

Manually or pneumatically actuated piston pumps Product series Pxx

For oil and fluid grease
For use in SKF MonoFlex single-line centralized lubrication systems



Manually or pneumatically actuated piston pumps with pressure relief valve are employed in SKF MonoFlex single-line systems.





Important information on product usage

SKF and Lincoln lubrication systems or their components are not approved for use with gases, liquefied gases, pressurized gases in solution and fluids with a vapor pressure exceeding normal atmospheric pressure (1 013 mbar) by more than 0,5 bar at their maximum permissible temperature.



CAD models for products shown in this brochure can be downloaded at:
skf-lubrication.partcommunity.com

General Information

SKF MonoFlex piston pumps have a limited displacement per stroke, which limits the metered quantity and expansion of a system.

These pumps are equipped with a relief device necessary for operation of the piston distributors.

When the pump piston returns to the normal position, the main line is also relieved via the pressure relief valve.

The connected load of the system must be considered when planning the system.

To ensure the reserves required for pressure build-up, the displacement of the piston pump should be at least 1.5 times the connected load.

When planning fluid grease systems, the compressibility of the grease (approx. 1%) must also be taken into consideration when determining the connected load.

The connected load consists of:

- a) The sum of all volumes metered by system distributors
- b) + 25% of this value (safety margin)
- c) + 1 cm³/m of main line (expansion loss)
- d) Compressibility loss with fluid greases
→ Table 2

SKF specialists can provide you with additional information.

Commissioning

To commission the product, fill the reservoir with lubricant and actuate the pump at intervals of 5 – 10 seconds until lubricant discharges at all lubrication points.

The venting process is facilitated by:

- Opening the ends of the main lines until bubble-free oil or fluid grease discharges from the ends.
- Filling long lubrication point lines, especially for distributor ports with low metering volumes, before connecting to the lubrication points.

Maintenance

- 1 Check the fill level and fill the reservoir in time. Use the lubricant in accordance with the information provided by the manufacturer. Always use a screen filter when re-filling oil.
- 2 After using the machine for an extended period of time, inspect all pipe connections for leakage and actuate the piston pump to check whether lubricant discharges at all lubrication points.

Only use original SKF spare parts.

Table 1

Permissible length of main line*)

due to required pressure reduction during relief phase

| Lubricant distributor | Lower temperature limit [°C] | Pipe dimensions (mm) | | |
|-----------------------|------------------------------|----------------------|------------------|-------------------|
| | | 6x0.7 Length [m] | 8x0.7 Length [m] | 10x0.7 Length [m] |
| 340 | 10 | 6 | 9 | 13 |
| 350 | | 6 | 9 | 13 |
| 390 | | 2 | 17 | 22 |

- *) On longer systems or operating temperatures <10°C
a) Select larger pipe diameters
b) Position pump unit in center of system
c) Installation an additional relief device

Table 2

Compressibility loss

| Compressibility loss [cm ³ /m] | Pipe dimensions (mm) | | |
|---|----------------------|-------|--------|
| | 6x0.7 | 8x0.7 | 10x0.7 |
| Compressibility loss [cm ³ /m] | 0.17 | 0.34 | 0.58 |

Compressibility loss with fluid greases
Displacement loss occurs due to the 1% compressibility of grease and must be considered when determining the connected load.

Pump overview

| Order No. | Lubricant | | Delivery rate [cm ³ /stroke] | Reservoir capacity [liter] | Drive | | | Fill level s witch | Page |
|---------------|-----------|--------------|--|-------------------------------|--------|-----------|-----------|-----------------------|------|
| | Oil | Fluid grease | | | manual | pneumatic | hydraulic | | |
| POE-15-0.5 | • | | 15 | 0.5 | • | | | | 6 |
| POE-15-1.0 | • | | 15 | 1.0 | • | | | | 6 |
| POE-15-1.0W | • | | 15 | 1.0 | • | | | • | 6 |
| POE-15-1.7 | • | | 15 | 1.7 | • | | | | 6 |
| POE-15-1.7W | • | | 15 | 1.7 | • | | | • | 6 |
| POEP-15-0.5 | • | | 15 | 0.5 | | • | | | 6 |
| POEP-15-1.0 | • | | 15 | 1.0 | | • | | | 6 |
| POEP-15-1.0W | • | | 15 | 1.0 | | • | | • | 6 |
| POEP-15-1.7 | • | | 15 | 1.7 | | • | | | 6 |
| POEP-15-1.7W | • | | 15 | 1.7 | | • | | • | 6 |
| P-289 | • | | 10 | 1.5 | | • | | | 10 |
| PW-289 | • | | 10 | 1.5 | | • | | • | 10 |
| PFE-15-0.5 | | • | 15 | 0.5 | • | | | | 8 |
| PFE-15-1.0 | | • | 15 | 1.0 | • | | | | 8 |
| PFE-15-1.0W2 | | • | 15 | 1.0 | • | | | • | 8 |
| PFE-15-1.7 | | • | 15 | 1.7 | • | | | | 8 |
| PFE-15-1.7W2 | | • | 15 | 1.7 | • | | | • | 8 |
| PFEP-15-0.5 | | • | 15 | 0.5 | | • | | | 8 |
| PFEP-15-1.0 | | • | 15 | 1.0 | | • | | | 8 |
| PFEP-15-1.0W2 | | • | 15 | 1.0 | | • | | • | 8 |
| PFEP-15-1.7 | | • | 15 | 1.7 | | • | | | 8 |
| PFEP-15-1.7W2 | | • | 15 | 1.7 | | • | | • | 8 |
| PF-289 | | • | 10 | 1.5 | | • | | | 10 |
| PFW-289 | | • | 10 | 1.5 | | • | | • | 10 |
| PPS | • | • | 30 | 1.5 | | • | | • | 12 |
| P-846-2 | • | | 7 | – | | • | | | 15 |
| P-886 | • | | 30 | – | | • | • | | 16 |

Piston pumps for commercial vehicles → Single-line Centralized Lubrication Systems for Commercial Vehicles, brochure 1-9420-EN

Pump overview



POE/PFE piston pumps

Lubricant **Oil** Page 4–5
Fluid grease Page 6–7

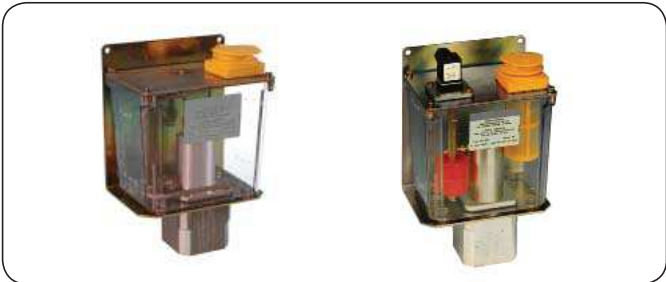
Actuation **manual**
 Fill level monitoring **optional**
 Reservoir capacity 0.5; 1.0 or 1.7 liters
 Delivery rate 15 cm³/stroke



POEP/PFEP piston pumps

Lubricant **Oil** Page 4–5
Fluid grease Page 6–7

Actuation **pneumatic**
 Fill level monitoring **optional**
 Reservoir capacity 0.5; 1.0 or 1.7 liters
 Delivery rate 15 cm³/stroke



P/PF/PW/PFW piston pumps

Lubricant **Oil** Page 8
Fluid grease Page 8

Actuation **pneumatic**
 Fill level monitoring **optional**
 Reservoir capacity 1.5 liters
 Delivery rate 10 cm³/stroke



PPS piston pumps

Lubricant **Oil and fluid grease** Page 12–14

Actuation **pneumatic**
 Fill level monitoring **optional**
 Integrated pressure switch **optional**
 Reservoir capacity 1.5 l
 Delivery rate 30 cm³/stroke



P-846-2 / P-886 piston pumps without reservoir

Lubricant **Oil** Page 15 / 16

P-846-2
 Actuation **pneumatic**
 Delivery rate 7 cm³/stroke

P-886
 Actuation **pneumatic or hydraulic**
 Delivery rate 30 cm³/stroke

POE(P) piston pumps for oil, manually or pneumatically actuated

Manually actuated



Pneumatically actuated



Order No. Overview

| Order No. | Reservoir capacity [liter] | Drive | | Fill level switch |
|--------------|----------------------------|--------|-----------|-------------------|
| | | manual | pneumatic | |
| POE-15-0.5 | 0.5 | • | | |
| POE-15-1.0 | 1.0 | • | | |
| POE-15-1.0W | 1.0 | • | | • |
| POE-15-1.7 | 1.7 | • | | |
| POE-15-1.7W | 1.7 | • | | • |
| POEP-15-0.5 | 0.5 | | • | |
| POEP-15-1.0 | 1.0 | | • | |
| POEP-15-1.0W | 1.0 | | • | • |
| POEP-15-1.7 | 1.7 | | • | |
| POEP-15-1.7W | 1.7 | | • | • |

Technical data

Pump

| | |
|-------------------------------------|---|
| Drive | manual or pneumatic |
| Reservoir capacity | 0.5; 1.0 and 1.7 liters |
| Reservoir material | Plastic (PP), transparent |
| Outlets | G ¹ / ₄ , on left or right |
| Compressed air connection | G ¹ / ₄ (on pump bottom) |
| Operating pressure, max. | 30 bar (manual. actuated) 60 bar (pneum. actuated) |
| Delivery rate per stroke | 15 cm ³ |
| Transmission ratio for pneum. pumps | 10:1 |

Ambient temperature 0 to +60 °C

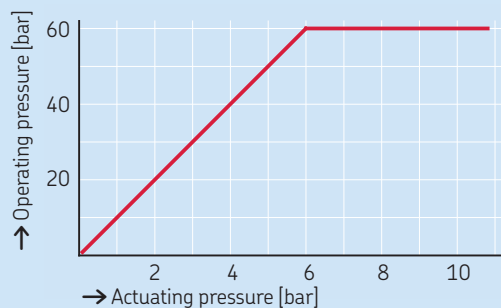
Lubricant Mineral, synthetic, and environmentally compatible oils, operating viscosity 20 to 1500 mm²/s

Fill level switch for monitoring the min. oil level

| | |
|--------------------------|-------------------------------------|
| Function | Contact opens at minimum fill level |
| Switching voltage, max. | 42 V DC |
| Switching capacity, max. | 50 W |
| Plug | 4-pin M12×1 circular plug |
| Mounting position | 1, 2 or 3 possible (2 on delivery) |

Diagram 1

Pressure diagram for pneumatic drive

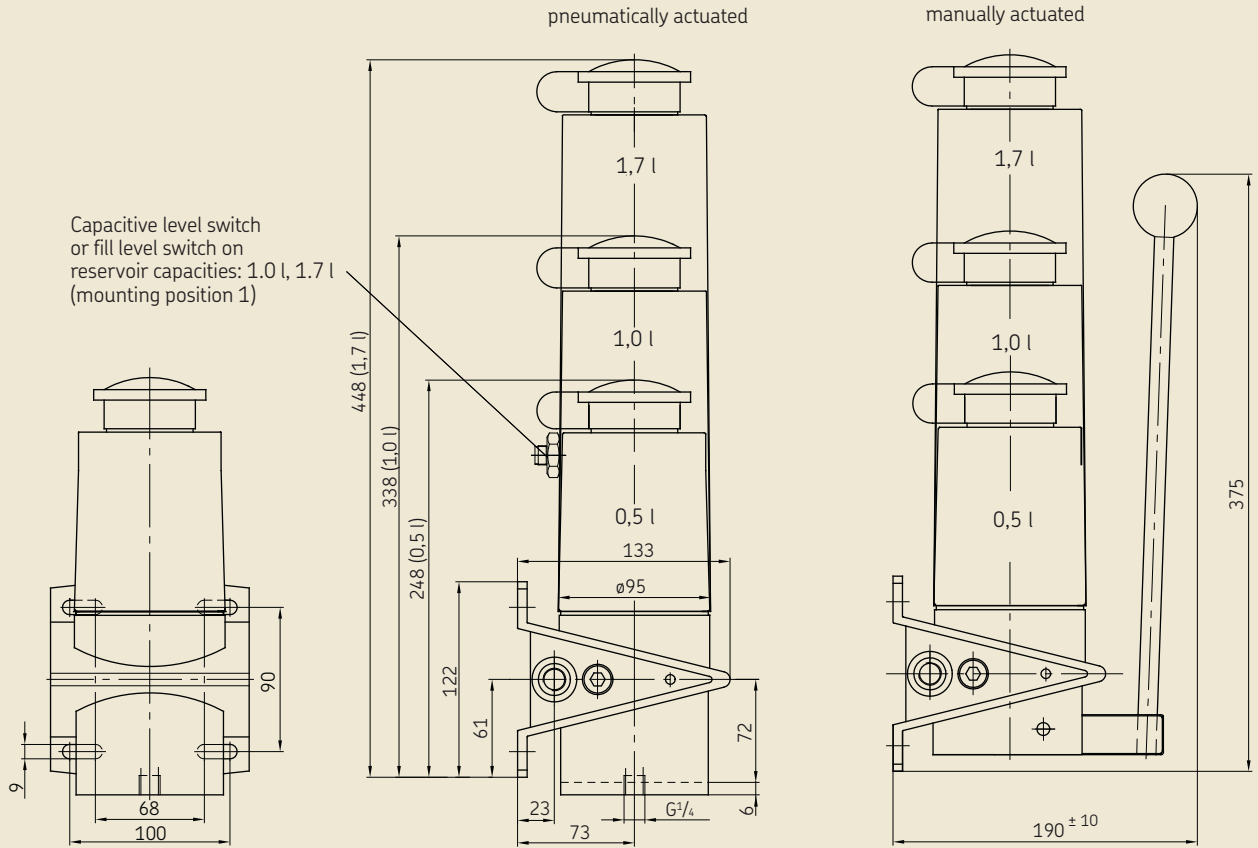


Note

For a hydraulic system pressure of >45 bar, use cutting-sleeve screw unions conforming to DIN 2353 or plug connectors as connection fittings.

For fittings and accessories → **brochure 1-0103-EN;**

for connector systems → **brochure 1-0103-1-EN.**



Capacitive level switch or fill level switch on reservoir capacities: 1.0 l, 1.7 l (mounting position 1)

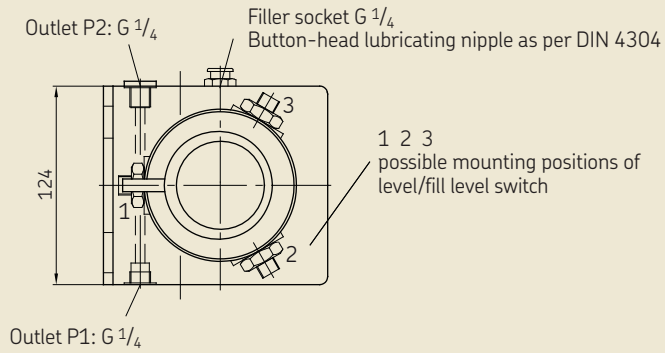


Fig. 2

Hydraulic layout for POE (manual)

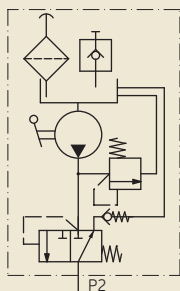


Fig. 3

Hydraulic layout for POEP (pneumatic)

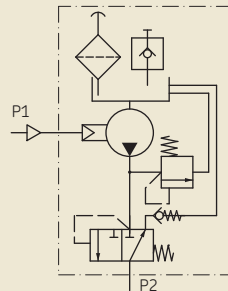
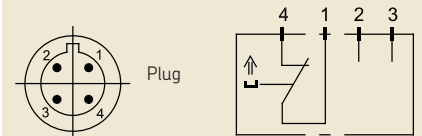


Fig. 4

Wiring diagram for fill level monitoring



PFE/PFEP piston pumps for fluid grease, manually or pneumatically actuated



Order No. Overview

| Order No. | Reservoir capacity [liter] | Drive | | Fill level switch |
|-----------------------------|----------------------------|--------|-----------|-------------------|
| | | manual | pneumatic | |
| PFE-15-0.5 | 0.5 | • | | |
| PFE-15-1.0 | 1.0 | • | | |
| PFE-15-1.0W2 ¹⁾ | 1.0 | • | | • |
| PFE-15-1.7 | 1.7 | • | | |
| PFE-15-1.7W2 ¹⁾ | 1.7 | • | | • |
| PFEP-15-0.5 | 0.5 | | • | |
| PFEP-15-1.0 | 1.0 | | • | |
| PFEP-15-1.0W2 ¹⁾ | 1.0 | | • | • |
| PFEP-15-1.7 | 1.7 | | • | |
| PFEP-15-1.7W2 ¹⁾ | 1.7 | | • | • |

¹⁾ Level switch connection, 4-pin M8x1 circular plug, plug with 5 m cable, order No. 179-990-762

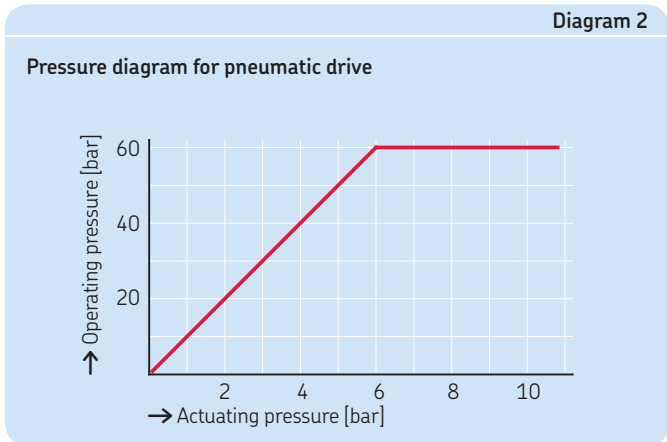
Technical data

Pump

| | |
|-------------------------------------|---|
| Drive | Manual or pneumatic |
| Reservoir capacity | 0.5; 1.0 and 1.7 liters |
| Reservoir material | Plastic (PP), transparent |
| Outlets | G ¹ / ₄ , on left or right |
| Compressed air connection | G ¹ / ₄ (on pump bottom) |
| Operating pressure, max. | 30 bar (manual. actuated) 60 bar (pneum. actuated) |
| Delivery rate per stroke | 15 cm ³ |
| Transmission ratio for pneum. pumps | 10:1 |
| Ambient temperature | 0 to +60 °C |
| Lubricant | Fluid grease, NLGI Grade 000, 00 |

Fill level switch for monitoring the min. grease level

| | |
|---------------------------------------|---|
| Function | NPN, PNP/NO-contact - NC contact |
| Switching voltage, max. | 10 to 36 V DC |
| Operating current at switching output | max. 150 mA |
| Protection class | IP 67 |
| Connection | 2 m PVC cable or 4-pin M8x1 circular plug |
| Mounting position | 1, 2 or 3 possible (2 on delivery) |



Note

For a hydraulic system pressure of >45 bar, use cutting-sleeve screw unions conforming to DIN 2353 or plug connectors as connection fittings. For fittings and accessories → **brochure 1-0103-EN..**

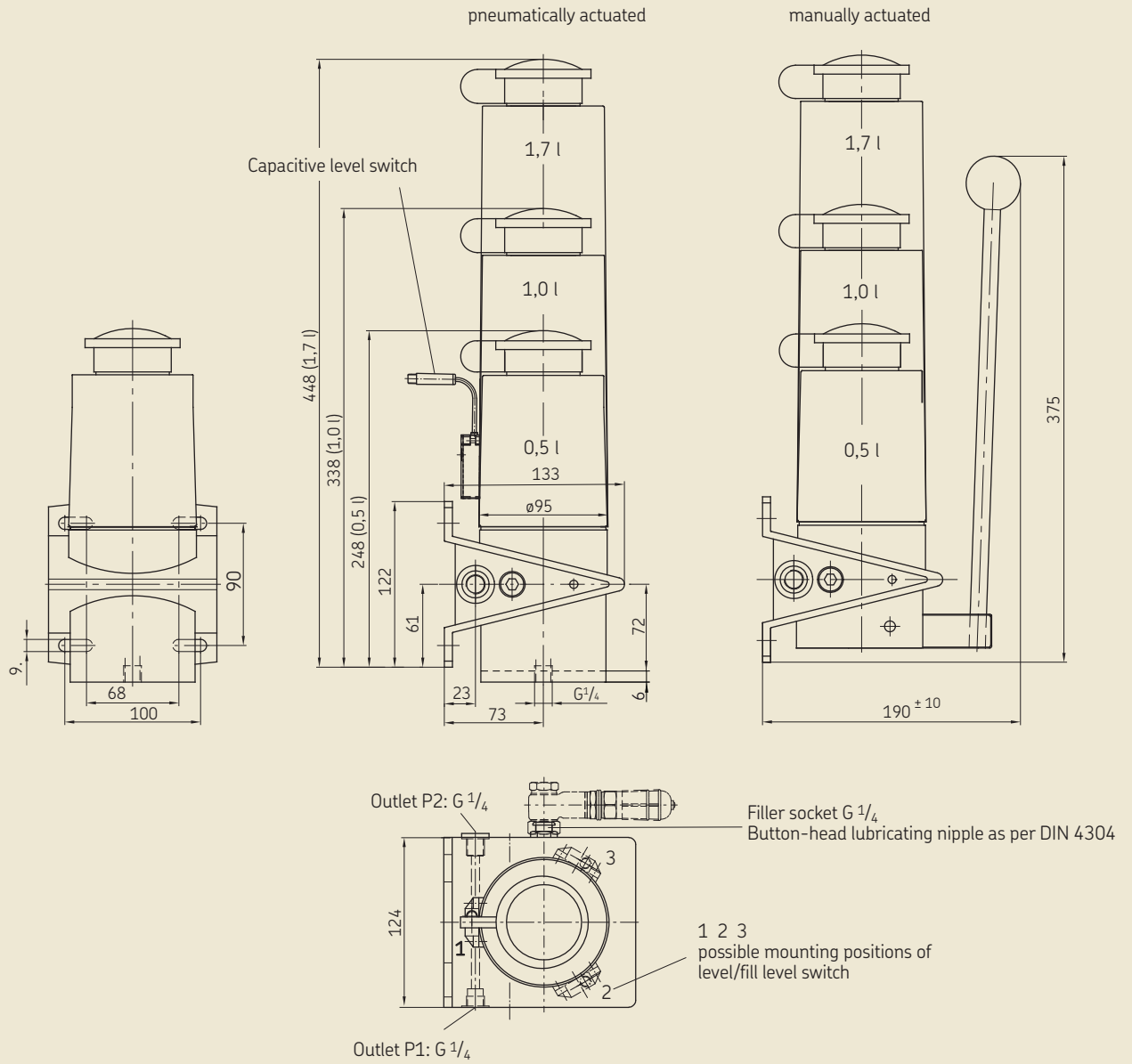


Fig. 6

Hydraulic layout for PFE (manual)

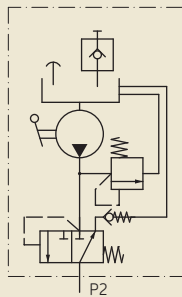


Fig. 7

Hydraulic layout for PFEP (pneumatic)

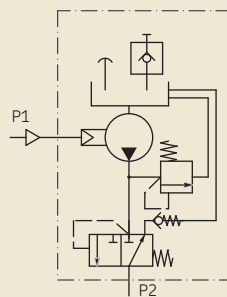
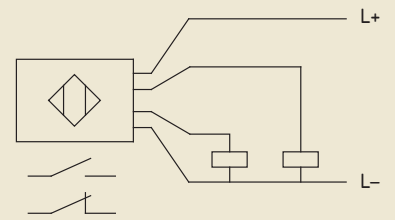


Fig. 8

Wiring diagram for fill level monitoring



P(F)(W)-289 piston pump for oil or fluid grease, pneumatically actuated



Order No. Overview

| Order No. | Lubricant | | Fill level switch | Fig. |
|-----------|-----------|--------------|-------------------|------|
| | Oil | Fluid grease | | |
| P-289 | • | | | 9 |
| PW-289 | • | | • | 11 |
| PF-289 | | • | | 9 |
| PFW-289 | | • | • | 11 |

A pressure regulating valve, e.g. WVN200-6B40, with a cracking pressure of 40 bar must be used to protect the system.

Technical data

Pump

| | |
|--------------------------|--------------------|
| Drive | pneumatic |
| Reservoir capacity | 1.5 liters |
| Operating pressure, max. | 3.5 to 10 bar |
| Delivery rate per stroke | 10 cm ³ |

Ambient temperature +10 to 40 °C
 Type of enclosure IP 54
 Lubricant Mineral, synthetic, and environmentally compatible oils, operating viscosity 20 to 1000 mm²/s or fluid grease, NLGI grades 000, 00

Fill level switch for monitoring the min. grease level

| | |
|-------------------------|------------------------|
| Function | 1 changeover |
| Switching voltage, max. | 230 V AC 230 V DC |
| Switching current max. | 1.0 A 1.0 A |
| Breaking capacity max. | 60 VA 40 W |
| Cable gland | PG11 |

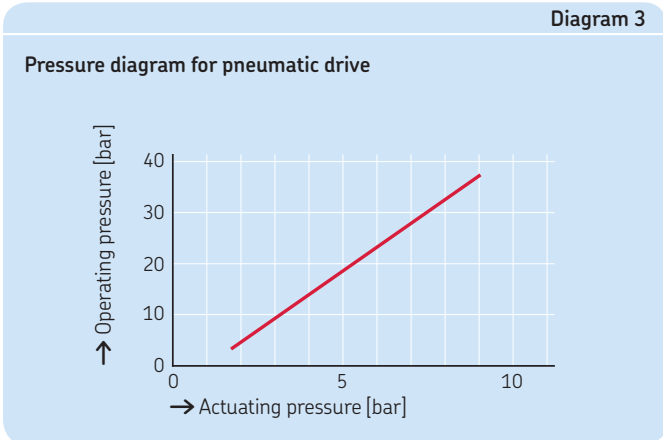
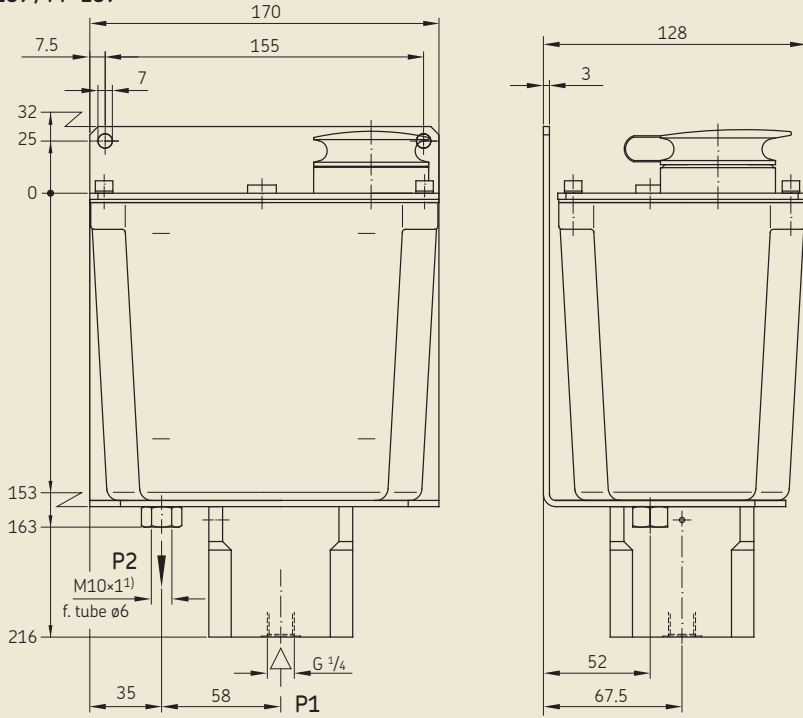


Fig. 9

P-289 / PF-289



P1 = Compressed air connection
 P2 = Compressed air connection to system
 1) Ports tapped for solderless tube connection for $\phi 6$ tubing

Fig. 10

Hydraulic layout for PF-289

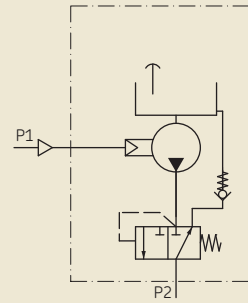
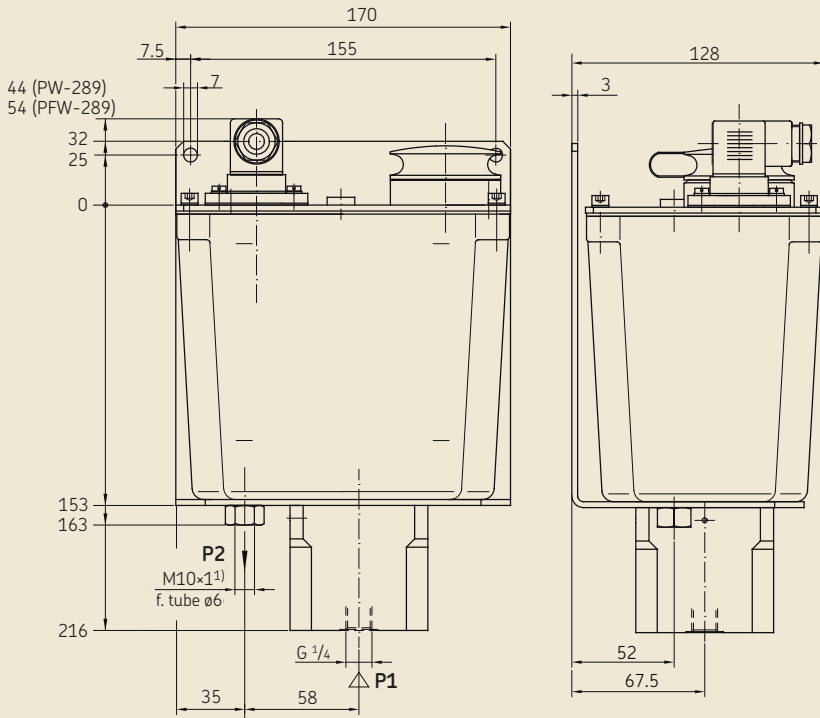


Fig. 11

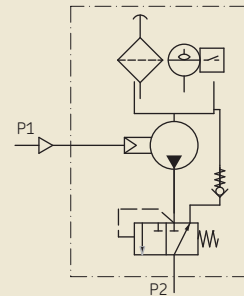
PW-289 / PFW-289



P1 = Compressed air connection
 P2 = Compressed air connection to system
 1) Ports tapped for solderless tube connection for $\phi 6$ tubing

Fig. 12

Hydraulic layout for PW-289



Piston pump unit PPS for oil and fluid grease, pneumatically driven



Technical data

Pump

| | |
|--------------------------|---|
| Drive | Pneumatic |
| Reservoir capacity | 1.5 liter |
| Reservoir material | Plastic (SAN) |
| Number of outlets | Max. 3 |
| Operating pressure, max. | Up to 27 bar (depending on actuating pressure) |
| Actuating pressure | 4.5-6 bar |
| Delivery rate per stroke | 30 cm ³ |
| Number of cycles | Max. 6 cycles/h |
| Ambient temperature | +10 to +50 °C |
| Lubricant | Mineral and synthetic oils, operating viscosity 20 to 1500 mm ² /s or fluid grease, NLGI Grade 000, 00 |

Fill level switch, min.

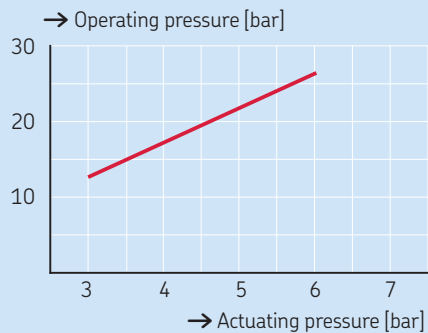
| | |
|--------------------------|------------------------|
| Lubricant | Oil or fluid grease |
| Function | Capacitive, NC contact |
| Switching voltage, max. | 10 to 36 V DC |
| Switching capacity, max. | 0.6 W |

Pressure switch

| | |
|--------------------------|---|
| Function | NO-contact |
| Nominal pressure | 16 bar |
| Electrical signal output | M12x1 circular plug, 4-pin acc. to DIN EN 60947-5-2 |
| Switching voltage, max. | 48 V |
| Switched current | 0.5 A |

Diagram 4

Pressure diagram for pneumatic drive



Piston pump unit PPS for oil and fluid grease, pneumatically driven

Fig. 13

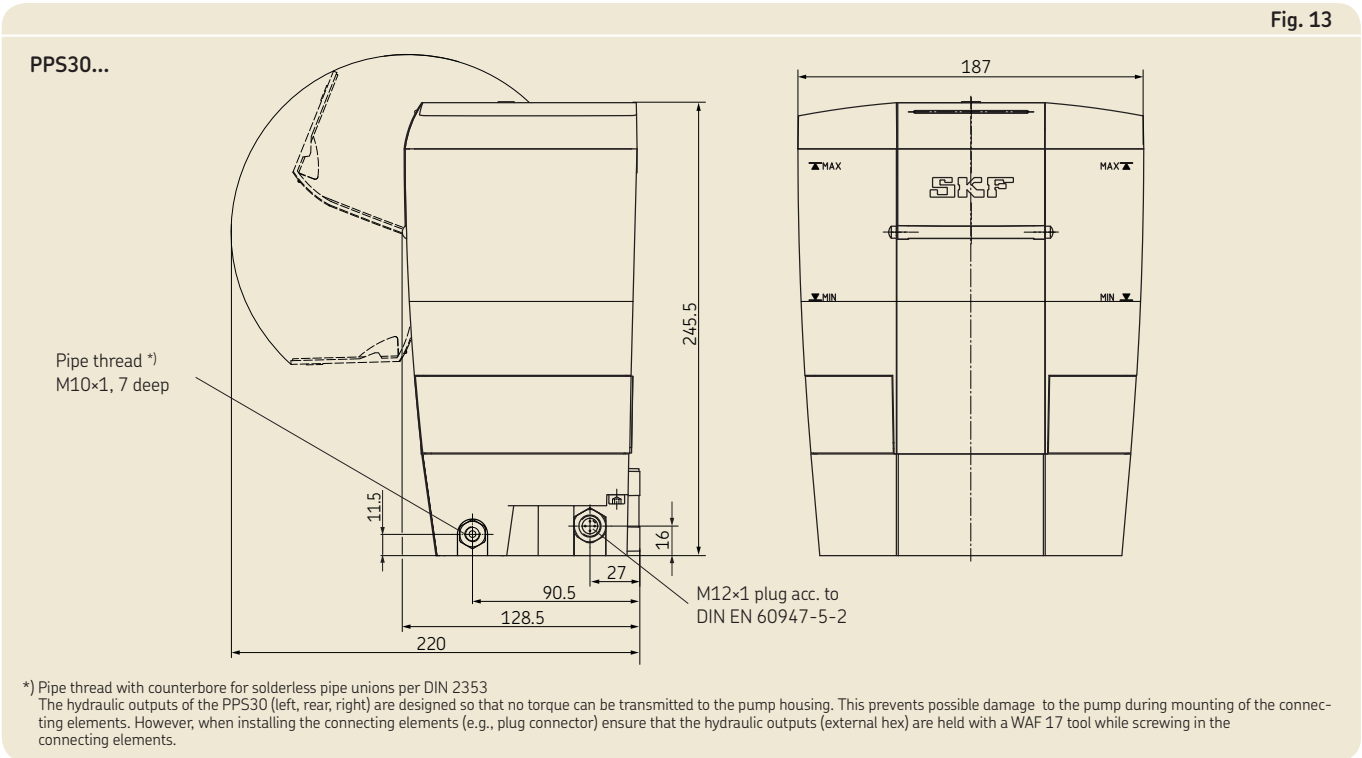


Fig. 14

PPS hydraulic layout

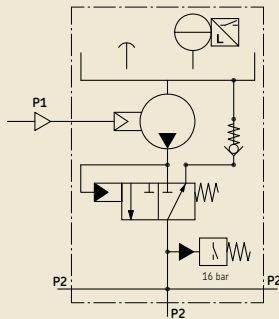


Fig. 15

Connection of pressure switch/fill level switch

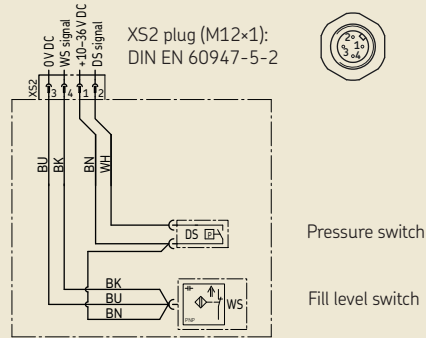
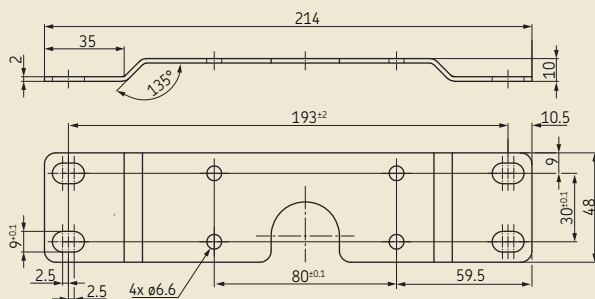


Fig. 16

Wall bracket for mounting from front

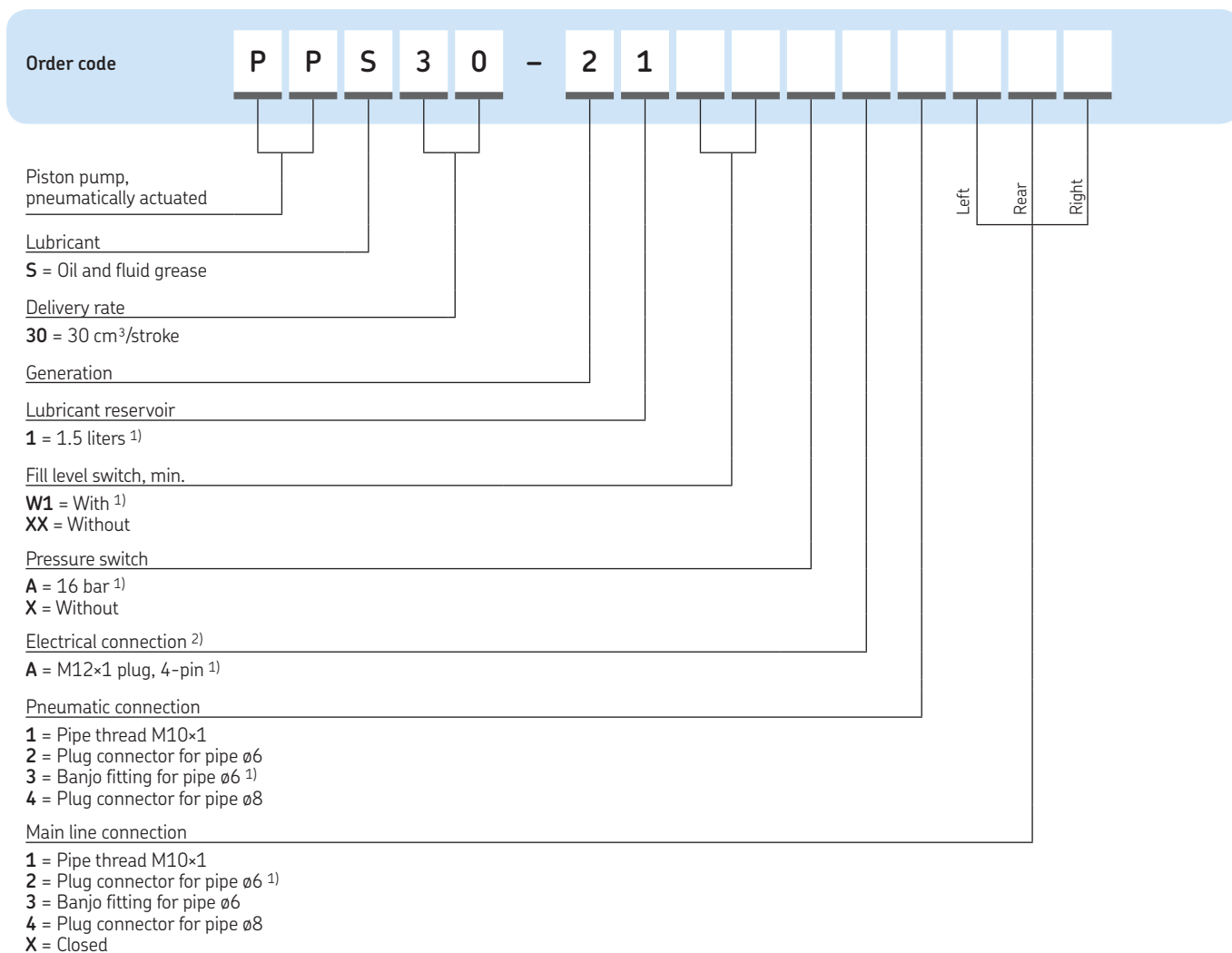


Accessories (optional)

Wall bracket incl. mounting equipment
(mounting kit) → Fig. 16
Order No. 995-901-061

PPS piston pump for oil and fluid grease

Order code



¹⁾ Standard design

²⁾ "x" is assigned automatically if fill level switch and pressure switch are absent.

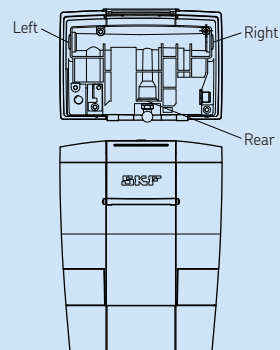
Fittings for pneumatic and main line connection

| For code | Order No. |
|----------|-------------|
| 1 | - |
| 2 | 406-004-VS |
| 3 | 506-140-VS |
| 4 | 408-004-VS |
| X | 466-431-001 |

Order example

PPS30-21W1AA1132XX

- Piston pump unit, pneumatically actuated
- For oil and fluid grease
- Delivery rate 30 cm³/stroke
- 2. Generation
- 1.5-liter plastic reservoir
- Warning switch for min. fill level
- Pressure switch 16 bar
- Electrical connection M12×1, 4-pin
- Pneumatic connection M10×1
- Main line connection Left: M10×1
Rear: Banjo fitting ø6
Right: Plug connector ø6



P-846-2 piston pump for oil, pneumatically operated



Technical data

| | |
|--------------------------------|---|
| Pump | P-846-2 |
| Order-No. | P-846-2 |
| Drive | pneumatic |
| Operating pressure | 2.5–8 bar |
| Delivery rate per stroke | 7 cm ³ |
| Type of enclosure | IP 54 |
| Operating temperature | +10 to +60 °C |
| Lubricant | Mineral or synthetic oils, compliant with plastic, NBR-elastomers, cooper and copper alloys |

Example with 7 liter metal reservoir



Diagram 5

Pressure diagram for pneumatic drive

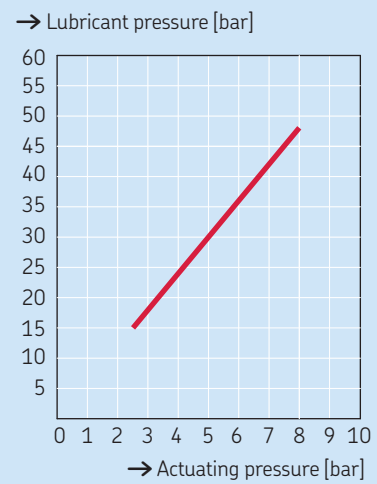
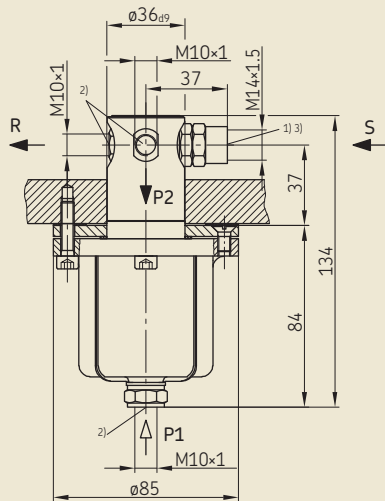


Fig. 17

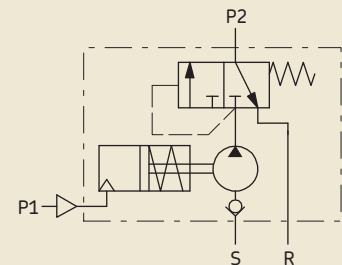
Fig. 18



P1 = Compressed air connection
 P2 = Lubricant pressure
 S = Inlet (inlet valve)
 R = Pressure relief valve (return)

¹⁾ The inlet valve (S) at the pump is attached separately.
²⁾ Ports tapped for solderless tube connection for tube ø6.
³⁾ Ports tapped for solderless tube connection for tube ø8.

P-846-2 hydraulic layout



P-886 piston pump for oil, pneumatically or hydraulically operated

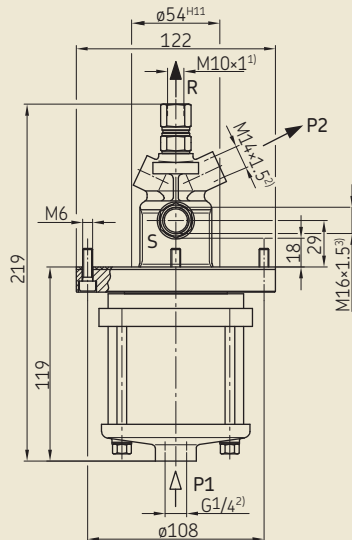


Technical data

| | |
|--------------------------------|--|
| Pump | |
| Order No. | P-886 |
| Drive | pneumatic or hydraulic ¹⁾ |
| Operating pressure | 4–10 bar |
| Delivery rate per stroke | 30 cm ³ |
| Type of enclosure | IP 54 |
| Operating temperature | +10 to +40 °C |
| Lubricant | Mineral or synthetic oils, compliant with plastic, NBR-elastomers, copper and copper alloys |

¹⁾ Residual pressure must be reduced to 0 bar at hydraulic operation.

Fig. 19

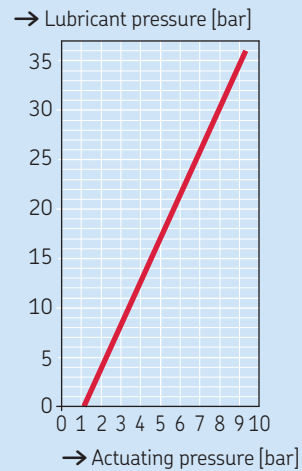


P1 = Connection for operating medium (e. g. compressed air)
 P2 = Pressure port, lubricating side
 S = Inlet (inlet valve)
 R = Pressure relief valve (return)

¹⁾ Ports tapped for solderless tube connection for tube $\varnothing 6$.
²⁾ Ports tapped for solderless tube connection for tube $\varnothing 8$.
³⁾ Ports tapped for solderless tube connection for tube $\varnothing 10$.

Diagram 6

Pressure diagram for pneumatic drive



Accessories for piston pumps

Fig. 20

Pressure reducing valve (kit)

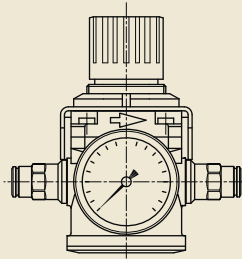
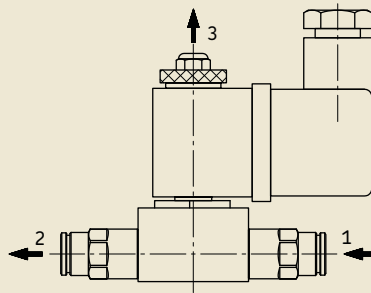


Fig. 21

3/2 directional control valve (kit)



Accessories (optional)

Pressure reducing valve (kit) → Fig. 20
Order No. 995-901-062

3/2 directional control valve (kit) → Fig. 18
Order No. 995-901-063
Voltage 24 V DC

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