

Operating Manual

Modul 115/42

Edition 04/2006

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Manufacturer's Declaration

according to the EC Machinery Directive

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We herewith declare that the following product:

| Designation | Parts Group |
|--------------|-------------|
| Modul 115/42 | 1000901 |

is intended for installation in a machine and that putting into operation is not allowed before it is found that the machine in which this product is to be installed complies with the provisions of the EC Directive 98/37/EC of June 22, 1998.

Applicable harmonized standards are:

ISO 12100-1 : 04-2004

ISO 12100-2 : 04-2004

EN 294



Furtwangen, April, 2006

(Manfred Bär, Managing Director)

1 Safety

1.1 Definition of the Alerts



WARNING

Indicates a potentially hazardous situation. Disregarding the safety regulations can result in serious injuries or death.



CAUTION

Indicates a potentially hazardous situation. Disregarding the safety regulations can result in material damage or injuries.

NOTE Offers additional information.

1.2 General Safety Instructions



WARNING

The system has to be de-energized for all installation, disassembly or repair work. High risk of injuries!



CAUTION

Motor connectors may not be inserted or disconnected under live condition. Risk of burning of the contacts.



CAUTION

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



CAUTION

During operation, the heating of the motor, in particular of stepper motors, can cause the burning of the skin when touching the motor.

Install a protective device!

1.3 Special warning



In addition to the notes, warnings and cautions referred to above you will also find the adjacent symbol in the Operating Manual. The risk of crushing of limbs exists at this position.

NOTE Observe the Manufacturer's Declaration

1.4 Manufacturer's Declaration

For safe operation of the components please observe following abridgement of the manufacturer's declaration:

- The putting into operation of the linear module is prohibited until it is determined that the machine in which it is to be installed complies with the provisions of the EC Directive 98/37/EC dated June 22, 1998 or the corresponding national standards and the conformity with the Machinery Directive was determined by the manufacturer of the overall equipment or the agency that will be putting it into circulation.

2 Areas of Application

The module 115/42 linear unit (see *Figure 1. page 9*) was designed for applications in handling technology. The use of a high-quality guide ensures high dynamics and good running characteristics. The toothed belt protects the internal guide system from dirt. In addition, the guide elements have special seals which protect the guideways from coarse dirt. If the linear unit is used in a contaminated surrounding area it is recommended to cover the toothed additionally by a masking tape. are available.

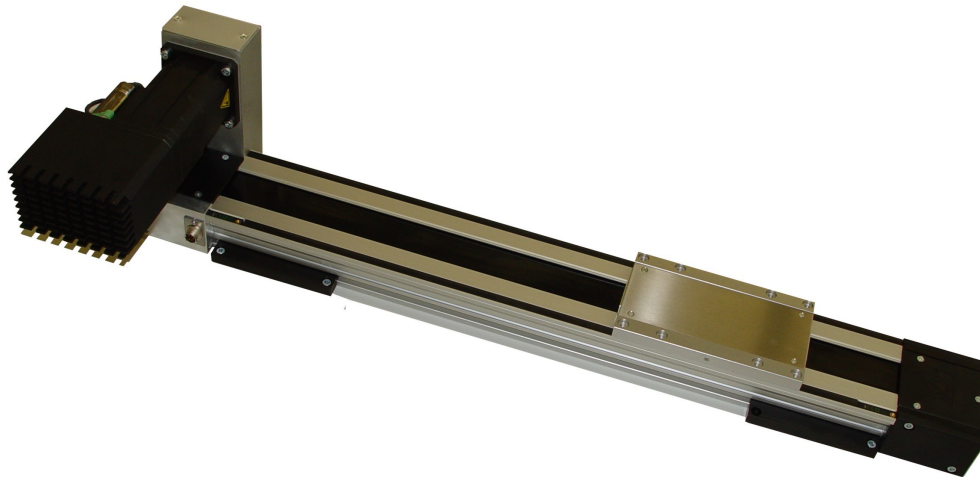


Figure 1: Modul 115/42

The fields of application for the module 115/42 are correspondingly versatile. They range from stop adjustments in the timber industry, component insertion systems for SMD components, insertion and pressing-in processes in precision engineering, loading and unloading stations of machine tools to manipulators for the packaging industry. The module 115/42 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. In special fields of application, such as the chemical or food industry or in explosive atmospheres, the use of the linear module without additional measures is not possible. In case of doubt, consult the manufacturer.

3 Installation

3.1 Installation Position

The linear unit Modul 115/42 can either be horizontally or vertically mounted.



CAUTION

If you mount the Modul 115/42 vertically, only use motors with a spring power brake to avoid the trolley dropping down when the electrical supply is switched off.

3.2 Technical Data of Module 115/42

| Parameter | Value |
|--|---|
| Repetition accuracy | +/- 0,05 mm |
| Weight (without motor at 0 mm stroke) | 8,85 |
| Weight increase per 100 mm stroke | 0,95 |
| Maximum movement speed | 5 m/s |
| Maximum acceleration | 40 m/s ² |
| Maximum transferable feed force with maximum movement speed (5 m/s) | 1278 N |
| Maximum torque Mx | 150 Nm |
| Maximum torque My | 80 Nm |
| Maximum torque Mz | 150 Nm |
| Carrying capacity C1 | 2000 N |
| Carrying capacity C2 | 800 N |
| Guide rigidity x | <i>See Figur 8: Deflection Diagram, page 14</i> |
| Geometrical moment of inertia of profile cross-section at center of gravity: | |
| I_x | 677502 mm ⁴ |
| I_y | 1868985 mm ⁴ |

Figure 2: Technical Data

3.3 Technical Data when Using a Planetary Gearbox

| Gearbox types | Single-stage x :1 | Torsional play, single-stage (arcmin) | Two-stage x :1 | Torsional play, two-stage (arcmin) | Three-stage x :1 | Torsional play, three-stage (arcmin) |
|------------------|----------------------|---|---|--|---|--|
| TP 004 MF 1 | 5; 7; 10 | < 5 | 21; 31; 61; 91 | < 5 | ----- | ----- |
| PLF 64 HP | 4; 5; 8 | < 3 | 16; 20; 25; 32; 40; 64 | < 5 | ----- | ----- |
| PLFE 64 | 3; 4; 5; 8 | < 20 | 9; 12; 15; 16; 20; 25; 32; 40; 64 | < 25 | ----- | ----- |
| PLE 60 | 3; 4; 5; 8 | < 20 | 9; 12; 15; 16; 20; 25; 32; 40; 64 | < 25 | 60; 80; 100; 120; 160; 200; 256; 320; 512 | < 30 |
| WPLE 60 | 3; 4; 5; 8 | < 30 | 9; 12; 15; 16; 20; 25; 32; 40; 64 | < 35 | 60; 80; 100; 120; 160; 200; 256; 320; 512 | < 40 |
| PLE 80 | 3; 4; 5; 8 | < 12 | 9; 12; 15; 16; 20; 25; 32; 40; 60 | < 17 | 60; 80; 100; 120; 160; 200; 256; 320; 512 | < 22 |
| WPLE 80 | 3; 4; 5; 8 | < 25 | 9; 12; 15; 16; 20; 25; 32; 40; 64 | < 30 | 60; 80; 100; 120; 160; 200; 256; 320; 512 | < 35 |
| PLS 70 OP 11 | 3; 4; 5; 8; 10 | < 3 | 12; 15; 16; 20; 25; 32; 40; 64; 100 | < 5 | ----- | ----- |
| WPLS 70 OP 11 | 4; 5; 8; 10 | < 5 | 16; 20; 25; 32; 40; 64; 100 | < 7 | ----- | ----- |
| PLS 90 OP 11 | 3; 4; 5; 8; 10 | < 3 | 12; 15; 16; 20; 25; 32; 40; 64; 100 | < 5 | ----- | ----- |
| WPLS 90 OP 11 | 4; 5; 8; 10 | < 5 | 16; 20; 25; 32; 40; 64; 100 | < 7 | ----- | ----- |

Figure 3: Gear types

3.4 Recommended input speeds



CAUTION

When using a planetary gearbox, attention must be paid to the recommended input speeds (**specification in rpm**).

3.4.1 Table recommended input speeds

| Gearbox types | Single-stage [rpm] | Two-stage [rpm] | Three-stage [rpm] |
|---------------|--------------------|-----------------|-------------------|
| TP 004 MF 1 | 3300 | 4000 | ----- |
| PLF 64 HP | 5500 | 5500 | ----- |
| PLFE 64 | 4000 | 4000 | ----- |
| PLE 60 | 4000 | 4000 | 4000 |
| WPLE 60 | 3000 | 3000 | 3000 |
| PLE 80 | 4000 | 4000 | 4000 |
| WPLE 80 | 3000 | 3000 | 3000 |
| PLS 70 OP 11 | 5000 | 5000 | ----- |
| WPLS 70 OP 11 | 3000 | 3000 | ----- |
| PLS 90 OP 11 | 4500 | 4500 | ----- |
| WPLS 90 OP 11 | 2500 | 2500 | ----- |

Figure 4: recommended input speeds

3.5 Load Cases

3.5.1 Torques and Load Cases

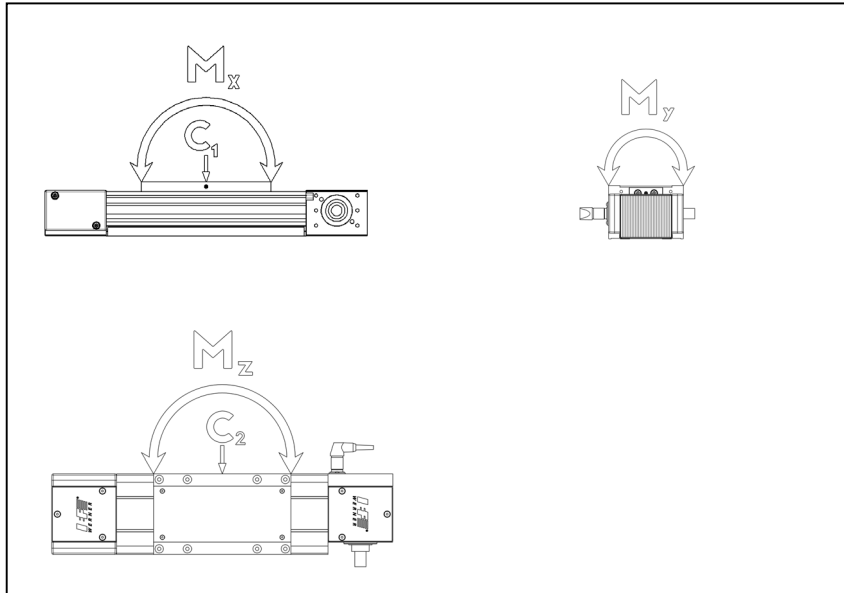


Figure 5: Torques and Load Cases

Excerpt from Table Technical Data (Figure 2, page 10)

| Parameter | Value |
|----------------------|--------|
| Maximum torque Mx | 80 Nm |
| Maximum torque My | 30 Nm |
| Maximum torque Mz | 100 Nm |
| Carrying capacity C1 | 1000 N |
| Carrying capacity C2 | 300 N |

Figure 6: Table of Torques and Load Cases

3.5.2 Tilting of the Carriage Unit with Side Load

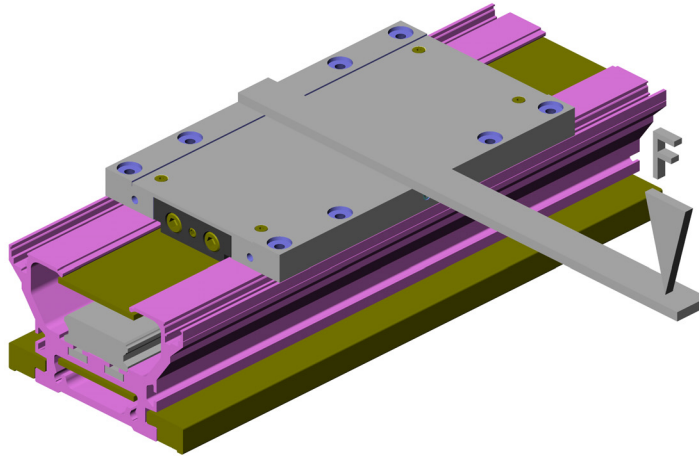
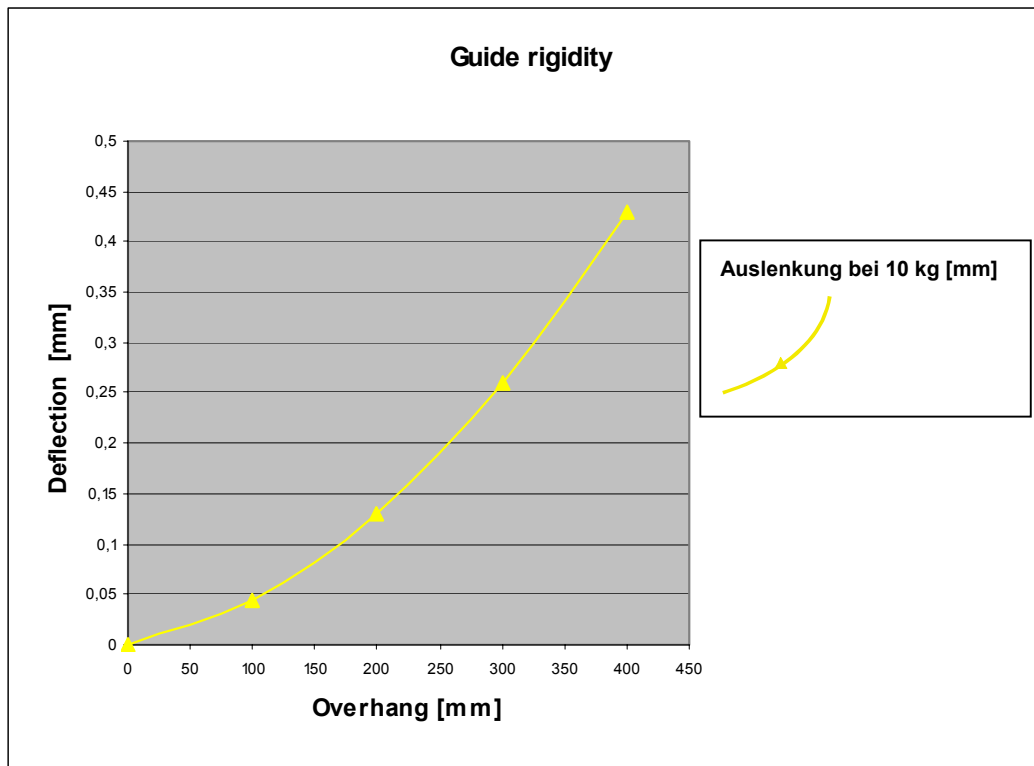


Figure 7: Tilting of the Carriage UNIT



Figur 8: Deflection Diagram

3.6 Attachment

In most applications, the module 115/42 is attached with clamping profiles to a flat assembly surface. The carriage moves freely.

Other types of attachment of the linear module, for example with additional drilled holes in the basic body, should be avoided. In almost all cases, these drilled holes cause tension in the guide basis and the damaging of inner parts of the module.



CAUTION

The clamping area should have a planeness of 0.1mm/m².

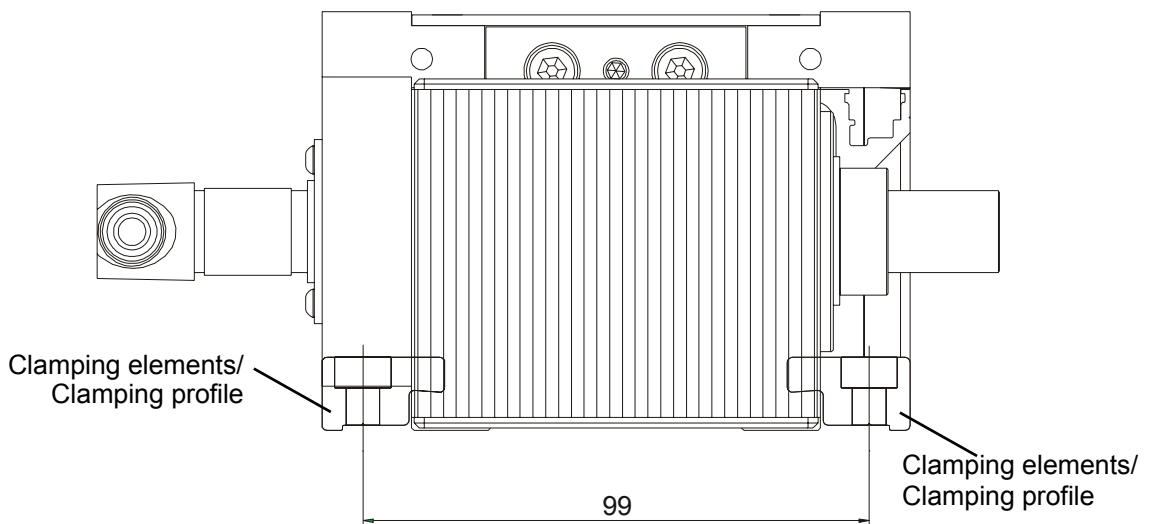


Figure 9: Attachment with Clamping elements / Clamping Profile

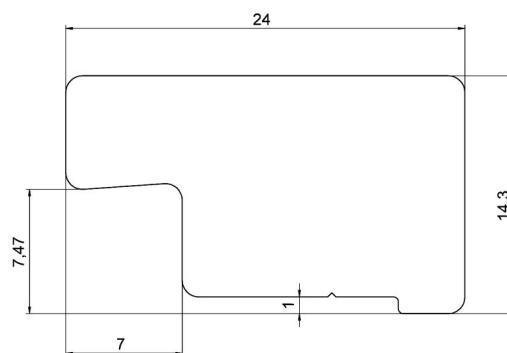


Figure 10: Dimensional Drawing of the Clamping Profile / Clamping Element



CAUTION

Pay attention to the crushing positions shown in Figure 11

Crushing Positions (see Figure 11, page 16)

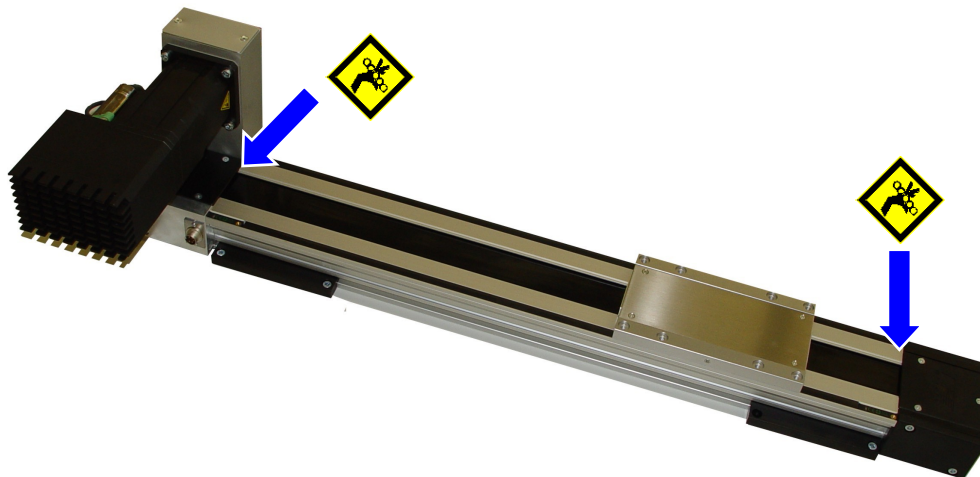


Figure 11: Potential Crushing Positions

Figure 12 indicates the drilling template of a standard slide.

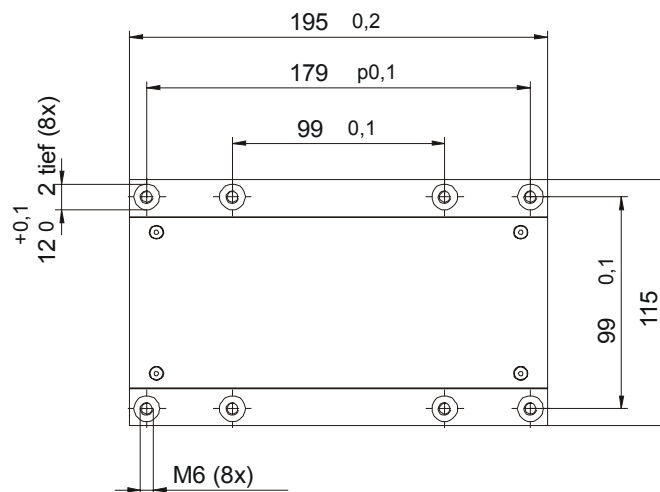


Figure 12: Standard Carriage Drilling Pattern

Figure 13 indicates the Centering Ring (Art.No. 1024021)

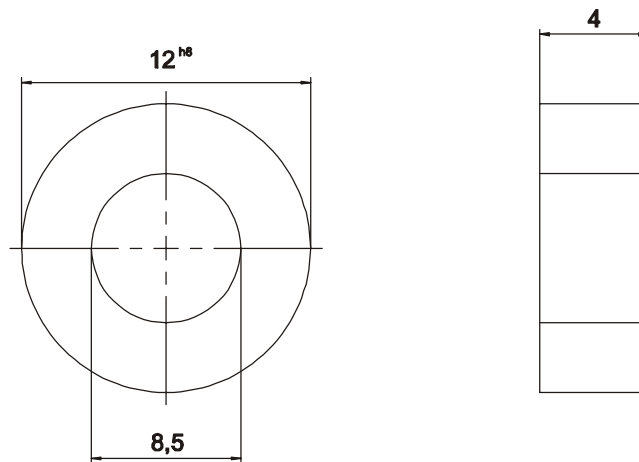


Figure 13: Centering Ring (Art.No. 1024021)

With the M6 threaded holes on the carriage, different axis configurations can be achieved, possibly via an adapter plate.

The counterbores with 12 mm dia. serve for centering of the clamping elements with possible adjustment.

3.7 Installation of Actuators

Actuators (gripper modules, cylinders) attached to the linear module are normally attached via the drilling pattern on the carriage (see Figure 12, page 16) to the linear unit.

4 Wiring

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.

4.2 Initiators

Inductive proximity switches (PNP break contacts, Article No.: 025165) are used as standard limit switches for the distance traveled. These switches are not safety limit switches according to EN60204-1. Optionally, an additional reference point switch (PNP make contact, Article No.: 726744) can also be retrofitted in the module 115/42. The active switch area is marked with a colored circle symbol. The break contacts have a green dot, the make contacts have a red dot. The initiators and their supply lines are protected in a cable duct which is integrated in the basic body and are routed jointly to a connector.

A plastic strip serves to cover the cable duct. The replacement of an initiator or its shifting is easily possible after removal of this plastic strip from the cable.

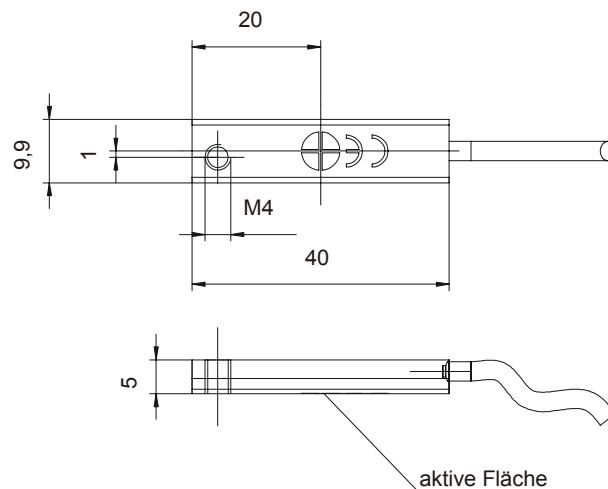


Figure 14: Initiator Dimensional Sketch

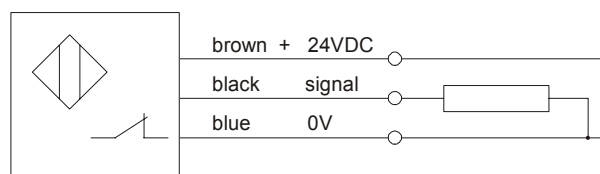


Figure 15: PNP Break Contact Connection Designation

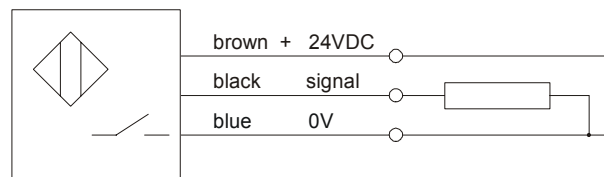


Figure 16: PNP Make Contact Connection Drawing

4.2.1 Technical Data of Initiators

| Parameter | Value |
|-------------------------------------|-----------------------------|
| Operating voltage including ripple | (10 ... 30) VDC \leq 15 % |
| Current load capacity | $I_a \leq$ 200 mA |
| Voltage drop at I_a max. | \leq 2,5 V |
| Switching frequency | \leq 1000 Hz |
| Self current consumption | \leq 15 mA |
| Nominal operating distance on steel | 1,5 mm \pm 10 % |
| Switch hysteresis | (3 ... 20) % |
| Reproducibility (U = const.) | \pm 0,01 mm |
| Operating temperature | - 25 °C ... + 70 °C |
| Protection class | IP 65 |
| Short-circuit proof | yes |
| Protected against polarity reversal | yes |

Figure 17: Technical Data of Initiators

4.2.2 Limit switch plug

| pin-no. | assignment | colour |
|---------|--------------------------------|--------|
| 1 | + 24 VDC | brown |
| 2 | Limit switch negative movement | green |
| 3 | 0 V | white |
| 4 | Limit switch positive movement | yellow |
| 5 | Reference switch | grey |

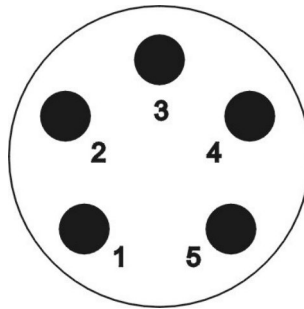


Figure 18: Connection Drawing of limit switch Plug

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 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.

5 Wartung

During the design of module 115/42, great importance was placed on the use of maintenance-free components. All roller elements are provided with lifetime lubrication in the factory.

The guide carriages are equipped with auxiliary lubrication elements. An operating performance of 10000 km is therefore achieved with the initial lubrication. In single-shift operation with a stroke of 500 mm and 20 cycles per minute, this is equivalent to an operating performance of almost 5 years.

After reaching the specified operating performance, the guide carriage can be relubricated with a special grease gun (IEF Werner Art. No.: 1055123 for module) (see Figure 19).

NOTE Do not use greases containing ester oils.

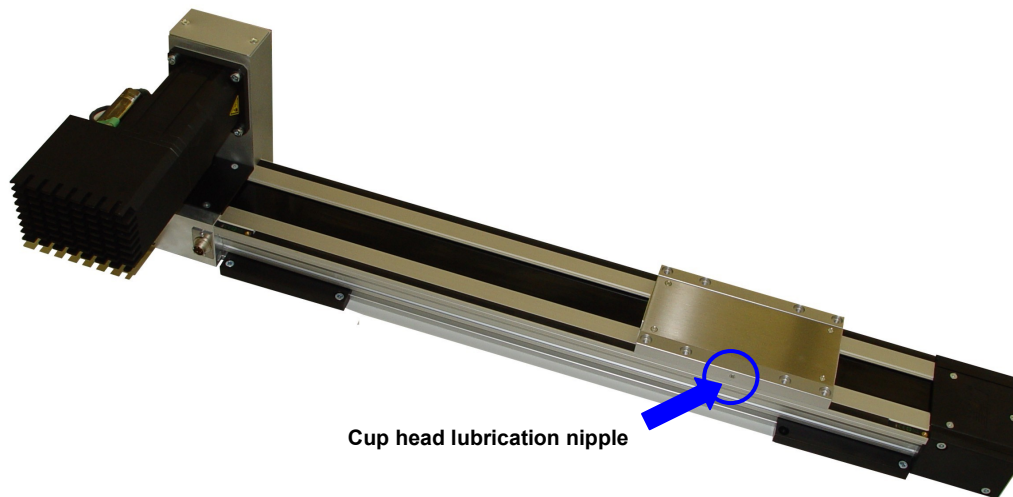


Figure 19: Lubrication of the Guide Carriage

6 Error Analysis

Error Table Part 1

| Error | Reason | Error Handling |
|-------------------------|---|---|
| Increased running noise | Nominal service life of guide carriage exceeded | Replace all guide carriages |
| | Guide carriages worn by overload (excessive torques, etc.) | Replace all guide carriages, reduce load |
| | Guide carriages worn by excessive soiling | Replace all guide carriages, clean and relubricate guide rails more frequently |
| | Guide rails worn | Replace guide rails, replace all guide carriages, check load, protect linear module from excessive soiling |
| | Guide rails corroded | Replace guide rails, replace guide carriages as required |
| | Pulley worn | Replace pulley |
| | Drive unit worn | Replace drive unit |
| | Toothed belt runs dry | Lightly grease toothed belt on the toothed inner side |
| | Excessive toothed belt tension | Readjust toothed belt tension on carriage part |
| | Toothed belt runs canted | Align toothed belt on fastener (pressure piece and gear segment), evenly tighten M6 fillister head screws! |
| | Heavy soiling of toothed belt on the toothed inner side | Replace toothed belt, protect linear module from heavy soiling |
| | Toothed belt defective | Replace toothed belt |
| | Motor (motor bearing) defective | Replace motor |
| | Motor with brake, brake does not release | Apply current to the brake, if the brake still does not release, replace motor |

Error Table Part 2

| Error | Reason | Error Handling |
|--|--|--|
| Linear unit does not move | Limit switch cable not connected | Connect the cable |
| | Limit switch defective | Replace limit switch |
| | Limit switch cable defective | Check limit switch cable |
| | Soldered connection on socket became loose | Solder wires |
| | Incorrect motor connection | Check and change connector assignment, if required |
| | Motor defective | Replace motor |
| | Error in power electronics or control unit | Check the power electronics or the control unit |
| | Motor cable defective | Check motor cable, replace cable, if required |
| | Belt transmission: Toothed disk slips | Firmly tighten clamping set and secure screws with safety lacquer |
| | Planetary gearbox: Coupling between motor and planetary gearbox slips | Firmly tighten coupling and secure screws with safety lacquer |
| Motor with brake, brake does not release | Apply current to the brake, if the brake still does not release, replace motor | |
| Play on reversal | Gearbox toothed belt not tensioned | Tension gearbox toothed belt |
| | Toothed disk of motor has play (parallel key connection) | Replace toothed disk of motor and, if the parallel key groove of the motor is damaged, replace motor |
| | Drive tooth belt not tensioned | Tension drive tooth belt |
| Linear unit moves mechanically against the stop during the reference run | Incorrect direction of rotation | Change motor direction of rotation |
| | Broken motor cable | Replace cable |

7 Repair Instructions



WARNING

Always de-energize the system before beginning the repair.



WARNING

Generally, repairs must be performed by specialist personnel who have read and understood the Operating Manual.



CAUTION

Only when original parts are used can warranty claims be accepted by IEF-Werner.

7.1 Special Installation Instructions

Toothed belt tension:

Adjustment with threaded pin (belt tension adjusted at the factory, see *Figure 20: adjusting screw for belt tension*)

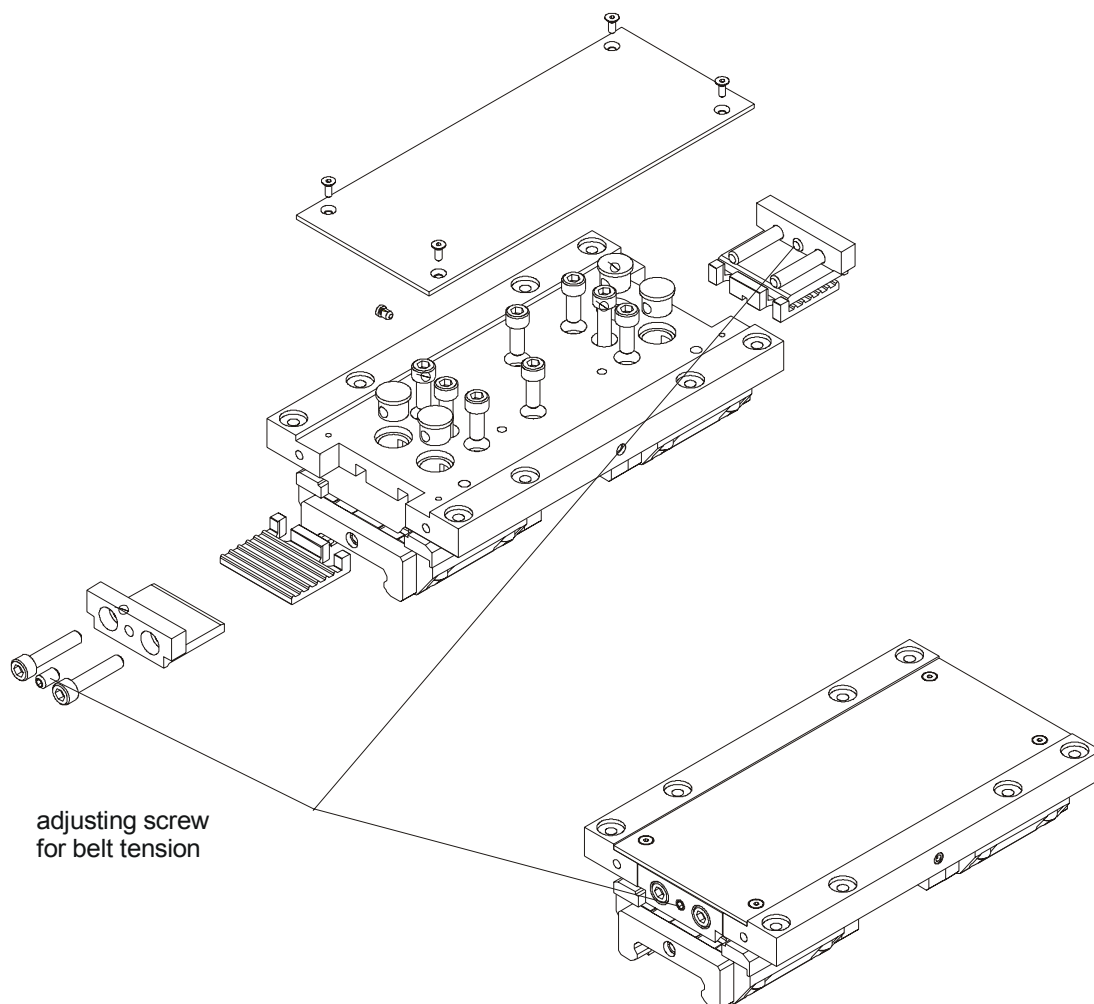


Figure 20: adjusting screw for belt tension

NOTE Do not remove the safety lacquer at the adjusting screw

Gearbox toothed belt tension: 150N (motor mounting variant 1-4).

7.2 Guide System

7.2.1 General

The guide rail is applied to the reference side of the basic body (marked by a 90° notch). The reference side of the carriage plate which is indicated by two locating pins which are attached one-sided is on the same side as the reference side of the basic body (see Figure 21).

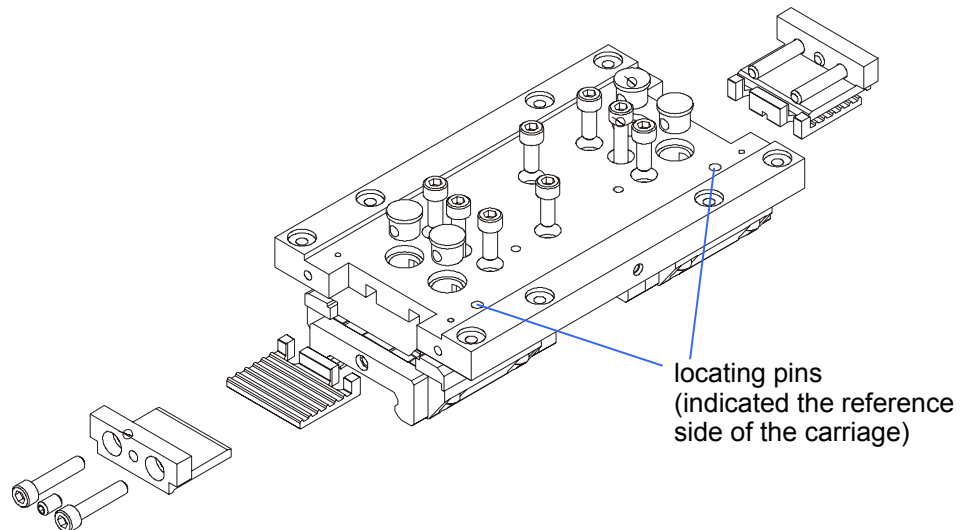


Figure 21: Reference side

The adapter plate is attached on the reference side on the two guide carriages. When new, the guide carriages have an increased slide resistance. After a short run-in period (1 to 2 days), the slide resistance is reduced to normal.

NOTE Do not interchange carriage plate and adapter plate with the carriage plate and adapter plate of another linear unit module 115/42.

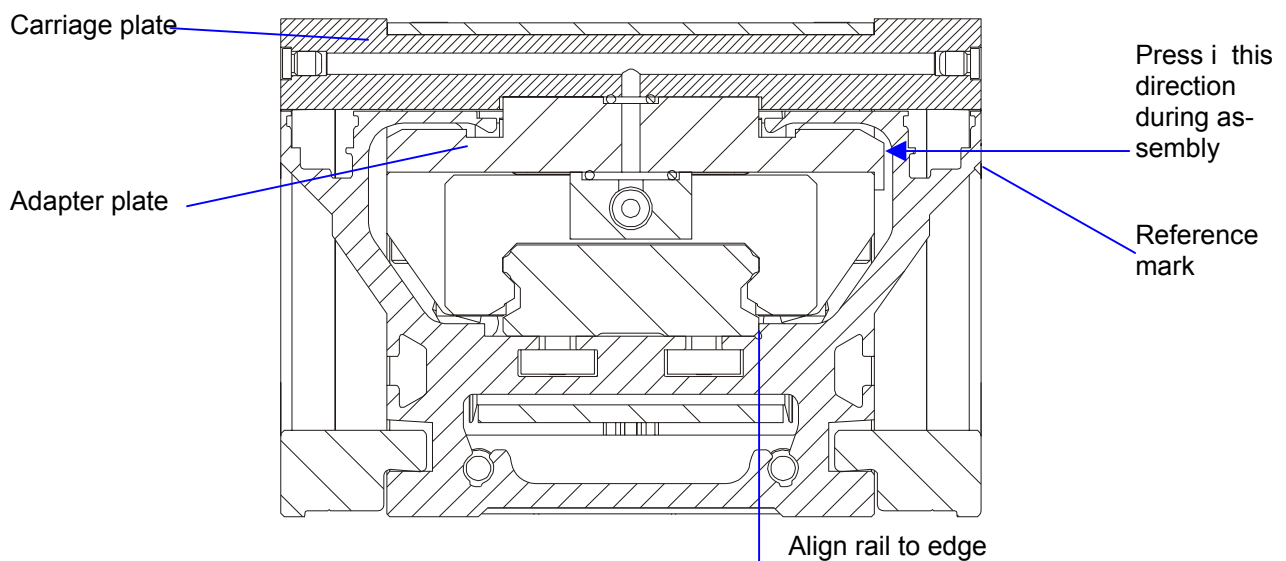


Figure 22: Installation of Guide System

7.3 Change of Toothed Belt

To change the toothed belt, please proceed as follows:

- (1) Loosen the M6x35 screws (pos. 200, *Figure 23*)
- (2) remove the pressure piece (pos. 30, *Figure 23*)

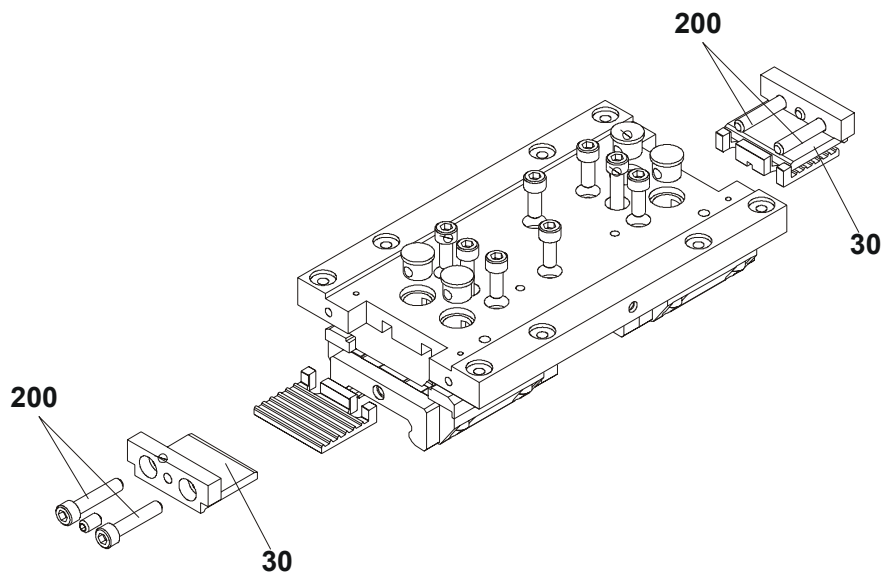


Figure 23: Loosen the screws and remove the pressure piece

- (3) Remove the covers (pos. 100, *Figure 24*)

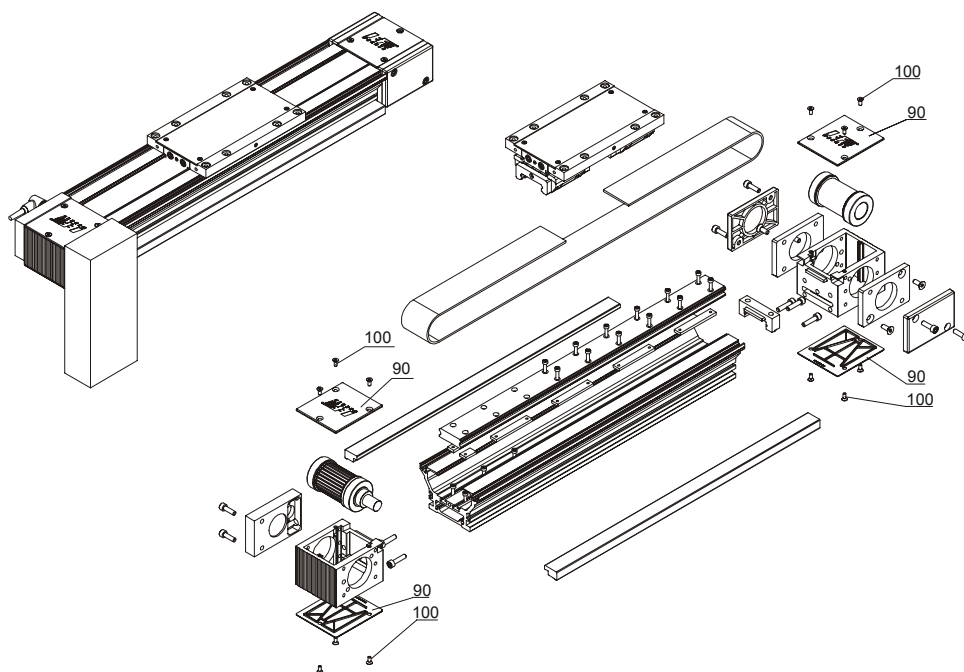


Figure 24: Module 115/42 Installation Variant 1, Exploded View

- (4) Remove the defective toothed belt, install the new toothed belt.
- (5) Insert the toothed belt in the gear segment (pos. 70, *Figure 25*).
- (6) tension the pressure piece with the M6x35 screws (pos.200, *Figure 25*) on "block"

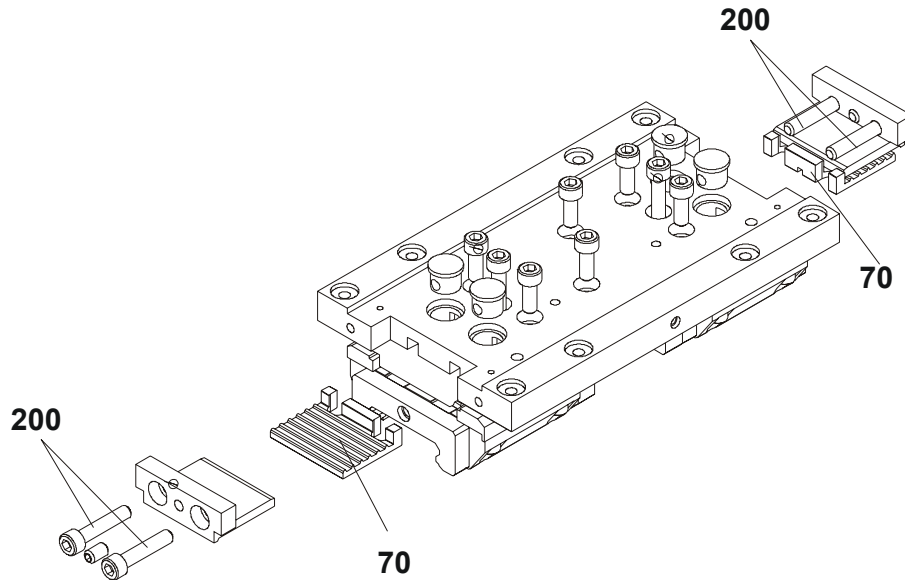


Figure 25: toothed segment

- (7) Reinstall the covers

HINWEIS Belt tension adjusted in factory: Do not remove the safety lacquer on the screws!

8 General Data

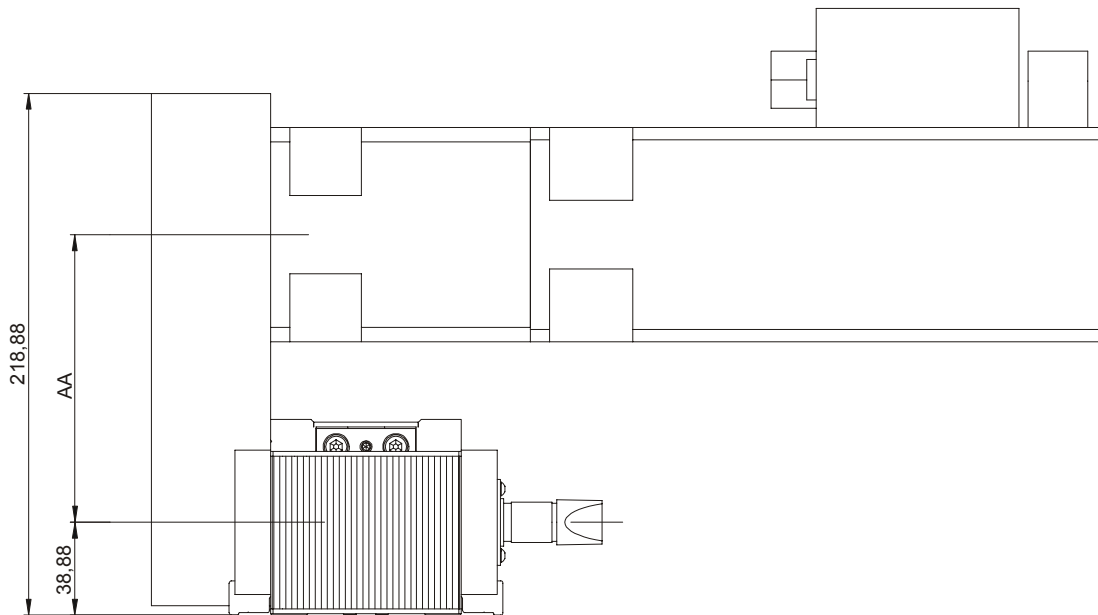
8.1 Technical Data

(see 3.2, Technical Data of Module 115/42)

8.2 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 (attachment of guide rail) | 4,9 |

8.3 Distances Between Axes and Number of Teeth



**Figure 26: Explanation of the Table of Distances between Axes,
Subassembly No.: 1000475**

Distances Between Axes According to Standard Gear Ratios

| I | Z1 output | Z2 drive | Drilled hole drive | L toothed belt | AA [mm] | Feed constant [mm] |
|---------|-----------|----------|--------------------|----------------|---------|--------------------|
| 1:1 | 42 | 42 | Maximum dia. 32 mm | 450 mm | 120 | 140 |
| 2.1 : 1 | 42 | 20 | Maximum dia. 16 mm | 390 mm | 116.18 | 66.667 |
| 2.625:1 | 42 | 16 | Maximum dia. 14 mm | 390 mm | 120.73 | 53.33 |
| 3 : 1 | 42 | 14 | Maximum dia. 12 mm | 375 mm | 115.35 | 46.667 |

9 Parts Lists

9.1 Modul 115/42

Part group No. 1000901; (see *Figure 27, page 32*)

| Z-Pos. | Art.-Nr. | Teil (1) / Teilegruppe (0) | + | Bezeichnung |
|--------|----------|----------------------------|---|---|
| 10 | 1000902 | 0 | | Module 115/42 basic body |
| 20 | 1000908 | 0 | | Modul 115/42 ball rail guide |
| 30 | 1021376 | 1 | | Toothed belt 49ATL5 |
| 40 | 1028964 | 1 | | Fillister head screw DIN 912-M4x16-12.9 |
| 50 | 1023994 | 1 | | Groove slide block 2xM4, flat |
| 60 | 1044009 | 1 | | Groove slide block |
| 70 | 1025262 | 1 | | Housing with damper |
| 80 | 626036 | 1 | | Fillister head screw DIN 912-M4x25 |
| 90 | 1034373 | 1 | | Cover |
| 100 | 626124 | 1 | | Hexagon socket head countersunk screw DIN 7991-M4 x 10-8.8 |
| 110 | 626050 | 1 | | Hexagon socket head countersunk screw DIN 7991-M6 x 16-8.8 |
| 120 | 1052923 | 1 | | Bearing cover |
| 121 | 626764 | 1 | | Hexagon socket head countersunk screw DIN 7991-M6 x 12-8.8 |
| 130 | 1043375 | 1 | | Bearing cover |
| 140 | 1052921 | 1 | | Adapter plate |
| 150 | 28585 | 1 | 0 | Limit switch holder |
| 160 | 025165 | 1 | 0 | Inductive switch, PNP break contact |
| 120 | 726744 | 1 | 0 | Inductive switch, PNP make contact |
| 180 | 30887 | 1 | 0 | Special screw M4 x 7 |
| 190 | 25626 | 1 | 0 | Retaining sheet metal |
| 200 | 725164 | 1 | 0 | Angular coupling WKV 50/6 |
| 210 | 725163 | 1 | 0 | Connector SFV 50/6 |
| 220 | 626038 | 1 | 0 | Oval head screw ISO 7360-M3x8-8.8 |
| 230 | 1044440 | 1 | | Plastic clip |
| 240 | 1044440 | 1 | | Plastic clip |
| 250 | 1018813 | 1 | | Drive unit 80/15/50 |
| 255 | 626056 | 1 | | Fillister head screw DIN 912 M6 x 16-8.8 |
| 260 | 1042982 | 1 | | Pulley 80/15/50 |
| 270 | 1054226 | 1 | 1 | Stop |
| 280 | 1052929 | 1 | | Carriage unit |

+ Usage depending on version

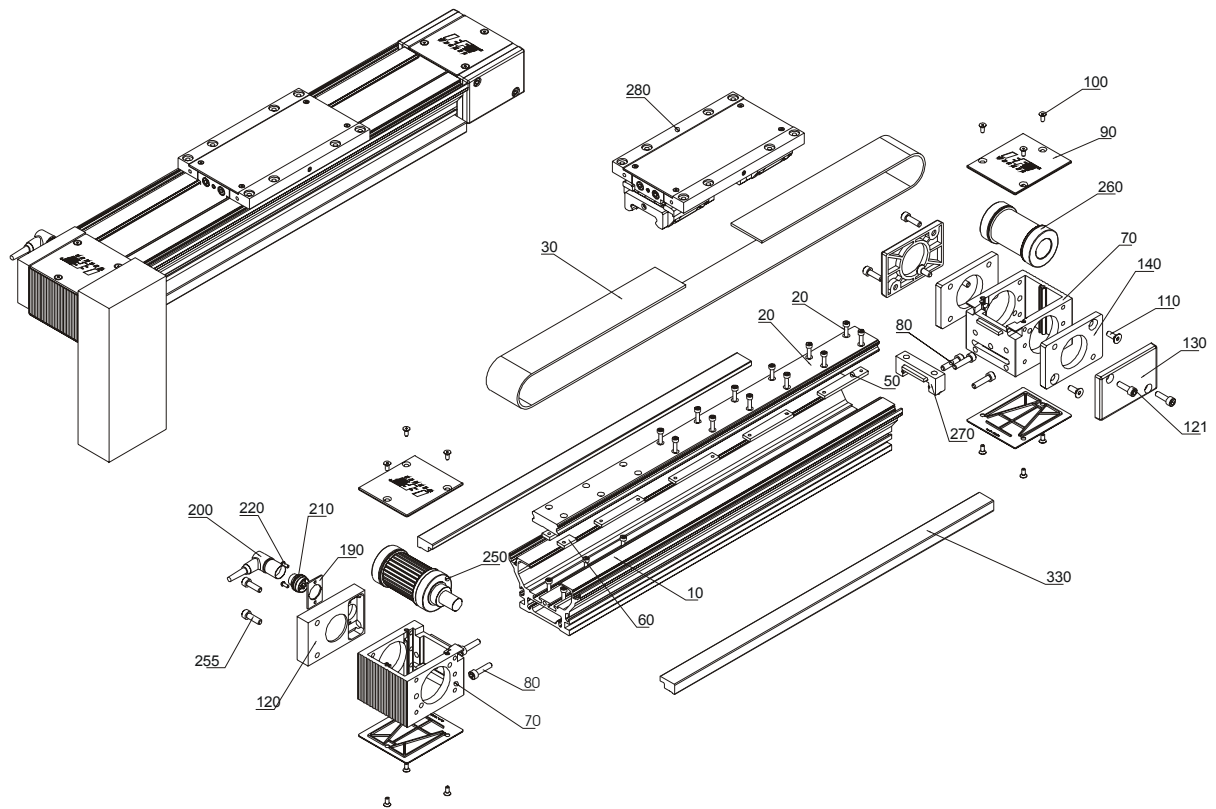


Figure 27: Modul 115/42, Installation Variant 1, Exploded View, Part group No. 100901

9.2 Carriage, Complete Modul 115/42

Article No.: 1052929; (see Figure 28, page 34)

| Drawing Pos. | Article No. | Part (1)/ Parts group (0) | Designation |
|--------------|-------------|------------------------------|--|
| 10 | 1056282 | 1 | Carriage plate |
| 20 | 1052457 | 1 | Adapter plate |
| 30 | 1055020 | 1 | Guide carriage left |
| 31 | 1055021 | 1 | Guide carriage right |
| 40 | 1018767 | 1 | Gear segment |
| 50 | 1056302 | 1 | Pressure piece Modul 115/42 |
| 60 | 1054179 | 1 | Lubricant tube |
| 70 | 1054232 | 1 | Lubricant adapter |
| 80 | 737231 | 1 | O-ring seal, NBR 70 Shore A 12,00-1,50 |
| 90 | 736614 | 1 | O-ring seal, NBR 70 Shore A 5,00-1,50 |
| 100 | 1028704 | 1 | Cup head lubrication nipple, DIN 3405, Type 04 |
| 110 | 626059 | 1 | Fillister head screw DIN 912 – M5x16-8.8 |
| 120 | 627158 | 1 | Fillister head screw DIN 912 - M6x30-8.8 |
| 130 | 626190 | 1 | Threaded pin DIN 9123M6x10-8.8 |
| 140 | 626056 | 1 | Fillister head screw DIN 912 - M6x16-8.8 |
| 150 | 626036 | 1 | Fillister head screw DIN 912 - M6x25-8.8 |
| 160 | 1023942 | 1 | Threaded bush |
| 170 | 1056300 | 1 | Cover |
| 180 | 626115 | 1 | Hexagon socket head countersunk screw ISO 10642-M3x8-8.8 |

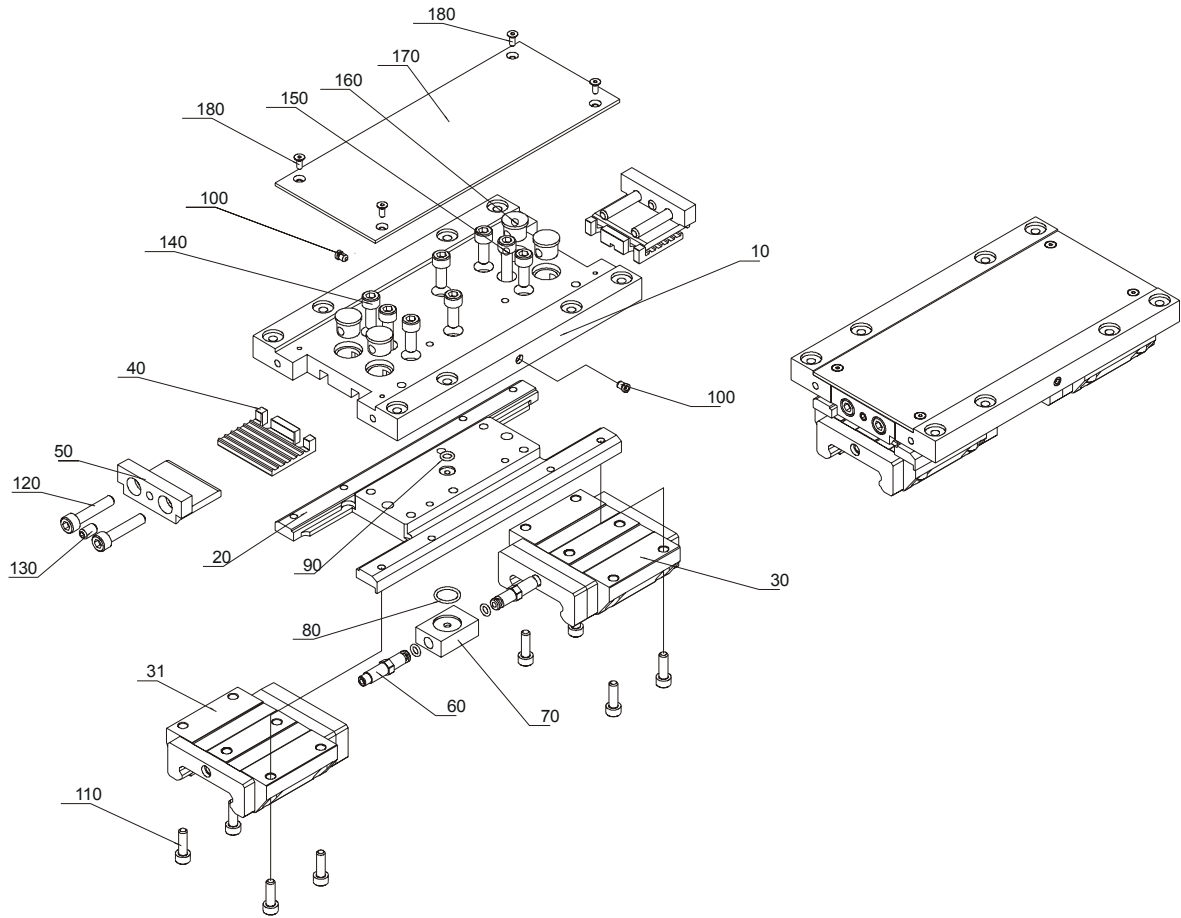


Figure 28: Modul 115/42 Art.-Nr.: 1052929, Exploded view

9.3 Modul 115/42, carriage with cover

Article No.: 1054342; see *Figure 29, page 36*

| Drawing Pos. | Article No. | Part (1)/ Parts group (0) | + |
|--------------|-------------|---------------------------|--|
| 10 | 1056282 | 1 | Carriage plate |
| 20 | 1056302 | 1 | Pressure piece Modul 115/42 |
| 30 | 1052457 | 1 | Adapter plate |
| 40 | 1054232 | 1 | Lubricant adapter |
| 50 | 1054270 | 1 | Lubricant tube |
| 60 | 1055020 | 1 | Guide carriage left |
| 61 | 1055021 | 1 | Guide carriage right |
| 70 | 1018767 | 1 | Gear segment |
| 80 | 1054340 | 1 | Washer disk |
| 90 | 1056307 | 1 | Stripper device |
| 100 | 1056300 | 1 | Cover |
| 110 | 1023942 | 1 | Threaded bush |
| 120 | 737231 | 1 | O-ring seal, NBR 70 Shore A 12,00-1,50 |
| 130 | 736614 | 1 | O-ring seal, NBR 70 Shore A 5,00-1,50 |
| 140 | 1028704 | 1 | Cup head lubrication nipple, DIN 3405, Type 04 |
| 150 | 627600 | 1 | needle bushing |
| 160 | 626059 | 1 | Zylinderschraube verzinkt M5 x 16 |
| 170 | 626190 | 1 | Gewindestift verzinkt M6 x 10 |
| 180 | 626056 | 1 | Zylinderschraube verzinkt M6 x 16 |
| 190 | 626036 | 1 | Zylinderschraube verzinkt M6 x 25 |
| 200 | 627158 | 1 | Zylinderschraube verzinkt M6 x 30 |
| 210 | 626115 | 1 | Senkschraube verzinkt M3 x 8 |
| 220 | 1054384 | 1 | Zylinderstift 8m6 x 70 |
| 230 | 626360 | 1 | Zylinderstift 8m6 x 90 |
| 240 | 626058 | 1 | Zylinderschraube verzinkt M5 x 25 |
| 250 | 1023812 | 1 | Lubrication felt |
| 260 | 1056283 | 1 | Carriage plate attachment |

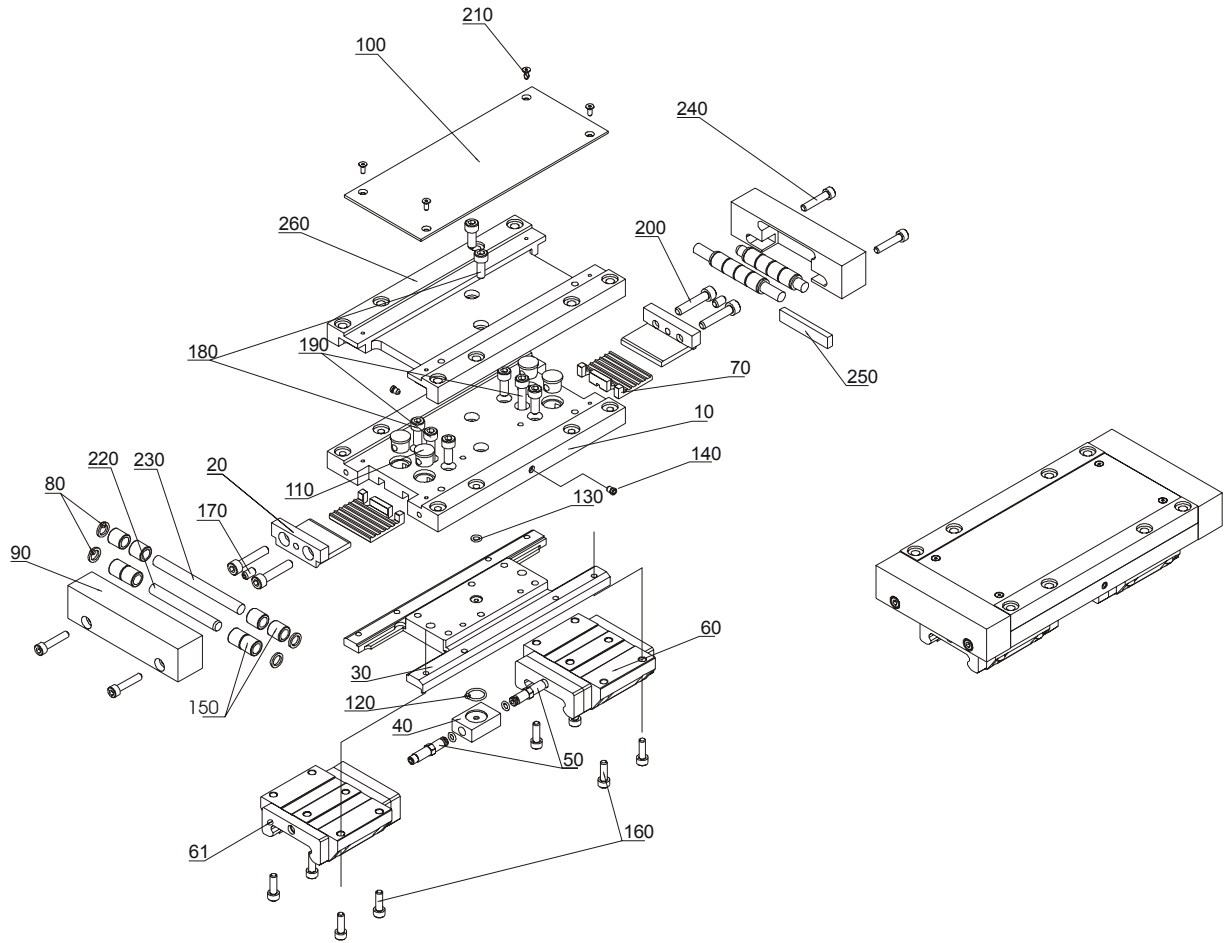


Figure 29: Modul 115/42, with cover, Article No.: 1054342

9.4 Gearbox Modul 115/42

Subassembly No. 1000475, for the drawing see *Figure 30, page 38*

| Drawing Pos. | Article No. | Part (1)/ Parts group (0) | + | Designation |
|--------------|-------------|------------------------------|---|---|
| 10 | 1021557 | 1 | + | Housing |
| 20 | 029690 | 1 | | Toothed disk AT5/42-0 |
| 30 | 1007376 | 1 | + | Toothed disk AT5/42-2 |
| 40 | 028722 | 1 | + | Toothed disk AT5/42-2 |
| 50 | 1006664 | 1 | + | Toothed disk AT5/42-2 |
| 60 | 732770 | 1 | | Clamping set 16/32 |
| 70 | 732770 | 1 | + | Clamping set 16/32 |
| 80 | 732294 | 1 | + | Clamping set 20/38 |
| 90 | 734168 | 1 | + | Clamping set 22/40 |
| 95 | 526735 | 1 | + | Toothed disk AT5/20-2 including clamping set 12 |
| 98 | 525983 | 1 | + | Toothed disk AT5/20-2 including clamping set 14 |
| 100 | 525984 | 1 | + | Toothed disk AT5/20-2 including clamping set 16 |
| 110 | 1005790 | 1 | + | Toothed disk AT5/14-2 including clamping set 10 |
| 120 | 1005756 | 1 | + | Toothed disk AT5/14-2 including clamping set 12 |
| 130 | 1003999 | 1 | | Belt transmission cover |
| 140 | 028574 | 1 | | Gliding block |
| 150 | 626072 | 1 | | Oval head screw ISO 7380-M4x8-8.8 |
| 160 | 1004001 | 1 | | Push-in cover |
| 170 | 730353 | 1 | + | Toothed belt 25AT5/390 |
| 180 | 732286 | 1 | + | Toothed belt 25AT5/375 |
| 190 | 908243 | 1 | + | Toothed belt 25AT5/450 |

+ Usage depending on version

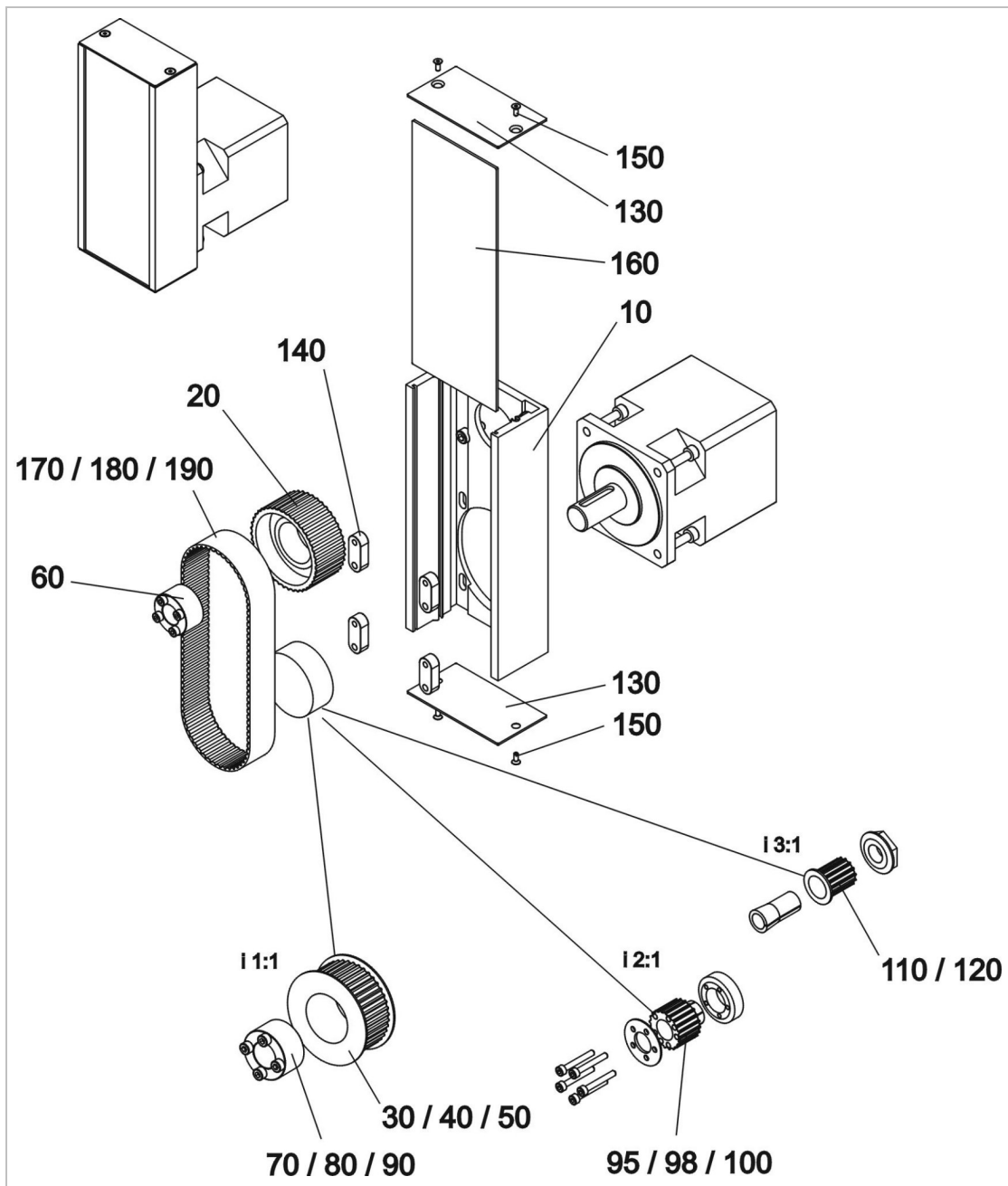


Figure 30: Module 80/15 Belt Transmission, Part group No. 1000475

9.5 Flange

Subassembly No. 1000476, for the drawing, see Fehler! Verweisquelle konnte nicht gefunden werden., page Fehler! Textmarke nicht definiert.

| Drawing Pos. | Article No. | Part (1)/ Parts group (0) | + | Designation |
|--------------|-------------|---------------------------|---|--|
| 10 | 1022105 | 1 | | Flange, axial |
| 20 | 1022129 | 1 | | Flange plate, axial |
| 30 | 734161 | 1 | | Plastic cover |
| 40 | 626037 | 1 | | Fillister head screw DIN 912 - M6x20-8.8 |
| 50 | 626244 | 1 | | Fillister head screw DIN 912-M6x60-8.8 |
| 60 | 627215 | 1 | | Retaining ring |
| 70 | 1022199 | 1 | + | Coupling dia.=16 |
| 75 | 1022203 | 1 | | Toothed ring red |
| 80 | 1022201 | 1 | + | Coupling dia.=20 |
| 90 | 1022202 | 1 | + | Coupling dia.=22 |
| 100 | 1006530 | 1 | + | Sleeve 12/16 |
| 110 | 1007310 | 1 | + | Sleeve 15/20 |
| 120 | 1008886 | 1 | + | Sleeve 14/16 |
| 130 | 1022206 | 1 | + | Sleeve 19/22 |

+ Usage depending on version

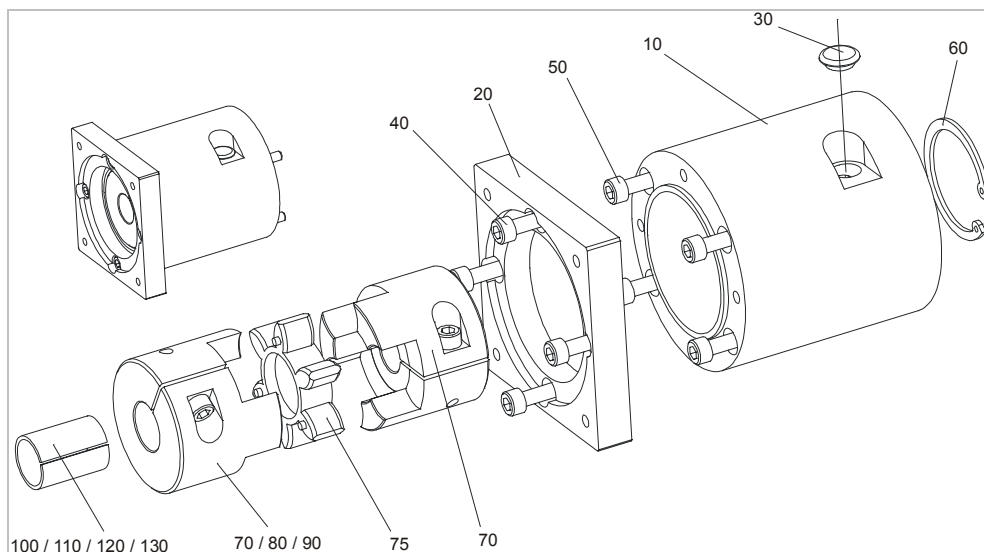


Figure 31: Module 80/15 Flange i=1:1, Part group No. 1000476



VORSICHT

Also please pay attention to the list of parts subject to wear specific to the order which is enclosed with the delivery.

10 Installation Variants

10.1 Overview of Installation Variants

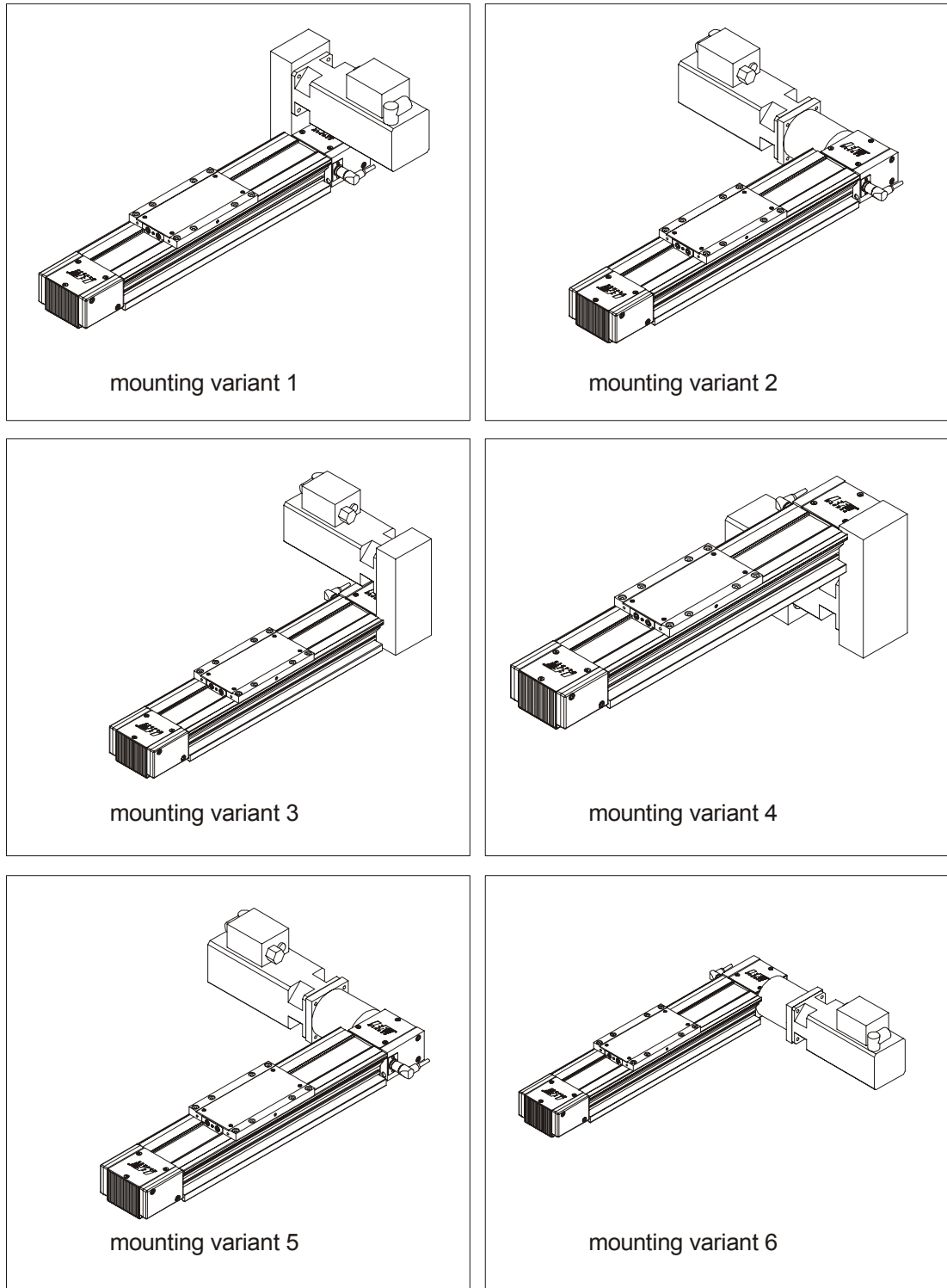


Figure 32: Installation Variants Modul 115/42

10.2 Modul 115/42 mounting variant 1

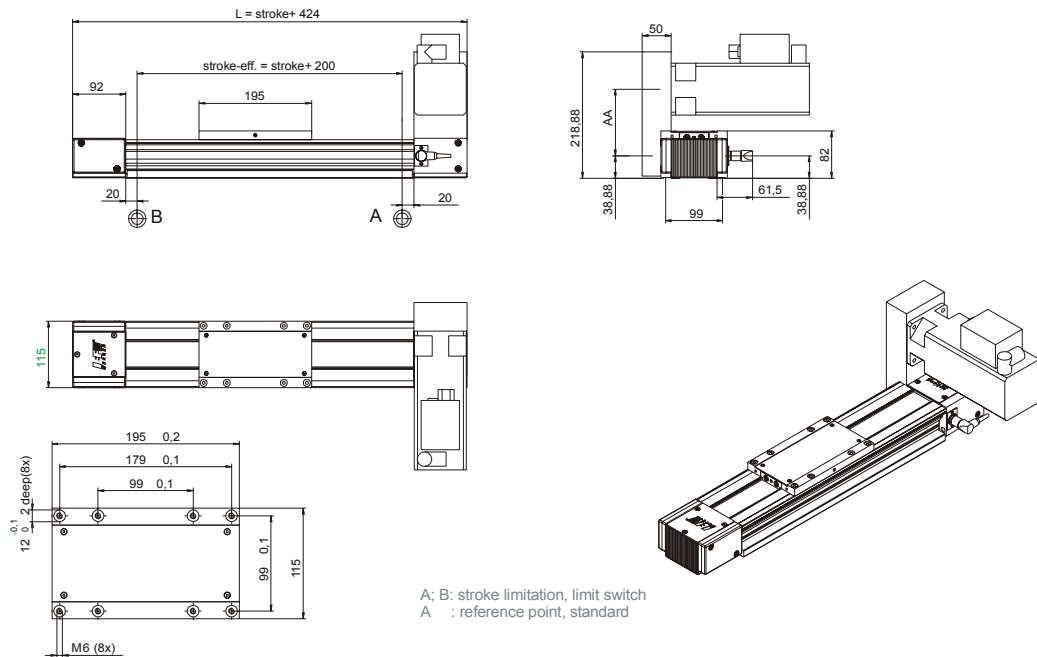


Figure 33 Modul 115/42 Part group Number 1000901

10.3 Module 115/42 mounting variant 5

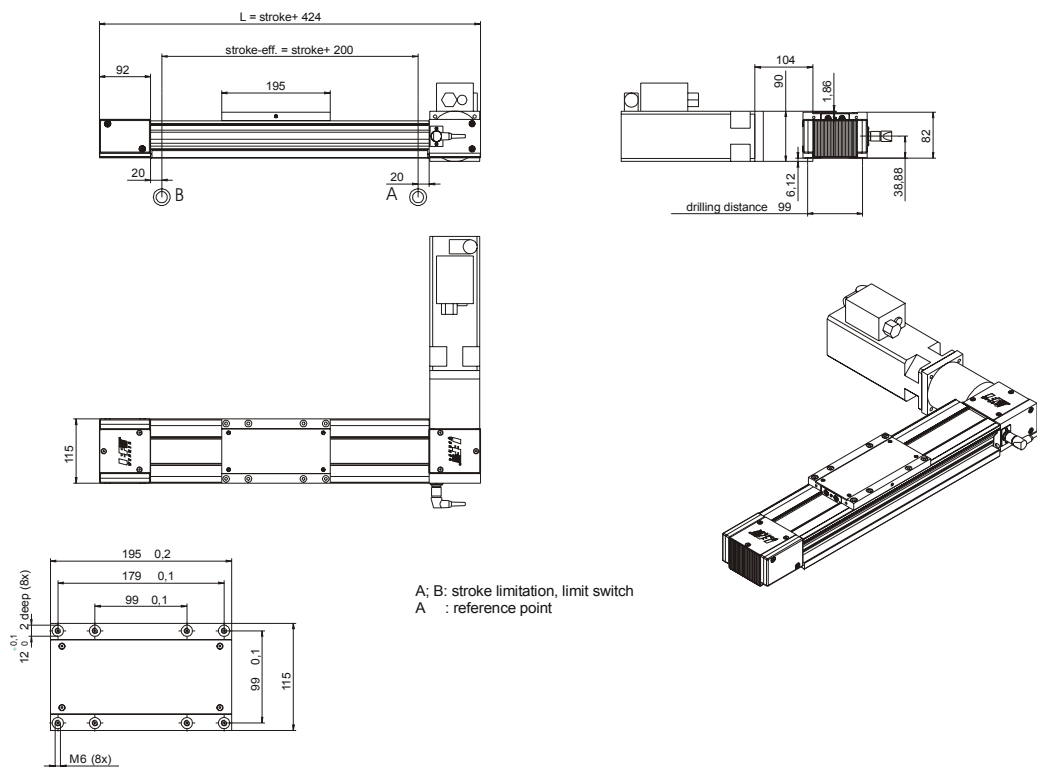


Figure 34: Modul 115/42, Part group Number 1000901

11 Accessory Drawings

11.1 Clamping Element 115 Z with Adjustment

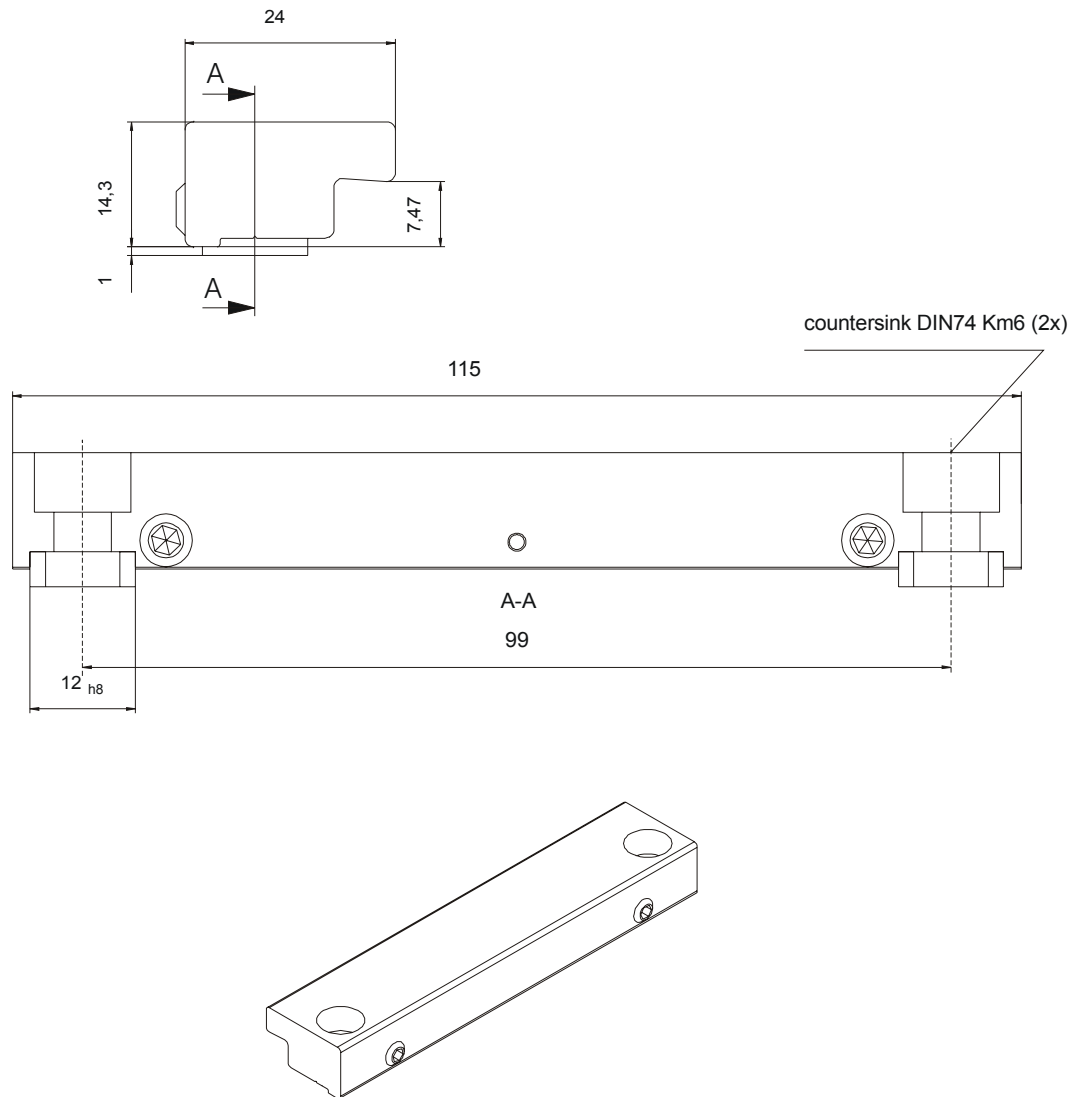


Figure 35: Clamping Element 115 Z, Article No.: 1054491

11.2 Clamping Element 105

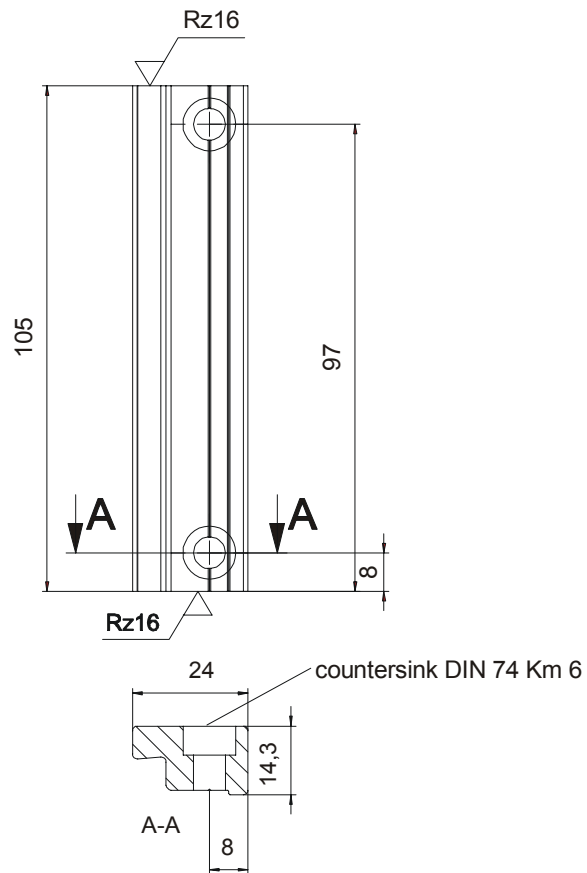


Figure 36: Clamping Element 105, Article No.: 028674

11.3 Clamping Element 140

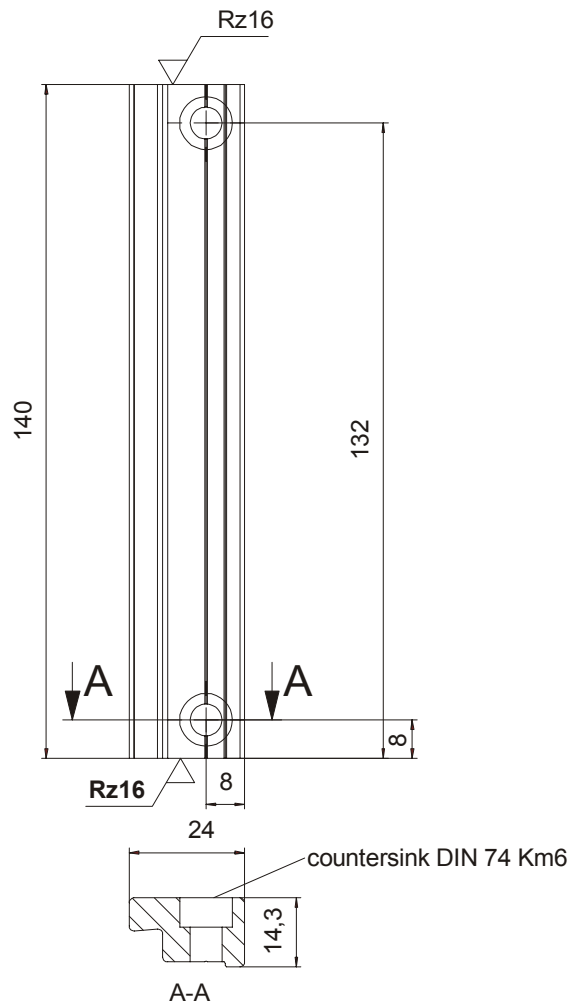


Figure 37: Clamping Element 140, Article No.: 220702