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

<table>
<thead>
<tr>
<th>Lubricant distributor</th>
<th>Lower temperature limit [°C]</th>
<th>Pipe dimensions (mm)</th>
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<tr>
<td></td>
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<td>6x0.7</td>
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<tr>
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* 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

<table>
<thead>
<tr>
<th>Pipe dimensions (mm)</th>
<th>Compressibility loss [cm³/m]</th>
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<tr>
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<td>10x0.7</td>
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Compressibility loss with fluid greases

Displacement loss occurs due to the 1% compressibility of grease and must be considered when determining the connected load.
## Lubricant Delivery rate Reservoir capacity Drive Fill level switch Page

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Lubricant</th>
<th>Delivery rate [cm³/stroke]</th>
<th>Reservoir capacity [liter]</th>
<th>Drive</th>
<th>pneumatic</th>
<th>hydraulic</th>
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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: 0.5, 1.0, or 1.7 liters
- Delivery rate: 15 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

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Reservoir capacity [liter]</th>
<th>Drive</th>
<th>Fill level switch</th>
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<td>POEP-15-1.7W</td>
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<td>pneumatic</td>
<td></td>
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</tbody>
</table>

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### 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 cm³
- **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**: 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)

---

### 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)

Outlet P1: G 1/4
Outlet P2: G 1/4

Filler socket G 1/4
Button-head lubricating nipple as per DIN 4304

1 2 3 possible mounting positions of level/fill level switch

Hydraulic layout for POE (manual)

Hydraulic layout for POEP (pneumatic)

Wiring diagram for fill level monitoring

Fig. 1
Fig. 2
Fig. 3
Fig. 4
PFE/PFEP piston pumps for fluid grease, manually or pneumatically actuated

Manually actuated

Pneumatically actuated

### Technical data

**Pump**

- Drive ........................................ Manual or pneumatic
- Reservoir capacity ...................... 0.5; 1.0 and 1.7 liters
- Reservoir material ....................... Plastic (PP), transparent
- Outlets ...................................... G1/4, on left or right
- Compressed air connection ............. G1/4 (on pump bottom)
- Operating pressure, max. ............. 30 bar (manual. actuated)
- Delivery rate per stroke ............... 15 cm³
- 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

**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 M8×1 circular plug
- Mounting position ....................... 1, 2 or 3 possible

**Order No. Overview**

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Reservoir capacity [liter]</th>
<th>Drive</th>
<th>Fill level switch</th>
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1) Level switch connection, 4-pin M8×1 circular plug, plug with 5 m cable, order No. 179-990-762

**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. 

### Diagram 2

Pressure diagram for pneumatic drive

![Pressure diagram](image-url)
Hydraulic layout for PFEP (pneumatic)

Hydraulic layout for PFE (manual)

Wiring diagram for fill level monitoring

Pneumatically actuated

Manually actuated

Capacitive level switch

Outlet P1: G 1/4

Outlet P2: G 1/4

Filler socket G 1/4

Button-head lubricating nipple as per DIN 4304

1 2 3 possible mounting positions of level/fill level switch
P(F)(W)-289 piston pump for oil or fluid grease, pneumatically actuated

**Order No. Overview**

<table>
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<tr>
<th>Lubricant</th>
<th>Order No.</th>
<th>Oil</th>
<th>Fluid grease</th>
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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 cm³
- 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

**Diagram 3**

Pressure diagram for pneumatic drive

<table>
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<tr>
<th>Operating pressure [bar]</th>
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<tr>
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Actuating pressure [bar]
P1 = Compressed air connection
P2 = Compressed air connection to system
1) Ports tapped for solderless tube connection for ø6 tubing

PW-289 / PFW-289

P1 = Compressed air connection
P2 = Compressed air connection to system
1) Ports tapped for solderless tube connection for ø6 tubing
Piston pump unit PPS for oil and fluid grease, pneumatically driven

### Technical data

**Pump**
- 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 cm³
- Number of cycles: Max. 6 cycles/h
- Ambient temperature: +10 to +50 °C
- Lubricant: Mineral and synthetic oils, operating viscosity 20 to 1500 mm²/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: M12×1 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**

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<th>Operating pressure [bar]</th>
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<td>5</td>
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### Accessories (optional)

**Oil filler screen**
- Order No.: 169-400-405

The oil filler screen option can be used only on PPS30 pumps produced after September 29, 2017.
Piston pump unit PPS for oil and fluid grease, pneumatically driven

Pipe thread *)
M10×1, 7 deep

*) Pipe thread with counterbore for solderless pipe unions per DIN 2353

The hydraulic outputs of the PPS30 (left, rear, right) are designed so that no torque can be transmitted to the pump housing. This prevents possible damage to the pump during mounting of the connecting elements. However, when installing the connecting elements (e.g., plug connector) ensure that the hydraulic outputs (external hex) are held with a WAF 17 tool while screwing in the connecting elements.

Fig. 14

PPS hydraulic layout

Fig. 15

Connection of pressure switch/fill level switch

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

<table>
<thead>
<tr>
<th>Order code</th>
<th>P</th>
<th>P</th>
<th>S</th>
<th>3</th>
<th>0</th>
<th>–</th>
<th>2</th>
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</thead>
<tbody>
<tr>
<td>Piston pump, pneumatically actuated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubricant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S = Oil and fluid grease</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Delivery rate</td>
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<td></td>
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</tr>
<tr>
<td>30 = 30 cm³/stroke</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Generation</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Lubricant reservoir</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = 1.5 liters ¹</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 = 1.5 liters with oil filler screen ²</td>
<td></td>
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<tr>
<td>Fill level switch, min.</td>
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</tr>
<tr>
<td>W1 = With ¹</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>XX = Without</td>
<td></td>
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<tr>
<td>Pressure switch</td>
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<td></td>
</tr>
<tr>
<td>A = 16 bar ¹</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>X = Without</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Electrical connection ³</td>
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<tr>
<td>A = M12×1 plug, 4-pin ¹</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Pneumatic connection</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = Pipe thread M10×1</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2 = Plug connector for pipe ø6</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 = Banjo fitting for pipe ø6 ¹</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 = Plug connector for pipe ø8</td>
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<tr>
<td>Main line connection</td>
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<td></td>
</tr>
<tr>
<td>1 = Pipe thread M10×1</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2 = Plug connector for pipe ø6 ¹</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 = Banjo fitting for pipe ø6</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4 = Plug connector for pipe ø8</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X = Closed</td>
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</tr>
</tbody>
</table>

¹ Standard design
² The oil filler screen option can be used only on PPS30 pumps produced after September 29, 2017.
³ "X" is assigned automatically if fill level switch and pressure switch are absent.

Fittings for pneumatic and main line connection

<table>
<thead>
<tr>
<th>For code</th>
<th>Order No.</th>
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<td>1</td>
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<td>2</td>
<td>406-004-VS</td>
</tr>
<tr>
<td>3</td>
<td>506-140-VS</td>
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<td>4</td>
<td>408-004-VS</td>
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<tr>
<td>X</td>
<td>466-431-001</td>
</tr>
</tbody>
</table>

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
Order-No. ...................... P-846-2
Drive ............................. pneumatic
Operating pressure ................. 2.5–8 bar
Delivery rate per stroke ............. 7 cm³
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-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-elastomeres,
                                      cooper and copper alloys

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

---

Diagram 6

Pressure diagram for pneumatic drive

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 ø6.
2) Ports tapped for solderless tube connection for tube ø8.
3) Ports tapped for solderless tube connection for tube ø10.
Accessories for piston pumps

**Accessories (optional)**

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

- **3/2 directional control valve (kit)** → Fig. 21
  - Order No. 995-901-063
  - Voltage 24 V DC
Further brochures
1-0103-EN  Fittings and Accessories
1-1701-EN  Pressure switches DSA, DSB, DSC, DSD
1-1702-EN  Fill level switch WSx
1-1730-EN  Electrical plug and socket connectors
1-5001-EN  Lubricant distributors
1-9201-EN  Transport of Lubricants in Centralized Lubrication Systems