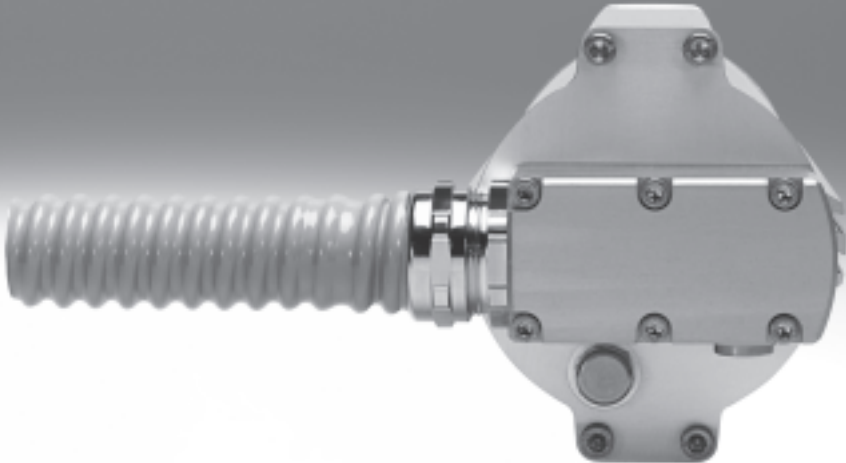


Linear actuators DFPI



# Linear actuators DFPI

Key features

FESTO

## General information

- Linear actuator for actuating process valves such as gate valves and shut-off valves, for example, in process automation systems
- Linear actuator with integrated displacement encoder (potentiometer)
- Product versions with integrated position controller and valve block available (DFPI-...-C1V-...). With this product version, the integrated position controller checks the position of the piston rod within the available stroke range. This actuator has a factory-defined safety position that is assumed if the operating voltage or the analogue setpoint value fails. Positions are specified via an analogue setpoint signal (4 ... 20 mA), for example via a master PLC/IPC or manually on-site via an external setpoint generator. The travel speed can be influenced using the integrated flow control screws
- With the P-connection type, the electrical and pneumatic connections are well protected from outside mechanical influences by a sturdy flanged socket
- With the ND2P-E-P variant, the displacement encoder supplies an analogue signal proportional to the displacement in the form of a voltage (voltage divider) that can then, for example, be processed further in an external position controller

## Sturdy

- Sturdy and compact housing with high degree of IP protection
- Ideal for exterior use thanks to high corrosion resistance
- Product designs with integrated position controller have a pressure compensation component that prevents the formation of condensate inside the housing in the event of temperature fluctuations and in this way protects the internal electronics from damage

## Simple

- Easy integration into an existing control architecture
- Commissioning of product designs with integrated position controller is as fast and easy as for product designs without integrated controller thanks to self-initialisation

## Individual

- Product variants with and without position controller and valve block available
- Proximity sensors can be installed in the available slots if necessary for additional binary sensing of positions

## Versatile

Suitable for use in:

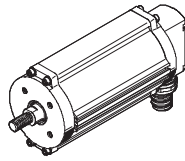
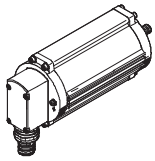
- water processing systems
- sewage treatment systems
- service water systems
- process water systems
- silo and bulk goods systems

# Linear actuators DFPI

Key features

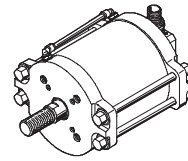
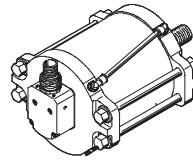
## Variant ND2P-E-P

Piston  $\varnothing$  100 ... 160



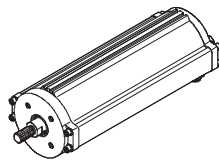
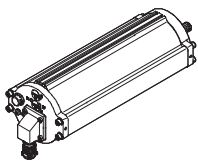
DFPI with integrated displacement encoder

Piston  $\varnothing$  200 ... 320



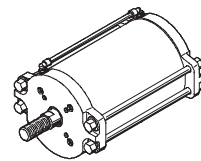
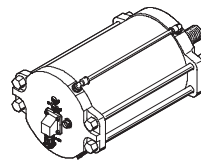
## Variant ND2P-C1V

Piston  $\varnothing$  100 ... 160



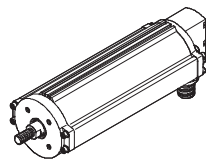
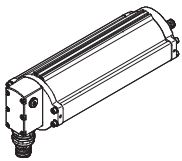
DFPI with integrated displacement encoder, position controller and valve block

Piston  $\varnothing$  200 ... 320



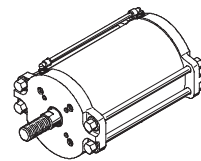
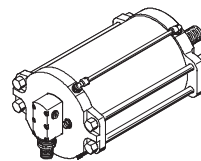
## Variant ND2P-C1V-P

Piston  $\varnothing$  100 ... 160



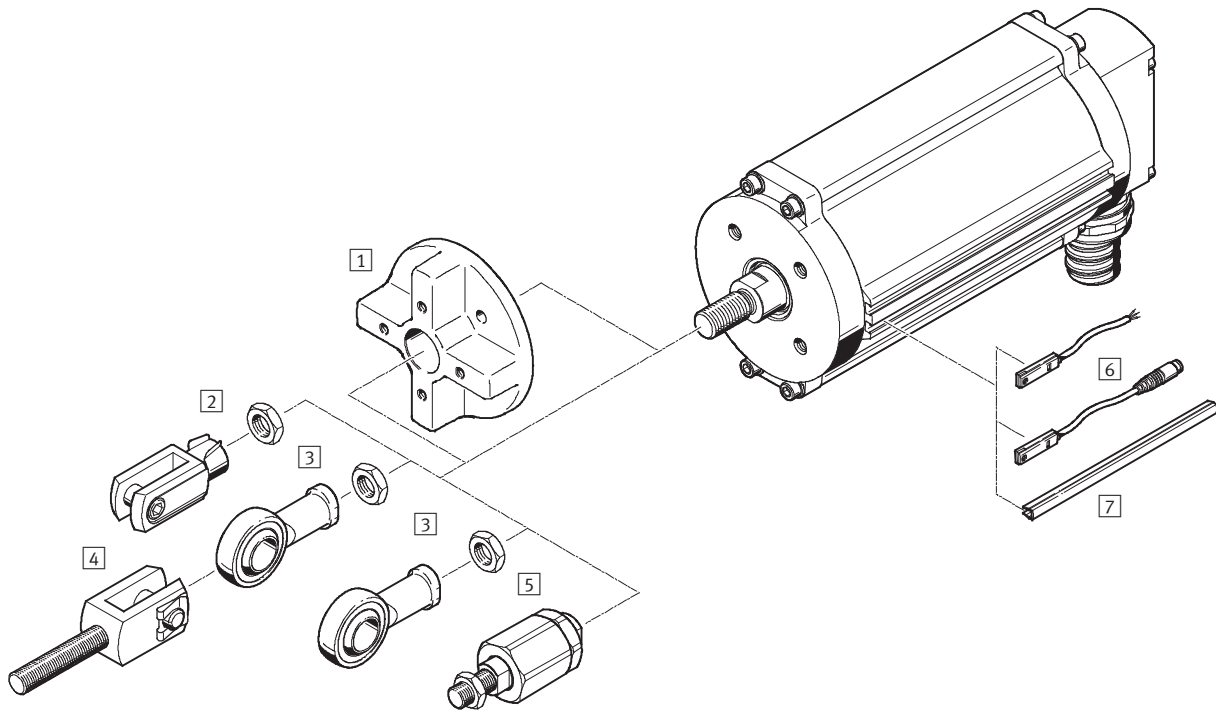
DFPI with integrated displacement encoder, position controller and valve block, with protected pneumatic connections

Piston  $\varnothing$  200 ... 320



# Linear actuators DFPI-ND2P-E-P

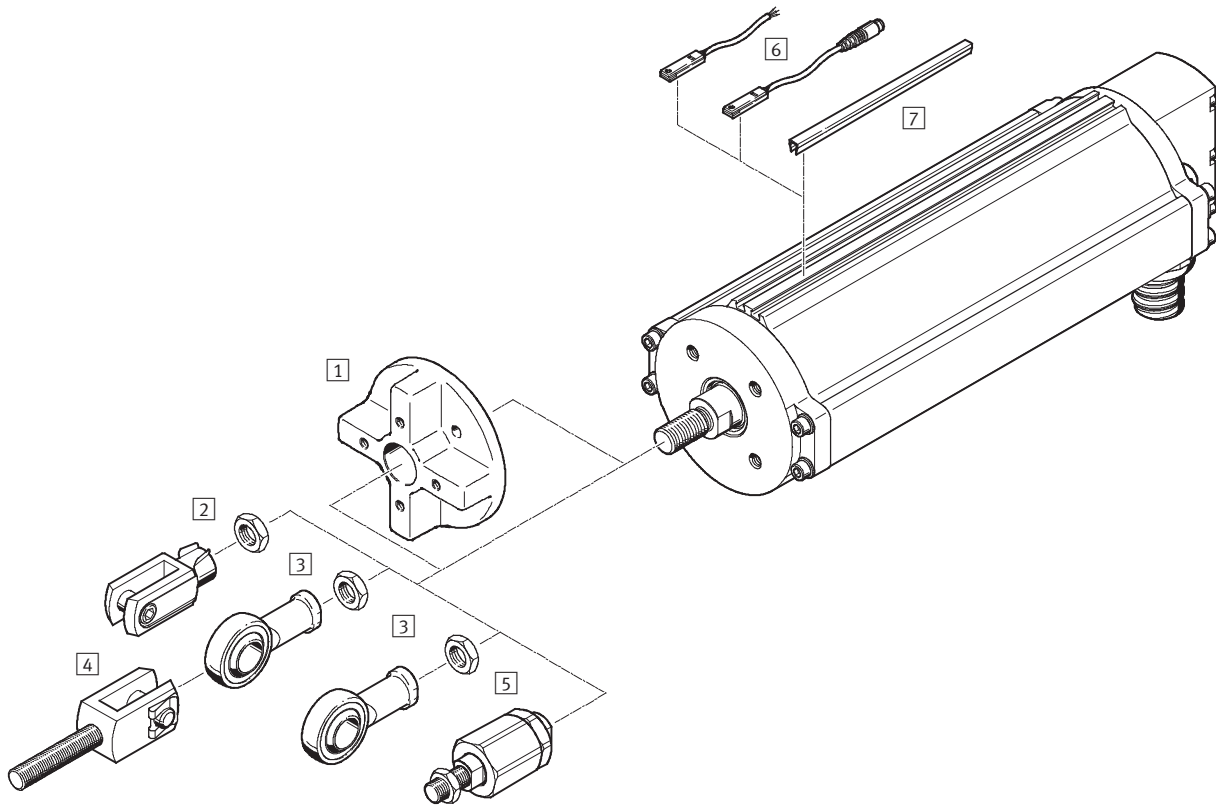
Peripherals overview – DFPI with integrated displacement encoder



| Mounting attachments and accessories |                                     |   |
|--------------------------------------|-------------------------------------|---|
|                                      | Brief description                   | → Page/Internet   |
| 1                                    | Adapter<br>DAPZ-FA                  | For mounting on gate valve actuator with interface to DIN 3358<br>17      |
| 2                                    | Rod clevis<br>SG                    | Enables a simple connection between the piston rod and slide plate<br>17  |
|                                      | Rod clevis, stainless steel<br>CRSG | 17  |
| 3                                    | Rod eye<br>SGS                      | With spherical bearing<br>17  |
|                                      | Rod eye, stainless steel<br>CRSGS   | 17  |
| 4                                    | Rod clevis<br>SGA                   | With male thread<br>17  |
| 5                                    | Self-aligning rod coupler<br>FK     | For compensating radial and angular deviations<br>17                      |
| 6                                    | Proximity sensor<br>SMT-8F-I        | Magneto-inductive, Namur, EU-compliant to directive 94/9/EC (ATEX)<br>18  |
|                                      | Proximity sensor<br>SMT-8           | Magneto-resistive, can be integrated in the cylinder profile barrel<br>18 |
|                                      | Proximity sensor<br>SME-8           | Magnetic reed, can be integrated in the cylinder profile barrel<br>18     |
| 7                                    | Slot cover<br>ABP-5-S               | To protect the sensor cables and slots from dirt<br>19                    |

# Linear actuators DFPI-ND2P-C1V

Peripherals overview – DFPI with integrated displacement encoder, position controller and valve block



| Mounting attachments and accessories |  |                 |
|--------------------------------------|--|-----------------|
|                                      | Brief description  | → Page/Internet |
| 1                                    | Adapter<br>DAPZ-FA<br>For mounting on gate valve actuator with interface to DIN 3358               | 17              |
| 2                                    | Rod clevis<br>SG   | 17              |
|                                      | Rod clevis, stainless steel<br>CRSG  | 17              |
| 3                                    | Rod eye<br>SGS   | 17              |
|                                      | Rod eye, stainless steel<br>CRSGS  | 17              |
| 4                                    | Rod clevis<br>SGA<br>With male thread  | 17              |
| 5                                    | Self-aligning rod coupler<br>FK<br>For compensating radial and angular deviations                  | 17              |
| 6                                    | Proximity sensor<br>SMT-8F-I<br>Magneto-inductive, Namur, EU-compliant to directive 94/9/EC (ATEX) | 18              |
|                                      | Proximity sensor<br>SMT-8<br>Magneto-resistive, can be integrated in the cylinder profile barrel   | 18              |
|                                      | Proximity sensor<br>SME-8<br>Magnetic reed, can be integrated in the cylinder profile barrel       | 18              |
| 7                                    | Slot cover<br>ABP-5-S<br>To protect the sensor cables and slots from dirt                          | 19              |

# Linear actuators DFPI

Type codes

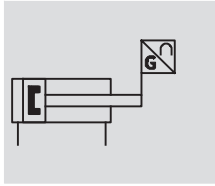
|  |   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
|--|---|------|---|-----|---|-----|--|---|---|----|---|---|----|--|---|---|---|---|--|
|  |   | DFPI | - | 100 | - | 100 |  | - | N | D2 | P | - | C1 |  | V | - | P | - |  |
| <b>Type</b>                              |   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| DFPI                                     | Double-acting pneumatic actuator for process automation, with integrated displacement encoder |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| <b>Piston Ø</b>                          |   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| 100                                      | 100 mm  |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| 125                                      | 125 mm  |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| 160                                      | 160 mm  |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| 200                                      | 200 mm  |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| 250                                      | 250 mm  |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| 320                                      | 320 mm  |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| <b>Stroke</b>                            |   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
|  | x length [40 ... 990 mm]  |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| <b>Function</b>                          |   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| -  | Double-acting   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| <b>Cushioning</b>                        |   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| N  | No cushioning   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| <b>Displacement encoder</b>              |   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| D2                                       | Analogue  |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| <b>Method of measurement</b>             |   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| P  | Potentiometer   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| <b>Controller</b>                        |   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| -  | Not specified   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| C1                                       | Controller 1  |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| <b>Attachment position of controller</b> |   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| -  | Integrated  |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| E  | External  |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| <b>Directional control valve</b>         |   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| -  | Not specified   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| V  | Integrated  |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| <b>Connection type</b>                   |   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| -  | Not specified   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| P  | Protected   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| <b>Safety setting</b>                    |   |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |
| -  | Piston rod advancing  |      |   |     |   |     |  |   |   |    |   |   |    |  |   |   |   |   |  |

# Linear actuators DFPI-ND2P-E-P


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Technical data

Function



-  - Piston  $\varnothing$   
100 ... 320 mm

-  - Stroke length  
40 ... 990 mm

-  - Force  
4,417 ... 48,255 N



| General technical data                                 |  |     |     |          |     |     |
|--|--|-----|-----|----------|-----|-----|
| Piston $\varnothing$                                   | 100  | 125 | 160 | 200      | 250 | 320 |
| Based on standard<br>(connection to process valve)     | DIN 3358   |     |     |          |     |     |
| Type of mounting                                       | On flange to DIN 3358                                      |     |     |          |     |     |
| Flange hole pattern                                    | F07  | F10 |     | F10, F14 |     |     |
| Pneumatic connection                                   | With standard O.D. for tubing O.D. 8 mm                    |     |     |          |     |     |
| Constructional design                                  | Piston rod, cylinder barrel                                |     |     |          |     |     |
| Cushioning   | None   |     |     |          |     |     |
| Mounting position                                      | Any  |     |     |          |     |     |
| Mode of operation                                      | Double-acting  |     |     |          |     |     |
| Measuring principle<br>of displacement encoder         | Potentiometer  |     |     |          |     |     |
| Position sensing                                       | Via proximity sensor, with integrated displacement encoder |     |     |          |     |     |
| Stroke length [mm]                                     | 40 ... 990   |     |     |          |     |     |
| Stroke reserve [mm]                                    | 3  |     |     | 4        |     |     |
| Max. tubing length [m]                                 | 30   |     |     |          |     |     |
| Continuous shock resistance<br>to DIN/IEC 68 Part 2-82 | Tested in accordance with severity class 2                 |     |     |          |     |     |
| Vibration resistance<br>to DIN/IEC 68 Part 2-6         | Tested in accordance with severity class 2                 |     |     |          |     |     |
| Max. operating voltage [V DC]                          | 15   |     |     |          |     |     |
| Electrical connection                                  | Straight plug, 3-pin screw terminal                        |     |     |          |     |     |

| Operating and environmental conditions  |   |
|---|---|
| Operating pressure [bar]  | 3 ... 8   |
| Nominal operating pressure [bar]  | 6   |
| Operating medium  | Filtered compressed air, grade of filtration 40 $\mu$ m, lubricated or unlubricated |
| Exterior use  | C1 – weather-protected areas  |
| Ambient temperature [°C]  | -20 ... +60   |
| Corrosion resistance class CRC <sup>1)</sup>  | 3   |
| Relative air humidity [%]   | 5 ... 95 condensing   |
| Protection class  | IP65, IP67 in assembled state to IEC 60529; IP69K, NEMA 4 in assembled state        |
| CE mark (see declaration of conformity)<br>→ <a href="http://www.festo.com">www.festo.com</a> | EU EMC directive<br>EU explosion protection directive (ATEX)                        |
| ATEX category for gas   | II 2G   |
| Ex ignition protection type for gas   | c T4X   |
| ATEX category for dust  | II 2D   |
| Ex ignition protection type for dust  | cT 120°CX   |
| EX ambient temperature <sup>1)</sup>  | -20°C ≤ Ta ≤ +60°C  |

1) Corrosion resistance class 3 as per Festo standard 940 070  
Components subject to higher corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as solvents and cleaning agents.

# Linear actuators DFPI-ND2P-E-P

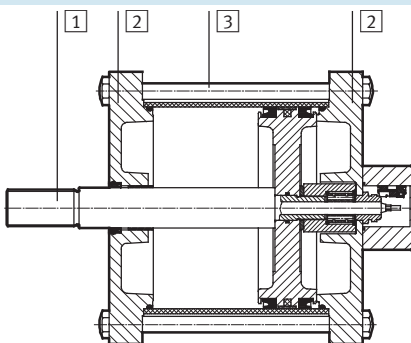
Technical data

| Forces [N] and air consumption [l]                     |        |        |        |        |        |        |
|--|--------|--------|--------|--------|--------|--------|
| Piston Ø   | 100    | 125    | 160    | 200    | 250    | 320    |
| Theoretical force at 6 bar, advancing                  | 4,712  | 7,363  | 12,064 | 18,850 | 29,452 | 48,255 |
| Theoretical force at 6 bar, retracting                 | 4,417  | 6,881  | 11,581 | 18,080 | 28,698 | 47,501 |
| Theoretical air consumption with 10 mm stroke, sliding | 0.5498 | 0.8590 | 1.4074 | 2.119  | 3.4361 | 5.6297 |
| Theoretical air consumption with 10 mm stroke, pushing | 0.5153 | 0.8027 | 1.3511 | 2.111  | 3.3482 | 5.5418 |

| Weight   |       |       |       |        |        |        |
|--|-------|-------|-------|--------|--------|--------|
| Piston Ø   | 100   | 125   | 160   | 200    | 250    | 320    |
| Basic weight with 0 mm stroke [g]                              | 3,476 | 5,530 | 6,529 | 13,946 | 22,569 | 35,359 |
| Additional moving load per 10 mm stroke [g]                    | 27    | 52    | 52    | 87     | 87     | 87     |
| Moving load with 0 mm stroke [g]                               | 1,228 | 1,944 | 2,250 | 4,722  | 7,059  | 11,417 |
| Additional weight per 10 mm stroke [g]                         | 80    | 145   | 159   | 187    | 325    | 399    |
| Additional weight of displacement encoder per 10 mm stroke [g] | 2     |       |       |        |        |        |

## Materials

Sectional view



| Linear actuators |                          |  |
|------------------|--------------------------|--|
| 1                | Piston rod               | High-alloy stainless steel                                   |
| 2                | Top cap (end cap)        | Piston Ø 100, 125, 320<br>Wrought aluminium alloy, anodised  |
|                  | Bottom cap (bearing cap) | Piston Ø 160 ... 250<br>Die-cast aluminium, painted          |
| 3                | Cylinder barrel          | Piston Ø 100 ... 200<br>Wrought aluminium alloy, anodised    |
|                  |                          | Piston Ø 250 ... 320<br>High-alloy stainless steel           |
| -                | Screws                   | Piston Ø 100, 200, 250, 320<br>High-alloy stainless steel    |
| -                | Seals                    | Piston Ø 125, 160<br>Steel                                   |
| -                | Note on materials        | Nitrile rubber   |
| -                |                          | Contains paint-wetting impairment substances, RoHS-compliant |



# Linear actuators DFPI-ND2P-E-P

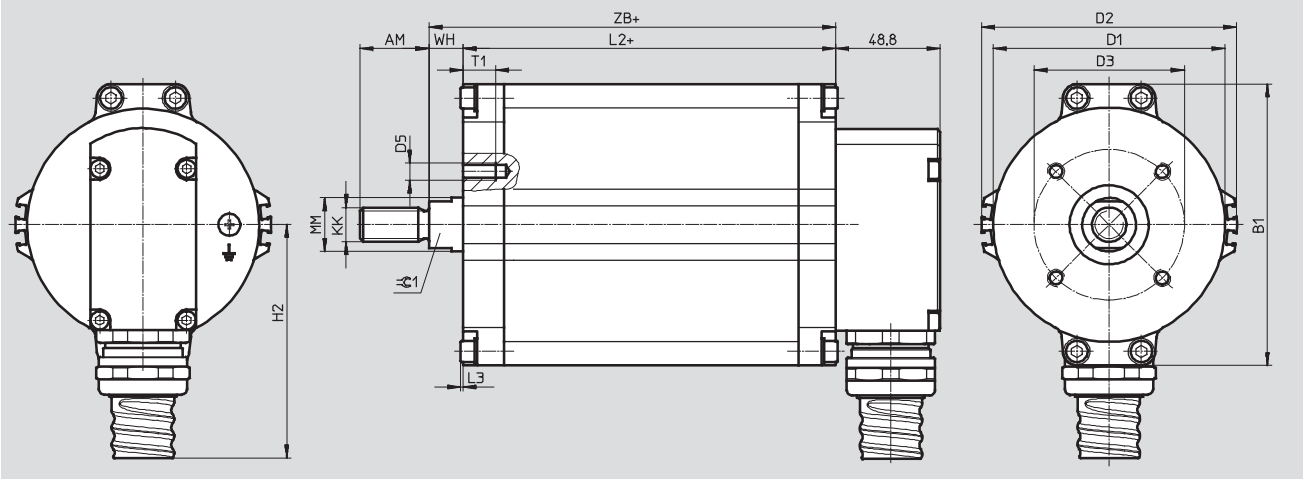
Technical data



## Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

Piston Ø 100 ... 160



| Piston Ø | AM | B1  | D1  | D2  | D3  | D5  | H2  | KK      | L2    | L3   | MM | T1 | WH | ZB    | ⌀C1 |
|----------|----|-----|-----|-----|-----|-----|-----|---------|-------|------|----|----|----|-------|-----|
| [mm]     | -2 | Ø   | Ø   | Ø   |     |     |     |         |       | min. | Ø  |    |    |       |     |
| DFPI-100 | 32 | 131 | 108 | 119 | 70  | M8  | 109 | M16x1.5 | 118.5 | 0.7  | 25 | 15 | 16 | 134.5 | 22  |
| DFPI-125 | 54 | 163 | 135 | 147 | 102 | M10 | 112 | M27x2   | 119   | -    | 32 | 18 | 24 | 143   | 27  |
| DFPI-160 |    | 199 | 170 | 182 |     |     | 131 |         | 126.5 |      |    |    |    | 150.5 |     |

# Linear actuators DFPI-ND2P-E-P

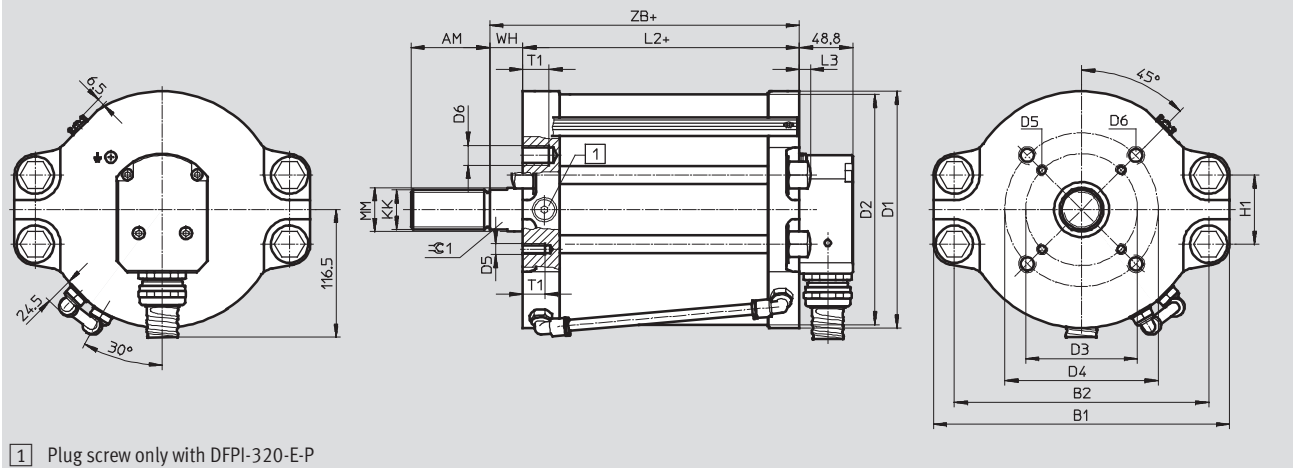
Technical data

FESTO

## Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

Piston Ø 200 ... 320



| Piston Ø | AM | B1  | B2  | D1  | D2     | D3  | D4  | D5  | D6  | H1  |
|----------|----|-----|-----|-----|--------|-----|-----|-----|-----|-----|
| [mm]     | -2 |     |     | Ø   | Ø min. | Ø   | Ø   |     |     |     |
| DFPI-200 | 72 | 270 | 232 | 216 | 210    | 102 | 140 | M10 | M16 | 63  |
| DFPI-250 |    | 308 | 268 | 260 | 254    |     |     |     |     | 82  |
| DFPI-320 |    | 378 | 338 | 332 | 325    |     |     |     |     | 126 |

| Piston Ø | KK    | L2    | L3   | MM | T1   | T2 | WH | ZB    | ≈∅1 |
|----------|-------|-------|------|----|------|----|----|-------|-----|
| [mm]     |       |       | min. | Ø  | min. |    |    |       |     |
| DFPI-200 | M36x2 | 152.5 | 10   | 40 | 24   | 20 | 30 | 182.5 | 36  |
| DFPI-250 |       | 152.2 | 25   |    | 25   |    |    | 182.2 |     |
| DFPI-320 |       | 159.2 | 13   |    | 25   |    |    | 189.2 |     |

## Ordering data

| Type | Piston Ø [mm] | Part No. | Type                  |
|------|---------------|----------|-----------------------|
|      | 100           | 562 478  | DFPI-100-...-ND2P-E-P |
|      | 125           | 562 479  | DFPI-125-...-ND2P-E-P |
|      | 160           | 562 480  | DFPI-160-...-ND2P-E-P |
|      | 200           | 564 831  | DFPI-200-...-ND2P-E-P |
|      | 250           | 564 832  | DFPI-250-...-ND2P-E-P |
|      | 320           | 564 833  | DFPI-320-...-ND2P-E-P |

- - Note

### Stroke length of the actuator

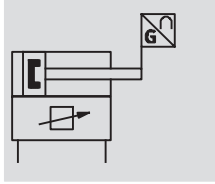
The stroke length of the actuator should generally at least correspond to the nominal diameter of the process valve so that the process valve can be fully opened and closed. The system tolerances can lead to



a greater stroke range than the specified nominal stroke range of the linear actuator. The adjustable rod clevis enables adjustment of the system.

# Linear actuators DFPI-ND2P-C1V


Technical data

Function



-  - Stroke length  
40 ... 990 mm
-  - Force  
4,417 ... 48,255 N



-  - Piston Ø  
100 ... 320 mm

| General technical data                                 |  |     |          |     |     |     |
|--|--|-----|----------|-----|-----|-----|
| Piston Ø   | 100  | 125 | 160      | 200 | 250 | 320 |
| Based on standard<br>(connection to process valve)     | DIN 3358   |     |          |     |     |     |
| Type of mounting                                       | On flange to DIN 3358  |     |          |     |     |     |
| Flange hole pattern                                    | F07  | F10 | F10, F14 |     |     |     |
| Constructional design                                  | Piston rod, cylinder barrel                                      |     |          |     |     |     |
| Cushioning   | None   |     |          |     |     |     |
| Mounting position                                      | Any  |     |          |     |     |     |
| Mode of operation                                      | Double-acting  |     |          |     |     |     |
| Position sensing                                       | Via proximity sensor, with integrated displacement encoder       |     |          |     |     |     |
| Measuring principle<br>of displacement encoder         | Potentiometer  |     |          |     |     |     |
| Pneumatic connection                                   |  |     |          |     |     |     |
| DFPI-...-...-ND2P-C1V                                  | G $\frac{1}{4}$  |     |          |     |     |     |
| DFPI-...-...-ND2P-C1V-P                                | Standard O.D. for tubing O.D. 8 mm                               |     |          |     |     |     |
| Stroke [mm]  | 40 ... 990   |     |          |     |     |     |
| Stroke reserve [mm]                                    | 3  |     |          | 4   |     |     |
| Max. line length [m]                                   | 30   |     |          |     |     |     |
| Vibration resistance<br>to DIN/IEC 68 Part 2-6         | Tested in accordance with severity class 2                       |     |          |     |     |     |
| Continuous shock resistance<br>to DIN/IEC 68 Part 2-82 | Tested in accordance with severity class 2                       |     |          |     |     |     |
| Electrical connection                                  | Straight plug, 5-pin screw terminal                              |     |          |     |     |     |
| Protection against polarity reversal                   | For operating voltage, setpoint value, initialisation connection |     |          |     |     |     |

# Linear actuators DFPI-ND2P-C1V

Technical data

| Operating and environmental conditions             |  |  |
|--|--|--|
| Operating pressure [bar]                           |  | 3 ... 8  |
| Nominal operating pressure [bar]                   |  | 6  |
| Operating voltage range [V DC]                     |  | 21.6 ... 26.4  |
| Nominal operating voltage [V DC]                   |  | 24   |
| Operating medium                                   |  | Filtered compressed air, grade of filtration 40 µm, lubricated/unlubricated  |
| Use in exterior                                    |  | C1 – weather-protected areas   |
| Protection class                                   |  | IP65, IP67 in assembled state to IEC 60529; IP69K, NEMA 4 in assembled state |
| Ambient temperature [°C]                           |  | -5 ... +50   |
| Corrosion resistance class CRC <sup>1)</sup>       |  | 3  |
| Relative air humidity [%]                          |  | 5 ... 95 condensing  |
| CE mark (see declaration of conformity)            |  | To EU EMC directive  |
| ➔ <a href="http://www.festo.com">www.festo.com</a> |  |  |
| ATEX category for gas                              |  | II 3G  |
| Ex ignition protection type for gas                |  | Ex nA II T4X   |
| ATEX category for dust                             |  | II 3D  |
| Ex ignition protection type for dust               |  | Ex tD A22 IP65/67/69k T120°CX  |
| EX ambient temperature <sup>1)</sup>               |  | -5°C ≤ Ta ≤ +50°C  |

1) Corrosion resistance class 3 as per Festo standard 940 070

Components subject to higher corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as solvents and cleaning agents.

| Forces [N] and air consumption [l]                     |        |        |        |        |        |        |
|--|--------|--------|--------|--------|--------|--------|
| Piston Ø   | 100    | 125    | 160    | 200    | 250    | 320    |
| Theoretical force at 6 bar, advancing                  | 4,712  | 7,363  | 12,064 | 18,850 | 29,452 | 48,255 |
| Theoretical force at 6 bar, retracting                 | 4,417  | 6,881  | 11,581 | 18,080 | 28,698 | 47,501 |
| Theoretical air consumption with 10 mm stroke, sliding | 0.5498 | 0.8590 | 1.4074 | 2.119  | 3.4361 | 5.6297 |
| Theoretical air consumption with 10 mm stroke, pushing | 0.5153 | 0.8027 | 1.3511 | 2.111  | 3.3482 | 5.5418 |

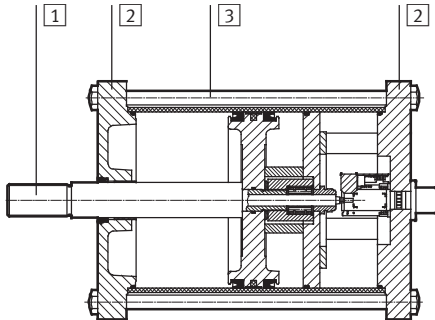
# Linear actuators DFPI-ND2P-C1V

Technical data

| Weight   |       |       |       |        |        |        |
|--|-------|-------|-------|--------|--------|--------|
| Piston Ø   | 100   | 125   | 160   | 200    | 250    | 320    |
| Basic weight with 0 mm stroke                                  |       |       |       |        |        |        |
| DFPI-...-...-ND2P-C1V [g]                                      | 4,671 | 7,693 | 9,099 | 18,358 | 29,956 | 45,200 |
| DFPI-...-...-ND2P-C1V-P [g]                                    | 5,237 | 8,259 | 9,665 | 18,924 | 30,522 | 45,766 |
| Moving load with 0 mm stroke [g]                               | 1,228 | 1,944 | 2,250 | 4,722  | 7,059  | 11,417 |
| Additional weight per 10 mm stroke [g]                         | 80    | 145   | 159   | 187    | 325    | 399    |
| Additional weight of moving load per 10 mm stroke [g]          | 27    | 52    | 52    | 87     | 87     | 87     |
| Additional weight of displacement encoder per 10 mm stroke [g] | 2     |       |       |        |        |        |
| Size of the dead zone [%]                                      | 2     |       |       |        |        |        |

## Materials

Sectional view

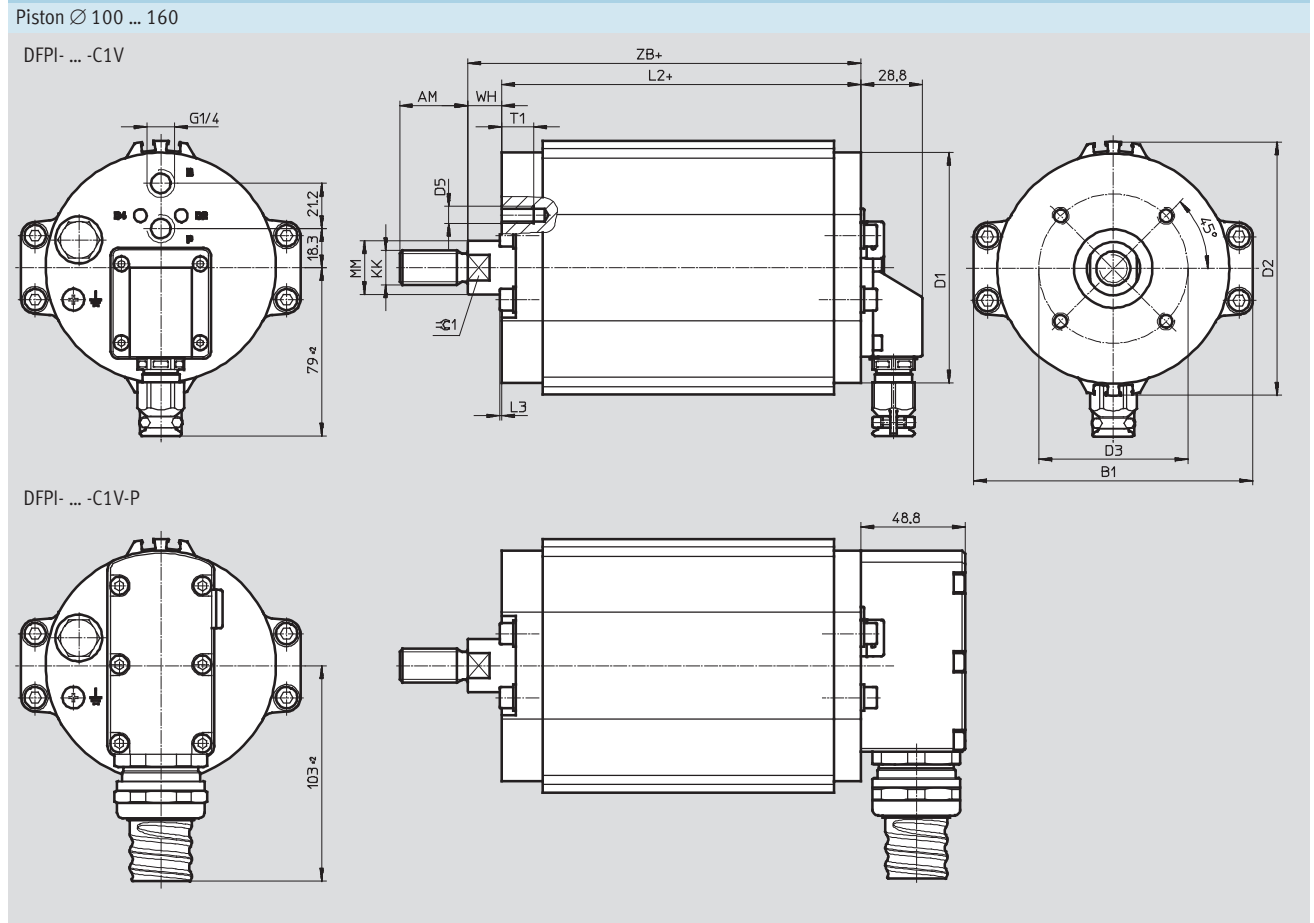


| Linear actuators |                          |  |
|------------------|--------------------------|--|
| 1                | Piston rod               | High-alloy stainless steel                                   |
| 2                | Top cap (end cap)        | Piston Ø 100, 125, 320                                       |
|                  |                          | Piston Ø 160 ... 250   |
|                  | Bottom cap (bearing cap) | Piston Ø 100, 125, 320                                       |
|                  |                          | Piston Ø 160 ... 250   |
| 3                | Cylinder barrel          | Piston Ø 100 ... 200   |
|                  |                          | Piston Ø 250 ... 320   |
| -                | Screws                   | Piston Ø 100, 200, 250, 320                                  |
| -                |                          | Piston Ø 125, 160  |
| -                | Seals                    | Nitrile rubber   |
| -                | Note on materials        | Contains paint-wetting impairment substances, RoHS-compliant |

# Linear actuators DFPI-ND2P-C1V

Technical data

**Dimensions** Download CAD data → [www.festo.com](http://www.festo.com)



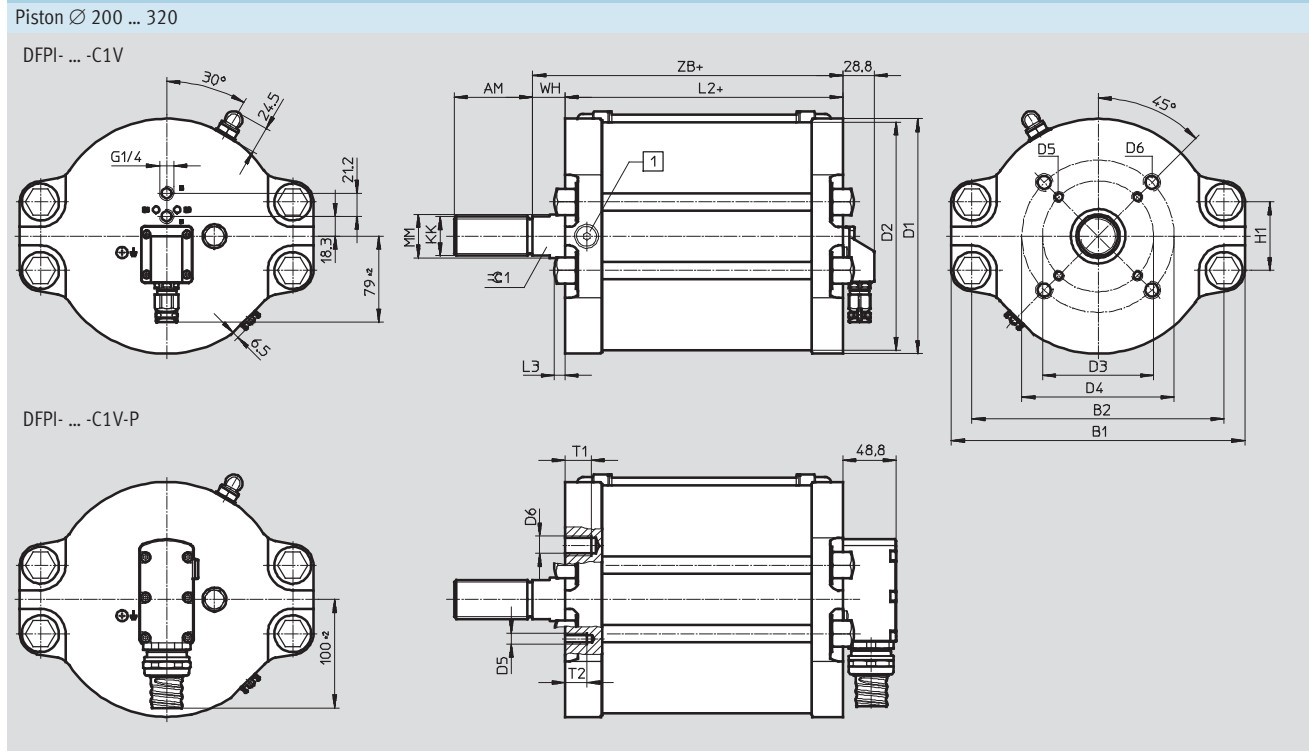
| Piston Ø | AM | B1  | D1  | D2  | D3  | D5  | KK      | L2    | L3   | MM | T1 | WH | ZB    | ≈C1 |
|----------|----|-----|-----|-----|-----|-----|---------|-------|------|----|----|----|-------|-----|
| [mm]     | -2 | Ø   | Ø   | Ø   |     |     |         |       | min. | Ø  |    |    |       |     |
| DFPI-100 | 32 | 131 | 108 | 119 | 70  | M8  | M16x1.5 | 218.5 | 0.7  | 25 | 15 | 16 | 234.5 | 22  |
| DFPI-125 | 54 | 163 | 135 | 147 | 102 | M10 | M27x2   | 221   | -    | 32 | 18 | 24 | 245   | 27  |
| DFPI-160 |    | 199 | 170 | 182 |     |     |         | 227.5 |      |    |    |    | 251.5 |     |

# Linear actuators DFPI-ND2P-C1V

Technical data



Dimensions Download CAD data → [www.festo.com](http://www.festo.com)

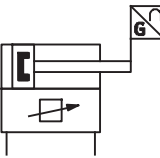


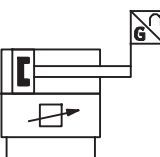
| Piston Ø | AM | B1  | B2  | D1  | D2     | D3  | D4  | D5  | D6  | H1  |
|----------|----|-----|-----|-----|--------|-----|-----|-----|-----|-----|
| [mm]     | -2 |     |     | Ø   | Ø min. | Ø   | Ø   |     |     |     |
| DFPI-200 | 72 | 270 | 232 | 216 | 210    | 102 | 140 | M10 | M16 | 63  |
| DFPI-250 |    | 308 | 268 | 260 | 254    |     |     |     |     | 82  |
| DFPI-320 |    | 378 | 338 | 332 | 325    |     |     |     |     | 126 |


| Piston Ø | KK    | L2    | L3   | MM | T1 | T2 | WH | ZB    | ≈C1 |
|----------|-------|-------|------|----|----|----|----|-------|-----|
| [mm]     |       |       | min. | Ø  |    |    |    |       |     |
| DFPI-200 | M36x2 | 255.5 | 10   | 40 | 24 | 20 | 30 | 285.5 | 36  |
| DFPI-250 |       | 255   | 25   |    | 25 |    |    | 285   |     |
| DFPI-320 |       | 262   | 13   |    | 25 |    |    | 292   |     |

# Linear actuators DFPI-ND2P-C1V

Technical data

| Ordering data   |               |          |                       |
|---|---------------|----------|-----------------------|
| Type  | Piston Ø [mm] | Part No. | Type                  |
|  | 100           | 558 189  | DFPI-100-...-ND2P-C1V |
|   | 125           | 558 190  | DFPI-125-...-ND2P-C1V |
|   | 160           | 558 191  | DFPI-160-...-ND2P-C1V |
|   | 200           | 563 789  | DFPI-200-...-ND2P-C1V |
|   | 250           | 563 790  | DFPI-250-...-ND2P-C1V |
|   | 320           | 563 791  | DFPI-320-...-ND2P-C1V |

| Ordering data   |               |          |                         |
|---|---------------|----------|-------------------------|
| Type  | Piston Ø [mm] | Part No. | Type                    |
|  | 100           | 561 380  | DFPI-100-...-ND2P-C1V-P |
|   | 125           | 561 381  | DFPI-125-...-ND2P-C1V-P |
|   | 160           | 561 382  | DFPI-160-...-ND2P-C1V-P |
|   | 200           | 563 792  | DFPI-200-...-ND2P-C1V-P |
|   | 250           | 563 793  | DFPI-250-...-ND2P-C1V-P |
|   | 320           | 563 794  | DFPI-320-...-ND2P-C1V-P |

-  - Note

**Stroke length of the actuator**

The stroke length of the actuator should generally at least correspond to the nominal diameter of the process valve so that the process valve can be fully opened and closed. The system tolerances can lead to a greater stroke range than the specified nominal stroke range of the linear actuator. During initialisation, the integrated position controller learns the stroke length used and ensures that the slide plate moves to the required positions in a controlled way – at most to the end positions learned during initialisation.



# Linear actuators DFPI

Accessories

## Adapter DAPZ-FA

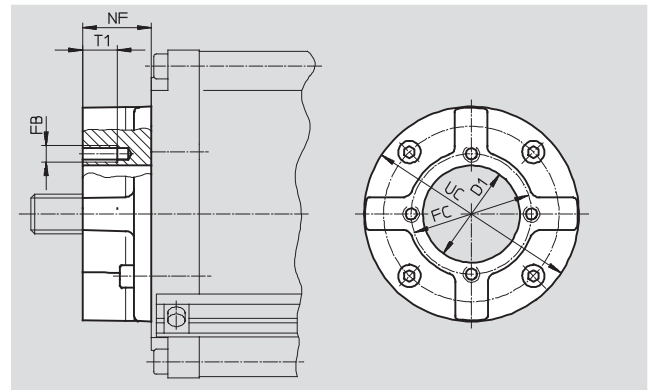
Based on DIN 3358

Scope of delivery:

- 1 flange adapter,
- 4 socket head screws DIN 912

Material:

- Wrought aluminium alloy
- Galvanised steel
- Free of copper, PTFE and silicone



| Dimensions and ordering data |         |         |     |     |    |    |         |                   |        |          |                 |
|------------------------------|---------|---------|-----|-----|----|----|---------|-------------------|--------|----------|-----------------|
| For Ø                        | Size    | D1      | FB  | FC  | NF | T1 | UC      | CRC <sup>1)</sup> | Weight | Part No. | Type            |
| [mm]                         |         | Ø<br>+1 |     | Ø   |    |    | Ø<br>+1 |                   | [g]    |          |                 |
| 100                          | F07/F07 | 30      | M8  | 70  | 40 | 20 | 125     | 3                 | 679    | 536 587  | DAPZ-FA-F07/F07 |
|                              | F07/F10 | 30      | M10 | 102 | 40 | 22 | 125     | 3                 | 670    | 536 588  | DAPZ-FA-F07/F10 |
| 125, 160,                    | F10/F07 | 55      | M8  | 70  | 40 | 20 | 125     | 3                 | 667    | 536 589  | DAPZ-FA-F10/F07 |
|                              | F10/F10 | 55      | M10 | 102 | 45 | 22 | 125     | 3                 | 707    | 536 590  | DAPZ-FA-F10/F10 |
| 200, 250,                    | F10/F14 | 55      | M16 | 140 | 65 | 25 | 175     | 3                 | 1,884  | 536 591  | DAPZ-FA-F10/F14 |
| 320                          | F14/F14 | 70      | M16 | 140 | 65 | 25 | 175     | 3                 | 2,130  | 536 592  | DAPZ-FA-F14/F14 |

1) Corrosion resistance class 3 as per Festo standard 940 070

Components subject to higher corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as solvents and cleaning agents.

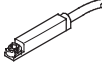
| Ordering data – Piston rod attachments |               |          |             | Technical data → Internet: piston rod attachment |               |          |            |
|--|---------------|----------|-------------|--|---------------|----------|------------|
| Description                            | For Ø         | Part No. | Type        | Description                                      | For Ø         | Part No. | Type       |
| <b>Rod eye SGS</b>                     |               |          |             | <b>Rod clevis SG</b>                             |               |          |            |
|  | 100           | 9 263    | SGS-M16x1,5 |  | 100           | 6 146    | SG-M16x1,5 |
|  | 125, 160      | 10 774   | SGS-M27x2   |  | 125, 160      | 14 987   | SG-M27x2-B |
|  | 200, 250, 320 | 10 775   | SGS-M36x2   |  | 200, 250, 320 | 9 581    | SG-M36x2   |
| <b>Rod clevis SGA</b>                  |               |          |             | <b>Self-aligning rod coupler FK</b>              |               |          |            |
|  | 100           | 10 768   | SGA-M16x1,5 |  | 100           | 6 142    | FK-M16x1,5 |
|  | 125, 160      | 10 770   | SGA-M27x2   |  | 125, 160      | 10 485   | FK-M27x2   |
|  | 200, 250, 320 | 10 771   | SGA-M36x2   |  | 200, 250, 320 | 10 746   | FK-M36x2   |

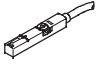
| Ordering data – Piston rod attachments, corrosion-resistant |          |          |              | Technical data → Internet: crsg |          |          |               |
|---|----------|----------|--------------|---------------------------------|----------|----------|---------------|
| Description   | For Ø    | Part No. | Type         | Description                     | For Ø    | Part No. | Type          |
| <b>Rod eye CRSG</b>   |          |          |              | <b>Rod clevis CRSGS</b>         |          |          |               |
|   | 100      | 13 571   | CRSG-M16x1,5 |                                 | 100      | 195 584  | CRSGS-M16x1,5 |
|   | 125, 160 | 185 361  | CRSG-M27x2   |                                 | 125, 160 | 195 586  | CRSGS-M27x2   |

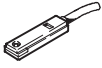
# Linear actuators DFPI

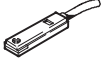
Accessories

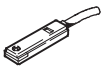
FESTO

| Ordering data – Proximity sensors for T-slot                                      |                  |                       |                  |          | Technical data → Internet: smt-8f |  |
|---|------------------|-----------------------|------------------|----------|-----------------------------------|--|
|   | Switching output | Electrical connection | Cable length [m] | Part No. | Type                              |  |
|  | Namur            | Cable, 2-wire         | 5.0              | 536 956  | SMT-8F-I-8,2V-K5,0-OE-EX          |  |

| Ordering data – Ex proximity sensors for T-slot, magneto-resistive                |                  |                       |                  |          | Technical data → Internet: smt-8m |  |
|---|------------------|-----------------------|------------------|----------|-----------------------------------|--|
|   | Switching output | Electrical connection | Cable length [m] | Part No. | Type                              |  |
|  | N/O contact      | Cable, 2-wire         | 5.0              | 543 874  | SMT-8M-ZS-24V-K-5,0-OE-Ex2        |  |




| Ordering data – Proximity sensors for T-slot, magneto-resistive                   |                  |                       |           |                  | Technical data → Internet: smt-8 |                      |
|---|------------------|-----------------------|-----------|------------------|----------------------------------|----------------------|
|   | Switching output | Electrical connection |           | Cable length [m] | Part No.                         | Type                 |
|   |                  | Cable                 | Plug M8x1 |                  |                                  |                      |
|  | N/O contact      |                       |           |                  |                                  |                      |
|   | PNP              | 3-wire                | –         | 2.5              | 175 436                          | SMT-8-PS-K-LED-24-B  |
|   |                  |                       | –         | 5.0              | 175 434                          | SMT-8-PS-K5-LED-24-B |
|   |                  | –                     | 3-pin     | 0.3              | 175 484                          | SMT-8-PS-S-LED-24-B  |
|   | NPN              | 3-wire                | –         | 2.5              | 171 180                          | SMT-8-NS-K-LED-24-B  |
|   |                  |                       | –         | 3-pin            | 0.3                              | 171 181              |

| Ordering data – Proximity sensors for T-slot  |                  |                       |                  |          | Technical data → Internet: crsmt |  |
|---|------------------|-----------------------|------------------|----------|----------------------------------|--|
|   | Switching output | Electrical connection | Cable length [m] | Part No. | Type                             |  |
|  | N/O contact      |                       |                  |          |                                  |  |
|   | PNP              | Cable, 3-wire         | 2.5              | 525 563  | CRSMT-8-PS-K2,5-LED-24           |  |
|   |                  |                       | 5.0              | 525 564  | CRSMT-8-PS-K5-LED-24             |  |


| Ordering data – Proximity sensors for T-slot, magnetic reed                         |   |                      |                  |          | Technical data → Internet: sme |                        |  |
|---|---|----------------------|------------------|----------|--------------------------------|------------------------|--|
|   | Connection technology                     |                      | Cable length [m] | Part No. | Type                           |                        |  |
|   | Cable                                     | Cable with plug M8x1 |                  |          |                                |                        |  |
|  | N/O contact                               |                      |                  |          |                                |                        |  |
|   | Operating voltage range 0 ... 30 V AC/DC  |                      |                  |          |                                |                        |  |
|   | 3-wire                                    | –                    | –                | 2.5      | 150 855                        | SME-8-K-LED-24         |  |
|   |   |                      |                  | 5.0      | 175 404                        | SME-8-K5-LED-24        |  |
|   |   |                      |                  | 7.5      | 530 491                        | SME-8-K-7,5-LED-24     |  |
|   | –   | –                    | 3-pin            | 0.3      | 150 857                        | SME-8-S-LED-24         |  |
|   | 2-wire                                    | –                    | –                | 2.5      | 171 169                        | SME-8-ZS-KL-LED-24     |  |
|   | Heat-resistant up to 120 °C               |                      |                  |          |                                |                        |  |
|   | 2-wire                                    | –                    | –                | 2.5      | 161 756                        | SME-8-K-24-S6          |  |
|   | Operating voltage range 3 ... 250 V AC/DC |                      |                  |          |                                |                        |  |
|   | 2-wire                                    | –                    | –                | 2.5      | 152 820                        | SME-8-K-LED-230        |  |
|   | Operating voltage range 5 ... 250 V AC/DC |                      |                  |          |                                |                        |  |
|   | 2-wire                                    | –                    | –                | 2.5      | 538 816                        | SME-8-ZS-230V-K2,5Q-OE |  |
|   |   |                      |                  | 5.0      | 538 817                        | SME-8-ZS-230V-K5,0Q-OE |  |
|   | N/C contact                               |                      |                  |          |                                |                        |  |
| 3-wire  | –   | –                    | 7.5              | 160 251  | SME-8-O-K-LED-24               |                        |  |

# Linear actuators DFPI

Accessories

| Ordering data – Connecting cables M8x1  |                              |                              |                  |                  | Technical data → Internet: nebu |                      |
|---|------------------------------|------------------------------|------------------|------------------|---------------------------------|----------------------|
|   | Electrical connection, left  | Electrical connection, right | Switching output | Cable length [m] | Part No.                        | Type                 |
| <b>Basic version</b>  |                              |                              |                  |                  |                                 |                      |
|  | Straight socket, M8x1, 3-pin | Cable, open end, 3-wire      | –                | 2.5              | 541 333                         | NEBU-M8G3-K-2.5-LE3  |
|   |                              |                              |                  | 5                | 541 334                         | NEBU-M8G3-K-5-LE3    |
|   |                              |                              |                  | 10               | 541 332                         | NEBU-M8G3-K-10-LE3   |
|  | Angled socket, M8x1, 3-pin   | Cable, open end, 3-wire      | –                | 2.5              | 541 338                         | NEBU-M8W3-K-2.5-LE3  |
|   |                              |                              |                  | 5                | 541 341                         | NEBU-M8W3-K-5-LE3    |
|   |                              |                              |                  | 10               | 541 335                         | NEBU-M8W3-K-10-LE3   |
| <b>With switching status display</b>  |                              |                              |                  |                  |                                 |                      |
|  | Angled socket, M8x1, 3-pin   | Cable, open end, 3-wire      | PNP              | 2.5              | 541 337                         | NEBU-M8W5P-K-2.5-LE3 |
|   |                              |                              |                  | 5                | 541 340                         | NEBU-M8W5P-K-5-LE3   |
|   |                              |                              | NPN              | 2.5              | 541 336                         | NEBU-M8W5N-K-2.5-LE3 |
|   |                              |                              |                  | 5                | 541 339                         | NEBU-M8W5N-K-5-LE3   |

| Ordering data – Slot cover for T-slot  |                       |            |                 |
|--|-----------------------|------------|-----------------|
|  | Assembly              | Length [m] | Part No. Type   |
|  | Insertable from above | 2x 0.5     | 151 680 ABP-5-S |

| Ordering data – Cable clip SMBK-8   |   |                |
|---|---|----------------|
|   |   | Part No. Type  |
|  | For fixing the cable in the sensor slot | 534 254 SMBK-8 |