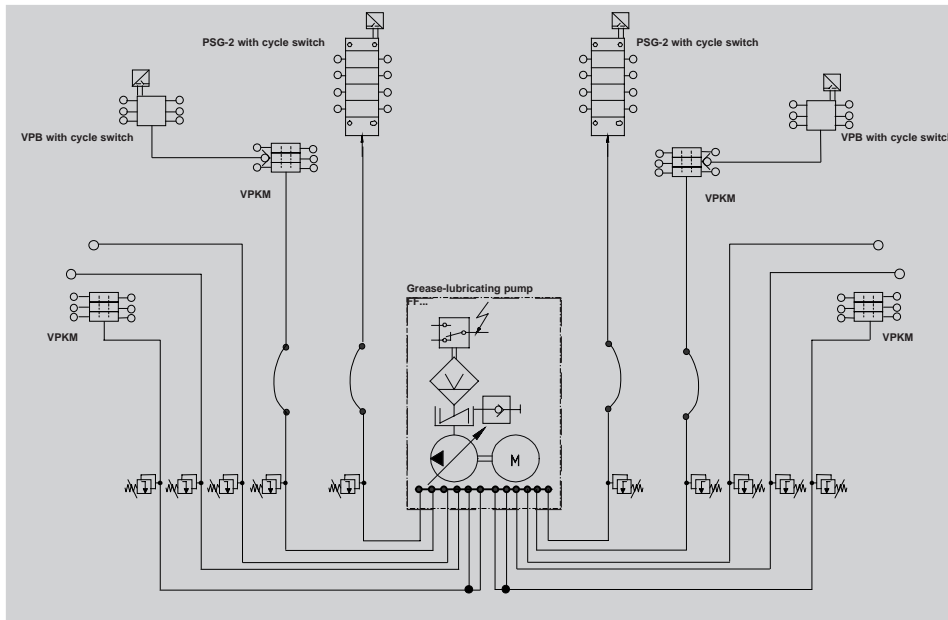


# Grease-lubricating pump FF...

DSK 2-008-00 E (01.03)

electrically operated, for small and medium-sized multiple-line and progressive systems



FF

## Specification

- **VOGEL fluidtec** Grease-lubricating pumps FF... are available with different three-phase motors, with 4 or 10 kg grease containers as well as with or without filling level control
- High operational pressure (up to 350 bar) possible
- Up to 12 individually adjustable pump elements (= outlets) with various delivery volumes and pipe connections  
Centralized lubrication system with direct lubrication position connection
- Max. 10 cm<sup>3</sup> lubricant per minute and outlet  
Supply by progressive distributors
- Various delivery plungers (6 mm, 8 mm and 10 mm Ø) for various delivery amounts and operational pressures (350 bar, 200 bar and 125 bar)
- Pressure control valve (accessory) mounted on the pump element (protects the grease-lubricating pump against unpermitted pressure buildup)
- Screwed sealing plugs for unused integral thread
- **VOGEL fluidtec** Grease-lubricating pumps FF... can also be used as an oil pump

[www.vogel-fluidtec.de](http://www.vogel-fluidtec.de)



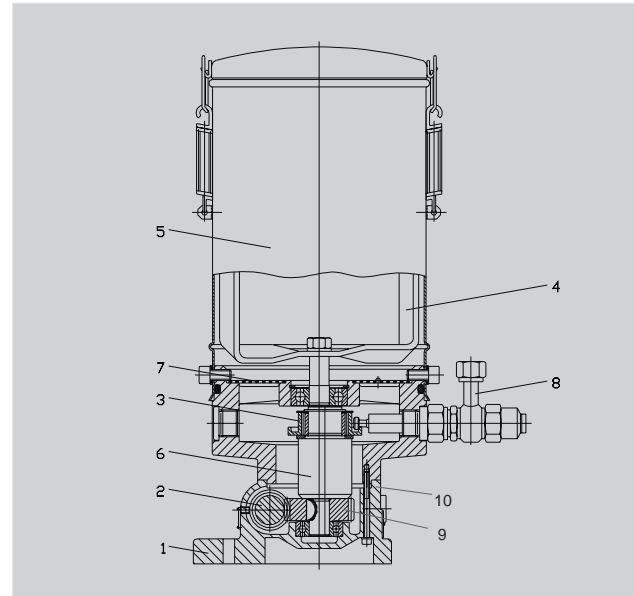
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## General

The grease-lubricating pump of the FF... series is suitable for small and medium-sized systems because of its flow rate and tank capacity.

The lubricant can be fed to the lubrication points directly or via a distributor (progressive distributor).



## Pump construction

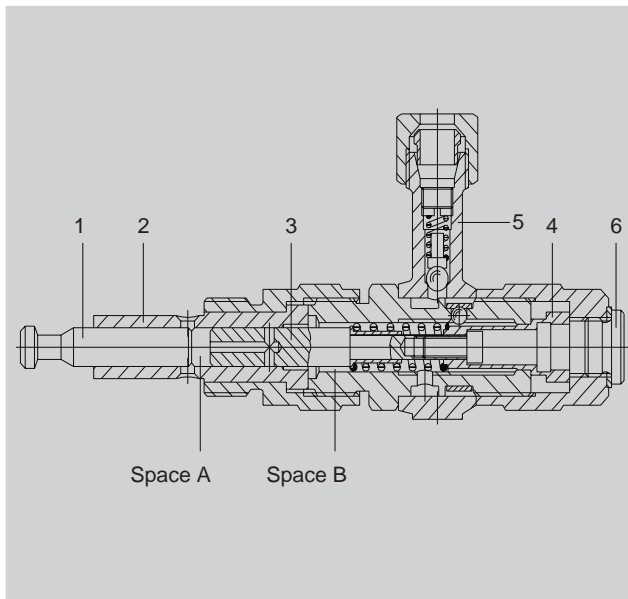
Position	Description
1	Housing with clamping collar
2	Motor shaft with screw
3	Guide ring
4	Agitator blade
5	Grease container
6	Eccentric motor shaft
7	Strainer
8	Pump element
9	Worm gear
10	Filler neck (G 3/8)

## Pump operation

The pump is operated by a worm gear transmission (5) consisting of a worm and the respective worm gear. The worm gear drives the eccentric motor shaft (6) with the fitted agitator blade (4). The agitator blade (4) pushes the lubricant through the strainer into the pump's inlet chamber.

The eccentric motor shaft (6) has a needle-bearing guide ring (3) to receive the delivery piston heads of the pump elements (8).

The suspended delivery pistons (into the guide ring) are forcibly moved by the eccentric movement of the guide ring (3).



By moving the delivery piston (1), the control piston (3) is also brought into its starting position by the spring tension.

A vacuum is created in space A resulting from the intake stroke movement of the delivery piston (1). By opening the suction hole, the lubricant reaches space A through the existing vacuum.

The pump element is prepared for the next lubrication step.

## Delivery volume adjustment on the pump element

The delivery volume of the pump element is determined by the stroke of the control piston. The screwed sealing plug (6) has to be removed when adjusting the delivery volume. Afterwards, the adjustment cap (4) can be turned.

The following settings apply:

- Turning to the right will result in decreased delivery volume
- Turning to the left will result in increased delivery volume

## Pump element construction with delivery volume adjustment

Position	Description
1	Delivery piston
2	Cylinder
3	Spring-loaded control piston
4	Adjustment cap
5	Ring-segment with non-return valve
6	Screwed sealing plug



### Note!

The delivery volume of the pump element must be reduced to 1/3 of the maximum delivery volume. This corresponds to turning the adjustment cap (4) by eight notches.

Delivery volume depending on the notch position on the pump element for piston diameters of 6 mm, 8 mm and 10 mm.

## Pump element operation

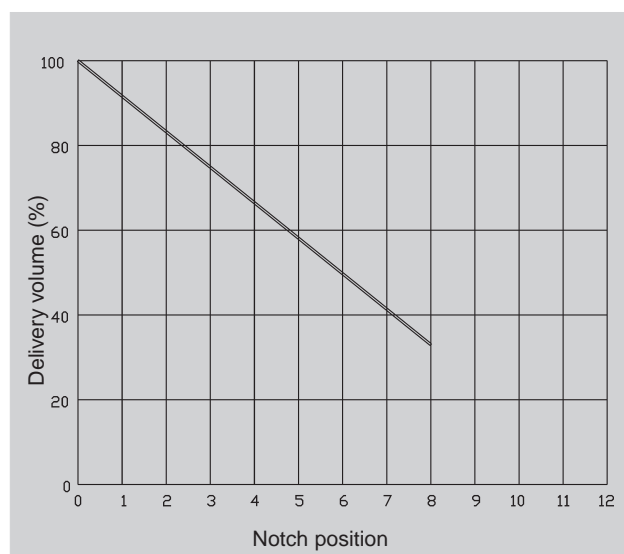
The delivery piston is forcibly activated as described in "Pump operation".

In the intake stroke position (as diagrammed) the cross hole of the control piston (3) is closed.

At the beginning of the pressure stroke, the delivery piston (1) closes the suction hole. The suctioned lubricant in space A is pressed against the spring-loaded control piston (3). The cross hole in the control piston (3) is opened.

The lubricant reaches space B under pressure over the lengthwise and cross hole of the control piston (3) and from there, over the ring canal and the non-return valve (5) to the outlet.

After the resulting pressure stroke, the intake stroke of the delivery piston (1) begins.



## Characteristics

### Lubricating pump FF ... 1M/2M

#### General

Mounting position ..... vertical ambient  
and lubricant temperature range .....  
..... -15 °C to + 40 °C<sup>1)</sup>  
Reservoir ..... for ca. 4 or 10 kg  
Amount of pump elements ..... 1 to 12  
Filling ..... via filler neck G 3/8  
Empty weight ..... FF 04 ca. 15 kg  
..... FF 10 ca. 20.5 kg

#### Gearbox

Type ..... worm gear  
**1 M** ..... two-stage  
**2 M** ..... one-stage translations  
1 M ..... 80 : 1; 150 : 1; 300 : 1; 600 : 1  
2 M ..... 33 : 1

#### Motor

see Table page 6 and 8 as well as type plate.

#### Pump

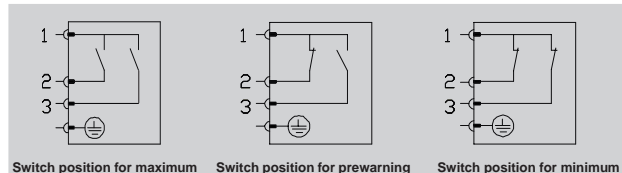
Type ..... multi-piston pump with 1 to 12 outlets

Working pressure for pump elements with piston diameter of  
6 mm ..... max. 350 bar  
8 mm ..... max. 200 bar  
10 mm ..... max. 125 bar  
Lubricants ..... Mineral oil or environmentally  
compatible oil starting with ISO VG 46 to the grease type NLGI  
Class 3 (please contact regarding synthetic oil types)  
Operating viscosity (oil) .....  $\geq 50 \text{ mm}^2/\text{s}$   
Worked penetration (grease) .....  $> 220 \text{ 1/10 mm}$

Delivery volume of the pump elements .....  
Piston Ø 6 .....  $0.027 \text{ to } 0.08 \text{ cm}^3/\text{stroke}$   
Piston Ø 8 .....  $0.05 \text{ to } 0.15 \text{ cm}^3/\text{stroke}$   
Piston Ø 10 .....  $0.077 \text{ to } 0.23 \text{ cm}^3/\text{stroke}$

## Level switch specifications

### Level indicator A



Delivery is also possible with modified contact functions

Specification ..... Microswitch; dip stick  
Switched current max. .... 15 A for AC  
..... (with inductive load 0.25 A for DC)  
Switching voltage max. .... 250 V DC - 380 V AC

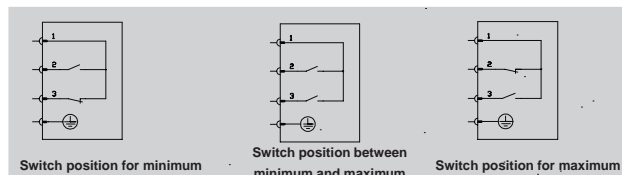
Switch specification ..... 3 switching points (closer)  
1. *max. filling level* ..... (contact 1+2 open; contact 1+3 open)  
2. *Filling level prewarning* ..... (contact 1+2 closed; contact 1+3 open)  
3. *min. filling level* ..... (contact 1+2 closed; contact 1+3 closed)  
Connection via connector ..... connector DIN 43 650  
Type of protection ..... IP 54  
opt. Filling level display via dip stick (grease overflow plate)

### Level indicator E



Specification ..... reed contact  
Switch specification ..... 1 switching point: min. (changeover switch)  
Switching capacity max. .... 60 W/VA  
Switching voltage max. .... 230 V AC/DC  
Connection via connector ..... connector DIN 43 650  
Type of protection connector/plug socket ..... IP 65

### Level indicator F

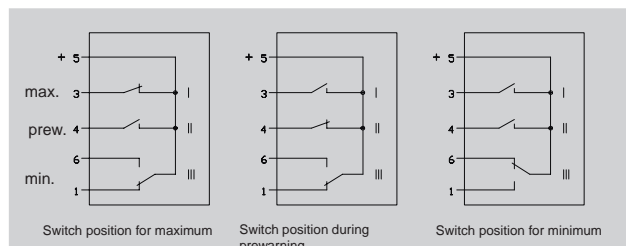


Specification ..... reed contact  
Switch specification ..... 2 switching points (min. - max.)  
Switched current max. .... 1 A for AC/DC  
Switching voltage max. .... 42 V AC/DC  
Connection via connector ..... connector DIN 43 650  
Type of protection connector/plug socket ..... IP 65

1) With higher ambient temperature, note that there will be a reduction in (motor) performance of ca. 1 % per Kelvin.

**Level indicator G**

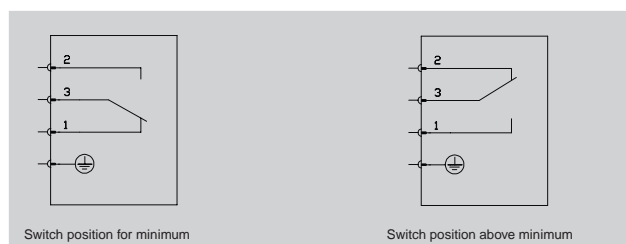
Specification ..... optical filling level control (dip stick)

**Level indicator H**

Specification ..... reed contact  
 Switching capacity max. .... 60 W/VA  
 Switching voltage max. .... 10 -30 V AC/DC  
 Switch specification ..... 3 switching points  
 1. *max. filling level* ..... (closer)  
 2. *filling level prewarning* ..... (closer)  
 3. *min. filling level* ..... (changeover switch)  
 Connection via connector ..... connector DIN 43 651  
 Type of protection connector/plug socket ..... IP 65

**Level indicator S**

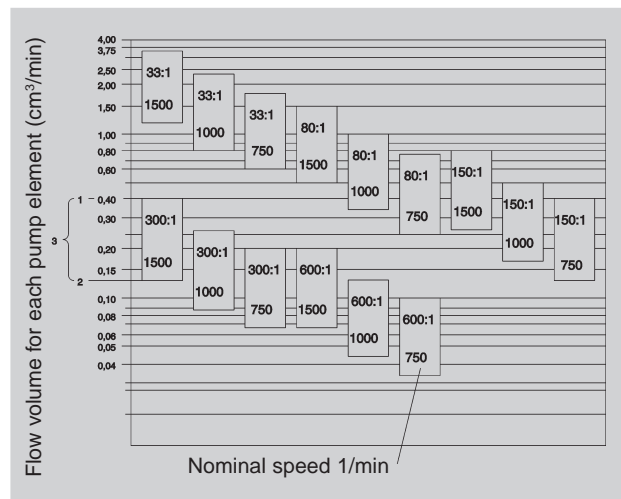
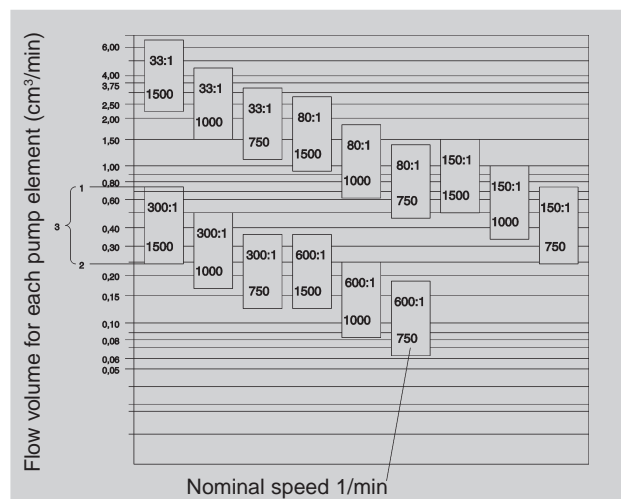
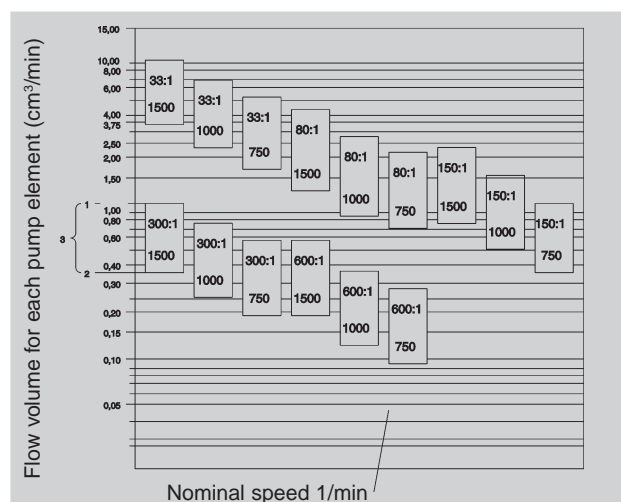
Specification ..... for oil; with visual control  
 (sight glass; filler neck with strainer on the cover)

**Level indicator W**

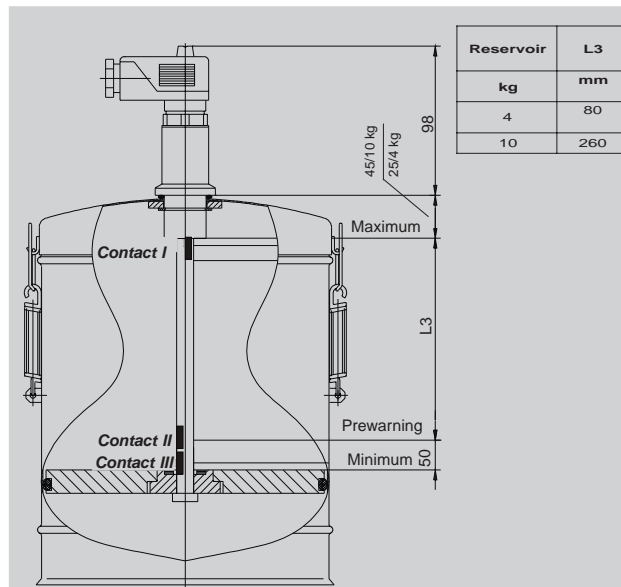
Specification: ..... for oil; with level switch reed contact  
 Switching capacity max. .... 10 W/40VA  
 Switching voltage max. .... 250 V AC/DC  
 Switch specification ..... 1 switching point  
*min. filling level* ..... (changeover switch)  
 with filler neck (strainer) on the cover  
 Connection via connector ..... connector DIN 43 650  
 Type of protection connector/plug socket ..... IP 65

## Delivery volume of the pump element with piston diameters 6, 8 and 10 mm

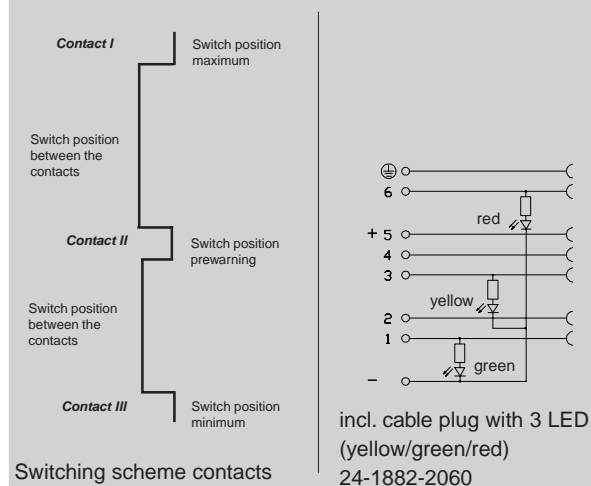
Delivery volume for each pump element depending on the rotational speed of the motor shaft.

**Piston diameter 6 mm****Piston diameter 8 mm****Piston diameter 10 mm**

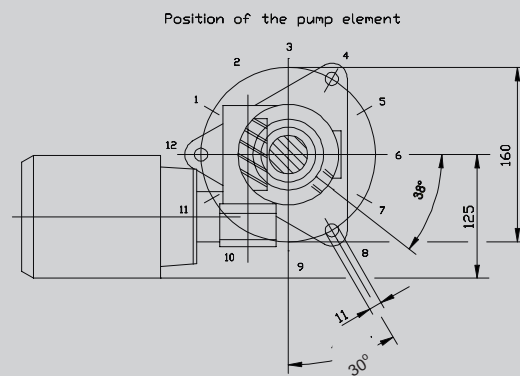
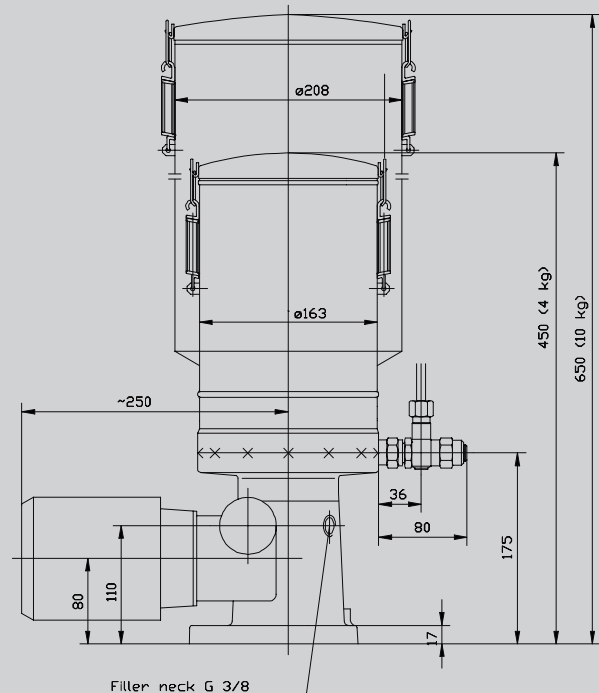
## Grease-lubricating pump FF..1M...illustration



Reservoir model with level switch "H"



Switching scheme contacts



Normal speed (min <sup>-1</sup> )	Frequency (Hz)	Normal power (kw)	Normal voltage (V)	Normal current (A)	Order no.
1000	50	0,09	230 / 400	0,80 / 0,46	AG
1000	50	0,09	290 / 500	0,64 / 0,37	AL
1000	50	0,09	400 / 690	0,46 / 0,26	AP
1500	50	0,18	230 / 400	1,13 / 0,65	MA
1500	50	0,18	290 / 500	0,90 / 0,52	AK
1500	50	0,18	400 / 690	0,65 / 1,07	AO

### Note!

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

## Oil level monitoring

When using the FF pump as an oil lubrication pump, the reservoir can be equipped with an oil level monitor (level switch "W"). This may have either one (basic design "Contact min.", two or three switching points. The specification of the oil level monitor is made to customer specifications corresponding to receipt of order. Additionally, a special filling device and an optical filling level display can be installed.

## Ordering example for grease-lubricating pump FF..1M...

### Type

Ordering example:

FF 04 X 1M 08 / 08 04 00 AA 0001 MA06

#### Type

##### Tank capacity

04 = 4 kg; 10 = 10 kg

##### Level switch

X = reservoir without level switch

A = level switch; microswitch; dip stick

E = level switch; 1 switching point (min. changeover switch)

F = level switch; reed contact; 2 switching points

G = opt. filling level control (dip stick)

H = level switch; reed contact, 3 switching points

1. max. filling level (closer)

2. filling level prewarning (closer)

3. min. filling level (changeover switch)

S = for oil; with visual control (sight glass)

W = for oil; reed contact; 1 switching point min.; changeover switch

#### Type of drive

##### Delivery index

08 = 80:1; 15 = 150:1; 30 = 300:1; 60 = 600:1

##### Drive position (see ill.)

##### Amount of pump elements piston-Ø 6 mm

##### Amount of pump elements piston-Ø 8 mm

$$\sum \leq 12$$

##### Amount of pump elements piston-Ø 10 mm

##### Pipe connection

A-pipe-Ø 6 mm; B-pipe-Ø 8 mm; C-pipe-Ø 10 mm; D-1/4 NPT-internal thread

##### A= modification letter

##### Model identification number

0001 = Basic model with adjustable pump elements

##### Nominal speed, frequency, nominal power, nominal voltage and nominal current (-see Table page 6)

##### Type of protection (motor)

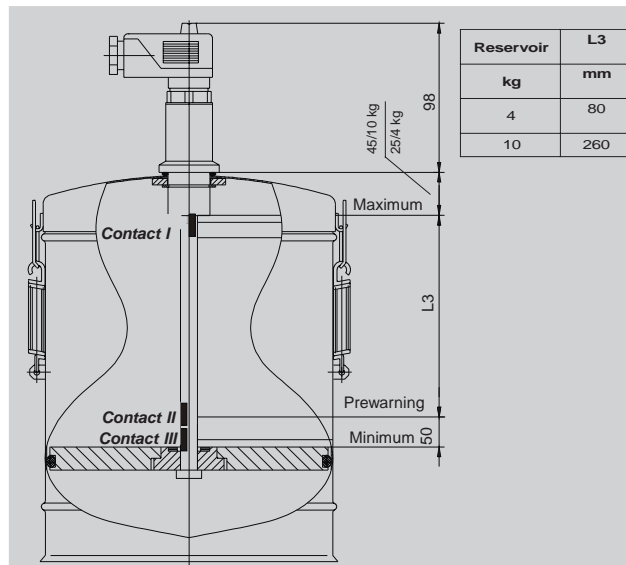
06 = IP54; 13 = EEx eIIT3 IP55; 34 = EEx dIICT4 IP55

### Ordering example

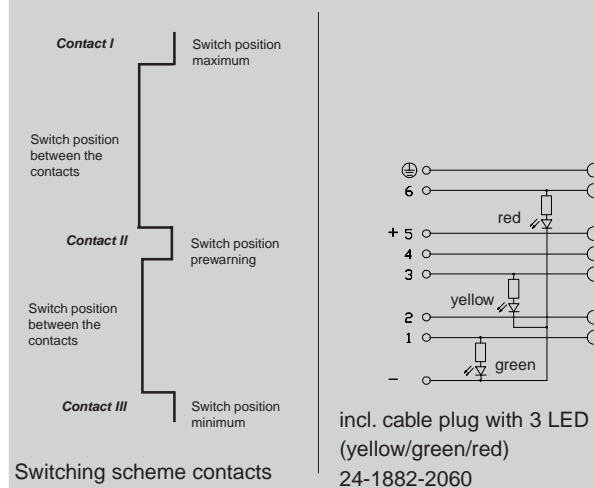
for a pump unit type FF with 4 kg-reservoir, without level switch, motor with drive levels, delivery index 08 (80:1), 8 pump elements with Ø 6 mm, 4 pump elements with Ø 8 mm, 0 pump elements with Ø 10 mm, pipe connection Ø 6 mm, modification letter A, basic design with adjustable pump elements, motor value of 1500 min<sup>-1</sup>, 230/400 V AC, 1.13/0.65 A, type of protection IP54.

FF04X1M08/080400AA0001MA06

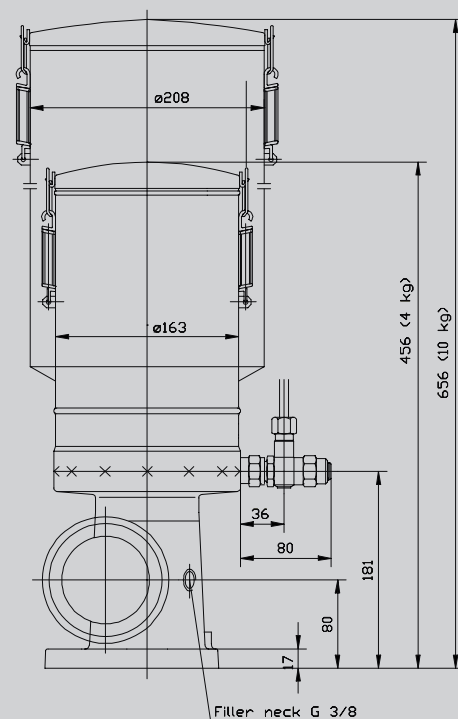
## Grease-lubricating pump FF..2M...illustration



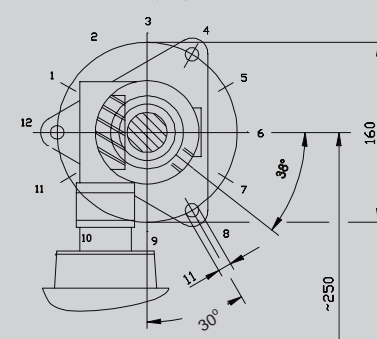
Reservoir model with level switch "H"



Switching scheme contacts



Position of the pump element



Nominal speed (min <sup>-1</sup> )	Freq- uency (Hz)	Nominal power (kw)	Nominal voltage (V)	Nominal current (A)	order no.
750	50	0,12	230 / 400	1,27 / 0,73	AH
750	50	0,12	290 / 500	0,34 / 0,58	AM
750	50	0,12	400 / 690	0,73 / 1,26	AQ
1000	50	0,25	230 / 400	1,91 / 1,10	AG
1000	50	0,25	290 / 500	0,51 / 0,88	AL
1000	50	0,25	400 / 690	0,10 / 0,17	AP

## Oil level monitoring

When using the FF pump as an oil lubrication pump, the reservoir can be equipped with an oil level monitor (level switch "W"). This may have either one (basic design "Contact min."), two or three switching points. The specification of the oil level monitor is made to customer-specifications corresponding to receipt of order. Additionally, a special filling device and an optical filling level display can be installed.

### Note!

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



## Ordering example for grease-lubricating pump FF..2M...

### Type

Ordering example:

**FF 04 X 2M 06 /08 04 00 AA 0001 AG 06**

#### Type

##### Tank capacity

04 = 4 kg; 10 = 10 kg

##### Level switch

X = reservoir without level switch

A = level switch; microswitch; dip stick

E = level switch; 1 switching point (min. changeover switch)

F = level switch; reed contact; 2 switching points

G = opt. filling level control (dip stick)

H = level switch; reed contact, 3 switching points

1. max. filling level (closer)

2. filling level prewarning (closer)

3. min. filling level (changeover switch)

S = for oil; with visual control (sight glass)

W = for oil; reed contact; 1 switching point min.; changeover switch

#### Type of

##### Delivery index

06 = 33:1

##### Drive position (see ill.)

##### Amount of pump elements piston-Ø 6 mm

##### Amount of pump elements piston-Ø 8 mm

##### Amount of pump elements piston-Ø 10 mm

$$\sum \leq 12$$

##### Pipe connection

A-pipe-Ø 6 mm; B-pipe-Ø 8 mm; C-pipe-Ø 10 mm; D-1/4 NPT-internal thread

##### A= modification letter

##### Model identification number

0001 = Basic model with adjustable pump elements

##### Nominal speed, frequency, nominal power, nominal voltage and nominal current (-see Table page 8)

##### Type of protection (motor)

06 = IP54; 13 = EEx eII T3 IP55; 34 = EEx dIICT4 IP55

### Ordering example

for a pump unit type FF with 4 kg-reservoir, without level switch, motor with drive levels, delivery index 06 (33:1), 8 pump elements with Ø 6 mm, 4 pump elements with Ø 8 mm, 0 pump elements with Ø 10 mm, pipe connection Ø 6 mm, modification letter A, basic design with adjustable pump elements, motor value of 1000 min<sup>-1</sup>, 230/400 V AC, 1.91/1,10 A, type of protection IP54.

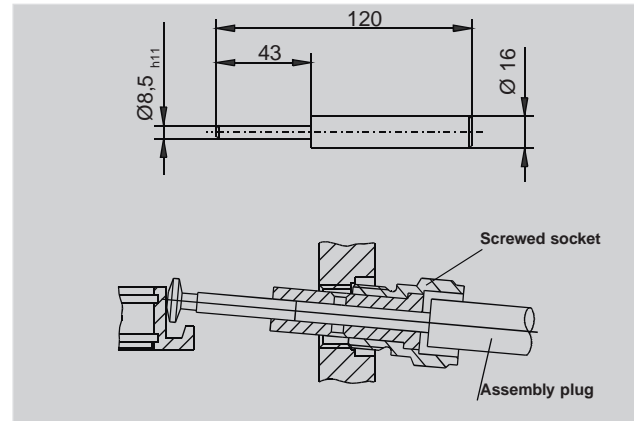
**FF04X2M06/080400AA0001AG06**

## Accessories

(separately ordered)

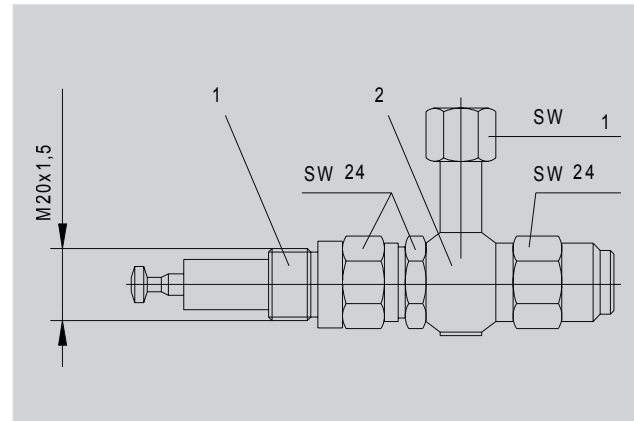
### Assembly plug

Application	for installing a pump element
Order no.	44-1827-2010



### Pump element with ring-segment

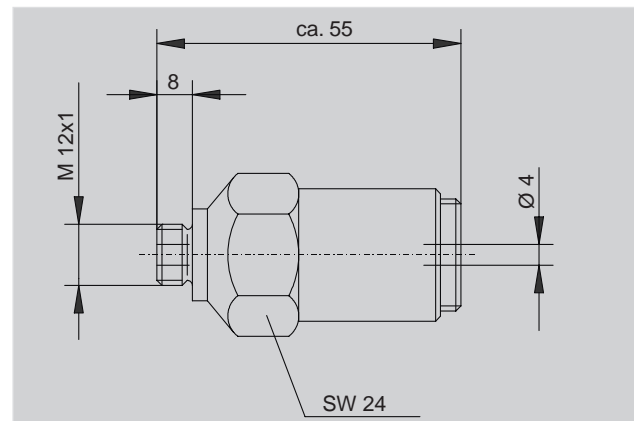
Application	For later installation or replacement			
	SW <sub>1</sub> ( mm )	SW <sub>2</sub> ( mm )	Weight ( kg/St )	Order no.
<b>Pump element ( Pos.1 )</b>				
Piston diameter 6mm	24	-	0,259	24-1557-3680
Piston diameter 8mm	24	-	0,264	24-1557-3681
Piston diameter 10mm	24	-	0,275	24-1557-3683
<b>Ring segment ( Pos.2 )</b>				
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



### Pressure control valve

(to insert into the pump element)

Application		
Set pressure ( bar )	Weight ( kg/St )	Order no.
50	0,13	24-2103-2273
100	0,13	24-2103-2344
150	0,13	24-2103-2342
175	0,13	24-2103-2272
350	0,13	24-2103-2271



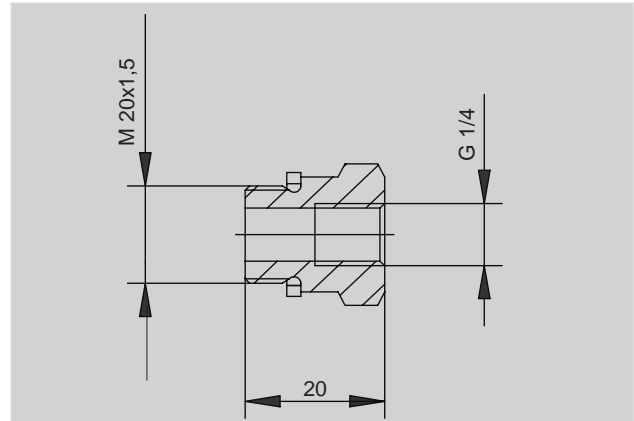
## Accessories

(separately ordered)

### Screwed socket for grease recirculation

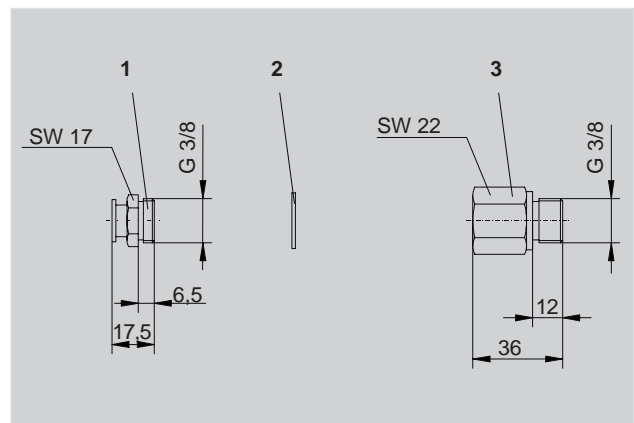
(at the position of a pump element)

Application	for grease recirculation into the pump housing
Specification	Steel, galvanized surface; with Cu-seal
Order no.	24-1755-2003



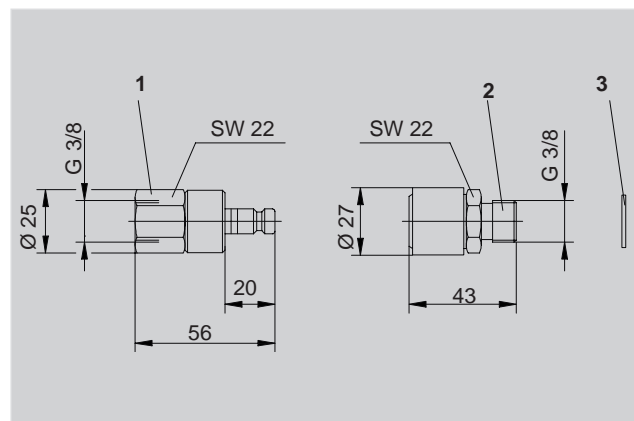
### Filling equipment - Reducing spout with lubricating nipple

Application	for connecting a manual grease press
<b>Designation</b>	<b>Part number</b>
<b>Lubricating nipple ( Pos. 1 )</b>	
<b>AG 1/4-16 DIN 3404</b>	96-0002-0053
<b>Conical nipple ( Pos.2 )</b>	
<b>A 17x21 DIN 7603 CU</b>	95-1721-7603
<b>Reducing fittings ( Pos.3 )</b>	
<b>RI 3/8x1/4 VZK EO</b>	96-3120-058



### Filling equipment - rapid action hose coupling

Application		for connecting automatic filling equipment	
Normal width DN ( mm )	SW	Weight ( kg/St. )	Order no.
Rapid action hose coupling without non-return valve ( Pos. 1 )			
6,0	22	0,06	24-1020-2278
Rapid action hose coupling sleeve with non-return valve ( Pos.2 )			
7,0	22	0,08	24-1020-2158
Seal ring ( Cu ) (Pos.3 )			
			95-1721-7603



**Publication notes**

Operating manual for grease-lubricating pump FF...	DSB 2-010-00
Replacement parts lists for grease-lubricating pump FF...	DSE 2-008-00
Leaflet for grease pump	1-0107-3
Leaflet for progressive distributor VPKM	1-0107-1
Leaflet for progressive distributor VPBM	1-0107-1
Leaflet for progressive distributor VPG	1-0107-1
Leaflet for segment distributor PSG 2	DSK 0-003-02
Leaflet for segment distributor PSG 3	DSK 0-003-03

**Note:**

Products from VOGEL fluidtec GmbH may only be used as intended and according to regulations. If operating manuals have been supplied with the products, observe the instructions and information in these which specifically apply to equipment.

It is especially important that dangerous materials of any sort may only be filled into VOGEL central lubrication systems and components and/or distributed with them after consultation and with the written permission of VOGEL fluidtec GmbH. This applies especially to those materials which are classified as dangerous in EC Guideline 67/548/EEC, Article 2, Paragraph 2.

None of the products manufactured by VOGEL are permitted for use with gases, liquified gases, gases which are dissolved under pressure, vapors, and those fluids whose vapor pressure at the maximum permitted temperature is more than 0.5 bar above normal atmospheric pressure (1013 mbar).

Subject to changes



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