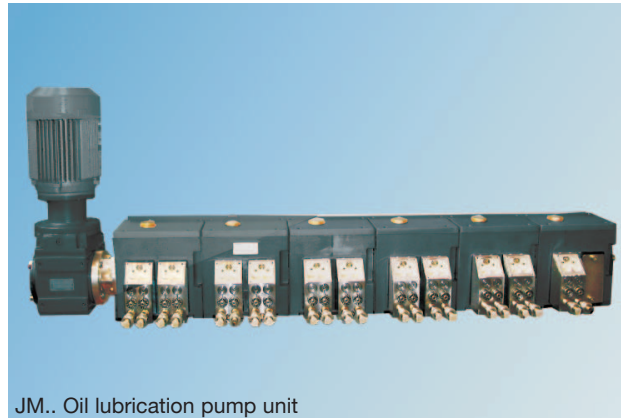


Multiline pumps and multiline units for total-loss oil lubrication systems on compressors



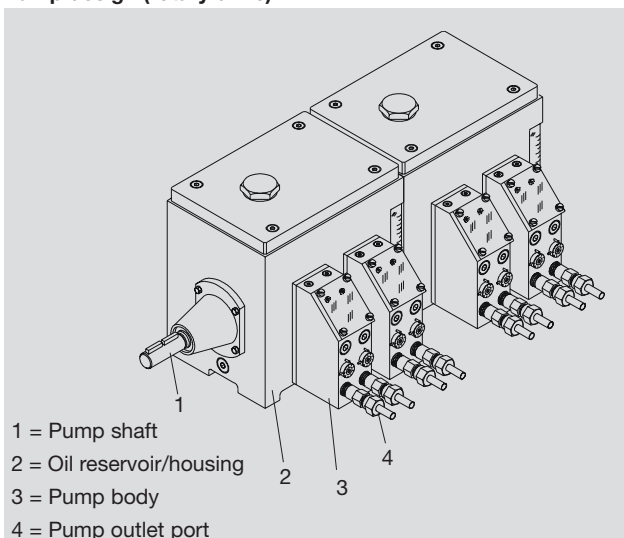
General remarks

The JM oil lubrication pump is a high-pressure pump that produces a maximum continuous pressure of 600 bars per outlet port.

The pump's main field of use is total-loss oil lubrication of the cylinders and packing used in piston compressors.

All mineral oils with a service viscosity ranging from 25 to 3000 mm²/s can be delivered with the JM oil lubrication pump. Please inquire before using synthetic oils!

Pump design (rotary drive)



Advantages

VOGEL JM... oil lubrication pumps

- have a pump body with a double piston system (feed and working piston) for each respective outlet port
- come with positively actuated, adjustable pump elements and are suitable for industrial applications and continuous operation
- come with a broad range of adjustable delivery rates extending from roughly 20 to 100% per outlet port
- have delivery rates ranging from 0.07 to 0.2 ml/stroke and outlet port
- reach operating pressures as high as 600 bars
- are application-oriented with 1 to a maximum of 24 pump elements that come with the unit or can be added on later
- are available in reservoir sizes of 2, 4, 6, 8, 10, or 12 liters (1 ... 6 housings)
- have an integrated visual drip control and conical non-return valve on each outlet port on the pressure side.

Design and mode of operation

(See Fig. 1)

The pump shaft (1) imparts the required stroke motion to both the feed piston (2) and the working piston (3). The feed piston (2) first injects into duct B the lubricant drawn in via duct A. The lubricant then makes its way via the ring groove (4) to duct C. From there the oil moves through a check valve (5) into the drop nozzle (6). The oil drips into the intake duct (8) behind the sight glass (7). As it continues its motion the working piston (3) closes the intake duct (8) and presses the apportioned quantity of oil from the cylinder chamber (9) through the pressure duct (10) and check valve (11) to the lube point. The delivery rate is regulated via the setscrew (12) that increases or decreases the effective stroke of the feed piston (2) by way of the cylinder bush (13). Turning the screw clockwise decreases the delivery rate. The delivery rate can be reduced to nearly zero.

Not only the position of the setscrew but also the pump element (0.07, 0.1 or 0.2 ccm/full stroke) and the drive speed as well as the selected step-down ratio are decisive in respect to the delivery rate. The delivery rates for the pump elements (driven by electric motors) are compared with each other on page 6.

It is easy to precisely determine and/or set the delivery rate:

Remove the sight glass

- Use a glass gauge to measure the delivery rate per unit of time at the drop nozzle
- Increase or decrease the delivery rate by turning the setscrew
- Repeat the procedure until the desired delivery rate is reached
Position 1 = minimum amount, position 8 = full amount
- Install the sight glass

Since every outlet port is supplied separately, the set delivery rate remains constant and independent of the rate set with neighboring setscrews.

Housing versions

The JM pump consists of 1 to 6 pump housings (individual reservoirs) with 1 to 4 outlet ports respectively. The capacity of the pump housings amounts to 2 liters respectively. A maximum of 6 housings can be screwed together to form one pump.

Drive versions

The pump shaft can be optionally driven directly, via a coupled shaft or gear train, with or without an electric motor, and with or without free-wheeling.

In the case of versions with integrated free-wheeling it is possible as an option to install a prelubricator on the side opposite the drive. With pumps that have more than 16 outlet ports the required motor power increases from 0.55 kW to 0.75 kW.

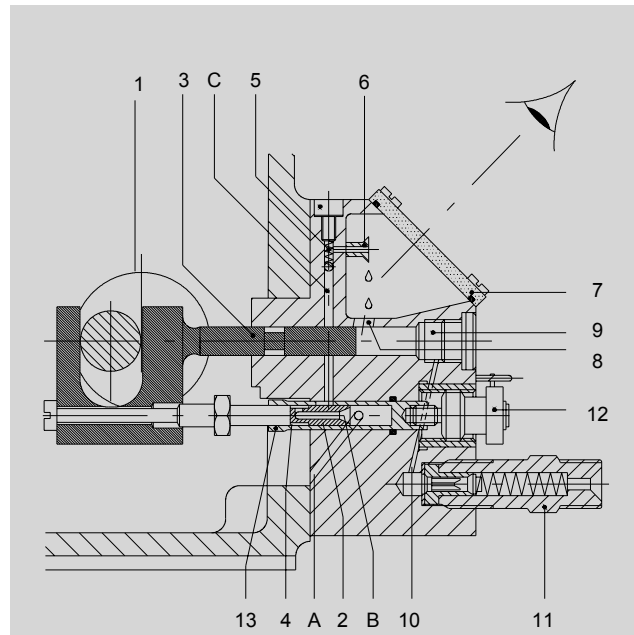


Fig. 1
Design of a JM pump element



Fig. 2
Housing versions

Rotary drive

Technical data

General information

Mounting position horizontal, level surface
 Ambient temperature 0 °C to + 80 °C
 Reservoir capacity 2, 4, 6, 8, 10, 12 liters
 Weight per housing approx. 4 kg

Pump

Type high-pressure pump with eccentric shaft drive of pump pistons
 Max. operating pressure 600 bars ¹⁾
 Number of addable individual housings 1 to 6
 Pump bodies per individual housing 1 to 2
 Outlet ports per pump body 1 to 2
 Number of outlet ports 1 to 24
 Adjustment of delivery rate per pump outlet stepless
 Max. delivery rate per outlet port and stroke .. 0,07-/ 0,1-/ 0.2 ml
 Direction of rotation CW or CCW (without free-wheeling)
 Lubricant mineral oils ²⁾
 Lubricant temperature range .. 0 °C to + 80 °C
 Service viscosity 25 to 3000 mm²/s

Order codes

Type

High-pressure pump, max. 600 bars with eccentric shaft drive of the pump pistons, with expandable, screwed-on pump housings

Oil reservoir capacity

02 = 2 liters (4 outlets) **08** = 8 liters (16 outlets)
04 = 4 liters (8 outlets) **10** = 10 liters (20 outlets)
06 = 6 liters (12 outlets) **12** = 12 liters (24 outlets)

Oil reservoir version

A = pressure-tight ³⁾ **B** = vented

Type of drive

1U = rotary, cylindrical shaft

Delivery rate key (step-down ratio)

01 = 1:1

Drive position

A = left **B** = right

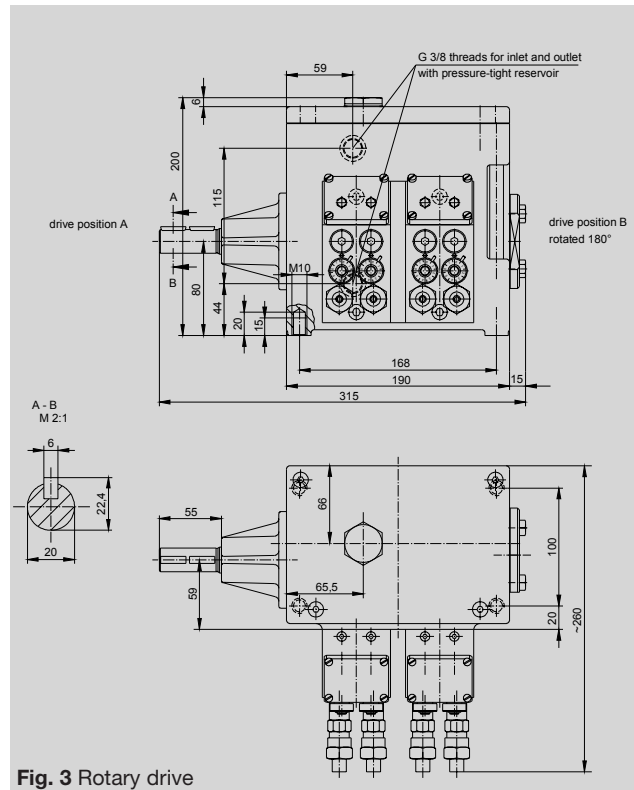


Fig. 3 Rotary drive

JM 02 A 1U 01 A 1 04 Z / A 0001

Version key

0001 = basic model

Modification letter

A = pump housing of chilled aluminum casting, plain bearings for eccentric shaft

Prelubrication, side opposite drive

/ = without prelubrication

Tubing port Ø and port type

Z = Ø 6 mm solderable

Y = Ø 6 mm solderless

X = Ø 8 mm solderable

w = Ø 8 mm solderless

- = G ¼ thread

Number of outlet ports

02 = 2 outlet ports to **24** = 24 outlet ports

Delivery rate per piston stroke

3 = 0.07 ml/stroke **2** = 0.2 ml/stroke

1 = 0.1 ml/ stroke **0** = mixed version

Order example

JM oil lubrication pump **JM02A1U01A104Z/A0001** consisting of model **JM** high-pressure pump, oil reservoir capacity 2 liters (**02**), pressure-tight version (**A**), rotary drive (**1U**), step-down ratio 1:1 (**01**), drive position A (**A**), delivery rate 0.1 ccm/stroke (**1**), with 4 outlet ports (**04**), tubing port Ø 6 mm, solderable (**Z**), without prelubrication (**/**), modification letter A (**A**) and version key 0001 (**0001**).

- 1) Please consult the Willy Vogel AG Service Center when the continuous operating pressure > 400 bars and the service viscosity < 100 cSt.
- 2) Please inquire before using synthetic lubricants.
- 3) For the supply of an additional or overhead reservoir.

Rotary drive with gear train

Technical data

General information

Mounting position horizontal, level surface
 Ambient temperature 0 °C to + 80 °C
 Reservoir capacity 2, 4, 6, 8, 10, 12 liters
 Weight per housing (gear train about 20 kg) approx. 4 kg

Pump

Type..high-pressure pump with eccentric shaft drive of pump pistons
 Max. operating pressure 600 bars ¹⁾
 Number of addable individual housings 1 to 6
 Pump bodies per individual housing 1 to 2
 Outlet ports per pump body 1 to 2
 Number of outlet ports 1 to 24
 Adjustment of delivery rate per pump outlet stepless
 Max. delivery rate per outlet port and stroke .. 0,07-/ 0,1-/ 0.2 ml
 Direction of rotation CW or CCW (without/with free-wheeling)
 Lubricant mineral oils ²⁾
 Lubricant temperature range .. 0 °C to + 80 °C
 Service viscosity 25 to 3000 mm²/s

- 1) Please consult the Willy Vogel AG Service Center when the continuous operating pressure > 400 bars and the service viscosity < 100 cSt.
- 2) Please inquire before using synthetic lubricants.
- 3) For the supply of an additional or overhead reservoir.

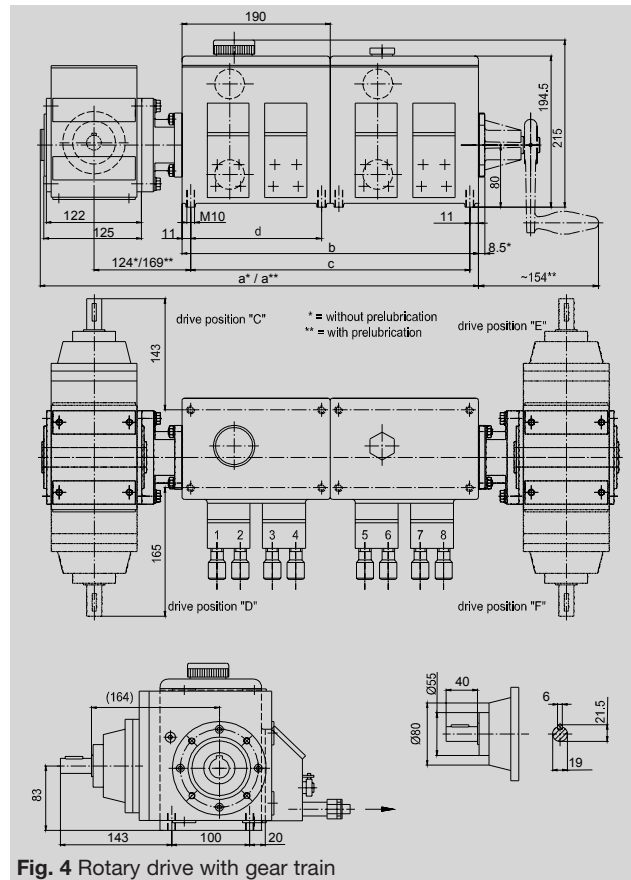


Fig. 4 Rotary drive with gear train

Order codes

Type

High-pressure pump, max. 600 bars with eccentric shaft drive of the pump pistons, with expandable, screwed-on pump housings

Oil reservoir capacity

02 = 2 liters (4 outlets)	08 = 8 liters (16 outlets)
04 = 4 liters (8 outlets)	10 = 10 liters (20 outlets)
06 = 6 liters (12 outlets)	12 = 12 liters (24 outlets)

Oil reservoir version

A = pressure-tight ³⁾ **B** = vented

Type of drive

5U = gear train with rotary shaft
6U = gear train with rotary shaft and free-wheeling

Delivery rate key (step-down ratio)

39 = approx. 39:1, **78** = approx. 78:1, **17** = approx. 167:1

Drive position

C = rear left **D** = front left **E** = rear right **F** = front right

Order example

JM oil lubrication pump **JM02A6U39A104ZHRA0001** consisting of model **JM** high-pressure pump, oil reservoir capacity 2 liters (**02**), pressure-tight version (**A**), gear train with rotary shaft and free-wheeling (**6U**), step-down ratio 39:1 (**39**), drive position C (**C**), delivery rate 0.1 ccm/stroke (**1**), with 4 outlet ports (**04**), tubing port Ø 6 mm, solderable (**Z**), with prelubrication (**H**), clockwise direction of rotation (**R**), modification letter A (**A**) and version key 0001 (**0001**).

JM 02 A 6U 39 C1 04 Z H R A 0001

Version key

0001 = basic model

Modification letter

A = pump housing of chilled aluminum casting, plain bearings for eccentric shaft, reinforced gears version

Direction of rotation/drive shaft (only with prelubrication)

R = clockwise
L = counterclockwise

Prelubrication, side opposite drive

/ = without prelubrication
H = with prelubrication (6U only)

Tubing port Ø and port type

Z = Ø 6 mm solderable
Y = Ø 6 mm solderless
X = Ø 8 mm solderable
w = Ø 8 mm solderless
- = Gained G ¼

Number of outlet ports

02 = 2 outlet ports to **24** = 24 outlet ports

Delivery rate per piston stroke

3 = 0.07 ml/stroke **2** = 0.2 ml/stroke
1 = 0.1 ml/ stroke **0** = mixed version

Electric motor drive with gear train

Technical data

General information

Mounting position horizontal, level surface
 Ambient temperature 0 °C to + 60 °C
 Reservoir capacity 2, 4, 6, 8, 10, 12 liters
 Weight per housing (gear train about 20 kg) approx. 4 kg

Pump

Type high-pressure pump with eccentric shaft drive of pump pistons
 Max. operating pressure 600 bars ¹⁾
 Number of addable individual housings 1 to 6
 Pump bodies per individual housing 1 to 2
 Outlet ports per pump body 1 to 2
 Number of outlet ports 1 to 24
 Adjustment of delivery rate per pump outlet stepless
 Max. delivery rate per outlet port and stroke .. 0,07-/ 0,1-/ 0.2 ml
 Direction of rotation CW or CCW (without/with free-wheeling)
 Lubricant mineral oils ²⁾
 Lubricant temperature range 0 °C to + 80 °C
 Service viscosity 25 to 3000 mm²/s

Gear train

Step-down ratios 39:1, 78:1, 130:1, 167:1,
 (see page 6 for further step-down ratios)

Motor

Model B14/V18
 Type of voltage 3-phase alternating voltage
 Power up to 16 outlets = 0.55 kW
 more than 16 outlets = 0.75 kW

Rated speed [rpm]	Frequency [Hz]	Rated output [kW]	Rated voltage [V]	Rated current [A]	Order code
1000	50	0,55	230/400	3,0/1,73	AG
1000	50	0,55	290/500	2,30/1,38	AL
1000	50	0,55	400/690	1,73/1,0	AP
1500	50	0,55	230/400	2,78/1,6	AF
1500	50	0,55	290/500	2,1/1,28	AK
1500	50	0,55	400/690	1,6/0,93	AO

- 1) Please consult the Willy Vogel AG Service Center when the continuous operating pressure > 400 bars and the service viscosity < 100 cSt.
- 2) Please inquire before using synthetic lubricants.

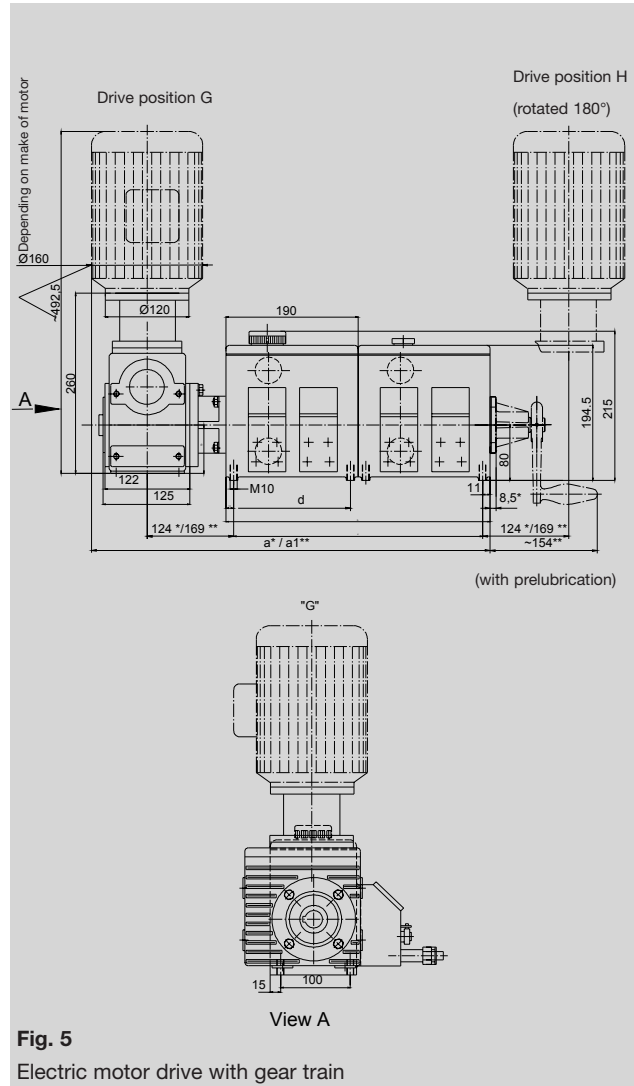


Fig. 5
 Electric motor drive with gear train

Rated speed [rpm]	Frequency [Hz]	Rated output [kW]	Rated voltage [V]	Rated current [A]	Order code
1000	50	0,75	230/400	4,23/2,43	AG
1000	50	0,75	290/500	3,35/1,94	AL
1000	50	0,75	400/690	2,43/1,41	AP
1500	50	0,75	230/400	3,65/2,1	AF
1500	50	0,75	290/500	2,9/1,68	AK
1500	50	0,75	400/690	2,1/1,22	AO

Please note!

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

Continued next page

Electric motor drive with gear train

Theoretical and calculated data in the case of an electric motor drive with gear train and an electric motor power of **0.55 kW** or **0.75 kW**.

Max. delivery rate of 0.07 ml/piston stroke

Rated speed: 1000 rpm No-load speed : 910 rpm

Step-down ratio [i = ... :1]	Delivery rate key	Gear train (3M, 4M) Delivery rate range in ml/min (calculated)		
		100 %	33,3 %	20 %
245,556	25	0,247	0,082	0,049
203,000	20	0,309	0,103	0,062
167,308	17	0,375	0,125	0,075
130,500	13	0,481	0,160	0,096
98,600	98	0,637	0,212	0,127
77,842	78	0,807	0,269	0,161
56,389	57	1,114	0,371	0,223
38,921	39	1,613	0,538	0,323

Max. delivery rate of 0.1 ml/piston stroke

Rated speed: 1000 rpm No-load speed : 910 rpm

Step-down ratio [i = ... :1]	Delivery rate key	Gear train (3M, 4M) Delivery rate range in ml/min (calculated)		
		100 %	33,3 %	20 %
245,556	25	0,357	0,119	0,071
203,000	20	0,448	0,149	0,090
167,308	17	0,544	0,181	0,109
130,500	13	0,697	0,232	0,139
98,600	98	0,923	0,308	0,185
77,842	78	1,169	0,390	0,234
56,389	57	1,614	0,538	0,323
38,921	39	2,338	0,779	0,468

Max. delivery rate of 0.2 ml/piston stroke

Rated speed: 1000 rpm No-load speed : 910 rpm

Step-down ratio [i = ... :1]	Delivery rate key	Gear train (3M, 4M) Delivery rate range in ml/min (calculated)		
		100 %	33,3 %	20 %
245,556	25	0,715	0,238	0,143
203,000	20	0,897	0,299	0,179
167,308	17	1,088	0,363	0,218
130,500	13	1,395	0,465	0,279
98,600	98	1,846	0,615	0,369
77,842	78	2,338	0,779	0,468
56,389	57	3,228	1,076	0,646
38,921	39	4,676	1,559	0,935

A maximum operating pressure of 600 bars is reached at a maximum delivery rate and a speed of > 6 rpm.

Max. delivery rate of 0.07 ml/piston stroke

Rated speed: 1500 rpm No-load speed : 1360 rpm

Step-down ratio [i = ... :1]	Delivery rate key	Gear train (3M, 4M) Delivery rate range in ml/min (calculated)		
		100 %	33,3 %	20 %
167,308	17	0,561	0,187	0,112
130,500	13	0,719	0,240	0,144
98,600	98	0,952	0,317	0,190
77,842	78	1,206	0,402	0,241
56,389	57	1,664	0,555	0,333
38,921	39	2,411	0,804	0,482

Max. delivery rate of 0.1 ml/piston stroke

Rated speed: 1500 rpm No-load speed : 1360 rpm

Step-down ratio [i = ... :1]	Delivery rate key	Gear train (3M, 4M) Delivery rate range in ml/min (calculated)		
		100 %	33,3 %	20 %
167,308	17	0,813	0,271	0,163
130,500	13	1,042	0,347	0,208
98,600	98	1,379	0,460	0,276
77,842	78	1,747	0,582	0,349
56,389	57	2,412	0,804	0,482
38,921	39	3,494	1,165	0,699

Max. delivery rate of 0.2 ml/piston stroke

Rated speed: 1500 rpm No-load speed : 1360 rpm

Step-down ratio [i = ... :1]	Delivery rate key	Gear train (3M, 4M) Delivery rate range in ml/min (calculated)		
		100 %	33,3 %	20%
167,308	17	1,626	0,542	0,325
130,500	13	2,084	0,695	0,417
98,600	98	2,759	0,920	0,552
77,842	78	3,494	1,165	0,699
56,389	57	4,824	1,608	0,965
38,921	39	6,989	2,330	1,398

Further step-down ratios available on request

Order codes

JM 06 A 3M 17 G 2 12 Z / A 0001 AG07

Type _____
 High-pressure pump, max. 600 bars with eccentric shaft drive of the pump pistons, with expandable, screwed-on pump housings

Oil reservoir capacity _____
02= 2 liters (4 outlets) **08** = 8 liters (16 outlets)
04= 4 liters (8 outlets) **10** = 10 liters (20 outlets)
06= 6 liters (12 outlets) **12** =12 liters (24 outlets)

Oil reservoir version _____
A = pressure-tight ¹⁾ **B** = vented

Type of drive _____
3M = electric motor with gear train
4M = electric motor with gear train and free-wheeling

Delivery rate key (step-down ratio) _____
39 = approx. 39:1 **78** = approx. 78:1 **13** = approx.130:1 **17** = approx.167:1
 (See page 6 for further step-down ratios)

Drive position _____
G = left **H** = right

Delivery rate per piston stroke _____
3 = 0,07 ml/stroke
1 = 0,1 ml/stroke
2 = 0,2 ml/stroke
0 = mixed version

Number of outlet ports _____
02 = 2 outlet ports to **24** = 24 outlet ports

Order code (motor)
(AG, AL, AP, AF, AK, AO)
 Rated speed, frequency, rated power, rated voltage, rated current
 - see motor table on page 5)
Type of enclosure (motor)
07 = IP 55 F
13 = EEx eII T3 IP55 F
34 = EEx deII CT4 IP55 F
 Standard direction of rotation
 - see rotation arrow

Version key
0001 = basic model

Modification letter
A = pump housing of chilled aluminum casting, plain bearings for eccentric shaft, reinforced gears version

Prelubrication, side opposite drive
 / = without prelubrication
H = with prelubrication (...4M only)

Tubing port Ø and port type
Z = Ø 6 mm solderable
Y = Ø 6 mm solderless
X = Ø 8 mm solderable
w = Ø 8 mm solderless
 - = G ¼ thread

1) For the supply of an additional or overhead reservoir.

Order example

JM oil lubrication pump **JM06A3M17G212Z/A0001AG07** consisting of a model **JM** high-pressure pump, oil reservoir capacity 6 liters (**06**), pressure-tight version (**A**), electric motor drive with gear train (**3M**), step-down ratio 167:1 (**17**), drive position on left (**G**), delivery rate 0.2 ccm/stroke (**2**), with 12 outlet ports (**12**), tubing port Ø 6 mm, solderable (**Z**), without prelubrication (**/**), modification letter A (**A**), version key 0001 (**0001**) and motor data of 1000 rpm, 230/400 V AC, 50 Hz, (**AG**), with IP55 F type of enclosure (**07**).

Publications

Operating instructions for JM oil lubrication pump **951-130-302**

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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