FB multiline lubrication pump

for grease and oil, electrically driven, for large multi-line and progressive systems

Design

- With up to 24 individually adjustable pump elements/outlets with various delivery volumes and tube connections
- With various delivery pistons (Ø 6 mm; Ø 8 mm; Ø 10 mm) for different delivery rates and operating pressures (350 bar, 200 bar and 125 bar).
- Positively actuated, adjustable pump elements for industrial applications and continuous operation
- With a delivery rate range from 0.04 to 7 cm^3
- Reservoir sizes of 6, 15, or 30 kg
- Fill level control/fill level switch with 1 to 4 switching points
- SKF FB lubrication pumps can also be used as oil lubrication pumps.

Advantages

- Very sturdy and vibration-resistant multi-line pump, designed both for oil and very stiff greases, for harsh operating conditions, and for continuous operation if necessary
- Multiline lubrication pumps of the FB series are suitable for large systems due to their delivery rate and reservoir capacities.
- The lubricant can be fed to the lubrication points directly or via the SKF ProFlex progressive feeder system.

Application

- Automotive industry
- Construction materials machinery
- Conveying systems
- Annealing machines
- Steel and heavy industry
- Sewage treatment plants
- Paper and boxing machinery
- Refineries
- Tunnel boring machinery, mining
- Metal-forming machinery
- Wind energy systems

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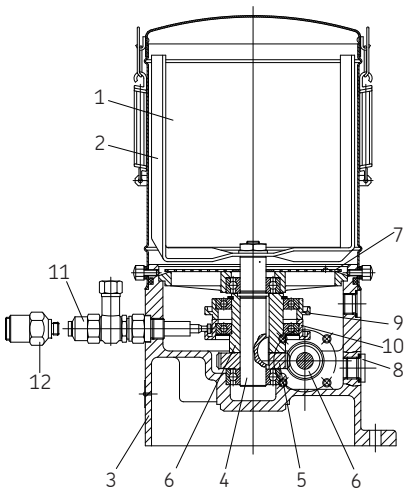
Pump operation

- see Figure 1

The pump is driven by a worm drive (**5**) consisting of a worm and related worm gear. The worm gear drives the eccentric drive shaft (**4**) with the fitted agitator (**2**). The agitator (**2**) works the grease and pushes the lubricant through the strainer (**7**) into the pump's inlet chamber. The eccentric drive shaft (**4**) has two guide rings running in ball bearings (**9**, **10**) to receive the delivery piston heads of the pump elements (**11**).

The eccentric movement of the guide rings (**9**, **10**) forcibly moves the delivery pistons (suspended in the two guide rings) of the pump elements (**11**).

Fig. 1 Sectional view of an FB pump



1 Grease reservoir
2 Agitator
3 Housing with mounting flange
4 Eccentric drive shaft
5 Worm drive
6 Eccentric bushing
7 Strainer
8 Filler socket (G 1/2)
9 Pump element guide ring, upper
10 Pump element guide ring, lower
11 Pump element
12 Pressure regulating valve (accessory)

Pump element operation

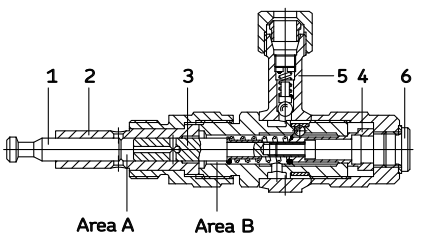
- see Figure 2

The delivery piston is forcibly actuated as described in "Pump operation."

In the suction stroke position (as illustrated), the cross hole of the delivery piston (**3**) is closed. At the start of the pressure stroke, the delivery piston (**1**) closes the suction hole. The suctioned lubricant in chamber A is pressed against the spring-loaded control piston (**3**). The cross hole in the control piston (**3**) is opened. The lubricant reaches chamber B under pressure through the cross and longitudinal hole of the control piston (**3**), where it flows through the ring duct and the check valve (**5**) to the outlet.

After the pressure stroke is complete, the suction stroke of the delivery piston (**1**) begins. Moving the delivery piston (**1**) also brings the control piston (**3**) back to its normal position using spring tension.The suction stroke movement of the delivery piston (**1**) generates negative pressure in chamber A. When the suction hole opens, the negative pressure draws the lubricant into chamber A.The pump element is now prepared for the next lubrication process.

Fig. 2 Pump element



1 Delivery piston
2 Cylinder
3 Spring-loaded control piston
4 Adjustment cap
5 Ring piece with check valve
6 Screw plug

Delivery volume adjustment on pump element- see Figures 2 and 3
The delivery volume of the pump element is determined by the control piston stroke and the piston diameter. The screw plug (**6**) must be removed in order to adjust the delivery volume. The adjustment cap (**4**) can then be turned.
When adjusting:

- **Clockwise rotation**
  results in decreased delivery volume
- **Counterclockwise rotation**
  results in increased delivery volume
- Unless otherwise requested, the pump is configured when delivered for full stroke.

Note
We recommend that the delivery volume not be reduced below 1/3 of the maximum to achieve the specified characteristics. This corresponds to clockwise rotation of the adjustment cap (**4**) by eight notches.

General notes

The order of the pump elements is factory-set. It begins with the smallest pump elements. The order is shown in the following pump illustrations.
The order of the pump elements can be modified at additional charge.

The lubricants to be used must conform with the requirements of the machines being lubricated and be suitable for use in centralized lubrication systems.

Pressure regulating valves for pump elements

Pump elements can be equipped with pressure regulating valves (see Accessories). This involves replacing the screw plug (**6**) with the pressure regulating valve.
If necessary, grease/oil recirculation can be provided from the pressure regulating valve to the pump housing. This does, however, require a different pressure regulating valve with a G 1/4 outlet and a M20x1.5 threaded socket.
The threaded socket needs to be placed into an available mounting space (1 to 24) for pump elements and connected with the pressure regulating valve using tubing.
Pressure regulating valves for line installation can also be ordered as accessories.

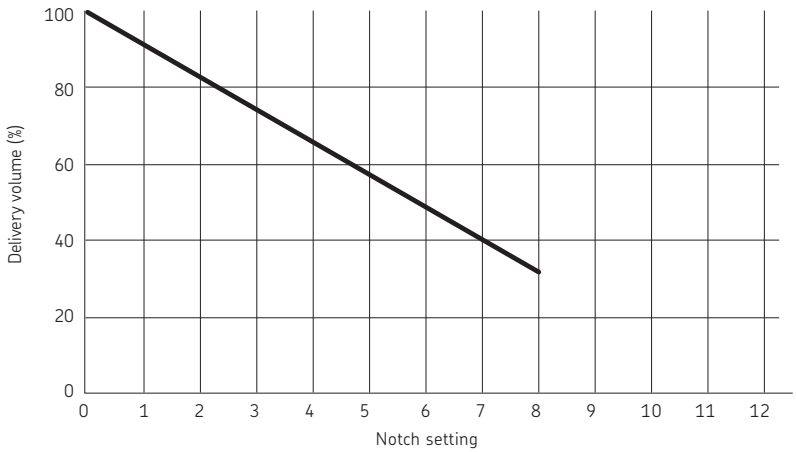
Design note

The FB multiline pump is equipped standard with a motor protection enclosure of protection class IP 55 (07). The pump is available in a design for explosive atmospheres (ATEX) on request.
There are also different fill level switches for different applications and lubricants.
We recommend the U2 ultrasonic design as the standard fill level switch.
When the FB pump is used as an oil lubrication pump, the reservoir can be equipped with an oil level monitor, fill level switch “W”. The oil level monitor is designed and fitted in accordance with the customer's specific requirements as stated when ordering. Additionally, a specialized filling device and a visual fill level indicator can be installed.

The FB multiline lubrication pump is available in the following special designs:

- ATEX design
- Pre-set delivery volumes
- Pre-installed pressure regulating valves
- Drive motor with custom voltage,custom frequency and custom protection class
- Custom paintwork

Fig. 3 Delivery volume adjustment on pump element



Delivery volume as a function of the notch setting on the pump element for piston diameters 6 mm, 8 mm and 10 mm

Design 1M, drive position B, drive position E

General characteristics 1M

General
Ambient and lubricanttemperature
range ..... -15 °C to + 40 °C [1])
Reservoir ..... B+H: 6, 15, 30 kg
..... E: 6, 15 kg
Number of pump elements
Lower row 1 to 12, Upper row 13 to 24

Filling ..... filler socket G 1/2"
Dry weight without pump elements
FB 06 ..... approx. 26 kg
FB 15 ..... approx. 28 kg
FB 30 ..... approx. 30 kg

Gearbox
Type ..... worm drive
1M ..... double reduction
Step-down ratios 1M 105:1; 288:1; 720:1

Motor
Standard design ...IP 55-F protection
See key motor data table for 1 Mand motor rating plate. [2])

Pump
Type multiline lubrication pump 1 to 24 outlets

Operating pressure for pump elements, piston Ø
6 mm ..... max. 350 bar
8 mm ..... max. 200 bar
10 mm ..... max. 125 bar

Delivery volume of pump elements,
piston Ø cm³/stroke
6 mm ..... 0.027 to 0.08
8 mm ..... 0.050 to 0.15
10 mm ..... 0.077 to 0.23

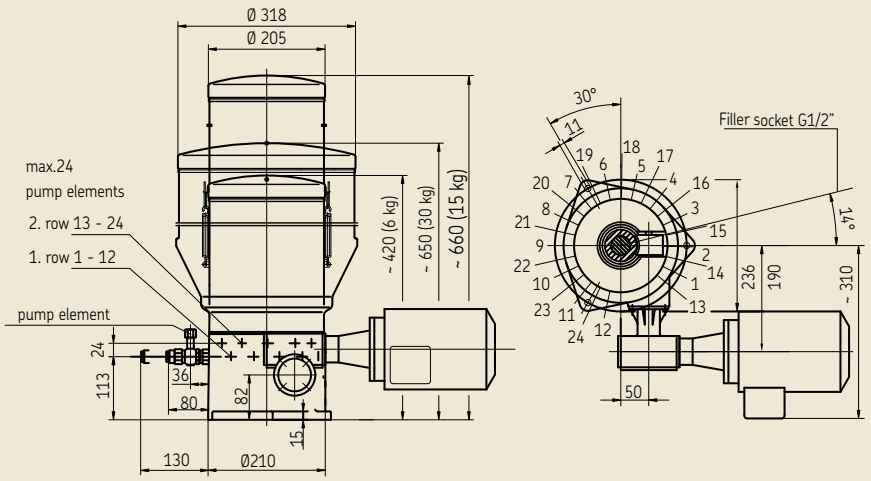
Lubricants [3])
Mineral oils or environmentally compatible oils from ISO VG 46 to greases of NLGI Grade 3 (

- Operating viscosity (oil) ≥ 50 to 5000 mm²/s
- Worked penetration (grease).....> 220 1/10 mm
- max. flow pressure ..... < 750 mbar
- content in solids ..... < 5%
- after lubricant specification . DIN 51825

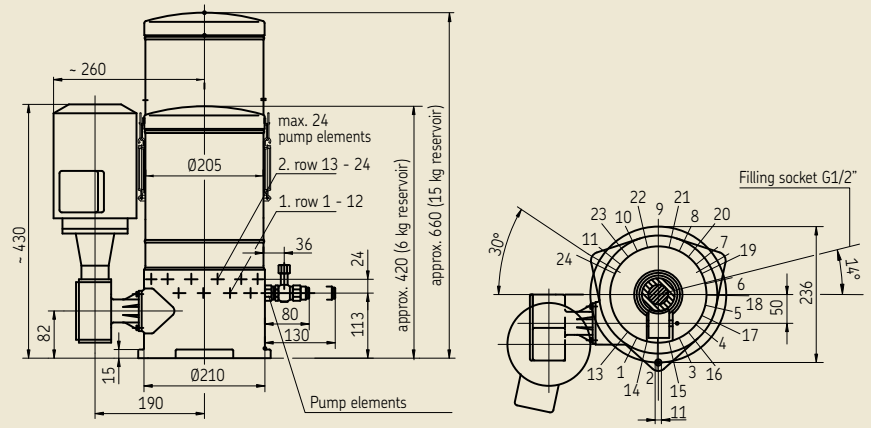
1) At higher ambient temperatures, note that there is reduction in (motor) performance of approx. 1% per Kelvin.
2) Other specifications available on request.
3) The use of synthetic and bio-degradable lubricants must be authorized by SKF.

FB design 1M

Drive position B



Drive position E



1M key motor data

Rated power [rpm]	Frequency voltage [Hz]	Rated current [kW]	Rated code [V]	Rated [A]	Orderspeed
			230/400	1.91/1.10	**AG**
1000	50	0.25	290/500	1.45/0.84	**AL**
			400/690	1.07/0.62	**AP**
			230/400	1.36/0.78	**AF**
1500	50	0.25	290/500	1.08/0.62	**AK**
			400/690	0.78/0.45	**AO**

Note This data refers to three-phase motors from VEM. There may be differences with motors from other manufacturers.

Design 2M, drive position H

General characteristics 2M

General

The general characteristics are identical to those of the 1M design(see page 4).They differ only in terms of gearbox design.

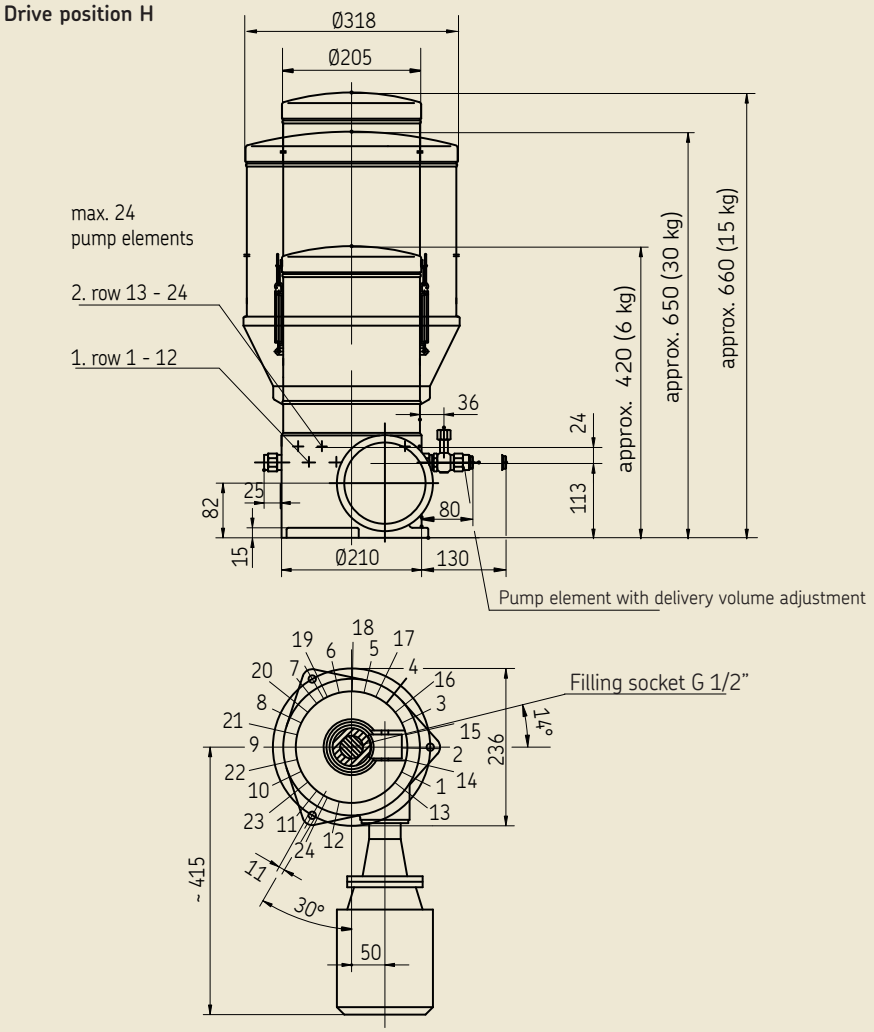
Gearbox
Type . . . . . worm drive
2 M . . . . . single reduction
Gear ratios 45:1

Motor
Standard design . . .
IP 55-F protection
See key motor data table for 2M and motor rating plate. [1])

1) Other specifications available on request.

FB design 2M

Drive position H



2M key motor data

Rated voltage [rpm]	Frequency Rated current [Hz]	Rated code [kW]	Rated [V]	Orderspeed [A]	power
1000	50	0.25	230/400	1.91/1.10	**AG**
			290/500	1.45/0.84	**AL**
			400/690	1.07/0.62	**AP**
1500	50	0.37	230/400	1.84/1.06	**AF**
			290/500	1.47/0.85	**AK**
			400/690	1.06/0.62	**AO**

Note This data refers to three-phase motors from VEM.There may be differences with motors from other manufacturers.

Delivery volume of pump elements with piston Ø 6 mm, 8 mm and 10 mm

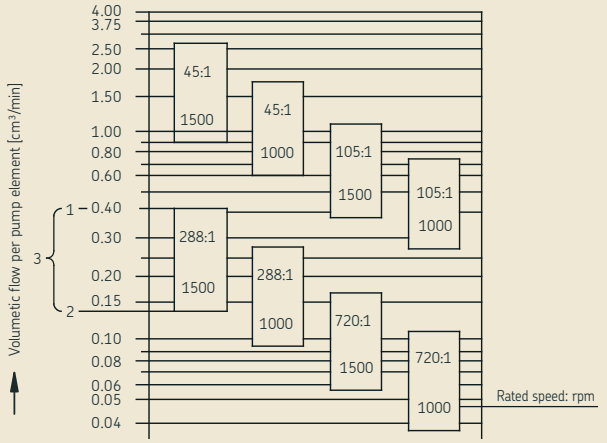
The delivery volume per pump element depends on the speed of the motor drive shaft.

Note:
The delivery volumes shown are based on the motors' rated speeds. At reduced speeds (see rating plate), the values are lowered accordingly.

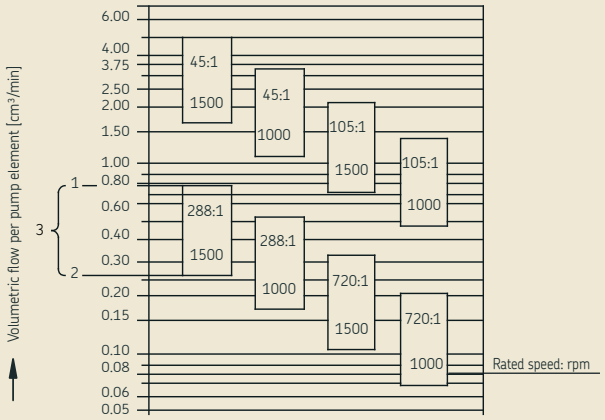
Legend

1 = maximum delivery volume at constant speed (100%)
2 = minimum delivery volume at constant speed (33%)
3 = adjustable delivery volume range

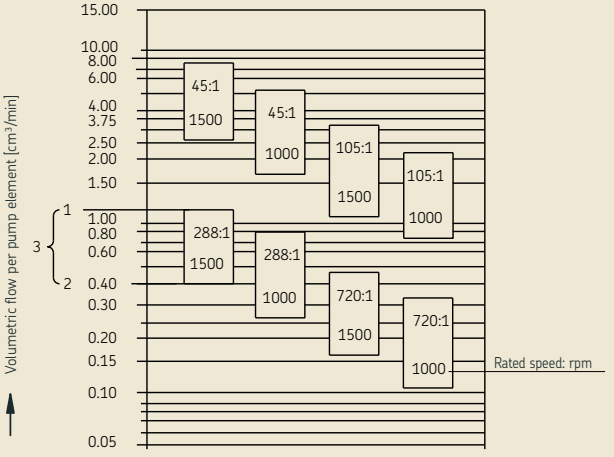
Delivery volume as a function of 6 mm piston diameter



Delivery volume as a function of 8 mm piston diameter



Delivery volume as a function of 10 mm piston diameter



Reservoir and fill level designs

The reservoirs shown in the following are available in sizes 6 kg, 15 kg, and 30 kg, depending on the pump design. The reservoirs for oil contain a filler socket with strainer plus a visual oil level indicator (electric if desired); the agitator is not included in this version.
The accompanying fill level switches differ in terms of switching points and their characteristics.

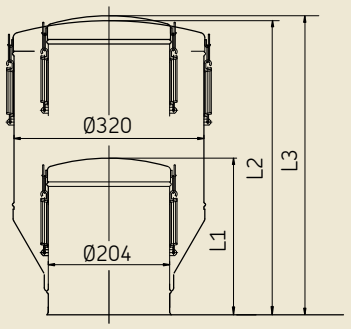
Reservoir design X

Design ..... without fill level control

Reservoir design X

Reservoir size [kg]	L1 [mm]	L2 [mm]	L3 [mm]
6	264		
15		504	
30			495

Reservoir design X



Visual fill level control for grease

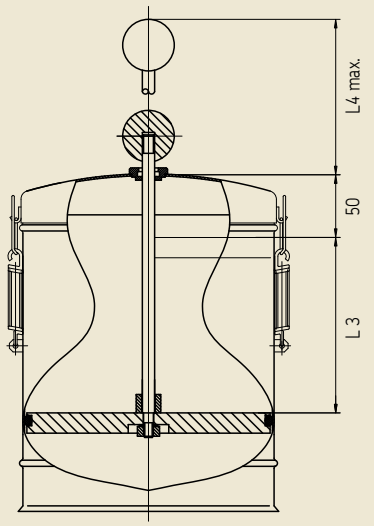
Fill level control G

Design . . . . . visual fill level indicator via dip stick (grease follower plate)

Fill level control G

Reservoir capacity [kg]	L3 [mm]	L4 max. [mm]
6	105	150
15	340	385
30	285	330

Fill level control G



Fill level switch for grease

Fill level switch A with 3 switching points

Design . . . . . position switch

Standard design (NO-contact)

1. Maximum fill level . . . . . contact 1+2 open contact 1+3 open2. Fill level pre-warning
contact 1+2 closed
contact 1+3 open
3. Minimum fill level . . . . . contact 1+2 closedcontact 1+3 closed

Switched current, max. . . 15 A with AC
(with inductive load 0.25 A with DC)

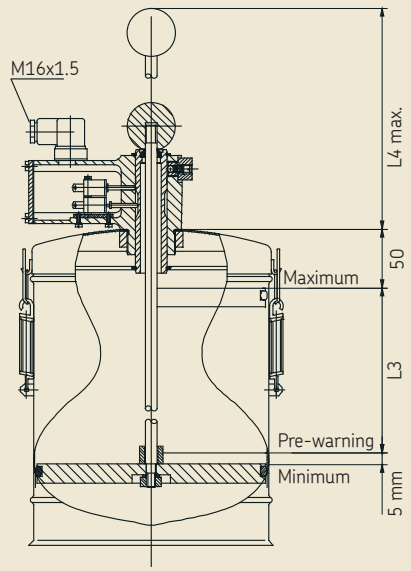
Switching voltage, max... 250 V to 380 V DC

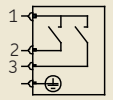
Connection . . . . . connector plug DIN EN175301-803Protection IP 54Visual fill level indicator via dip stick (grease follower plate)

Fill level switch A

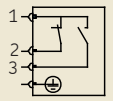
Reservoir capacity [kg]	L3 [mm]	L4 max. [mm]
6	105	200
15	340	345
30	285	380

Fill level switch A [1)]

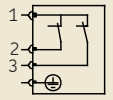




Switch position at maximum



Switch position at pre-warning



Switch position at minimum

1) Special design with cable break protection available on request

Connector pin assignment

PIN	Description
1	= + supply voltage
2	= signal output "above minimum"
3	= signal output "minimum"
4	= PE protective earth

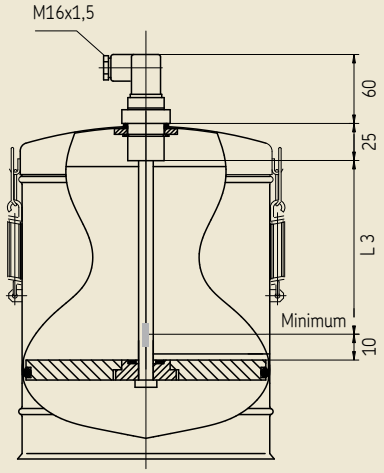
Fill level switch E with 1 switching point

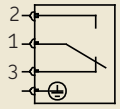
Design	reed contact, magnetically actuated
Switch design	1 switching point (min. changeover)
Switching capacity	60 W/VA
Switched current, max.	1 A
Switching voltage, max.	230 V AC/DC
Connection	connector plug DIN 43 650
Protection class	IP 65

Fill level switch E

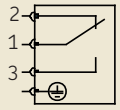
Reservoir capacity [kg]	L3 [mm]
6	114
15	300
30	225

Fill level switch E





Switch position at minimum



Switch position above minimum

Connector pin assignment

PIN	Description
1	= + supply voltage
2	= signal output “above minimum”
3	= signal output “minimum”
4	= PE protective earth

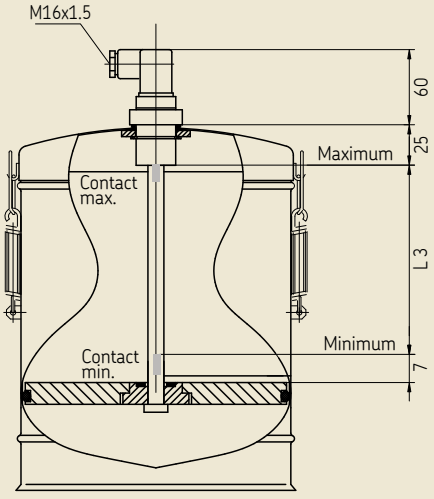
Fill level switch F with 2 switching points

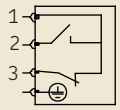
Design	reed contact,magnetically actuated
Switch design	2 switching points (Min. - Max.)
Switched current, max.	1 A with AC/DC)
Switching voltage, max.	42 V AC/
DCConnection	connector plug DIN 43 650
Protection class	IP 65

Fill level switch F

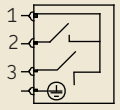
Reservoir capacity [kg]	L3 [mm]
6	114
15	300
30	225

Fill level switch F

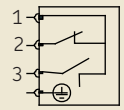




Switch position at minimum



Switch position between maximum and minimum



Switch position at maximum

Connector pin assignment

PIN	Description
1	= + supply voltage
2	= signal output “above minimum”
3	= signal output “minimum”
4	= PE protective earth

Fill level switch H with 3 switching points

Design . . . . . reed contact

Switch design . . . . . 3 switching points
1. Maximum fill level . . . . (NO-contact)
2. Fill level pre-warning . . . (NO-contact)
3. Min. fill level . . . . . (changeover)

Switching capacity . . . . . 60 W/VA

Switched current, max. . . . 15 A
Switching voltage, max. . 10-30 V DC/AC

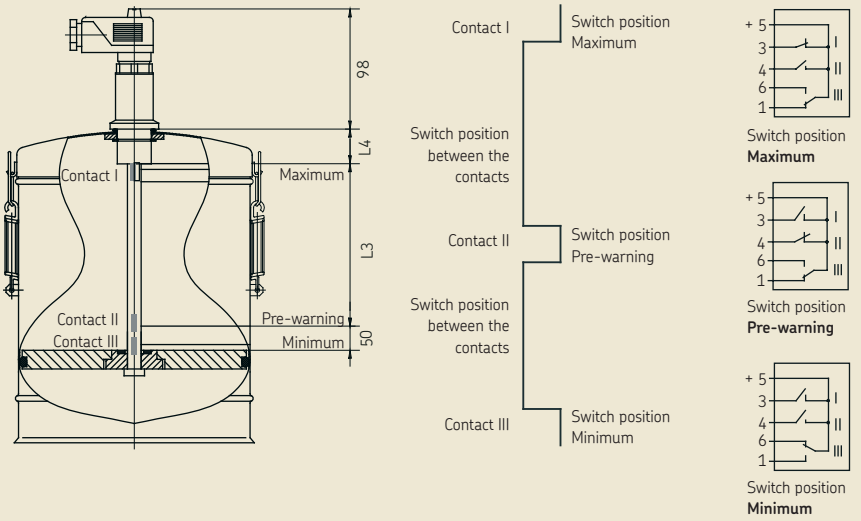
Connection . . . . . connector plug DIN 43 651

Protection class . . . . . IP 65

Fill level switch H

Reservoir capacity [kg]	L3 [mm]	L4 [mm]
6	70	45
15	310	45
30	180	57

Fill level switch H



Fill level switch J with 4 switching points

Note
Only for 30 kg reservoir design

Proximity switches (4x)

Design . . . . . PNP, XOR, short circuit proof, reverse polarity protected
Function indicator . . . . . LED

Switch design . . . . . 1 switching point

Switching capacity, max. 60 W/VA

Switching voltage, max. 10-30 V DC/AC

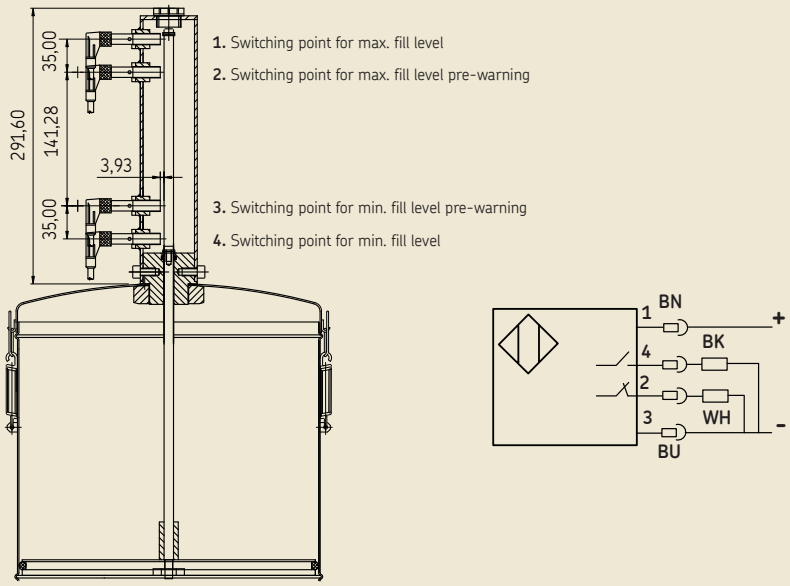
Connection . . . . . via connector plug with 3 meter cable

Protection class, ... IP 68
plug/socket

Fill level switch J

Reservoir capacity	30 kg

Fill level switch J



Fill level control for oil

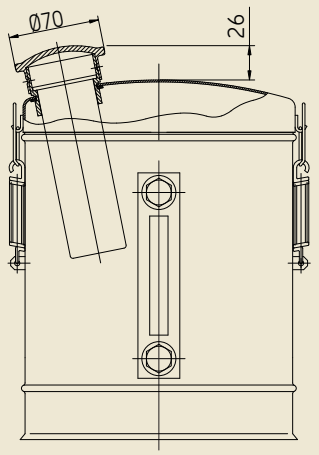
Reservoir design S for oil

Design **for oil lubrication pumps**; with visual inspection, sight glass, filler socket with strainer on cover

Fill level switch W

Reservoir capacity
6 kg
15 kg
30 kg

Fill level control S



Fill level switch for oil

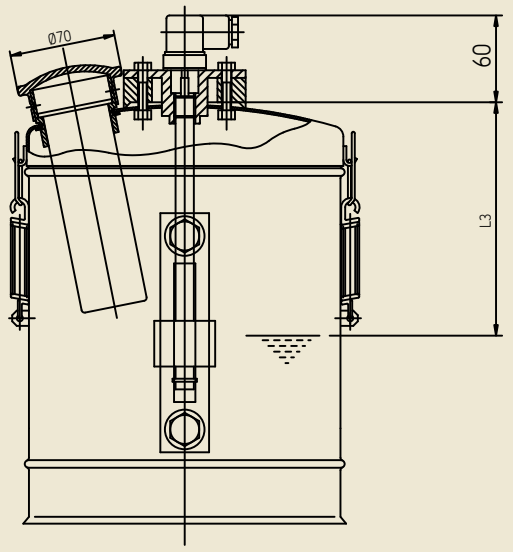
Fill level switch W with 1 switching point

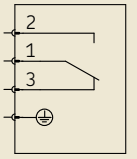
Design	reed contact,magnetically actuated
Switch design	1 switching point (min. changeover)
Switching capacity, max.	100 W/ 40 VA
Switching voltage, max.	250 V AC/DC
Connection	connector plug DIN 43 650
Protection class	IP 65

Fill level switch W

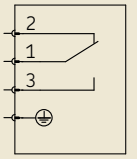
Reservoir capacity	L3[kg] [mm]
6	150
15	400
30	370

Fill level switch W





Switch position at minimum



Switch position at maximum

Fill level monitoring
U2 ultrasonic sensor with 2 switching points

The ultrasonic sensor works with a piezo-ceramic element as a sonic transmitter and receiver. A decoupling layer is used to decouple the ultrasound from the acoustically thinner air medium. The ultrasonic transducer is embedded water-tight in foam in the sensor's housing. The active area of the ultrasonic sensor is designated as the detection area and is limited by the shortest sensing distance (A_1) and longest sensing distance (A_2). These values depend on the size of the transducer. The transducer transmits a sound burst and converts the echo back into voltage.

The integrated controller uses the echo time and speed of sound to calculate the distance between the minimum (A_2) and maximum (A_1) fill level.

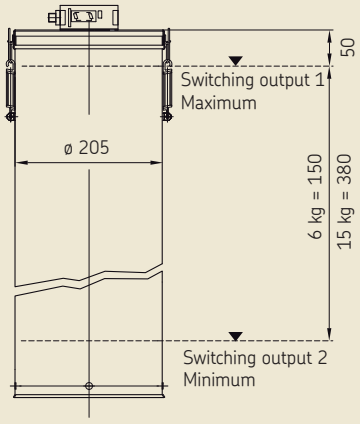
Note

The factory-set values can be changed by the customer at any time (teach-in).

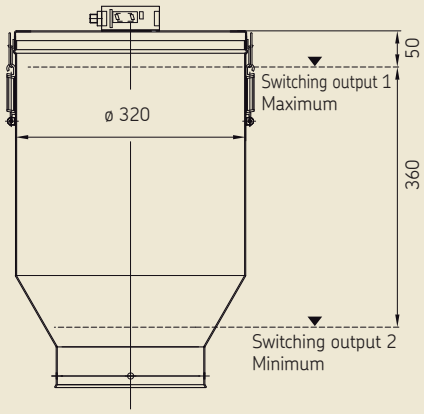
Contact box is not part of the shipment. Available for seperate order.

Fill level switch U2 with 2 switching points

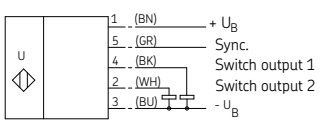
Reservoir design 6 kg and 15 kg



Reservoir design 30 kg

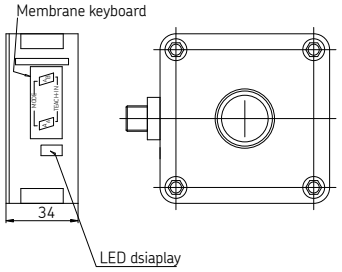


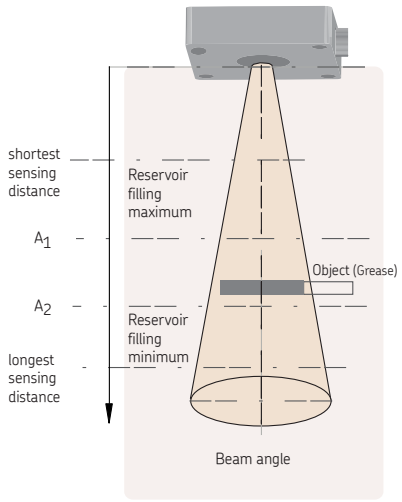
Standard symbol/connection:



Plug connector V15

Membrane keyboard





U2 Ultrasonic sensor characteristics

Design:
Ultrasonic sensor with two adjustable switching points (maximum, minimum)

Form of contact . . . . . pnp, choice of NO-contact/NC contact
Ambient temperature. . . . . -25 °C to +70 °C

Indicator
Yellow LED 1 . . . . . **constant**: state of switching output 1 / **flashing**: teach-in function
Yellow LED 2 . . . . . **constant**: state of switching output 2 / **flashing**: teach-in function
Red LED . . . . . normal operation: "fault"/no lubricant detected

Electrical data
Operating voltage . . . . . 10 to 30 V DC, ripple 10%
No-load current I_0 . . . . . ≤ 50 mA
Protection class . . . . . IP 65
Connection . . . . . V15 connector socket (12Mx1), 5-pin

Description	Order No.
Contact box (not part of the shipment)	**24-1882-2076**

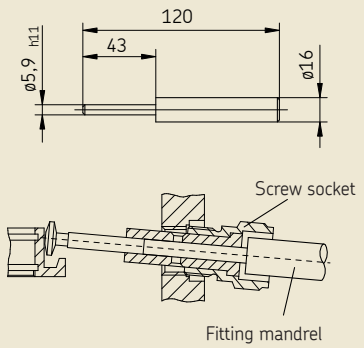
Accessories

(ordered separately)

Fitting mandrel (for installing a pump element)

Description	Order No.
Fitting mandrel	**44-1827-2010**

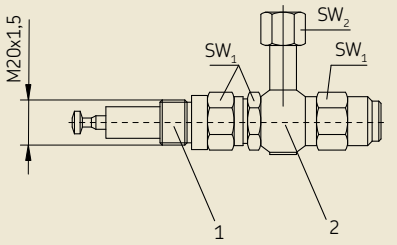
Fitting mandrel



Pump element with ring piece (for installing a pump element)

Description	Piston	WAF_1 [kg/each]	WAF_2	Weight	Order No.	Ø
Pump element (pos.1 in figure)	6 mm	24	-	0.26	**24-1557-3680**	
	8 mm	24	-	0.26	**24-1557-3681**	
	10 mm	24	-	0.28	**24-1557-3683**	
Ring piece (pos.2 in figure)	6 mm	-	14	0.10	**24-2255-2003**	
	8 mm	-	17	0.08	**24-2255-2004**	
Tube diameter	10 mm	-	19	0.10	**24-2255-2005**	

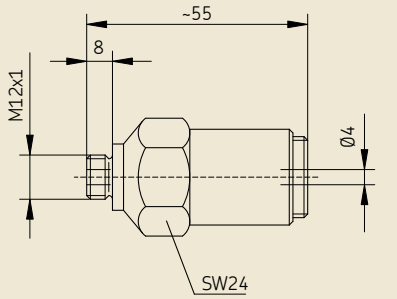
Pump element



Pressure regulating valves for grease (for insertion into pump elements)

Set pressure [bar]	Weight [kg/each]	Order No.
50		**24-2103-2273**
100		**24-2103-2344**
125		**24-2103-2345**
150	0.13	**24-2103-2342**
175		**24-2103-2272**
200		**24-2103-2346**
350		**24-2103-2271**

Pressure regulating valve

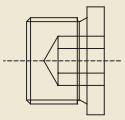


Screw plug

(for closing unused pump outlets)

Design	Weight kg/each	Order No.
M20x1.5	0.04	**95-1520-0908**

Screw plug

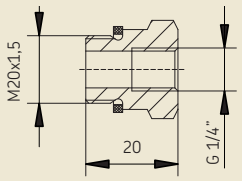


Threaded socket for grease recirculation

(in place of a pump element to recirculate grease into pump housing)

Design	Order No.
Steel, galvanized surface, with copper washer	**24-1755-2003**

Threaded socket

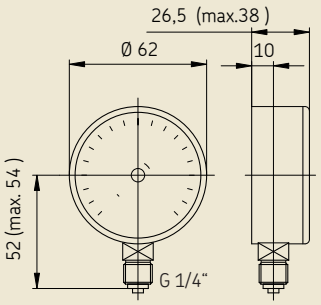


Pressure gauge

Indicating range	Order No.
0 to 250 bar 0 to 3600 psi	169-125-0000
to 400 bar	169-140-001
Washer [1])	248-610.02

1) Washer must be ordered separately for each pressure gauge.

Pressure gauge



Pressure gauge screw

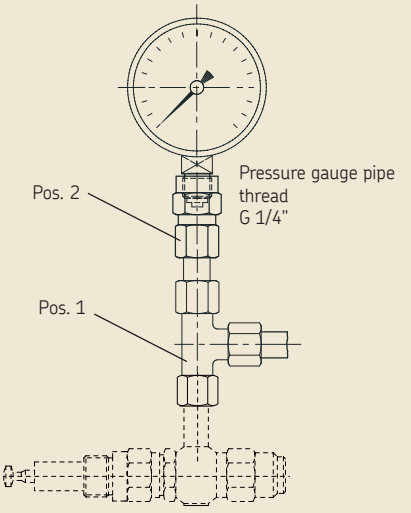
Pos. 1 **elbow fitting, directionally adjustable, according to DIN 2353**

Tube external diameter	Thread	Order No.
6 mm	M 12x1.5	443-406-061
8 mm	M 14x1.5	443-408-081
10 mm	M 16x1.5	443-410-101

Pos. 2 **Pressure gauge screw**

Tube external diameter	Thread	Order No.
6 mm	M 12x1.5	441-406-061
8 mm	M 14x1.5	96-0308-0060
10 mm	M 16x1.5	96-0310-0060

Pressure gauge screws

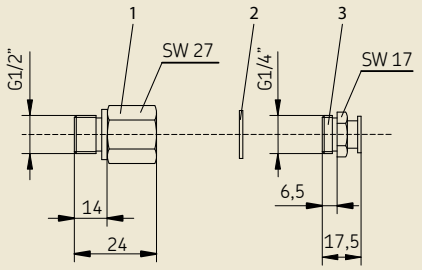


Reduction fitting with flat-type lubricant nipple for filling device

(for connecting a manual grease press)

Pos.	Description	Order No.
1	Reduction fitting RI 1/2x1/4 VZK EO	**401-016-132**
2	Washer A 17x21 DIN 7603 CU	**DIN 7603A14x18Cu**
3	Flat-type lubricant nipple AG 1/4-16 DIN 3404	**96-0002-0053**

Filling device with lubricant nipple

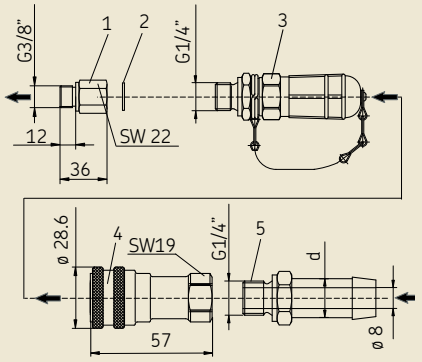


Filling device - quick-action coupling

(for connecting an automatic filling device)

Pos.	Description	Order No.
1	Reduction fitting RI 3/8x1/4 VZK EO	**96-3120-0058**
2	Washer A 17x21 DIN 7603 CU	**DIN 7603A17x21CU**
3	Filler socket	**995-000-705**
4	Coupling socket (for refill connection)	**995-001-500**
5	Hose fitting for connection to coupling socket Diameter (d) 13 mm Diameter (d) 16 mm	 **857-760-007** **857-870-002**

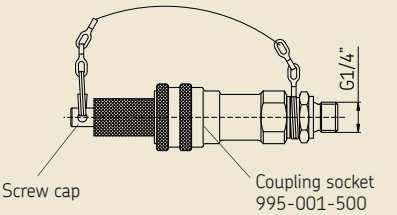
Filling device with quick-action coupling



Coupling socket with cap for installation on a topping-up pump

Description	Order No.
Coupling socket with cap	**995-001-509**

Coupling socket with cap



Manual topping-up pumps

Description	Order No.
With truck for 25 kg drum for 50 kg drum	 **169-000-042** **169-000-054**
Without truck for 25 kg drum	 **169-000-342**
Matching filler socket	**995-000-705**

Technical data

Delivery rate . . . . . ~ 40 cm^3/stroke

1) *Note* *A generic pump is depicted; the actual pumps may differ in appearance.*

Topping-up pump [1)]

Explanation of order codes

Order example: **FB 15 U2 1M 06 B 10 08 06 B D 0001 AG 07**

Pump type **FB**

Reservoir capacity
06 = 6 kg; **15** = 15 kg; **30** = 30 kg

Fill level control/fill level switch
X = reservoir without fill level control/fill level switch
For grease:
G = visual fill level control (dip stick)
E = fill level switch, 1 switching point (min.)
F = fill level switch, 2 switching points (min., max.)
H = fill level switch, 3 switching points (min., min. pre-warning, max.)
A = fill level switch, 3 switching points (min., min. pre-warning, max.)
J = fill level switch, 4 switching points (min., min. pre-warning, max. p
For oil
S = visual fill level control (sight glass)
W = reed contact, 1 switching point (min.)
For grease and oil
U2 = ultrasonic sensor, 2 switching points (min., max.)

Drive type
1M = motor drive with double gear reduction
2M = motor drive with single gear reduction

Drive speed
1M : **06** = 105:1; **07** = 288:1; **08** = 720:1
2M : **04** = 45:1

Drive position see pages 4 and 5
1M = **B** or **E** (E for 6 and 15 kg reservoir only); 2M = **H**

Number of pump elements
Number of pump elements, piston Ø 6 mm
Number of pump elements, piston Ø 8 mm
Number of pump elements, piston Ø 10 mm

$\Sigma \leq 24$

Tube connection
A-tube - Ø 6 mm; **B**-tube - Ø 8 mm; **C**-tube - Ø 10 mm; **D**- 1/4 NPT-internal thread

D = modification letter

Design key **0001** => basic design

Motor data /protection class
Motor data order code for rated speed, frequency, rated power, rated voltage, and rated current
(see key motor data table, 1M and 2M, on pages 4 and 5)

Motor protection class
07 = IP55-F; **13** = Ex e IIC T3-IP55-F; **34** = Ex de IIC T4-IP55-F (other specifications available on request)

Order example: For a pump unit of type **FB** with a 15 kg reservoir (**15**), with ultrasonic sensor (**U2**), drive type 1M (**1M**) with a drive speed 06 (105:1) (**06**), drive position B (**B**), 10 pump elements with Ø 6 mm (**10**), 8 pump elements with Ø 8 mm (**08**), 6 pump elements with Ø 10 mm (**06**), tube connection B with Ø 8mm (**B**), modification letter D (**D**), basic design (**0001**), motor values (1M) for rated speed 1000 rpm, rated voltage 230/400 V (**AG**), protection class IP55 (**07**), the order number is: **FB 15 U2 1M 06 B 10 08 06 B D 0001 AG 07**.

Order number: 1-3026-EN
Subject to change without notice. (7/2014)

Important information on product usage
All products from SKF may be used only for their intended purpose as described in this brochure and the operating instructions. If operating instructions are supplied together with the products, they must be read and followed.
Not all lubricants can be fed using centralized lubrication systems. SKF can, on request, inspect the feedability of the lubricant selected by the user in centralized lubrication systems. Lubrication systems and their components manufactured by SKF are not approved for use in conjunction with gases, liquefied gases, pressurized gases in solution, vapors or such fluids whose vapor pressure exceeds normal atmospheric pressure (1013 mbar) by more than 0.5 bar at their maximum permissible temperature.In particular, we call your attention to the fact that hazardous materials of any kind, especially the materials classified as hazardous by EC Directive 67/548/EEC, Article 2, Para. 2, may only be filled into SKF centralized lubrication systems and components and delivered and/or distributed with the same after consultation with and written approval from SKF.

Brochure note

1-3025-EN	FF multiline pump unit
951-170-201-EN	Operating Instructions for FF/FB multiline pump unit
1-3030-EN	Reservoir pump units of the KFG series for industrial use
1-3034-EN	Reservoir pump units of the KFG series for rotary application
1-3035-EN	Reservoir pump units of the KFG series for use in vehicles

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