

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 in process automation systems
- Linear actuator with integrated displacement encoder (potentiometer)
- Product versions with integrated positioner and valve block available (DFPI-...-C1V-...). With this product version, the integrated positioner 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. Position feedback is provided via an analogue feedback signal from 4 ... 20 mA. The feedback signal increases reliability and simplifies diagnostics for the user. 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 positioner

Sturdy

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

Simple

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

Individual

- Product variants with and without positioner 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:

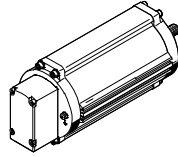
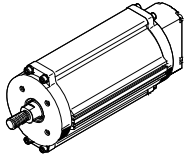
- water technology
- sewage treatment systems
- service water systems
- process water systems
- silo and bulk goods systems

Linear actuators DFPI

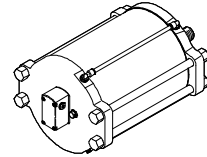
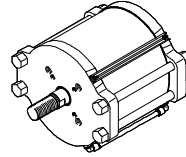
Key features

Variant ND2P-E-P-G2

Piston \varnothing 100 ... 160



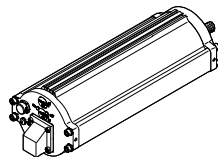
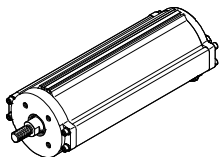
Piston \varnothing 200 ... 320



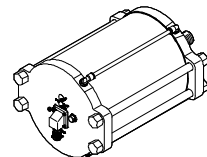
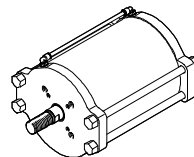
DFPI with integrated displacement encoder and protected pneumatic and electrical connections

Variant ND2P-C1V-A

Piston \varnothing 100 ... 160



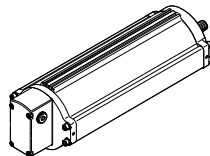
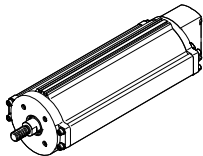
Piston \varnothing 200 ... 320



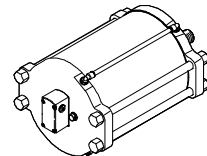
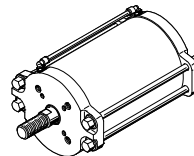
DFPI with integrated displacement encoder, positioner and valve block

Variant ND2P-C1V-P-A

Piston \varnothing 100 ... 160



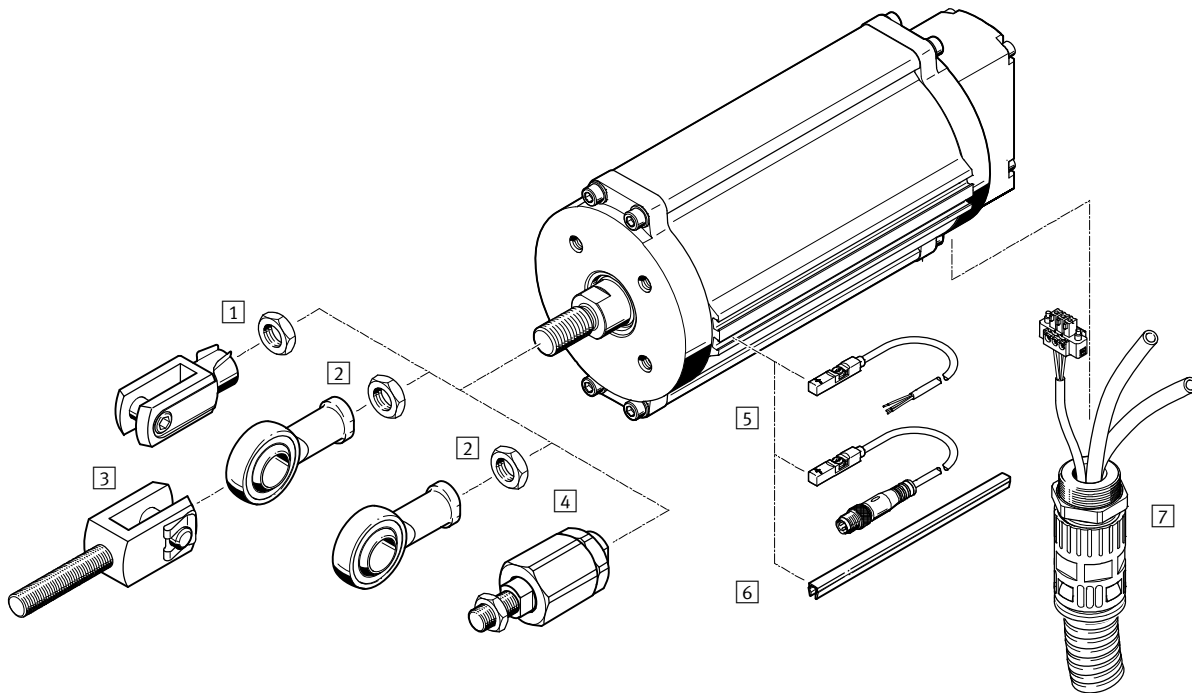
Piston \varnothing 200 ... 320



DFPI with integrated displacement encoder, positioner and valve block and protected pneumatic and electrical connections

Linear actuators DFPI-ND2P-E-P-G2

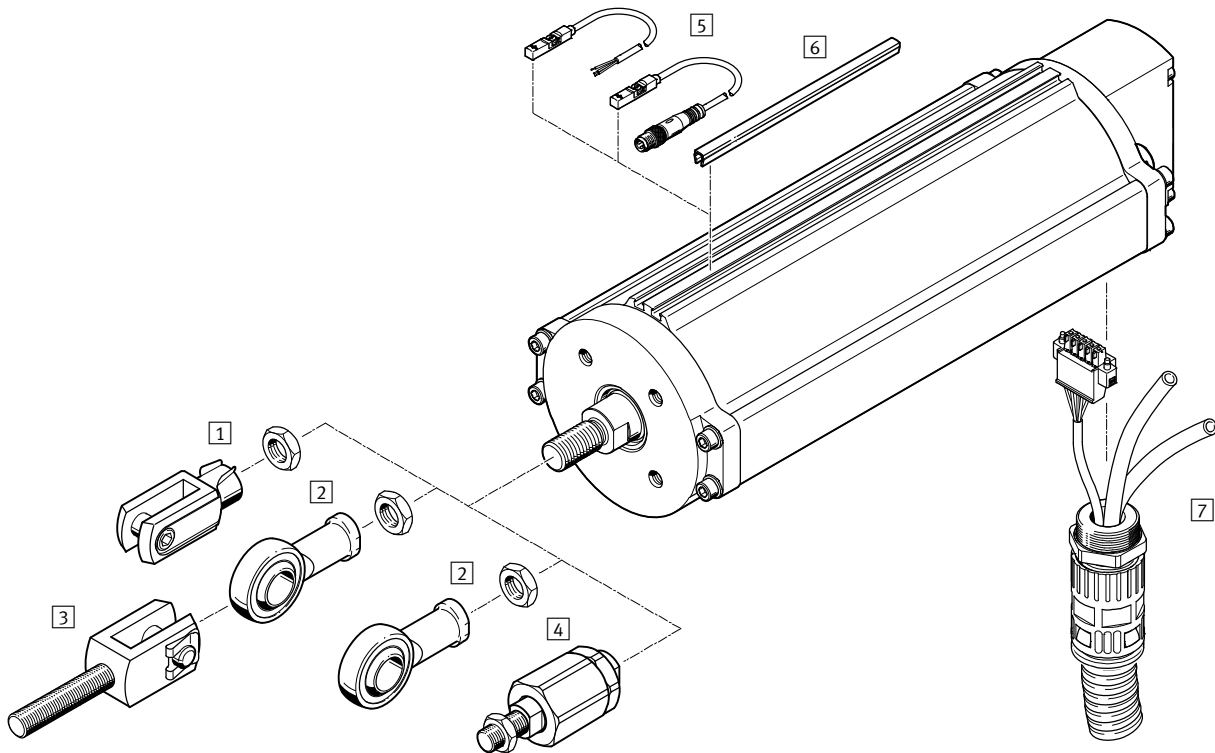
Peripherals overview – DFPI with integrated displacement encoder



| Mounting components and accessories | | |
|-------------------------------------|--------------------------------------|-----------------|
| | Brief description | → Page/Internet |
| 1 | Rod clevis SG | 22 |
| | Rod clevis, stainless steel CRSG | 22 |
| 2 | Rod eye SGS | 22 |
| | Rod eye, stainless steel CRSGS | 22 |
| 3 | Rod clevis SGA | 22 |
| 4 | Self-aligning rod coupler FK/CRFK | 22 |
| 5 | Proximity sensor SMT-8M-A | 22 |
| | Proximity sensor CRSM-8 | 22 |
| | Proximity sensor SDBT | 23 |
| 6 | Slot cover ABP-5-S | 23 |
| 7 | Connecting cable NH5B | 19 |

Linear actuators DFPI-ND2P-C1V-...-A

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



| Mounting components and accessories | | Brief description | → Page/Internet |
|-------------------------------------|-------------------------------------|-------------------------------------------------------------------------------------|-----------------|
| 1 | Rod clevis SG | Enables a simple connection between the piston rod and slide plate | 22 |
| | Rod clevis, stainless steel CRSG | | 22 |
| 2 | Rod eye SGS | With spherical bearing | 22 |
| | Rod eye, stainless steel CRSGS | | 22 |
| 3 | Rod clevis SGA | With male thread | 22 |
| 4 | Self-aligning rod coupler FK | For compensating radial and angular deviations | 22 |
| 5 | Proximity sensor SMT-8M-A | Magneto-resistive, 5 ... 30 V DC, to EU Explosion Protection Directive (ATEX) | 22 |
| | Proximity sensor CRSMT-8 | Magneto-resistive, corrosion resistant, to EU Explosion Protection Directive (ATEX) | 22 |
| | Proximity sensor SDBT | Magneto-resistive, NAMUR, to EU Explosion Protection Directive (ATEX) | 23 |
| 6 | Slot cover ABP-5-S | To protect the sensor cables and slots from dirt | 23 |
| 7 | Connecting cable NHSB | 5-wire, for DFPI- ... -C1V | 19 |

Linear actuators DFPI

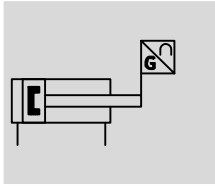
Type codes

| | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------------------|-------------------------------------------|------|---|-----|---|-----|---|--|---|---|----|---|---|----|--|---|---|---|---|--|---|---|---|--|
| | | DFPI | - | 100 | - | 100 | - | | - | N | D2 | P | - | C1 | | V | - | P | - | | - | A | - | |
| Type | | | | | | | | | | | | | | | | | | | | | | | | |
| DFPI | Regulated actuator for process automation | | | | | | | | | | | | | | | | | | | | | | | |
| Piston Ø | | | | | | | | | | | | | | | | | | | | | | | | |
| 100 | 100 mm | | | | | | | | | | | | | | | | | | | | | | | |
| 125 | 125 mm | | | | | | | | | | | | | | | | | | | | | | | |
| 160 | 160 mm | | | | | | | | | | | | | | | | | | | | | | | |
| 200 | 200 mm | | | | | | | | | | | | | | | | | | | | | | | |
| 250 | 250 mm | | | | | | | | | | | | | | | | | | | | | | | |
| 320 | 320 mm | | | | | | | | | | | | | | | | | | | | | | | |
| Stroke | | | | | | | | | | | | | | | | | | | | | | | | |
| | x length [40 ... 990 mm] | | | | | | | | | | | | | | | | | | | | | | | |
| Function | | | | | | | | | | | | | | | | | | | | | | | | |
| - | Double-acting | | | | | | | | | | | | | | | | | | | | | | | |
| Cushioning | | | | | | | | | | | | | | | | | | | | | | | | |
| N | No cushioning | | | | | | | | | | | | | | | | | | | | | | | |
| Displacement encoder | | | | | | | | | | | | | | | | | | | | | | | | |
| D2 | Analogue | | | | | | | | | | | | | | | | | | | | | | | |
| Method of measurement | | | | | | | | | | | | | | | | | | | | | | | | |
| P | Potentiometer | | | | | | | | | | | | | | | | | | | | | | | |
| Controller | | | | | | | | | | | | | | | | | | | | | | | | |
| - | Not specified | | | | | | | | | | | | | | | | | | | | | | | |
| C1 | Controller 1 | | | | | | | | | | | | | | | | | | | | | | | |
| Attachment position of controller | | | | | | | | | | | | | | | | | | | | | | | | |
| - | Integrated | | | | | | | | | | | | | | | | | | | | | | | |
| E | External | | | | | | | | | | | | | | | | | | | | | | | |
| Directional control valve | | | | | | | | | | | | | | | | | | | | | | | | |
| - | Not specified | | | | | | | | | | | | | | | | | | | | | | | |
| V | Integrated | | | | | | | | | | | | | | | | | | | | | | | |
| Connection type | | | | | | | | | | | | | | | | | | | | | | | | |
| - | Not specified | | | | | | | | | | | | | | | | | | | | | | | |
| P | Protected | | | | | | | | | | | | | | | | | | | | | | | |
| Safety position | | | | | | | | | | | | | | | | | | | | | | | | |
| - | Piston rod advancing | | | | | | | | | | | | | | | | | | | | | | | |
| Feedback | | | | | | | | | | | | | | | | | | | | | | | | |
| A | Analogue feedback signal | | | | | | | | | | | | | | | | | | | | | | | |
| Generation | | | | | | | | | | | | | | | | | | | | | | | | |
| G2 | Second generation | | | | | | | | | | | | | | | | | | | | | | | |

Linear actuators DFPI-ND2P-E-P-G2

Technical data

Function



- | - Stroke
40 ... 990 mm

- ||| - Force
4417 ... 48255 N

- ∅ - Piston ∅
100 ... 320 mm



| General technical data | | | | | | |
|-----------------------------------------------------|--------------------------------------|-----|----------|-----|-----|-----|
| Piston ∅ | 100 | 125 | 160 | 200 | 250 | 320 |
| Based on standard (connection to process valve) | DIN 3358 | | | | | |
| Type of mounting | On flange to DIN 3358 | | | | | |
| Flange hole pattern | F07 | F10 | F10, F14 | | | |
| Design | Piston rod, cylinder barrel | | | | | |
| Cushioning | None | | | | | |
| Mounting position | Any | | | | | |
| Mode of operation | Double-acting | | | | | |
| Stroke [mm] | 40 ... 990 | | | | | |
| Stroke reserve [mm] | 3 | | | | 4 | |
| Pneumatic connection | For tubing O.D. 8 mm | | | | | |
| Electrical connection | 3-pin, straight plug, screw terminal | | | | | |
| Max. cable length [m] | 15 | | | | | |
| Measuring principle displacement encoder | Potentiometer | | | | | |
| Position sensing | With integrated displacement encoder | | | | | |
| Repetition accuracy [mm] | ±0.12 | | | | | |
| Independent linearity [%] | 0.04 | | | | | |
| Hysteresis [mm] | 0.33 | | | | | |
| Continuous shock resistance to DIN/IEC 68 Part 2-82 | Tested to severity level 2 | | | | | |
| Vibration resistance to DIN/IEC 68 Part 2-6 | Tested to severity level 2 | | | | | |

Linear actuators DFPI-ND2P-E-P-G2

Technical data

| Operating and environmental conditions | | | | | | |
|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-----|-----|-----|-----|-----|
| Piston Ø | 100 | 125 | 160 | 200 | 250 | 320 |
| Operating pressure [bar] | 3 ... 8 | | | | | |
| Nominal operating pressure [bar] | 6 | | | | | |
| Operating medium | Compressed air in accordance with ISO 8573-1:2010 [7:4:4] | | | | | |
| Note on operating/pilot medium | Lubricated operation possible (in which case lubricated operation will always be required) | | | | | |
| Operating voltage range [V DC] | 0 ... 15 | | | | | |
| Max. operating voltage [V DC] | 15 | | | | | |
| Exterior use | C1 – weather-protected areas in accordance with IEC 60654 | | | | | |
| Recommended contact current [µA] | <0.1 | | | | | – |
| Max. short-time contact current [mA] | 10 | | | | | – |
| Ambient temperature [°C] | –20 ... +60 | | | | | |
| Storage temperature [°C] | –20 ... +80 | | | | | – |
| Corrosion resistance class CRC ¹⁾ | 3 | | | | | |
| Relative air humidity [%] | 5 ... 100, condensing | | | | | |
| Protection class | IP65, IP67, IP68, IP69K, NEMA 4 | | | | | |
| Certification | C-Tick | | | | | – |
| CE marking (see declaration of conformity) → www.festo.com | To EU Explosion Protection Directive (ATEX) | | | | | |
| ATEX category for gas | II 2G | | | | | |
| Explosion ignition protection type for gas | c T4 X | | | | | |
| ATEX category for dust | II 2D | | | | | |
| Explosion ignition protection type for dust | c 120°C X | | | | | |
| Explosion-proof temperature | –20°C ≤ Ta ≤ +60°C | | | | | |

1) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

Linear actuators DFPI-ND2P-E-P-G2

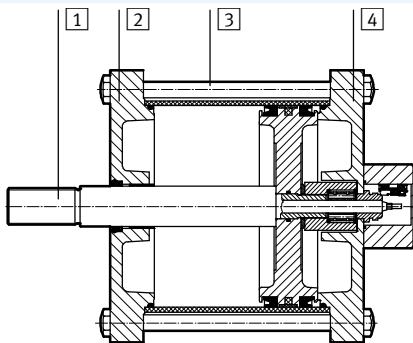
Technical data

| Forces [N] and air consumption [l] | | | | | | |
|-----------------------------------------------|--------|--------|--------|-------|--------|--------|
| Piston Ø | 100 | 125 | 160 | 200 | 250 | 320 |
| Theoretical force at 6 bar, advancing | 4712 | 7363 | 12064 | 18850 | 29452 | 48255 |
| Theoretical force at 6 bar, retracting | 4417 | 6881 | 11581 | 18080 | 28698 | 47501 |
| Air consumption, advancing, per 10 mm stroke | 0.5498 | 0.859 | 1.4074 | 2.119 | 3.4361 | 5.6297 |
| Air consumption, retracting, per 10 mm stroke | 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] | 3476 | 5530 | 6529 | 13946 | 22569 | 35359 |
| Additional moving load per 10 mm stroke [g] | 27 | 52 | 52 | 87 | 87 | 87 |
| Moving load with 0 mm stroke [g] | 1228 | 1944 | 2250 | 4722 | 7059 | 11417 |
| Additional weight per 10 mm stroke [g] | 80 | 145 | 159 | 187 | 325 | 399 |
| Additional weight of displacement encoder per 10 mm [g] | 2 | | | | | |

Materials

Sectional view



| | Piston Ø | |
|----------------------------|--------------------|-----------------------------------------------------|
| 1 Piston rod | 100 ... 320 | High-alloy stainless steel |
| 2 Bottom cap (bearing cap) | 100 ... 320 | Anodised wrought aluminium alloy |
| | | Painted anodised wrought aluminium alloy |
| | | Painted die-cast aluminium |
| 3 Cylinder barrel | 100 ... 200 | Anodised wrought aluminium alloy |
| | 250 ... 320 | High-alloy stainless steel |
| 4 Top cap (end cap) | 100 ... 320 | Anodised wrought aluminium alloy |
| | | Painted anodised wrought aluminium alloy |
| | | Painted die-cast aluminium |
| - Screws | 100, 200, 250, 320 | High-alloy stainless steel |
| | 125, 160 | High-alloy stainless steel |
| | | Steel |
| - Ring nut | 100 ... 200 | Coated steel |
| - Seals | 100 | PU |
| | 125 ... 320 | NBR |
| | | NBR |
| - Note on materials | 100 ... 320 | Contains PWIS (paint-wetting impairment substances) |
| | | RoHS-compliant |

Linear actuators DFPI-ND2P-E-P-G2

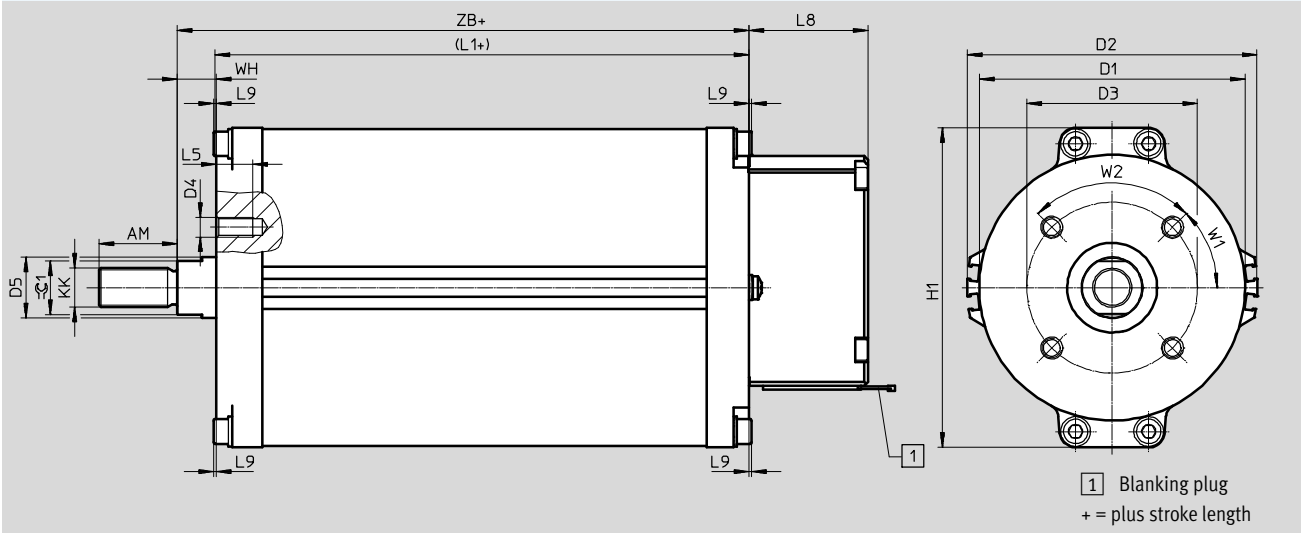
Technical data

FESTO

Dimensions

Download CAD data → www.festo.com

Piston Ø 100 ... 160



| Piston Ø | AM | D1 | D2 | D3 | D4 | D5 | H1 | KK | L1+ |
|----------|----|-----|-----|-----|-----|----|-----|---------|-------|
| [mm] | -2 | Ø | Ø | Ø | | Ø | | | |
| DFPI-100 | 32 | 109 | 119 | 70 | M8 | 25 | 131 | M16x1.5 | 118.5 |
| DFPI-125 | 54 | 135 | 147 | 102 | M10 | 32 | 163 | M27x2 | 119 |
| DFPI-160 | | 170 | 182 | | | | 199 | | 126.5 |

| Piston Ø | L5 | L8 | L9 | W1 | W2 | WH | ZB+ | ∅C1 | Flange dimension to DIN 3358 |
|----------|----|------|----|-----|-----|----|-------|-----|------------------------------|
| [mm] | | | | | | | | | |
| DFPI-100 | 15 | 48.8 | 1 | 45° | 90° | 16 | 134.5 | 22 | F07 |
| DFPI-125 | 18 | 48.8 | - | 45° | 90° | 24 | 143 | 27 | F10 |
| DFPI-160 | | | | | | | 150.5 | | |

Linear actuators DFPI-ND2P-E-P-G2

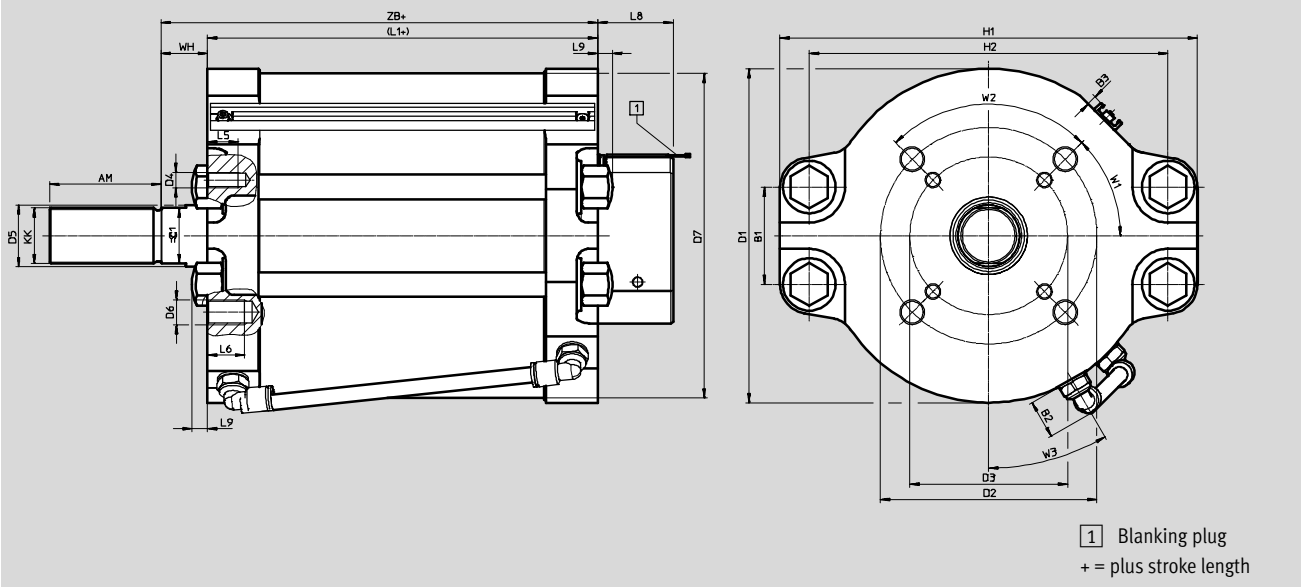
Technical data



Dimensions

Download CAD data → www.festo.com

Piston Ø 200 ... 320

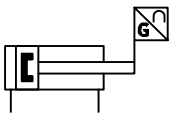



| Piston Ø | AM | B1 | B2 | B3 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | H1 | H2 |
|----------|----|-----|------|-----|-----|-----|-----|-----|----|-----|--------|-----|-----|
| [mm] | -2 | | | | Ø | Ø | Ø | | Ø | | Ø min. | | |
| DFPI-200 | 72 | 63 | 25.6 | 6.5 | 216 | 140 | 102 | M10 | 40 | M16 | 210 | 270 | 232 |
| DFPI-250 | 72 | 82 | 25.6 | 6.5 | 260 | 140 | 102 | M10 | 40 | M16 | 254 | 308 | 268 |
| DFPI-320 | | 126 | | | 332 | | | | | | 325 | | |

| Piston Ø | KK | L1+ | L5 | L6 min. | L8 | L9 | WH | W1 | W2 | W3 | ZB+ | ⊖C1 | Flange dimension to DIN 3358 |
|----------|-------|-------|----|---------|------|----|----|----|----|----|-------|-----|------------------------------|
| [mm] | | | | | | | | | | | | | |
| DFPI-200 | M36x2 | 152.5 | 20 | 24 | 48.8 | 10 | 30 | 45 | 90 | 30 | 182.5 | 36 | F1014 |
| DFPI-250 | M36x2 | 152.2 | 20 | 25 | 48.8 | 25 | 30 | 45 | 90 | 30 | 182.2 | 36 | F1014 |
| DFPI-320 | | 160 | | 24 | | | | | | | 190 | | |

Linear actuators DFPI-ND2P-E-P-G2

Technical data

| Ordering data | | | |
|-----------------------------------------------------------------------------------|---------------|----------|----------------------------|
| Type | Piston Ø [mm] | Part No. | Type |
|  | 100 | 1808236 | DFPI-100- ... -ND2P-E-P-G2 |
| | 125 | 1808239 | DFPI-125- ... -ND2P-E-P-G2 |
| | 160 | 1808242 | DFPI-160- ... -ND2P-E-P-G2 |
| | 200 | 1808245 | DFPI-200- ... -ND2P-E-P-G2 |
| | 250 | 1808253 | DFPI-250- ... -ND2P-E-P-G2 |
| | 320 | 1808263 | DFPI-320- ... -ND2P-E-P-G2 |

-  - Note

Stroke length of the actuator

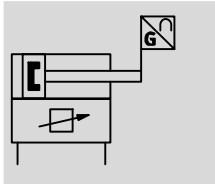
The stroke length of the actuator should generally at least correspond to the nominal diameter of the process valve so that the process valve can be fully opened and closed. The system tolerances can lead to a

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-...-A

Technical data

Function



- | - Stroke
40 ... 990 mm

- ||| - Force
4417 ... 48255 N

- ∅ - Piston ∅
100 ... 320 mm



| General technical data | | | | | | |
|--------------------------------------------------------|--------------------------------------|-------|----------|-------|-----|-------|
| Piston ∅ | 100 | 125 | 160 | 200 | 250 | 320 |
| Based on standard (connection to process valve) | DIN 3358 | | | | | |
| Type of mounting | On flange to DIN 3358 | | | | | |
| Flange hole pattern | F07 | F10 | F10, F14 | | | |
| Design | Piston rod, cylinder barrel | | | | | |
| Cushioning | No cushioning | | | | | |
| Mounting position | Any | | | | | |
| Mode of operation | Double-acting | | | | | |
| Stroke [mm] | 40 ... 990 | | | | | |
| Stroke reserve [mm] | 3 | | | | 4 | |
| Pneumatic connection | | | | | | |
| DFPI-...-ND2P-C1V-A | G1/4 | | | | | |
| DFPI-...-ND2P-C1V-P-A | For tubing O.D. 8 mm, O.D. 10 mm | | | | | |
| Electrical connection | 5-pin, straight plug, screw terminal | | | | | |
| Max. cable length [m] | 15 | | | | | |
| Measuring principle displacement encoder | Potentiometer | | | | | |
| Position sensing | With integrated displacement encoder | | | | | |
| Repetition accuracy | ±1 %FS | | | | | |
| Positioning accuracy | 1 %FS | | | | | |
| Hysteresis | ±1 %FS | | | | | |
| Size of the dead zone | 1 %FS | | | | | |
| Accuracy of analogue output | 1 %FS | | | | | |
| Max. speed, retracting [m/s] | 0.071 | 0.048 | 0.031 | 0.016 | - | 0.005 |
| Max. speed, advancing [m/s] | 0.074 | 0.049 | 0.031 | 0.018 | - | 0.007 |
| Continuous shock resistance to DIN/IEC 68 Part 2-82 | Tested to severity level 2 | | | | | |
| Vibration resistance to DIN/IEC 68 Part 2-6 | Tested to severity level 2 | | | | | |

Linear actuators DFPI-ND2P-C1V-...-A

Technical data

| Operating and environmental conditions | |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Operating pressure [bar] | 3 ... 8 |
| Nominal operating pressure [bar] | 6 |
| Operating medium | Compressed air in accordance with ISO 8573-1:2010 [7:4:4] |
| Note on operating/pilot medium | Lubricated operation possible (in which case lubricated operation will always be required) |
| Operating voltage range [V DC] | 21.6 ... 26.4 |
| Nominal operating voltage [V DC] | 24 |
| Setpoint input [mA] | 4 ... 20 |
| Analogue output [mA] | 4 ... 20 |
| Max. current consumption [mA] | 220 |
| Reverse polarity protection | For operating voltage For setpoint value For initialisation connection |
| Exterior use | C1 – weather-protected areas in accordance with IEC 60654 |
| Ambient temperature [°C] | -5 ... +50 |
| Temperature of medium [°C] | -5 ... +40 |
| Corrosion resistance class CRC ¹⁾ | 3 |
| Relative air humidity [%] | 5 ... 100, condensing |
| Protection class | IP65, IP67, IP68, IP69K, NEMA 4 |
| Certification | RCM trademark |
| CE marking (see declaration of conformity) → www.festo.com | To EU EMC Directive To EU Explosion Protection Directive (ATEX) |
| ATEX category for gas | II 3G |
| Explosion ignition protection type for gas | Ex nA IIC T4 X Gc |
| ATEX category for dust | II 3D |
| Explosion ignition protection type for dust | Ex tc IIIC T120°C X Dc |
| Explosion-proof temperature [°C] | -5°C ≤ Ta ≤ +50°C |

1) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional requirements for the surface and which are in direct contact with a normal industrial environment.

| Forces [N] and air consumption [l] | 100 | 125 | 160 | 200 | 250 | 320 |
|-----------------------------------------------|--------|--------|--------|-------|--------|--------|
| Piston Ø | | | | | | |
| Theoretical force at 6 bar, advancing | 4712 | 7363 | 12064 | 18850 | 29452 | 48255 |
| Theoretical force at 6 bar, retracting | 4417 | 6881 | 11581 | 18080 | 28698 | 47501 |
| Air consumption, retracting, per 10 mm stroke | 0.5153 | 0.8027 | 1.3511 | 2.111 | 3.3482 | 5.5418 |
| Air consumption, advancing, per 10 mm stroke | 0.5498 | 0.859 | 1.4074 | 2.119 | 3.4361 | 5.6297 |

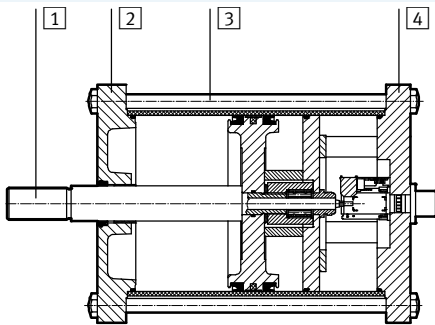
Linear actuators DFPI-ND2P-C1V-...-A

Technical data

| Weight | | | | | | |
|---------------------------------------------------------|------|------|------|-------|-------|-------|
| Piston \varnothing | 100 | 125 | 160 | 200 | 250 | 320 |
| Basic weight with 0 mm stroke | | | | | | |
| DFPI-...-...-ND2P-C1V-A [g] | 4671 | 7693 | 9099 | 18358 | 29956 | 45200 |
| DFPI-...-...-ND2P-C1V-P-A [g] | 5237 | 8259 | 9665 | 18924 | 30522 | 45766 |
| Moving load with 0 mm stroke [g] | 1228 | 1944 | 2250 | 4722 | 7059 | 11417 |
| Additional weight per 10 mm stroke [g] | 80 | 145 | 159 | 187 | 325 | 399 |
| Additional moving load per 10 mm stroke [g] | 27 | 52 | | 87 | | |
| Additional weight of displacement encoder per 10 mm [g] | 2 | | | | | |

Materials

Sectional view



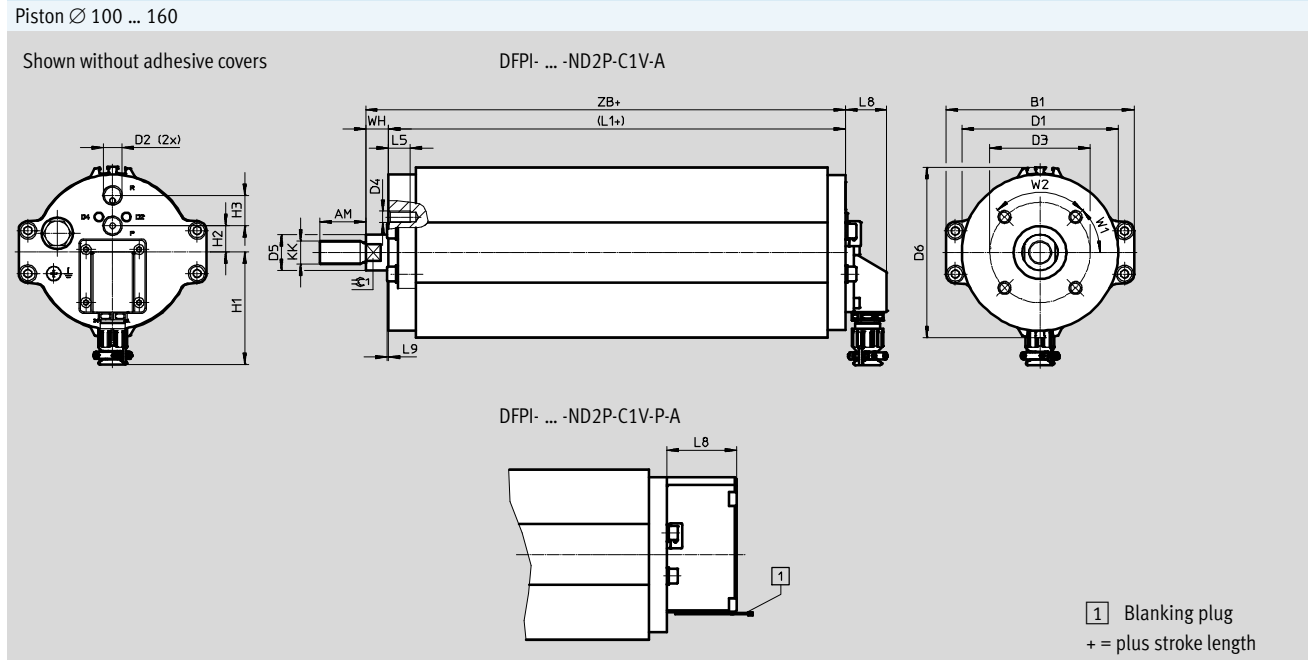
| | Piston \varnothing | |
|----------------------------|----------------------|-----------------------------------------------------|
| 1 Piston rod | 100 ... 320 | High-alloy stainless steel |
| 2 Bottom cap (bearing cap) | 100 ... 320 | Anodised wrought aluminium alloy |
| | | Painted anodised wrought aluminium alloy |
| | | Painted die-cast aluminium |
| 3 Cylinder barrel | 100 ... 200 | Anodised wrought aluminium alloy |
| | 250 ... 320 | High-alloy stainless steel |
| 4 Top cap (end cap) | 100 ... 320 | Anodised wrought aluminium alloy |
| | | Painted anodised wrought aluminium alloy |
| | | Painted die-cast aluminium |
| - Screws | 100, 200, 250, 320 | High-alloy stainless steel |
| | 125, 160 | High-alloy stainless steel |
| | | Steel |
| - Seals | 100 | PU |
| | | NBR |
| | 125 ... 320 | NBR |
| - Note on materials | 100 ... 320 | Contains PWIS (paint-wetting impairment substances) |
| | | RoHS-compliant |

Linear actuators DFPI-ND2P-C1V-...-A

Technical data



Dimensions Download CAD data → www.festo.com



| Piston Ø [mm] | AM -2 | B1 | D1 Ø | D2 Ø | D3 Ø | D4 | D5 Ø | D6 Ø | H1 ±2 | H2 |
|----------------------|----------|-----|---------|-----------------|---------|-----|---------|---------|----------|------|
| DFPI-100- ... -C1V-A | 32 | 131 | 109 | G $\frac{1}{4}$ | 70 | M8 | 25 | 119 | 79 | 18.3 |
| DFPI-125- ... -C1V-A | 54 | 163 | 135 | G $\frac{1}{4}$ | 102 | M10 | 32 | 147 | 79 | 18.3 |
| DFPI-160- ... -C1V-A | | 199 | 170 | | | | | 182 | | |

| Piston Ø [mm] | H3 | KK | L1+ | L5 | L8 | L9 | WH | ZB+ | ⌀C1 | Flange dimension to DIN 3358 |
|----------------------|------|---------|-------|----|------|----|----|-------|-----|------------------------------------|
| DFPI-100- ... -C1V-A | 21.2 | M16x1.5 | 218.5 | 15 | 28.8 | 1 | 16 | 234.5 | 22 | F07 |
| DFPI-125- ... -C1V-A | 21.2 | M27x2 | 221 | 18 | 28.8 | - | 24 | 245 | 27 | F10 |
| DFPI-160- ... -C1V-A | | | 227.5 | | | | | 251.5 | | |

| Piston Ø [mm] | AM -2 | B1 | D1 Ø | D2 Ø | D3 Ø | D4 | D5 Ø | D6 Ø | H1 | H2 |
|------------------------|----------|-----|---------|-----------------|---------|-----|---------|---------|----|------|
| DFPI-100- ... -C1V-P-A | 32 | 131 | 109 | G $\frac{1}{4}$ | 70 | M8 | 25 | 119 | - | 18.3 |
| DFPI-125- ... -C1V-P-A | 54 | 163 | 135 | G $\frac{1}{4}$ | 102 | M10 | 32 | 147 | - | 18.3 |
| DFPI-160- ... -C1V-P-A | | 199 | 170 | | | | | 182 | | |

| Piston Ø [mm] | H3 | KK | L1+ | L5 | L8 | L9 | WH | ZB+ | ⌀C1 | Flange dimension to DIN 3358 |
|------------------------|------|---------|-------|----|------|----|----|-------|-----|------------------------------------|
| DFPI-100- ... -C1V-P-A | 21.2 | M16x1.5 | 218.5 | 15 | 48.8 | 1 | 16 | 234.5 | 22 | F07 |
| DFPI-125- ... -C1V-P-A | 21.2 | M27x2 | 221 | 18 | 48.8 | - | 24 | 245 | 27 | F10 |
| DFPI-160- ... -C1V-P-A | | | 227.5 | | | | | 251.5 | | |

Linear actuators DFPI-ND2P-C1V-...-A

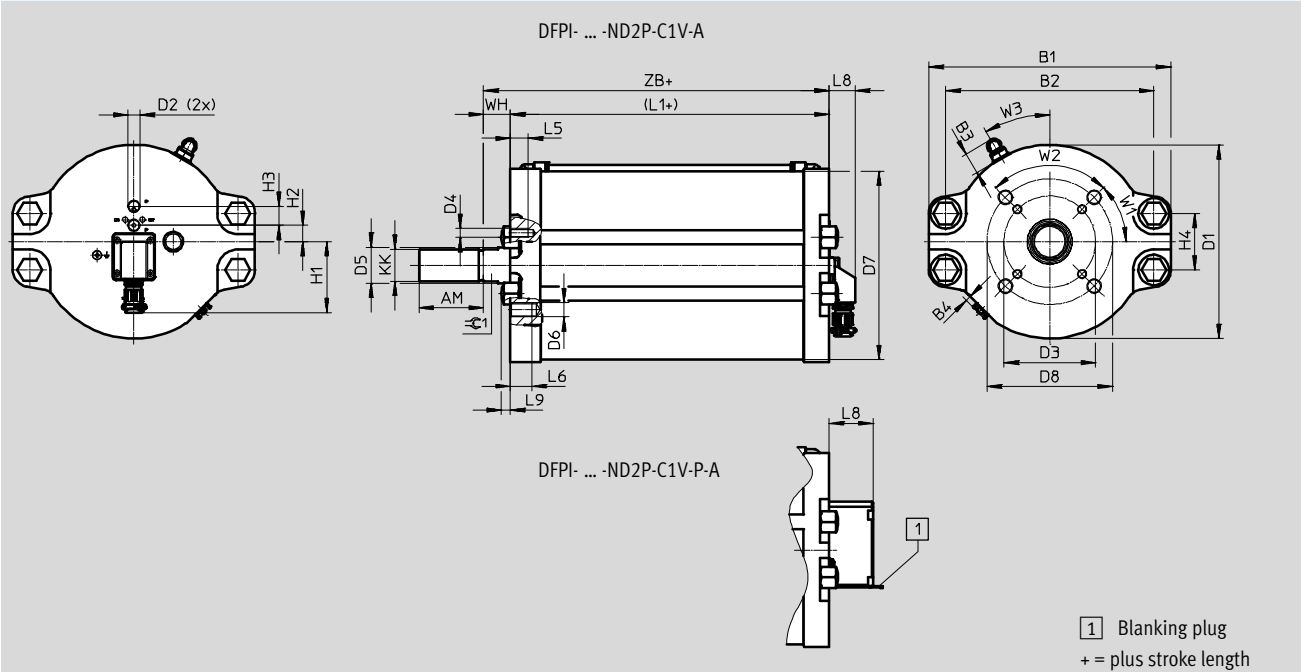
Technical data

FESTO

Dimensions

Download CAD data → www.festo.com

Piston Ø 200 ... 320



| Piston Ø | AM | B1 | B2 | B3 | B4 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | H1 | H2 |
|----------------------|----|-----|-----|------|-----|-----|------|-----|-----|----|-----|--------|-----|----|------|
| [mm] | -2 | | | | | Ø | | Ø | | Ø | | Ø min. | Ø | ±2 | |
| DFPI-200- ... -C1V-A | 72 | 270 | 232 | 24.5 | 6.5 | 216 | G1/4 | 102 | M10 | 40 | M16 | 210 | 140 | 79 | 18.3 |
| DFPI-250- ... -C1V-A | 72 | 308 | 268 | 24.5 | 6.5 | 260 | G1/4 | 102 | M10 | 40 | M16 | 254 | 140 | 79 | 18.3 |
| DFPI-320- ... -C1V-A | | 378 | 338 | | | 332 | | | | | | 325 | | | |

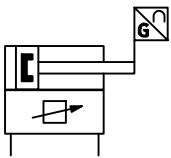
| Piston Ø | H3 | H4 | KK | L1+ | L5 | L6 | L8 | L9 | ∓C1 | WH | W1 | W2 | W3 | ZB+ | Flange dimension to DIN 3358 |
|----------------------|------|-----|-------|-------|----|------|------|----|-----|----|-----|-----|-----|-------|------------------------------|
| [mm] | | | | | | min. | | | | | | | | | |
| DFPI-200- ... -C1V-A | 21.2 | 63 | M36x2 | 255.5 | 20 | 24 | 28.8 | 10 | 36 | 30 | 45° | 90° | 30° | 285.5 | F1014 |
| DFPI-250- ... -C1V-A | 21.2 | 82 | M36x2 | 255 | 20 | 25 | 28.8 | 25 | 36 | 30 | 45° | 90° | 30° | 285 | F1014 |
| DFPI-320- ... -C1V-A | | 126 | | 262 | | | | - | | | | | | 292 | |

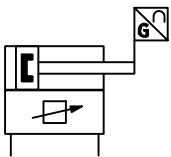
| Piston Ø | AM | B1 | B2 | B3 | B4 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | H2 | H3 |
|------------------------|----|-----|-----|------|-----|-----|------|-----|-----|----|-----|--------|-----|------|------|
| [mm] | -2 | | | | | Ø | | Ø | | Ø | | Ø min. | Ø | | |
| DFPI-200- ... -C1V-P-A | 72 | 270 | 232 | 24.5 | 6.5 | 216 | G1/4 | 102 | M10 | 40 | M16 | 210 | 140 | 18.3 | 21.2 |
| DFPI-250- ... -C1V-P-A | 72 | 308 | 268 | 24.5 | 6.5 | 260 | G1/4 | 102 | M10 | 40 | M16 | 254 | 140 | 18.3 | 21.2 |
| DFPI-320- ... -C1V-P-A | | 378 | 338 | | | 332 | | | | | | 325 | | | |


| Piston Ø | H4 | KK | L1+ | L5 | L6 | L8 | L9 | ∓C1 | WH | W1 | W2 | W3 | ZB+ | Flange dimension to DIN 3358 |
|------------------------|-----|-------|-------|----|------|------|----|-----|----|-----|-----|-----|-------|------------------------------|
| [mm] | | | | | min. | | | | | | | | | |
| DFPI-200- ... -C1V-P-A | 63 | M36x2 | 255.5 | 20 | 24 | 48.8 | 10 | 36 | 30 | 45° | 90° | 30° | 285.5 | F1014 |
| DFPI-250- ... -C1V-P-A | 82 | M36x2 | 255 | 20 | 25 | 48.8 | 25 | 36 | 30 | 45° | 90° | 30° | 285 | F1014 |
| DFPI-320- ... -C1V-P-A | 126 | | 262 | | | | - | | | | | | 292 | |

Linear actuators DFPI-ND2P-C1V-...-A

Technical data

| Ordering data | | | |
|-----------------------------------------------------------------------------------|---------------|----------|---------------------------|
| Type | Piston Ø [mm] | Part No. | Type |
|  | 100 | 1548004 | DFPI-100- ... -ND2P-C1V-A |
| | 125 | 1548020 | DFPI-125- ... -ND2P-C1V-A |
| | 160 | 1548026 | DFPI-160- ... -ND2P-C1V-A |
| | 200 | 1548030 | DFPI-200- ... -ND2P-C1V-A |
| | 250 | 1548037 | DFPI-250- ... -ND2P-C1V-A |
| | 320 | 1548041 | DFPI-320- ... -ND2P-C1V-A |

| Ordering data | | | |
|-------------------------------------------------------------------------------------------------|---------------|----------|-----------------------------|
| Type | Piston Ø [mm] | Part No. | Type |
| Variant with integrated displacement encoder and protected pneumatic and electrical connections | | | |
|  | 100 | 1548005 | DFPI-100- ... -ND2P-C1V-P-A |
| | 125 | 1548021 | DFPI-125- ... -ND2P-C1V-P-A |
| | 160 | 1548028 | DFPI-160- ... -ND2P-C1V-P-A |
| | 200 | 1548032 | DFPI-200- ... -ND2P-C1V-P-A |
| | 250 | 1548039 | DFPI-250- ... -ND2P-C1V-P-A |
| | 320 | 1548044 | DFPI-320- ... -ND2P-C1V-P-A |

-  - 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

Connecting cable NHSB
for DFPI-ND2P-E-P-G2 and
DFPI-ND2P-C1V-P-A



| General technical data | | | |
|---------------------------|--------------------|----------------------|-----------------------|
| Connecting cable | [mm ²] | 3x 0.75 | 5x 0.75 |
| Mounting position | | Any | |
| Min. cable bending radius | [mm] | 100 | |
| Pneumatic connection | | For tubing O.D. 8 mm | |
| | | – | For tubing O.D. 10 mm |

| Operating and environmental conditions | | | |
|------------------------------------------------------|--------|-----------------------------------------------------------|--|
| Ambient temperature | [°C] | –20 ... +60 | |
| Ambient temperature with flexible cable installation | [°C] | –5 ... +60 | |
| Operating voltage range | [V DC] | 0 ... 30 | |
| Operating medium | | Compressed air in accordance with ISO 8573-1:2010 [7:4:4] | |
| Note on operating/pilot medium | | Lubricated operation possible | |
| Protection class | | IP65, IP67, IP69K, NEMA 4 in assembled state | |
| Exterior use | | C1 – weather-protected areas | |
| Relative air humidity | [%] | 5 ... 100, condensing | |

| Materials | | | |
|--------------------|--|-----------------------------------------------------|--|
| Protective conduit | | PA | |
| Conduit fitting | | PA | |
| Cable sheath | | PVC | |
| Seals | | TPE | |
| Note on materials | | Contains PWIS (paint-wetting impairment substances) | |
| | | RoHS-compliant | |

Linear actuators DFPI

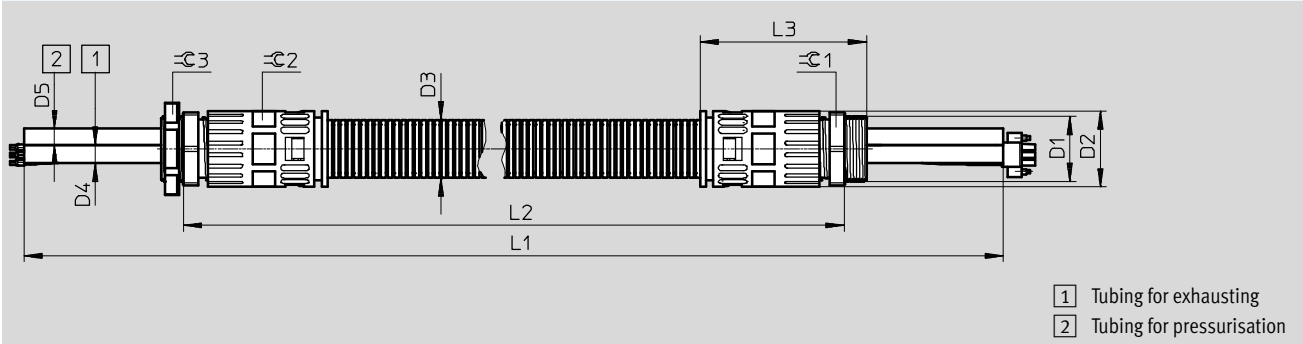
Accessories

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Dimensions

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3-wire

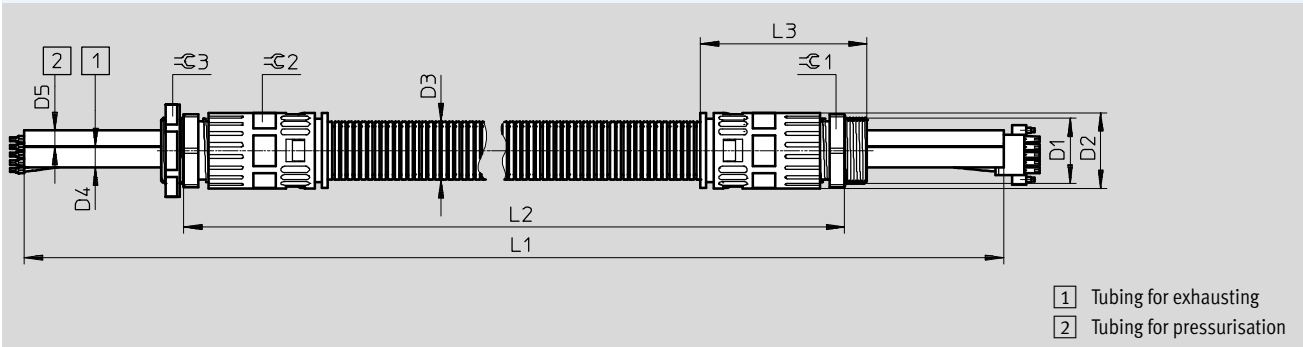


| Type | D1 | D2 Ø | D3 Ø | D4 Ø | D5 Ø | L1 ±25 | L2 ±25 | L3 | ∅C1 | ∅C2 | ∅C3 |
|------------------------------|---------|---------|---------|---------|---------|-----------|-----------|----|-----|-----|-----|
| NHSB-A1-5-BLG3-LE3-PU8-2xBB | M32x1.5 | 37 | 28.5 | 8 | 8 | 6100 | 5000 | 82 | 36 | 34 | 41 |
| NHSB-A1-10-BLG3-LE3-PU8-2xBB | | | | | | 11100 | 10000 | | | | |
| NHSB-A1-15-BLG3-LE3-PU8-2xBB | | | | | | 16100 | 15000 | | | | |

Dimensions

Download CAD data → www.festo.com

5-wire





| Type | D1 | D2 Ø | D3 Ø | D4 Ø | D5 Ø | L1 ±25 | L2 ±25 | L3 | ∅C1 | ∅C2 | ∅C3 |
|------------------------------|---------|---------|---------|---------|---------|-----------|-----------|----|-----|-----|-----|
| NHSB-A1-5-BLG5-LE5-PU8-2xBB | M32x1.5 | 37 | 28.5 | 10 | 8 | 6100 | 5000 | 82 | 36 | 34 | 41 |
| NHSB-A1-10-BLG5-LE5-PU8-2xBB | | | | | | 11100 | 10000 | | | | |
| NHSB-A1-15-BLG5-LE5-PU8-2xBB | | | | | | 16100 | 15000 | | | | |

Linear actuators DFPI

Accessories





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


| Ordering data – Connecting cable | | | | | | Technical data → Internet: nhsb | |
|-----------------------------------------------------------------------------------|-------------------------|-------------------------|---------------|-----------------------------------------|-----------------------|---------------------------------|-------------------------------------|
| | Electrical connection 1 | Electrical connection 2 | Length [m] | Cable composition [mm ²] | Product weight [g] | Part No. | Type |
| 3-wire, for DFPI- ... -ND2P-E-P | | | | | | | |
|  | Straight plug, 3-pin | Open end, 3-wire | 5 | 3x 0.75 | 1250 | 1686608 | NHSB-A1-5-BLG3-LE3-PU8-2XBB |
| | | | 10 | | 2500 | 1686609 | NHSB-A1-10-BLG3-LE3-PU8-2XBB |
| | | | 15 | | 3750 | 1686610 | NHSB-A1-15-BLG3-LE3-PU8-2XBB |
| 5-wire, for DFPI- ... -C1V-P | | | | | | | |
|  | Straight plug, 5-pin | Open end, 5-wire | 5 | 5x 0.75 | 1250 | 1585793 | NHSB-A1-5-BLG5-LE5-PU8-2XBB |
| | | | 10 | | 2500 | 1585794 | NHSB-A1-10-BLG5-LE5-PU8-2XBB |
| | | | 15 | | 3750 | 1585795 | NHSB-A1-15-BLG5-LE5-PU8-2XBB |


Linear actuators DFPI


Accessories


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| Ordering data – Piston rod attachments | | | | Technical data → Internet: piston rod attachment | | | |
|-----------------------------------------------------------------------------------|---------------|--------------|--------------------|-----------------------------------------------------------------------------------|---------------|--------------|-------------------|
| Designation | For Ø | Part No. | Type | Designation | For Ø | Part No. | Type |
| Rod eye SGS | | | | Rod clevis SG | | | |
|  | 100 | 9263 | SGS-M16x1,5 |  | 100 | 6146 | SG-M16x1,5 |
| | 125, 160 | 10774 | SGS-M27x2 | | 125, 160 | 14987 | SG-M27x2-B |
| | 200, 250, 320 | 10775 | SGS-M36x2 | | 200, 250, 320 | 9581 | SG-M36x2 |
| Rod clevis SGA | | | | Self-aligning rod coupler FK | | | |
|  | 100 | 10768 | SGA-M16x1,5 |  | 100 | 6142 | FK-M16x1,5 |
| | 125, 160 | 10770 | SGA-M27x2 | | 125, 160 | 10485 | FK-M27x2 |
| | 200, 250, 320 | 10771 | SGA-M36x2 | | 200, 250, 320 | 10746 | FK-M36x2 |

| Ordering data – Piston rod attachments, corrosion-resistant | | | | Technical data → Internet: piston rod attachment | | | |
|-------------------------------------------------------------------------------------|----------|----------------|---------------------|-----------------------------------------------------------------------------------|----------|--------------|----------------------|
| Designation | For Ø | Part No. | Type | Designation | For Ø | Part No. | Type |
| Rod eye CRSG | | | | Rod clevis CRSGS | | | |
|  | 100 | 13571 | CRSG-M16x1,5 |  | 100 | 19584 | CRSGS-M16x1,5 |
| | 125, 160 | 185361 | CRSG-M27x2 | | 125, 160 | 19586 | CRSGS-M27x2 |
| Self-aligning rod coupler CRFK | | | | | | | |
|  | 100 | 2490673 | CRFK-M16x1,5 | | | | |

| Ordering data – Proximity sensor 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 | | | | | | | |
|  | Contactless | 2-wire | – | 5 | 574341 | SMT-8M-A-ZS-24V-E-5,0-OE-EX2 | |
| | PNP | – | 3-pin | 0.3 | 574342 | SMT-8M-A-PS-24V-E-0,3-M8D-EX2 | |



| Ordering data – Proximity sensor for T-slot, corrosion resistant | | | | Technical data → Internet: crsmt | | | |
|-------------------------------------------------------------------------------------|-----------------------|---------------|------------------|----------------------------------|-------------------------------|--|--|
| Switching output | Electrical connection | | Cable length [m] | Part No. | Type | | |
| | Cable | | | | | | |
| N/O contact | | | | | | | |
|  | PNP | Cable, 3-wire | 2.5 | 525563 | CRSMT-8-PS-K2,5-LED-24 | | |
| | | | 5.0 | 525564 | CRSMT-8-PS-K5-LED-24 | | |




| Ordering data – Proximity sensor for T-slot, NAMUR | | | | Technical data → Internet: sdbt | | | |
|-------------------------------------------------------------------------------------|-----------------------|---------------|------------------|---------------------------------|------------------------------------|--|--|
| Switching output | Electrical connection | | Cable length [m] | Part No. | Type | | |
| | Cable | | | | | | |
| N/O contact | | | | | | | |
|  | NAMUR | Cable, 2-wire | 5 | 579071 | SDBT-MS-20NL-ZN-E-5-LE-EX6 | | |
| | | | 10 | 579072 | SDBT-MS-20NL-ZN-E-10-LE-EX6 | | |


Linear actuators DFPI

Accessories

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| Ordering data – Proximity sensor for T-slot, magnetic reed | | | | | Technical data → Internet: sme | | |
|-----------------------------------------------------------------------------------|-------------------------------------------|-------------------------|---------------------|----------|--------------------------------|--|--|
| Connection technology | | Cable with plug M8x1 | Cable length [m] | Part No. | Type | | |
| Cable | | | | | | | |
| N/O contact | | | | | | | |
|  | Operating voltage range 0 ... 30 V AC/DC | | | | | | |
| | 3-wire | – | 2.5 | 150855 | SME-8-K-LED-24 | | |
| | | | 5.0 | 175404 | SME-8-K5-LED-24 | | |
| | | | 7.5 | 530491 | SME-8-K-7,5-LED-24 | | |
| | – | 3-pin | 0.3 | 150857 | SME-8-S-LED-24 | | |
| | 2-wire | – | 2.5 | 171169 | SME-8-ZS-KL-LED-24 | | |
| | Heat-resistant up to 120 °C | | | | | | |
| | 2-wire | – | 2.5 | 161756 | SME-8-K-24-S6 | | |
| | Operating voltage range 3 ... 250 V AC/DC | | | | | | |
| | 2-wire | – | 2.5 | 152820 | SME-8-K-LED-230 | | |
| N/C contact | | | | | | | |
|  | 3-wire | – | 7.5 | 160251 | SME-8-O-K-LED-24 | | |

| Ordering data – Connecting cable M8x1 | | | | | Technical data → Internet: nebu | |
|-------------------------------------------------------------------------------------|------------------------------|------------------------------|------------------|---------------------|---------------------------------|----------------------|
| Electrical connection, left | | Electrical connection, right | Switching output | Cable length [m] | Part No. | Type |
| Basic design | | | | | | |
|  | Straight socket, M8x1, 3-pin | Cable, open end, 3-wire | – | 2.5 | 541333 | NEBU-M8G3-K-2.5-LE3 |
| | | | | 5 | 541334 | NEBU-M8G3-K-5-LE3 |
| | | | | 10 | 541332 | NEBU-M8G3-K-10-LE3 |
|  | Angled socket, M8x1, 3-pin | Cable, open end, 3-wire | – | 2.5 | 541338 | NEBU-M8W3-K-2.5-LE3 |
| | | | | 5 | 541341 | NEBU-M8W3-K-5-LE3 |
| | | | | 10 | 541335 | NEBU-M8W3-K-10-LE3 |
| With switching status display | | | | | | |
|  | Angled socket, M8x1, 3-pin | Cable, open end, 3-wire | PNP | 2.5 | 541337 | NEBU-M8W5P-K-2.5-LE3 |
| | | | | 5 | 541340 | NEBU-M8W5P-K-5-LE3 |
| | | | NPN | 2.5 | 541336 | NEBU-M8W5N-K-2.5-LE3 |
| | | | | 5 | 541339 | NEBU-M8W5N-K-5-LE3 |

| Ordering data – Slot cover for T-slot | | | |
|-----------------------------------------------------------------------------------------------------------|---------------|----------|---------|
| Assembly | Length [m] | Part No. | Type |
|  Insertable from above | 2x 0.5 | 151680 | ABP-5-S |

| Ordering data – Cable clip SMBK-8 | | |
|-----------------------------------------------------------------------------------------------------------------------------|----------|--------|
| | Part No. | Type |
|  For fixing the cable in the sensor slot | 534254 | SMBK-8 |