**Translation of the original instructions**

# Module 90/15

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# 1 Safety

## 1.1 Definition or warning notes

**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 property damage or injury.

**NOTE** Offers additional information.

## 1.2 General warning notes

The module must only be commissioned by specialists who 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**

**The system must be powered down for all assembly, disassembly or repair work. There is a high danger of injury.**

**WARNING OF HOT SURFACE**

During operation, heating of the motor, in particular of stepper motors, can cause burns of the skin when touching the motor. Install a protective device, if possible! Do not touch the marked areas or wait for an adequate cooling time.

**CAUTION**

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

**CAUTION**

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

**NOTE** Observe the Declaration of Incorporation (see section *Declaration* of incorporation*, page 43*).

## 1.3 Special hazard warnings

In addition, this Original User's Manual also contains the following special hazard warning:

**DANGER Of CRUSHING**

**These places of the components pose the danger of crushing limbs in operation.**

# 2 Intended use

The linear unit module 90/15 (see *Figure 1*) was designed for use in the commercial area. Use of a high-quality guide warrants high dynamics and good running behaviour. The internal guide system is protected from contamination by the side covers. Additionally, the guide elements have special seals that protect the guide tracks from gross contamination. Use of the linear unit module 90/15 under conditions with increased contamination and abrasive dusts, however, should be avoided because there are no further protective measures like bellows, etc.

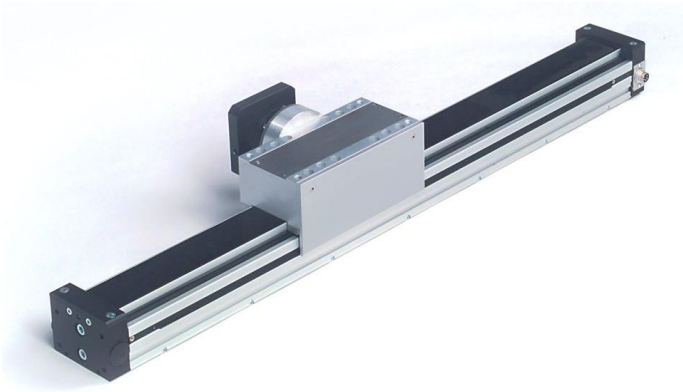


**Figure 1: Module 90/15**

In combination with many standardised installation elements and the other linear modules (e.g. module 80/15, module 160/15) and carriage units by IEF Werner GmbH, complex multi-axis handling systems can be developed as well.

The areas of application of module 90/15 are accordingly diverse.
They encompass:

- Stop adjustment in the wood industry
- Equipment systems for SMD components
- Joining and press-in processes in precision mechanics
- Loading and unloading station of tool machines up to
- Manipulators for the packaging industry

## 2.1 Reasonably foreseeable misuse

The linear module 90/15 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 module 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.

# 3 Assembly instructions

## 3.1 Installation position

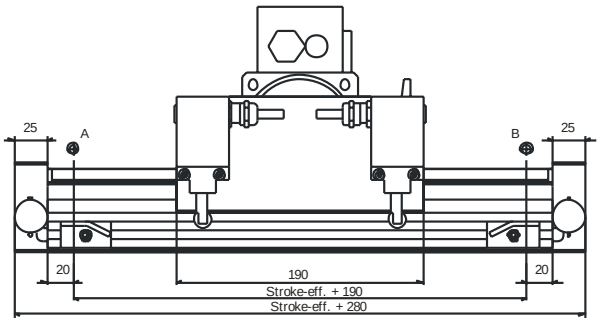
The installation position is optional, i.e. the linear module 80/15 can be used horizontally as well as vertically.

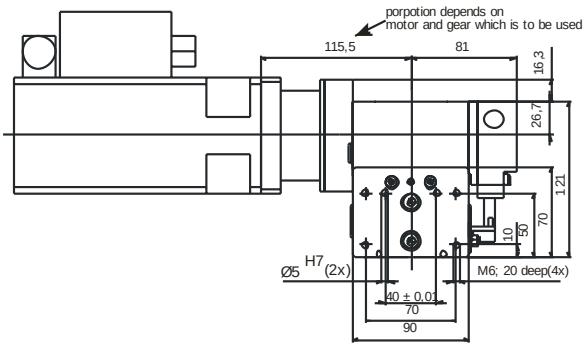
**CAUTION**

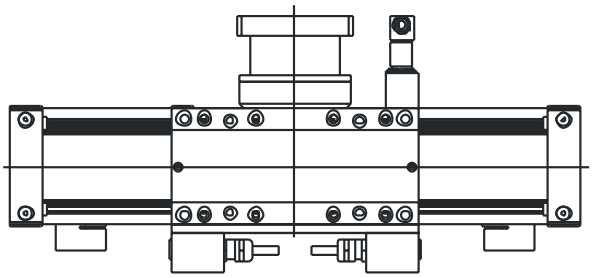
In the vertical installation position, use only motors with spring-operated brake to prevent the lowering of the drive in de-energized condition!

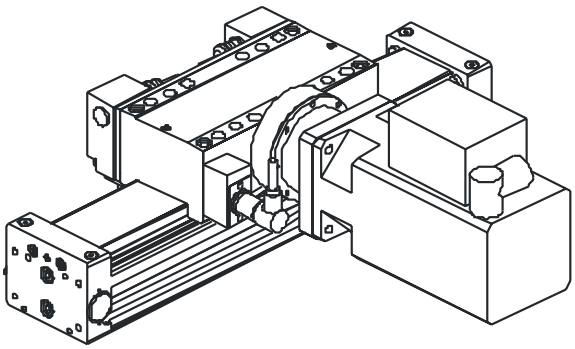
## 3.2 Overview of motor installation variants

### 3.2.1 Module 90/15, installation variant 1

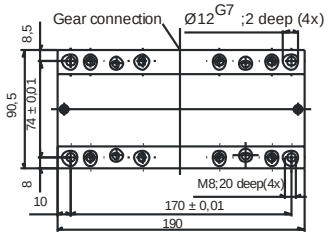




Carriage dimensions :




**Installation variant with integrated mechanical safety switches**

A; B: Stroke limited switch

A : Standard reference point

**Figure 2: Installation/setup version part 1:**

### 3.2.2 Module 90/15, installation variant 2

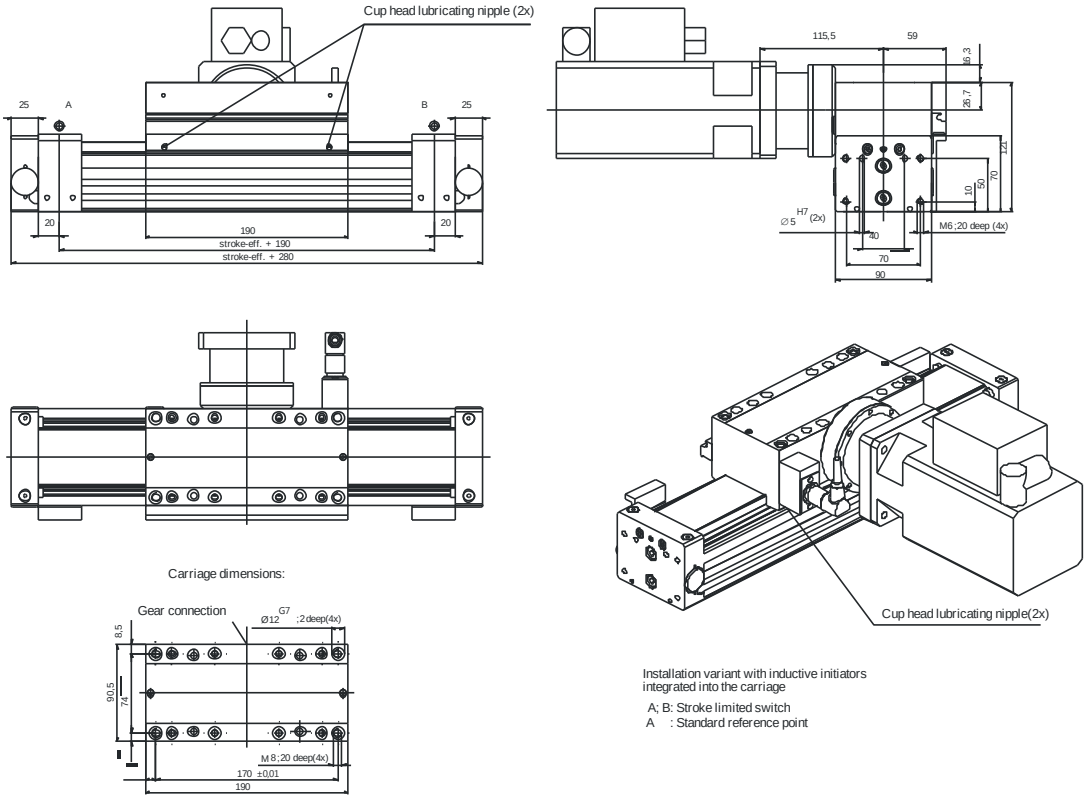



**Figure 3: Installation/setup version part 2:Module 90/15, installation variant 3**

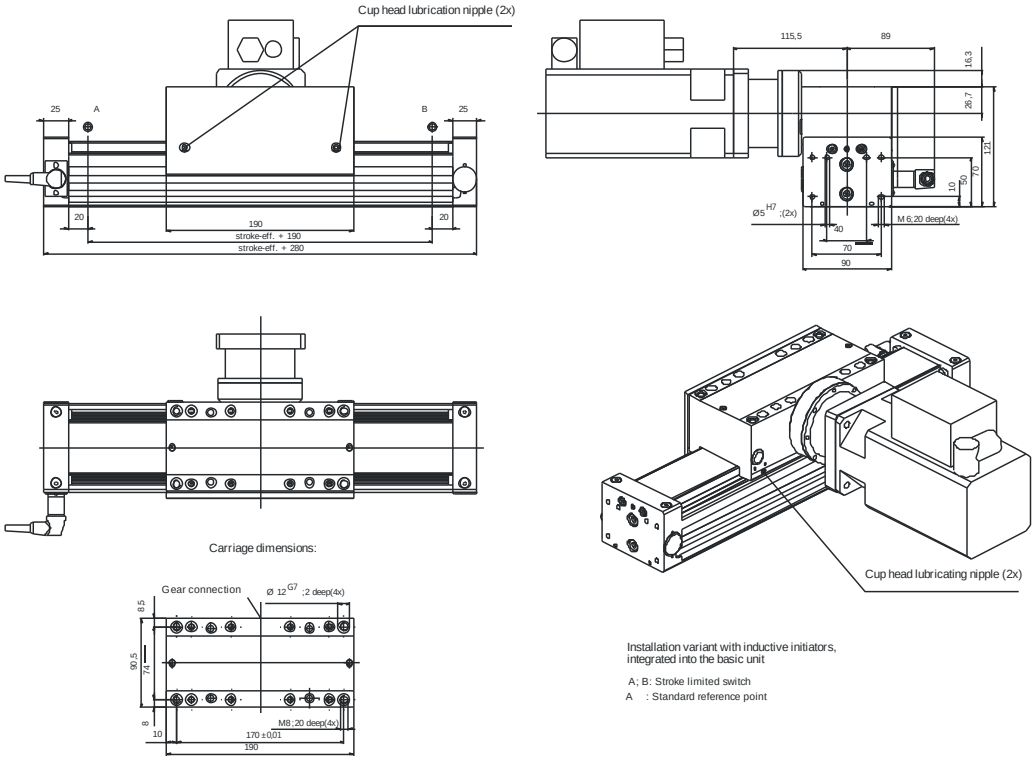



**Figure 4: Installation/setup version part 3:**

### 3.2.3 Module 90/15, installation variant 4

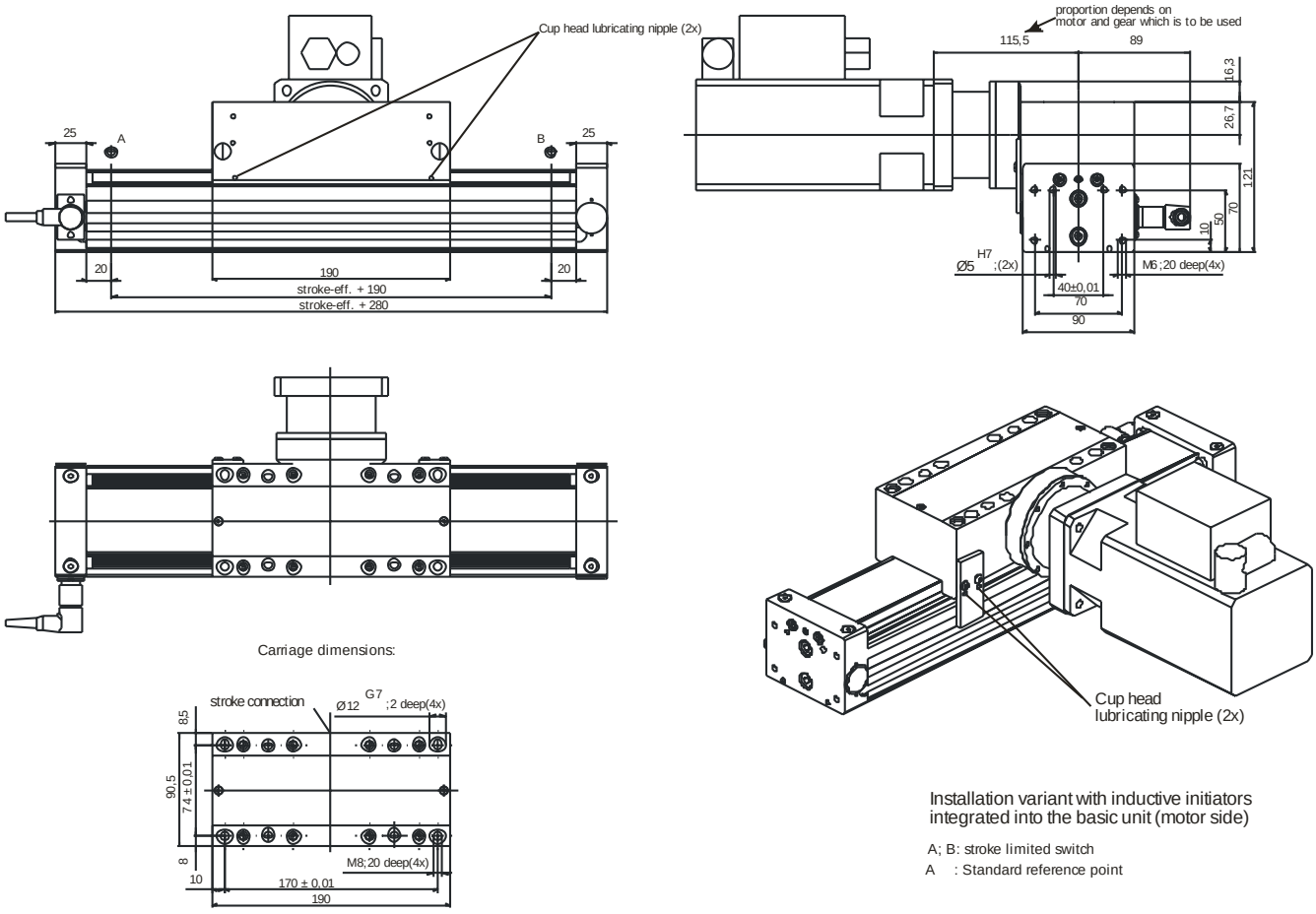



**Figure 5: Installation/setup version part 4:**

**NOTE** For more information on special setups/versions, see section *Special versions, Page 32*.

## 3.3 Attachment

The linear unit module 90/15 was specifically designed for boom or vertical operation. A motor-gearbox combination is placed at the fixed carriage part to minimise the moving dead weight.

The linear unit is attached using 4 bores (M8 x 20) in the carriage part that are applied with additional alignment recesses (∅12$^{G7}$; 2 deep) (see *Figure* 6). These bores/alignment recesses permit fixed-position assembly of the linear unit that can be repeated accurately. The matching centring sleeve (see *Figure 7*) is available as IEF Werner art. no.: 1024021.

Various adapter plates are available for cross assembly with other linear units.

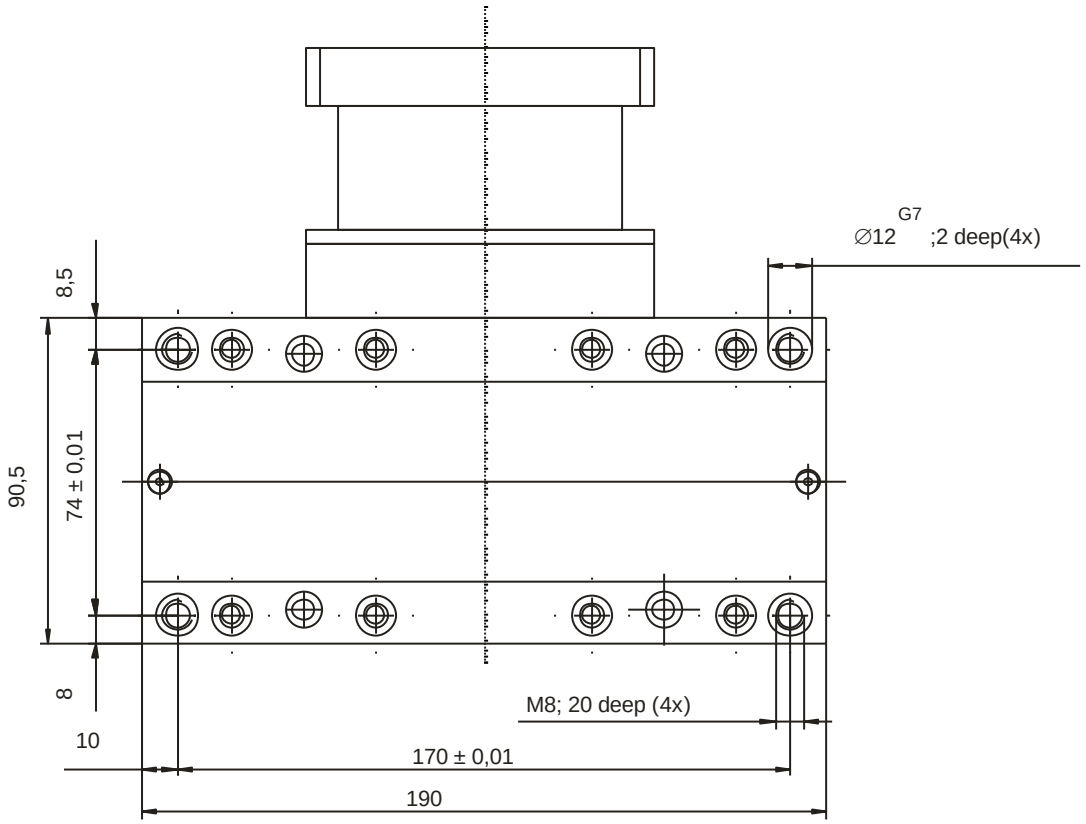



**Figure 6: Attachment**

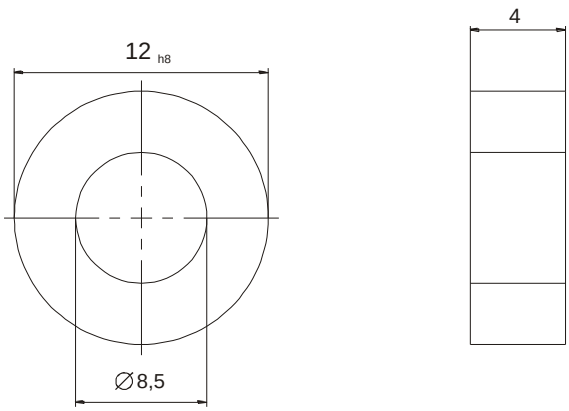



**Figure 7: Centring sleeve.**

**DANGER OF CRUSHING**

**These places of the components pose the danger of crushing limbs.**

There is danger of crushing at the start and end of a stroke (see *Figure 8*).

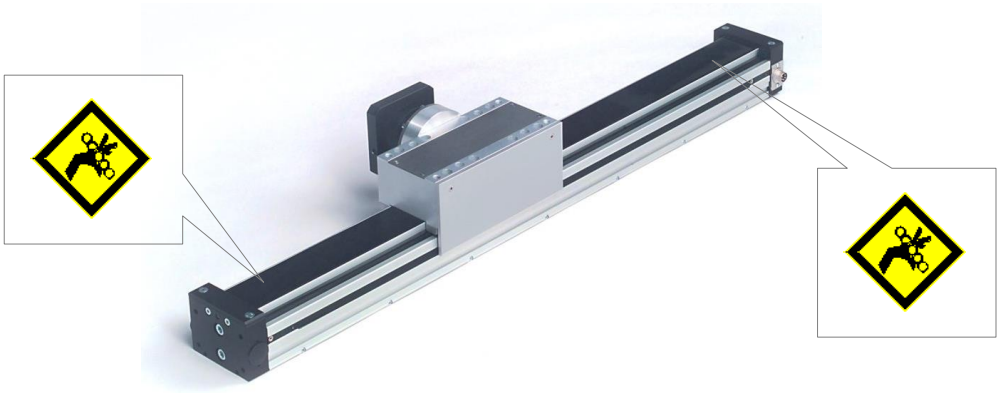


**Figure 8: Possible crushing points**

### 3.3.1 Installation of actuators

Both end plates of the moving basic unit have four M5 threaded bores and 2 pin holes ∅5$^{H7}$ for taking up and fastening actuators (see *Figure 9*).

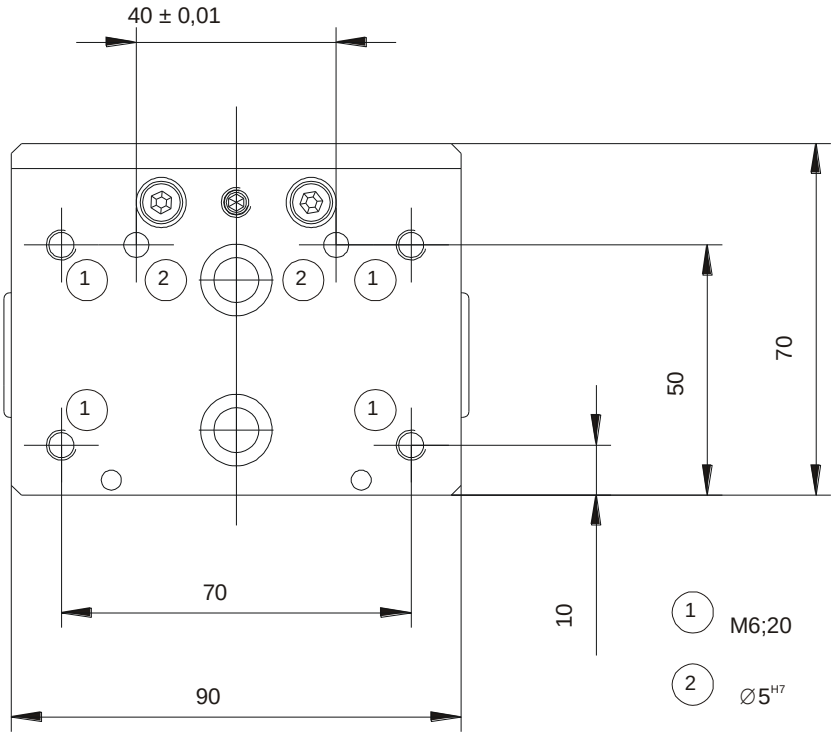



**Figure 9: End plate 90/15, scaled figure**

## 3.4 Wiring

### 3.4.1 Motors

**CAUTION**

The electrical connection of the motors is performed according to the motor data sheet. For customer-specific motors, the data sheet must be requested from the respective manufacturer and the motor connected accordingly.

### 3.4.2 Initiators

Inductive proximity switches (PNP normally closed contacts, article no.: 025165) are used as standard limit switches for the running path. These switches are no safety limit switches pursuant to EN60204-1. Optionally, (also subsequently) an additional reference point switch (PNP normally open contact article no.: 726744), can be installed in the linear module 90/15. The active button is marked with a coloured circle. Normally closed contacts are marked with a green, normally open contacts with a red dot. The initiators and their supply lines are protected in a cable channel integrated in the basic unit or carriage, and are wired to a joint plug. The cable channel is covered with a plastic strip. To replace or relocate an initiator, the plastic strip can be removed from the cable channel.

Attachment of the inductive proximity switches is possible according to different versions (see section *Limit* switch installation variants*, page 16*). Optionally, attachment of mechanical end position switches is possible as well (also see section *Limit* switch installation variants*, page 16*).

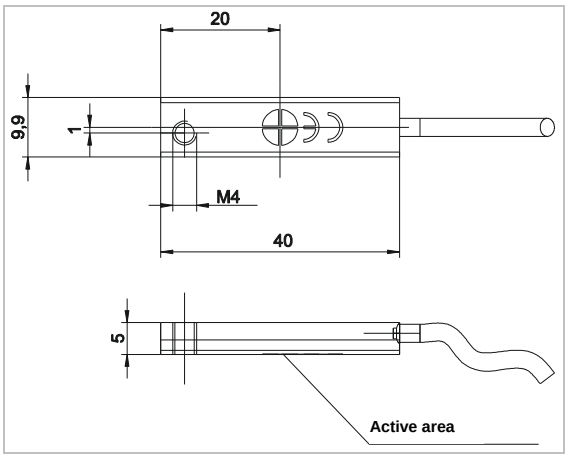



**Figure 10: Scaled sketch of inductive proximity switch**

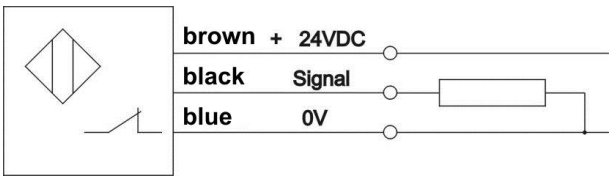



**Figure 11: Connection allocation PNP normally closed contact**

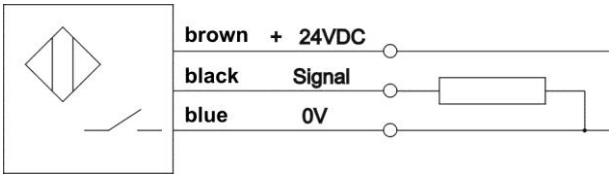



**Figure 12: Connection allocation PNP normally open contact**

3.4.2.1 Technical data of initiators

| Parameter | Value |
|---|---|
| Operating voltage, incl. residual ripple | (10 ... 30) VDC ≤ 15 % |
| Current load capacity | $I_a$ ≤ 200 mA |
| Voltage drop at $I_a$ max. | ≤ 2.5 V |
| Switching frequency | ≤ 1,000 Hz |
| Own current consumption | ≤ 15 mA |
| Nominal switching distance on steel | 1.5 mm ± 10 % |
| Switching hysteresis | (3 ... 20) % |
| Reproducibility (U = const.) | ± 0.01 mm |
| Operating temperature | - 25 °C ... + 70 °C |
| Protection class | IP 65 |
| Short-circuit proof | yes |
| Protected against polarity reversal | yes |

**Figure 13: Technical data of initiators**

#### 3.4.2.2 Plug end position switch

The end position switch is assigned as follows (see *Figure 14*):

| Pin-No. | Assignment | IEF Werner cables |
|---|---|---|
| 1 | + 24 V | brown |
| 2 | Limit switch negative direction | green |
| 3 | 0 V | white |
| 4 | Limit switch positive direction | yellow |
| 5 | Reference switch | grey |

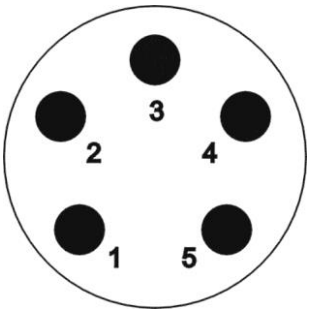



**Figure 14: Connection assignment plug end position switch**

### 3.4.3 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 to also order cables and cable routing chains at IEF Werner GmbH.

## 3.5 Limit switch installation variants

The linear unit module 90/15 can be used with various installation variants of stroke limitation switches as listed in the following to meet different needs and provide best solutions for your specific requirements (see *Figure 15* to *Figure 18*).

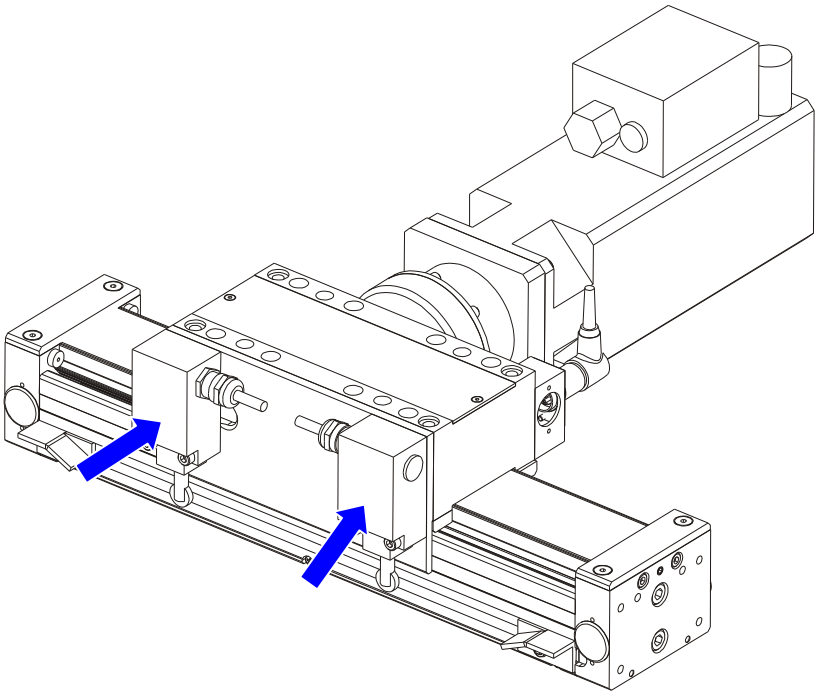


**Figure 15: Var.1, safety switch with forced opening according to IEC 60947-5-1-3**

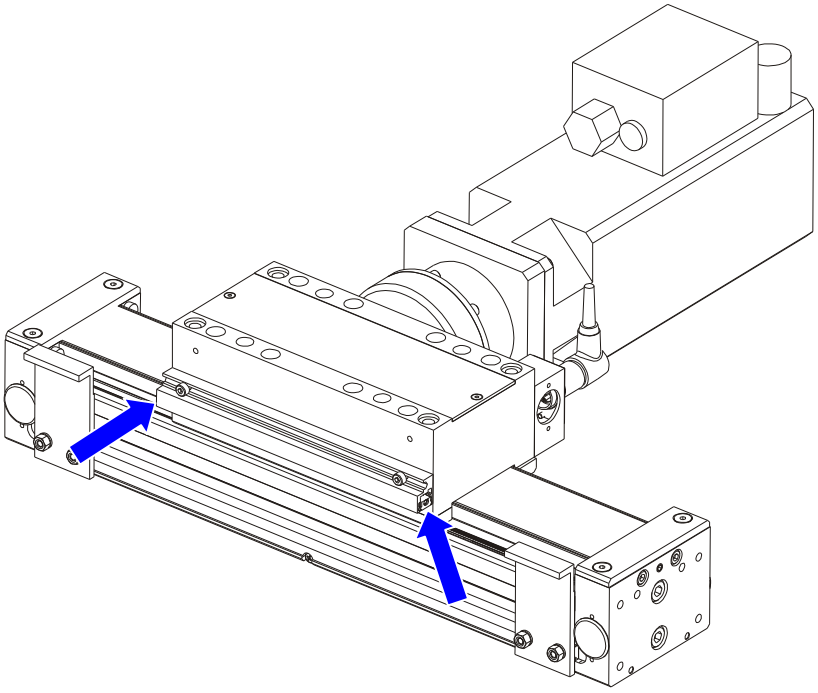


**Figure 16: Version 2, inductive proximity switches integrated into the carriage**

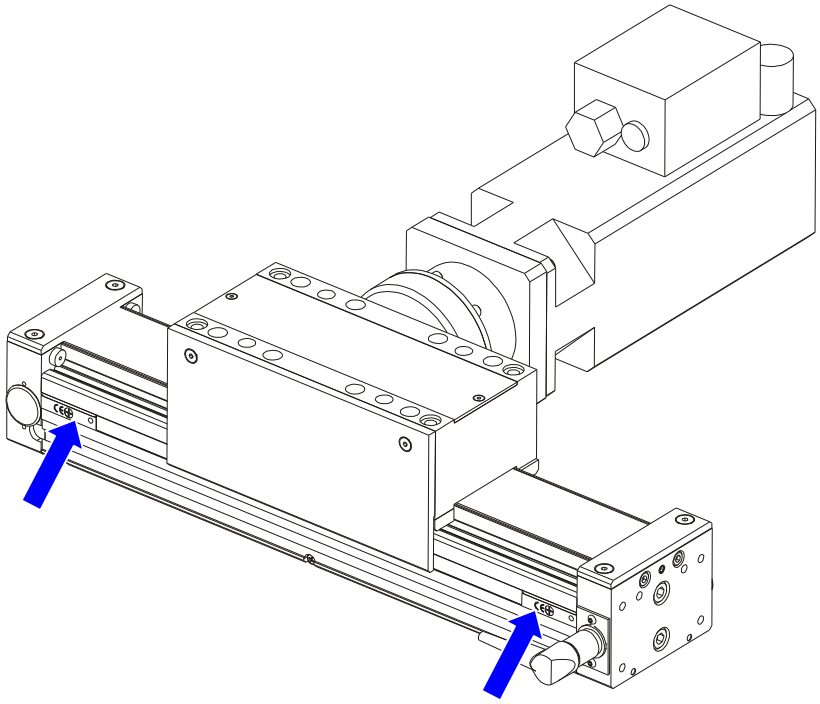


**Figure 17: Version 3, inductive proximity switches integrated into the basic unit**

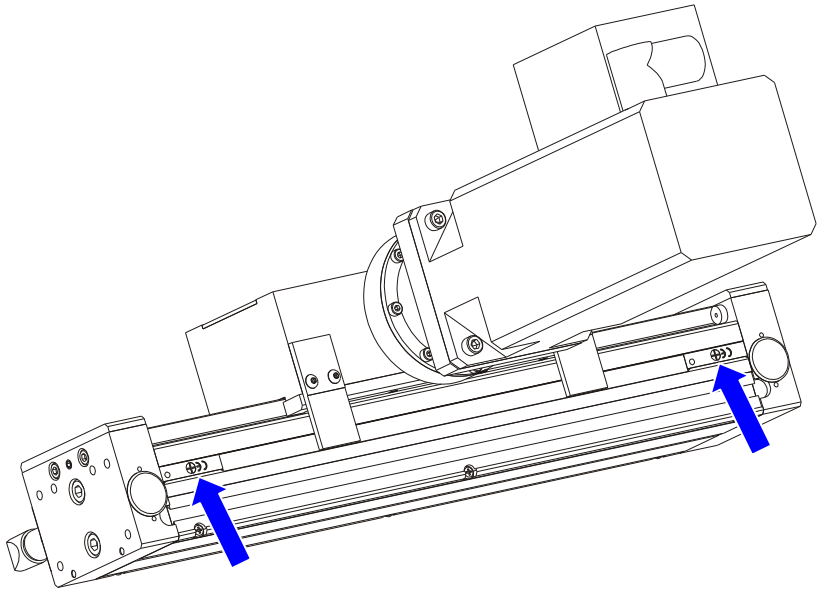


**Figure 18: Version 4, inductive proximity switches integrated into the basic unit on the motor side**

## 3.6 Technical data

### 3.6.1 Tightening torques for screw connections

| Screw 8.8 | Tightening torque [Nm] |
|---|---|
| M3 | 1,1 |
| M4 | 2,5 |
| M5 | 5,0 |
| M6 | 8,5 |
| M8 | 21,0 |
| M10 | 41,0 |
| M12 | 71,0 |
| **Screw 12.9** | **Tightening torque [Nm]** |
| M4 (guide rail attachment) | 4,9 |

### 3.6.2 Technical data of the linear module 90/15

| Parameter | Value |
|---|---|
| Repeating accuracy | ± 0.05 mm |
| Weight (at stroke 40 mm) without motor and gearbox | 7.6 kg<br>(Weight increase per 60 mm stroke: 0.6kg) |
| Maximum movement speed | 3 m/s |
| Toothed belt | 50 mm wide |
| Rope pull resistance toothed belt | 4,200 N |
| Area inertia basic unit:<br>Ix<br>Iy | <br>445.755 $mm^4$<br>521.756 $mm^4$ |
| Infeed constant without gear | 140 mm |

### 3.6.3 Type label

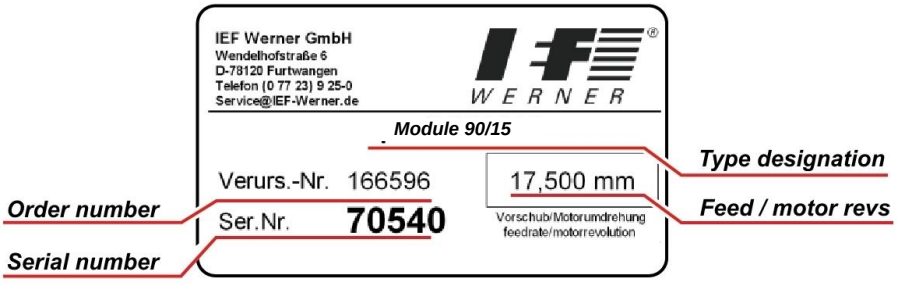



**Figure 19: Type label (example)**

### 3.6.4 Technical data when using a planetary gear

Before commissioning, observe the possible input speeds of the gear manufacturers. Too-high input speeds can lead to increased wear at the gear
and/or thermal problems.

The accuracy of the linear unit is influenced by the reverse play of the gears.

**Example:**

The gear reverse play (S) is 9 angle minutes.

How high is the reverse play at the carriage of the linear unit?

Infeed constant of the linear unit (Vk): 140 mm

Reverse play at the carriage = (Vk • S) / (360 x 60)

= (140 mm • 9) / (360 x 60)

= 0.058 mm

Consider the information of the respective gear manufacturer in any case.

e.g. http://www.neugart.de/index.php/de/Produkte/Standardgetriebe

http://www.wittenstein-alpha.de/896.htm

### 3.6.5 Load cases

3.6.5.1 Load resilience in boom operation

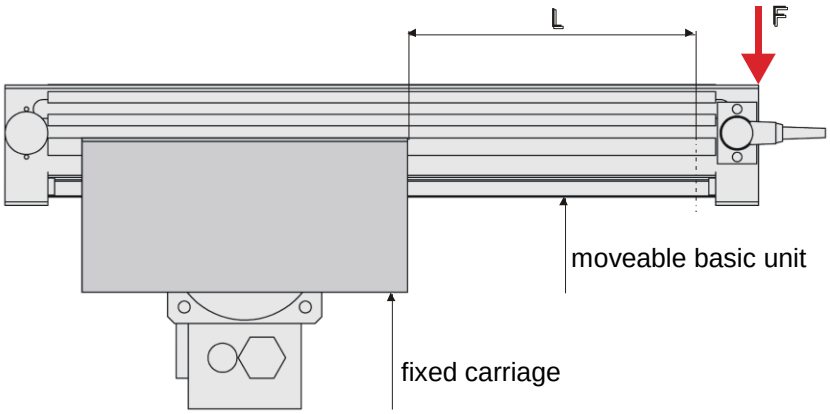



**Figure 20: Load capacity module 90/15 in boom operation**

| | | | | | | |
|---|---|---|---|---|---|---|
| F [N] | 680 | 290 | 170 | 110 | 70 | 40 |
| L [mm] | 100 | 280 | 460 | 640 | 820 | 1000 |

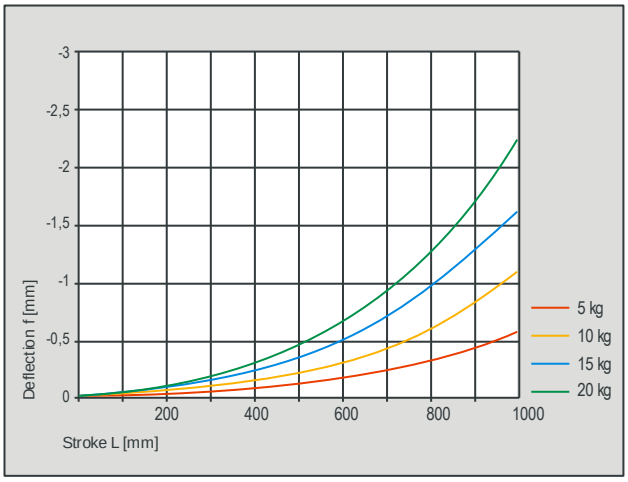



**Figure 21: Bending resistance module 90/15**

# 4 Maintenance

During the design of the linear module module 90/15, great importance was placed on the use of low-maintenance components. All roller elements were provided with lifetime lubrication in the factory.

The guide carriages are equipped with attached lubrication elements. This makes it possible to achieve a running performance of 10000 km with initial lubrication. In single-shift operation, this corresponds to nearly 5 years at a stroke of 500 mm and 20 cycles per minute.

Once the indicated running output is reached, the guide carriage can be re-lubricated with a special grease press (IEF-item no.: 1055123) using high-performance lubricant Dynalub 510 (see *Figure 22* and *Figure 23*).

**NOTE** Never use any grease that contains ester oils.

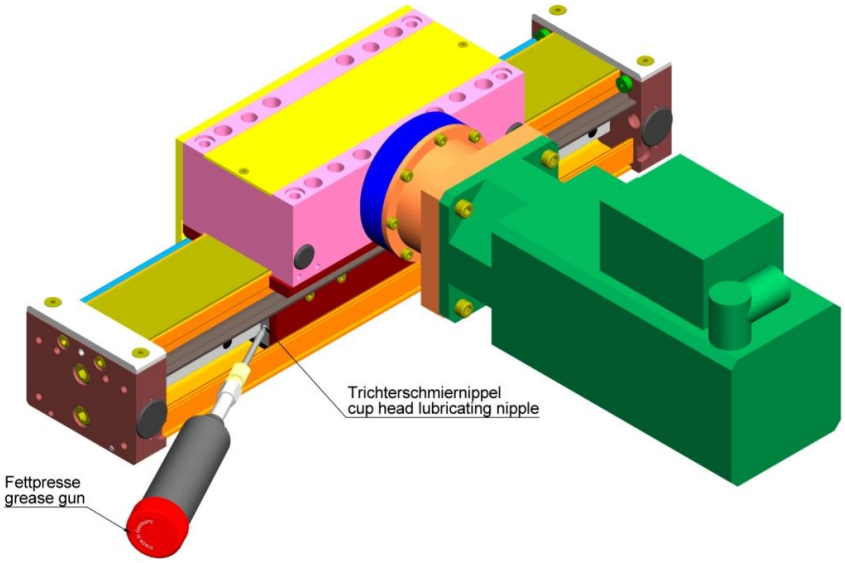



**Figure 22: Lubrication of the guide carriages (carriage without external lubrication)**

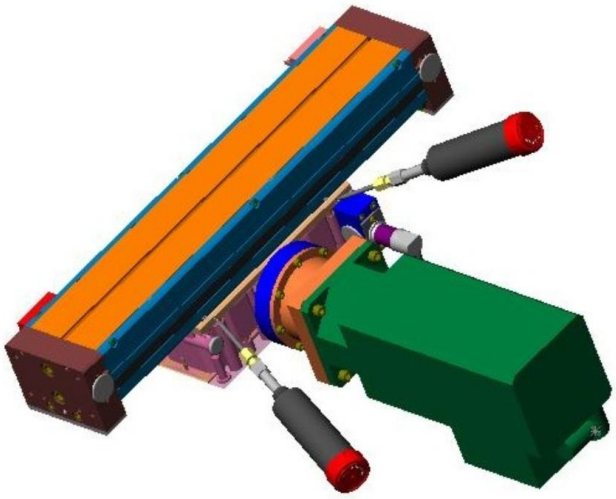


**Figure 23: Lubrication of the guide carriages (carriage with external lubrication)**

# 5 Troubleshooting

| Interference | Reason | Correction |
|---|---|---|
| Increased running noise | Nominal service life of guide carriage exceeded | Replace all guide carriages (see Z-item 220 in *Figure 26* to *Figure 29*, pages *28 and 29*). Check profile rail guide (see Z item 10.30 in *Figure 26* to *Figure 29*, pages *28 and 29*) for wear and replace if required. |
| | Profile rail guide worn or corroded. | Replace profile rail guide (see Z-item 10.30 in *Figure 26* to *Figure 29*, pages *28 and 29*). Replace all guide carriages (see Z item 220 in *Figure 26* to *Figure 29*, pages *28 and 29*). |
| | Too high deflector roll tension | Reduce tension |
| | Toothed disc bearing/deflector roll bearing defective | Replace bearing |
| | Drive toothed belt defective | Replace toothed belt (see Z item 280 in *Figure 26* to *Figure 29*, pages *28 and 29*) |
| | Motor (motor bearing) defective | Replace motor (see Z item 70 in *Figure 26* to *Figure 29*, pages *28 and 29*) |
| | Planetary gear defective | Replace planetary gear (see Z item 50 in *Figure 26* to *Figure 29*, pages *28 and 29*) |
| | Motor with brake, brake does not open correctly | Apply current to the brake, if the brake still does not open correctly, replace motor (see Z-item 70 in *Figure 26* to *Figure 29*, pages *28 and 29*) |
| Linear drive unit does not move | Limit switch cable not connected. | Connect the cable |
| | Limit switch defective | Replace limit switch (see Z item 400 and Z-item 360 in *Figure 26* to *Figure 29*, pages *28 and 29*) |
| | Limit switch cable defective | Check limit switch cable |
| | Solder connection on socket has come loose | Solder on wires |
| | Motor connected incorrectly | Check and change connector assignment, if required |
| | Motor defective | Replace motor (see Z item 70 in *Figure 26* to *Figure 29*, pages *28 and 29*) |
| | Error in power electronics or control unit | Check the power electronics or the control unit |

Troubleshooting, continued

| Interference | Reason | Correction |
|---|---|---|
| Linear drive unit does not move | Motor cable defective | Check motor cable, replace cable, if required |
| | Motor with brake, brake does not open | Connect brake or check brake connection. If brake defective, replace motor |
| | Clutch between motor and planetary gear slips | Clamp motor shaft in the planetary gear clutch (tighten clamping screw) |
| Reverse play too large | Deflection rolls not pre-tensioned | Tension deflection rolls |
| | Planetary gear defective | Replace planetary gear |
| | Planetary gear / motor attach-ment screws not tightened | Tighten screws |
| Linear drive unit moves mechanically against the stop during the reference run | Incorrect direction of rotation | Change motor direction of rotation |
| | Broken motor cable | Replace cable |

# 6 Repair

**WARNING**

**Always power down the system before starting repairs.**

**WARNING**

**Any repairs must only be performed by specialist personnel who have read and understood the operating instructions.**

**CAUTION**

Only use original replacement parts, otherwise IEF Werner GmbH will not accept any warranty.

## 6.1 Factory-setting of the toothed belt tension

**CAUTION**

Toothed belt tension:
The toothed belt tension is set ex works using the distance between the deflector rolls and must not be changed!

Toothed belt clamping screws
**Do not loosen!**

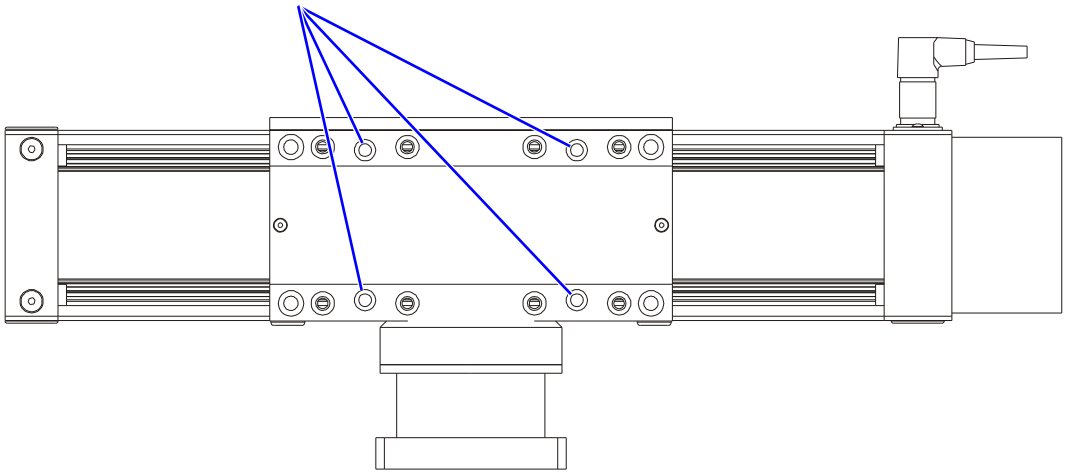


**Figure 24: Position of the toothed belt clamping screws**

If wear parts must be replaced (ball bearing), the distance at assembly of the deflector rolls must be re-created and the axes must be in parallel (see *Figure 25*)!

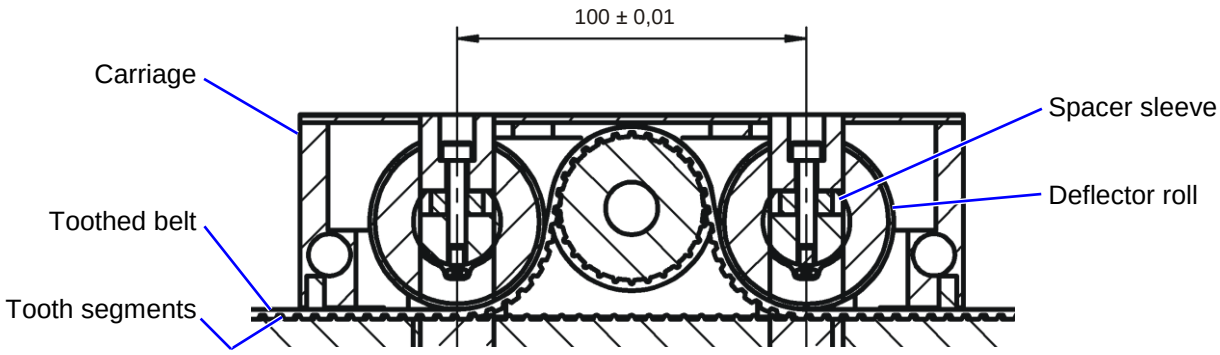



**Figure 25: Setting the deflector rolls**

Spacer sleeves in the carriage are used to vertically set the press-on pressure of the deflector rolls on the toothed belt and the rack (see *Figure* 25), while the attachment screw position (size 100) sets the toothed belt tension horizontally.

This size must be set at mounting!

# 7 Parts lists and drawings

## 7.1 Linear unit Module 90/15 (installation variants 1-4)

TG 1000338 (drawing see *Figure 26* to *Figure 29* on pages *28* to *29*)

| Drawing item | Article no. | Part (1) / subassembly (0) | E/V | Usage | Designation |
|---|---|---|---|---|---|
| 10.10 | 1021087 | 1 | | | Basic unit |
| 10.20 | 1021100 | 1 | | | Cover |
| 10.30 | 1021757 | 1 | * | | Guide rail |
| 12 | 1020923 | 1 | | | Carriage M90/15 complete |
| 13 | 626242 | 1 | | | Cylindrical screw DIN912 M6x50 |
| 15 | 626056 | 1 | | | Cylindrical screw DIN912 M6x16 |
| 20 | 734161 | 1 | | | Plastic cover D=16/12 |
| 30 | 1021010 | 1 | | | Gear flange TP004 |
| 40 | 627003 | 1 | | | Recessed-head screw DIN7991 M5x16 |
| 50 | | 1 | * | + | Flange planetary gear |
| 60 | 626061 | 1 | | | Cylindrical screw DIN912 M4x16 |
| 70 | | | * | + | Drive motor |
| 80 | | 1 | | + | Motor attachment screw |
| 90 | 025626 | 1 | | | Retaining plate |
| 100 | 626038 | 1 | | | Fillister head screw ISO7380 M3x8 |
| 110 | 725163 | 1 | | | Installation plug, round |
| 115 | 725164 | 1 | * | | Angle coupling |
| 120 | 626484 | 1 | | + | Cylindrical screw DIN912 M4x25 |
| 130 | 1021001 | 1 | | + | Adapter piece |
| 140 | 028668 | 1 | | | Plastic clip |
| 150 | 1030991 | 1 | | | Tapping screw DIN7981 C3.5 x 9.5 |
| 160 | 1021216 | 1 | | | Cylindrical screw DIN912 M4x32 |
| 180 | 626336 | 1 | | | Cylindrical pin DIN6325 6m6x12 |
| 190 | 1021030 | 1 | | | Carriage angle |
| 200 | 626483 | 1 | | | Cylindrical screw DIN912 M4x10 |
| 210 | 626328 | 1 | | | Cylindrical pin DIN6325 5m6x18 |
| 220 | 1029382 | 1 | * | | Guide carriage |
| 230 | 732284 | 1 | | | Plastic cover D=25/20.5 |
| 240 | 1021892 | 1 | | | End plate cpl. |
| 250 | 626256 | 1 | | | Cylindrical screw DIN912 M8x40 |
| 260 | 626333 | 1 | | | Cylindrical pin DIN6325 5m6x40 |

+ use depending on design
* Replacement or wear part

Table, continued

| Drawing item | Article no. | Part (1) / subassembly (0) | E/V | Usage | Designation |
|---|---|---|---|---|---|
| 270 | 1021089 | 1 | | + | Clamping segment 1 |
| 270 | 1021120 | 1 | | + | Clamping segment 2 |
| 280 | 1021376 | 1 | * | | Toothed belt |
| 290 | 626488 | 1 | | | Cylindrical screw DIN912 M5x12 |
| 300 | 1021091 | 1 | | | Tooth segment |
| 310 | 1020689 | 1 | | | Nut |
| 320 | 1045945 | 1 | | + | Slot nut |
| 325 | 1021123 | 1 | | + | Switching angle |
| 330 | 1021122 | 1 | | + | Switching cam right (limit switch installation variant 1 only) |
| 335 | 1021121 | 1 | | + | Switching cam left (limit switch installation variant 1 only) |
| 350 | 626058 | 1 | | + | Cylindrical screw DIN912 M5x25 (limit switch installation variant 1 only) |
| 360 | 1020889 | 1 | * | + | Position switch (limit switch installation variant 1 only) |
| 370 | 726449 | 1 | | + | Cable screw (limit switch installation variant 1 only) |
| 380 | 626479 | | | + | Recessed-head screw DIN7991 M4x12 (limit switch installation variants 1+3) |
| 390 | 1021027 | | | + | Button retention plate (limit switch installation variant 1 only) |
| 395 | 1021029 | | | + | Switching plate (limit switch installation variant 3 only) |
| 400 | 025165 | | | + | Inductive switch |
| 402 | 626176 | | | + | Threaded pin DIN913 M4x5 |
| 405 | 030887 | | | + | Special screw M4x7 |
| 410 | 028585 | | | + | Limit switch holder |
| 420 | 028668 | | | + | Plastic clip |
| 430 | 1020920 | | | + | Switching strip (limit switch installation variant 2 only) |
| 440 | 626061 | | | + | Cylindrical screw DIN912 M4x16 (limit switch installation variant 2 only) |
| 450 | 1024021 | | | + | Centring ring |
| 460 | 1028704 | 1 | | | Funnel lubrication nipple |
| 470 | 1031602 | 1 | * | | O-Ring |
| 480 | 627562 | 1 | | | Steel ball |

+ use depending on design
* Replacement or wear part

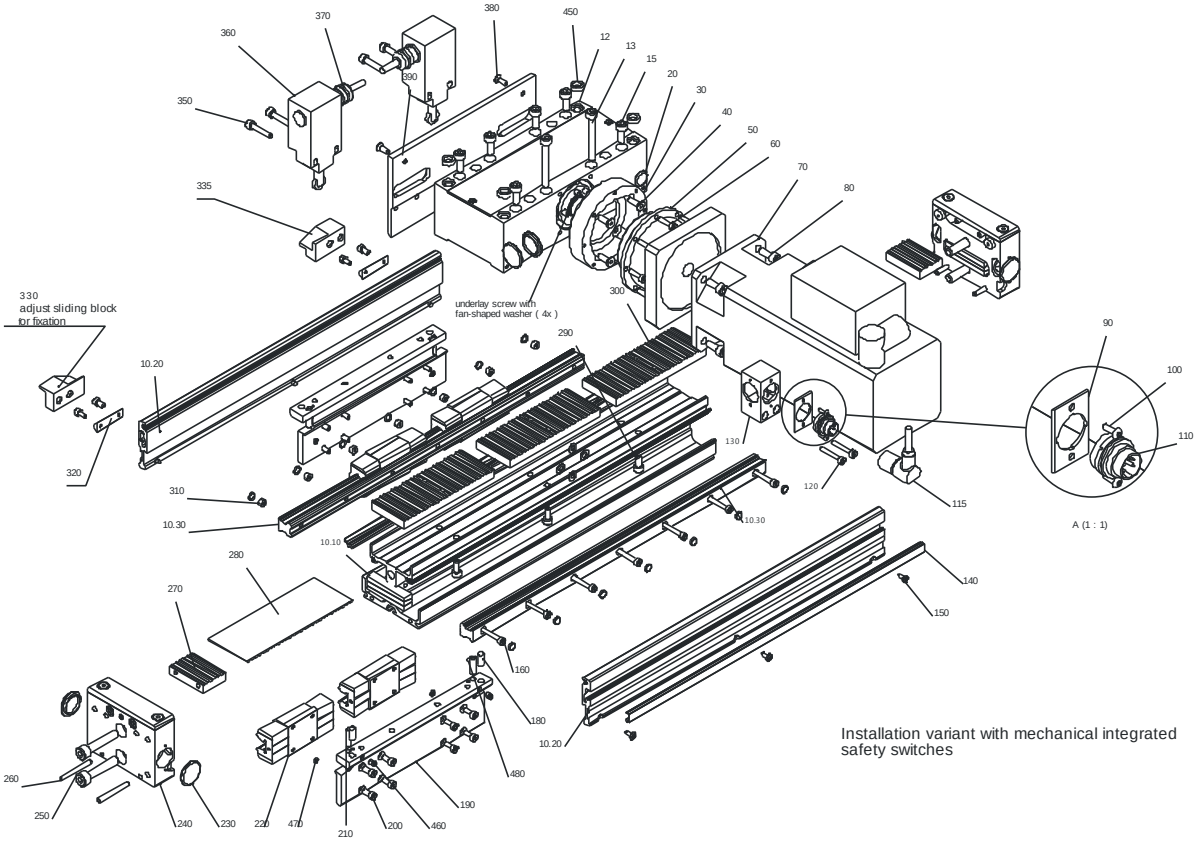



**Figure 26: Module 90/15, exploded drawing installation variant 1**

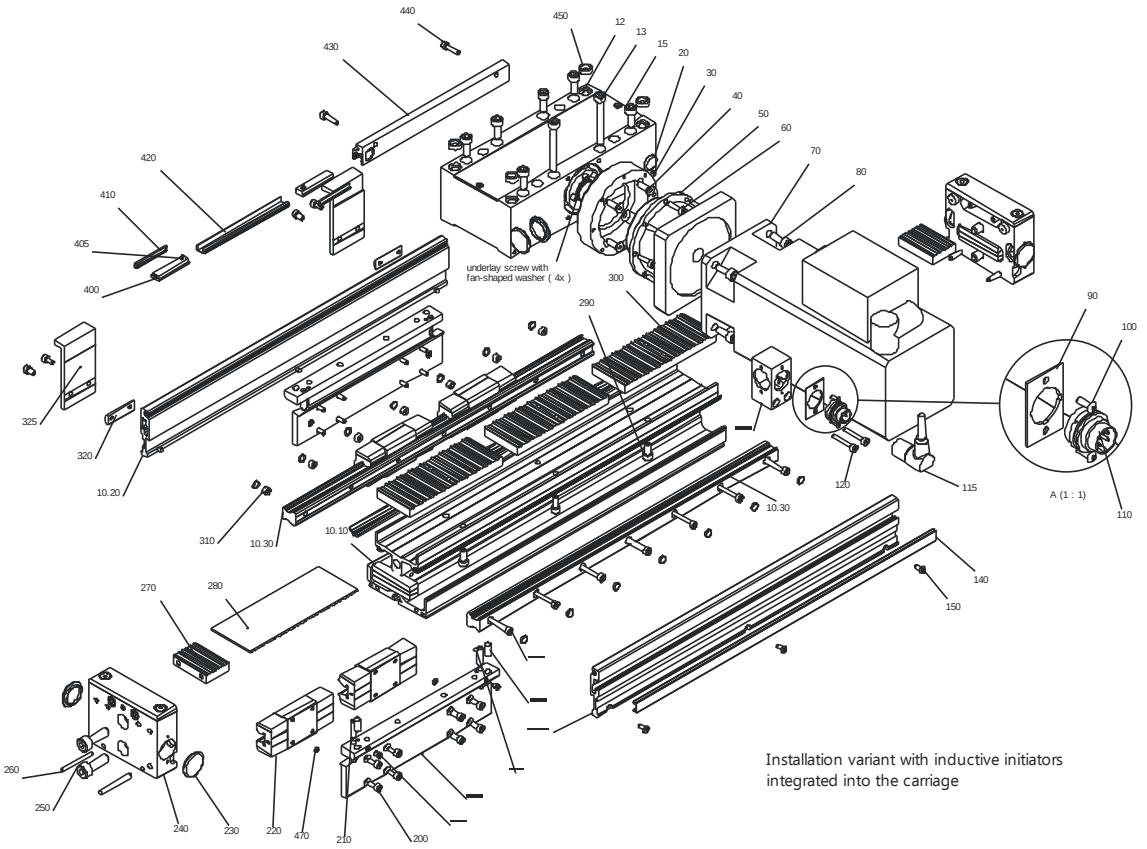



**Figure 27: Module 90/15, exploded drawing installation variant 2**

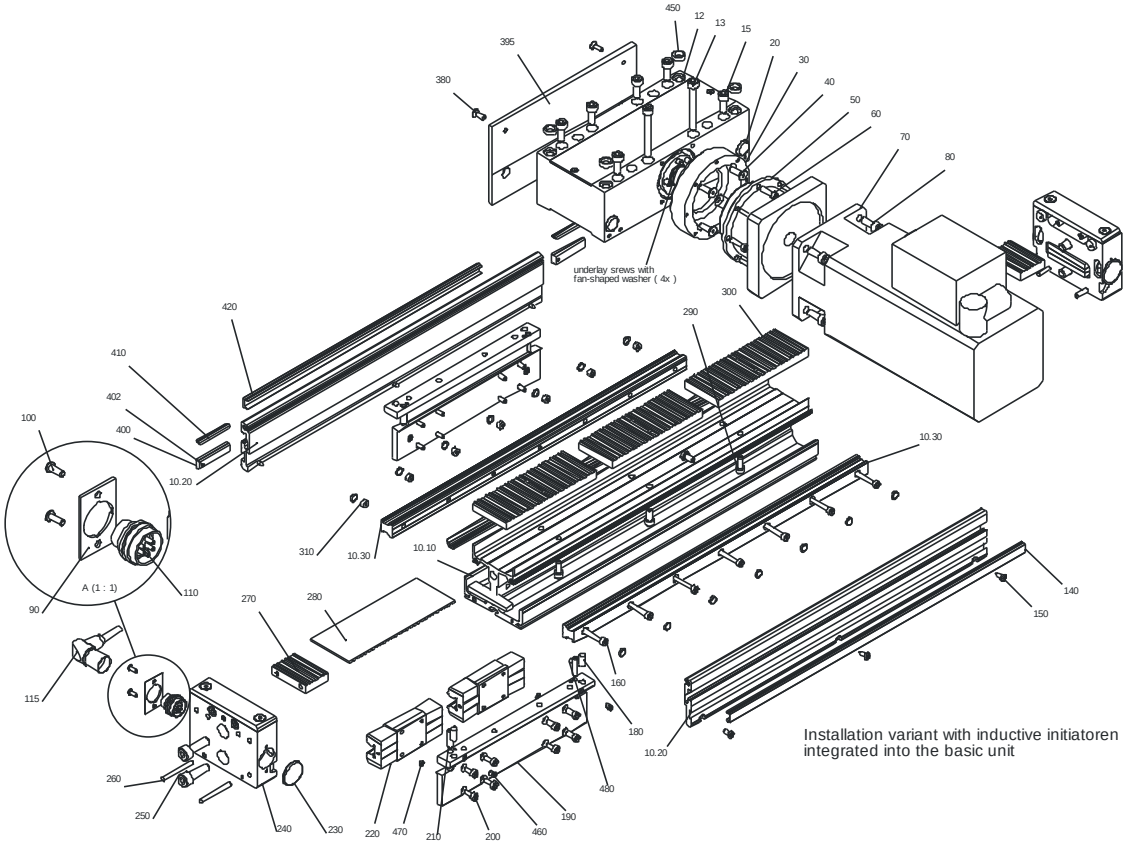



**Figure 28: Module 90/15, exploded drawing installation variant 3**

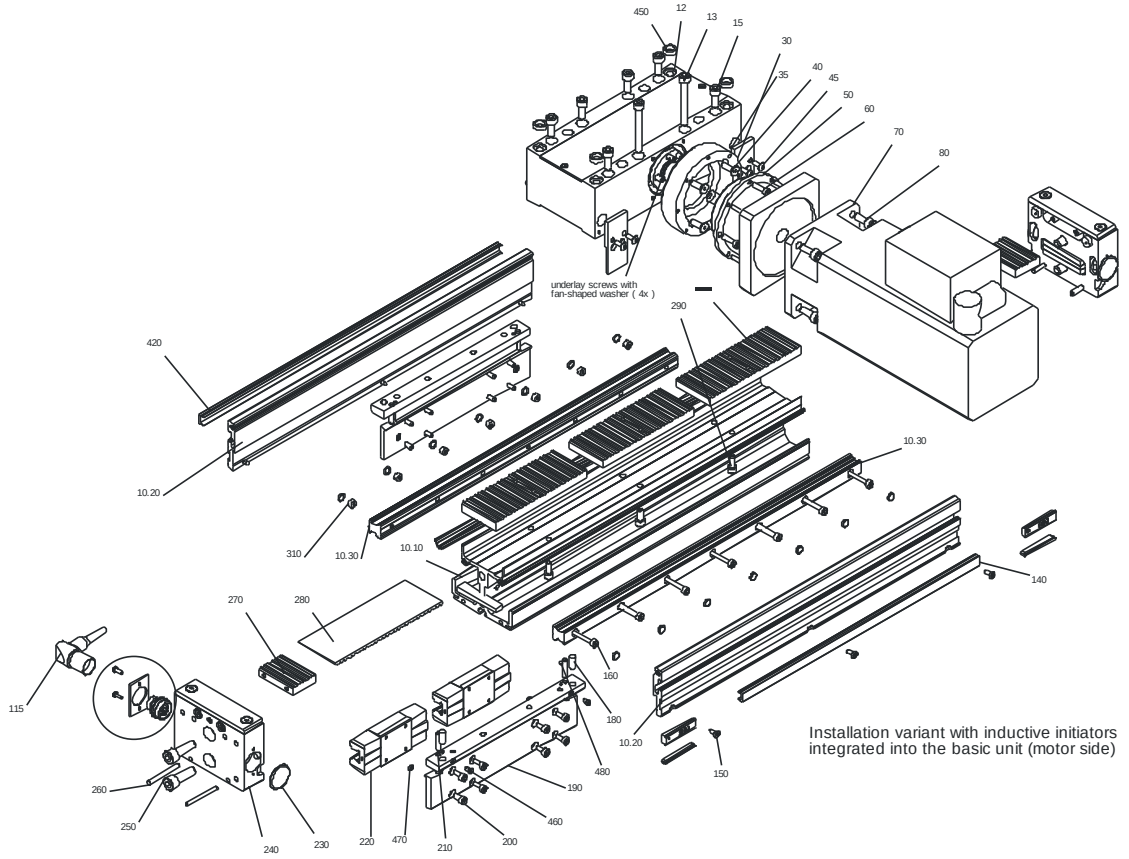



**Figure 29: Module 90/15, exploded drawing installation variant 4**

## 7.2 Carriage module 90/15 complete

Article no.: 1020923 (see *Figure 30*).

| Drawing item | Article no. | Part (1) / subassembly (0) | Designation |
|---|---|---|---|
| 10 | 1020924 | 1 | Carriage body |
| 20 | 1020927 | 1 | Cover sheet |
| 30 | 626491 | 1 | Cylindrical screw DIN912 M5x30 |
| 40 | 626115 | 1 | Cylindrical screw DIN7991 M3x8 |
| 50 | 1023812 | 1 | Lubrication felt |
| 60 | 1020930 | 1 | Deflection unit |
| 70 | 1020928 | 1 | Drive unit |

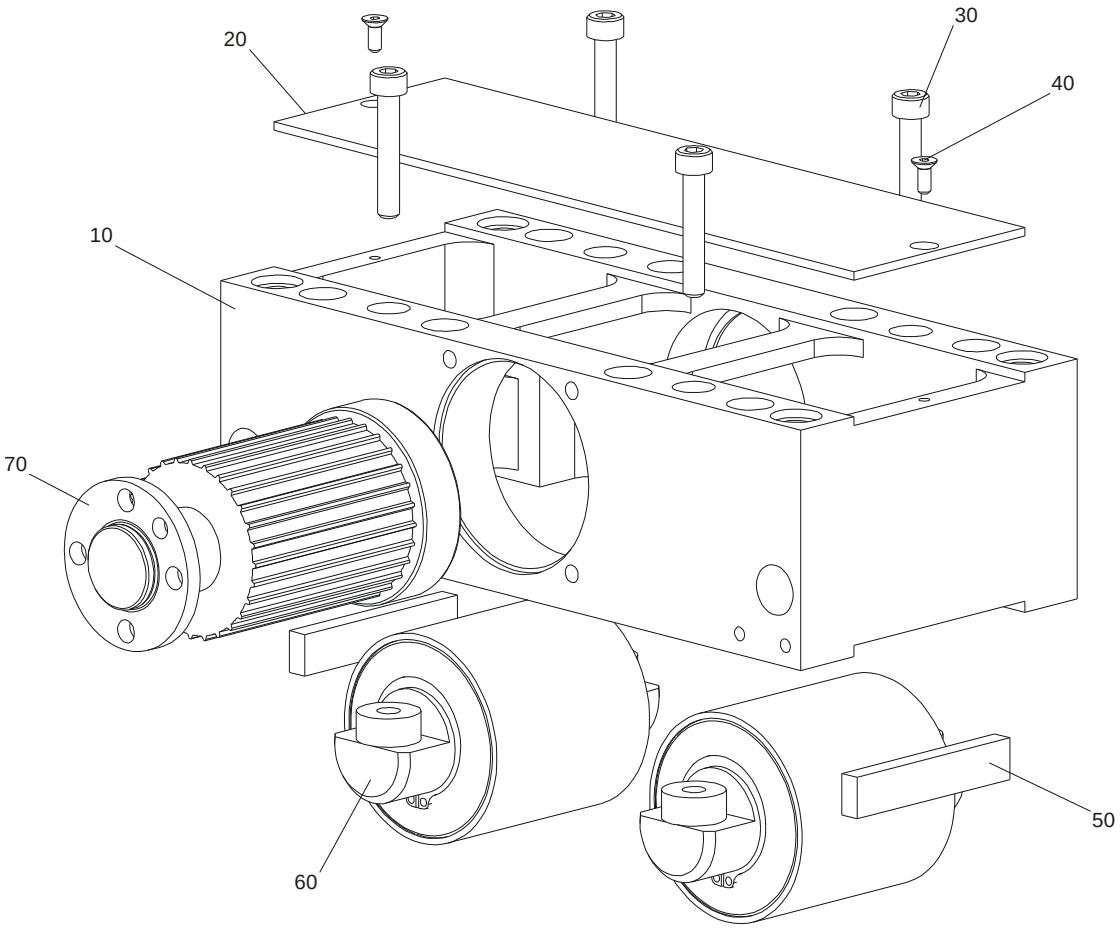



**Figure 30: Carriage, complete**

## 7.3 End plate module 90/15 complete

Article no.: 1021892 (see *Figure 31*)

| Drawing item | Article no. | Part (1) / subassembly (0) | Designation |
|---|---|---|---|
| 10 | 627003 | 1 | Cylindrical screw DIN7991 M5x16 |
| 20 | 1021083 | 1 | Clamping plate |
| 30 | 026481 | 1 | Dampener |
| 40 | 1021031 | 1 | End-plate |
| 50 | 626057 | 1 | Cylindrical screw DIN912 M5x20 |
| 60 | 1021085 | 1 | Threaded pin |
| 70 | 1023812 | 1 | Lubrication felt |

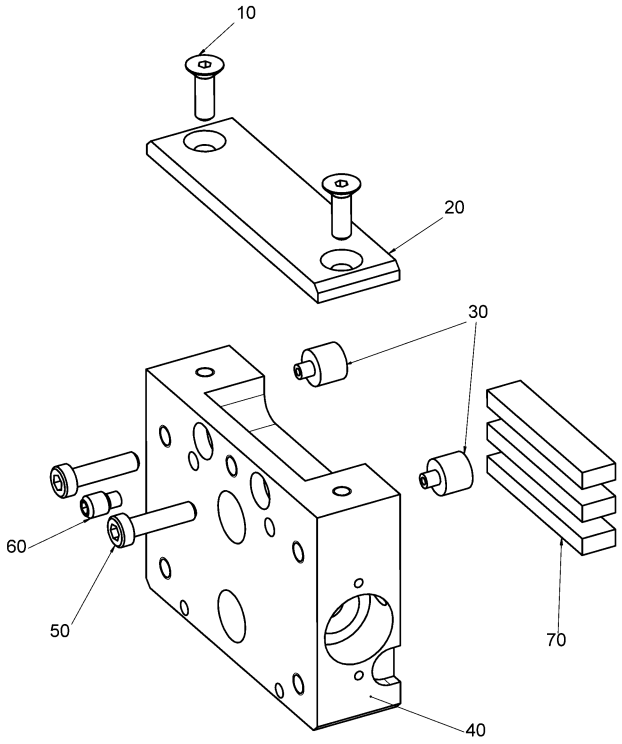



**Figure 31: End plate complete**

## 7.4 Special versions

### 7.4.1 Module 90/15 with integrated rotating unit

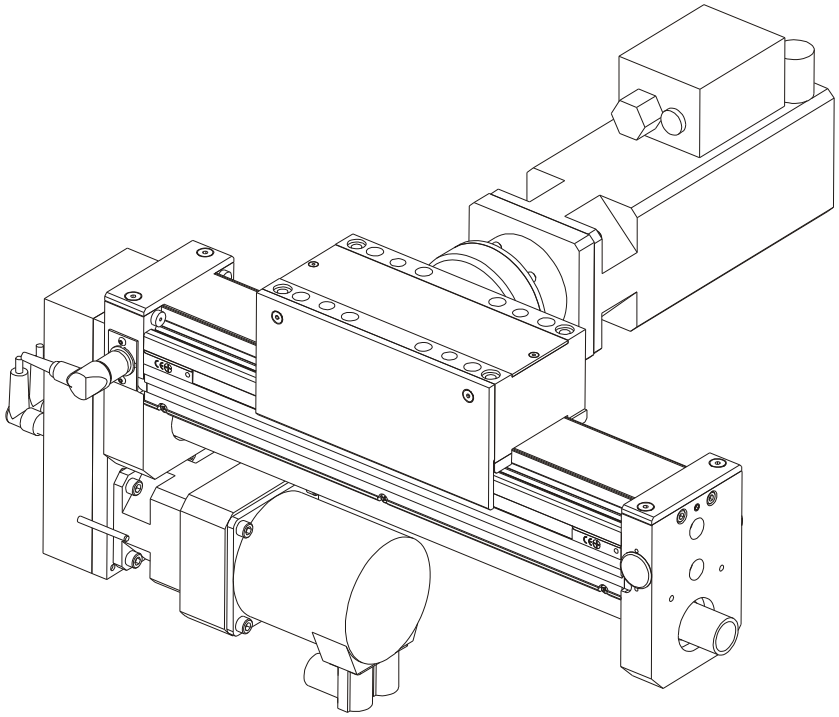


**Figure 32: Module 90/15 with integrated rotating unit**

7.4.1.1 Technical data of rotating unit

- Rotating angle 0 to 440 degrees, limited mechanically and via inductive proximity switches PNP-normally closed contact
- Hollow shaft with inner diameter 20 mm to guide through hoses and cables

This page was kept empty on purpose!

7.4.1.2 Assembly set rotating unit

Article no.: 1023805 (drawing see *Figure 33, page 35*).

| Drawing item | Article no. | Part (1) / subassembly (0) | E/V | Usage | Designation |
|---|---|---|---|---|---|
| 10 | 1023806 | 1 | | | Bearing plate rotating unit cpl. |
| 20 | 029281 | 1 | | | Flange plate drive |
| 30 | 029283 | 1 | | | Cover rotating unit |
| 40 | 733639 | 1 | * | | Groove ball bearing DIN625 6305.2RSR |
| 50 | 029282 | 1 | | | Disc drive unit easyLINE |
| 60 | 029288 | 1 | | | Toothed disc St21,0 AT5/32-2 |
| 70 | 733640 | 1 | | | Groove nut GUK05-M25x1.5 |
| 75 | 626056 | 1 | | | Cylindrical screw DIN912 M6x16 |
| 80 | 725611 | 1 | * | | Toothed belt 16AT5/280 |
| 90 | 330021 | 1 | * | | Cylindrical inductive initiator |
| 95 | 626233 | 1 | | | Cylindrical screw DIN912 M5x45 |
| 100 | 029285 | 1 | | | Switching vane |
| 110 | 732770 | 1 | | | Clamping set 16/32 |
| 120 | 029289 | 1 | | | Toothed disc St20,0 AT5/20-0 |
| 130 | 029290 | 1 | | | Motion link for rotating unit |
| 140 | 732724 | 1 | | + | Planetary gear PL70 i=10:1 |
| 150 | | 1 | | + | Drive motor |
| 160 | 029286 | 1 | | | Shaft for rotating unit |
| 170 | 627215 | 1 | | | Retention ring DIN472 |
| 180 | 626562 | 1 | * | | Groove ball bearing DIN625 6005.2RSR |
| 190 | 1023804 | 1 | | | End plate rotating unit cpl. |

+ use depending on design
* Replacement or wear part

**CAUTION**

Please additionally observe the wear parts lists included with the delivery according to the order

7.4.1.3 Module 90/15 with rotating unit/exploded drawing

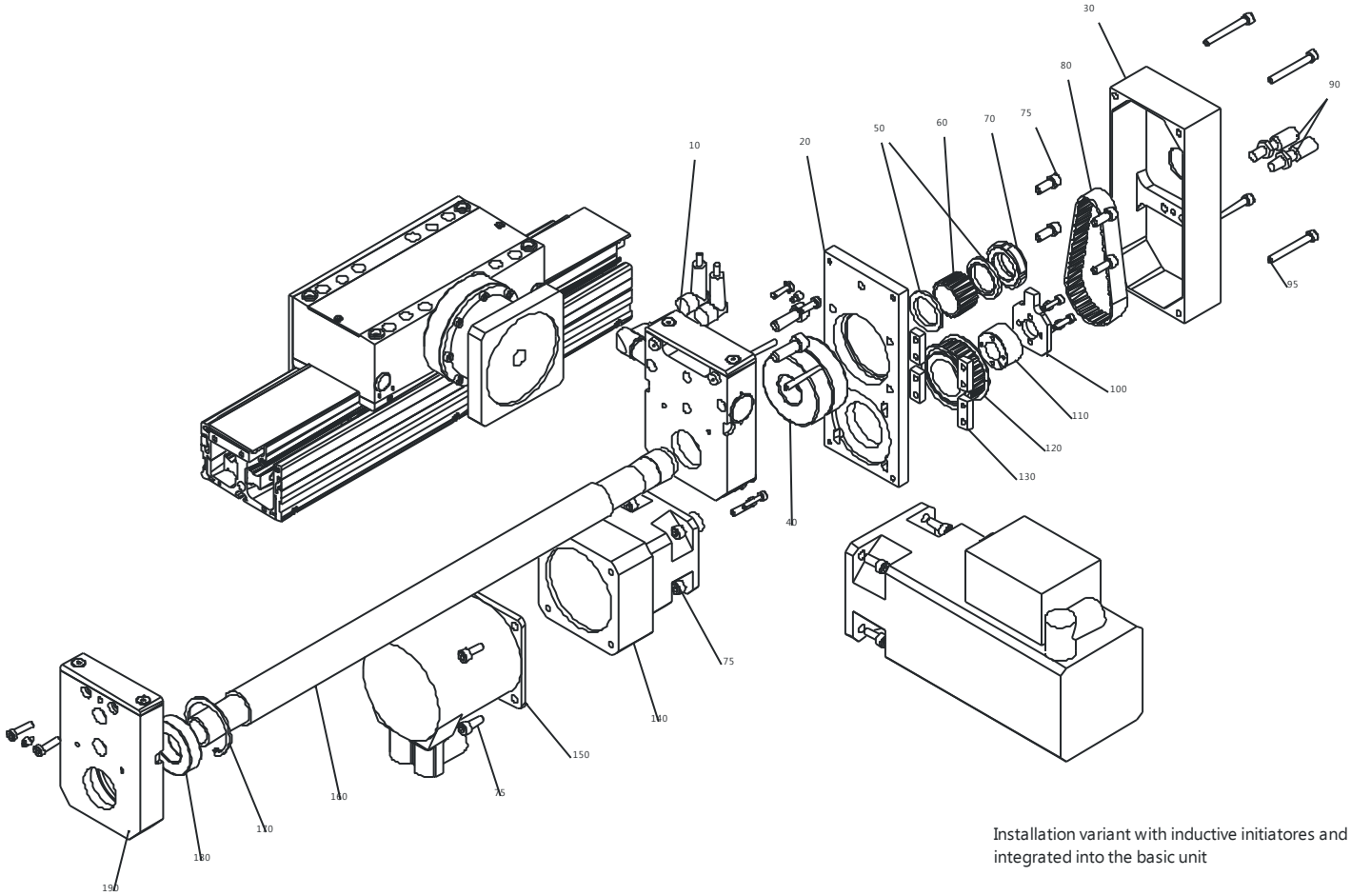



**Figure 33: Module 90/15 with rotating unit**

7.4.1.4 Installation variant 5 with integrated rotating unit

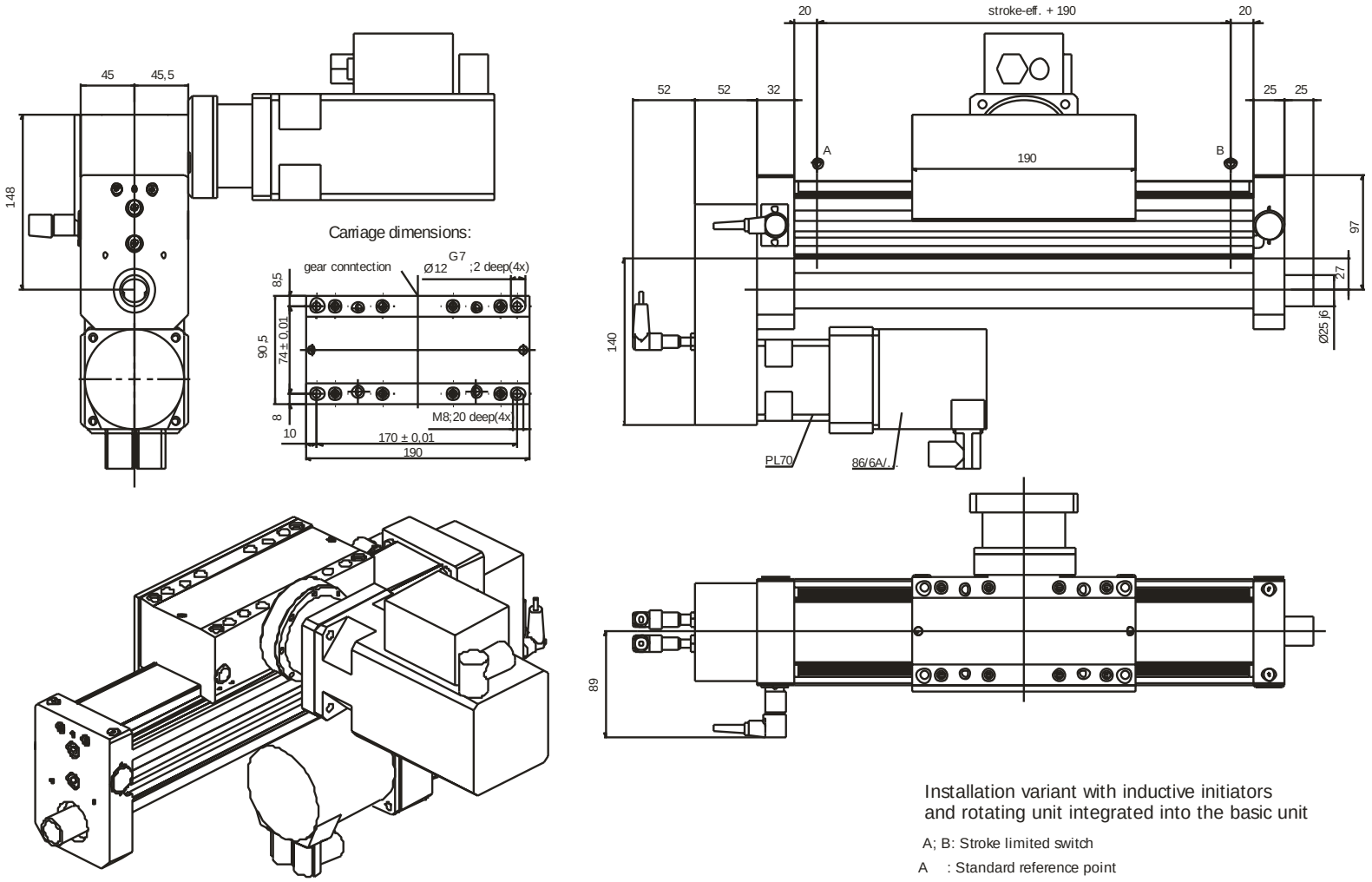



**Figure 34: Module 90/15 installation variant 5 with integrated rotating unit**

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### 7.4.2 Module 90/15 in telescopic version

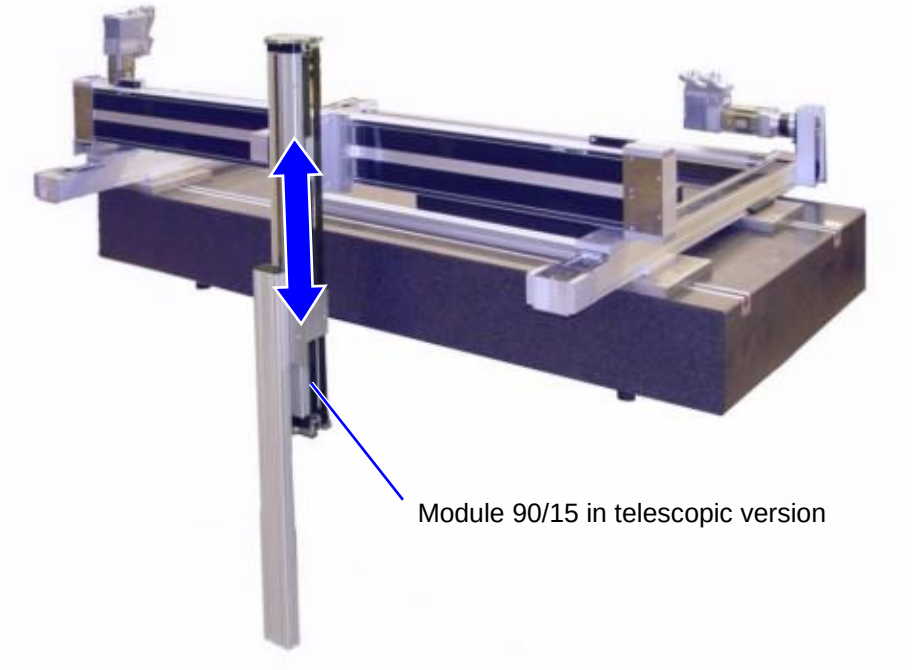


**Figure 35: Module 90/15 in telescopic version**

7.4.2.1 Technical data

- Stroke to 1400 mm
- Repetition accuracy ± 0,05 mm
- Load up to 5 kg

7.4.2.2 Mounting set telescopic axis

TG no.: 1000817 (drawing see *Figure 36, page 41*).

| Drawing item | T/TG no. | Part (1) / subassembly (0) | E/V | Usage | Designation |
|---|---|---|---|---|---|
| 250 | 1041372 | 1 | | | Deflection plate left |
| 260 | 1041365 | 1 | | | Deflection plate right |
| 270 | 1041363 | 1 | | | Connection plate |
| 280 | 1041362 | 1 | | | Attachment angle |
| 290 | 1041361 | 1 | | | Guide plate |
| 300 | 1041387 | 1 | | | Stop plate |
| 310 | 1021376 | 1 | * | | Toothed belt 49ATL5 with E-wire 0.60 mm |
| 320 | 1021376 | 1 | * | | Toothed belt 49ATL5 with E-wire 0.60 mm |
| 330 | 1041374 | 1 | * | | Deflector roll |
| 340 | 1041377 | 1 | * | | Deflection shaft |
| 350 | 626562 | 1 | * | | Groove ball bearing DIN625, type: 6005.2RSR |
| 360 | 627012 | 1 | | | Retention ring, DIN 471, type:25x1.2 |
| 370 | 1041368 | 1 | | | Belt receptacle |
| 380 | 1000814 | 0 | * | | Guide rail |
| 390 | 1029382 | 1 | * | | Guide carriage |
| 400 | 1021419 | 1 | | | Slot nut, type: 80/160/15 |
| 410 | 731466 | 1 | | | Slot nut, zinc-plated, type: 5 St/M4 |
| 420 | 1000831 | 0 | | | Item 80x40 light |
| 430 | 1041373 | 1 | | | Alignment holder |
| 440 | 10411386 | 1 | | | End-plate |
| 450 | 1024021 | 1 | | | Centring ring, type: Module 90/15 |
| 460 | 1041390 | 1 | | | Carriage |
| 470 | 1041571 | 1 | | | Switch strip |
| 480 | 1041568 | 1 | | | Attachment angle |
| 490 | 1041569 | 1 | | | Spacer block |
| 500 | 1041572 | 1 | | | Adapter piece |
| 510 | 732284 | 1 | | | Plastic cover D025/20.5 sw, type GPN910/766 |
| 520 | 25626 | 1 | | | Retaining plate |

+ use depending on design
* Replacement or wear part

Table, continued

| Drawing item | T/TG no. | Part (1) / subassembly (0) | E/V | Usage | Designation |
|---|---|---|---|---|---|
| 540 | 1041385 | 1 | | | Spacer sleeve |
| 550 | 26481 | 1 | | | Dampener green PUR 80 Shore |
| 560 | 627122 | 1 | | | Headed drill bush, DIN 172, type: A6x10 |
| 570 | 25165 | 1 | | | Induction switch PNP normally closed contact, type: IKF05BADKX-62602 |
| 571 | 28585 | 1 | | | Limit switch holder type easyLINE |
| 572 | 30887 | 1 | | | Special screw M4x7 with inner hexagon |
| 580 | 28668 | 1 | | | Plastic clip easyLINE |
| 590 | 626062 | 1 | | | Cylindrical pin, zinc-plated, DIN 912, type:M4x12 |
| 600 | 626061 | 1 | | | Cylindrical pin, zinc-plated, DIN 912, type:M4x16 |
| 610 | 626763 | 1 | | | Cylindrical pin, zinc-plated, DIN 912, type:M4x40 |
| 620 | 626135 | 1 | | | Cylindrical pin, zinc-plated, DIN 7991, type:M5x16 |
| 630 | 626141 | 1 | | | Cylindrical pin, zinc-plated, DIN 7991, type:M6x10 |
| 640 | 626056 | 1 | | | Cylindrical pin, zinc-plated, DIN 912, type:M6x16 |
| 660 | 626143 | 1 | | | Cylindrical pin, zinc-plated, DIN 7991, type:M6x10 |
| 670 | 626043 | 1 | | | Cylindrical pin, zinc-plated, DIN 912, type:M8x20 |
| 680 | 626995 | 1 | | | Cylindrical pin, zinc-plated, DIN 7991, type:M8x20 |
| 690 | 626259 | 1 | | | Cylindrical pin, zinc-plated, DIN 912, type:M8x5 |
| 700 | 626038 | 1 | | | Cylindrical pin, zinc-plated, DIN 7380 |
| 710 | 626988 | 1 | | | Cylindrical pin, DIN 6325, type: 6m6x32 |
| 720 | | 1 | | | Slot nut |

+ use depending on design
O Replacement or wear part

### 7.4.2.3 Telescopic axis 90/15, exploded drawing

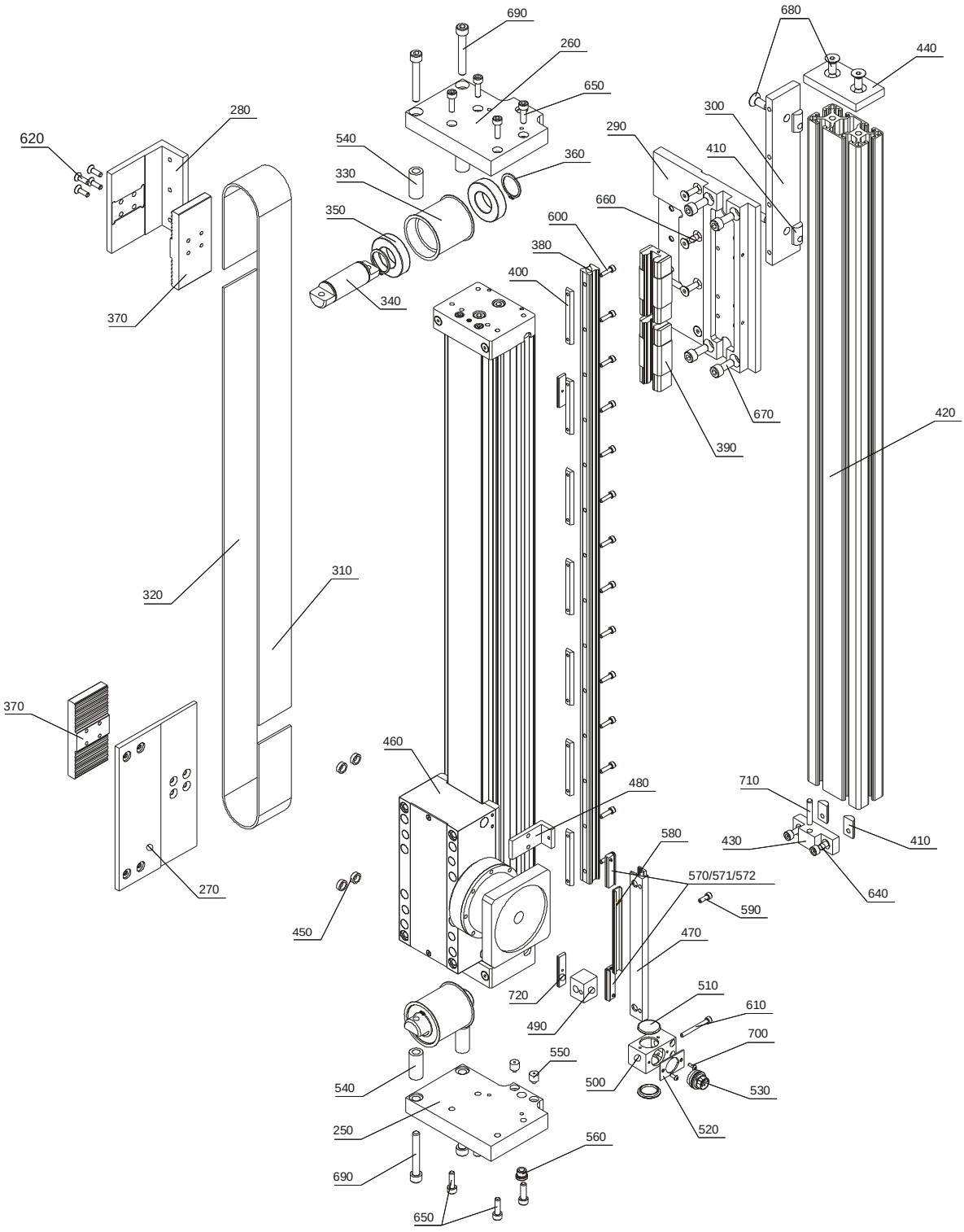


**Figure 36: Telescopic axis 90/15**

### 7.4.2.4 Telescopic axis 90/15, dimensions

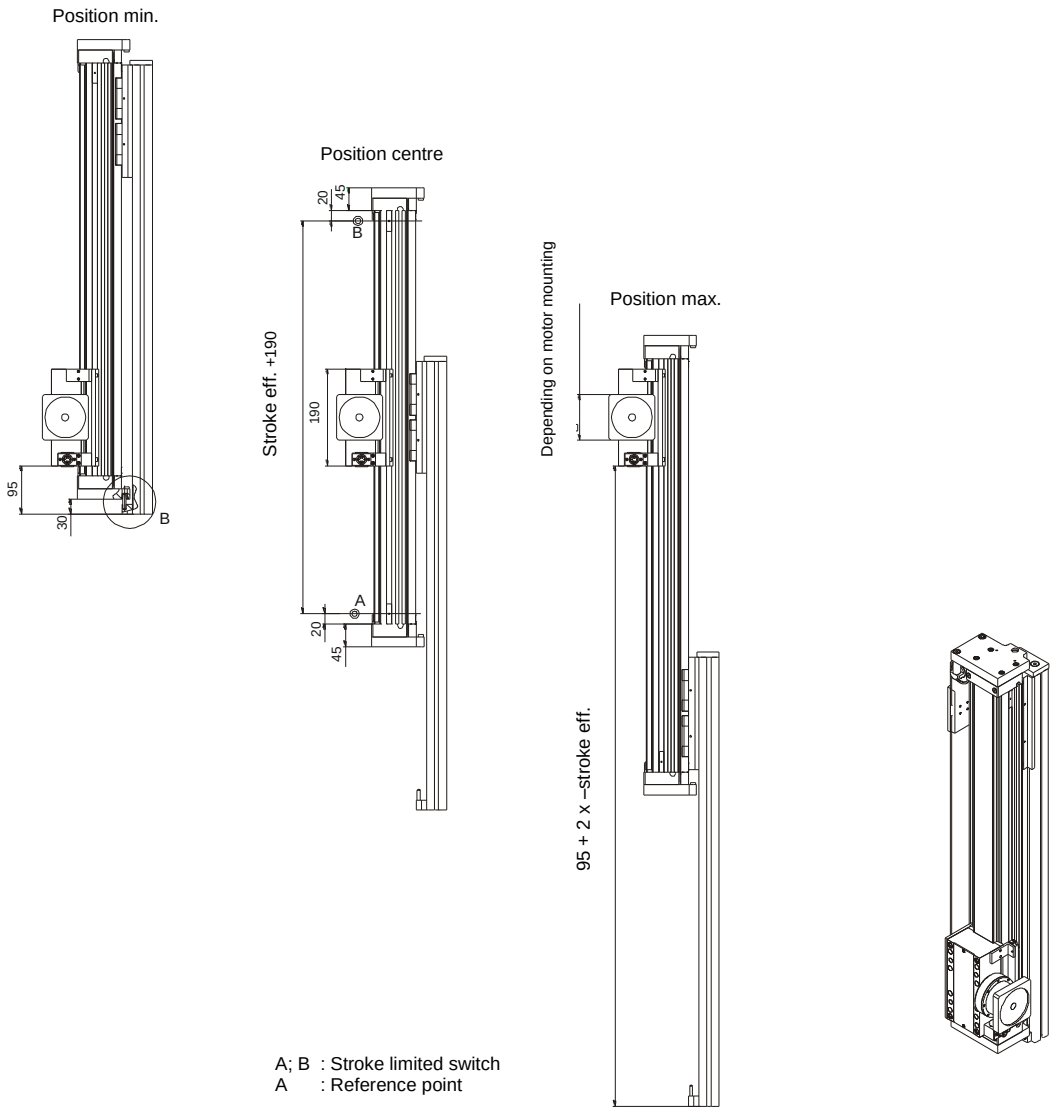


**Figure 37: Telescopic axis 90/15, dimensions**

# 8 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/partial machine):

| Designation | IEF Werner parts group number |
|---|---|
| Module 90/15 | TG1000398 |

where possible based on the scope of delivery, correspond 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**.

The incomplete machine also corresponds to the following further directives:

Directive **2004/108/EC** of the council, dated 15 December 2004, for harmonisation of the legal provisions of the member states on electromagnetic compatibility.

Directive **2006/95/EC** of the council, dated 12 December 2006, for harmonisation of the legislation of the member states regarding electrical equipment for use within specified voltage thresholds.

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:
EN ISO 12100-1,-2 / EN ISO 13857 / EN ISO 13850 / EN 60201-1

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 of the documentation officer: Frank Reichelt, technical editor

Address of the documentation officer: see manufacturer's address

Furtwangen, 06 February 2010

Manfred Bär (manager)