

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](http://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 cm<sup>3</sup>/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 <sup>3</sup> /m]	Pipe dimensions (mm)		
	6x0.7	8x0.7	10x0.7
Compressibility loss [cm <sup>3</sup> /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 <sup>3</sup> /stroke]	Reservoir capacity [liter]	Drive		Fill level switch	Page
	Oil	Fluid grease			manual	pneumatic		
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

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 cm<sup>3</sup>/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 cm<sup>3</sup>/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 cm<sup>3</sup>/stroke  
 15 cm<sup>3</sup>/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 cm<sup>3</sup>/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 <sup>1</sup> / <sub>4</sub> , on left or right
Compressed air connection	G <sup>1</sup> / <sub>4</sub> (on pump bottom)
Operating pressure, max.	30 bar (manual. actuated) 60 bar (pneum. actuated)
Delivery rate per stroke	15 cm <sup>3</sup>
Transmission ratio for pneum. pumps	10:1

Ambient temperature . . . . . 0 to +60 °C

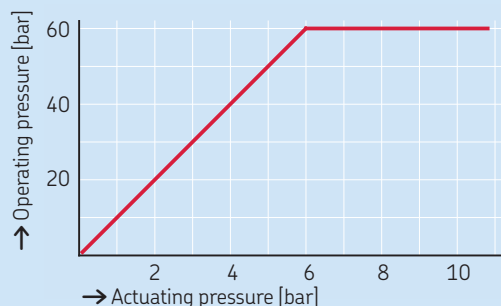
Lubricant . . . . . Mineral, synthetic, and environmentally compatible oils, operating viscosity 20 to 1500 mm<sup>2</sup>/s

### 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.**

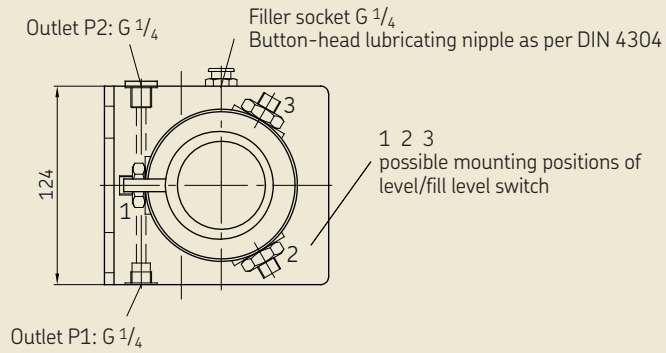
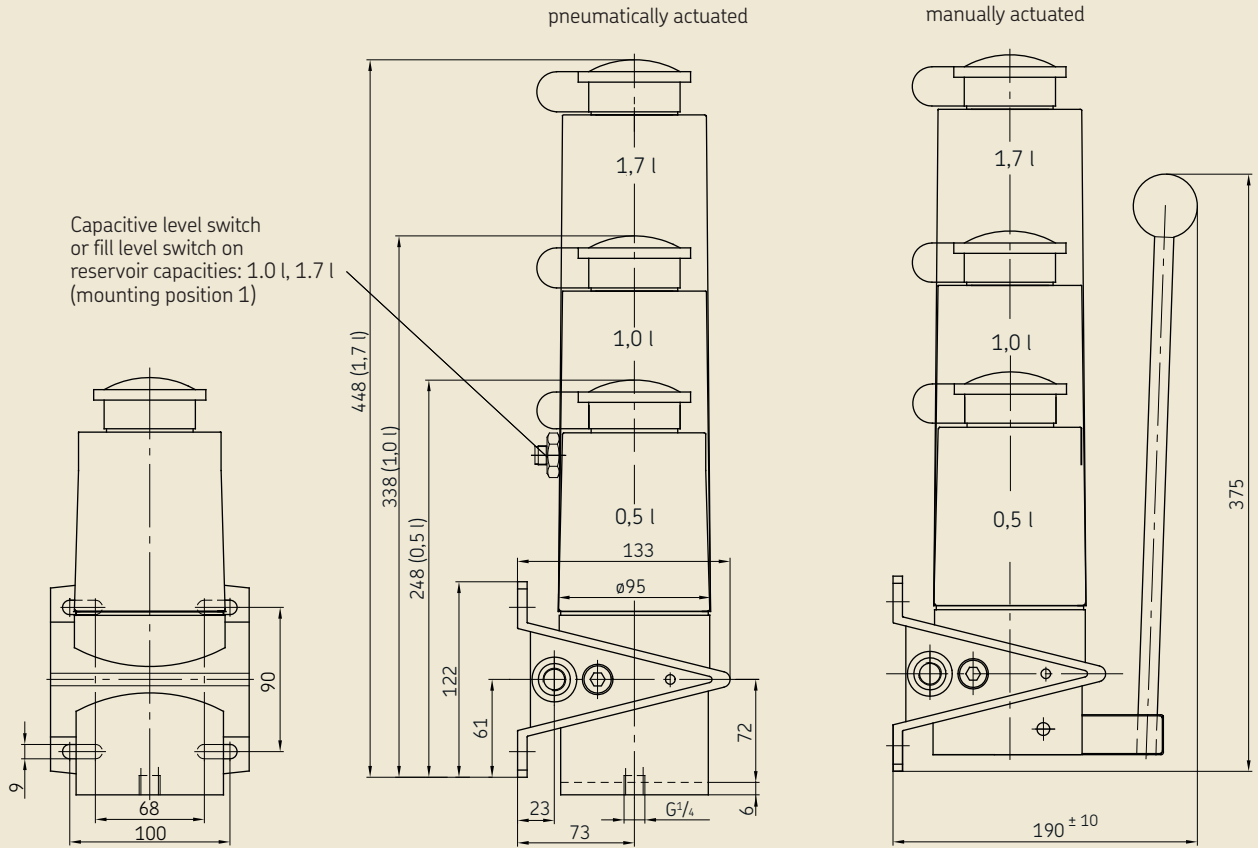


Fig. 2

Hydraulic layout for POE (manual)

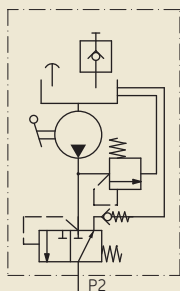


Fig. 3

Hydraulic layout for POEP (pneumatic)

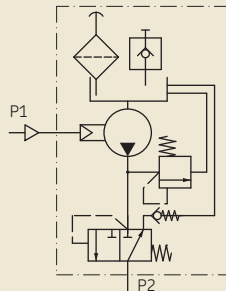
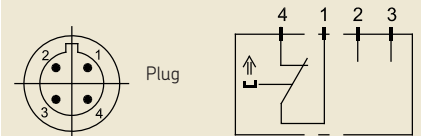


Fig. 4

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 <sup>1)</sup>	1.0	•		•
PFE-15-1.7	1.7	•		
PFE-15-1.7W2 <sup>1)</sup>	1.7	•		•
PFEP-15-0.5	0.5		•	
PFEP-15-1.0	1.0		•	
PFEP-15-1.0W2 <sup>1)</sup>	1.0		•	•
PFEP-15-1.7	1.7		•	
PFEP-15-1.7W2 <sup>1)</sup>	1.7		•	•

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

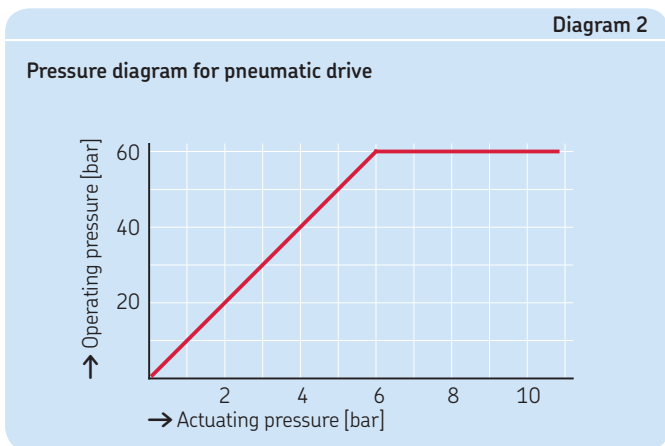
**Technical data**

**Pump**

Drive	Manual or pneumatic
Reservoir capacity	0.5; 1.0 and 1.7 liters
Reservoir material	Plastic (PP), transparent
Outlets	G <sup>1</sup> / <sub>4</sub> , on left or right
Compressed air connection	G <sup>1</sup> / <sub>4</sub> (on pump bottom)
Operating pressure, max.	30 bar (manual. actuated) 60 bar (pneum. actuated)
Delivery rate per stroke	15 cm <sup>3</sup>
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..**



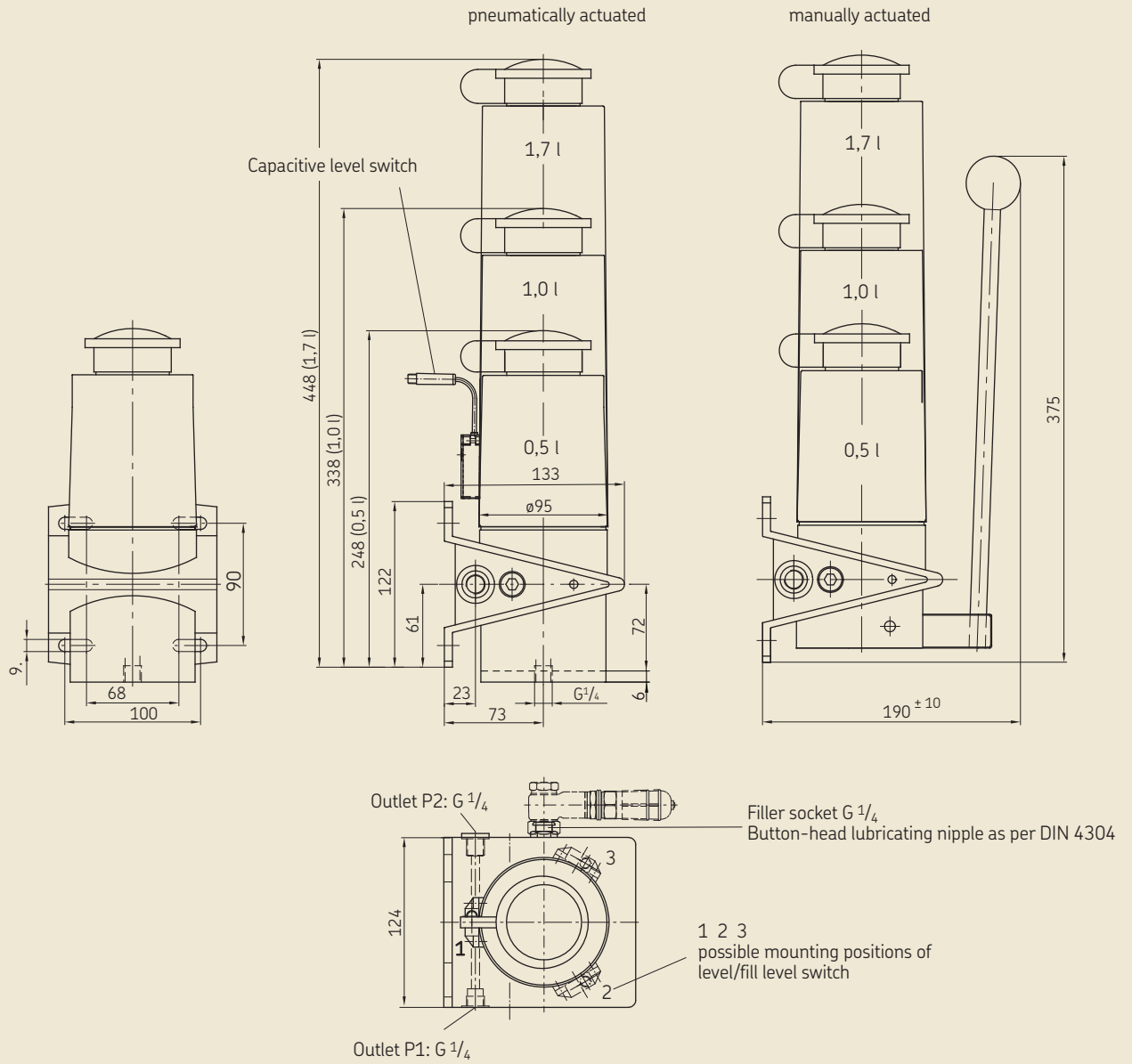


Fig. 6

Hydraulic layout for PFE (manual)

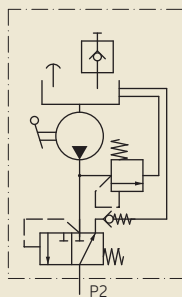


Fig. 7

Hydraulic layout for PFEP (pneumatic)

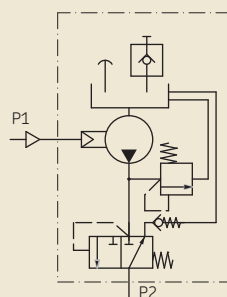
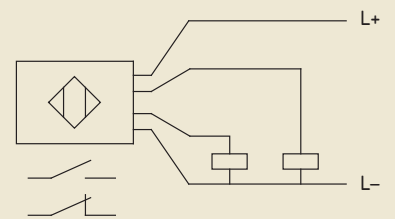


Fig. 8

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 <sup>3</sup>

Ambient temperature . . . . . +10 to 40 °C  
 Type of enclosure . . . . . IP 54  
 Lubricant . . . . . Mineral, synthetic, and environmentally compatible oils, operating viscosity 20 to 1000 mm<sup>2</sup>/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

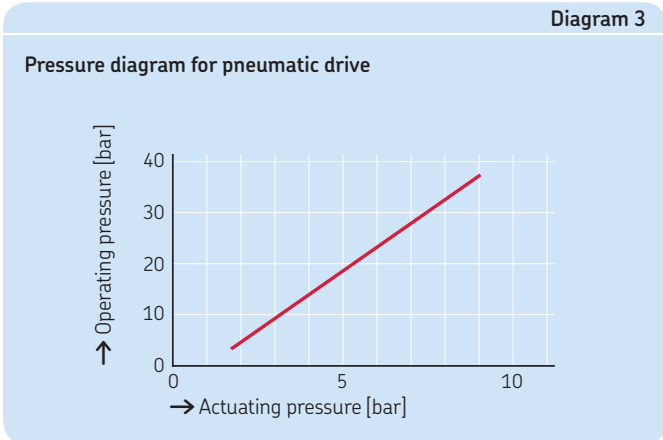
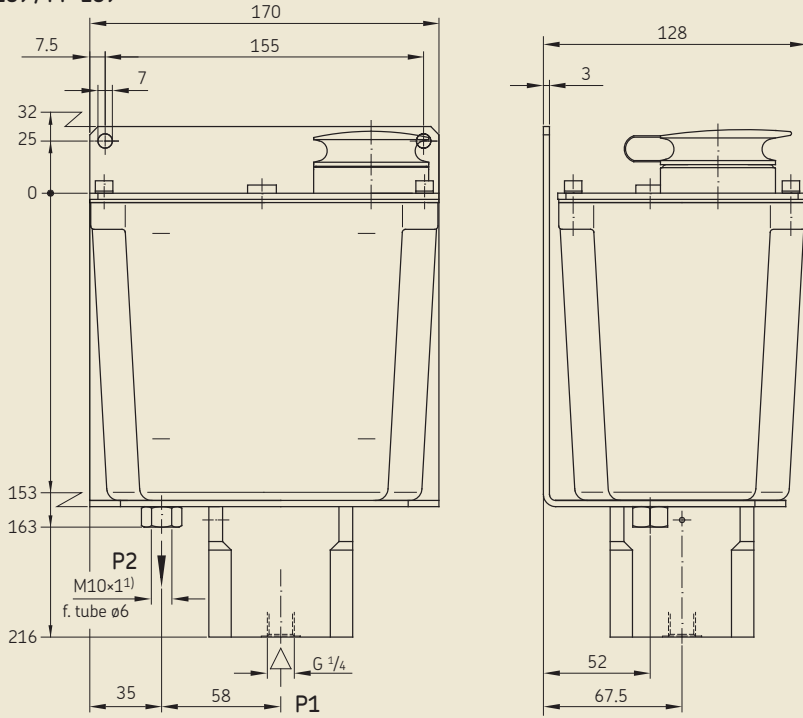


Fig. 9

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

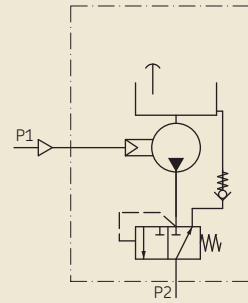
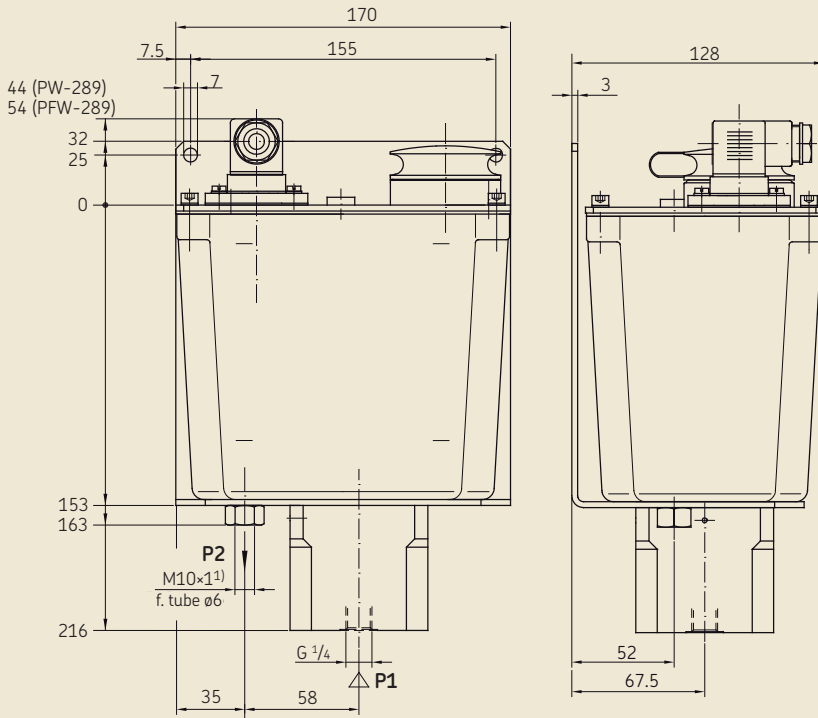


Fig. 11

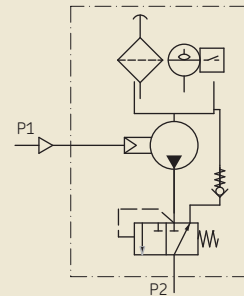
PW-289 / PFW-289



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 <sup>3</sup>
Number of cycles	Max. 6 cycles/h
Ambient temperature	+10 to +50 °C
Lubricant	Mineral and synthetic oils, operating viscosity 20 to 1500 mm <sup>2</sup> /s or fluid grease, NLGI Grade 000, 00

### Fill level switch, min.

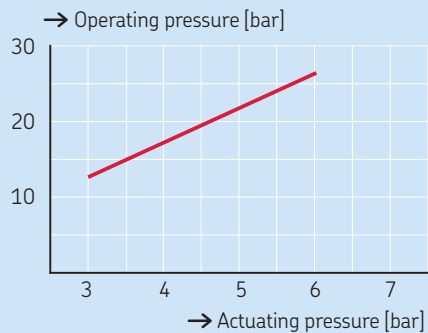
Lubricant	Oil or fluid grease
Function	Capacitive, NC contact
Switching voltage, max.	10 to 36 V DC
Switching capacity, max.	0.6 W

### 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

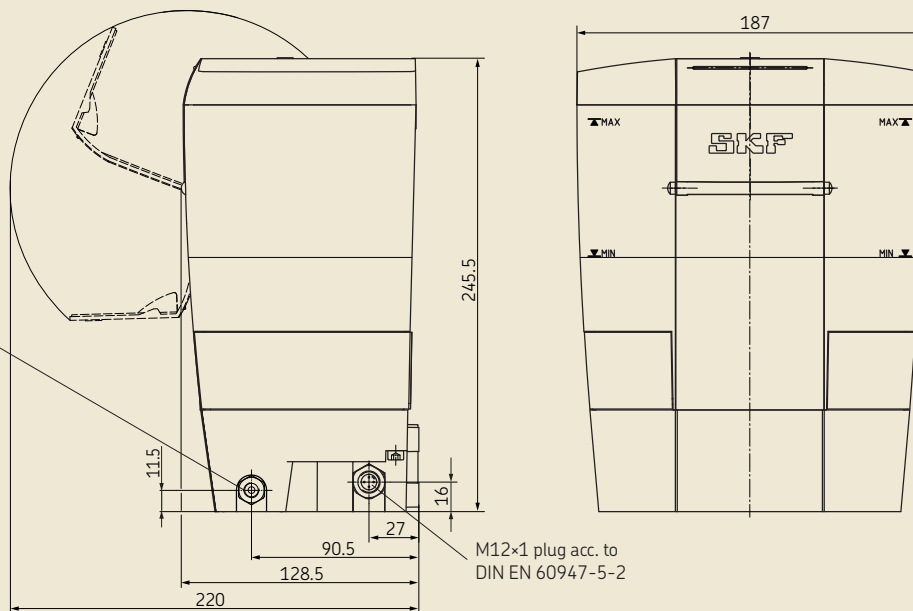


# Piston pump unit PPS for oil and fluid grease, pneumatically driven

Fig. 13

PPS30...

Pipe thread \*)  
M10x1, 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

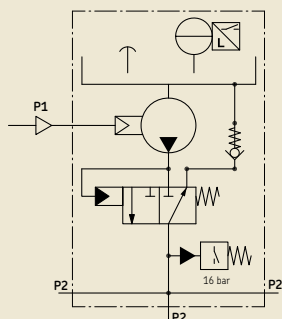


Fig. 15

Connection of pressure switch/fill level switch

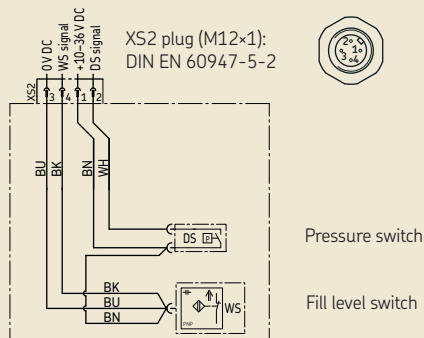
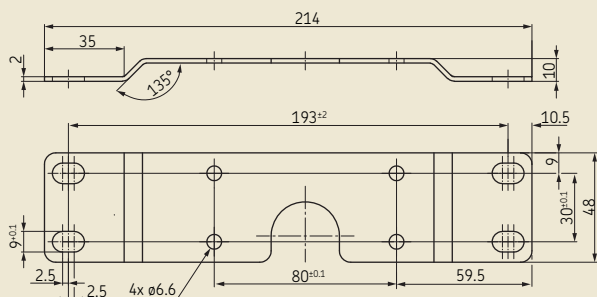


Fig. 16

Wall bracket for mounting from front



Accessories (optional)

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



# Accessories for piston pumps

Fig. 17

Pressure reducing valve (kit)

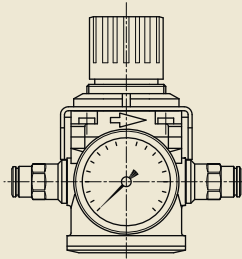
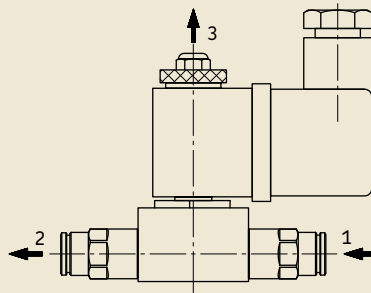


Fig. 18

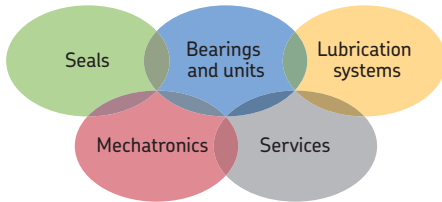
3/2 directional control valve (kit)



## Accessories (optional)

Pressure reducing valve (kit) → Fig. 17  
Order No. 995-901-062

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



### The Power of Knowledge Engineering

Drawing on five areas of competence and application-specific expertise amassed over more than 100 years, SKF brings innovative solutions to OEMs and production facilities in every major industry worldwide. These five competence areas include bearings and units, seals, lubrication systems, mechatronics (combining mechanics and electronics into intelligent systems), and a wide range of services, from 3-D computer modelling to advanced condition monitoring and reliability and asset management systems. A global presence provides SKF customers uniform quality standards and worldwide product availability.

#### Further brochures

<i>1-0103-EN</i>	<i>Fittings and Accessories</i>
<i>1-1701-EN</i>	<i>Pressure switches DSA, DSB, DSC, DSD</i>
<i>1-1702-EN</i>	<i>Fill level switch WSx</i>
<i>1-1730-EN</i>	<i>Electrical plug and socket connectors</i>
<i>1-5001-EN</i>	<i>Lubricant distributors</i>
<i>1-9201-EN</i>	<i>Transport of Lubricants in Centralized Lubrication Systems</i>

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