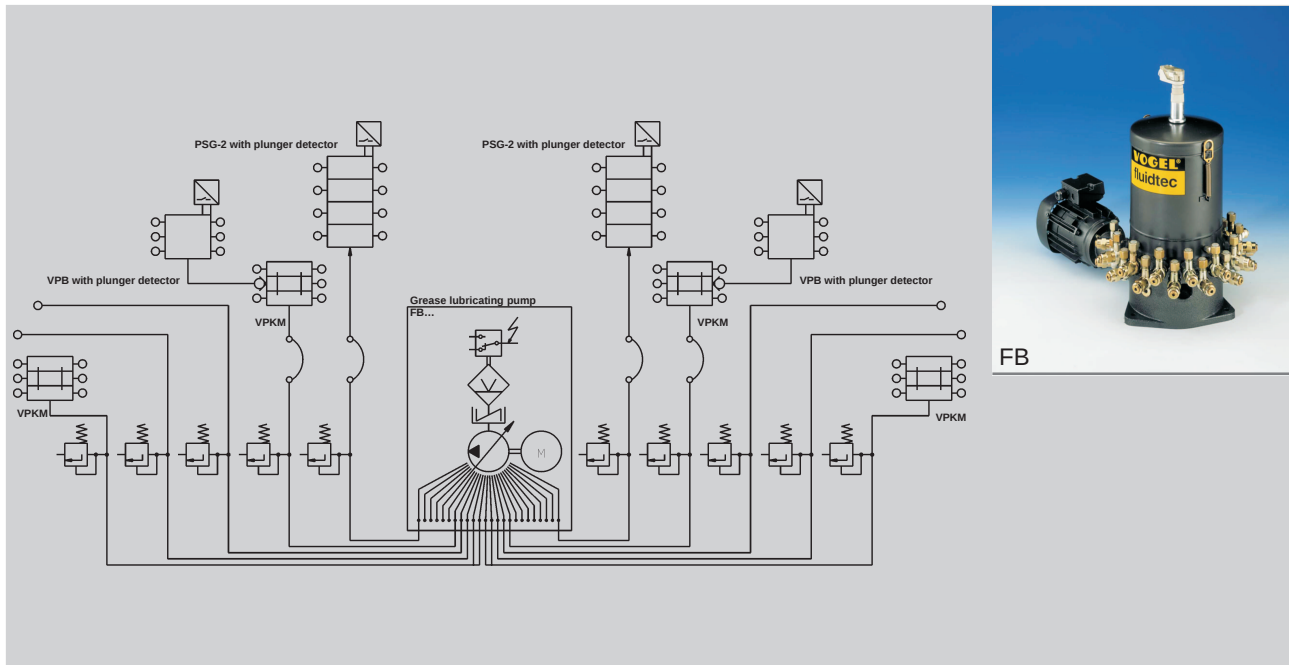


Grease lubricating pump FB...

DSK 2-005-00 US (06.02)

electrically-driven, for medium-sized and large-scale multiline and progressive systems



Application

- Motor industry
- Metalworking machinery
- Tunnel driving machinery
- Paper machinery
- Refining equipment
- Mining industry
- Smelting and heavy industry
- Building material machinery
- Sewage treatment plants
- Hardening machines
- Materials handling equipment

Advantages

- **VOGEL fluidtec** FB... grease lubricating pumps are designed to displace volumes from 0.04 cm³ to 7 cm³
- Available with 6, 15 or 30 kg tanks
- Equipped with 1 to 24 pump elements to suit the application. The number of elements can be changed as required.
- Pump elements with delivery plunger diameters of 6, 8 or 10 mm for operating pressures of 350, 200 or 150 bar
- Positively-driven, variable pump elements suitable for industrial applications and continuous operation
- Pressure limiting valves are designed to be fitted directly to the pump elements
- A wide range of level switches available
- **VOGEL fluidtec** grease lubricating pumps FB... can also be used as oil lubricating pumps



www.vogel-fluidtec.de



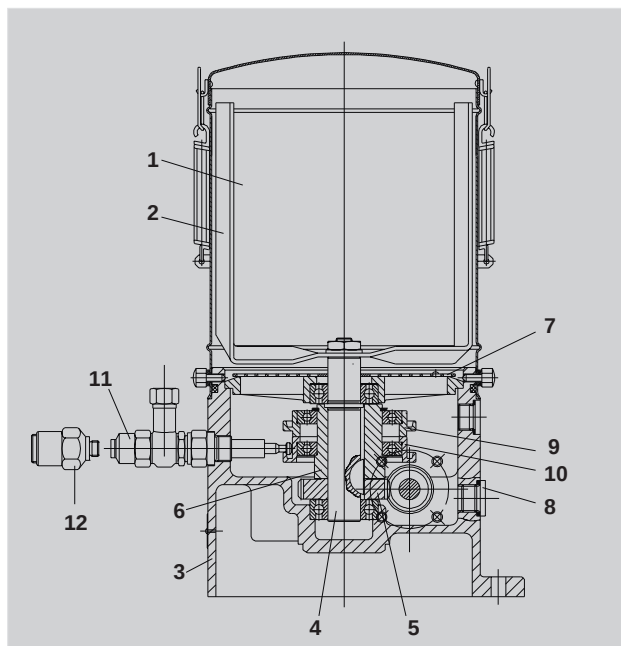
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General

The displaced volume and tank size make the grease lubricating pumps from the FB... series suitable for medium to large systems.

The lubricant can be fed to the lubricating points either directly or via (progressive) distributors.



Pump structure

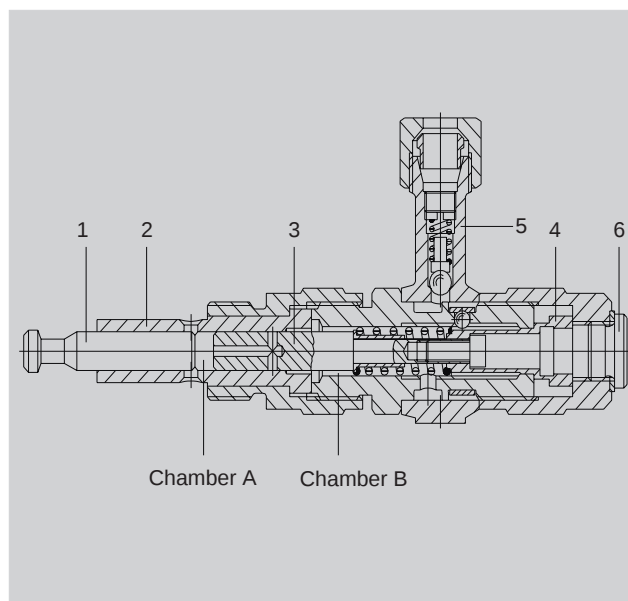
Position	Description
1	Grease tank
2	Agitator blade
3	Casing with mounting flange
4	Eccentric drive shaft
5	Worm gear
6	Eccentric bush
7	Screen
8	Filling nozzle (G 1/2)
9	Guide ring, top pump element
10	Guide ring, bottom pump element
11	Pump element
12	Pressure limiting valve (accessory)

How the pump works

The pump is driven by a worm gear (5) consisting of a screw and the associated worm wheel. The worm wheel drives the eccentric drive shaft (4) with attached agitator blade (2). The agitator blade (2) works the grease and forces the lubricant through the screen (7) and into the intake chamber of the pump.

The eccentric drive shaft (4) has two guide rings with ball bearings (9,10) for holding the delivery plunger heads of the pump elements (11).

The eccentric movement of the guide rings (9,10) forces the movement of the pump element delivery plungers which are attached (to the two guide rings).



Displaced volume adjustment on the pump element

The volume displaced by the pump element is determined by the distance travelled by the control plunger. The screw plug (6) must be removed in order to adjust the displaced volume. The adjusting sleeve (4) can then be turned with a hexagon socket-head spanner.

Remember:

- Turn clockwise to reduce the displaced volume
- Turn anticlockwise to increase the displaced volume
- The pump is supplied with the full stroke, unless otherwise specified.



Please note:

To guarantee the specified characteristics when the volume displaced by the pump elements is reduced, we recommend that you set no more than 1/3 of the maximum displaced volume. This corresponds to turning the adjusting sleeve (4) clockwise eight notches.

Structure of the pump element

Position	Description
1	Delivery plunger, positively-driven
2	Cylinder
3	Control plunger, spring-loaded
4	Adjusting sleeve
5	Collar with non-return valve
6	Screw plug

How the pump element works

Actuation of the delivery plunger is forced as described under "How the pump works".

In the intake stroke position (as shown), the transverse hole in the control plunger (3) is closed.

As the discharge stroke starts, the delivery plunger (1) closes the intake hole. The lubricant taken up into chamber A is pressed against the spring-loaded control plunger (3). The transverse hole in the control plunger (3) is opened.

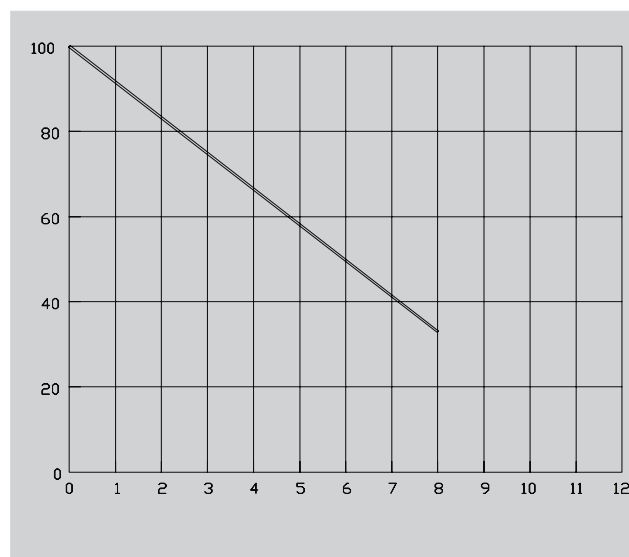
Under pressure, the lubricant passes through the longitudinal and transverse holes in the control plunger (3) into chamber B, and from there via the ring channel and non-return valve (5) to the exit.

As soon as the discharge stroke is complete, the delivery plunger (1) starts its intake stroke.

As the delivery plunger (1) moves, the spring force returns the control plunger (3) to its starting position. The intake stroke of the delivery plunger (1) creates a partial vacuum in chamber A. When the intake hole opens, the partial vacuum causes the lubricant to pass into chamber A.

The pump element is now primed for the next lubrication operation.

Displaced volume in relation to the notch position on the pump element, for plunger diameters 6, 8 and 10 mm.



Pressure limiting valves for pump elements

Pump elements may be fitted with pressure limiting valves (see Accessories). In this case, the screw plug (6) on the pump element is replaced with the pressure limiting valve.

If necessary, a grease or oil return line can be fitted from the pressure limiting valve to the pump casing. In this case, a different pressure limiting valve with a G 1/4 exit and a M20x1.5 screwed socket will be needed, however.

Insert the screwed socket into a free pump element mounting location (1 to 24) and connect to the pressure limiting valve with a pipe.

Pressure limiting valves for installing in the lines can also be ordered as accessories.

Characteristics

Lubricating pump FB ... 1M – drive position B

General

Assembly position Vertical
 Ambient and lubricant temperature range
 -15 °C to + 40 °C
 Tank For 6, 15 or 30 kg
 Number of pump elements
 Bottom row 1 to 12
 Top row 13 to 24
 Filling Via G 1/2 filling nozzle
 Net weight without pump element
 FB 06 approx. 26 kg
 FB 15 approx. 28 kg
 FB 30 approx. 30 kg

Gear

Type Worm gear
1 M Two-stage
 transmission ratios
1 M 105: 1; 288 : 1; 720 : 1

Motor Standard version Degree of protection IP 55-F
 - See table and rating plate.^{1) 2)}

Pump

Type Multi-plunger pump with 1 to 24 exits

Operating pressure for pump elements with plunger diameter:
 6 mm max. 350 bar
 8 mm max. 200 bar
 10 mm max. 125 bar
 Lubricants Mineral oils and environmentally-friendly
 oils from ISO VG 46 through to NLGI class 3 greases (Please
 contact us if you wish to use synthetic lubricants)



Please note

The lubricants used should be determined by the requirements of the machines to be lubricated and their manufacturers. The lubricants must be guaranteed as suitable for use in central lubrication systems

Operating viscosity (oil) $\geq 50 \text{ mm}^2/\text{s}$
 Worked penetration (grease) $> 220 \text{ 1/10 mm}$
 Number of plunger strokes 1 to 40 strokes/min

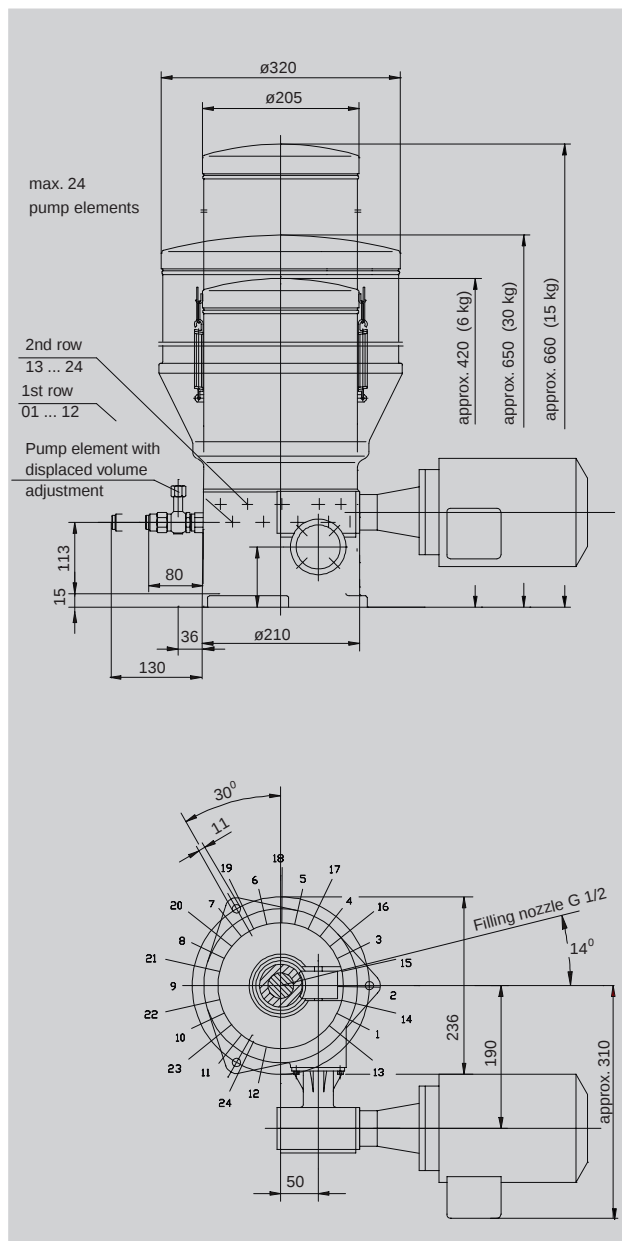
Displaced volume of pump elements

Ø 6 plunger 0.027 to 0.08 cm³/stroke
 Ø 8 plunger 0.05 to 0.15 cm³/stroke
 Ø 10 plunger 0.077 to 0.23 cm³/stroke

Pipe connection for pump element A pipe Ø 6 mm;
 B pipe Ø 8 mm; C pipe Ø 10 mm; D 1/4 NPT internal thread

1) For higher ambient temperatures, note there will be a drop in output (motor) of approx. 1% per Kelvin.

2) Other ratings available upon request.



Nominal speedl (rpm)	Fre quency (Hz)	Nominal output (kW)	Nominal voltage (V)	Nominal current (A)	Order referen-ce
1000	50	0.25	230/400	1.91/1.1	AG
1000	50	0.25	290/500	1.45/0.84	AL
1000	50	0.25	400/690	1.07/0.62	AP
1500	50	0.25	230/400	1.36/0.78	AF
1500	50	0.25	290/500	1.08/0.62	AK
1500	50	0.25	400/690	0.78/0.45	AO

Please note:

This information relates to three-phase AC motors from VEM. The values may differ for motors from other manufacturers.

Characteristics

Grease lubricating pump FB... 2M04 – drive position H

General

Assembly position.....	Vertical
Ambient and lubricant temperature range	-15 °C to + 40 °C
Tank	For 6, 15 or 30 kg
Number of pump elements	
Bottom row	1 to 12
Top row	13 to 24
Filling	Via G 1/2 filling nozzle
Net weight without pump element	
FB 06	approx. 19 kg
FB 15	approx. 21 kg
FB 30	approx. 23 kg

Gear

Type	Worm gear
2 M	Single stage transmission ratios
2 M	45:1

Motor

..... Standard version Degree of protection IP 55-F
– See table and rating plate. 1) 2)

Pump

Type Multi-plunger pump with 1 to 24 exits

Operating pressure for pump elements with plunger diameter:

6 mm	max. 350 bar
8 mm	max. 200 bar
10 mm	max. 125 bar

Lubricants Mineral oils and environmentally-friendly oils from ISO VG 46 through to NLGI class 3 greases (Please contact us if you wish to use synthetic lubricants)



Please note

The lubricants used should be determined by the requirements of the machines to be lubricated and their manufacturers. The lubricants must be guaranteed as suitable for use in central lubrication systems .

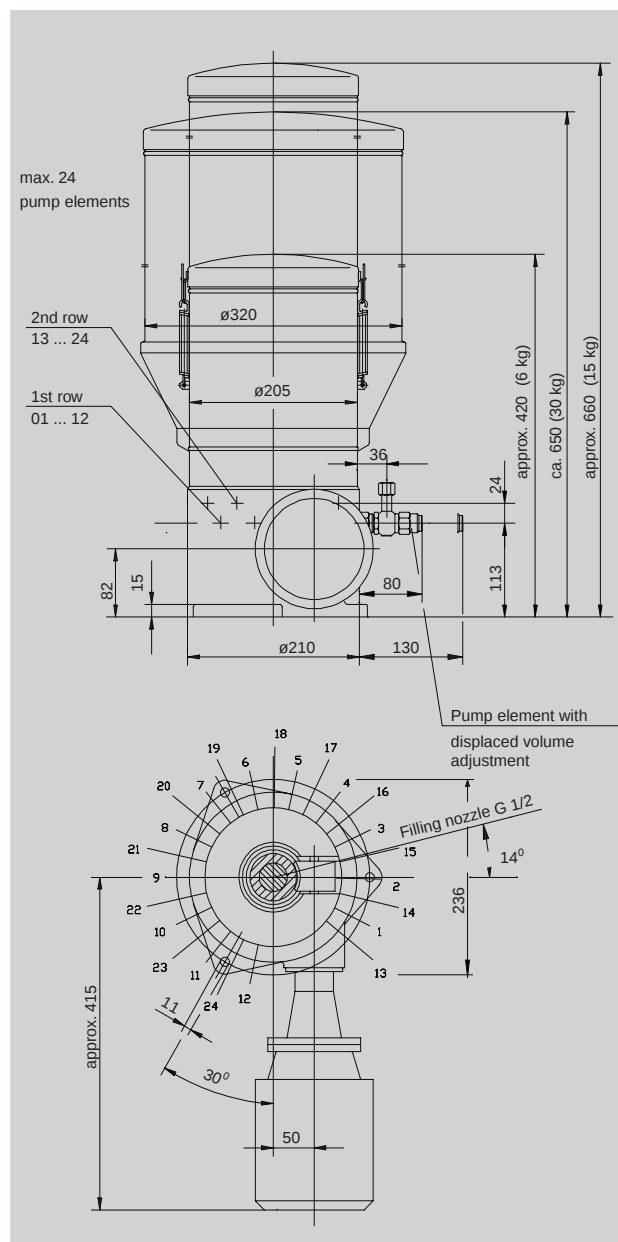
Operating viscosity (oil)	≥ 50 mm ² /s
Worked penetration (grease)	> 220 1/10 mm
Number of plunger strokes	1 to 40 strokes/min

Displaced volume of pump elements	
Ø 6 plunger	0.027 to 0.08 cm ³ /stroke
Ø 8 plunger	0.05 to 0.15 cm ³ /stroke
Ø 10 plunger	0.077 to 0.23 cm ³ /stroke

Pipe connection for pump element A pipe - Ø 6 mm;
B pipe Ø 8 mm; C pipe Ø 10 mm; D- 1/4 NPT internal thread

1) For higher ambient temperatures, note there will be a drop in output (motor) of approx. 1% per Kelvin.

2) Other ratings available upon request.



Nominal speed (rpm)	Frequency (Hz)	Nominal output (kw)	Nominal voltage (V)	Nominal current (A)	Order reference
1000	50	0.25	230/400	1.91/1.1	AG
1000	50	0.25	290/500	1.45/0.84	AL
1000	50	0.25	400/690	1.07/0.62	AP
1500	50	0.37	230/400	1.84/1.06	AF
1500	50	0.37	290/500	1.47/0.85	AK
1500	50	0.37	400/690	1.06/0.62	AO

Please note:

This information relates to three-phase AC motors from VEM. The values may differ for motors from other manufacturers.

Displaced volume of pump element with plunger diameter 6, 8 and 10 mm

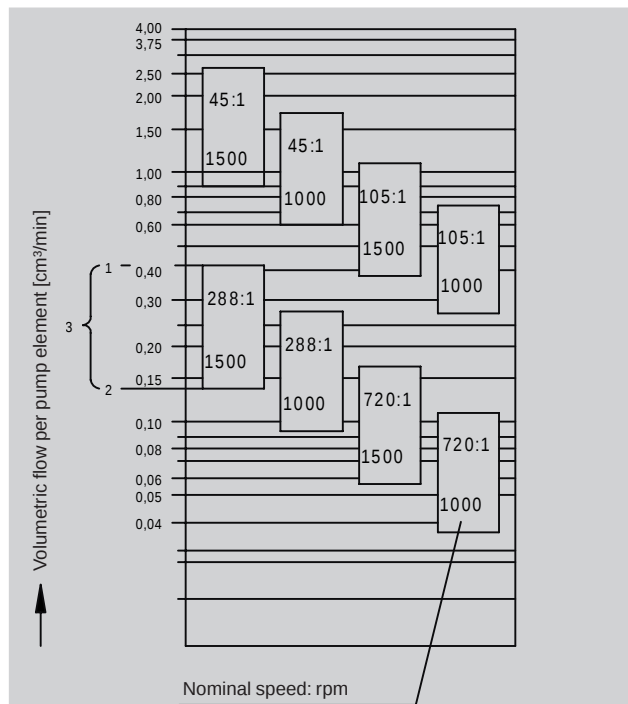
Volume displaced by each pump element in relation to the speed of the motor drive shaft.



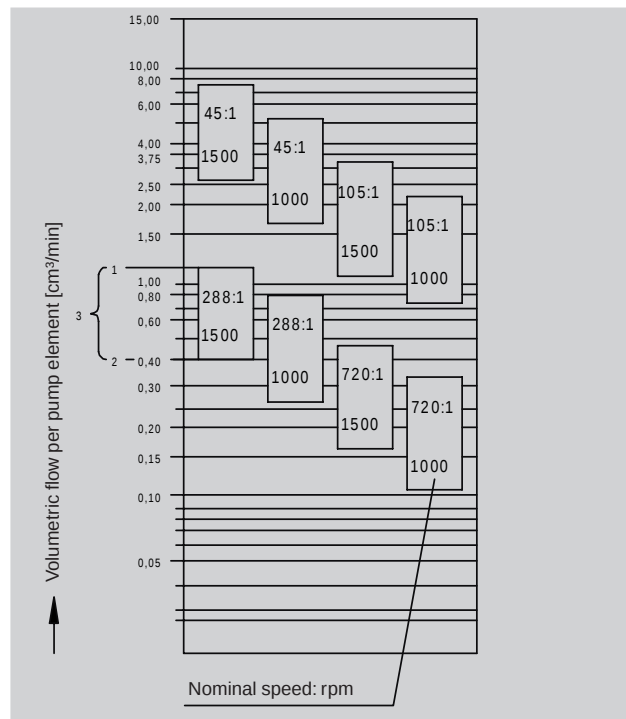
Please note:

The displaced volumes relate to the motors running at synchronous speed. Reduce the values accordingly for reduced asynchronous speed (see rating plate)

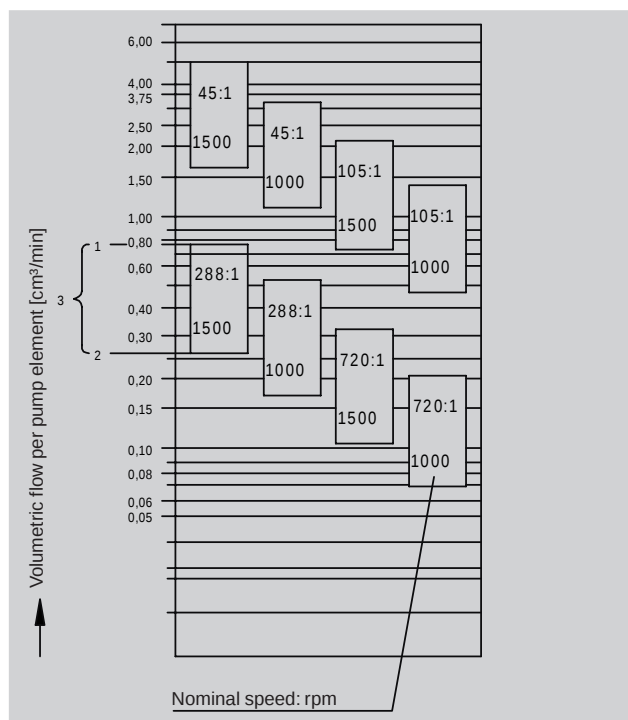
Plunger diameter 6 mm



Plunger diameter 10 mm



Plunger diameter 8 mm



- 1 = Maximum displaced volume (at constant speed)
- 2 = Minimum displaced volume (at constant speed)
- 3 = Variable displaced volume range (at constant speed)

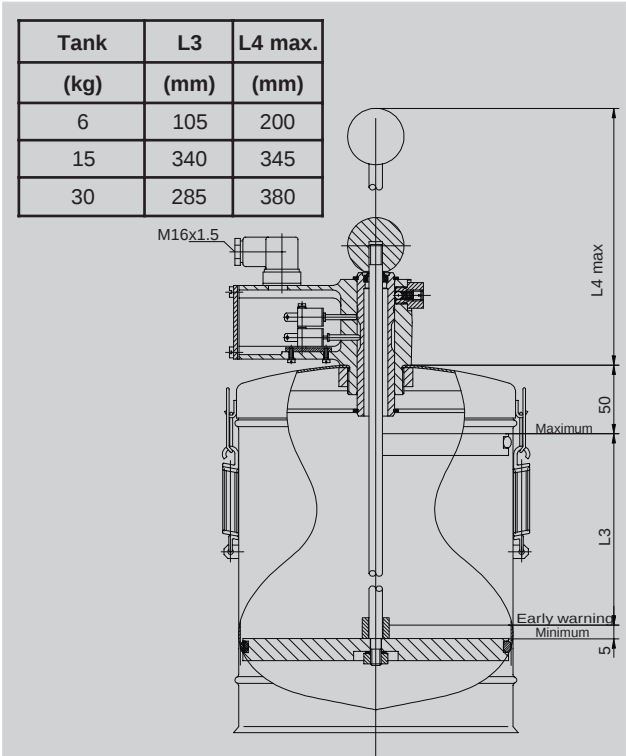
Tank and fill level versions

The tanks illustrated below are available in 6 kg, 15 kg and 30 kg sizes. Tanks for oil have a filler neck with screen and a visual (electrical) oil level indicator. There is no agitator blade

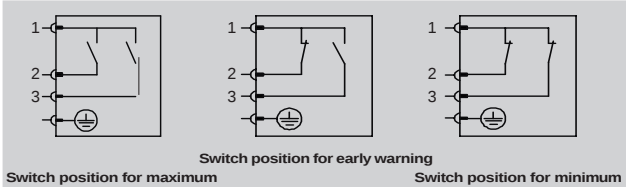
The associated level switches have different characteristics.

Tank with fill level indicator

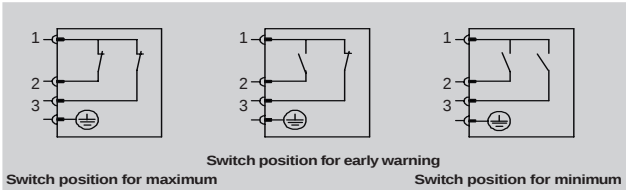
Level switch A with 3 switching points



Special version A...
(for automatically controlling a filling pump)

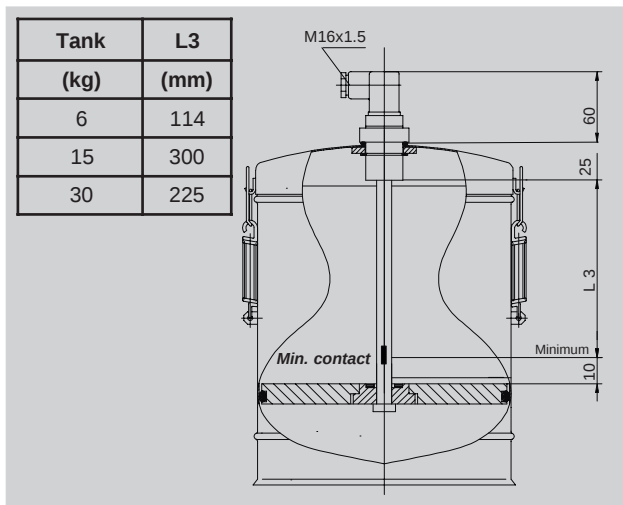


Special version A 4... (cable break protection)



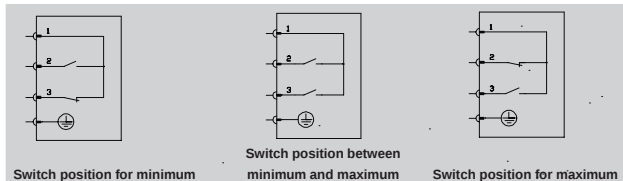
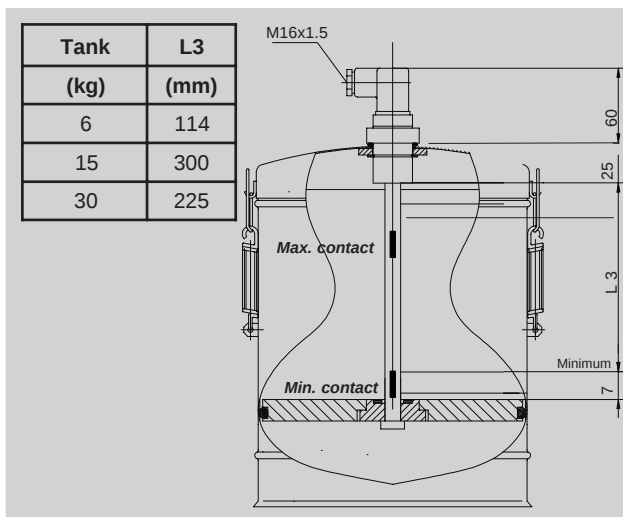
Version A Position switch
Max. switching current 15 A for AC
..... (0.25 A for DC with inductive load)
Max. switching voltage 250 V DC - 380 V AC
Switch version 3 switching points (normally open)
1. Max. fill level (Contact 1+2 open; contact 1+3 open)
2. Fill level early warning ..(Contact 1+2 closed; contact 1+3 open)
3. Min. fill level (Contact 1+2 closed; contact 1+3 closed)
Plug-in connectionDIN 43 650 plug
Degree of protectionIP 54
Opt. fill level indicator with dip stick (grease pressing plate)

Level switch E with 1 switching point



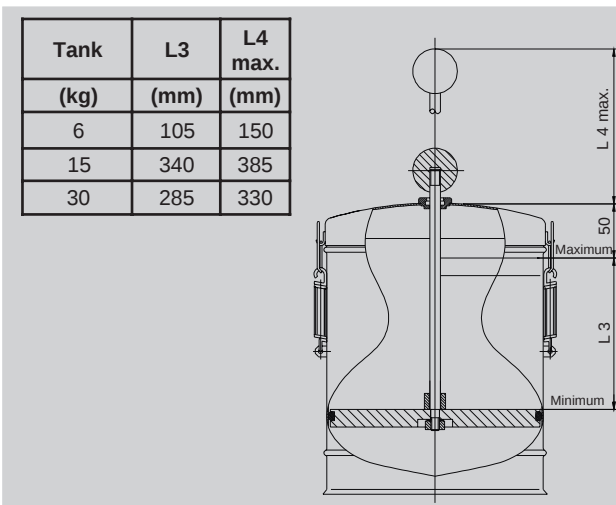
Version Reed contact, solenoid-actuated
 Switch version..... 1 switching point: min. (changeover)
 Max. switching capacity 60W/VA
 Max. switching voltage 230 V AC/DC
 Plug-in connection DIN 43 650 plug
 Degree of protection, plug/socket IP 65

Level switch F with 2 switching points



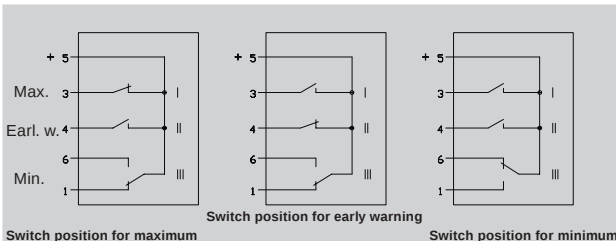
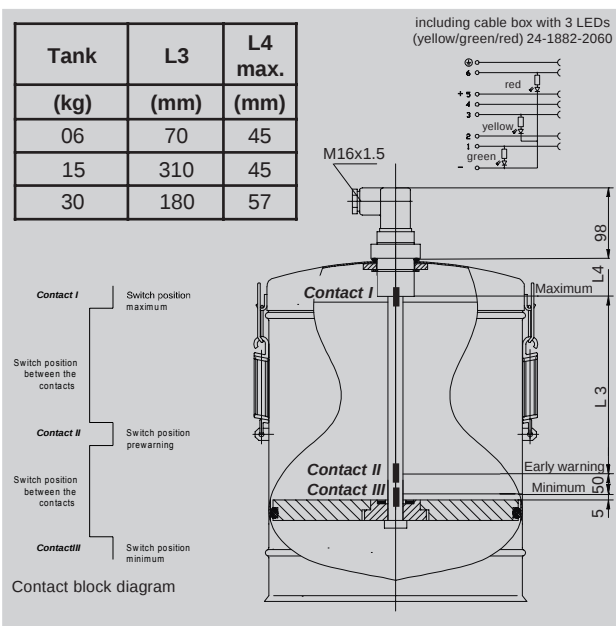
Version Reed contact
 Switch version 2 switching points (min. - max.)
 Max. switching current 1 A for AC/DC
 Max. switching voltage 42 V for AC/DC
 Plug-in connection DIN 43 650 plug
 Degree of protection, plug/socket IP 65

Level switch G, visual, with dip stick



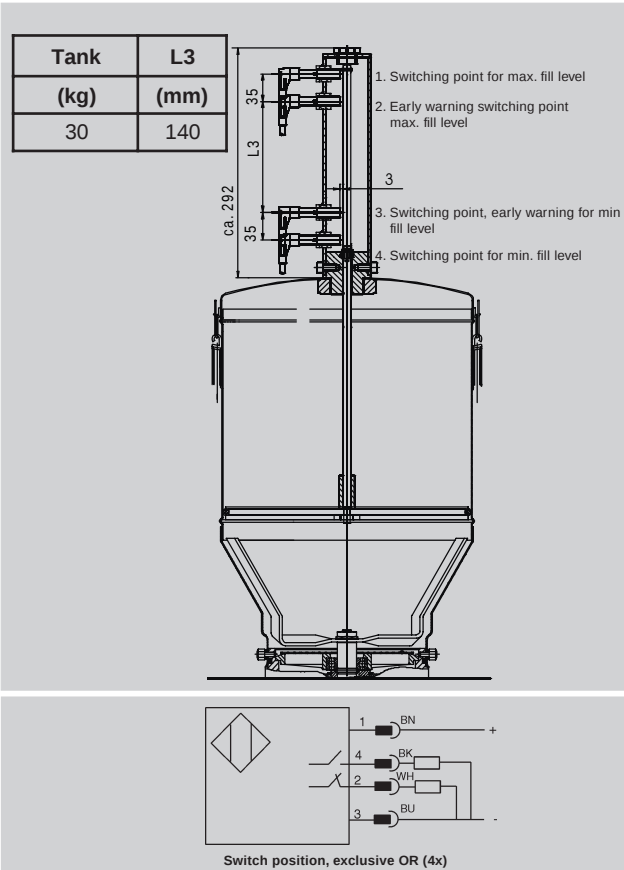
Version visual fill level indicator

Level switch H with 3 switching points



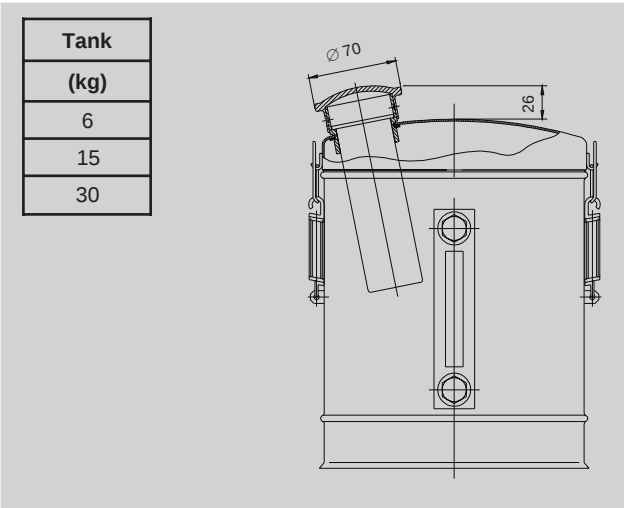
Version Reed contact
 Max. switching capacity 60W/VA
 Max. switching voltage 10 -30 V AC / DC
 Switch version 3 switching points
 1. Max. fill level (normally open)
 2. Fill level early warning (normally open)
 3. Min. fill level (changeover)
 Plug-in connection DIN 43 651 plug
 Degree of protection plug/socket IP 65
 Function indicator in socket Min. /max. LED

Level switch J with 4 switching points



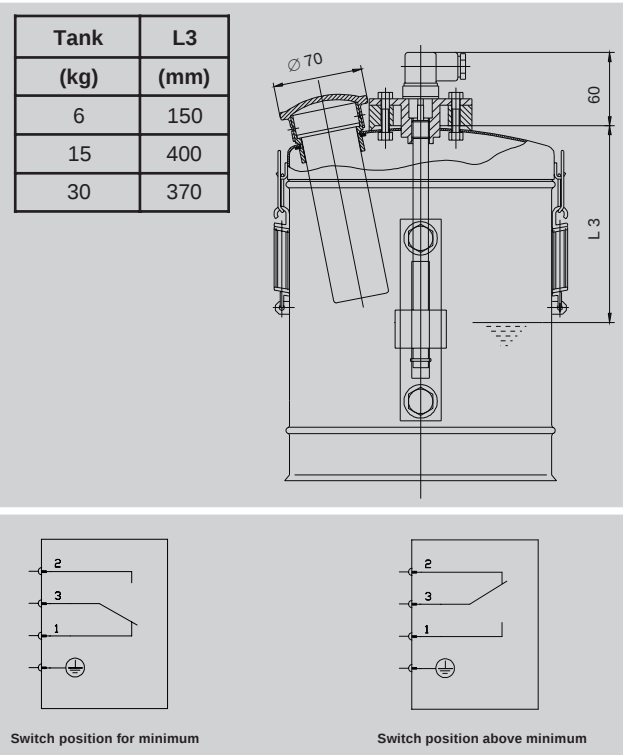
Proximity switch (4x)
Version PNP, exclusive OR, short-circuit resistant, polarised
Function indicator LED
Switch version 1 switching point
Max. switching capacity 60W/VA
Max. switching voltage10-30 V DC
Plug-in connection with cable connector (3m)
Degree of protection, plug/socketIP 68

Tank version S for oil



Version for oil, with visual inspection
(sight glass; filler neck with screen at the lid)

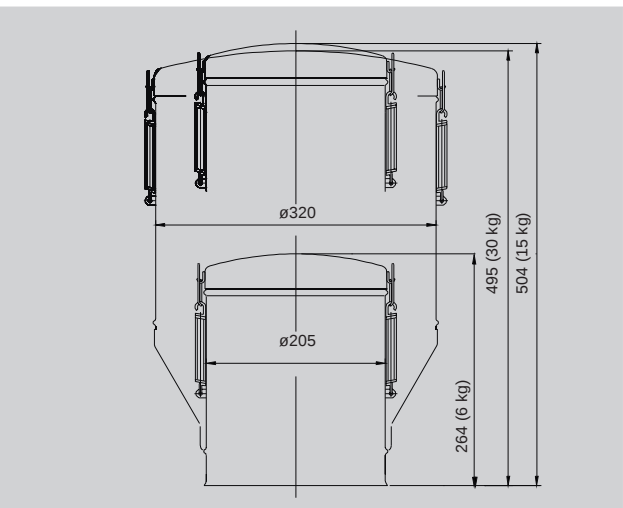
Level switch W for oil



Version For oil; with level switch and reed contact
Max. switching capacity10W /40 VA
Max. switching voltage 250 V AC/DC
Switch version 1 switching point
Min. fill level (changeover)
with filler neck (screen) at the lid
Plug-in connection DIN 43,650 plug
Degree of protection, plug/socket IP 65

Tank without fill level indicator

Version X for grease



Sample order for grease lubricating pump FB...

Sample order:	FB	15	X	1M	06	E	10	08	06	A	D	0001	AG	07
Type														
Tank size 06 = 6 kg; 15 = 15 kg; 30 = 30 kg														
Level switch A = Level switch E = Level switch F = Level switch G = Visual fill level indicator H = Fill level indicator J = Level switch; proximity switch S = For oil, with visual inspection (sight glass) W = For oil; reed contact; 1 switching point (changeover) X = Tank without level switch														
Type of drive 1M = Motor drive with 2 speeds 2M = Motor drive with 1 speed														
Pump index 1M 06 = 105:1; 07 = 288:1; 08 = 720:1 2M 04 = 45:1														
Drive position (see diagram) 1M = B or E / 2M = H														
Number of pump elements Ø 6 mm plunger														
Number of pump elements Ø 8 mm plunger														
Number of pump elements Ø 10 mm plunger														
Pipe connection A pipe - Ø 6 mm; B pipe - Ø 8 mm; C pipe - Ø 10 mm; D - 1/4 NPT internal thread														
D=Revision index														
Version identifier 0001 = Basic version														
Nominal speed, frequency, nominal output, nominal voltage and nominal current (See table on page 4-)														
Grease lubricating pump FB... 07 = IP55-F; 13 = EEX ell CT4-IP55-F; 34 = EEX dell CT4-IP55-F (Other ratings available on request)														

Sample order

for a type FB unit with 6 kg tank, without level switch, motor 1M with 2 speeds, pump index 06 (105:1), 10 pump elements with Ø 6 mm, 8 pump elements with Ø 8 mm, 6 pump elements with Ø 10 mm, pipe connection A with Ø 6 mm, revision index D, basic version 0001, nominal speed of 1000 rpm, 230/400 V 50 Hz, AG, 1.9/1.1A, degree of protection 07 (IP 55).

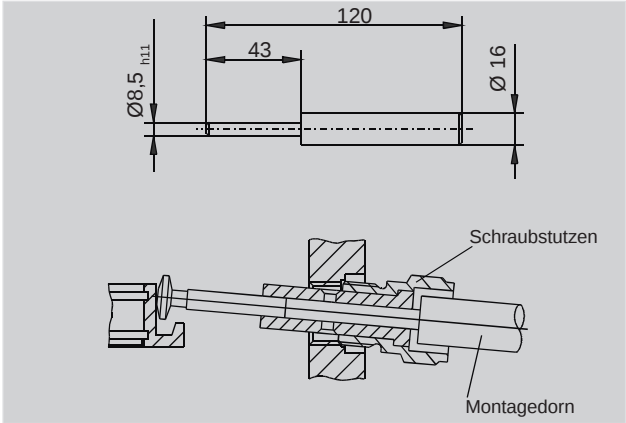
FB06X1M06/100806AD0001AG07

Accessories

(order separately)

Assembly spike

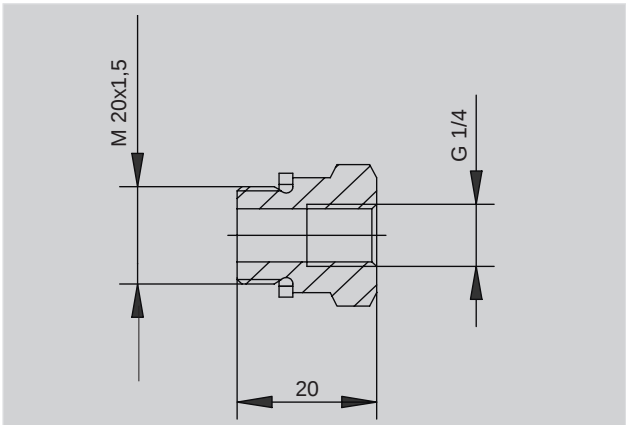
Use	For fitting a pump element
Order number	44-1827-2010



Screwed socket for grease recirculation

(in place of a pump element)

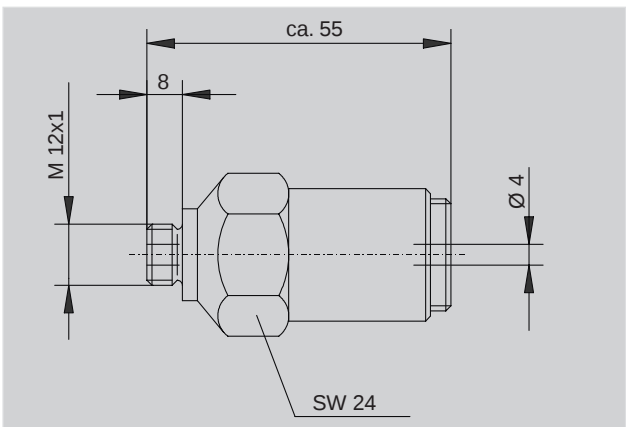
Use	For returning the grease to the pump casing
Order number	24-1755-2003



Pressure limiting valve

Use	For later installation or as a spare part
-----	---

Set pressure (bar)	Weight (kg/St)	Order no.
50	0.13	24-2103-2273
100	0.13	24-2103-2344
125	0.13	24-2103-2345
150	0.13	24-2103-2342
175	0.13	24-2103-2272
200	0.13	24-2103-2346
350	0.13	24-2103-2271

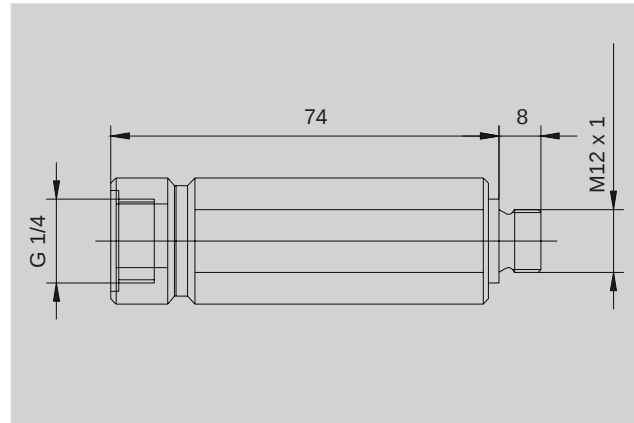


Accessories

(order separately)

Pressure limiting valve with return connection

Use	For fitting directly in the pump element Suitable for grease and oil	
Set pressure (bar)	Weight (kg/St)	Order no.
75	0.20	24-2103-2662
100	0.20	24-2103-2663
120	0.20	24-2103-2664
150	0.20	24-2103-2665
200	0.20	24-2103-2666
350	0.20	24-2103-2667

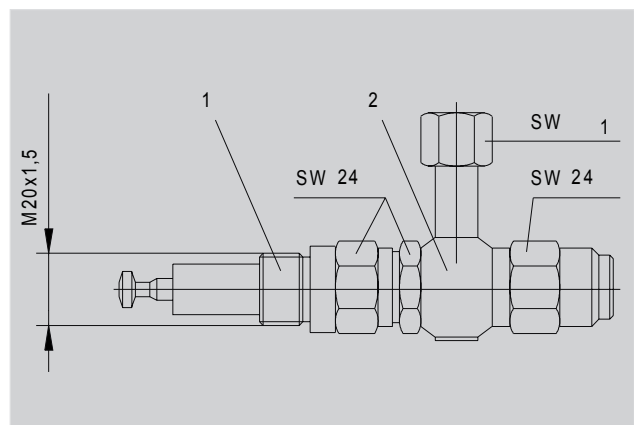


Screw plug M20 x 1.5

Use	For closing off unused pump exits
Weight (kg/St)	Order number
0.037	95-1520-0908

Pump element and collar

Use	For later installation or as a spare part		
	Size 1 (mm)	Weight (kg/St)	Order no.
Pump element (no. 1)			
Plunger diameter 6mm	-	0.259	24-1557-3680
Plunger diameter 8mm	-	0.264	24-1557-3681
Plunger diameter 10mm	-	0.275	24-1557-3683
Collar (No. 2)			
Pipe diameter 6mm	14	0.101	24-2255-2003
Pipe diameter 8mm	17	0.076	24-2255-2004
Pipe diameter 10mm	19	0.100	24-2255-2005
Pipe diameter 1/4 NPT (internal thread)	18	0.220	24-2255-2008

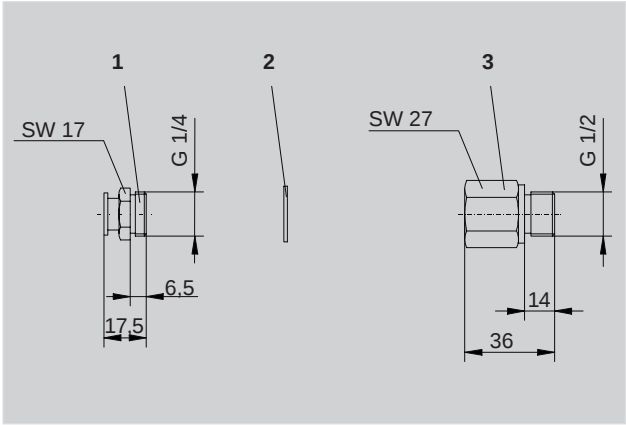


Accessories

(order separately)

Filling device
reducing adapter with grease nipple

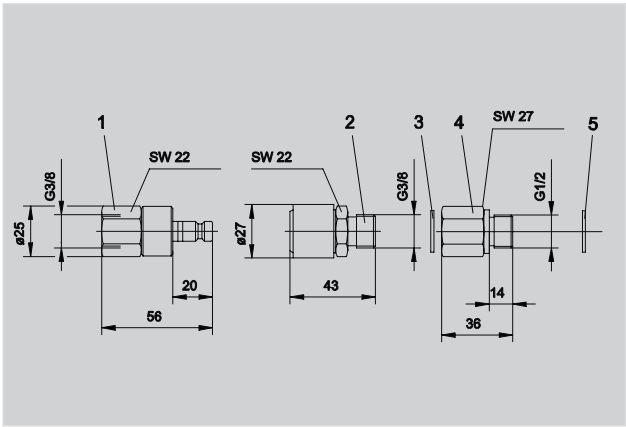
Designation	Order no.
Grease nipple (no. 1)	
AG 1/4-16 DIN 3404	96-0002-0053
Gasket (No. 2)	
A14x18 DIN 7603 Cu	95-0713-7603
Reducing nozzle (no. 3)	
G 1/2 x1/4 VZK EO	96-3103-0058



Filling coupling

Use	For connecting an automatic filling device
-----	--

Nominal diameter DN (mm)	Size	Weight (kg/St.)	Order no.
Quick-release connector with non-return valve (no. 1)			
6.0	22	0.06	24-1020-2278
Quick-release sleeve with non-return valve (no. 2)			
7.0	22	0.08	24-1020-2158
Gasket A 18x22 DIN 7603 Cu (no. 3)			
			95-0913-7603
Reducing nozzle (no. 4)			
G1/2 x G3/8	27	0.091	96-3123-0058



Other publications

Operating instructions for grease lubricating pump FB...	DSB 2-010-00
Spare parts lists for grease lubricating pump FB...	DSE 2-005-00
Grease pump units leaflet	1-0107-3
Progressive distributors VPBM leaflet	1-0107-1
Progressive distributors VPKM leaflet	1-0107-1
Progressive distributors VPG leaflet	1-0107-1
Segment distributors PSG 2 leaflet	DSK 0-003-02
Segment distributors PSG 3 leaflet	DSK 0-003-03

Please note:

All VOGEL products must be used correctly. If operating instructions are supplied with the products, any additional device-specific instructions and information given in those operating instructions should be applied.

Please note, in particular, that hazardous materials of any type, particularly materials that are classified as hazardous in EU Directive 67/548/EEC, article 2, para. 2, must not be used to fill or be pumped and/or distributed by VOGEL central lubrication systems and components without the prior written approval of VOGEL.

No products manufactured by VOGEL are approved for use with gases, liquefied gases, gases that are released under pressure, vapours and any liquids with a vapour pressure of more than 0.5 bar above normal atmospheric pressure (1013 mbar) at the maximum permitted temperature.



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