

Multi-line pumps

Product series RA

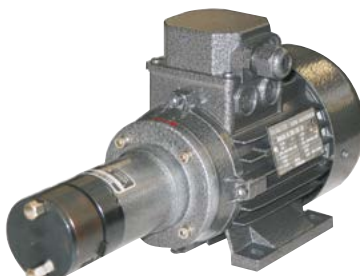
For oil and grease

For use in SKF MultiFlex multi-line lubrication systems

RA 1UA



RA 1M



RAB 07



The SKF MultiFlex multi-line pump is a positive-displacement pump with multiple utilizable outlets. The displacement is continuously variable.

Special characteristics

The SKF MultiFlex multi-line pump is constructed as a radial piston pump in a modular design. Up to five pump elements, each with one, two, or four outlets, can be “combined” so that the number of outlets can be adapted to current requirements in the best possible way.

This simple stacking design also allows for subsequent expansion or reduction of the number of pump outlets.

The displacement of a pump element's outlets is continuously variable (stepless adjustment) from outside.

Continuous variability and an extended speed range result in an extremely broad spectrum of delivery rates. This makes the pump highly attractive as a feed pump in circulating lubrication systems with low circulation rates (up to 30 cm³/min per outlet) or as a multi-circuit pump to supply multiple independent lubrication zones.

The pump can be driven in either direction of rotation as desired.

Its operating pressure is max. 63 bar, with up to 100 bar for short periods. The design of the RA/RAB multi-line pump permits it to pump both mineral-based and synthetic-based oils and greases.

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Design

In its basic design, the SKF MultiFlex multi-line pump is comprised of a drive, spacer ring with lubricant inlet, at least one pump element, and a cap.

The pump element shown in **Figure 1** in its pressure phase is comprised of the pump ring (1), the pump shaft (2) with the two radial pump pistons (3), and the track ring with elliptical inner contour (4) which is permanently joined to the adjusting plate (5). The pump ring (1) houses the suction grooves and the pressure bores. The pump shaft, which also acts as the drive shaft for the next pump element via the embedded coupling, is designed as a rotary valve. The two pump pistons are pressed against the inner side of the track ring by the spring (6).

Mode of operation

Suction phase

As the pump shaft turns, the two pump pistons move apart due to the spring loading, until the outer dead center (following a track ring) is reached. Until the outer dead center is reached, the control bore in the pump shaft connects the space between the two pump pistons with a lubricant inlet in the spacer ring.

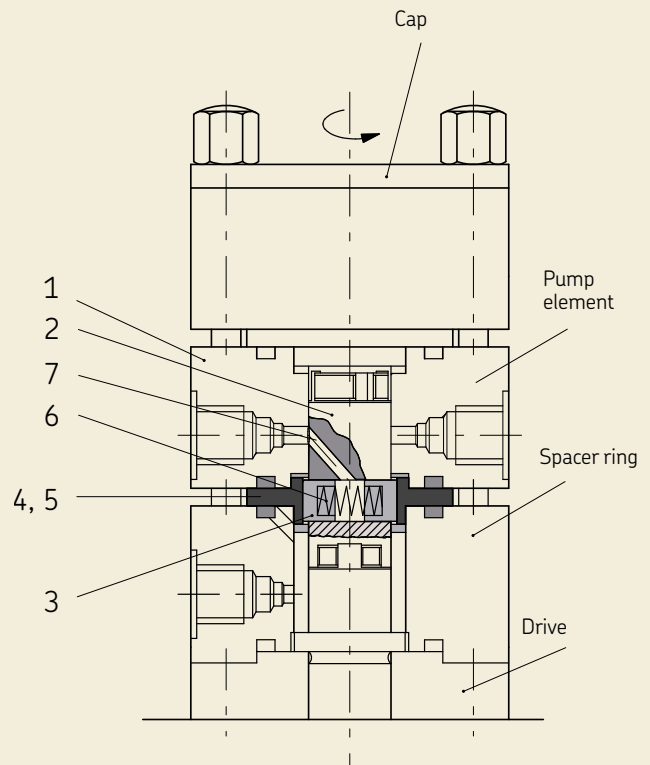
Pressure phase

Due to the elliptically shaped track ring, the pump pistons move together against the spring force as the pump shaft continues to turn, until the inner dead center is reached. Until this reached, the control bore (7) in the pump shaft connects the space between the two pump pistons with a lubricant outlet in the pump ring.

The displacement can be varied continuously (steplessly) with the adjusting plate using the phase control method, meaning that the track ring position is changed relative to the position of the control bore in the pump shaft. The stroke of the two pistons remains the same in every phase variation; it is fully effective or only partially effective, depending on the setting. This means that a part of the stroke volume is fed back in the outlet bolt, which reduces the effective displacement.

Fig. 1

Pump element in the pressure phase



CAUTION

The important information on product usage located on the back cover applies to all systems described in this brochure.

Displacement

The displacement of the RA multi-line pump series for oils and greases (reference viscosity 140 mm²/s) as a function of drive speed and step-down ratio is shown in **Diagram 1**.

Diagram 2 illustrates the achievable continuous operating pressure as a function of operating viscosity and piston stroke rate.

$$\text{Piston stroke rate } z = \frac{\text{Drive speed } [\eta]}{\text{Step-down ratio } [i]}$$

The maximum achievable operating pressure varies according to the operating viscosity of the lubricating medium and the given piston stroke rate.

Restrictions apply to the permitted operating viscosity at piston stroke rates > 50 rpm.

The individual pump elements can be set to no less than 1/3 capacity.

Setting $0 = 1/3$ capacity

Diagram 1

Displacement

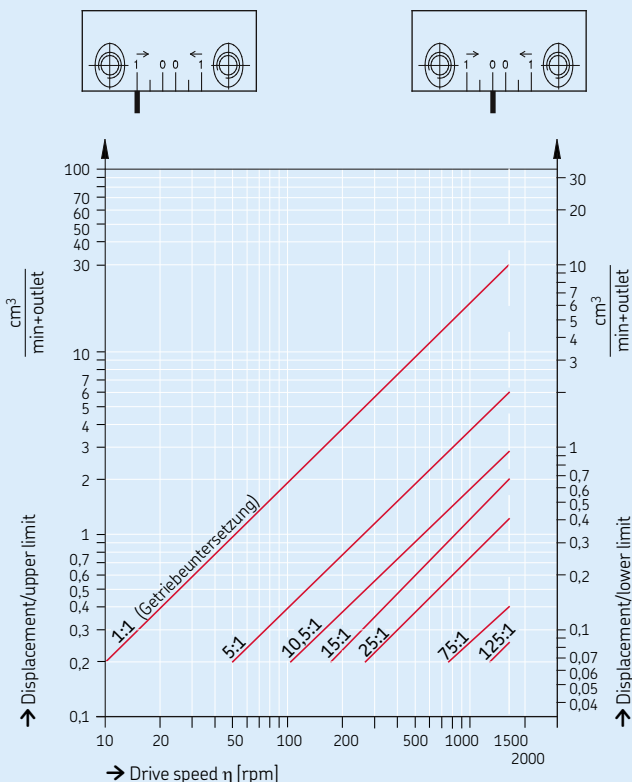
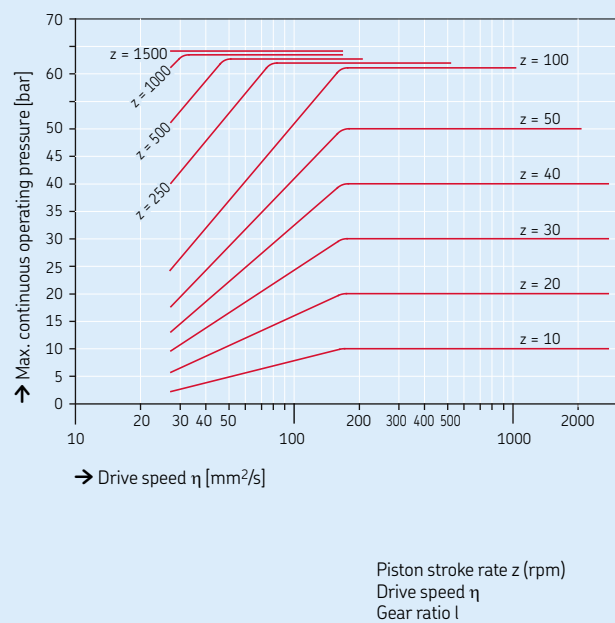


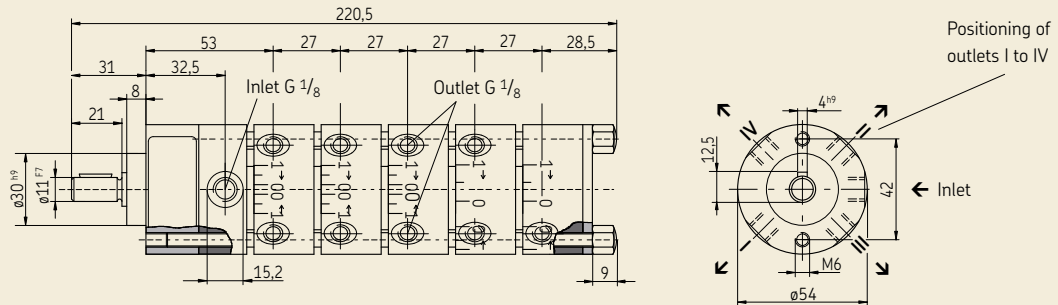
Diagram 2

Continuous operating pressure



Rotary drive, coaxial

Fig. 2



Technical data

General

Mounting position	Any
Ambient temperature	-15 to +80°C

Pump

Type	Radial piston pump
Operating pressure	63 bar ¹⁾
Short-term pressure	100 bar
Number of combinable pump elements	Max. 5
Outlets per pump element	1, 2 or 4
Displacement variability per pump element	Continuously variable
Displacement per outlet and revolution of the pump shaft	Max. 0.02 cm ³
Drive speed	10 to 1500 rpm
Direction of rotation	Clockwise or counterclockwise ²⁾

Lubricant	Mineral oils ³⁾
Temperature range	-15 to +80°C
Operating viscosity	25 to 2500 mm ² /s
Suction height	500 mm
Intake tube inside diameter	≥ 4 mm

Weight with pump element	1	2.74 kg
	2	1.59 kg
	3	1.97 kg
	4	2.36 kg
	5	2.74 kg

¹⁾ Max. operating pressure – see page 4, diagram 2.

²⁾ Standard: clockwise.

³⁾ For synthetic lubricants on request.

Explanation or order codes

Type	RA	Drive	1UA	Step-down ratio	00/4421	Number of outlet ports per pump element	R	Direction of rotation	0001
Radial piston pump RA		1UA = rotary, coaxial		00 = 1:1		1 = 1 outlet 2 = 2 outlets 4 = 4 outlets 1 to 5 pump elements (counted from drive)		R = Standard: clockwise L = counterclockwise	

Order example

SKF MultiFlex multi-line pump consisting of a radial piston pump (RA), rotary drive, coaxial (1UA), step-down ratio 1:1 (00), with 4 pump elements, with a total of 11 outlets, consisting of: pump element 1 with 4 outlets, pump element 2 with 4 outlets, pump element 3 with 2 outlets and pump element 4 with 1 outlet (4421), direction of rotation clockwise (R) and design key (0001),

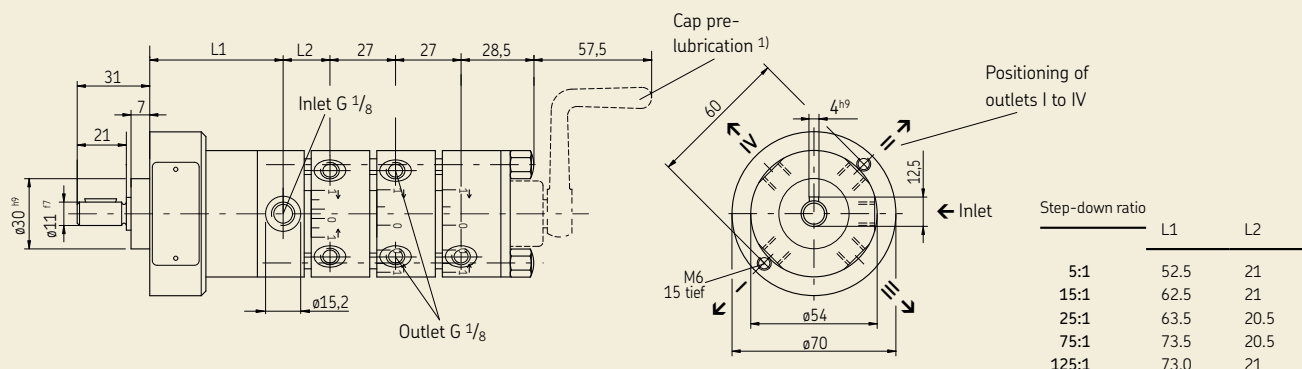
Order No. RA 1UA 00 / 4421 R 0001

Note

Accessories and spare parts – see pages 19–20.

Rotary drive with coaxial gear

Fig. 3



¹⁾ Hand crank is included in scope of delivery and comes with the pump on delivery.

Technical data

General

Mounting position Any
Ambient temperature -15 to +80°C

Pump

Type Radial piston pump
Operating pressure 63 bar¹⁾
Short-term pressure 100 bar
Number of combinable pump elements Max. 5
Outlets per pump element 1, 2 or 4
Displacement variability per pump element Continuously variable
Displacement per outlet and revolution of the pump shaft Max. 0.02 cm³
Drive speed Up to 3600 rpm
Direction of rotation Clockwise or counterclockwise²⁾

Lubricant Mineral oils³⁾
Temperature range -15 to +80°C
Operating viscosity 25 to 2500 mm²/s
Suction height 500 mm
Intake tube inside diameter ≥ 4 mm

Gearbox

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

Weight with pump element

1	2.24 kg ³⁾
2	2.63 kg ³⁾
3	3.01 kg ³⁾
4	3.40 kg ³⁾
5	3.78 kg ³⁾

¹⁾ Max. operating pressure – see page 4, diagram 2.

²⁾ For synthetic lubricants on request.

³⁾ Weight is increased by 100 g with cap prelubrication.

Explanation of order codes

RA 2UB 15/442 D R 0001

Type Radial piston pump RA

Drive 2UB = rotary with coaxial gear

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

Number of outlet ports per pump element 1 = 1 outlet 2 = 2 outlets 4 = 4 outlets
1 to 5 pump elements (counted from drive)

Cap prelubrication D = with cap prelubrication
(direction of rotation can only be set to clockwise)
/ = without cap prelubrication

Direction of rotation R = Standard: clockwise
L = counterclockwise

Design key 0001

Order example

SKF MultiFlex multi-line pump, consisting of a radial piston pump (RA), rotary drive with coaxial gear (2UB), step-down ratio 15:1 (15), with 3 pump elements, with a total of 10 outlets, consisting of: pump element No. 1 with 4 outlets, pump element No. 2 with 4 outlets and pump element No. 3 with 2 outlets (442) cap prelubrication (D), direction of rotation clockwise (R) and design key (0001),

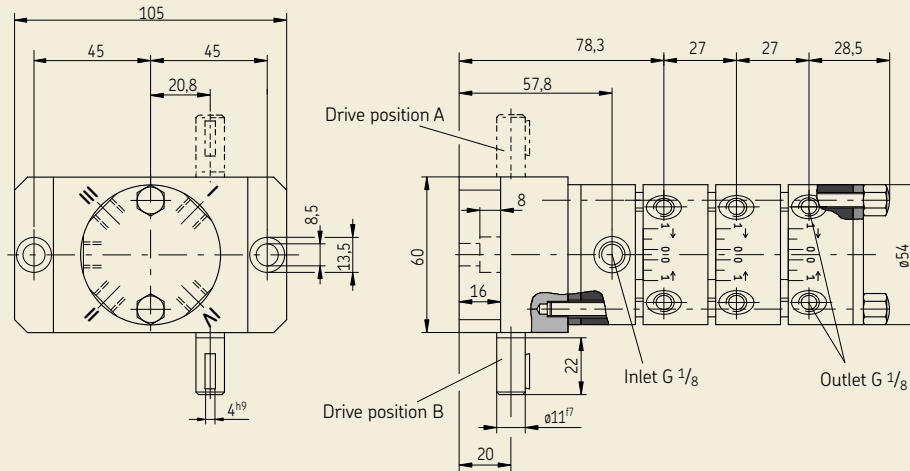
Order No. RA 2UB 15 / 442 D R 0001

Note

For accessories and spare parts – see pages 19–20.

Rotary drive with bevel gear

Fig. 4



Technical data

General

Mounting position Any
Ambient temperature -15 to +80°C

Pump

Type Radial piston pump
Operating pressure 63 bar¹⁾
Short-term pressure 100 bar
Number of combinable
pump elements Max. 5
Outlets per pump element 1, 2 or 4
Displacement variability per
pump element Continuously variable
Displacement per outlet and
revolution of the pump shaft Max. 0.02 cm³
Drive speed 10 to 1800 rpm
Direction of rotation Clockwise or
counterclockwise²⁾

Lubricant Mineral oils³⁾
Temperature range -15 to +80°C
Operating viscosity 25 to 2500 mm²/s
Suction height 500 mm
Intake tube inside diameter ≥ 4 mm

Gearbox

Drive position A or B

Weight with pump element	1	1.69 kg
	2	2.07 kg
	3	2.46 kg
	4	2.84 kg
	5	3.23 kg

¹⁾ Max. operating pressure— see page 4, diagram 2.

²⁾ Standard: clockwise.

³⁾ Synthetic lubricants can be provided on request.

Note

For accessories and spare parts – see pages 19–20.

Explanation of order codes

RA 3UA 01 A 4 2 4 4 1 R 0001

Type
Radial piston pump **RA**

Drive
3UA = rotary with bevel gear

Step-down ratio
01 = 10.5:1

Drive position
A or **B**

Number of outlet ports per pump element
1 = 1 outlet **2** = 2 outlets **4** = 4 outlets
1 to 5 pump elements (counted from drive)

Direction of rotation
R = Standard: clockwise
L = counterclockwise

Design key
0001

Order example

SKF MultiFlex multi-line pump, consisting of a radial piston pump (**RA**), rotary drive with bevel gear (**3UA**), step-down ratio 10.5:1 (**01**), drive position a (**A**), with 5 pump elements, with a total of 15 outlets, consisting of: pump element 1 with 4 outlets, pump element 2 with 2 outlets, pump element 3 with 4 outlets, pump element 4 with 4 outlets and pump element 5 with 1 outlet (**42441**), direction of rotation clockwise (**R**) and design key (**0001**),

Order No. RA 3UA 01 A 42441 R 0001

Electric motor drive, coaxial

Technical data

General

Mounting position Any
Ambient temperature -15 to +80°C

Pump

Type Radial piston pump
Operating pressure 63 bar¹⁾
Short-term pressure 100 bar
Number of combinable
pump elements Max. 5
Outlets per pump element 1, 2 or 4
Displacement variability per
pump element Continuously variable
Displacement per outlet and
motor speed of 1360 rpm Approx. 27.2 cm³/min

Lubricant Mineral oils²⁾
Temperature range -15 to +80°C
Operating viscosity 25 to 2500 mm²/s
Suction height 500 mm
Intake tube inside diameter ≥ 4 mm

Motor

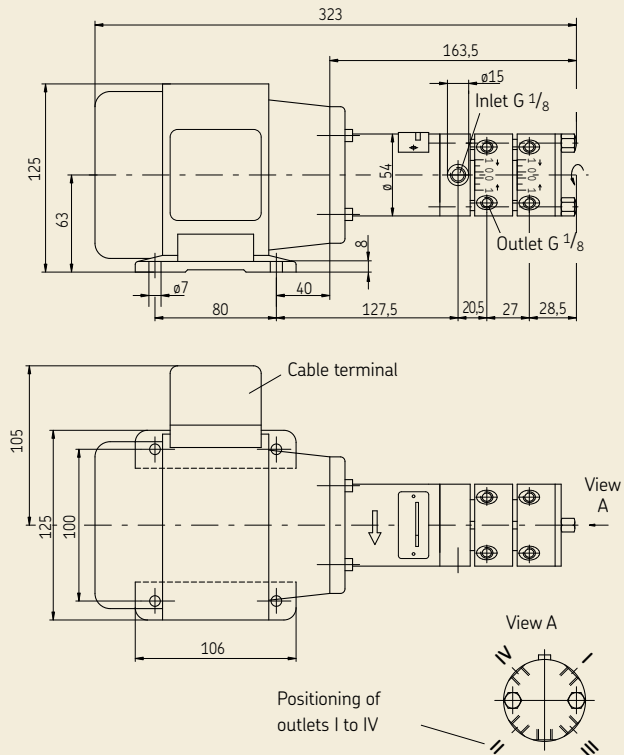
Type/size IM B34/63 C 90
Type of voltage 3-phase
AC voltage
Weight 5.2 kg

Weight with pump element

1	7.05 kg
2	7.44 kg
3	7.82 kg
4	8.21 kg
5	8.59 kg

¹⁾ Max. operating pressure – see page 4, diagram 2.
²⁾ Synthetic lubricants can be provided on request.

Fig. 5



Explanation of order codes

RA 1M 00/44421 R 0001 AF 07

Type Radial piston pump **RA**

Drive **1M** = electric motor, coaxial

Step-down ratio **00** = 1:1

Number of outlet ports per pump element **1** = 1 outlet **2** = 2 outlets **4** = 4 outlets
1 to 5 pump elements (counted from drive)

Direction of rotation **R** = Standard: clockwise
L = counterclockwise

Design key 0001 **0001**

Motor order code **AF, AK, AO** (see Table 1, "Motor ratings")

Motor protection class **07** = Protection class IP55
(Ex design on request)

Table 1

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	0.65/0.38	AO

Order example

SKF MultiFlex multi-line pump, consisting of a radial piston pump (**RA**), electric motor drive, coaxial (**1M**), step-down ratio 1:1 (**00**), with 5 pump elements, with a total of 15 outlets, consisting of: pump element No. 1, No. 2 and No. 3 with 4 outlets each, pump element No. 4 with 2 outlets and pump element No. 5 with 1 outlet (**44421**), direction of rotation clockwise (**R**) and design key (**0001**), motor values of 1500 rpm, 230/400 V AC, 1.13/0.65 A (**AF**), with protection class IP55 (**07**)
Order No. RA 1M 00 / 44421 R 0001 AF 07

Note
The motor specifications refer to three-phase motors from VEM. There may be differences with motors from other manufacturers. For accessories and spare parts – see pages 19–20.

Electric motor drive with coaxial gear

Technical data

See page 8

Displacement per outlet and motor speed of 1360 rpm See **Table 2**

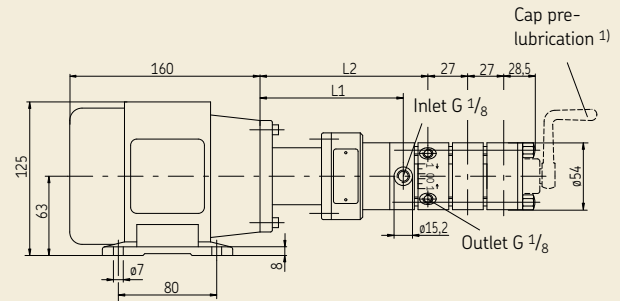
Gearbox

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

Weight with pump element		
1	.....	8.34 kg ¹⁾
2	.....	8.73 kg ¹⁾
3	.....	9.11 kg ¹⁾
4	.....	9.50 kg ¹⁾
5	.....	9.88 kg ¹⁾

¹⁾ Weight is increased by 100 g with cap prelubrication.

Fig. 6



¹⁾ Hand crank is included in scope of delivery and comes with the pump on delivery.

Table 2

Step-down ratio	Length L1 [mm]	Length L2 [mm]	Displacement [cm /min]	Pressure max. [bar]
5:1	110,5	131,5	Approx. 1.8 to approx. 5.44	63
15:1	120,5	141,5	Approx. 0.6 to approx. 1.81	63
25:1	120,5	141,5	Approx. 0.36 to approx. 1.09	50
75:1	131	152	Approx. 0.12 to approx. 0.36	20
125:1	131	152	Approx. 0.07 to approx. 0.21	10

Explanation of order codes

Type	RA	2M	15/421	D R	0001	AF	07
Radial piston pump RA							
Drive							
2M = Electric motor with coaxial gear							
Step-down ratio							
05 = 5:1, 15 = 15:1, 25 = 25:1, 75 = 75:1, 13 = 125:1							
Number of outlet ports per pump element							
1 = 1 outlet 2 = 2 outlets 4 = 4 outlets 1 to 5 pump elements (counted from drive)							
Cap prelubrication							
D = with cap prelubrication (direction of rotation can only be set to clockwise) / = without cap prelubrication							
Direction of rotation							
R = Standard: clockwise L = counterclockwise							
Design key 0001							
Motor order code							
AF, AK, AO (see Table 1, "Motor ratings")							
Motor protection class							
07 = Protection class IP55 (Ex design on request)							

Order example

SKF MultiFlex multi-line pump, consisting of a radial piston pump (RA), electric motor drive with coaxial gear (2M), step-down ratio 15:1 (15), with 3 pump elements, with a total of 7 outlets, consisting of: pump element No. 1 with 4 outlets, pump element No. 2 with 2 outlets and pump element No. 3 with 1 outlet, (421), cap prelubrication (D), default direction of rotation clockwise (R), design key (0001), motor values of 1500 rpm, 230/400 V AC, 1.13/0.65 A, (AF), with protection class IP55 (07),

Order No. RA 2M 15/421 DR 0001 AF 07

Note The motor specifications refer to three-phase motors from VEM. There may be differences with motors from other manufacturers. For accessories and spare parts – see pages 19–20.

Electric motor drive with bevel gear

Technical data

General

Mounting position Any
Ambient temperature -15 to +80 °C

Pump

Type Radial piston pump
Operating pressure 63 bar¹⁾
Short-term pressure 100 bar
Number of combinable
pump elements Max. 5
Outlets per pump element 1, 2 or 4
Displacement variability per
pump element Continuously variable
Displacement per outlet and
motor speed of 1360 rpm Approx. 2.59 cm³/min

Lubricant Mineral oils²⁾
Temperature range -15 to +80 °C
Operating viscosity 25 to 2500 mm²/s
Suction height 500 mm
Intake tube inside diameter ≥ 4 mm

Motor

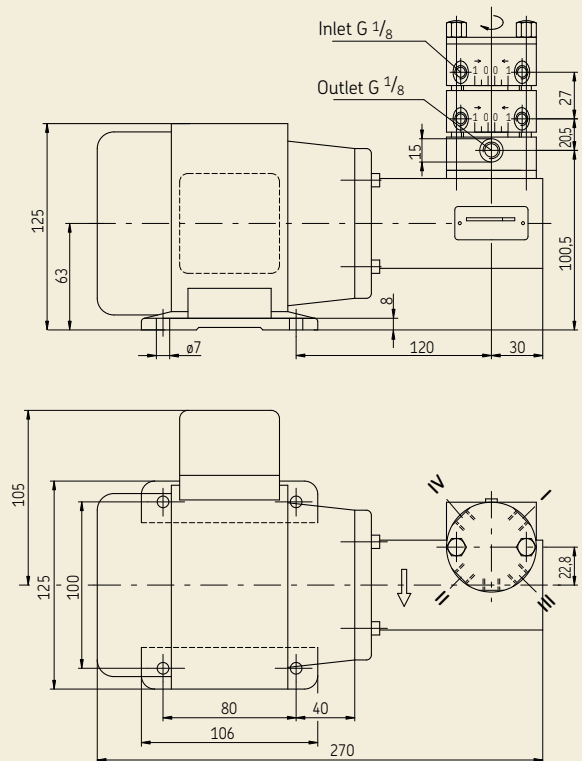
Type/size IM B34/63 C 90
Type of voltage 3-phase
AC voltage

Weight with pump element

1	6.90 kg
2	7.28 kg
3	7.67 kg
4	8.05 kg
5	8.44 kg

¹⁾ Max. operating pressure—see page 4, diagram 2.
²⁾ Synthetic lubricants can be provided on request.

Fig. 7



Explanation of order codes

RA 3M 01/44421 / 0001 AF 07

Type
Radial piston pump **RA**

Drive
3M = Electric motor with
bevel gear

Step-down ratio
01 = 10.5:1

Number of outlet ports per pump element
1 = 1 outlet **2** = 2 outlets **4** = 4 outlets
1 to 5 pump elements (counted from drive)

Design key 0001

Motor order code
AF, AK, AO (see Table 3, "Motor ratings")

Motor protection class
07 = Protection class IP55
(Ex design on request)

Note
The motor specifications refer to three-phase motors from VEM.
There may be differences with motors from other manufacturers.
For accessories and spare parts – see pages 19–20.

Table 3

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	0.65/0.38	AO

Order example

SKF MultiFlex multi-line pump, consisting of a radial piston pump (**RA**), electric motor drive with bevel gear (**3M**), step-down ratio 10.5:1 (**01**), with 5 pump elements, with a total of 15 outlets, consisting of:
pump element No. 1 with 4 outlets,
pump element No. 2 with 4 outlets,
pump element No. 3 with 4 outlets,
pump element No. 4 with 2 outlets and
pump element No. 5 with 1 outlet (**44421**)
design key (**0001**), motor values of 1500 rpm, 230/400 V AC, 1.13/0.65 A (**AF**), with protection class IP 55 (**07**)

Order No. RA 3M 01 / 44421 / 0001 AF 07

Rotary drive with bevel gear and reservoir

Technical data

General

Reservoir capacity	2 or 4.5 kg
Mounting position	Vertical
Ambient temperature	-15 to +80°C
Filling	From above (through reservoir cover) or via filler socket
Fill level control	With or without fill level switch

Pump

Type	Radial piston pump
Operating pressure	63 bar ¹⁾
Short-term pressure	100 bar
Number of combinable pump elements	Max. 3
Outlets per pump element	1, 2 or 4
Displacement variability per pump element	Continuously variable
Displacement per outlet and revolution of the pump shaft	Approx. 0.02 cm
Drive speed	100 to 1800 rpm
Direction of rotation	Drive position A, counterclockwise; drive position B, clockwise
Lubricant	Greases based on mineral oil ²⁾
Temperature range	-15 to +80°C
Penetration as per NLGI	≤ 2

Gearbox

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

Weight for 4.5 kg reservoir

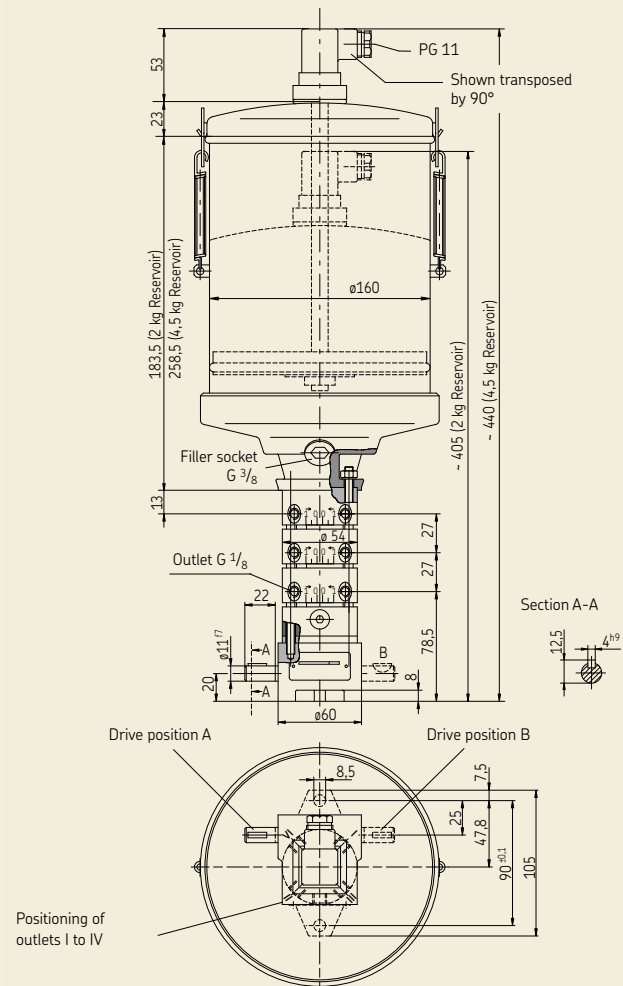
with pump element	1	6.11 kg ³⁾
	2	6.50 kg ³⁾
	3	6.88 kg ³⁾

¹⁾ Max. operating pressure – see page 4, diagram 2.

²⁾ Synthetic lubricants can be provided on request.

³⁾ Weight is reduced by 300 g with a 2 kg reservoir.

Fig. 8



Explanation of order codes

RA 20 F 3UA 01 B 4 4 2 / 0001

Type

Radial piston pump RA

Reservoir capacity

20 = 2 kg; 45 = 4.5 kg

Fill level switch

X = none; E = with 1 switching point;
F = with 2 switching points (see page 18)

Drive

3UA = rotary with bevel gear

Step-down ratio

01 = 10.5:1

Drive position A or B

Number of outlet ports per pump element

1 = 1 outlet 2 = 2 outlets 4 = 4 outlets
1 to 3 pump elements (counted from drive)

Design key 0001

Order example

SKF MultiFlex multi-line pump, consisting of a radial piston pump (RA), 2 kg reservoir (20), with fill level switch (F), rotary drive with bevel gear (3UA), step-down ratio 10.5:1 (01), drive position B (B), with 3 pump elements, with a total of 10 outlets, consisting of: pump element No. 1 with 4 outlets, pump element No. 2 with 4 outlets and pump element No. 3 with 2 outlets, (442), design key (0001),

Order No. RA 20 F 3UA 01 B 4 4 2 / 0001.



Note

For fill level switch, accessories and spare parts – see pages 18–20.

Electric motor drive with coaxial gear and reservoir

Technical data

General

Reservoir capacity	2 or 4.5 kg
Mounting position	Vertical
Ambient temperature	-15 to +60°C
Filling	From above (through reservoir cover) or via filler socket
Fill level control	With or without fill level switch

Pump

Type	Radial piston pump
Operating pressure	63 bar ¹⁾
Short-term pressure	100 bar
Number of combinable pump elements	Max. 3
Outlets per pump element	1, 2 or 4
Displacement variability per pump element ...	Continuously variable
Displacement per outlet at motor speed of 1360 rpm	See Table 5

Lubricant	Greases based on mineral oil ²⁾
Temperature range	-15 to +80°C
Penetration as per NLGI	≤ 2

Motor

Type/size IM B34/63 C 90
Type of voltage 3-phase
AC voltage

Gearbox

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

Weight for 4.5 kg reservoir

with pump element	1	12.77 kg ³⁾
	2	13.15 kg ³⁾
	3	13.54 kg ³⁾

1) Max. operating pressure – see page 4, diagram 2.

2) Synthetic lubricants can be provided on request.

3) Weight is reduced by 300 g with a 2 kg reservoir.

Table 4

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	0.65/0.38	AO

Fig. 9

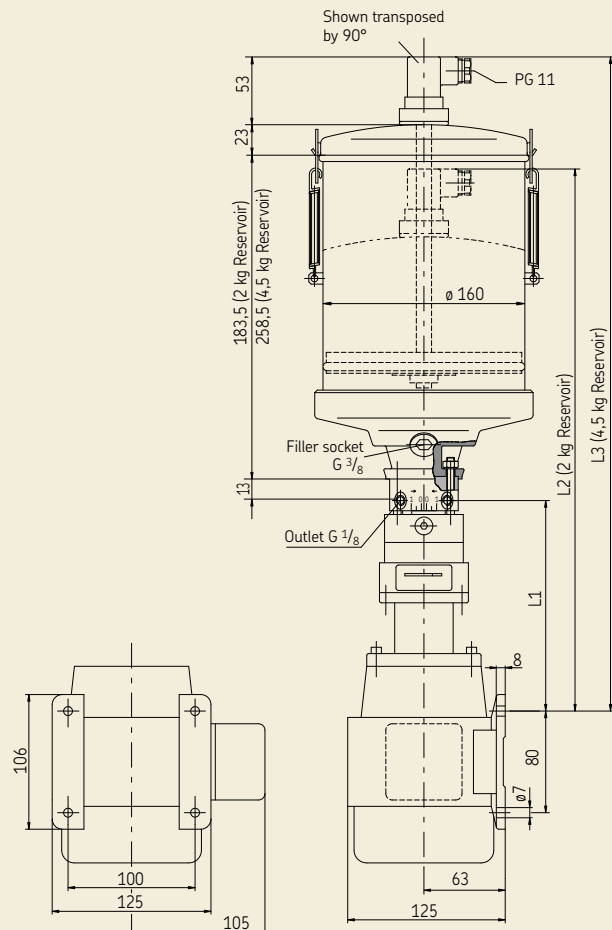


Table 5

Step-down ratio	Length L1 [mm]	Length L2 [mm]	Length L3 [mm]	Displacement [cm /min]
5:1	171.5	444	519	Approx. 1.63 to 4.89
15:1	181.5	454	529	Approx. 0.54 to 1.62
25:1	181.5	454	529	Approx. 0.32 to 0.97
75:1	192	464.5	539.5	Approx. 0.10 to 0.32
125:1	192	464.5	539.5	Approx. 0.06 to 0.19



Note

NOTE The motor specifications refer to three-phase motors from VEM. There may be differences with motors from other manufacturers. For fill level switch, accessories and spare parts – **see pages 18–20.**

Electric motor drive with coaxial gear and reservoir

Explanation of order codes

	RA	20	F	2M	05	/	4	4	2	/	0001	AF	07
Type													
Radial piston pump RA													
Reservoir capacity													
20 = 2 kg; 45 = 4.5 kg													
Fill level switch													
X = none; E = with 1 switching point; F = with 2 switching points (see page 18)													
Drive													
2M = Electric motor with coaxial gear													
Step-down ratio													
05 = 5:1 15 = 15:1 25 = 25:1 75 = 75:1 13 = 125:1													
Number of outlet ports per pump element													
1 = 1 outlet 2 = 2 outlets 4 = 4 outlets 1 to 3 pump elements (counted from drive)													
Design key													
0001													
Motor order code													
AF, AK, AO (see Table 4 , "Motor ratings")													
Motor protection class													
07 = Protection class IP55 (Ex design on request)													

Order example

SKF MultiFlex multi-line pump, consisting of a radial piston pump (RA), 2 kg reservoir (20), with fill level switch (F), electric motor drive with coaxial gear (2M), step-down ratio 5:1 (05), with 3 pump elements, with a total of 10 outlets, consisting of:
 pump element No. 1 with 4 outlets,
 pump element No. 2 with 4 outlets and
 pump element No. 3 with 2 outlets, (442),
 design key (0001), motor values of 1 500 rpm, 230/400 V AC, 1.13/0.65 A (AF), with protection class IP 55 (07)

Order No. RA 20 F 2M 05 / 442 / 0001 AF 07

Electric motor drive with bevel gear and reservoir

Technical data

General

Reservoir capacity	2 or 4.5 kg
Mounting position	Vertical
Ambient temperature	−15 to +60°C
Filling	From above (through reservoir cover) or via filler socket
Fill level control	With or without fill level switch

Pump

Type	Radial piston pump
Operating pressure	63 bar ¹⁾
Short-term pressure	100 bar
Number of combinable pump elements	Max. 3
Outlets per pump element	1, 2 or 4
Displacement variability per pump element	Continuously variable
Displacement per outlet at motor speed of 1360 rpm	Approx. 2.33 cm ³ /min

Lubricant	Greases based on mineral oil ²⁾
Temperature range	−15 to +80°C
Penetration as per NLGI	≤ 2

Motor

Type/size	IM B34/63 C 90
Type of voltage	3-phase AC voltage

Gearbox

Step-down ratio	10.5:1
-----------------	--------

Weight for 4.5 kg reservoir with pump element

1	11.37 kg ³⁾
2	11.76 kg ³⁾
3	12.14 kg ³⁾

¹⁾ Max. operating pressure – see page 4, diagram 2.
²⁾ Synthetic lubricants can be provided on request.
³⁾ Weight is reduced by 300 g with a 2 kg reservoir.

Fig. 10

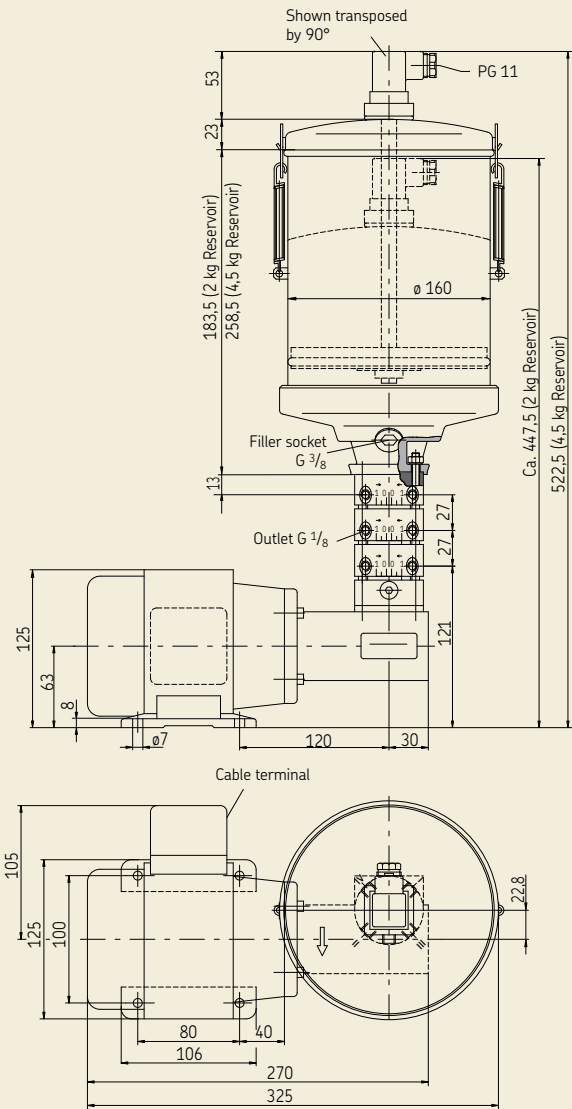


Table 6

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	0.65/0.38	AO

Note
The motor specifications refer to three-phase motors from VEM.
There may be differences with motors from other manufacturers.
For fill level switch, accessories and spare parts – see pages 18–20.

Electric motor drive with bevel gear and reservoir

Explanation of order codes

	RA	20	F	3M	01	/	1	2	4	/	0001	AF	07
Type	Radial piston pump												
Reservoir capacity		20 = 2 kg; 45 = 4.5 kg											
Fill level switch			X = none; E = with 1 switching point; F = with 2 switching points (see page 18)										
Drive				3M = Electric motor with bevel gear									
Step-down ratio					01 = 10.5:1								
Number of outlet ports per pump element													
Design key													
Motor order code													
Motor protection class													

Order example

SKF MultiFlex multi-line pump, consisting of a radial piston pump (RA), 2 kg reservoir (20), with fill level switch (F), electric motor drive with bevel gear (3M), step-down ratio 10.5:1 (01), with 3 pump elements, with a total of 7 outlets, consisting of:
 pump element No. 1 with 1 outlet,
 pump element No. 2 with 2 outlets and
 pump element No. 3 with 4 outlets, (124),
 design key (0001), motor values of 1 500 rpm, 230/400 V AC, 1.13/0.65 A (AF), with protection class IP 55 (07)

Order No. RA 20 F 3M 01 / 124 / 0001 AF 07

Electric motor drive with 3, 7, or 15 liter reservoir

Technical data

General

Mounting position Horizontal
Ambient temperature -15 to +60°C
Filling Via filler cap
Fill level control With or without fill level switch

Pump

Type Radial piston pump
Operating pressure See **Table 8**
Short-term pressure 100 bar
Number of combinable pump elements Max. 5
Outlets per pump element 1, 2 or 4
Displacement variability per pump element Continuously variable
Displacement per outlet at motor speed of 1 360 rpm See **Table 7**

Lubricant mineral oil¹⁾
Temperature range -15 to +80°C
Operating viscosity 25 to 2 500 mm²/s

Motor

Type/size IM B34/63 C 90
Type of voltage 3-phase AC voltage

Gearbox

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

Reservoir

Capacity 3, 7 or 15 liters
Design for 3 and 7 liters Polyamide, transparent
Design for 15 liters Aluminum

¹⁾ Synthetic lubricants can be provided on request.

Table 7

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	0.65/0.38	AO

Note

The motor specifications refer to three-phase motors from VEM. There may be differences with motors from other manufacturers. For fill level switch, accessories and spare parts – see **pages 18–20**.

Order example

SKF MULTIFLEX multi-line pump consisting of a radial piston pump RA installed on a reservoir (**RAB**), 7 liter reservoir (**07**), with fill level switch (**V**), electric motor drive, coaxial (**1M**), without step-down ratio 0:0 (**00**), pump mounted on the right side of reservoir (**/**), with 5 pump elements, with a total of 13 outlets, consisting of:
pump element 1 with 2 outlets,
pump element 2 with 1 outlet,
pump element 3 with 4 outlets
pump element 4 with 2 outlets and
pump element 5 with 4 outlets (**21424**),
without cap prelubrication (**/**), design key (**0001**),
motor values of 1 500 rpm, 230/400 V AC, 1.13/0.65 A (**AF**),
with protection class IP 55 (**07**)

Order No. RAB 07 V 1M 00 / 21424 / 0001 AF 07

Explanation of order codes

Type

Radial piston pump **RA** installed on reservoir

Reservoir capacity

03 = 3 liters; **07** = 7 liters; **15-2** = 15 liters

Fill level switch

X = none; **V** = with fill level switch for min. (reed contact) (see **page 18**)

Drive type

1M = Electric motor, coaxial; **2M** = Electric motor with coaxial gear; **3M** = Electric motor with bevel gear

Step-down ratio

00 = 1:1 (1M); **01** = 10.5:1 (3M); **05** = 5:1 (2M); **15** = 15:1 (2M);
25 = 25:1 (2M); **75** = 75:1 (2M); **13** = 125:1 (2M)

Attachment location

A = on right side of reservoir (3M pump pointing upwards), **/** = on right side of reservoir (1M, 3M)

Number of outlet ports per pump element

1 = 1 outlet **2** = 2 outlets **4** = 4 outlets
1 to 5 pump elements (counted from drive)

Cap prelubrication

DR = with cap prelubrication, direction of rotation can only be set to clockwise (2M); **/** = none (1M, 2M)

Design key 0001

Motor order code

AF, **AK**, **AO** (see **Table 7**, "Motor ratings")

Motor protection class

07 = Protection class IP55 (Ex design on request)

RAB 07 V 1M 00 / 21424 / 0001 AF 07

Pump element 1

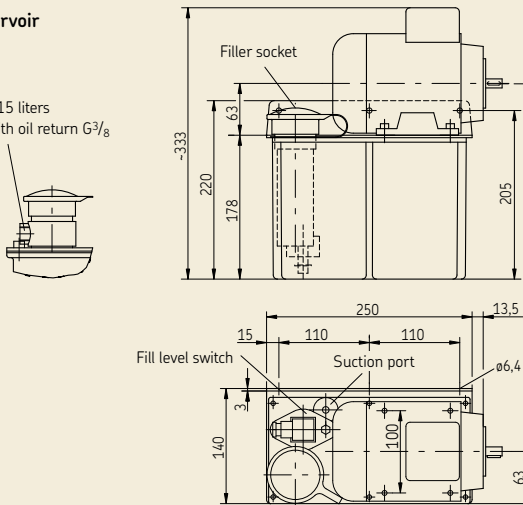
Pump element 5

Electric motor drive with 3, 7, or 15 liter reservoir

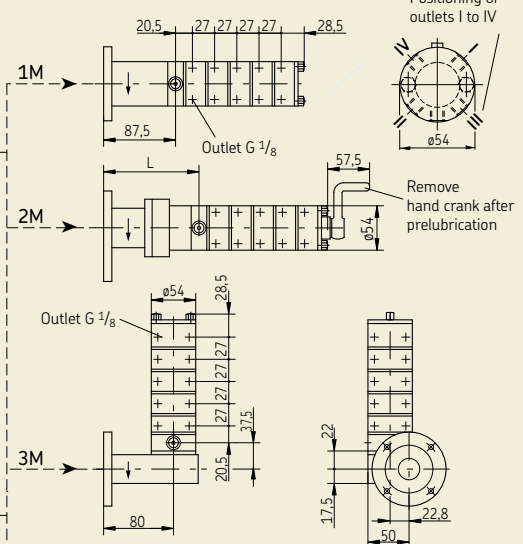
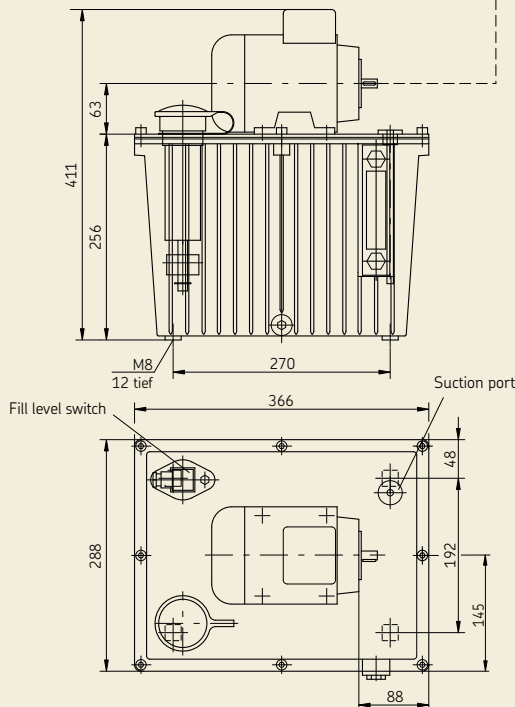
Fig. 11

3 liter reservoir

For 3, 7 and 15 liters
on request with oil return G $\frac{3}{8}$



15 liter reservoir



7 liter reservoir

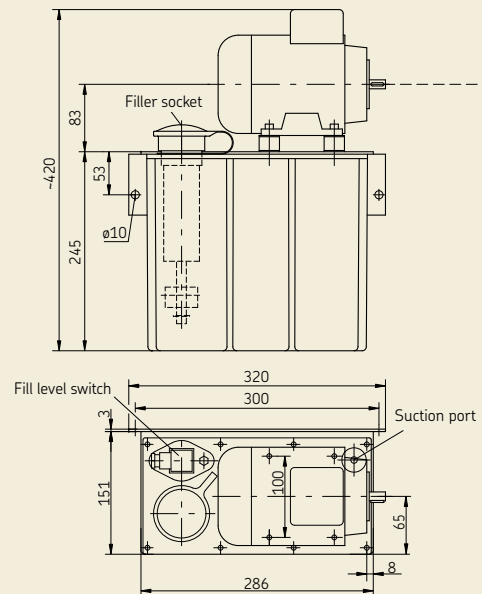


Table 8

Step-down ratio	Length L [mm]	Displacement per outlet [cm ³ /min.]	Max. operating pressure [bar]
1:1	87.5	Approx. 27.2	63
10.5:1	—	Approx. 2.59	63
5:1	110.5	Approx. 5.44	63
15:1	120.5	Approx. 1.81	63
25:1	120.5	Approx. 1.09	50
75:1	131	Approx. 0.36	20
125:1	131	Approx. 0.22	10

Table 9

Weights

3 liter reservoir	1.7 kg	Fill level switch	0.135 kg
7 liter reservoir	2.76 kg	Motor	5.2 kg
15 liter reservoir	8 kg	per pump element	0.385 kg
		Cap prelubrication	0.1 kg

Pump design

Drive type 1M	1.48 kg
Drive type 2M	2.76 kg
Drive type 3M	1.33 kg

Fill level switch for grease

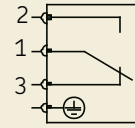
Technical data

Fill level switch E

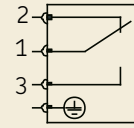
Design	Reed contact
Switch design	1 switching point min. (changeover)
Switching capacity, max.	60 W/VA
Switching voltage, max.	230 V AC/DC
Connector plug	DIN EN 175301-803-A
Protection class of plug/socket	IP 65

Fig. 12

Wiring diagram for fill level switch E



Contact position
min. fill level



Contact position
above min. fill level

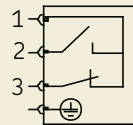
Technical data

Fill level switch F

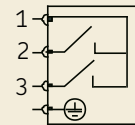
Design	Reed contact
Switch design	2 switching points (min. - max.)
Switch current, max.	1 A with AC/DC ¹⁾
Switching voltage, max.	42 V AC/DC
Connector plug	DIN EN 175301-803-A
Protection class of plug/socket	IP 65

Fig. 13

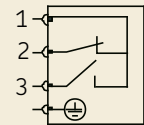
Wiring diagram for fill level switch F



Contact position
min. fill level



Contact position between
min. and max. fill level



Contact position
max. fill level

¹⁾ Provide spark quenching if there is inductive load.

Fill level switch for oil

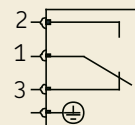
Technical data

Fill level switch V

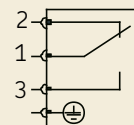
Design	Min. monitoring
Contact voltage	10 - 42 V AC/DC
Rated contact current	1 A
Load contact	Changeover ¹⁾ (reed contact)
Connector plug	DIN EN 175301-803-A
Protection class of plug/socket	IP 65

Fig. 14

Wiring diagram for fill level switch V



Contact position
max. fill level



Contact position
above max. fill level

¹⁾ Other specification available on request.

Accessories

Accessories (ordered separately)

Designation	for pipe ø	Thread	Order No.
Union nut	4	R 1/8	44-0709-2040
	6	R 1/8	44-0709-2041
Double tapered ring	4		44-0405-2002
	6		406-001
Straight connector	4	R 1/8 tap.	404-403W
	6	R 1/8 tap.	406-423W
	8	R 1/8 tap.	408-423W
Banjo fitting	4	R 1/8	96-7004-0058
	6	R 1/8	96-7006-0058
	8	R 1/8	96-7008-0058
GE screw union with check valve	4	R 1/8 tap.	24-2103-2933
	6	R 1/8 tap.	24-2103-2927
Banjo fitting with check valve	4	R 1/8 tap.	24-2106-2016
	6	R 1/8 tap.	24-2106-2017
Banjo fitting ¹⁾	6	R 1/8	24-2106-2390
Pressure regulating valve ²⁾		R 1/8	24-2103-3680
Pressure regulating valve ³⁾	6	R 1/8 tap.	24-2103-3681

¹⁾ With additional connection thread for directly screwing pressure regulating valves.

²⁾ Up to 90 bar, without pipe connection for RA pumps operated for short periods.

³⁾ Up to 60 bar, with pipe connection for continuous duty.

SKF plug connector with cylindrical internal thread

Designation	for pipe ø	Thread	Order No.
Adapter	4	G 1/8	404-040-VS
	6	G 1/8	456-004-VS
Banjo fitting	4	G 1/8	504-108-VS
	6	G 1/8	506-108-VS
Elbow	4	G 1/8 tap.	514-018-VS
	6	G 1/8 tap.	506-511-VS



Note

For further detailed information about SKF plug connectors and related tools, see our brochure on connector systems, brochure **No. 1-0103-EN**.

Spare parts

Spare parts (ordered separately)

For rotary drive,
coaxial, with coaxial and bevel gear

Electric motor drive, coaxial

Description	Order No.
Rotary drive	
Coaxial 1:1	24-0701-3000
Coaxial 5:1	24-0701-3070
Coaxial 5:1 with prelubrication	24-0701-3080
Coaxial 15:1	24-0701-3071
Coaxial 15:1 with prelubrication	24-0701-3081
Coaxial 25:1	24-0701-3072
Coaxial 25:1 with prelubrication	24-0701-3082
Coaxial 75:1	24-0701-3073
Coaxial 75:1 with prelubrication	24-0701-3083
Coaxial 125:1	24-0701-3074
Coaxial 125:1 with prelubrication	24-0701-3084
Bevel gear	
Drive position A (10.5:1)	24-0701-3001
Drive position B (10.5:1)	24-0701-3002
Spacer ring (only at 1:1)	24-1721-2000
Pump element	
With 1 outlet	24-1557-3520
With 2 outlets	24-1557-3521
With 4 outlets	24-1557-3522
Stud bolt for step-down ratios 1:1, 10.5:1, 15:1, 25:1 and 75:1¹⁾	
For 1 pump element	44-0717-2060
For 2 pump elements	44-0717-2061
For 3 pump elements	44-0717-2062
For 4 pump elements	44-0717-2063
For 5 pump elements	44-0717-2064
Stud bolt for step-down ratios 5:1 and 125:1¹⁾	
For 1 pump element	44-0717-2069
For 2 pump elements	44-0717-2070
For 3 pump elements	44-0717-2071
For 4 pump elements	44-0717-2072
For 5 pump elements	44-0717-2073
Washer ¹⁾	DIN125-B6.4-ST
Nut ¹⁾	DIN934-M6-8
Cap	44-0413-2610
Cap nut ¹⁾	95-0006-0917
Hand crank	24-0801-2070

¹⁾ Two required per pump.

Spare parts (ordered separately)

For electric motor drive with
coaxial and bevel gear and
coaxial and bevel gear with reservoir

Description	Order No.
Electric motor	
Order code AF ¹⁾	84-1700-4790
Order code AK ¹⁾	84-1700-4808
Order code AO ¹⁾	84-1700-4786
Cheese-head screw ²⁾	DIN 912-M5×16-8.8
2 kg reservoir	
Without fill level switch	24-0254-2312
With fill level switch E	24-0254-2334
With fill level switch F	24-0254-2330
4.5 kg reservoir	
Without fill level switch	24-0254-2310
With fill level switch E	24-0254-2335
With fill level switch F	24-0254-2331
Rotary drive with bevel gear and reservoir	
Bevel gear (10.5:1)	24-0701-3003
Spacer ring (only at 1:1)	24-1721-2001
Pump element	
With 1 outlet	24-1557-3520
With 2 outlets	24-1557-3521
With 4 outlets	24-1557-3522
Stud bolt³⁾	
For 1 pump element	44-0717-2070
For 2 pump elements	44-0717-2071
For 3 pump elements	44-0717-2072
Washer ³⁾	DIN125-B6.4-ST
Nut ³⁾	DIN934-M6-8

¹⁾ Protection class IP 55

²⁾ Four required per pump.

³⁾ Two required per pump.

Notes

The Power of Knowledge Engineering

Combining products, people, and application-specific knowledge, SKF delivers innovative solutions to equipment manufacturers and production facilities in every major industry worldwide. Having expertise in multiple competence areas supports SKF Life Cycle Management, a proven approach to improving equipment reliability, optimizing operational and energy efficiency and reducing total cost of ownership.

These competence areas include bearings and units, seals, lubrication systems, mechatronics, and a wide range of services, from 3-D computer modelling to cloud-based condition monitoring and asset management services.

SKF's global footprint provides SKF customers with uniform quality standards and worldwide product availability. Our local presence provides direct access to the experience, knowledge and ingenuity of SKF people.



Important information on product usage

SKF and Lincoln lubrication systems or their components are not approved for use with gases, liquefied gases, pressurized gases in solution and fluids with a vapor pressure exceeding normal atmospheric pressure (1 013 mbar) by more than 0,5 bar at their maximum permissible temperature.

Further brochures

1-0103-EN

Fittings and Accessories

1-9201-EN

Transport of Lubricants in Centralized Lubrication Systems

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