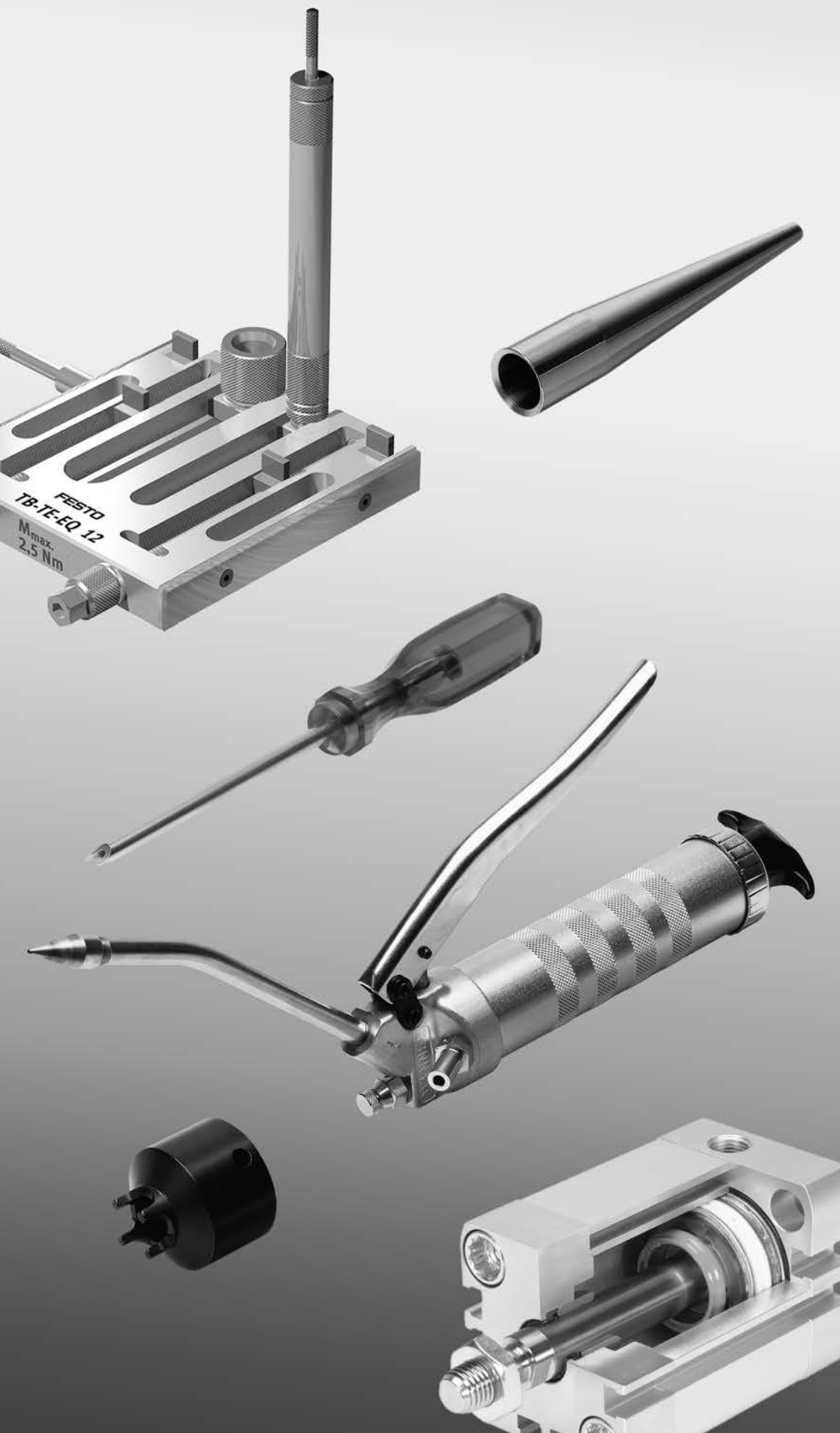
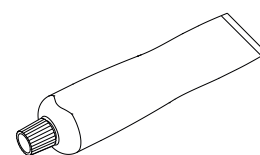


# Tools and repair accessories



**FESTO**

Information  
brochure (en)



## About this magazine

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All technical data are subject to change according to technical updates.

## Foreword

This information brochure describes the tools and repair accessories required to assemble, maintain and repair Festo products.

This information brochure has been prepared with care.

Festo SE & Co. KG does not, however, accept liability for any errors in this information brochure or their consequences. Likewise, no liability is accepted for direct or consequential damage resulting from improper use of the tools and repair accessories named in this information brochure.

More detailed information on this can be found in → [Chapter 16 on page 42](#).

To find out which tools and repair accessories to use for which product and for which assembly, maintenance and repair steps, please refer to the spare parts documentation, operating instructions and repair instructions for the product.

The relevant regulations on occupational safety, safety engineering, environmental protection and interference suppression as well as the stipulations contained in this information brochure must be observed when using the tools and repair accessories.

This information brochure is valid to the exclusion of any liability claims.

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# 1 Important information

## 1.1 About this information brochure

This document contains important information about the correct way of using the tools and repair accessories required to assemble, operate, maintain and repair Festo products. Before using the respective tools and repair accessories you should read the relevant section in this information brochure.

To find out which tools and repair accessories to use for which product and for which assembly, maintenance and repair steps, please refer to the spare parts documentation and operating instructions for the product and, if available, the repair instructions. There you will also find precise indications for e.g. relubrication intervals, greasing instructions, application, etc.

## 1.2 Pictograms used in this information brochure

### Danger categories

The following symbols identify text passages which draw attention to specific hazards.



**Warning**

### Marking special information

The following symbols identify text passages which contain special information.



**Note**



**Information**



**Environment**



**Cleaning**



**Extremely thin grease film**



**Thin grease film**



**Grease reservoir**

### 1.3 Text designations used in this information brochure

- Activities that can be carried out in any order.
- 1. Activities which should be carried out in the specified order.
- General lists.
- ➔ Reference to further information.

Underlined, blue text indicates a cross-reference or hyperlink that you can click on in the PDF.

### 1.4 General safety information



#### Warning

The tools and repair accessories must only be used by authorised and trained persons in accordance with the specifications in this information brochure and the respective product documentation such as spare parts documentation, operating instructions and repair instructions.

Use of the tools and repair accessories by unauthorised and untrained persons is dangerous and therefore not permitted.

The current safety data sheets for the lubricating greases, screw locking agents and special oils can be viewed at ➔ [www.festo.com/en/msds](http://www.festo.com/en/msds).



When using lubricating grease, oil, screw locking agent, cleaning agents and other chemicals, the locally applicable environmental protection regulations must be followed.

All environmental information about the lubricating greases, screw locking agents and special oils can be found in the current safety data sheets (➔ [www.festo.com/en/msds](http://www.festo.com/en/msds)).

## 2 Lubricating greases and grease gun

### 2.1 Lubricating greases



#### Warning

The possible dangers of the product (in this case lubricating greases) to people and how to protect against these dangers as well as information on first-aid measures can be found in the current safety data sheets for the lubricating greases.

The safety data sheets in accordance with Regulation (EC) No. 1907/2006 can be viewed at  
 → [www.festo.com/en/msds](http://www.festo.com/en/msds).



When using lubricating greases, the locally applicable environmental protection regulations must be followed.

All environmental information about lubricating greases can be found in the current safety data sheets.

The safety data sheets in accordance with Regulation (EC) No. 1907/2006 can be viewed at  
 → [www.festo.com/en/msds](http://www.festo.com/en/msds).

Lubricating greases with different characteristics are used for assembly, repair and maintenance.



To find out which lubricating grease to use for which product and for the assembly, maintenance and repair steps in question, please refer to the spare parts documentation and operating instructions for the product and, if available, the repair instructions. There you will also find precise indications for e.g. relubrication intervals, application, etc.

The lubrication instructions for pneumatic cylinders can be found in → [Chapter 15 on page 41](#).

Type	Designation	Characteristic	Quantity	Order No.
<b>Assembly grease for pneumatic and electromechanical drives (standard)</b>				
Festo special grease	LUB-KC1	Silicone-free	20 ml	684474
<b>Assembly grease for pneumatic drives and grippers</b>				
Festo special grease	LUB-KB1	Silicone-free	20 ml	665354
<b>Assembly grease for pneumatic drives</b>				
Festo special grease	LUB-KB2	Silicone-free	20 ml	397446
<b>Assembly grease for variant S6 (heat resistant seals to 120 °C)</b>				
Festo special grease	LUB-MS6	Silicone-free	20 ml	329555
<b>Assembly grease for drives with variant S10 (slow speed) or S11 (low friction)</b>				
Festo special grease	LUB-KL5	Silicone-free	10 ml	397399
<b>Assembly grease (suitable for use with foodstuffs to USDA H1)</b>				
Festo special grease	LUB-E1	Silicone-free	20 ml	394819
<b>Assembly grease for valves</b>				
Festo special grease	LUB-KU6	Contains silicone	8 g	255267
<b>Assembly grease for grippers</b>				
Festo special grease	LUB-M1	Silicone-free	10 ml	397394
<b>Assembly grease for cassette valves</b>				
Festo special grease	LUB-KU2	Contains silicone	10 ml	397395
<b>Assembly grease for service units</b>				



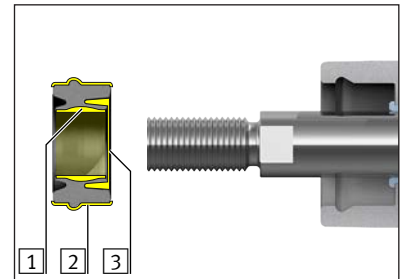
Type	Designation	Characteristic	Quantity	Order No.
Festo special grease	LUB-KB5	Silicone-free	20 ml	665358
<b>Assembly grease for TT variant (low temperature)</b>				
Festo special grease	LUB-AL2	Silicone-free	20 ml	711822

Range of applications:

**Greasing components during assembly, repair and maintenance.**



The different components and seals require different levels of greasing depending on a number of factors. Information on this can be found in the spare parts documentation, operating instructions and, if available, repair instructions for the product (→ [Chapter 15.2 on page 41](#)).



Sample application

**Sample application:**

Greasing a new piston rod seal before assembly:

- 1 Grease reservoir<sup>1)</sup> for piston rod: Fill 2/3 with grease
- 2 External surface for bearing cap: Apply a thin film<sup>2)</sup>
- 3 Grease reservoir<sup>1)</sup> for bearing: Fill 2/3 with grease

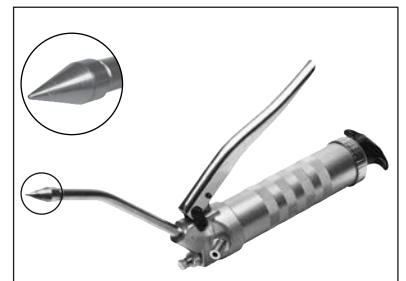
<sup>1)</sup> → [Chapter 15.2.3 on page 41](#) / <sup>2)</sup> → [Chapter 15.2.2 on page 41](#)

## 2.2 Grease gun

### 2.2.1 One-hand grease gun LUB-1

Sturdy and ergonomic design for manual lubrication. Used for lubricating greases and mineral oils.

Technical specifications	Values
Capacity	120 cm <sup>3</sup>
Delivery rate	0.5 cm <sup>3</sup> /stroke
Operating pressure	400 bar
Empty weight	660 g
Length without nozzle pipe	230 mm
Container diameter × length	40×140 mm
Nozzle connecting thread	M10×1
Nozzle pipe connecting thread	G1/8"



Handling:

- Filling is done manually or using the filler neck with a filling device.
- Venting is done through the air vent.

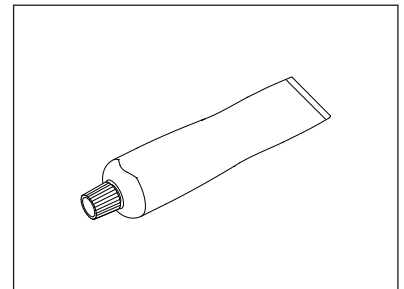
Type	Quantity	Order No.
One-hand high-pressure grease gun LUB-1 with pinpoint nozzle LUB-1-TR	1 piece	647958

Range of applications:

The pinpoint nozzle LUB-1-TR is suitable for **funnel-shaped lubrication nipples to DIN 3405, miniature funnel-shaped lubrication nipples** and also **lubricating holes**, e.g. for lubricating recirculating ball bearing guides and lead screws.

### 2.2.1.1 Lubricating grease ELKALUB VP 922

Lubricating grease ELKALUB VP 922 for one-hand grease gun LUB-1 (→ [Chapter 2.2.1 on page 9](#)).



Type	Designation	Quantity	Order No.
Festo special grease	ELKALUB VP 922	250 g	8117071

Range of applications:

ELKALUB VP 922 lubricating grease is used, among other things, in electric and pneumatic cylinders, as well as in linear drives.

## 2.2.2 Accessories for one-hand grease gun LUB-1

### 2.2.2.1 Lubrication adapter LUB-1-KU

The lubrication adapter LUB-1-KU can be fitted on the one-hand grease gun LUB-1 instead of the pinpoint nozzle LUB-1-TR (→ [Chapter 2.2.1 on page 9](#)).



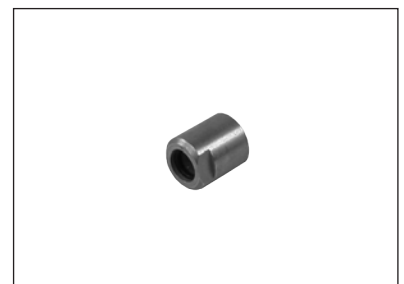
Type	Quantity	Order No.
Lubrication adapter LUB-1-KU (female thread M10×1) for the electric slide EGSK-20/-26/-33	1 piece	744166

Range of applications:

The lubrication adapter LUB-1-KU is suitable for **ball-type lubricating nipples similar to those specified in DIN 3402**.

### 2.2.2.2 Lubrication adapter LUB-1-KE

The lubrication adapter LUB-1-KE can be fitted on the one-hand grease gun LUB-1 instead of the pinpoint nozzle LUB-1-TR (→ [Chapter 2.2.1 on page 9](#)).



Type	Quantity	Order No.
Lubrication adapter LUB-1-KE (female thread M10×1) for the electric slide EGSK-46	1 piece	744167

Range of applications:

The lubrication adapter LUB-1-KE is suitable for **ball-type lubricating nipples similar to those specified in DIN 71412**.

### 2.2.2.3 Lubrication adapter LUB-1-TR-I

The nozzle pipe LUB-1-TR-I can be screwed onto the one-hand grease gun LUB-1 instead of the pinpoint nozzle LUB-1-TR and is ideal for lubricating components in locations that are very difficult to access (→ [Chapter 2.2.1 on page 9](#)).



Type	Quantity	Order No.
Lubrication adapter LUB-1-TR-I (nozzle pipe Ø 6×200 axial)	1 piece	647959

Range of applications:

The lubrication adapter LUB-1-TR-I is ideal for **lubricating components in locations that are very difficult to access.**

### 2.2.2.4 Lubrication adapter LUB-1-TR-L

The nozzle pipe LUB-1-TR-L can be screwed onto the one-hand grease gun LUB-1 instead of the pinpoint nozzle LUB-1-TR (→ [Chapter 2.2.1 on page 9](#)).



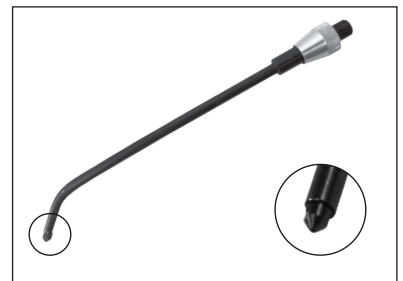
Type	Quantity	Order No.
Lubrication adapter LUB-1-TR-L (nozzle pipe Ø 6×200 lateral)	1 piece	647960

Range of applications:

The lubrication adapter LUB-1-TR-L is ideal for **lubricating components in locations that are very difficult to access.**

### 2.2.2.5 Lubrication adapter LUB-1-TR-W

The nozzle pipe LUB-1-TR-W can be screwed onto the one-hand grease gun LUB-1 instead of the pinpoint nozzle LUB-1-TR (→ [Chapter 2.2.1 on page 9](#)).



Type	Quantity	Order No.
Lubrication adapter LUB-1-TR-W (nozzle pipe Ø 6×200, 45° angled)	1 piece	8073388

Range of applications:

The lubrication adapter LUB-1-TR-W is ideal for **lubricating components in locations that are very difficult to access.**

### 3 Screw locking agent



#### Warning

The possible dangers of the product (in this case screw locking agent) to people and how to protect against these dangers as well as information on first-aid measures can be found in the current safety data sheets for the screw locking agents.

The safety data sheets in accordance with Regulation (EC) No. 1907/2006 can be viewed at  
 → [www.festo.com/en/msds](http://www.festo.com/en/msds).



When using the screw locking agents, the locally applicable environmental protection regulations must be followed. All environmental information about the screw locking agents can be found in the current safety data sheets.

The safety data sheets in accordance with Regulation (EC) No. 1907/2006 can be viewed at  
 → [www.festo.com/en/msds](http://www.festo.com/en/msds).

LOCTITE screw locking agents are single-component adhesives in liquid and semi-solid form. They cure to a stable duroplast at room temperature and can be used to join steel, aluminium, brass and most other metals.

LOCTITE screw locking agents are suitable for a variety of applications.



To find out which screw locking agent to use for which product and for which assembly, maintenance and repair work, please refer to the spare parts documentation and operating instructions for the product and, if available, the repair instructions.

Type	Designation	Characteristic	Quantity	Order No.
Screw locking agent	LOCTITE 222	Low strength	1 ml	395251
Screw locking agent	LOCTITE 243	Medium strength	1 ml	247891
Screw locking agent	LOCTITE 243	Medium strength	10 ml	384267
Screw locking agent	LOCTITE 2701	High strength	10 ml	701774

Range of applications:

#### Securing screws and threaded connections

The LOCTITE screw locking agent stops screws and threaded connections loosening as a result of vibration and shock loads.



Sample application

## 4 Special oils and oil guns

### 4.1 Special oils



When using and disposing of the special oils, the locally applicable environmental protection regulations must be followed.

All environmental information about the special oils can be found in the current safety data sheets.

The safety data sheets in accordance with Regulation (EC) No. 1907/2006 can be viewed at  
 → [www.festo.com/en/msds](http://www.festo.com/en/msds).



To find out which special oil to use for which product and for which application, please refer to the spare parts documentation for the product and the operating instructions.

#### 4.1.1 Special oil OFSW-32

Special oil for use in Festo lubricators.



Type	Designation	Quantity	Order No.
Festo special oil	OFSW-32	1000 ml	152811

Range of applications:

**Lubricating compressed air using the**

- lubricators LOE from the D series and
- lubricators MS-LOE from the MS series.



Lubricator MS9-LOE, MS series

#### 4.1.2 Special oil OFSB-1

Special oil for hydraulic cushioning cylinders, shock absorbers and rotary indexing tables.

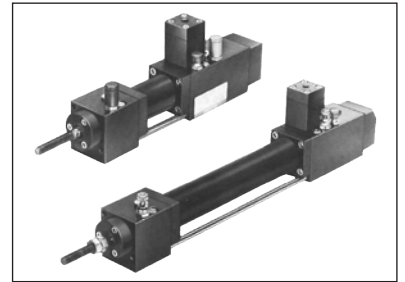


Type	Designation	Quantity	Order No.
Festo special oil	OFSB-1	1000 ml	207873

Range of applications:

**Special oil for**

- hydraulic cushioning cylinders type YZL-... and
- hydraulic cushioning cylinders type YD-...



Hydraulic cushioning cylinder

## 4.2 Oil guns

### 4.2.1 Oil guns for cushioning components

**Oil gun YD**



**Oil gun YSR-OEP**



Type	Quantity	Order No.
Oil gun YD	1 piece	2212
Oil gun YSR-OEP	1 piece	11698

Range of applications:

- **Hydraulic cushioning cylinders type YZL-... and**
- **hydraulic cushioning cylinders type YD-...**

**4.2.2 Oil gun and cartridges for manual relubricating**

**4.2.2.1 Oil gun for manual relubrication with AZLO-H1-C-10 type cartridges**

**AZTP-S-L oil gun**

The cartridge is **not** included with the oil gun.



Type	Quantity	Order No.
AZTP-S-L oil gun	1 piece	8041022

Range of applications:

The AZTP-S-L oil gun is suitable for electric and pneumatic axes, linear drives and mini slides.

**4.2.2.2 AZLO-H1-C-10 cartridge for AZTP-S-L oil gun**

AZLO-H1-C-10 cartridge contains 10 ml Elkalub VP 916 (oil for the food sector).



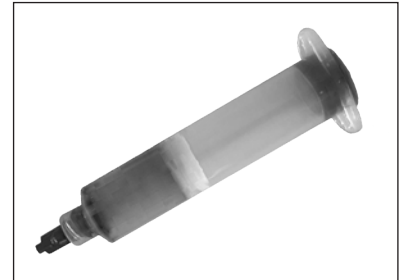
Type	Quantity	Order No.
AZLO-H1-C-10 cartridge	1 piece	8086576

Range of applications:+

- **ELGA-TB-RF-70 / 80 / 120**
- **ELFA-RF-70 / 80**

**4.2.2.3 AZLG-H1-C-10 cartridge for AZTP-S-L oil gun**

AZLG-H1-C-10 cartridge contains 10 ml Elkalub VP 922 (grease).



Type	Quantity	Order No.
AZLG-H1-C-10 cartridge	1 piece	8073523

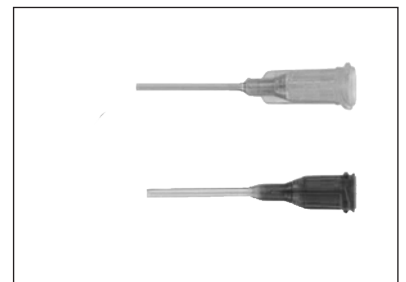
Range of applications:

- **DLGF-KF-20 / 25**
- **EGSC-BS-KF-25 / 32 / 45 / 60**

**4.2.2.4 Metering nozzle set AZTN-DS**

Metering nozzle set AZTN-DS contains:

- 1× metering nozzle size 18, straight (green)  
Outside diameter: 1.27 mm  
for
  - **ELGA-RF-70**
  - **ELFA-RF-70**
  
- 1× metering nozzle size 15, straight (amber-coloured)  
Outside diameter: 1,83 mm  
for
  - **ELGA-RF-80 / 120**
  - **ELFA-RF-80**



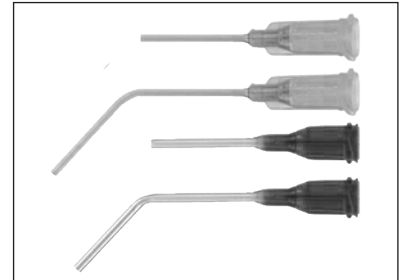
Type	Quantity	Order No.
Metering nozzle set AZTN-DS	1 Set	8086577



#### 4.2.2.5 Metering nozzle set AZTN-DSG

Metering nozzle set AZTN-DSG contains

- 1× metering nozzle size 18, straight (green)  
Outside diameter: 1.27 mm  
for
  - **EGSC-BS-KF-32 / -45**
  
- 1× metering nozzle size 18, bent 45° (green)  
Outside diameter: 1.27 mm  
for
  - **DLGF-20**
  
- 1× metering nozzle size 20, straight (pink)  
Outside diameter: 0.91 mm  
for
  - **EGSC-BS-KF-25**
  
- 1× metering nozzle size 14, bent 45° (olive)  
Outside diameter: 1.83 mm  
for
  - **DLGF-25**



Type	Quantity	Order No.
Metering nozzle set AZTN-DSG	1 set	8075522

### 5 Box spanners for slotted nut on twin-piston cylinder DPZ / DPZJ

Box spanners for loosening and tightening slotted nuts.

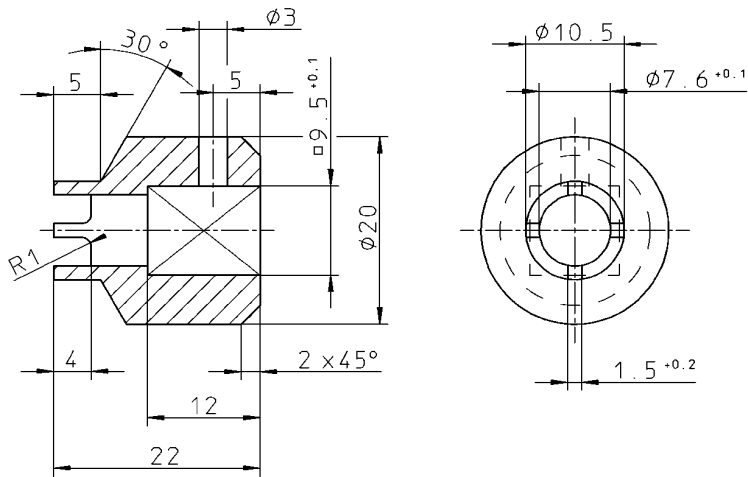


The box spanners for the slotted nuts must be produced by the customer.  
The exact dimensions can be found in the schematic diagrams below.



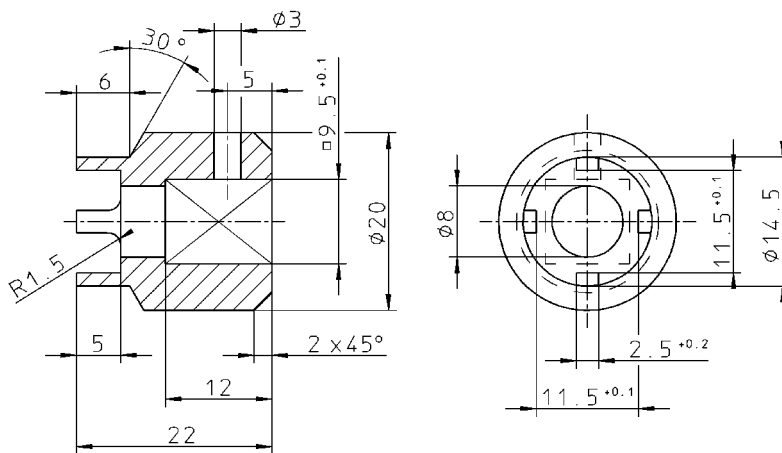
5.1 Box spanner for slotted nuts DPZ-10-...

Schematic diagram:



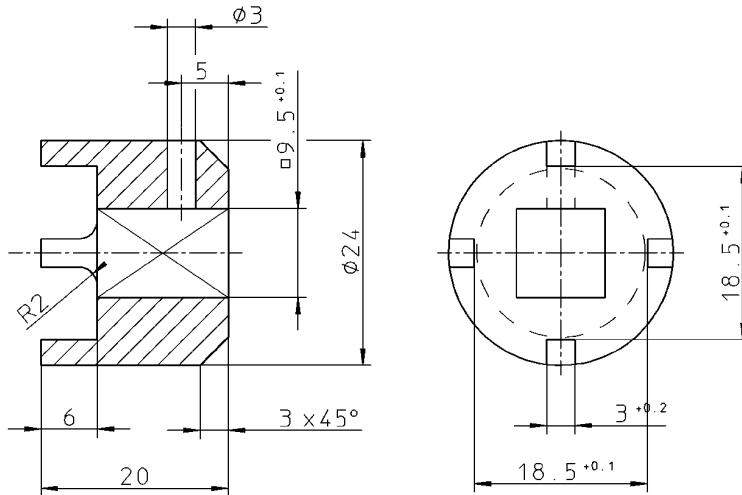
5.2 Box spanner for slotted nuts DPZ-16/20/25-...

Schematic diagram:



### 5.3 Box spanner for slotted nuts DPZ-32-...

Schematic diagram:

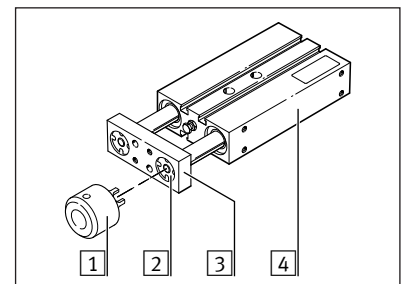


Range of applications:

#### Twin-piston cylinder DPZ/DPZJ

The box spanner is required to fasten the yoke/end plate [2] to the piston rod [3] using the slotted nut [1].

- [1] Box spanner for slotted nuts
- [2] Slotted nut
- [3] Yoke/end plate
- [4] Twin-piston cylinder DPZ/DPZJ



Sample application

## 6 Mounting sleeve for solenoid valves

Mounting sleeve for fitting sealing rings.



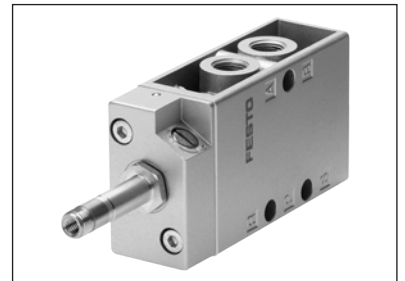
Type	Area of application	Quantity	Order No.
1/8" mounting sleeve	Solenoid valve VL-5-1/8 and MFH-5-1/8	1 piece	228389
1/4" mounting sleeve	Solenoid valve VL-5-1/4 and MFH-5-1/4	1 piece	229363

Range of applications:

### Solenoid valves of the type:

- VL-5-1/8
- VL-5-1/4
- MFH-5-1/8
- MFH-5-1/4

The mounting sleeve is used to fit sealing rings on the hand lever valve/stem on the above mentioned solenoid valves.



Solenoid valve MFH

## 7 Mounting sleeve for piston rods on cylinder CRDSNU

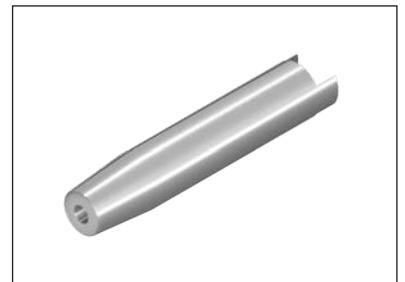
Mounting sleeve for piston rods for protecting the piston rod seal in the sealing seat during repairs.



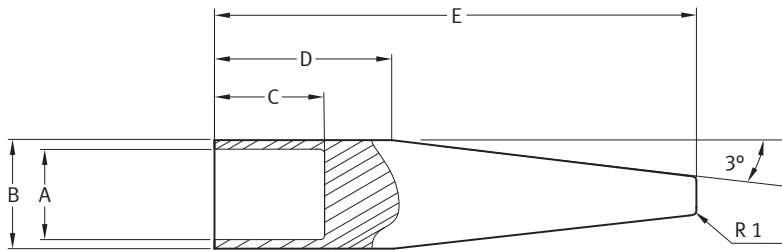
The mounting sleeve for piston rods must be produced by the customer.

The exact dimensions can be found in the schematic diagram below.

The dimensions "C", "D" and "E" (→ schematic diagram) must be adjusted accordingly when using an **extended piston rod thread** or a piston rod with **female thread**.



**Schematic diagram:**



A (= piston rod diameter)	B	C	D	E
6	∅ 6.6	26	27	55
8	∅ 8.6	23.5	25	65
10	∅ 10.6	27	28	75
12	∅ 12.6	34	35	85
16	∅ 16.6	35	40	90
20	∅ 20.6	45	50	100
25	∅ 25.6	55	60	100
32	∅ 32.6	65	80	110
40	∅ 40.6	100	110	160
50	∅ 50.6	110	120	200
63	∅ 63.6	130	150	230

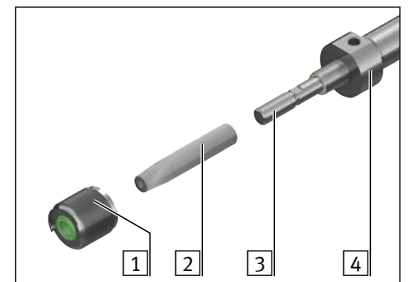
All dimensions in millimetres [mm]

Range of applications:

**Pushing the sealing seat onto the piston rod**

The appropriate mounting sleeve for piston rods [2] protects the new piston rod seal from damage caused by the piston rod thread [3] when pushing the piston rod through the sealing seat [1].

- [1] Sealing seat
- [2] Mounting sleeve for piston rods
- [3] Piston rod thread
- [4] Cylinder



Sample application



The exact procedure for exchanging the piston rod seal in the sealing seat of cylinders with piston rod can be found in the respective repair instructions.

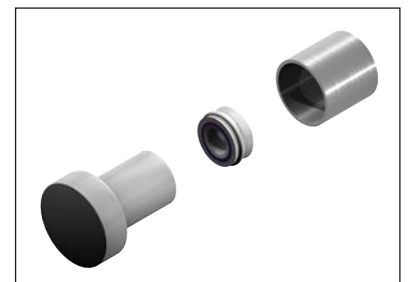
## 8 Mounting sleeve and pressure piece for scraper ring on the CRDSNU

The mounting sleeve and matching pressure piece prevent damage to the scraper ring when inserting it into the sealing seat of the round cylinder CRDSNU.

A sample application of these tools can be found at the end of [Chapter 8.2 on page 23](#).

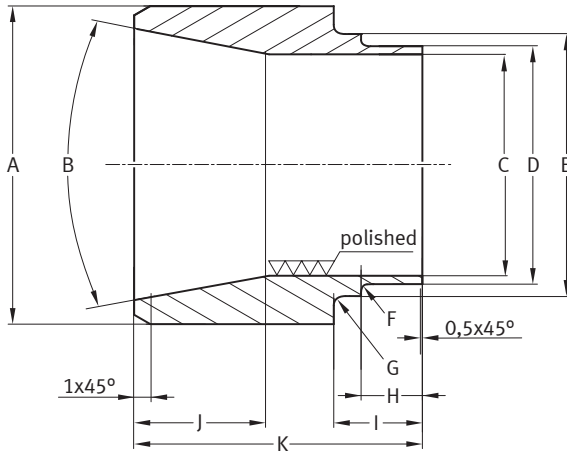


The mounting sleeve and matching pressure piece for inserting the scraper ring into the sealing seat of the round cylinder CRDSNU must be produced by the customer. The exact dimensions can be found in the schematic diagrams below.



### 8.1 Mounting sleeve and pressure piece for scraper ring on the CRDSNU-12 / 16 / 20 / 25

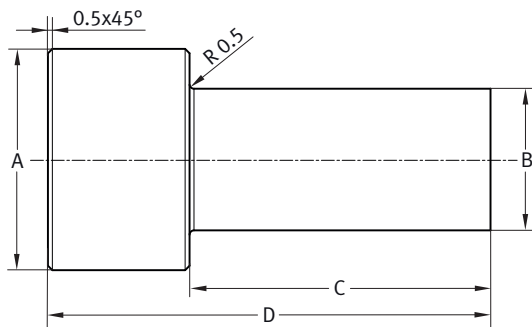
Schematic diagram:



Round cylinder	A	B	C	D	E	F	G	H	I	J	K
CRDSNU-12	$\varnothing 18$	$12^\circ$	$\varnothing 11$	$\varnothing 11.5$	$\varnothing 14$	R 0.4	–	8.2	9.6	6	22.6
CRDSNU-16	$\varnothing 18$	$12^\circ$	$\varnothing 11$	$\varnothing 11.5$	$\varnothing 14$	R 0.4	–	8.2	9.6	6	22.6
CRDSNU-20	$\varnothing 24$	$12^\circ$	$\varnothing 14.2$	$\varnothing 16.2$	$\varnothing 17.5$	R 0.4	R 1	9	12	8	24
CRDSNU-25	$\varnothing 24$	$12^\circ$	$\varnothing 16$	$\varnothing 16.4$	$\varnothing 17.5$	–	R 1	10.3	13.3	8	26

All dimensions in millimetres [mm] unless otherwise specified

Schematic diagram:

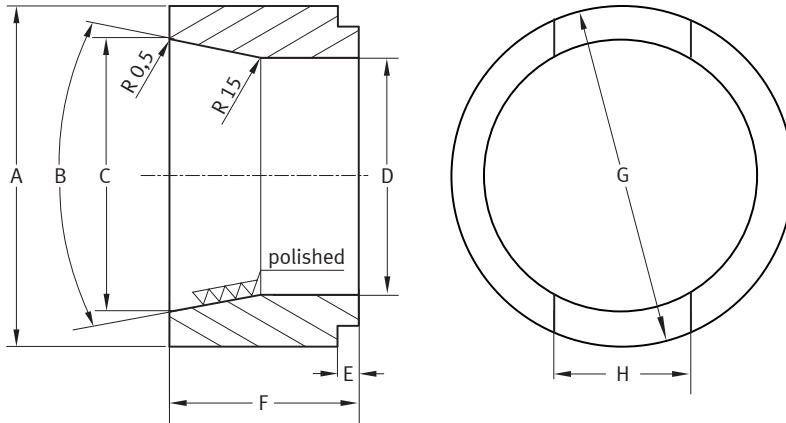


Round cylinder	A	B	C	D
CRDSNU-12	$\varnothing 30$	$\varnothing 10.9$	40	60
CRDSNU-16	$\varnothing 30$	$\varnothing 10.9$	40	60
CRDSNU-20	$\varnothing 30$	$\varnothing 14.1$	40	60
CRDSNU-25	$\varnothing 30$	$\varnothing 15.9$	40	60

All dimensions in millimetres [mm]

## 8.2 Mounting sleeve and pressure piece for scraper ring on the CRDSNU-32 / 40 / 50 / 63

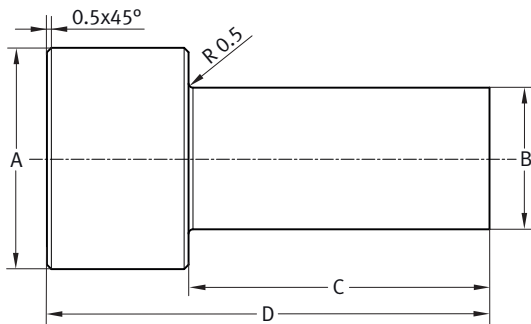
Schematic diagram:



Round cylinder	A	B	C	D	E	F	G	H
CRDSNU-32	∅ 29.5	30 °	∅ 25.3	∅ 22	3.1	16	∅ 30	13.1
CRDSNU-40	∅ 35.5	30 °	∅ 29.2	∅ 26	3.6	16.5	∅ 36	18.1
CRDSNU-50	∅ 42.5	30 °	∅ 33.2	∅ 30	3.9	16.5	∅ 43	22.1
CRDSNU-63	∅ 42.5	30 °	∅ 33.2	∅ 30	3.9	16.5	∅ 43	22.1

All dimensions in millimetres [mm] unless otherwise specified

Schematic diagram:



Round cylinder	A	B	C	D
CRDSNU-32	∅ 40	∅ 21.9	40	60
CRDSNU-40	∅ 40	∅ 25.9	40	60
CRDSNU-50	∅ 40	∅ 29.9	40	60
CRDSNU-63	∅ 40	∅ 29.9	40	60

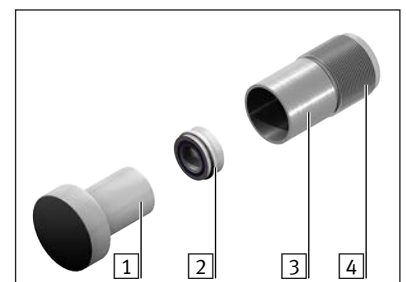
All dimensions in millimetres [mm]

Range of applications:

### Inserting the scraper ring into the sealing seat of the round cylinder CRDSNU

Place the appropriate mounting sleeve [3] on the sealing seat [4] to insert the scraper ring [2] without damaging it into the sealing seat [4] using the matching pressure piece [1].

- [1] Pressure piece for scraper ring
- [2] Scraper ring
- [3] Mounting sleeve for scraper ring
- [4] Sealing seat CRDSNU



Sample application

## 9 Mounting sleeve for piston rod with male thread on the cylinder DNC / DSBx / DFPI / CRDNG / ADVU / AEVU

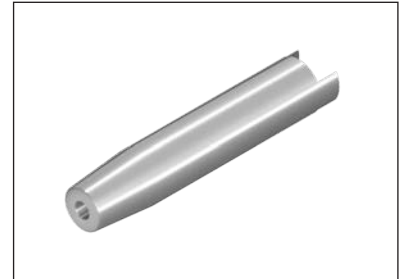
Assembly tools for piston rods **with male thread** for protecting the piston rod seal and the bearing in the bearing cap or sealing seat during repairs.



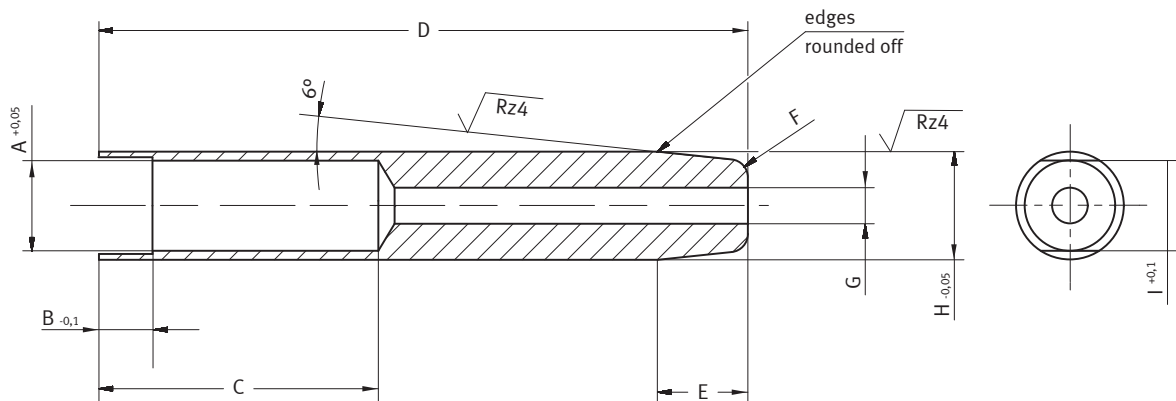
The assembly tools for piston rods must be produced by the customer.

The exact dimensions can be found in the schematic diagrams below.

The dimensions “C” and “D” (→ schematic diagram) must be adjusted accordingly when using an **extended piston rod thread**.



Schematic diagram:



### DNC / DSBx / DFPI / CRDNG

Piston rod diameter	A	B	C	D	E	F	G	H	I
12	∅ 10	6	31	72	10	R2	∅ 4	∅ 12	10.1
16	∅ 12	6.5	32	84	15	R2	∅ 4	∅ 16	13.1
20	∅ 16	8	42	102	20	R2	∅ 4	∅ 20	17.1
25	∅ 20	10	52	117	25	R4	∅ 4	∅ 25	22.1
32	∅ 27	13	72	95	27	R4	∅ 4	∅ 32	27.1
40	∅ 36	17	94	122	31	R4	∅ 4	∅ 40	36.1
50	∅ 42	17	106	140	37	R4	∅ 4	∅ 50	46.1
63	∅ 48	17	118	164	49	R4	∅ 4	∅ 63	55.1

All dimensions in millimetres [mm]

### ADVU / AEVU

Piston rod diameter	A	B	C	D	E	F	G	H	I
12	∅ 10	4.75	30	53	20	R1	∅ 4	∅ 12	10.1
16	∅ 12	6.14	32	55	20	R1	∅ 4	∅ 16	13.1
16	∅ 12	6.14	32	55	20	R1	∅ 4	∅ 16	13.1
20	∅ 16	7.14	42	66	25	R2	∅ 4	∅ 20	17.1
25	∅ 20	9	55	90	34	R2	∅ 8	∅ 25	22.1
32	∅ 27	13.2	60	95	34	R2	∅ 8	∅ 32	27.1

All dimensions in millimetres [mm]



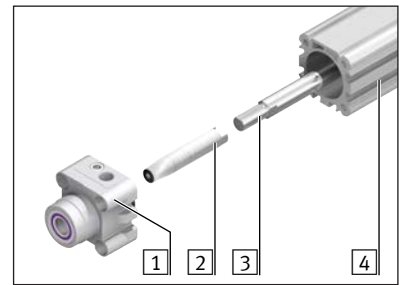
Range of applications:

**Pushing the bearing cap onto the piston rod**

– Piston rod with male thread for cylinder DNC / DSBx / DFPI / CRDNG / ADVU / AEUU)

The appropriate mounting sleeve for piston rods [2] protects the bearing and the new piston rod seal from damage caused by the piston rod thread [3] when pushing the piston rod through the bearing cap [1].

- [1] Bearing cap
- [2] Mounting sleeve for piston rods
- [3] Piston rod thread
- [4] Cylinder barrel



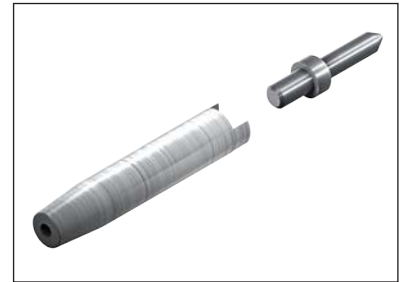
Sample application

**9.1 Mounting sleeve for piston rod with female thread on the cylinder DNC / DSBx / CRDNG / ADVU / AEUU**

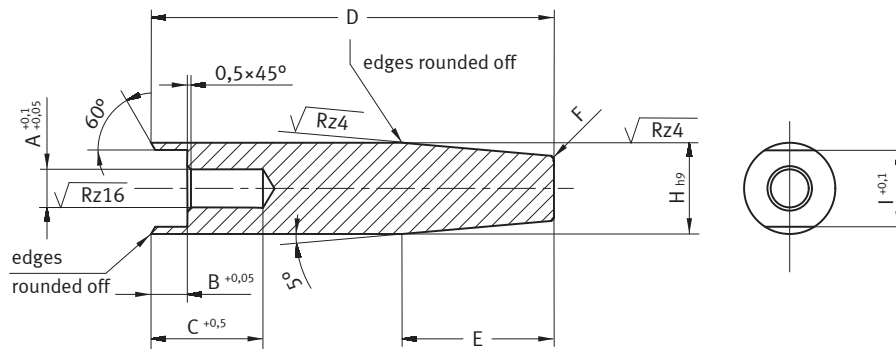
Assembly tools for piston rods **with female thread** for protecting the piston rod seal and the bearing in the bearing cap or sealing seat during repairs.



The assembly tools for piston rods must be produced by the customer.  
The exact dimensions can be found in the schematic diagrams below.



**Schematic diagram:**

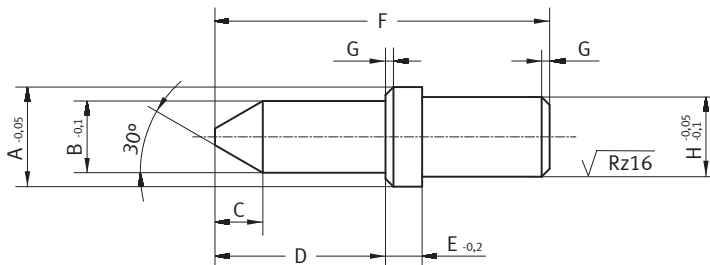


Piston rod diameter	A	B	C	D	E	F	H	I
12	∅ 5	4.75	14.75	54.6	20	R0.5	∅ 12	10.1
16	∅ 5	6.14	10	55	20	R1	∅ 16	13.1
20	∅ 6	7.14	10	66	25	R2	∅ 20	17.1
25	∅ 8	9	55	90	34	R2	∅ 25	22.1
32	∅ 8	13.2	25.2	95	23	R2	∅ 32	27.1

All dimensions in millimetres [mm]

## 9.2 Mandrel for piston rod with female thread on the cylinder DNC / DSBx / CRDNG / ADVU / AEVU

Schematic diagram:



Piston rod diameter	A	B	C	D	E	F	G	H
12	Ø 6.35	Ø 4.5	3	9.7	2.3	20	0.5 × 45°	Ø 5
16	Ø 8.35	Ø 6.2	4	12.9	3.1	24	0.5 × 45°	Ø 5
20	Ø 10.45	Ø 8	5	17	4.4	29.5	0.5 × 45°	Ø 6
25	Ø 12.95	Ø 9.8	5	19	5.9	36	1 × 45°	Ø 8
32	Ø 16.95	Ø 13.9	10	23.1	6.9	40	1 × 45°	Ø 8

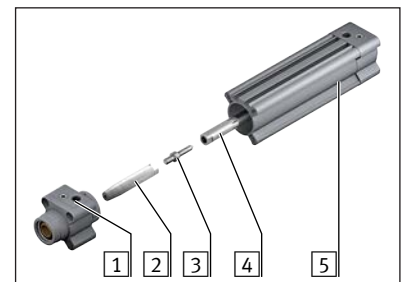
All dimensions in millimetres [mm]

Range of applications:

### Pushing the bearing cap onto the piston rod with female thread for cylinder DNC / DSBx / CRDNG / ADVU / AEVU

The appropriate mounting sleeve for piston rods [2] and a mandrel [3] protects the bearing and the new piston rod seal from damage caused by the piston rod [4] when pushing the piston rod with female thread [4] through the bearing cap [1].

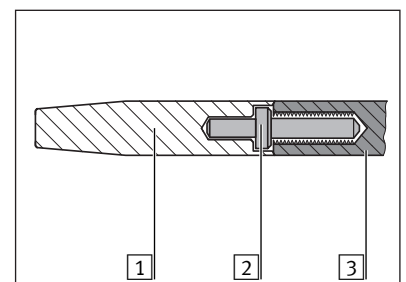
- [1] Bearing cap
- [2] Mounting sleeve for piston rods
- [3] Mandrel
- [4] Piston rod with female thread
- [5] Cylinder barrel



Sample application

A mandrel [2] is additionally inserted into the female thread of the piston rod for piston rods with female thread [3]. The mounting sleeve for piston rods [1] is placed on this mandrel [2].

- [1] Mounting sleeve for piston rods
- [2] Mandrel
- [3] Piston rod with female thread



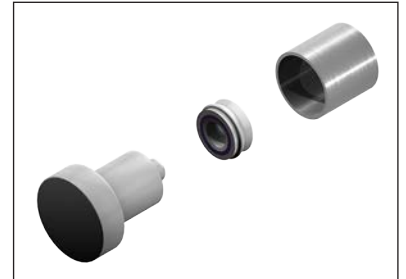
## 10 Mounting sleeve and pressure piece for scraper ring on the DNC / DSBx / DFPI / DFPI-NB3P / CRDNG

The mounting sleeve and matching pressure piece prevent damage to the scraper ring when inserting it into the bearing cap.

Sample applications of these tools can be found at the end of [Chapter 10.1 on page 27](#) and at the end of [Chapter 10.2 on page 29](#).

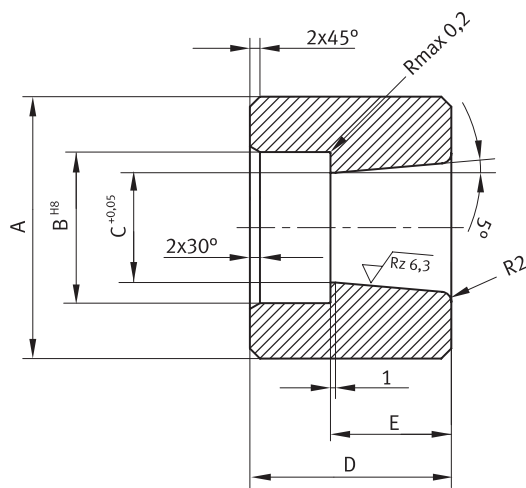


The mounting sleeve and matching pressure piece for inserting the scraper ring into the bearing cap must be produced by the customer. The exact dimensions can be found in the schematic diagrams below.



### 10.1 Mounting sleeve and pressure piece for scraper ring on the DNC / DSBx / DFPI-NB3P / CRDNG

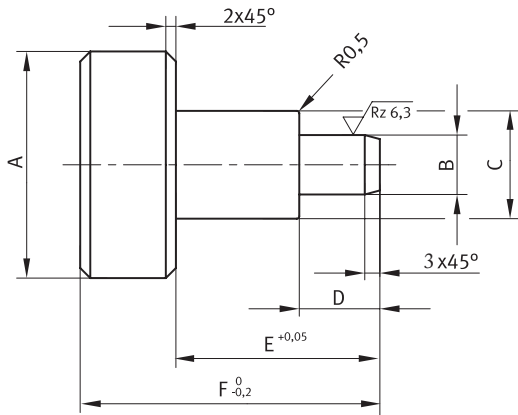
Schematic diagram:



Piston diameter	A	B	C	D	E
32	Ø 52	Ø 30	Ø 21	40	24
40	Ø 52	Ø 35	Ø 25	42	24
50	Ø 53	Ø 40	Ø 29	50	24
63	Ø 53	Ø 45	Ø 29	50	24
80	Ø 53	Ø 45	Ø 34	57	24
100	Ø 61	Ø 55.5	Ø 34	61	24
125	Ø 66	Ø 61.5	Ø 41	68	24
160	Ø 71	Ø 65.5	Ø 49.1	84	24
200	Ø 81	Ø 75.5	Ø 49.1	89	24
250	Ø 96	Ø 90.5	Ø 59.2	103	24
320	Ø 116	Ø 110.5	Ø 74.2	113	24

All dimensions in millimetres [mm]

Schematic diagram:

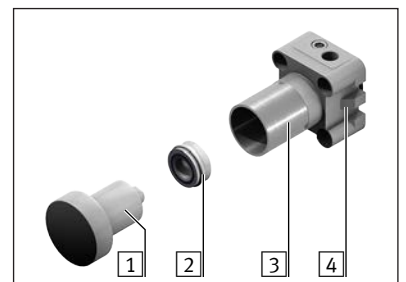


Piston diameter	A	B	C	D	E	F
32	∅ 37	∅ 12	∅ 20.8	16	40.5	56
40	∅ 41	∅ 16	∅ 24.8	16	40.5	56
50	∅ 45	∅ 20	∅ 28.8	16	40.5	56
63	∅ 45	∅ 20	∅ 28.8	16	40.5	56
80	∅ 50	∅ 25	∅ 33.8	17.5	42	70
100	∅ 50	∅ 25	∅ 33.8	17.5	42	70
125	∅ 58	∅ 32	∅ 40.8	17.5	42	70
160	∅ 65	∅ 40	∅ 48.9	17.5	42	70
200	∅ 65	∅ 40	∅ 48.9	17.5	42	70
250	∅ 75	∅ 50	∅ 59	19	45	80
320	∅ 90	∅ 63	∅ 74	20	45	80

All dimensions in millimetres [mm]

Range of applications:

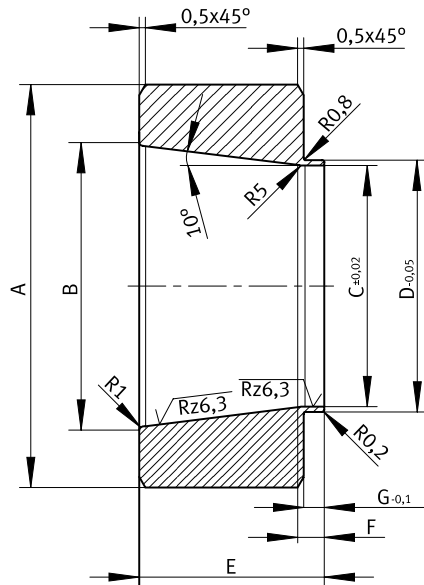
- 1 Pressure piece for scraper ring
- 2 Scraper ring
- 3 Mounting sleeve for scraper ring
- 4 DNC bearing cap



Sample application

## 10.2 Mounting sleeve and pressure piece for scraper ring on the DFPI

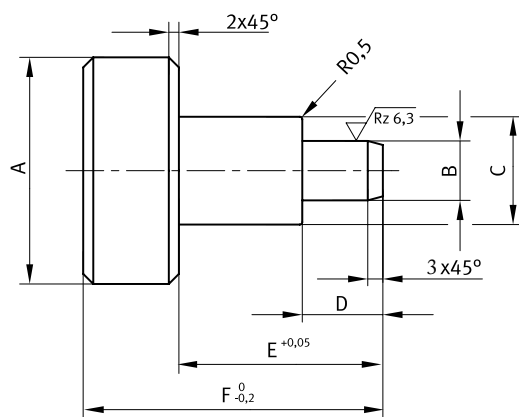
Schematic diagram:



Piston diameter	A	B	C	D	E	F	G
100	∅ 50	∅ 40.7	∅ 34	∅ 35	22.3	3.3	2.3
125	∅ 55	∅ 47.7	∅ 41	∅ 42	22.3	3.3	2.3
160	∅ 55	∅ 47.7	∅ 41	∅ 42	22.3	3.3	2.3
200	∅ 65	∅ 55.8	∅ 49.1	∅ 50.1	22.3	3.3	2.3
250	∅ 65	∅ 55.8	∅ 49.1	∅ 50.1	22.3	3.3	2.3
320	∅ 65	∅ 55.8	∅ 49.1	∅ 50.1	22.3	3.3	2.3

All dimensions in millimetres [mm]

Schematic diagram:

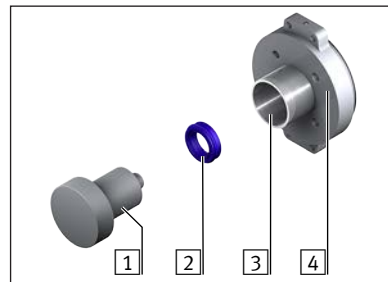


Piston diameter	A	B	C	D	E	F
100	∅ 50	∅ 25	∅ 33.8	17.5	37.7	65
125	∅ 55	∅ 32	∅ 40.8	17.5	37.7	65
160	∅ 55	∅ 40	∅ 40.8	17.5	37.7	65
200	∅ 65	∅ 40	∅ 48.9	17.5	37.7	65
250	∅ 65	∅ 40	∅ 48.9	17.5	37.7	65
320	∅ 65	∅ 40	∅ 48.9	17.5	37.7	65

All dimensions in millimetres [mm]

Range of applications:

- 1 Pressure piece for scraper ring
- 2 Scraper ring
- 3 Mounting sleeve for scraper ring
- 4 DFPI bearing cap

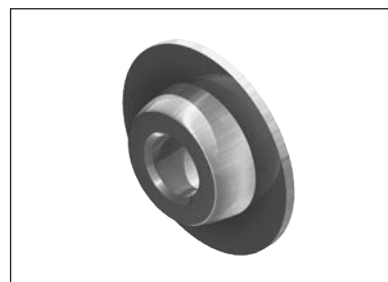


Sample application

## 11 Centring tool and tubular box spanner for mounting the cushioning bosses on cylinders of the type ADN-...-PPS and ADNGF-...-PPS

### 11.1 Centring tool for the cushioning bosses on cylinders of the type ADN-...-PPS and ADNGF-...-PPS

The centring tool for the cushioning bosses is used to centre the front cushioning boss on the piston rod on cylinders of the type ADN-...-PPS and ADNGF-...-PPS.



Type	Area of application	Piston diameter [mm]	Quantity	Order No.
Centring tool	Cushioning boss ADN/ADNGF-32-...-PPS	12	1 piece	1356097
Centring tool	Cushioning boss ADN/ADNGF-40-...-PPS	12	1 piece	1437387
Centring tool	Cushioning boss ADN/ADNGF-50-...-PPS	16	1 piece	1437415
Centring tool	Cushioning boss ADN/ADNGF-63-...-PPS	16	1 piece	1437415
Centring tool	Cushioning boss ADN/ADNGF-80-...-PPS	20	1 piece	1441528
Centring tool	Cushioning boss ADN/ADNGF-100-...-PPS	20	1 piece	2585245

Type	Area of application	Piston diameter [mm]	Quantity	Order No.
Cushioning boss	Cushioning boss ADN/ADNGF-32-...-PPS	12	2 piece	1273587
Cushioning boss	Cushioning boss ADN/ADNGF-40-...-PPS	12	2 piece	1280390
Cushioning boss	Cushioning boss ADN/ADNGF-50-...-PPS	16	2 piece	1271128
Cushioning boss	Cushioning boss ADN/ADNGF-63-...-PPS	16	2 piece	1280411
Cushioning boss	Cushioning boss ADN/ADNGF-80-...-PPS	20	2 piece	1273684
Cushioning boss	Cushioning boss ADN/ADNGF-100-...-PPS	20	2 piece	1724489



Further information on spare parts for cylinders of the type ADN / ADNGF-...-PPS can be found in the online spare parts catalogue on the Festo website (→ [www.festo.com/spareparts](http://www.festo.com/spareparts)).

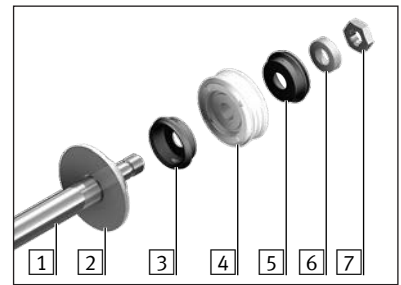
Range of applications:

**Compact cylinders of the type:**

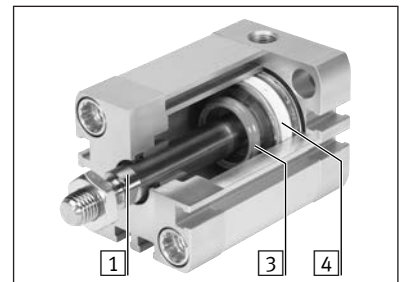
- **ADN-...-PPS**
- **ADNGF-...-PPS**

Place the centring tool [2] on the piston rod [1] to centre the front cushioning boss [3] on the piston rod [1] and secure it until the piston module [4] and the rear cushioning boss [5] are permanently mounted on the piston rod [1] using a hex nut (→ [Chapter 11.2 on page 31](#)) or a second piston rod (with S2 / S20). Then remove the centring tool [2] from the piston rod [1].

- |                           |                          |
|---------------------------|--------------------------|
| [1] Piston rod            | [5] Rear cushioning boss |
| [2] Centring tool         | [6] Washer               |
| [3] Front cushioning boss | [7] Hex nut              |
| [4] Piston module         |                          |



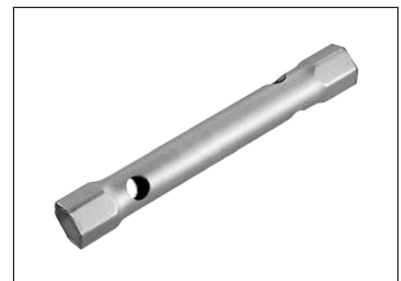
Sample application



ADN-32-...-PPS

## 11.2 Tubular box spanner for dismounting and mounting the cushioning bosses on cylinders of the type ADN-...-PPS and ADNGF-...-PPS

Tubular box spanner for loosening and tightening the hex nuts on the piston rod on cylinders of the type ADN/ADNGF-...-PPS. This tubular box spanner protects the cushioning boss against damage.



Type	Area of application	Wall thickness
Tubular box spanner, A/F 13	ADN/ADNGF-32-...-PPS	1.6 mm
Tubular box spanner, A/F 17	ADN/ADNGF-40-...-PPS	1.6 mm
Tubular box spanner, A/F 19	ADN/ADNGF-50-...-PPS	2.3 mm
Tubular box spanner, A/F 19	ADN/ADNGF-63-...-PPS	2.3 mm
Tubular box spanner, A/F 22	ADN/ADNGF-80-...-PPS	2.3 mm
Tubular box spanner, A/F 22	ADN/ADNGF-100-...-PPS	2.3 mm



The wall thickness of the tubular box spanner used together with the size of the spanner are key for ensuring that the installation is completed without damaging the cushioning boss.

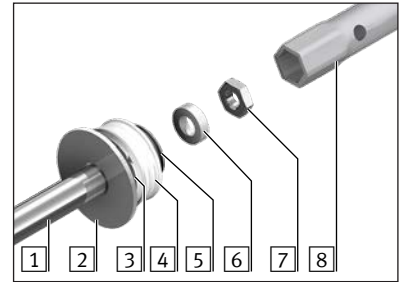
Range of applications:

**Exchanging the cushioning bosses on compact cylinders of the type:**

- **ADN-...-PPS**
- **ADNGF-...-PPS**

Use the tubular box spanner [8] to loosen or tighten the hex nut [7] on the piston rod [1] without damaging the rear cushioning boss [5].

- |                                     |                          |
|-------------------------------------|--------------------------|
| [1] Piston rod                      | [5] Rear cushioning boss |
| [2] Centring tool                   | [6] Washer               |
| [3] Front cushioning boss (covered) | [7] Hex nut              |
| [4] Piston module                   | [8] Box spanner          |



Sample application



The exact procedure for exchanging the cushioning bosses can be found in the respective repair instructions. This can be found on the Festo website (→ [www.festo.com/spareparts](http://www.festo.com/spareparts)).

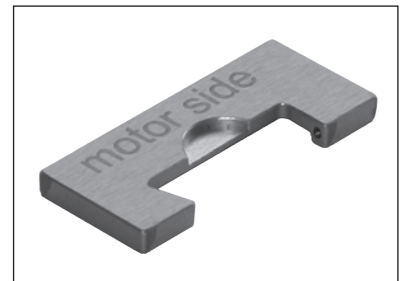
## 12 Distance piece and distance plates for referencing the parallel kinematic system



The distance piece and the distance plate are both required for referencing the parallel kinematic system.

### 12.1 Distance piece

The distance piece is required for referencing the parallel kinematic system. Referencing serves the purpose of setting the control of the parallel kinematic system to the distance plate thickness of 4 mm. The zero point of the axis is defined in this process. Type



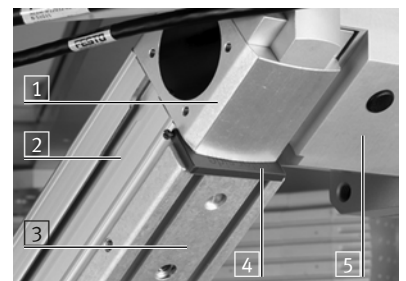
Type	Area of application	Quantity	Order No.
Distance piece	EXPT-45 / 70 / 95 / 120-...	1 piece	1495926

Range of applications:

**Referencing the parallel kinematic system of type:**

- **EXPT-45 / 70 / 95 / 120-...**

- |                       |
|-----------------------|
| [1] Drive cover       |
| [2] Slide             |
| [3] Toothed belt axis |
| [4] Distance piece    |
| [5] Axial kit         |



Sample application



The exact procedure for referencing the parallel kinematic system can be found in the repair instructions. This can be found on the Festo website (→ [www.festo.com/spareparts](http://www.festo.com/spareparts)).

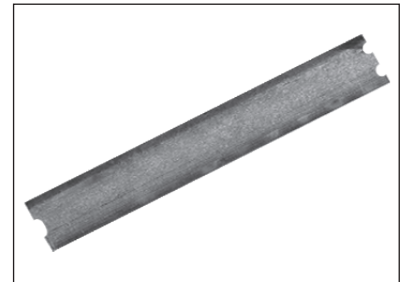


## 12.2 Distance plate for parallel kinematic system EXPT-45 / 70

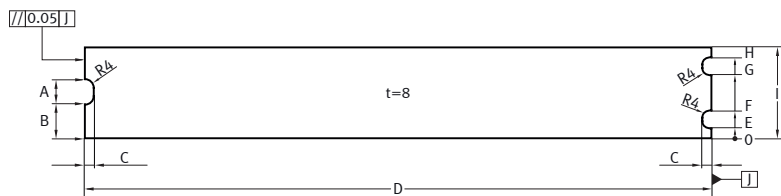
The distance plate is required for referencing the parallel kinematic system.  
 The parameters of the motor controllers are set correctly to the zero point using the distance plate (nominal dimension of the distance plate 350 mm).



The distance plate must be produced by the customer.  
 The exact dimensions can be found in the schematic diagram below.



### Schematic diagram:



A	B	C	D	E	F	G	H	I
14 <sup>+0.2</sup>	18 <sup>+0.1</sup>	5 <sup>+0.2</sup>	350	5.1 <sup>-0.1</sup>	15 <sup>+0.1</sup>	35 <sup>-0.1</sup>	45 <sup>+0.1</sup>	50

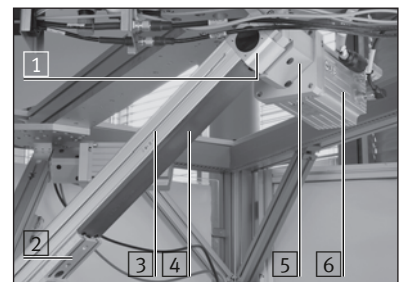
All dimensions in millimetres [mm]

Range of applications:

### Referencing the parallel kinematic system of type:

– EXPT-45 / 70-...

- 1 Drive cover
- 2 Slide
- 3 Toothed belt axis
- 4 Distance plate
- 5 Axial kit
- 6 Servomotor



Sample application



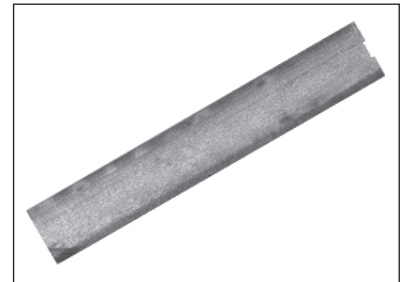
The exact procedure for referencing the parallel kinematic system can be found in the repair instructions. This can be found on the Festo website (→ [www.festo.com/spareparts](http://www.festo.com/spareparts)).

### 12.3 Distance plate for parallel kinematic system EXPT-95 / 120

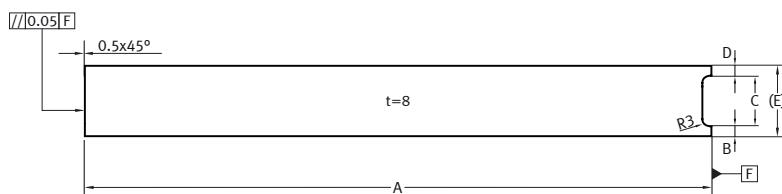
The distance plate is required for referencing the parallel kinematic system. The parameters of the motor controllers are set correctly to the zero point using the distance plate (nominal dimension of the distance plate 600 mm).



The distance plate must be produced by the customer. The exact dimensions can be found in the schematic diagram below.



#### Schematic diagram:



A	B	C	D	(E)
600	6 <sup>+0.1</sup>	34 <sup>+0.1</sup>	5 <sup>-0.1</sup>	45

All dimensions in millimetres [mm]

Range of applications:

#### Referencing the parallel kinematic system of type:

- EXPT-95 / 120-...



The exact procedure for referencing the parallel kinematic system can be found in the repair instructions. This can be found on the Festo website (→ [www.festo.com/spareparts](http://www.festo.com/spareparts)).

## 13 Devices for checking the toothed belt pretension

### 13.1 Test device V2 / TB-TE-EQ12

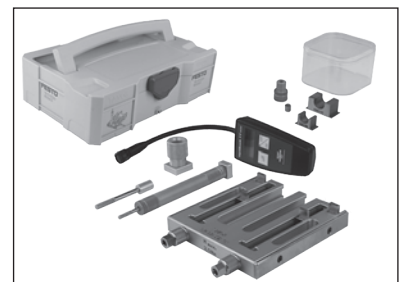


The exact procedure for checking the toothed belt pretensioning can be found in the operating instructions "Test device for toothed belt pretensioning V2 / TB-TE-EQ12" (→ [TB-TE-EQ12.pdf](#)).

#### Systainer with test device V2 / TB-TE-EQ10

The Systainer (with foam insert) contains:

- Test device V2 / TB-TE-EQ12
- Acoustic frequency meter TB-TE-EQ3 (→ [Chapter 13.4.1 on page 38](#)).
- Clamping component for DGE-25-ZR-RF
- Clamping component for DGE-40-ZR-RF
- Round magnet (L = 6 mm) for DGE-63
- Plastic box for small parts



Type	Designation	Order No.
Systainer with test device V2 / TB-TE-EQ10 – with acoustic frequency meter	TB-TE-EQ10	8026615

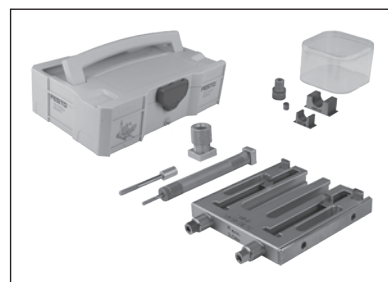
### Systainer with test device V2 / TB-TE-EQ12

The Systainer (with foam insert) contains:

- Test device V2 / TB-TE-EQ12
- Clamping component for DGE-25-ZR-RF
- Clamping component for DGE-40-ZR-RF
- Round magnet (L = 6 mm) for DGE-63
- Plastic box for small parts



The acoustic frequency meter TB-TE-EQ13 must be ordered separately (→ [Chapter 13.4.1 on page 38](#)).



Type	Designation	Order No.
Systainer with test device V2 / TB-TE-EQ12 – <b>without</b> acoustic frequency meter	TB-TE-EQ12	8026617

It is possible to excite the natural frequency of the toothed belt in any position by the plunger via a force stimulus thanks to the 2-spring system in the plunger housing and the absence of parts that can fall out. Space permitting, there are no restrictions with respect to the position of the toothed belt axis when using the test device.

Depending on the toothed belt axis, the test device is either clamped or tensioned and self-supporting. The clamping jaws are available in two depths (1 mm and 6 mm).

Thanks to its clamping function, the test device is also suitable for testing from below or with the toothed belt axis in an inclined or vertical mounting position. The test device V2 / TB-TE-EQ12 has a holder for the test probe of the acoustic frequency meter type TB-TE-EQ3.

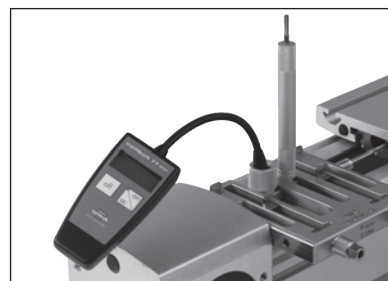


Range of applications:

#### Checking the toothed belt pretensioning on toothed belt axes type:

- DGE-25 / 40 / 63-ZR-RF
- DGE-25 / 40 / 63-ZR-(KF)
- DGEA-18 / 25 / 40-ZR
- EGC-50 / 70 / 80 / 120 / 185-TB-KF
- EGC-HD-125-TB
- EGC-HD-160 / 220-TB-(GP)
- ELGA-70 / 80 / 120-TB-G
- ELGA-70 / 80 / 120-TB-RF/-KF-...(F1)
- ELGA-150-TB-KF

The toothed belt pretensioning of the above-named toothed belt axes can be tested using the **acoustic frequency meter TB-TE-EQ3 or TB-TE-EQ13** connected to the V2 / TB-TE-EQ12 test device.



Sample application

### 13.2 Mounting kit TB-TE-EQ4 for test device V1 / TB-TE-EQ2 for toothed belt axis ELGA-TB-G / RF-(F1) / KF-(F1)

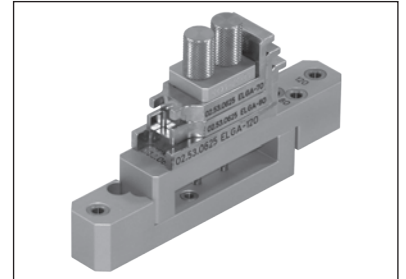
The mounting kit TB-TE-EQ4 can only be used in combination with the **test device V1 / TB-TE-EQ2** (→ [Chapter 13.2 on page 36](#)) for checking the toothed belt pretensioning on toothed belt axes of the type **ELGA-TB-G / RF-(F1) / KF-(F1)** for size **70 / 80 / 120**.



The **mounting kit TB-TE-EQ4** cannot be used for **ELGA-TB-KF-150**. For **ELGA-TB-KF-150** measure without device. The procedure is described in the repair instructions.

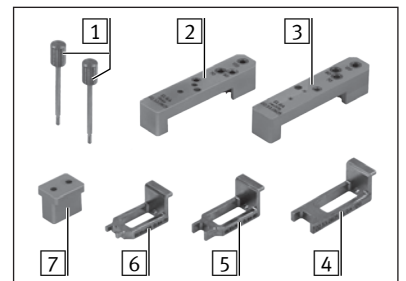
The acoustic frequency meter TB-TE-EQ13 must be ordered separately (→ [Chapter 13.4.1 on page 38](#)).

The test device V1 / TB-TE-EQ2 is no longer available.



#### Contents of the mounting kit TB-TE-EQ4:

- 1 Position stop bolt
- 2 Left-hand position stop
- 3 Right-hand position stop
- 4 Distance piece for ELGA-TB-G-120 / RF-120-(F1) / KF-120-(F1)
- 5 Distance piece for ELGA-TB-G-80 / RF-80-(F1) / KF-80-(F1)
- 6 Distance piece for ELGA-TB-G-70 / RF-70-(F1) / KF-70-(F1)
- 7 Transport holder for distance pieces



Type	Designation	Order No.
Mounting kit TB-TE-EQ4 for toothed belt axis ELGA-TB-G / RF-(F1) / KF-(F1)	TB-TE-EQ4	760460

Range of applications:

#### Checking the toothed belt pretensioning only on toothed belt axes ELGA-TB-G / RF / KF-70 / 80 / 120

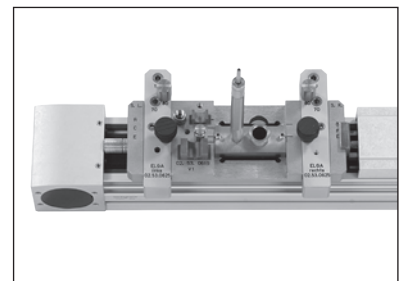
The toothed belt pretensioning of the above-named toothed belt axes can be tested using the **acoustic frequency meter TB-TE-EQ3 or TB-TE-EQ13** connected to the V1 / TB-TE-EQ2 test device and the **TB-TE-EQ4 adapter kit**.



The **mounting kit TB-TE-EQ4** cannot be used for **ELGA-TB-KF-150**. For **ELGA-TB-KF-150** measure without device. The procedure is described in the repair instructions.



The exact procedure for checking the toothed belt pretensioning using the mounting kit can be found in the operating instructions **“Test device for toothed belt pretensioning V1 / TB-TE-EQ2”** (→ [TB-TE-EQ02.pdf](#)).



Sample application

### 13.2.1 Mounting kit TB-TE-EQ7 for test device V1 / TB-TE-EQ2 for toothed belt axis EGC-HD-...-TB(-GP)

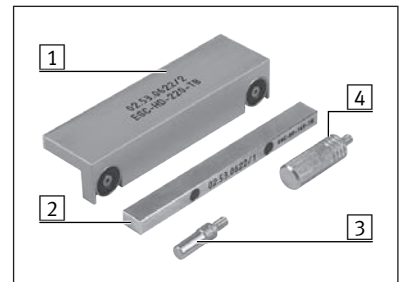
The mounting kit TB-TE-EQ7 can only be used in combination with the **test device V1 / TB-TE-EQ2** (→ [Chapter 13.2 on page 36](#)) for checking the toothed belt pretensioning on toothed belt axes of the type **EGC-HD-125-...-TB** and **EGC-HD-160 / 220-...-TB-...(-GP)**.



The acoustic frequency meter TB-TE-EQ13 must be ordered separately (→ [Chapter 13.4.1 on page 38](#)).  
The test device V1 / TB-TE-EQ2 is no longer available.

#### Contents of the mounting kit TB-TE-EQ7:

- 1 Distance piece for EGC-HD-220-...-TB-...(-GP)
- 2 Distance piece for EGC-HD-160-...-TB-...(-GP)
- 3 Stop bolt for EGC-HD-125-...-TB (bolt Ø 7 mm)
- 4 Stop bolt for EGC-HD-160-...-TB-...-GP (bolt Ø 13 mm, 35 mm long)

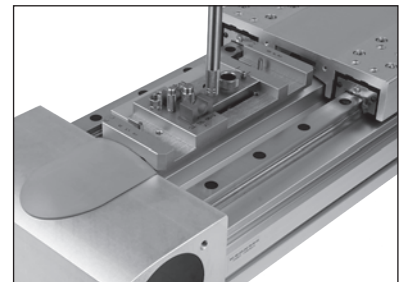


Type	Designation	Order No.
Mounting kit TB-TE-EQ7 for toothed belt axis EGC-HD-...-TB-...(-GP)	TB-TE-EQ7	8026574

Range of applications:

#### Checking the toothed belt pretensioning only on toothed belt axes EGC-HD-125-...-TB and EGC-HD-160 / 220-...-TB-...(-GP)

The toothed belt pretensioning of the above-named toothed belt axes can be tested using the **acoustic frequency meter TB-TE-EQ3 or TB-TE-EQ13** connected to the V1 / TB-TE-EQ2 test device and the **TB-TE-EQ7 adapter kit**.



Sample application



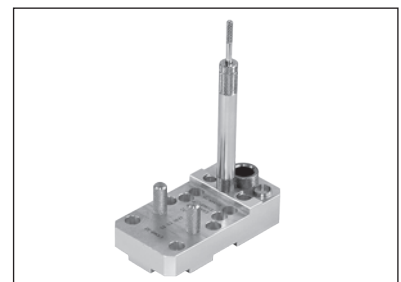
The exact procedure for checking the toothed belt pretensioning using the mounting kit can be found in the operating instructions “**Test device for toothed belt pretensioning V1 / TB-TE-EQ2**” (→ [TB-TE-EQ02.pdf](#)).

### 13.3 Test device TB-TE-EQ5

The TB-TE-EQ5 test device has a holder for the test probe of the acoustic frequency meter type TB-TE-EQ3 or TB-TE-EQ13 and enables the toothed belt to be excited by a plunger.



The acoustic frequency meter TB-TE-EQ13 must be ordered separately (→ [Chapter 13.4.1 on page 38](#)).



Type	Designation	Order No.
Test device TB-TE-EQ5	TB-TE-EQ5	760461

Range of applications:

**Checking the toothed belt pretensioning on drives of type:**

- **ERMB**
- **EHMB**

The toothed belt pretensioning of the above-named drives can be tested using the **acoustic frequency meter TB-TE-EQ3 or TB-TE-EQ13** connected to the TB-TE-EQ5 test device.



Sample application



The exact procedure for checking the toothed belt pretensioning on drives **ERMB** and **EHMB** can be found in the respective repair instructions. This can be found on the Festo website (→ [www.festo.com/spareparts](http://www.festo.com/spareparts)).

## 13.4 Accessories for devices

### 13.4.1 Acoustic frequency meter TB-TE-EQ13

Acoustic frequency meter for measurements with and without a test device.

The O-ring 10×1 for mounting the test probe in the respective test device is included in the scope of delivery.



Purchasing spare O-rings 10×1 (→ [Chapter 13.4.2 on page 39](#)).



Type	Designation
Acoustic frequency meter	TB-TE-EQ13

Range of applications:

**For checking the toothed belt pretensioning of Festo:**

- **Toothed belt axes**
- **Cantilever axes**
- **Cartesian systems**
- **Tripod kinematic systems**
- **Parallel kits**
- **Rotary drives**

**Use with the following test devices for measuring the toothed belt pretension:**

- **Test device V2 / TB-TE-EQ12**  
(→ [Chapter 13.1 on page 34](#))
- **Test device V1 / TB-TE-EQ2**  
(→ [Chapter 13.2 on page 36](#))
- **Test device TB-TE-EQ5**  
(→ [Chapter 13.3 on page 37](#))

If the toothed belt is excited by means of a force stimulus, it oscillates with its natural frequency; this dies down reasonably quickly depending on the attenuation. The frequency meter measures the natural frequency generated (transverse oscillation) using the acoustic operating principle.



Sample application



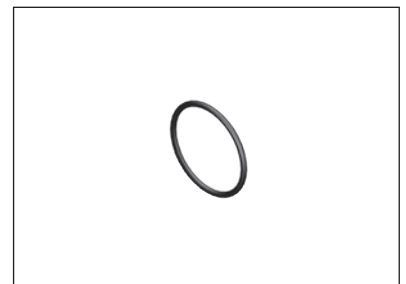
The exact procedure for checking the toothed belt pretensioning can be found in the following documentation:

- “Test device for toothed belt pretensioning V1 / TB-TE-EQ2”  
(→ [TB-TE-EQ02.pdf](#))
- “Test device for toothed belt pretensioning V2 / TB-TE-EQ12”  
(→ [TB-TE-EQ12.pdf](#))
- The exact procedure for checking the toothed belt pretensioning on drives **ERMB** and **EHMB** can be found in the respective repair instructions. This can be found on the Festo website (→ [www.festo.com/spareparts](http://www.festo.com/spareparts)).

### 13.4.2 Spare O-ring 10×1

For fixing the test probe of the frequency meter TB TE EQ3 and TB-TE-EQ13 in the respective test device by means of clamping friction.

The O-ring 10×1 is included in the scope of delivery of the frequency meter TB-TE-EQ13 (→ [Chapter 13.4.1 on page 38](#)).



Type	Quantity	Order No.
O-ring 10×1	1 piece	200926

## 14 Clamping elements

The EADT-S-L5... clamping elements are used to clamp the cover band of electric axes (→ table). The clamping element assigned to the axis is placed on the cover band, as shown in the sample application. By pressing the clamping element onto the cover band and pushing it towards the actuator end cap at the same time, the cover band is pushed into the slot provided in the actuator end cap and is clamped using the two threaded pins.

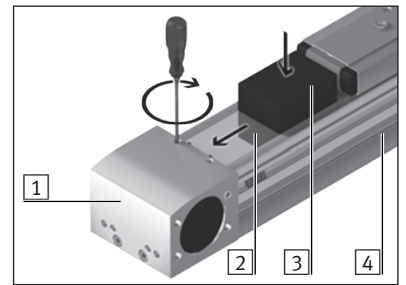


Type	Area of application	Quantity	Order No.
Clamping element EADT-S-L5-32	ELGC-TB / BS-32 / 45	1 piece	8065818
	ELFC-KF-32 / 45		
Clamping element EADT-S-L5-70	ELGA-G / RF / KF-70 / 80	1 piece	8058451
	ELFA-KF / RF-70 / 80		
	ELGC-TB / BS-60 / 80		
	ELFC-KF-60 / 80		
	ELCC-TB-KF-60		
Clamping element EADT-S-L5-90	ELCC-TB-KF-70 / 90	1 piece	8097157
Clamping element EADT-S-L5-120	ELGA-G / RF / KF-120 / 150	1 piece	8058450
	ELFA-KF-120		
	ELCC-TB-KF-110		

Range of applications:

**Clamping the cover band**

- 1 Drive cover with corner pulley
- 2 Cover band
- 3 Clamping element EADT-S-L5-...
- 3 Toothed belt axis ELGA-TB-KF



Sample application



## 15 Cleaning and greasing

### 15.1 Cleaning



The components must be thoroughly cleaned of all foreign particles, machining residues and old lubricants before they are greased.



#### Note

Clean with a soft, lint-free cloth and non-abrasive cleaning agents.  
Check the compatibility of the cleaning agent with the materials to be cleaned.

### 15.2 Greasing

The different components require different levels of greasing depending on a number of factors.



To find out which lubricating grease to use for which product and for instructions on greasing the individual components, please refer to the spare parts documentation and operating instructions and, if available, the repair instructions for the product. There you will also find precise indications for e.g. relubrication intervals, application, etc.

#### 15.2.1 Extremely thin grease film



A barely continuous film of grease covers the bearing surface. The grease can give a sheen to the surface; however, the colour of the grease must not darken it.

##### Recommendation:

Apply the grease using a cloth or similar dipped in the grease.  
Remove the excess grease from the seal system components (e.g. by drawing the assembled piston with the piston rod once fully through the greased cylinder barrel) and then remove the excess from the seal components by wiping it off.

#### 15.2.2 Thin grease film



A film of grease covers the bearing surface so that a continuous film of grease exists and the grease colour darkens the surface slightly.

##### Recommendation:

Apply the grease with a soft brush or similar.

#### 15.2.3 Grease reservoir



There is a certain amount of oil enclosed between two sealing rims or in enclosed ring volumes.

#### 15.2.4 Assembly greasing

Thin film of grease on the surface of sealing elements and on installation spaces, mating surfaces and edges, over which the sealing elements must be moved for assembly.

**16 Liability**

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