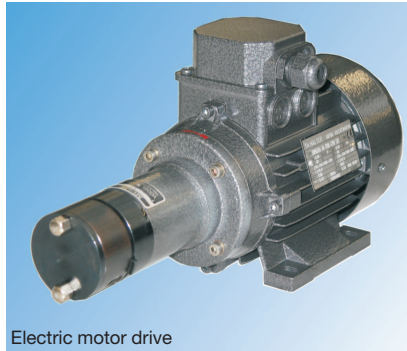


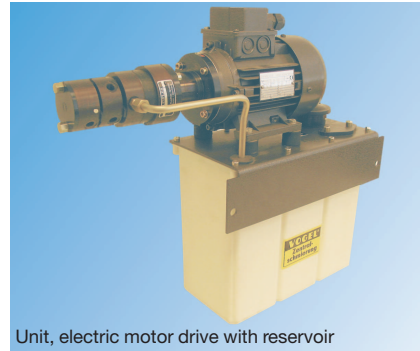
Multiline pumps and multiline units for oil and grease



Rotary drive



Electric motor drive



Unit, electric motor drive with reservoir

System description

The MULTIFLEX multiline pump is a positive-displacement pump with multiple outlet ports. The delivery rate is infinitely adjustable.

Special features

The MULTIFLEX multiline pump is a radial piston pump based on a modular design. As many as five pump elements with one, two or four outlet ports each can be "stacked" to reach an optimal number of outlet ports for the respective need. This simple stacked configuration naturally permits later expansion or reduction of the number of pump outlet ports.

The delivery rates of a pump element's ports are jointly adjustable from the outside. Stepless adjustability and a large range of speeds ensure an extremely broad range of delivery rates.

That also makes the pump extremely interesting for the supply of circulating lubrication systems designed for small amounts of lubricant (up to 30 ccm/min and outlet); or as a multicircuit pump for the supply of multiple, mutually independent lube circuits.

The pump can be optionally driven in both directions of rotation. The maximum operating pressure amounts to 63 bars, the maximum short-time pressure to 100 bars

The underlying design principle of the MULTIFLEX multiline pump permits equally good delivery of oil and grease based on mineral oil or synthetic substances.

How the pumps work

When the pump shaft rotates the two pump pistons move away from each other – due to their spring loading – all the way to their outer dead center (lying on a thrust collar). The control bore in the pump shaft connects the space between the two pump pistons to a lubricant inlet in the intermediate ring up until the outer dead center is reached. This is the suction phase.

When the pump shaft continues its rotation the elliptical thrust collar moves the pump pistons toward each other against the spring force until the inner dead center is reached.

The control bore in the pump shaft connects the space between the two pump pistons to the lubricant outlet in the pump ring up until the inner dead center is reached. This is the pressure phase.

The delivery rate is infinitely adjustable by the phase-control method with the help of the adjustment ring, i.e. the thrust collar's position is changed in respect to the position of the control bore in the pump shaft. The stroke of the two pistons remains the same in each adjustment phase; it exerts an effect, depending on the setting, in whole or only in part.

Design

The basic version of the MULTIFLEX multiline pump consists of a drive, intermediate ring with lubricant inlet, at least one pump element and a cover.

The pump element shown in Fig. 1 in the pressure phase consists of the pump ring (1), pump shaft (2) with the two radial pump pistons (3) and the thrust collar with an elliptical internal contour (4) which is permanently affixed to the adjustment ring (5).

The suction grooves and pressure bores are accommodated in the pump ring. The pump shaft – simultaneously the shaft that drives the next pump element via the engaged coupling – is a rotary slide valve. The two pump pistons are pressed by the spring (6) against the inside of the thrust collar.

Delivery rate

The delivery rate of MULTIFLEX pumps for oil and grease (reference viscosity: 140 mm²/s) is shown in Fig. 2 as a function of the drive speed and step-down ratio.

Figure 3 shows the achievable continuous operating pressure as a function of the service viscosity and number of piston strokes.

$$\text{Number of piston strokes } Z = \frac{\text{drive speed}}{\text{step-down ratio}}$$

The maximum operating pressure depends on the lubricant's service viscosity and the given number of piston strokes.

More than > 50 piston strokes per min. result in limitations on the permissible service viscosity.

The delivery rate of the individual pump elements can be reduced to a maximum of 1/3 their output.

Setting 0 = 1/3 delivery rate

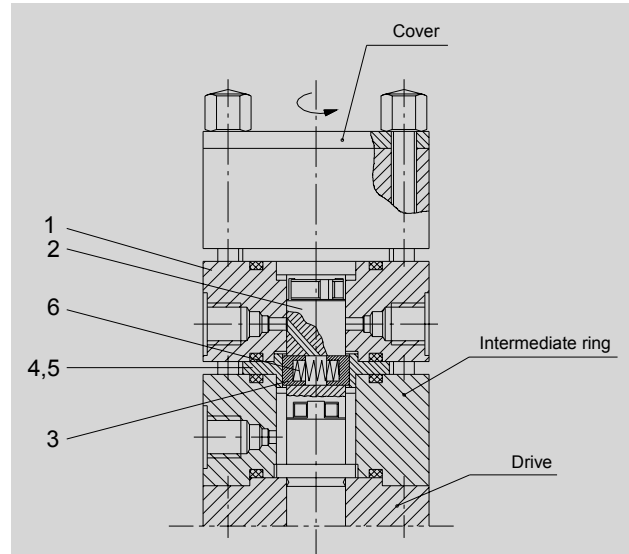


Fig. 1 Pump element in the pressure phase

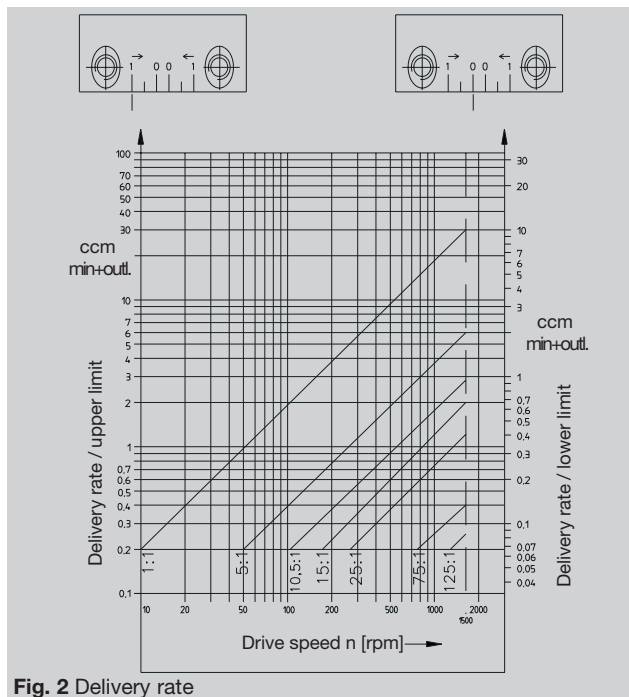


Fig. 2 Delivery rate

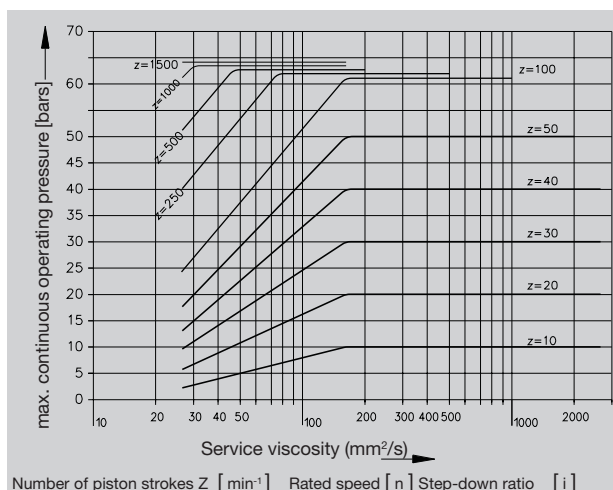


Fig. 3 Continuous operating pressure

Rotary drive, coaxial

Technical data

General information

Mounting position any

Ambient temperature - 15 °C to + 80 °C

Pump

Type radial piston pump

Operating pressure 63 bars ¹⁾

Short-time pressure 100 bars

Max. number of stackable pump elements 5

Outlets per pump element 1, 2 or 4

Delivery rate adjustment per pump element stepless

Max. delivery rate per outlet

and pump shaft revolution 0.02 ccm

Drive speed 10 to 1500 rpm

Direction of rotation clockwise or counterclockwise
(standard version clockwise)

Lubricant mineral oils ²⁾

Lubricant temperature range .. - 15 °C to + 80 °C

Service viscosity 25 to 2500 mm²/s

Suction head 500 mm

Inside suction-tubing diam. = ≥ 4 mm

1) = max. operating pressure – see Fig. 3, page 2.

2) Please inquire before using synthetic lubricants.

3) Optionally 1 to 5 pump elements as counted from drive.

4) Standard version.

See pages 22 – 23 for accessories and spare parts.

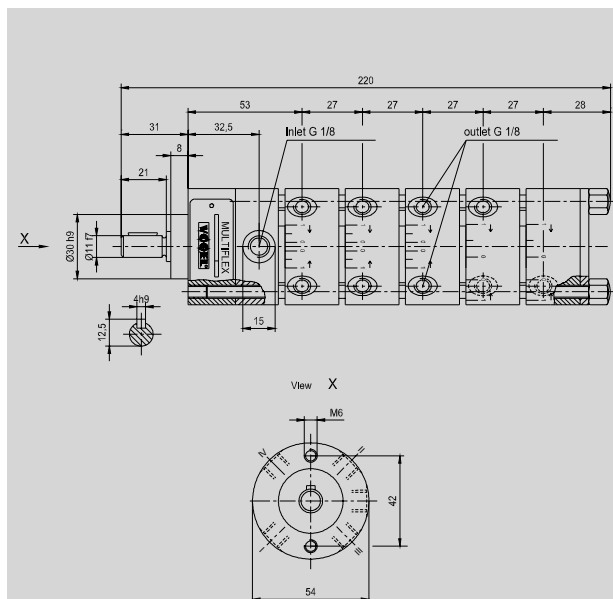


Fig. 4 Multiflex, rotary drive, coaxial

Order codes

Type	RA	1UA	00 / 42441	R	0001
Radial piston pump, size A					
Drive					
1UA = rotary, coaxial					
Step-down ratio					
00 = 1:1					
Number of pump elements ³⁾					
with indication of outlet ports per pump element					
1 = 1 outlet, 2 = 2 outlets, 4 = 4 outlets					
Direction of rotation					
R = clockwise ⁴⁾ , L = counterclockwise					
Version key					

Order example

Multiflex multiline pump **RA 1UA 00/42441 R 0001**, consisting of a radial piston pump, size A (**RA**), rotary drive, coaxial (**1UA**), step-down ratio 1:1 (**00**), with 4 pump elements, all in all with 11 outlet ports, consisting of pump element No. 1 with 4 outlet ports, pump element No. 2 with 4 outlet ports, pump element No. 3 with 2 outlet ports and pump element No. 4 with 1 outlet port (**42441**), clockwise direction of rotation (**R**) and version key (**0001**).

Rotary drive, with coaxial gears

Technical data

General information

Mounting position any

Ambient temperature - 15 °C to + 80 °C

Pump

Type radial piston pump

Operating pressure 63 bars ¹⁾

Short-time pressure 100 bars

Max. number of stackable pump elements 5

Outlets per pump element 1, 2 or 4

Delivery rate adjustment per pump element ... stepless

Max. delivery rate per outlet

and pump shaft revolution 0.02 ccm

Drive speed up to 3600 rpm

Direction of rotation clockwise or counterclockwise
(standard version clockwise)

Lubricant mineral oils ²⁾)

Lubricant temperature range .. - 15 °C to + 80 °C

Service viscosity 25 to 2500 mm²/s

Suction head 500 mm

Inside suction-tubing diam. ≥ 4 mm

Gears

Step-down ratio 5:1; 15:1 ; 25:1; 75:1; 125:1

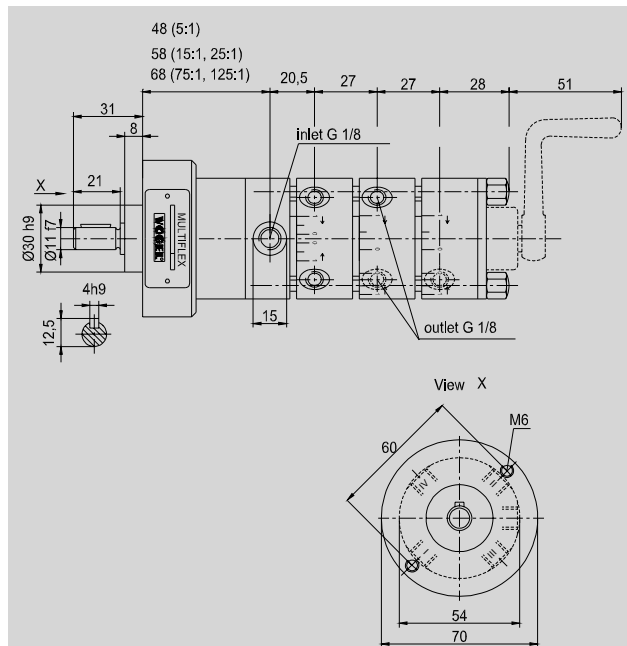


Fig. 5 Multiflex, rotary drive, with coaxial gears

Order codes

Type
Radial piston pump, size **A**

Drive
2UB = rotary, with coaxial gears

Step-down ratio
05 = 5:1; **15** = 15:1; **25** = 25:1;
75 = 75:1, **13** = 125

Number of pump elements ³⁾
with indication of outlet ports per pump element
1 = 1 outlet, **2** = 2 outlets, **4** = 4 outlets

Cover prelubrication
D = with cover prelubrication,
/ = without

Direction of rotation
R = clockwise ⁴⁾, **L** = counterclockwise

Version key

Order example

Multiflex multiline pump **RA 2UB15/442 D R 0001**, consisting of a radial piston pump, size A (**RA**), rotary drive, with coaxial gears (**2UB**), step-down ratio 15 : 1 (**15**), with 3 pump elements, all in all with 10 outlet ports, consisting of pump element No. 1 with 4 outlet ports, pump element No. 2 with 4 outlet ports, pump element No. 3 with 2 outlet ports (**442**), cover prelubrication (**D**), preset clockwise direction of rotation (**R**) and version key (**0001**).

1) = max. operating pressure – see Fig. 3, page 2.

2) Please inquire before using synthetic lubricants.

3) Optionally 1 to 5 pump elements as counted from drive.

4) Standard version.

See pages 22 – 23 for accessories and spare parts.

Rotary drive, with bevel gears

Technical data

General information

Mounting position any

Ambient temperature - 15 °C to + 80 °C

Pump

Type radial piston pump

Operating pressure 63 bars ¹⁾

Short-time pressure 100 bars

Max. number of stackable pump elements 5

Outlets per pump element 1, 2 or 4

Delivery rate adjustment per pump element stepless

Max. delivery rate per outlet

and pump shaft revolution 0.02 ccm

Drive speed 10 to 1500 rpm

Direction of rotation clockwise or counterclockwise
(standard version clockwise)

Lubricant mineral oils ²⁾

Lubricant temperature range .. - 15 °C to + 80 °C

Service viscosity 25 to 2500 mm²/s

Suction head 500 mm

Inside suction-tubing diam. ≥ 4 mm

Gears

Step-down ratio 10.5 : 1

Drive position A or B

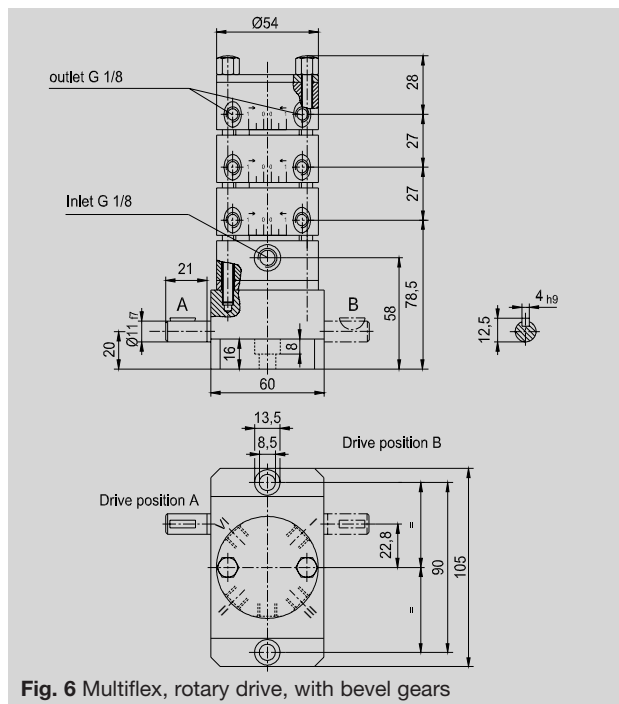


Fig. 6 Multiflex, rotary drive, with bevel gears

Order codes

	RA	3UA	01	A	42441	R	0001
Type							
Radial piston pump, size A							
Drive							
3UA = rotary, with bevel gears							
Step-down ratio							
01 = 10.5 : 1							
Drive position							
A or B							
Number of pump elements ³⁾							
with indication of outlet ports per pump element							
1 = 1 outlet, 2 = 2 outlets, 4 = 4 outlets							
Direction of rotation							
R = clockwise ⁴⁾ , L = counterclockwise							
Version key							

Order example

Multiflex multiline pump **RA 3UA 01 A 42441 R 0001**, consisting of a radial piston pump, size A (**RA**), rotary drive, with bevel gears (**3UA**), step-down ratio 10.5 : 1 (**01**), drive position A (**A**) with 5 pump elements, all in all with 15 outlet ports, consisting of pump element No. 1 with 4 outlet ports, pump element No. 2 with 2 outlet ports, pump element No. 3 with 4 outlet ports, pump element No. 4 with 4 outlet ports and pump element No. 5 with 1 outlet port (**42441**), clockwise direction of rotation (**R**) and version key (**0001**).

1) = max. operating pressure – see Fig. 3, page 2.

2) Please inquire before using synthetic lubricants.

3) Optionally 1 to 5 pump elements as counted from drive.

4) Standard version.

See pages 22 – 23 for accessories and spare parts.

Electric motor drive, coaxial

Technical data

General information

Mounting position any

Ambient temperature - 15 °C to + 60 °C

Pump

Type radial piston pump

Operating pressure 63 bars ¹⁾

Short-time pressure 100 bars

Max. number of stackable pump elements 5

Outlets per pump element 1, 2 or 4

Delivery rate adjustment per pump element stepless

Delivery rate per outlet port and 1360 rpm motor speed approx. 27.2 ccm/min.

Lubricant mineral oils ²⁾

Lubricant temperature range .. - 15 °C to + 80 °C

Service viscosity 25 to 2500 mm²/s

Suction head 500 mm

Inside suction-tubing diam. ≥ 4 mm

Motor

Type / size IM B34 / 63 C 90

Power 3-phase alternating voltage

Rated speed [rpm]	Frequency [Hz]	Rated output [kW]	Rated voltage [V]	Rated current [A]	Order code
1500	50	0,18	230/400	1,13/0,65	AF
1500	50	0,18	290/500	0,90/0,52	AK
1500	50	0,18	400/690	0,65/1,07	AO

Please note!

The motor data refer to three-phase motors made by the VEM company. Deviations are possible with motors from other manufacturers.

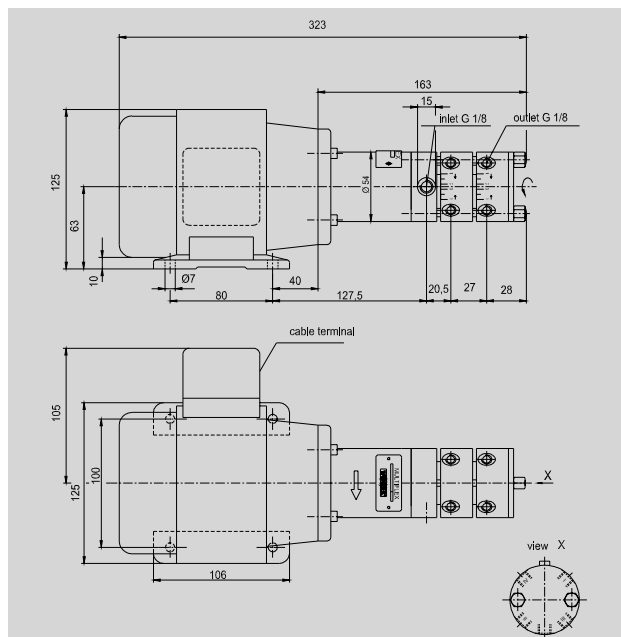


Fig. 7 Multiflex, electric motor drive, coaxial

Order codes

	RA 1M 00 /44421/R 0001 AF 07
Type	Radial piston pump, size A
Drive	1M = electric motor drive, coaxial
Step-down ratio	00 = 1 : 1
Number of pump elements ³⁾	with indication of outlet ports per pump element 1 = 1 outlet, 2 = 2 outlets, 4 = 4 outlets
Direction of rotation	R = clockwise L = counterclockwise (standard direction of rotation: see rotation arrow)
Version key	
Order code (motor)	(AF, AK, AO) (rated speed, frequency, rated output, rated voltage, rated current - see motor table)
Type of enclosure (motor)	07 = IP 55; 13 = EEx ellT3 IP55; 34 = EEx dellCT4 IP55

Order example

Multiflex multiline pump **RA 1M 00 /44421 0001 AF 07**, consisting of a radial piston pump, size A (**RA**), electric motor drive, coaxial (**1M**), step-down ratio 1:1 (**00**), with 5 pump elements, all in all with 15 outlet ports, consisting of pump element No. 1 with 4 outlet ports, pump element No. 2 with 4 outlet ports, pump element No. 3 with 4 outlet ports, pump element No. 4 with 2 outlet ports and pump element No. 5 with 1 outlet port (**44421**), version key (**0001**), motor values of 1500 rpm, 230/400 V AC, 1.13/065 A, (**AF**), with IP55 type of enclosure (**07**).

1) = max. operating pressure – see Fig. 3, page 2.

2) Please inquire before using synthetic lubricants.

3) Optionally 1 to 5 pump elements as counted from drive.

See pages 22 – 23 for accessories and spare parts.

Electric motor drive, with bevel gears

Technical data

General information

Mounting position any

Ambient temperature - 15 °C to + 60 °C

Pump

Type radial piston pump

Operating pressure 63 bars ¹⁾

Short-time pressure 100 bars

Max. number of stackable pump elements . 5

Outlets per pump element 1, 2 or 4

Delivery rate adjustment per pump element ... stepless

Delivery rate per outlet port
and 1360 rpm motor speed ... approx. 2.59 ccm/min

Lubricant mineral oils ²⁾
(please inquire before using synthetic oils)

Lubricant temperature range .. - 15 °C to + 80 °C

Service viscosity 25 to 2500 mm²/s

Suction head 500 mm

Inside suction-tubing diam. ≥ 4 mm

Gears

Step-down ratio 10.5 : 1

Motor

Type / size M B34 / 63 C 90

Power 3-phase alternating voltage

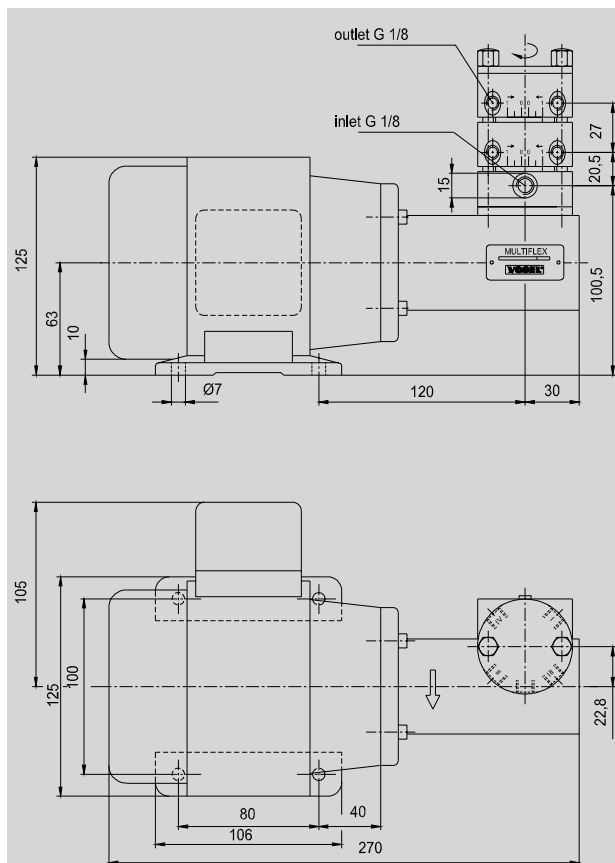


Fig. 9 Multiflex, electric motor drive, with bevel gears

Rated speed [rpm]	Frequency [Hz]	Rated output [kW]	Rated voltage [V]	Rated current [A]	Order code
1500	50	0,18	230/400	1,13/0,65	AF
1500	50	0,18	290/500	0,90/0,52	AK
1500	50	0,18	400/690	0,65/1,07	AO

Please note!

The motor data refer to three-phase motors made by the VEM company. Deviations are possible with motors from other manufacturers.

1) = max. operating pressure – see Fig. 3, page 2.

2) Please inquire before using synthetic lubricants.

3) Optionally 1 to 5 pump elements as counted from drive.

Order codes

	RA	3M	01	/44421/	0001	AK	13
Type							
Radial piston pump, size A							
Drive							
3M = electric motor drive, with bevel gears							
Step-down ratio							
01 = 10.5 : 1							
Number of pump elements ³⁾							
with indication of outlet ports per pump element							
1 = 1 outlet, 2 = 2 outlets, 4 = 4 outlets							
Version key							
Order code (motor)							
(AF , AK , AO)							
(rated speed, frequency, rated output, rated voltage, rated current - see motor table							
Type of enclosure (motor)							
07 = IP 55; 13 = EEx elIT3 IP55; 34 = EEx deIICT4 IP55							

Standard direction of rotation – see rotation arrow

Order example

Multiflex multiline pump **RA 3M 01 /44421/ 0001 AK 13**, consisting of a radial piston pump, size **A (RA)**, electric motor drive with bevel gears (**3M**), step-down ratio 10.5 : 1 (**01**), with 5 pump elements, all in all with 15 outlet ports, consisting of pump element No. 1 with 4 outlet ports, pump element No. 2 with 4 outlet ports, pump element No. 3 with 4 outlet ports, pump element No. 4 with 2 outlet ports and pump element No. 5 with 1 outlet port (**44421**), version key (**0001**), motor values of 1500 rpm, 290/500 V AC, 0.90/0.52 A, (**AK**), with EEx elIT3 IP55 type of enclosure (**13**)

Rotary drive, with bevel gears and grease reservoir

Technical data

General information

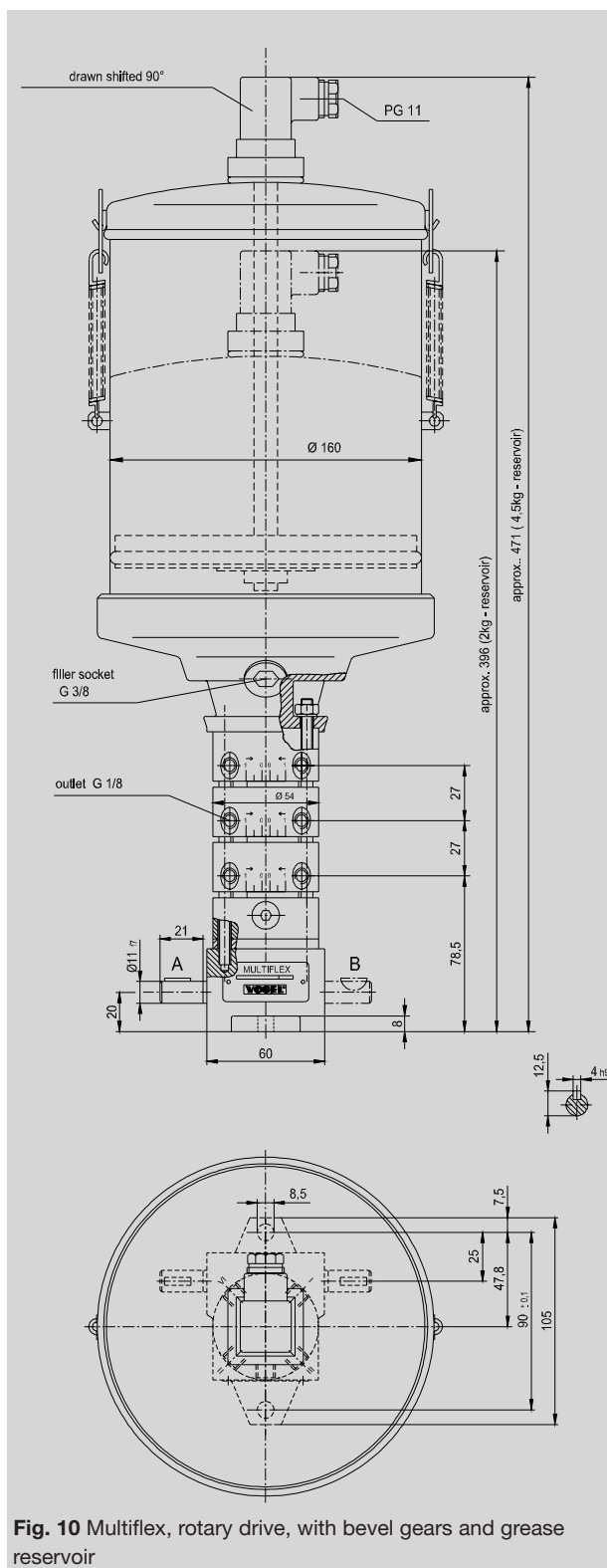
Capacity of grease reservoir ...	2 or 4.5 kg
Mounting position	vertical
Ambient temperature	- 15 °C to + 80 °C
Filling	from top (reservoir cover) or via filler socket
Filling level check	without filling level switch with filling level switch

Pump

Type	radial piston pump
Operating pressure	63 bars
Short-time pressure	100 bars
Max. number of stackable pump elements .	3
Outlets per pump element	1, 2 or 4
Delivery rate adjustment per pump element ...	stepless
Max. delivery rate per outlet and pump shaft revolution	0.018 g/min
Speed range	100 to 1500 rpm
Direction of rotation	CCW with drive position A CW with drive position B
Lubricant	grease based on mineral oils ¹⁾
Penetration to NLGI	≤ 2
Lubricant temperature range ..	- 15 °C to + 80 °C

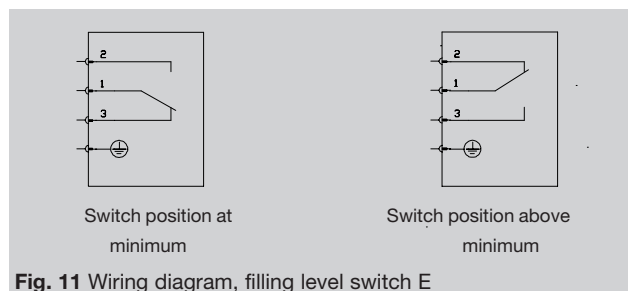
Gears

Step-down ratio	10.5 : 1
Drive position	A or B



1) Please inquire before using synthetic lubricants.
See pages 22 – 23 for accessories and spare parts.

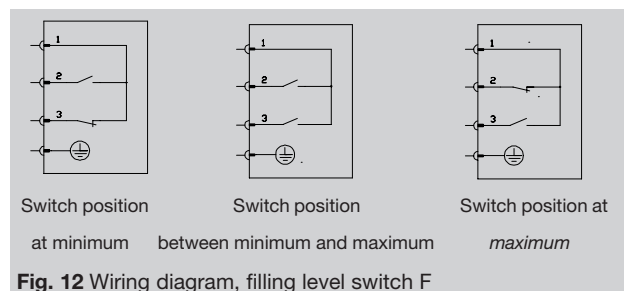
Wiring diagram, filling level switch E



Filling level switch E

Type reed contact
 Switch configuration 1 switching point: min. (changeover)
 Max. switching capacity 60 W/VA
 Max. switched voltage 230 V AC/DC
 Connected by plug plug to DIN 43 650
 Type of enclosure: plug/socket .. IP 65

Wiring diagram, filling level switch F



Filling level switch F

Type reed contact
 Switch configuration 2 switching points (min. – max.)
 Max. switched current 1 A with AC/DC²⁾
 Max. switched voltage 42 V AC/DC
 Connected by plug plug to DIN 43 650
 Type of enclosure: plug/socket .. IP 65

Order codes

	RA	20	F	3UA	01	B	442 / 0001
Type							
Radial piston pump, size A							
Grease reservoir capacity							
20 = 2 kg, 45 = 4.5 kg							
Filling level switch							
X = without, E = with 1 switching point, min. changeover, F = with 2 switching points							
Drive							
3UA = rotary, with bevel gears							
Step-down ratio							
01 = 10.5 : 1							
Drive position							
A or B							
Number of pump elements ³⁾							
with indication of outlet ports per pump element 1 = 1 outlet, 2 = 2 outlets, 4 = 4 outlets							
Version code							

2) Provide for spark quenching with inductive loads.

3) Optionally 1 to 3 pump elements as counted from drive.

Order example

Multiflex multiline pump **RA 20 F 3UA 01 B 442 / 0001**, consisting of a radial piston pump, size **A (RA)**, 2 kg grease reservoir (**20**) with filling level switch (**F**), rotary drive with bevel gears (**3UA**), step-down ratio 10.5 : 1 (**01**), drive position **B (B)** with 3 pump elements, all in all with 10 outlet ports, consisting of pump element No. 1 with 4 outlet ports, pump element No. 2 with 4 outlet ports, and pump element No. 3 with 2 outlet ports (**442**), and version key (**0001**).

Electric motor drive, with coaxial gears and grease reservoir

Technical data

General information

Capacity of grease reservoir ... 2 or 4.5 kg

Mounting position vertical

Ambient temperature - 15 °C to + 60 °C

Pump

Type radial piston pump

Operating pressure 63 bars

Short-time pressure 100 bars

Max. number of stackable pump elements . 1

Outlets per pump element 1, 2 or 4

Delivery rate adjustment per pump element ... stepless

Delivery rate per outlet port

and 1360 rpm motor speed ... see table

Lubricant grease based on mineral oil ¹⁾

Penetration to NLGI ≤ 2

Lubricant temperature range - 15 °C to + 80 °C

Gears

Step-down ratio 5:1; 15:1; 25:1; 75:1; 125:1

Motor

Type / size IM B34 / 63 C 90

Power 3-phase alternating voltage

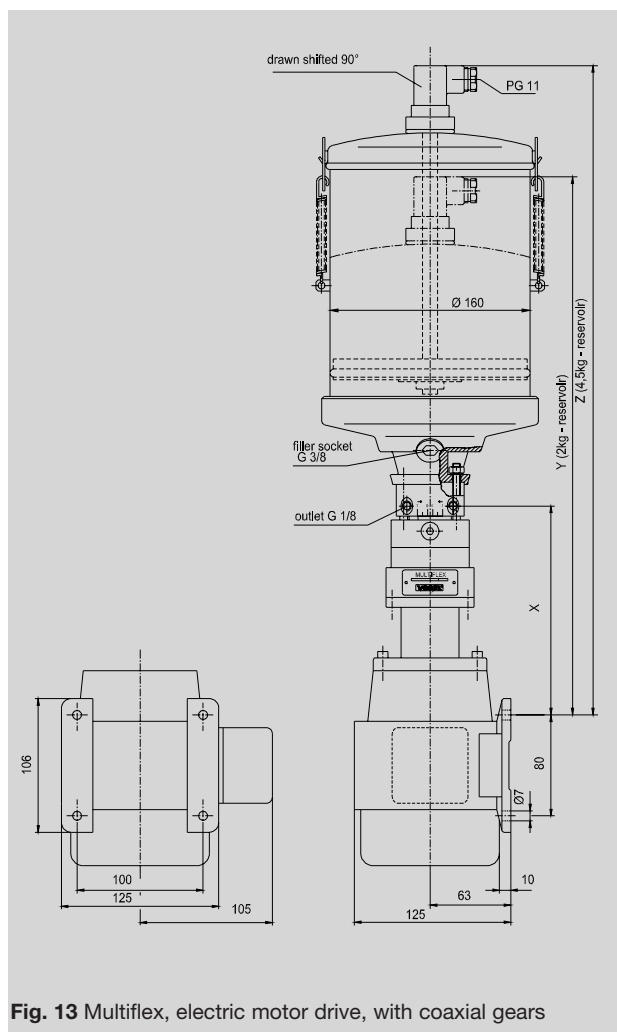


Fig. 13 Multiflex, electric motor drive, with coaxial gears

Rated speed [rpm]	Frequency [Hz]	Rated output [kW]	Rated voltage [V]	Rated current [A]	Order code
1500	50	0,18	230/400	1,13/0,65	AF
1500	50	0,18	290/500	0,90/0,52	AK
1500	50	0,18	400/690	0,65/1,07	AO

Please note!

The motor data refer to three-phase motors made by the VEM company. Deviations are possible with motors from other manufacturers.

1) Please inquire before using synthetic lubricants.

See pages 22 – 23 for accessories and spare parts.

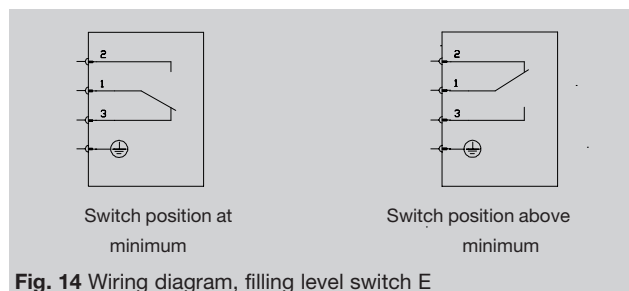
Table of measures

Step-down ratio	[x]	[y]	[Z]
5:1	171	434	509
15:1	181	444	519
25:1	181	444	519
75:1	191	454	529
125:1	191	454	529

Delivery rate per outlet port and pressure at a motor speed of 1360 rpm

Step-down ratio	[g/min]
5:1	approx. 1.63 to approx. 4.89
15:1	approx. 0.54 to approx. 1.62
25:1	approx. 0.32 to approx. 0.97
75:1	approx. 0.10 to approx. 0.32
125:1	approx. 0.06 to approx. 0.19

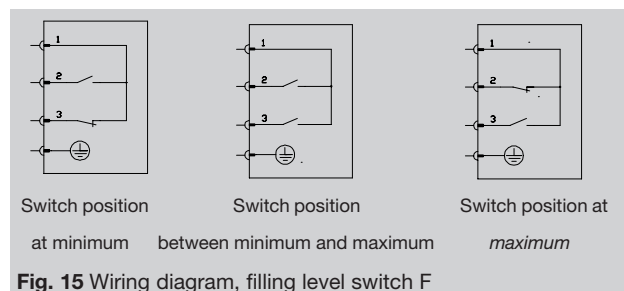
Wiring diagram, filling level switch E



Filling level switch E

Type reed contact
 Switch configuration 1 switching point: min. (changeover)
 Max. switching capacity 60 W/VA
 Max. switched voltage 230 V AC/DC
 Connected by plug plug to DIN 43 650
 Type of enclosure: plug/socket .. IP 65

Wiring diagram, filling level switch F



Filling level switch F

Type reed contact
 Switch configuration 2 switching points (min. – max.)
 Max. switched current 1 A with AC/DC²⁾
 Max. switched voltage 42 V AC/DC
 Connected by plug plug to DIN 43 650
 Type of enclosure: plug/socket .. IP 65

Order codes

	RA	20	F	2M	05 / 4 / 0001	AF 07
Type Radial piston pump, size A						
Grease reservoir capacity 20 = 2 kg, 45 = 4.5 kg						
Filling level check X = without, E = with 1 switching point, min. changeover, F = with 2 switching points						
Drive 2M = electric motor drive, with coaxial gears						
Step-down ratio 05 = 5:1; 15 = 15:1; 25 = 25:1; 75 = 75:1, 13 = 125:1						
Number of pump elements ³⁾ with indication of outlet ports per pump element 1 = 1 outlet, 2 = 2 outlets, 4 = 4 outlets						
Version code						
Order code (motor) (AF , AK , AO) (rated speed, frequency, rated output, rated voltage, rated current - see motor table)						
Type of enclosure (motor) 07 = IP 55; 13 = EEx elIT3 IP55; 34 = EEx delICT4 IP55 Standard direction of rotation – see rotation arrow						

- 2) Provide for spark quenching with inductive loads.
 3) Only 1 pump element.

Order example

Multiflex multiline pump **RA 20 F 2M 05/4/0001 AF 07**, consisting of a radial piston pump, size **A** (**RA**), 2.5 kg grease reservoir (**20**) filling level switch (**F**) with 2 min./max. NO switching points, electric motor drive with coaxial gears (**2M**), step-down ratio 5:1 (**05**), with 1 pump element with 4 outlet ports (**4**), version key (**0001**), motor values of 1500 rpm, 230/400 V AC, 1.13/065 A, (**AF**), with IP55 type of enclosure (**07**).

Electric motor drive, with bevel gears

Technical data

General information

Grease reservoir capacity 2 or 4.5 kg
 Mounting position vertical
 Ambient temperature - 15 °C to + 60 °C
 Filling from top (reservoir cover) or via
 filler socket
 Filling level check without filling level switch
 with filling level switch

Pump

Type radial piston pump
 Operating pressure 63 bars
 Short-time pressure 100 bars
 Max. number of stackable pump elements . 3
 Outlets per pump element 1, 2 or 4
 Delivery rate adjustment per pump element ... stepless
 Delivery rate per outlet port
 and 1360 rpm motor speed ... approx. 2.33 g/min
 Lubricant grease based on mineral oil ¹⁾
 Penetration to NLGI ≤ 2
 Lubricant temperature range .. - 15 °C to + 80 °C

Gears

Step-down ratio 10.5:1

Motor

Type / size IM B34 / 63 C 90
 Power 3-phase alternating voltage

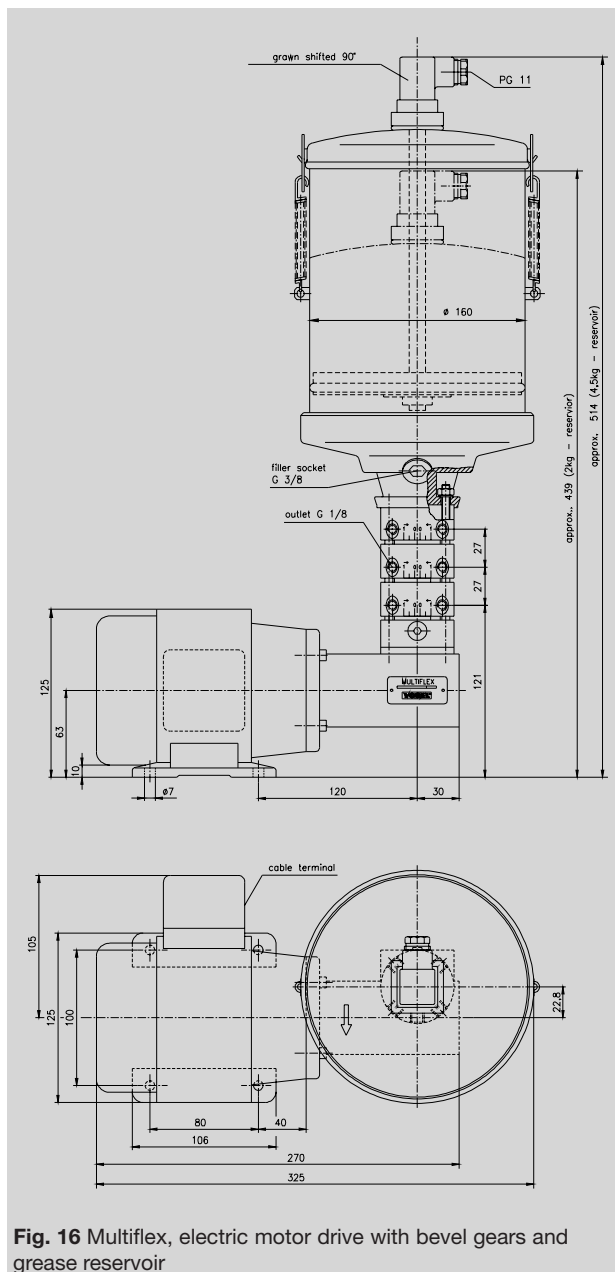


Fig. 16 Multiflex, electric motor drive with bevel gears and grease reservoir

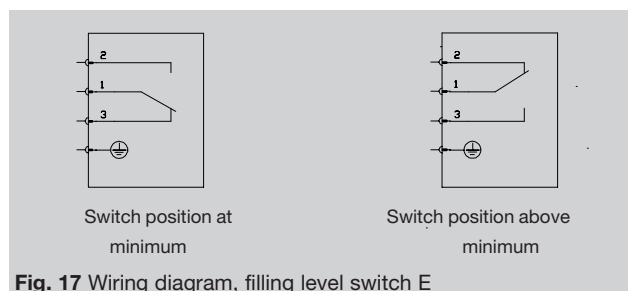
Rated speed [rpm]	Frequency [Hz]	Rated output [kW]	Rated voltage [V]	Rated current [A]	Order code
1500	50	0,18	230/400	1,13/0,65	AF
1500	50	0,18	290/500	0,90/0,52	AK
1500	50	0,18	400/690	0,65/1,07	AO

Please note!

The motor data refer to three-phase motors made by the VEM company. Deviations are possible with motors from other manufacturers.

1) Please inquire before using synthetic lubricants.
 See pages 22 – 23 for accessories and spare parts.

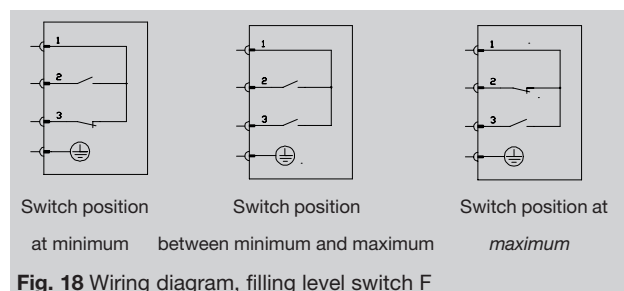
Wiring diagram, filling level switch E



Filling level switch E

Type reed contact
 Switch configuration 1 switching point: min. (changeover)
 Max. switching capacity 60 W/VA
 Max. switched voltage 230 V AC/DC
 Connected by plug plug to DIN 43 650
 Type of enclosure: plug/socket .. IP 65

Wiring diagram, filling level switch F



Filling level switch F

Type reed contact
 Switch configuration 2 switching points (min. – max.)
 Max. switched current 1 A with AC/DC²⁾
 Max. switched voltage 42 V AC/DC
 Connected by plug plug to DIN 43 650
 Type of enclosure: plug/socket .. IP 65

Order codes

	RA	20	X	3M	01	/	124/	0001	AF	07
Type Radial piston pump, size A										
Grease reservoir capacity 20 = 2 kg, 45 = 4.5 kg										
Filling level check X = without, E = with 1 switching point, min. changeover, F = with 2 switching points										
Drive 3M = electric motor drive, with bevel gears										
Step-down ratio 01 = 10.5 : 1										
Number of pump elements ³⁾ with indication of outlet ports per pump element 1 = 1 outlet, 2 = 2 outlets, 4 = 4 outlets										
Preset direction of rotation / = without designation of direction of rotation R = clockwise, in the case of the version without an electric motor										
Version code										
Order code (motor) (AF , AK , AO) (rated speed, frequency, rated output, rated voltage, rated current - see motor table)										
Type of enclosure (motor) 07 = IP 55; 13 = EEx elIT3 IP55; 34 = EEx delICT4 IP55 Standard direction of rotation – see rotation arrow										

Order example

Multiflex multiline pump **RA 20 X 3 M01 124/ 0001 MA 07**, consisting of a radial piston pump, size **A** (**RA**), 2 kg grease reservoir (**20**), without filling level switch (**X**), electric motor drive with bevel gears (**3M**), step-down ratio 10.5 : 1 (**01**), with 3 pump elements, all in all with 7 outlet ports consisting of pump element No. 1 with 1 outlet port, pump element No. 2 with 2 outlet ports and pump element No. 3 with 4 outlet ports (**124**), without designation of direction of rotation (**/**), version code (**0001**), motor values of 1500 rpm, 230/400 V AC, 1.13/065 A, (**AF**), with IP55 type of enclosure (**07**).

2) Provide for spark quenching with inductive loads.

3) Optionally 1 to 5 pump elements as counted from drive

Order codes

Type Radial piston pump RA mounted on reservoir	RAB	03	V	1M	00	/	21424	/	0001	AF	07
Reservoir capacity 03 = 3 liters											
Filling level switch V = with switch for minimum filling level (reed contact) X = without filling level switch											
Drive 1M = electric motor drive, coaxial 2M = electric motor drive, with coaxial gears 3M = electric motor drive, with bevel gears											
Step-down ratio 00 = 1 : 1 (1M) 25 = 25:1 (2M) 01 = 10.5:1 (3M) 75 = 75:1 (2M) 05 = 5:1 (2M) 13 = 125:1 (2M) 15 = 15:1 (2M)											
Layout A = on the right on reservoir (3M – pump points upward) / = on the right on reservoir (1M, 2M)											
Number of pump elements ³⁾ with indication of outlet ports per pump element 1 = 1 outlet, 2 = 2 outlets, 4 = 4 outlets											
Cover prelubrication DR = with cover prelubrication, preset clockwise direction of rotation (2M) (the direction of rotation cannot be changed!) / = without (1M, 3M)											
Version code 0001 = basic version											
Order code (motor) (AF, AK, AO) (rated speed, frequency, rated output, rated voltage, rated current - see motor table)											
Type of enclosure (motor) 07 = IP 55; 13 = EEx elIT3 IP55; 34 = EEx deICT4 IP55 Standard direction of rotation – see rotation arrow											

Order example

Multiflex pump unit **RAB 03 V 1M 00/ 21424 / 0001 AF 07**, consisting of a radial piston pump installed on a reservoir, size A (**RAB**), 3 liter oil reservoir (**03**), with filling level switch (**V**), electric motor drive (**1M**), without step-down 0:0 (**00**), pump mounted to the right on the reservoir (**/**), with 5 pump elements, all in all with 13 outlet ports consisting of pump element No. 1 with 2 outlet ports, pump element No. 2 with 1 outlet port, pump element No. 3 with 4 outlet ports, pump element No. 4 with 2 outlet ports and pump element No. 5 with 4 outlet ports (**21424**), without cover prelubrication (**/**), version code (**0001**), motor values of 1500 rpm, 230/400 V AC, 1.13/065 A, (**AF**), with IP55 type of enclosure (**07**).

3) Optionally 1 to 5 pump elements as counted from the drive.

Unit, electric motor drive with 7 liter oil reservoir

Technical data

General information

Mounting position horizontal

Ambient temperature - 15 °C to + 60 °C

Filling via filler cap

Filling level check without filling level switch
with filling level switch

Pump

Type radial piston pump

Operating pressure 63 bars, see table

Short-time pressure 100 bars

Max. number of stackable pump elements 5

Outlets per pump element 1, 2 or 4

Delivery rate adjustment per pump element ... stepless

Delivery rate per outlet port see table of measures

Lubricant mineral oils ¹⁾

Service viscosity 25 to 2500 mm²/s

Lubricant temperature range .. - 15 °C to + 80 °C

Gears

Step-down ratio 1:1; 10.5:1; 5:1; 15:1; 25:1; 75:1; 125:1

Motor

Type / size B3/B14; 63 C 90

Power 3-phase alternating voltage

Rated speed	Frequency	Rated output	Rated voltage	Rated current	Order code
[rpm]	[Hz]	[kW]	[V]	[A]	
1500	50	0,18	230/400	1,13/0,65	AF
1500	50	0,18	290/500	0,90/0,52	AK
1500	50	0,18	400/690	0,65/1,07	AO

Please note!

The motor data refer to three-phase motors made by the VEM company. Deviations are possible with motors from other manufacturers.

Reservoir

Version 7 liters, polyamide, transparent

Filling level switch

Version minimum-level check

Contact voltage 10-42 V AC, DC

Rated contact current..... 1A

Load contact changeover (reed contact) ²⁾

Type of enclosure IP65

Type of connection plug to DIN 43 650

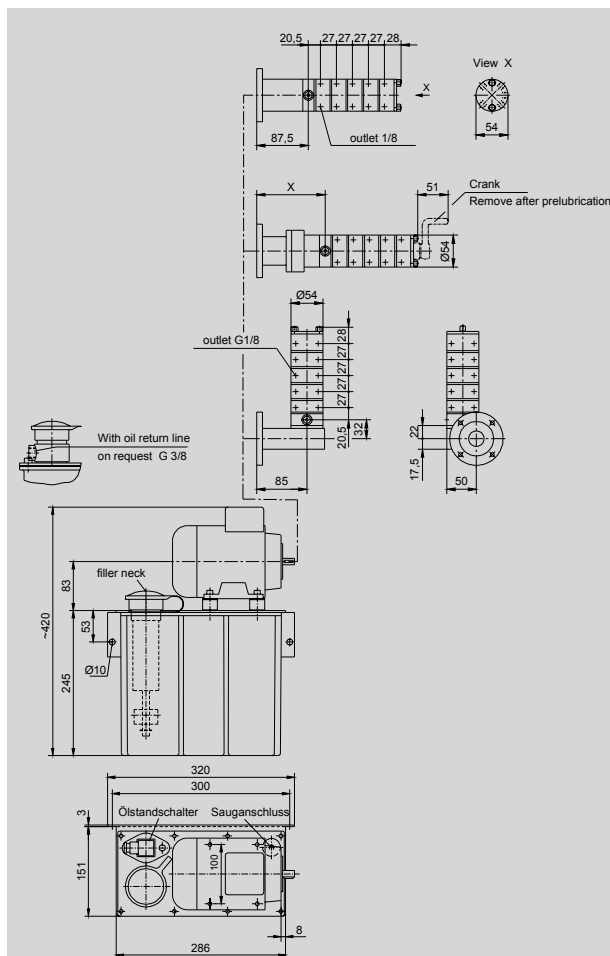


Fig. 20 Multiflex unit with 7 liter reservoir

Table of measures for version Delivery rate and pressure

Step-down ratio		Delivery rate per outlet [ccm/min]	Max. pressure [bars]
1:1	87,5	approx. 27.2	63
10,5:1	-	approx. 2.59	63
5:1	106	approx. 5.44	63
15:1	116	approx.1.81	63
25:1	116	approx.1.09	50
75:1	126	approx. 0.36	20
125:1	126	approx. 0.22	10

1) Please inquire before using synthetic lubricants.

2) Deviations on request

See pages 22 – 23 for accessories and spare parts.

Order codes

Type	RAB	07	V	1M	00	/	21424	/	0001	AF	07
Radial piston pump RA mounted on reservoir											
Reservoir capacity 07 = 3 liters											
Filling level switch V = with switch for minimum filling level (reed contact) X = without filling level switch											
Drive 1M = electric motor drive, coaxial 2M = electric motor drive, with coaxial gears 3M = electric motor drive, with bevel gears											
Step-down ratio 00 = 1 : 1 (1M) 25 = 25:1 (2M) 01 = 10.5:1 (3M) 75 = 75:1 (2M) 05 = 5:1 (2M) 13 = 125:1 (2M) 15 = 15:1 (2M)											
Layout A = on the right on reservoir (3M – pump points upward) / = on the right on reservoir (1M, 2M)											
Number of pump elements ³⁾ with indication of outlet ports per pump element 1 = 1 outlet, 2 = 2 outlets, 4 = 4 outlets											
Cover prelubrication DR = with cover prelubrication, preset clockwise direction of rotation (2M) (the direction of rotation cannot be changed!) / = without (1M, 3M)											
Version code 0001 = basic version											
Order code (motor) (AF, AK, AO) (rated speed, frequency, rated output, rated voltage, rated current - see motor table)											
Type of enclosure (motor) 07 = IP 55; 13 = EEx elIT3 IP55; 34 = EEx deICT4 IP55 Standard direction of rotation – see rotation arrow											

Order example

Multiflex pump unit **RAB 07 V 1M 00/ 21424 / 0001 AF 07**, consisting of a radial piston pump installed on a reservoir, size A (**RAB**), 7 liter oil reservoir (**07**), with filling level switch (**V**), electric motor drive (**1M**), without step-down 0:0 (**00**), pump mounted to the right on the reservoir (**/**), with 5 pump elements, all in all with 13 outlet ports consisting of pump element No. 1 with 2 outlet ports, pump element No. 2 with 1 outlet port, pump element No. 3 with 4 outlet ports, pump element No. 4 with 2 outlet ports and pump element No. 5 with 4 outlet ports (**21424**), without cover prelubrication (**/**), version code (**0001**), motor values of 1500 rpm, 230/400 V AC, 1.13/065 A, (**AF**), with IP55 type of enclosure (**07**).

3) Optionally 1 to 5 pump elements as counted from the drive.

Unit, electric motor drive with 15 liter oil reservoir

Technical data

General information

Mounting position horizontal

Ambient temperature - 15 °C to + 60 °C

Filling via filler cap

Filling level check without filling level switch
with filling level switch

Pump

Type	radial piston pump
Operating pressure	63 bars, see table
Short-time pressure	100 bars
Max. number of stackable pump elements	5
Outlets per pump element	1, 2 or 4
Delivery rate adjustment per pump element ...	stepless
Delivery rate per outlet port	see table of measures
Lubricant	mineral oils '1)
Service viscosity	25 to 2500 mm ² /s
Lubricant temperature range ..	- 15 °C to + 80 °C

Gears

Step-down ratio 1:1; 10.5:1; 5:1; 15:1; 25:1; 75:1; 125:1

Motor

Type / size B3/B14; 63 C 90
Power 3-phase alternating voltage

Rated speed	Frequency	Rated output	Rated voltage	Rated current	Order code
[rpm]	[Hz]	[kW]	[V]	[A]	
1500	50	0,18	230/400	1,13/0,65	AF
1500	50	0,18	290/500	0,90/0,52	AK
1500	50	0,18	400/690	0,65/1,07	AO

Please note!

The motor data refer to three-phase motors made by the VEM company. Deviations are possible with motors from other manufacturers.

Reservoir

Version 15 liters, aluminum

Filling level switch

Version	minimum-maximum check
Contact voltage	10-42 V AC, DC
Rated contact current	1A
Load contact	changeover (reed contact) 1)
Type of enclosure	IP65
Type of connection	plug to DIN 43 650

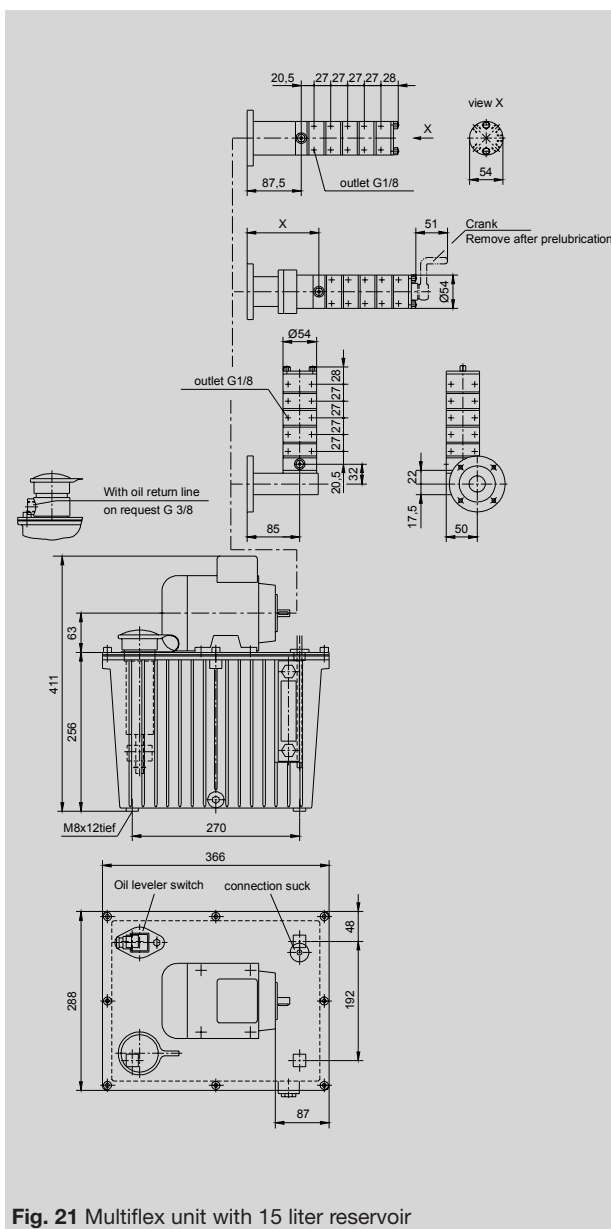


Fig. 21 Multiflex unit with 15 liter reservoir

Table of measures for version Delivery rate and pressure

Step-down ratio		Delivery rate per outlet [ccm/min]	Max. pressure [bars]
1:1	87,5	approx. 27.2	63
10,5:1	-	approx. 2.59	63
5:1	106	approx. 5.44	63
15:1	116	approx. 1.81	63
25:1	116	approx. 1.09	50
75:1	126	approx. 0.36	20
125:1	126	approx. 0.22	10

1) Please inquire before using synthetic lubricants.

2) Deviations on request

See pages 22 – 23 for accessories and spare parts.

Order codes

Type	RAB	15-2	V	1M	00	/	21424	/	0001	AF	07
Radial piston pump RA mounted on reservoir											
Reservoir capacity 15-2 = 15 liters											
Filling level switch V = with switch for minimum filling level (reed contact) X = without filling level switch											
Drive 1M = electric motor drive, coaxial 2M = electric motor drive, with coaxial gears 3M = electric motor drive, with bevel gears											
Step-down ratio 00 = 1 : 1 (1M) 25 = 25:1 (2M) 01 = 10.5:1 (3M) 75 = 75:1 (2M) 05 = 5:1 (2M) 13 = 125:1 (2M) 15 = 15:1 (2M)											
Layout A = on the right on reservoir (3M – pump points upward) / = on the right on reservoir (1M, 2M)											
Number of pump elements ³⁾ with indication of outlet ports per pump element 1 = 1 outlet, 2 = 2 outlets, 4 = 4 outlets											
Cover prelubrication DR = with cover prelubrication, preset clockwise direction of rotation (2M) (the direction of rotation cannot be changed!) / = without (1M, 3M)											
Version code 0001 = basic version											
Order code (motor) (AF, AK, AO) (rated speed, frequency, rated output, rated voltage, rated current - see motor table)											
Type of enclosure (motor) 07 = IP 55; 13 = EEx elIT3 IP55; 34 = EEx delICT4 IP55 Standard direction of rotation – see rotation arrow											

3) Optionally 1 to 5 pump elements as counted from the drive.

Order example

Multiflex **RAB 15 V-2 1M 00 / 21424 / 0001 AF 07**, consisting of a radial piston pump installed on a reservoir, size A (**RAB**), 15 liter oil reservoir (**15-2**), with filling level switch (**V**), electric motor drive (**1M**), without step-down 0:0 (**00**), pump mounted to the right on the reservoir (**/**), with 5 pump elements, all in all with 13 outlet ports consisting of pump element No. 1 with 2 outlet ports, pump element No. 2 with 1 outlet port, pump element No. 3 with 4 outlet ports, pump element No. 4 with 2 outlet ports and pump element No. 5 with 4 outlet ports (**21424**), without cover prelubrication (**/**), version code (**0001**), motor values of 1500 rpm, 230/400 V AC, 1.13/065 A, (**AF**), with IP55 type of enclosure (**07**).

Accessories (please order separately)

Designation	Dimension	Order No.
Socket union	Ø 4-R 1/8"	44-0709-2040
	Ø 6-R 1/8"	44-0709-2041
Double tapered ring	Ø 4	44-0405-2002
	Ø 6	406-001
Straight connector	Ø 4-R 1/8" K	404-403W
	Ø 6-R 1/8" K	406-423W
	Ø 8-R 1/8" K	408-423W
Banjo fitting	Ø 4-R 1/8"	96-7004-0058
	Ø 6-R 1/8"	96-7006-0058
	Ø 8-R 1/8"	96-7008-0058
Straight connector with check valve	Ø 4-R 1/8"K	24-2103-2933
	Ø 6-R 1/8"K	24-2103-2927
Banjo fitting with check valve	Ø 4-R 1/8"K	24-2106-2016
	Ø 6-R 1/8"K	24-2106-2017
Banjo fitting ¹⁾	Ø 6-R 1/8"K	24-2106-2390
Relief valve ²⁾	1/8"	24-2103-3680
Relief valve ³⁾	Ø 6-R1/8"	24-2103-3681

1) with additional connection thread for direct installation of relief valves.

2) up to 90 bars, without tubing connection for briefly operated RA pumps.

3) up to 60 bars, with tubing connection for continuous operation.

Vogel quick connectors

Adapter with cylindrical internal thread

Tubing diam A	Thread	Order No.
4	G 1/8	404-040-VS
6	G 1/8	456-004-VS

Banjo fittings with cylindrical internal thread

Tubing diam A	Thread	Order No.
4	G 1/8	504-108-VS
6	G 1/8	506-108-VS

Elbows with tapered internal thread

Tubing diam A	Thread	Order No.
4	R 1/8 keg	514-018-VS
6	R 1/8 keg	506-511-VS

Please note!

You can find further detailed information about Vogel quick connectors and associated tools in our Quick Connector System leaflet No. 1-0103-1.

Spare parts (please order separately)

Rotary drive, coaxial

Rotary drive, with coaxial gears

Rotary drive, with bevel gears

Electric motor drive, coaxial

Electric motor drive, with coaxial gears

Electric motor drive, with bevel gears and grease reservoir

Electric motor drive, with coaxial gears and grease reservoir

Designation	Weight [kg each]	Order No.
Rotary drive. coaxial 1:1	0,420	24-0701-3000
coaxial 5:1	0,420	24-0701-3070
coaxial 5:1 with prelubrication	0,420	24-0701-3080
coaxial 15:1	0,420	24-0701-3071
coaxial 15:1 with prelubrication	0,420	24-0701-3081
coaxial 25:1	0,420	24-0701-3072
coaxial 25:1 with prelubrication	0,420	24-0701-3082
coaxial 75:1	0,420	24-0701-3073
coaxial 75:1 with prelubrication	0,420	24-0701-3083
coaxial 125:1	0,420	24-0701-3074
coaxial 125:1 with prelubrication	0,420	24-0701-3084
Bevel Drive position A 10,5:1	0,650	24-0701-3001
gears Drive position B 10,5:1	0,650	24-0701-3002
Intermed. ring (only with 1:1 step-down)	0,230	24-1721-2000
Pump- element	with 1 outlet 0,385 with 2 outle 0,380 with 4 outle 0,370	24-1557-3520 24-1557-3521 24-1557-3522
Stud bolt for step-down ratios of 1:1 and 10,5:1 ¹⁾	for 1 pump element 0,011 for 2 pump elements 0,016 for 3 pump elements 0,026 for 4 pump elements 0,031 for 5 pump elements 0,031	44-0717-2060 44-0717-2061 44-0717-2062 44-0717-2063 44-0717-2064
Stud bolt for step-down ratios of 1:1 to 10,5:1 ¹⁾	for 1 pump elements 0,011 for 2 pump elements 0,016 for 3 pump elements 0,021 for 4 pump elements 0,026 for 5 pump elements 0,031	44-0717-2069 44-0717-2070 44-0717-2071 44-0717-2072 44-0717-2073
Washer	6,4 DIN 125 ¹⁾	DIN 125-B6.4-ST
Nut	M 6 DIN 934 ¹⁾	DIN 934-M6-8
Cover	0,080	44-0413-2610
Cap nut M 6-DIN 917 ¹⁾	0,005	95-0006-0917
Electric motor order code AF		84-1700-4790
Electric motor order code AK		84-1700-4808
Electric motor order code AO		84-1700-4786
Cap screws ²⁾ M5x16 DIN 912		DIN 912-M5x16-8.8

Designation	Weight [kg each]	Order No.
Grease reservoir (2 kg)		
without filling level switch	2150	24-0254-2312
with filling level switch E	4160	24-0254-2334
with filling level switch F	4160	24-0254-2330
Grease reservoir (4kg)		
without filling level switch	2500	24-0254-2310
with filling level switch E	4560	24-0254-2335
with filling level switch F	4560	24-0254-2331

Rotary drive, with bevel gears and grease reservoir

Designation	Weight [kg each]	Order No.
Bevel gears	Drive position A 0,650 Drive position B 0,650	24-0701-3001 24-0701-3002
Intermed. ring (only with 1:1 step-down)	0,235	24-1721-2001
Pump- element	with 1 outlet 0,385 with 2 outle 0,380 with 4 outle 0,370	24-1557-3520 24-1557-3521 24-1557-3522
Stud bolt ¹⁾	for 1 pump element 0,011 for 2 pump elements 0,016 for 3 pump elements 0,021	44-0717-2070 44-0717-2071 44-0717-2072
Washer	6,4 DIN 125 ¹⁾	DIN 125-B6.4-ST
Nut	M 6 DIN 934 ¹⁾	DIN 934-M6-8
Grease reservoir (2 kg)		
without filling level switch	2150	24-0254-2312
with filling level switch E	4160	24-0254-2334
with filling level switch F	4160	24-0254-2330
Grease reservoir (4 kg)		
without filling level switch	2500	24-0254-2310
with filling level switch E	4560	24-0254-2335
with filling level switch F	4560	24-0254-2331

1) 2 per pump required

2) 4 per pump required

Publications

Operating instructions for MULTIFLEX multiline pumps
and multiline unitsDSB 1-010-00

Please note:

All products from Willy Vogel AG may be used only for their intended purpose. If operating instructions are supplied together with the products, the provisions and information therein of specific relevance to the equipment must be observed as well.

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, Par. 2, may

only be filled into VOGEL central lubrication systems and components and delivered and/or distributed with the same after consultation with and written approval from Willy Vogel AG.

All products manufactured by VOGEL are not approved for use in conjunction with gases, liquefied gases, pressurized gases in solution and fluids with a vapor pressure exceeding normal atmospheric pressure (1013 mbars) by more than 0.5 bar at their maximum permissible temperature.



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