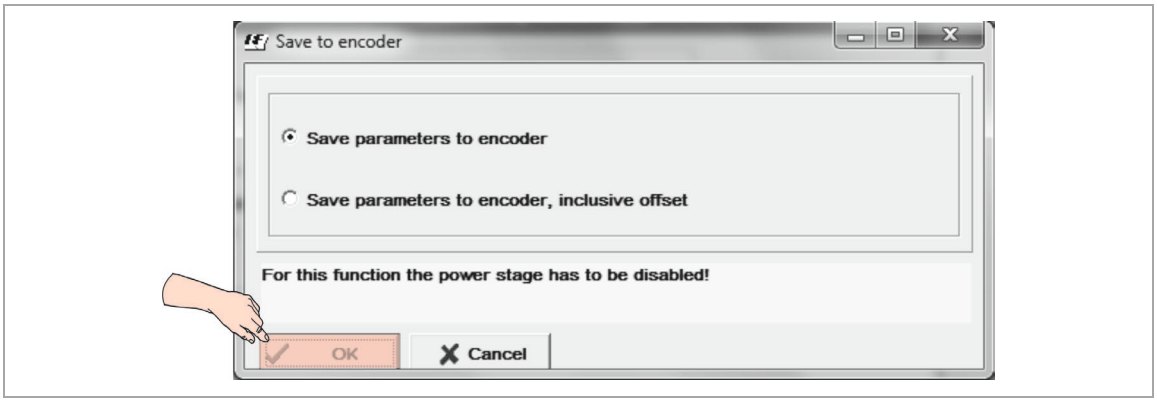

Figure 24 Select button "OK"

The saving-process is displayed in an information window.

(7) Select the "OK" button in the *Information* window to confirm that the parameters have been saved.

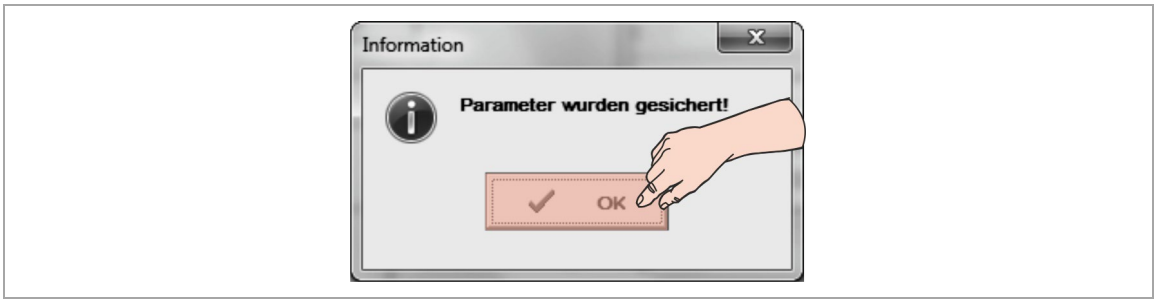

Figure 25 Select button "OK"

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5.2 Carry out homing run

(1) Select the icon „REF" (homing position) in the symbol line of the S2 Commander.

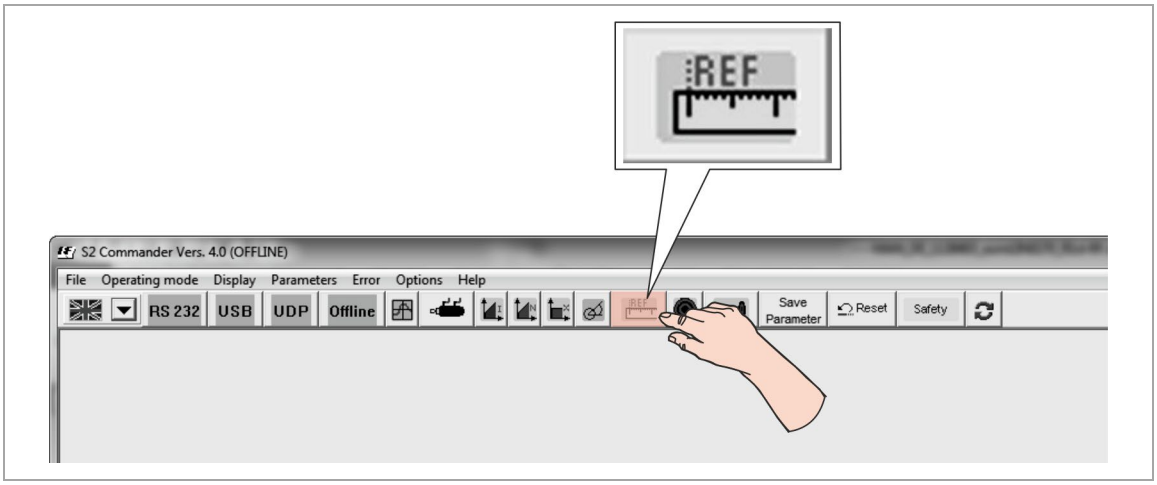

Figure 26 Choose "REF" icon

(2) Select the button "GO!" (GO!) to start homing run.
Note: The controller has to be enabled for this purpose!

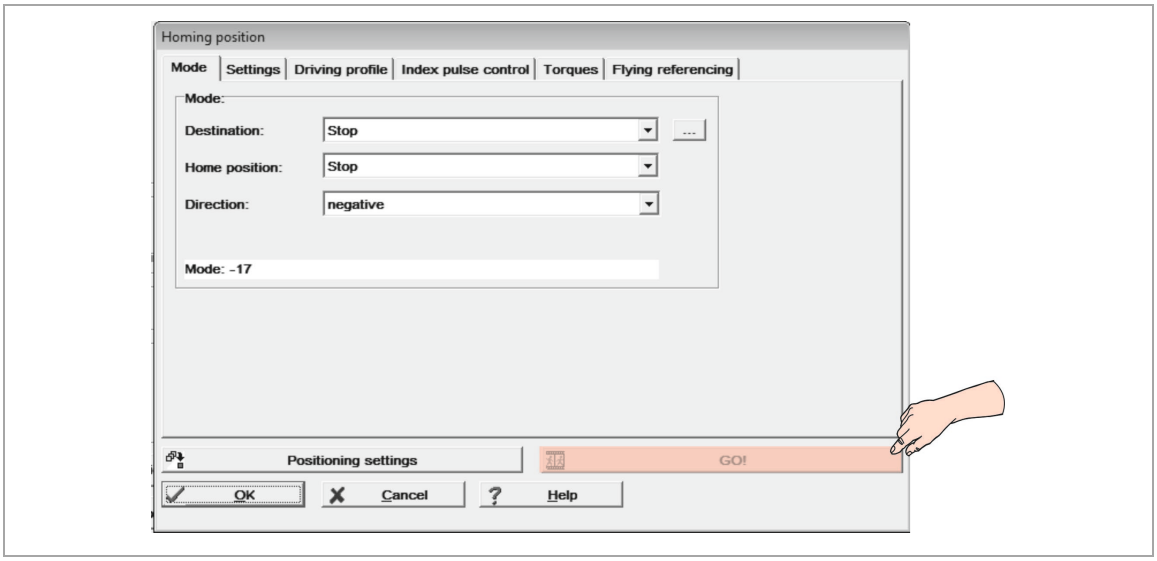

Figure 27 Select button "GO!"

The homing run is carried out.

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(3) After successful homing: Select the tap "settings" (**Settings**) and select the button "Save to encoder" (**Save to encoder**) to save the basic parameters/reference position into the encoder.

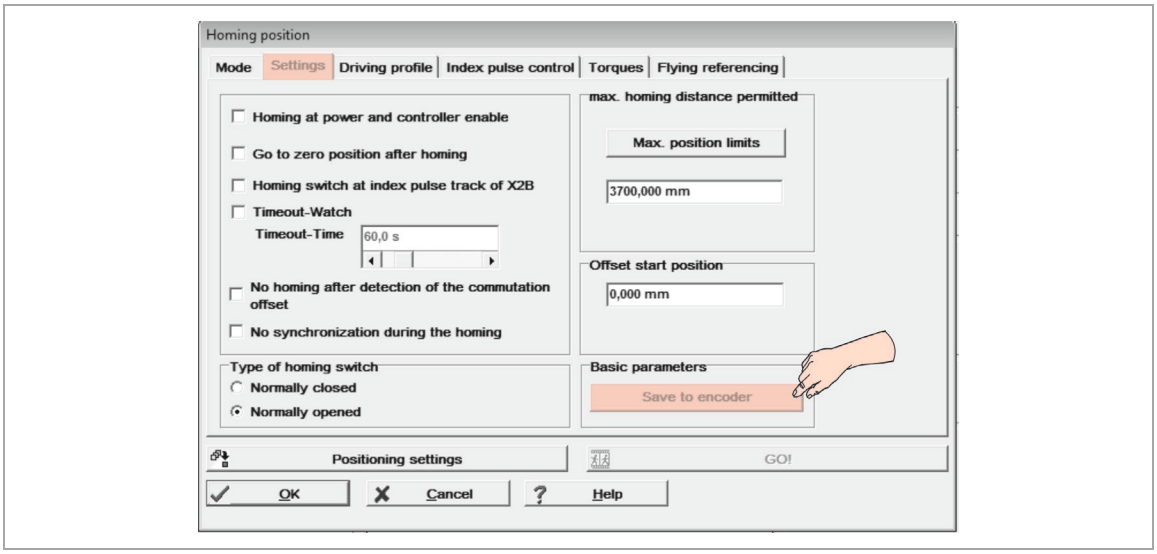

Figure 28 Select button "Save to encoder"

(4) Confirm the storage by selecting the "OK" button in the *Save to encoder* window.

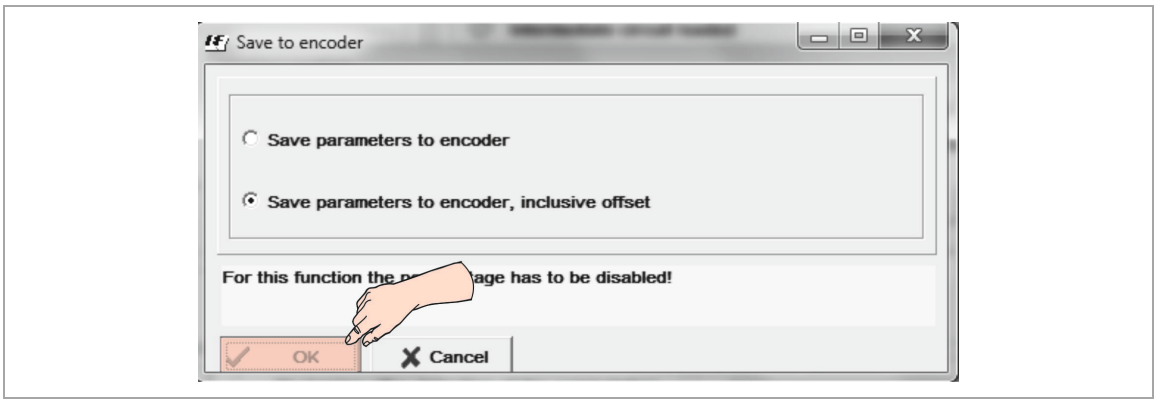

Figure 29 Select button "OK"

(5) Confirm the message of homing run with the "Yes" button.

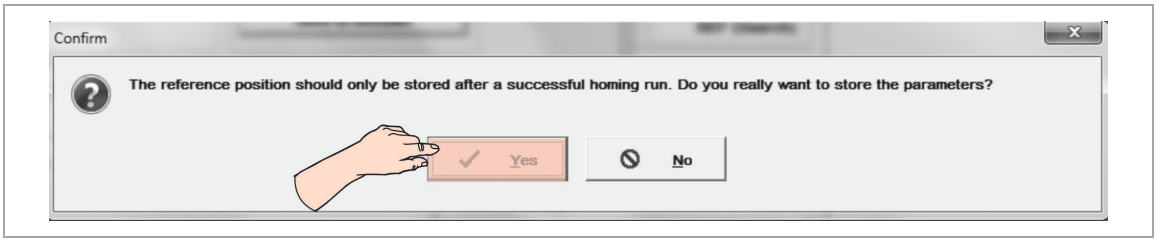

Figure 30 Select button "Yes"

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(6) Select the button "OK" in the *Information* window to confirm that the parameters have been saved.

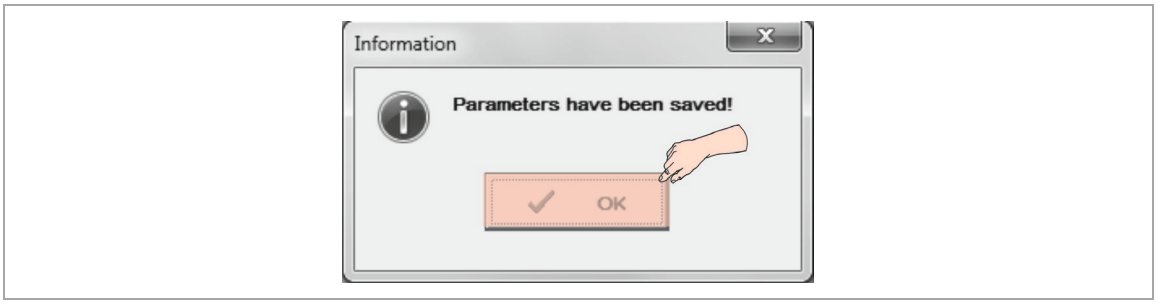

Figure 31 Select button "OK"

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6 Maintenance

⚠ WARNING

Warning of dangerous electrical voltage.

The system must be powered down for all assembly, disassembly or repair work. Non-observance of the safety provisions may cause death.

NOTE

Any repairs must only be performed by specialist personnel who have read and understood these original operating instructions.
Only use genuine spare parts, since IEF-Werner GmbH will not assume any warranty otherwise.

6.1 Maintenance of the Visual Measuring System

NOTE

Changes and repairs on this measuring system must only be performed by the manufacturer or persons authorised by him.

The manufacturer shall not be liable for any damage caused by non-authorised changes to the measuring system. Unauthorised actions cause all warranty claims to lapse.

The measuring system is generally maintenance-free.

The absolute length system used in the linear unit euroLINE 170 shows only slight contamination sensitivity.

Since the length system is integrated into the linear unit, regular cleaning is not necessary.

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6.2 Lubrication of Guide Carriage

The guide carriages are equipped with long-time lubrication for a running output of 10,000 km in the factory. For a higher running output, we recommend regularly relubricating the guides. Relubrication takes place with the lubricant Dynalub by a manual surge press (IEF-Werner item no.: 1055123) using four lubrication nipples attached to the carriage.

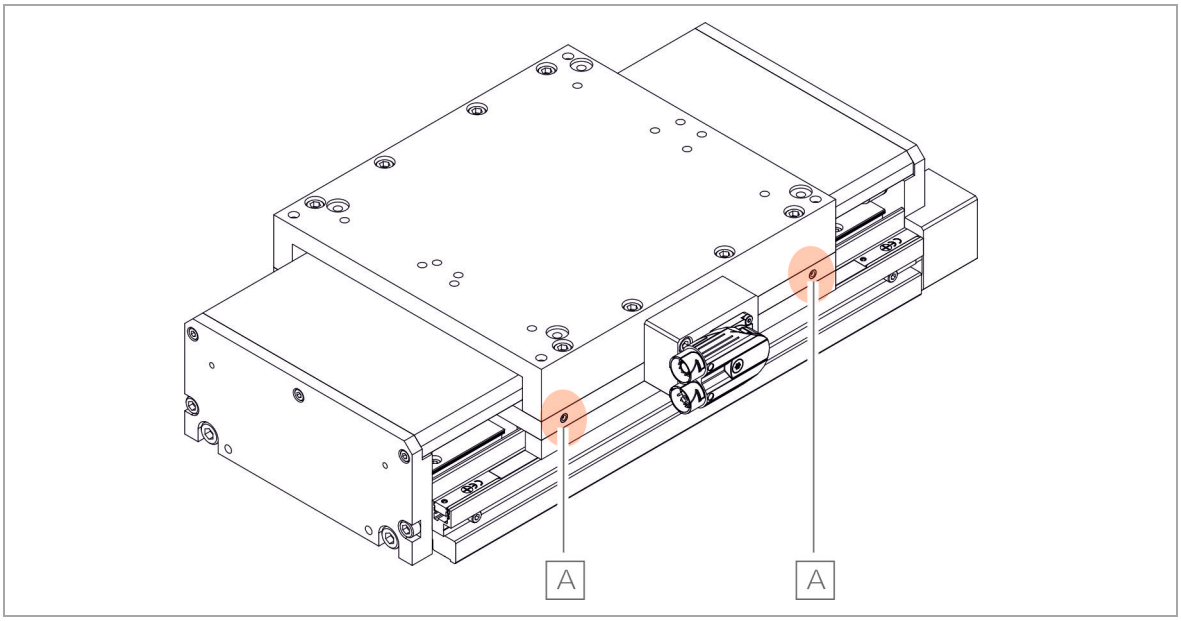

Figure 32 Lubrication of the module/guide carriages via lubrication nipples

A Hopper lubrication nipples (4 in total)

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6.3 Precautions by replacing the carriage

⚠ WARNING

Danger of crushing of limbs.

Due to strong magnetic pulls a risk of crushing of limbs (fingers) consists by replacing the carriage.

NOTE

When sliding the carriage off the guide system, the guide carriage can be damaged.

Remove the magnetic front plate before sliding the carriage off the guide rails. Otherwise the carriage might tilt and block due to the magnetic pulls.

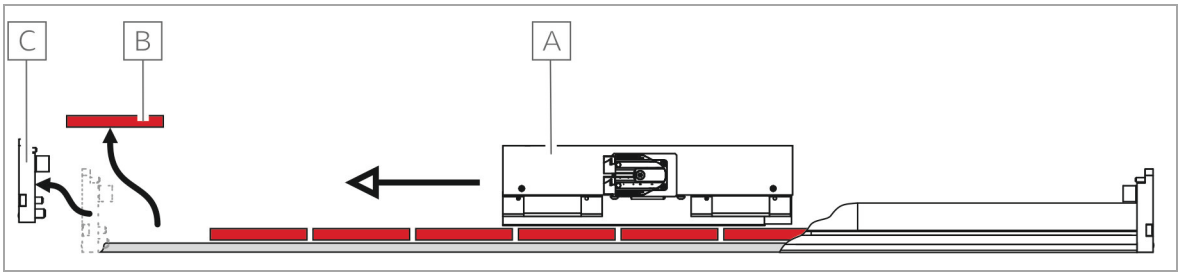

Figure 33 Replacing carriage

A Carriage (complete with guide carriage and coil unit)

B Front magnetic plate (shown removed)

C End plate

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7 Troubleshooting

Interference	Reason	Correction
Increased running noise	Nominal service life of guide carriage exceeded	Complete exchange of the guide carriages
	Torque load on guide carriage too high, causing play in the guide carriage	Complete exchange of the guide carriages
	Motor coil does not run "freely" and scrapes	Replace complete carriage unit
	Error in power electronics or control unit	Check, if required, exchange the power electronics, control
Linear drive unit does not move	Block from magnetic foreign parts in the area of the magnets	Remove foreign parts, check motor coil for damage
	Motor coil does not run "freely" and blocks	Replace complete carriage unit
	Plugs loose	Connect clamps U, V, W Attention: Only when powered down
	Encoder line defective	Replace encoder line
	Measuring system defective	Check distance measuring head ↔ measuring tape; target = 0.15 mm +0.2/-0.1 Replace complete carriage unit
	Motor coil defective	Replace complete carriage unit
	Guide carriage defective (stiffness, block)	Replacement of the guide carriages, if required of the guide rails
	Error in power electronics or control unit	Check components, replace if necessary
Position loss	Measuring system defective	Check distance measuring head ↔ measuring tape; target = 0.15 mm +0.2/-0.1 Replace complete carriage unit
	Measuring tape contaminated / damaged	Check components, replace if necessary

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8 Parts Lists and Drawings

8.1 euroLINE 170, Piece List TG1002431

Drawing item	Article no.	Designation
10	TG1002432	Basic body, type: Module LM170
20	1121353	Carriage euroLINE, TL12, l=270 mm, type: 170-S2-LIC4
	1122452	Carriage euroLINE, TL9, l=220 mm, type: 170-S1-LIC4
	1308694	Carriage euroLINE, TL9, l=220 mm, type: 170-S1-LIC411
	1308693	Carriage euroLINE, TL12, l=270 mm, Typ: 170-S2-LIC411
30	TG1002478	Cover
40	TG1002479	Switch strip
50	1116400	End-plate
60	1116421	Plug housing, compl.
80	28668	Plastic clip easyLINE
85	1115708	Initiator strip TL12
90	25165	Induction switch PNP normally closed contact
110	TG1002433	Guide rail type LM170
120	1114068	Magnetic plate 288 mm, type: TL
130	1114067	Magnetic plate 192 mm, type: TL
132	1121400	Measuring scale holder, 1 piece à 60 mm
133	1121400	Measuring scale holder, 1 piece à 127 mm
134	1121401	Mounting kit
140	626062	Cylindrical screw, zinc-plated, DIN 912/ISO 4762, type: M4 x 12 – 8.8
150	626040	Cylindrical screw, zinc-plated, DIN 7984, Typ: M6 x 20 – 8.8

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Drawing item	Article no.	Designation
160	626062	Cylindrical screw, zinc-plated, DIN 912/ISO 4762, type: M4 x 12 – 8.8
170	626496	Cylindrical screw, zinc-plated, DIN 912/ISO 4762, type: M8 x 16 – 8.8
180	626329	Cylindrical pin, DIN 6325/ISO 8734, type: 5m6 x 20 – A
200	627070	Cylindrical screw, zinc-plated, DIN 912/ISO 4762, type: M4 x 20 – 8.8
210	627071	Cylindrical screw, zinc-plated, DIN 7984, type: M5 x 12 – 8.8
220	627120	Cylindrical pin, DIN 6325/ISO 8734, type: 4m6 x 16 – A

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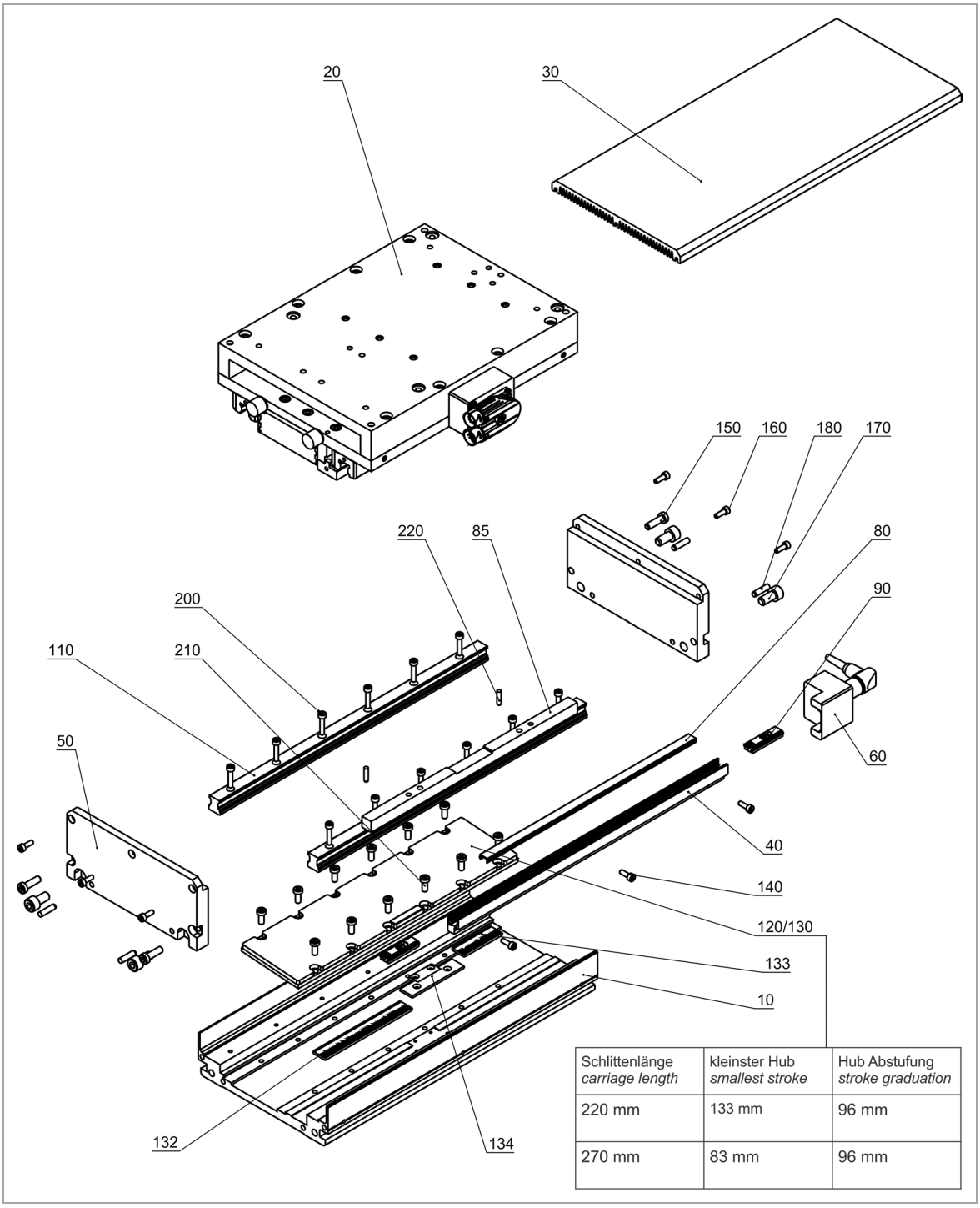

Schlittenlänge *carriage length*	kleinster Hub *smallest stroke*	Hub Abstufung *stroke graduation*
220 mm	133 mm	96 mm
270 mm	83 mm	96 mm

Figure 34 Exploded drawing TG1002431

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8.2 euroLINE 170, Standard Carriage Length = 220 mm, Item No.: 1308694

With measuring head LIC 4 → until June 2018 → IEF article no.: 1122452
With measuring head LIC 411 → from June 2018 upwards → IEF article no.: 1308694

Drawing item	Article no.	Designation
10	1122447	Intermediate plate TL9, type: LM170
20	1122449	Carriage plate TL9, type: LM170
30	1115717	Cable protection, type: LM170
40	1115776	Cable guide, type: U-profile
50	1121354	Terminal box, compl. LM170, type: Carriage LM170
60	1148492	Guide carriage, type: KWD-015_SLS-C1-P-1
70	1115711	Coil unit, type: TL9S
80	1028704	T-lubrication nipple, type: D4; DIN 3405
90	1419797	Measuring head holder, type: euroLINE 170 / LIC411
100	1601220	Measuring head with 1 m cable, type: AK LIC 411 / EnDat 2.2
105	1138676	Felt holder, type 170
110	1122448	Sliding track, type LM170
115	1138670	Felt, type: 170-S2, length 200, glued on the inside of the bracket
	1138670	Felt, type: 170-S2, length 22, glued on position 105
120	1121388	Cover cable, type: LM170
125	1138675	Angle, type: 170-S1
130	626705	Cylindrical screw, galvanized, DIN 912 / ISO 4762, type: M3 x 8 – 8.8
140	626709	Cylindrical screw, galvanized, DIN 912 / ISO 4762, type: M3 x 20 – 8.8
150	625179	Lens-head screw, galvanized, ISO 7380, type: M4 x 10 – 10.9
160	626332	Cylindrical pin, DIN 6325 / ISO 8734, type: 5 m6 x 32 – A
170	627120	Cylindrical pin, DIN 6325 / ISO 8734, type: 4 m6 x 16 – A
180	626061	Cylindrical screw, galvanized, DIN 912 / ISO 4762, type: M4 x 16 – 8.8

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Drawing item	Article no.	Designation
190	626059	Cylindrical screw, galvanized, DIN 912 / ISO 4762, type: M5 x 16 – 8.8
200	626326	Cylindrical pin, DIN 6325 / ISO 8734, type: 5 m6 x 14 – A
210	626484	Cylindrical screw, galvanized, DIN 912 / ISO 4762, type: M4 x 25 – 8.8
220	1031602	O-Ring NBR 70 Shore A, type: 1.80-1.80
230	626344	Cylindrical screw, DIN 6325 / ISO 8734, type: 6 m6 x 40 – A
240	626049	Cylindrical screw, galvanized, DIN 912 / ISO 4762, type: M6 x 35 – 8.8
250	1118738	Rubber-metal buffer 15x13, hardness D: medium, type: M4 x 13
260	626376	Hexagon nut, galvanized, DIN 934 / ISO 4032, type: M4 – 8
270	626062	Cylindrical screw, galvanized, DIN 912 / ISO 4762, type: M4 x 12 – 8.8
280	626072	Lens-head screw, galvanized, ISO 7380, type: M4 x 8 – 8.8
290	1603360	Contact washer, steel, galvanized, type M3
300	726657	Crimp cable lug, (0.5 - 1) mm², red, type: M3

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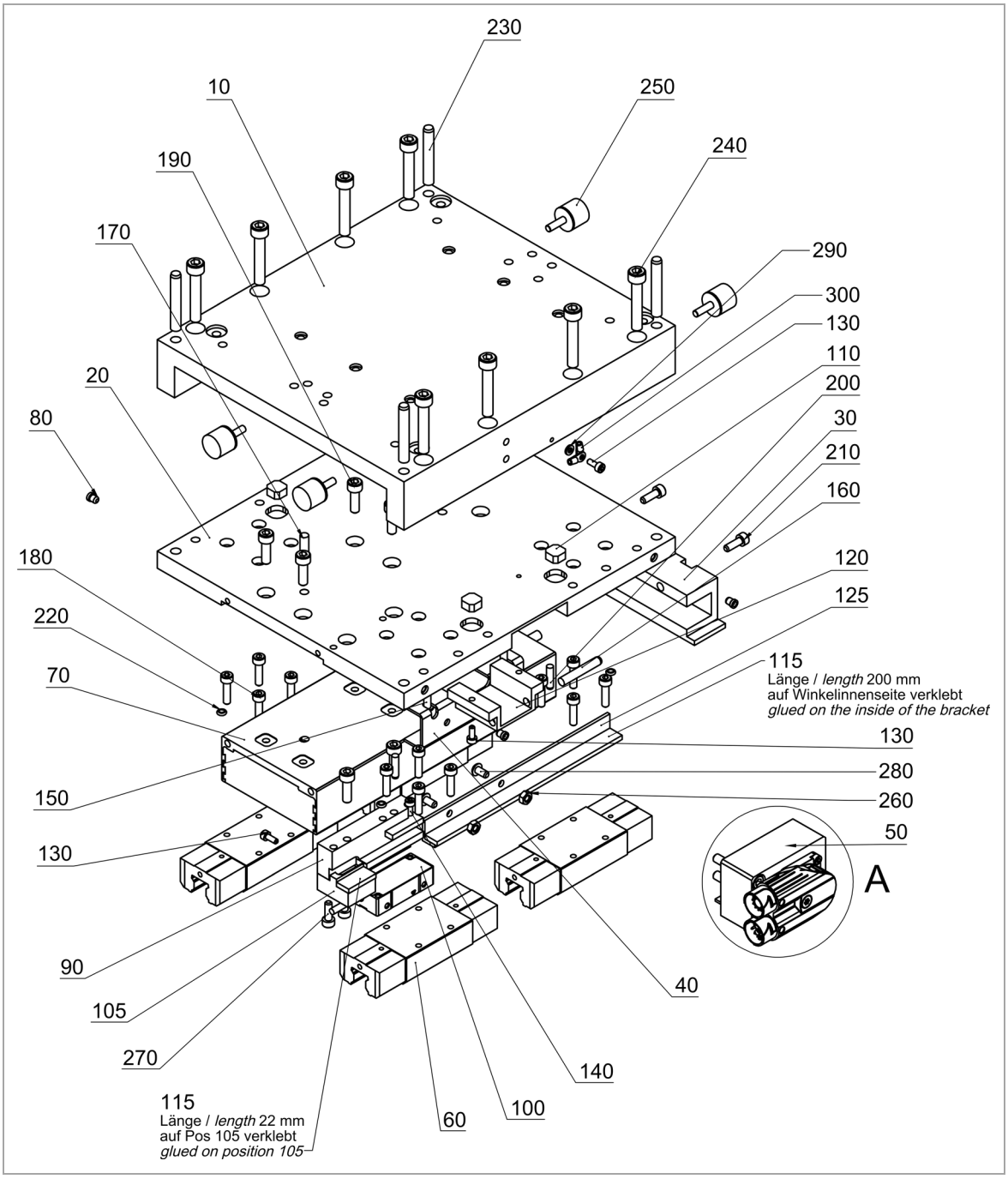

Figure 35 euroLINE 170, standard carriage, length 220 mm (1308694)

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8.3 euroLINE 170, Long Carriage, Length = 270 mm, Item No.: 1308693

With measuring head LIC 4 → until June 2018 → IEF article no.: 1121353
With measuring head LIC 411 → from June 2018 upwards → IEF article no.: 1308693

Drawing item	Article no.	Designation
10	1121373	Carriage plate TL12, type: LM170
20	1121371	Intermediate plate TL12, type: LM170
30	1115717	Cable protection, type: LM170
40	1115776	Cable guide, type: U-profile
50	1121354	Terminal box, compl. LM170; type: Carriage LM170
60	1148492	Guide carriage, type: KWD-015_SLS-C1-P-1
70	1115712	Coil unit, type: TL12N
80	1028704	T-lubrication nipple, type: D4; DIN-no. 3405
90	1419797	Measuring head holder, type: euroLINE 170 / LIC 411
100	1601220	Measuring head, type: AK LIC 411 / EnDat 2.2
105	1138676	Felt holder, type: 170
110	1121372	Sliding track, type: LM170
115	1138670	Felt, type 170-S2, length 200, glued on the inside of the bracket
	1138670	Felt, type 170-S2, length 22, glued on position 105 with superglue
120	1121388	Cover cable, type: LM170
125	1138672	Angle, type: 170-S2
130	626705	Cylinder screw, galvanized, DIN 912 / ISO 4762, type: M3 x 8 – 8.8
140	626709	Cylinder screw, galvanized, DIN 912 / ISO 4762, type: M3 x 20 – 8.8
150	625179	Lens-head screw, galvanized, ISO 7380, type: M4 x 10 – 10.9
160	626332	Cylindrical pin, DIN 6325 / ISO 8734, type: 5 m6 x 32 – A
170	627120	Cylindrical pin, DIN 6325 / ISO 8734, type: 4 m6 x 16 – A
180	626061	Cylinder screw, galvanized, DIN 912 / ISO 4762, type: M4 x 16 – 8.8
190	626059	Cylinder screw, galvanized, DIN 912 / ISO 4762; type: M5 x 16 – 8.8

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Drawing item	Article no.	Designation
200	626326	Cylindrical pin, DIN 6325 / ISO 8734, type: 5 m6 x 14 – A
210	626484	Cylinder screw, galvanized, DIN 912 / ISO 4762, type: M4 x 25 – 8.8
220	1031602	O-Ring NBR 70 Shore A, type: 1.80-1.80
230	626344	Cylindrical screw, DIN 6325 / ISO 8734, type: 6 m6 x 40 – A
240	626049	Cylinder screw, galvanized, DIN 912 / ISO 4762, type: M6 x 35 – 8.8
250	1118738	Rubber-metal buffer 15x13, hardness D: medium, type: M4 x 13
260	626376	Hexagon nut, galvanized, DIN 934 / Iso 4032, type: M4 – 8
270	626062	Cylinder screw, galvanized, DIN 912 / ISO 4762, type: M4 x 12 – 8.8
280	626072	Lens-head screw, galvanized, ISO 7380, type: M4 x 8 – 8.8
290	1603360	Contact washer, steel, galvanized, type M3
300	726657	Crimp cable lug, (0.5 - 1) mm², red, type: M3

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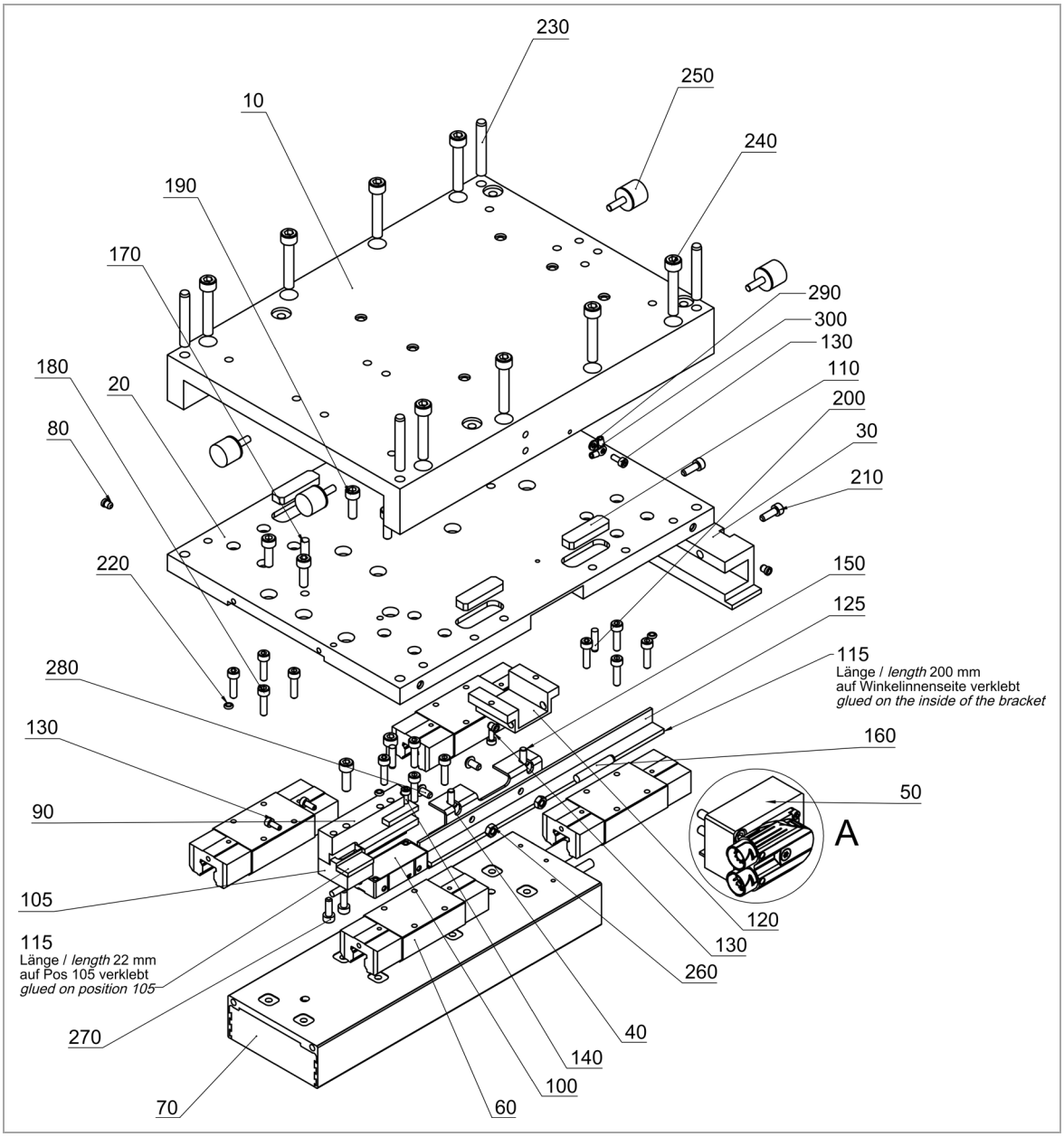

Figure 36 euroLINE 170, long carriage, length 270 mm (1308693)

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8.4 Drawing Accessories

8.4.1 Centering ring 1024021

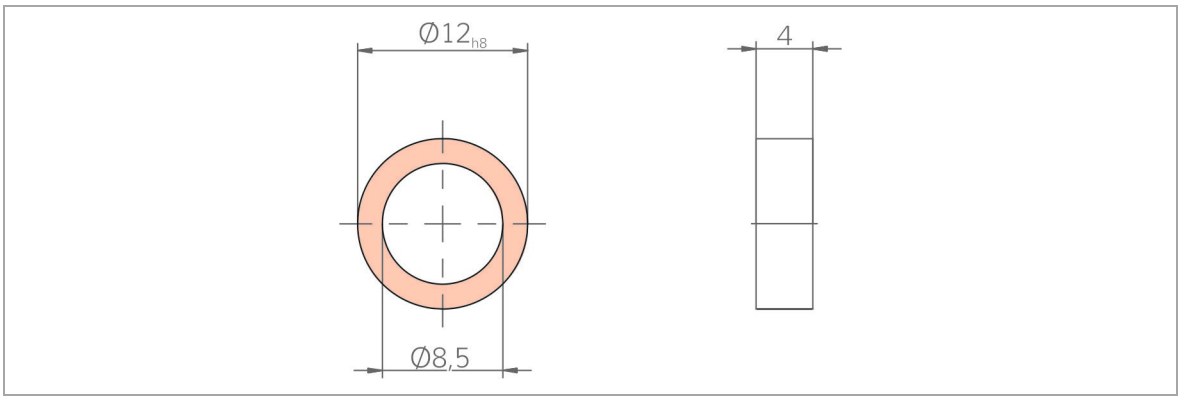

Figure 37 Centering ring

8.4.2 Clamping element euroLINE 170

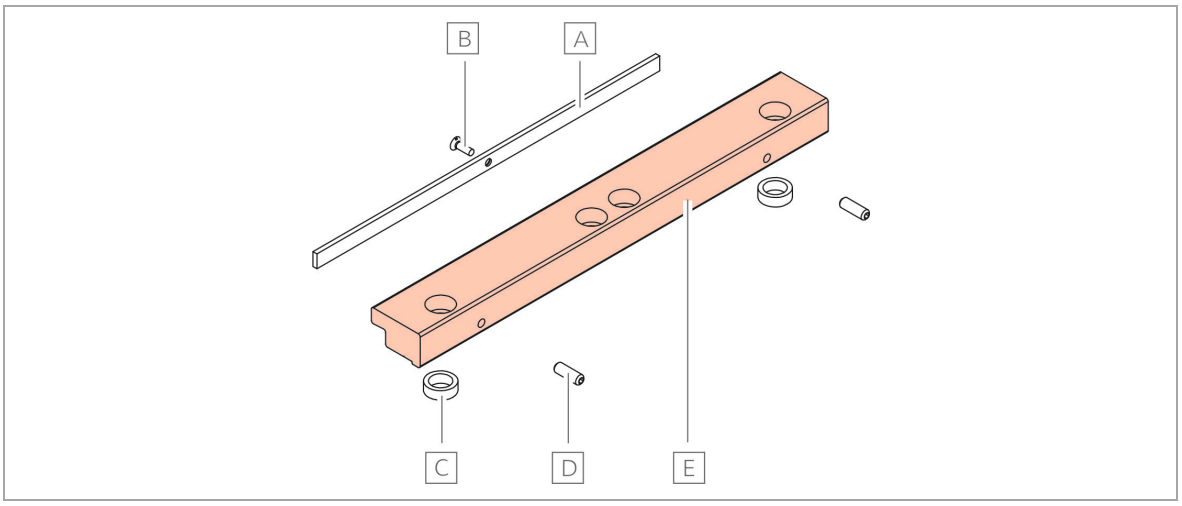

Figure 38 Clamping element (item no.: 1115733)

A Strip
B Recessed-head screw, zinc-plated, M2.5 x 8
C Centering ring
D Threaded pin, zinc-plated M4 x 12
E Clamping element (cross installation)

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