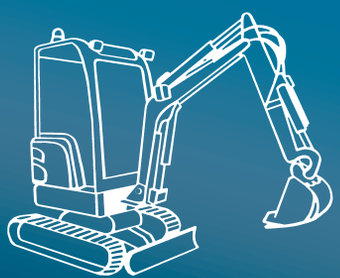
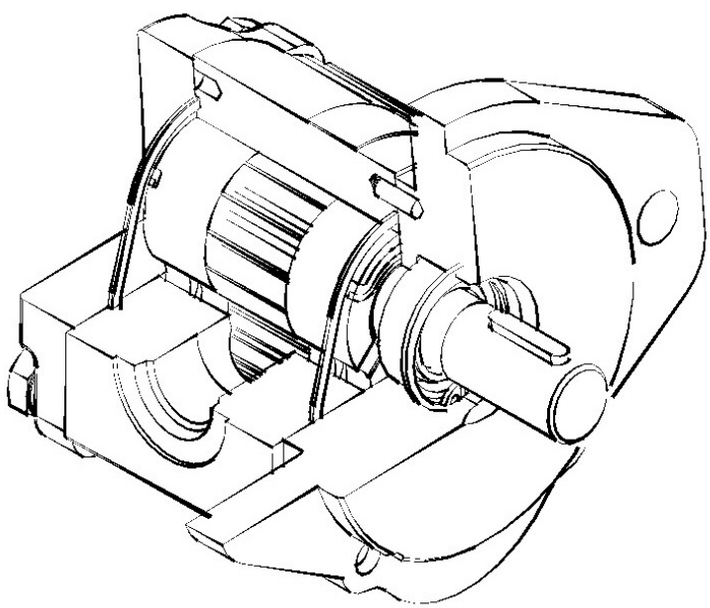
jihostroj
AERO TECHNOLOGY & HYDRAULICS



GEAR MOTORS
JM

Displacement from 2 to 15 ccm
Pressure up to 280 bar
Speed from 500 to 4000 RPM

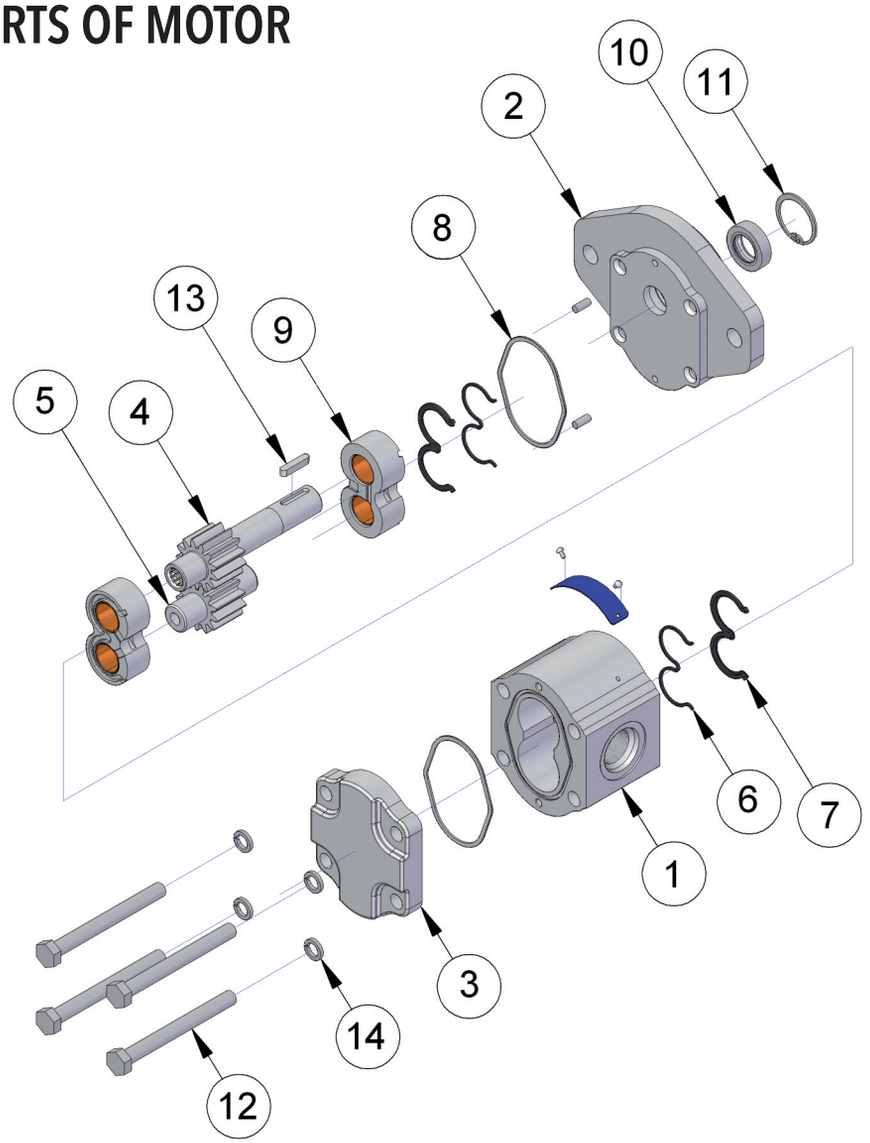
TABLE OF CONTENTS



DESCRIPTION

- Gear motors are used for transformation of liquid pressure head in mechanical energy. The JM line motors are designed for advanced hydraulic systems with lower capacity (approximately up to 10 kW) with high operational reliability and long service life. A wide variety of designs with diverse drives, connecting flanges, fluid inlets and outlets enable the motors to be used in hydraulic systems of both fixed and mobile machines and equipment. The JM series covers the range of displacements from 2 to 15 cm^3/rev.
- The flange types used as well as the form of the working liquid inlets and outlets (located laterally – in the body or axially – in the cover) meet all worldwide standards. The pump body is made of a heavy duty aluminium alloy. The cover and the flange are made of grey iron or aluminium alloy, and gear wheels of heavy duty steel. Axle pins with a high surface duality are imbedded in sliding sleeves, continuously lubricated and cooled by a stream of working liquid. JM line motors can be delivered in one-way design as clockwise or anti-clockwise rotating engines; they are also available in reversible version.

BASIC PARTS OF MOTOR



1. Body
2. Flange
3. Cover
4. Driving gear
5. Driven gear
6. Balancing sealing
7. Sealing protective plates
8. Peripheral sealing
9. Bearing sleeves
10. Shaft seal
11. Safety ring
12. Connection bolts
13. Key
14. Spring washers

PARAMETER TABLE

One direction motors

Nominal Size Parameters		Sym.	Unit	JM 2	JM 3	JM 4	JM 5	JM 6	JM 7
Actual displacement		V_g	[cm^3]	2.00	3.01	4.01	5.01	6.02	7.02
Rotation speed	nominal	n_n	[min^{-1}]	1500	1500	1500	1500	1500	1500
	minimum	n_{min}	[min^{-1}]	500	500	500	500	500	500
	maximum	n_{max}	[min^{-1}]	4000	4000	4000	4000	3600	3500
Pressure at outlet	minimum	p_{1min}	[bar]	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
	maximum	p_{1max}	[bar]	210	210	210	210	210	210
Pressure at inlet	max. continuous	p_{2n}	[bar]	280	280	280	280	280	280
	maximum	p_{2max}	[bar]	290	290	290	290	290	290
	peak	p_3	[bar]	300	300	300	300	300	300
Nominal input flow rate (max.) at n_n and p_{2n}		Q_n	[$dm^3.min^{-1}$]	3.54	5.31	6.84	8.55	10.03	11.70
Maximum input flow rate at n_{max} and p_{2max}		Q_{max}	[$dm^3.min^{-1}$]	8.55	12.81	17.08	21.34	23.04	24.64
Nominal output power (min.) at n_n and p_{2n}		P_n	[kW]	1.20	1.80	2.40	3.00	3.60	4.20
Maximum output power at n_{max} a p_{2max}		P_{max}	[kW]	3.28	4.92	6.56	8.20	8.86	9.47
Nominal Torque at n_n and p_{2n}		M	[Nm]	7.61	11.40	15.20	19.00	22.79	26.59
Weight		m	[kg]	1.75	1.80	1.85	1.90	1.95	1.95

Nominal Size Parameters		Sym.	Unit	JM 8	JM 10	JM 11	JM 12	JM 15
Actual displacement		V_g	[cm^3]	8.02	10.03	11.03	12.03	15.01
Rotation speed	nominal	n_n	[min^{-1}]	1500	1500	1500	1500	1500
	minimum	n_{min}	[min^{-1}]	500	500	500	500	500
	maximum	n_{max}	[min^{-1}]	3100	2800	2500	2400	2200
Pressure at outlet	minimum	p_{1min}	[bar]	-0.3	-0.3	-0.3	-0.3	-0.3
	maximum	p_{1max}	[bar]	210	180	165	150	110
Pressure at inlet	max. continuous	p_{2n}	[bar]	280	250	235	220	190
	maximum	p_{2max}	[bar]	290	270	255	240	210
	peak	p_3	[bar]	300	280	265	250	220
Nominal input flow rate (max.) at n_n and p_{2n}		Q_n	[$dm^3.min^{-1}$]	13.37	16.71	18.38	20.05	25.06
Maximum input flow rate at n_{max} and p_{2max}		Q_{max}	[$dm^3.min^{-1}$]	25.60	29.86	28.16	30.71	35.19
Nominal output power (min.) at n_n and p_{2n}		P_n	[kW]	4.80	5.30	5.48	5.60	5.72
Maximum output power at n_{max} a p_{2max}		P_{max}	[kW]	9.94	10.69	9.62	9.87	9.90
Nominal Torque at n_n and p_{2n}		M	[Nm]	30.38	35.06	35.80	36.62	35.06
Weight		m	[kg]	2.00	2.10	2.10	2.20	2.45

Reversible motors

Nominal Size Parameters		Sym.	Unit	JM 2	JM 3	JM 4	JM 5	JM 6	JM 7
Actual displacement		V_g	[cm^3]	2.00	3.01	4.01	5.01	6.02	7.02
Rotation speed	nominal	n_n	[min^{-1}]	1500	1500	1500	1500	1500	1500
	minimum	n_{min}	[min^{-1}]	500	500	500	500	500	500
	maximum	n_{max}	[min^{-1}]	4000	4000	4000	4000	3600	3500
Pressure at outlet	minimum	p_{1min}	[bar]	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
	maximum	p_{1max}	[bar]	180	180	180	180	180	180
Pressure at inlet	max. continuous	p_{2n}	[bar]	250	250	250	250	250	250
	maximum	p_{2max}	[bar]	260	260	260	260	260	260
	peak	p_3	[bar]	270	270	270	270	270	270
Nominal input flow rate (max.) at n_n and p_{2n}		Q_n	[$dm^3.min^{-1}$]	3.54	5.31	6.84	8.55	10.03	11.70
Maximum input flow rate at n_{max} and p_{2max}		Q_{max}	[$dm^3.min^{-1}$]	8.55	12.81	17.08	21.34	23.04	24.64
Nominal output power (min.) at n_n and p_{2n}		P_n	[kW]	1.20	1.80	2.40	3.00	3.60	4.20
Maximum output power at n_{max} a p_{2max}		P_{max}	[kW]	3.28	4.92	6.56	8.20	8.86	9.47
Nominal Torque at n_n and p_{2n}		M	[Nm]	7.61	11.40	15.20	19.00	22.79	26.59
Weight		m	[kg]	1.75	1.80	1.85	1.90	1.95	1.95

Nominal Size Parameters		Sym.	Unit	JM 8	JM 10	JM 11	JM 12	JM 15
Actual displacement		V_g	[cm^3]	8.02	10.03	11.03	12.03	15.01
Rotation speed	nominal	n_n	[min^{-1}]	1500	1500	1500	1500	1500
	minimum	n_{min}	[min^{-1}]	500	500	500	500	500
	maximum	n_{max}	[min^{-1}]	3100	2800	2500	2400	2200
Pressure at outlet	minimum	p_{1min}	[bar]	-0.3	-0.3	-0.3	-0.3	-0.3
	maximum	p_{1max}	[bar]	180	160	145	130	100
Pressure at inlet	max. continuous	p_{2n}	[bar]	250	230	215	200	170
	maximum	p_{2max}	[bar]	260	250	235	220	190
	peak	p_3	[bar]	270	260	245	230	200
Nominal input flow rate (max.) at n_n and p_{2n}		Q_n	[$dm^3.min^{-1}$]	13.37	16.71	18.38	20.05	25.06
Maximum input flow rate at n_{max} and p_{2max}		Q_{max}	[$dm^3.min^{-1}$]	25.60	29.86	28.16	30.71	35.19
Nominal output power (min.) at n_n and p_{2n}		P_n	[kW]	4.80	5.30	5.48	5.60	5.72
Maximum output power at n_{max} a p_{2max}		P_{max}	[kW]	9.94	10.69	9.62	9.87	9.90
Nominal Torque at n_n and p_{2n}		M	[Nm]	30.38	35.06	35.80	36.62	35.06
Weight		m	[kg]	2.00	2.10	2.10	2.20	2.45

External drainage must be used in case of the reversible design.

FORMULAS USED FOR CALCULATION

Flow rate
Q

$$Q = \frac{V_g \cdot n}{1000} \cdot \eta_v \quad [dm^3 \cdot min^{-1}]$$

V_g [cm^3] pump displacement
n [min^{-1}] rotation speed
η_v [–] volumetric efficiency

Displacement
V_g

$$V_g = \frac{Q \cdot 1000}{n \cdot \eta_v} \quad [cm^3]$$

Torque
M_k

$$M_k = \frac{V_g \cdot p}{20 \cdot \pi \cdot \eta_m} \quad [Nm]$$

p [bar] required pressure at outlet
η_m [–] mechanical efficiency

Input power
P

$$P = \frac{V_g \cdot n \cdot p}{600 \cdot 1000 \cdot \eta_t} \quad [kW]$$

η_t [–] total efficiency

PUMP EFFICIENCIES

Volumetric efficiency
η_v

It determines the amount of flow losses. Its value is $\eta_v = 0{,}92 \div 0{,}98$ (depending on rotation speed, viscosity of working liquid and outlet pressure). It can be expressed as follows:

$$\eta_v = \frac{Q_{act.}}{Q_{theor}} \quad [–]$$

$Q_{act.}$ [$dm^3 \cdot min^{-1}$] actual flow rate
Q_{theor} [$dm^3 \cdot min^{-1}$] theoretical flow rate

Mechanical efficiency
η_m

It determines mechanical losses. Its value is about $\eta_m = 0{,}85$.
It can be expressed as follows:

$$\eta_m = \frac{M_{theor}}{M_{act.}} \quad [–]$$

$M_{act.}$ [Nm] actual torque
M_{theor} [Nm] theoretical torque

Total efficiency
η_t

t is defined as product of η_n and η_m
and determines difference between theoretical and actual required input power:

$$\eta_t = \eta_v \cdot \eta_m = \frac{P_{theor}}{P_{act.}} \quad [–]$$

$P_{act.}$ [kW] actual input power
P_{theor} [kW] theoretical input power

WORKING LIQUID

- Mineral oils for hydraulic drives
- Hydraulic liquids based on plant oils suitable for hydraulic drives

Liquid temperature

- t = –20 ÷ +80 [°C]
  when used with FKM (Viton) seal up to 120 [°C]

Cinematic viscosity

- Recommended (during continuous operation): $\nu = 20 \div 80 \cdot 10^{-6}\ [m^2 \cdot s^{-1}]$
- Maximum (cold starting, at viscosity >1000, operating pressure <10 bar is permissible, speed <1500·min^{-1}): $\nu = 1200 \cdot 10^{-6}\ [m^2 \cdot s^{-1}]$
- Minimum (operating mode at 10·10^{-6} up 20·10^{-6} should be consulted with manufacturer): $\nu = 10 \cdot 10^{-6}\ [m^2 \cdot s^{-1}]$

Filtration coefficient β_α

$\beta_{25}\ 75 \geq$ (for pressure $p_2 < 200$ bar)
$\beta_{10}\ 75 \geq$ (for pressure $p_2 > 200$ bar)

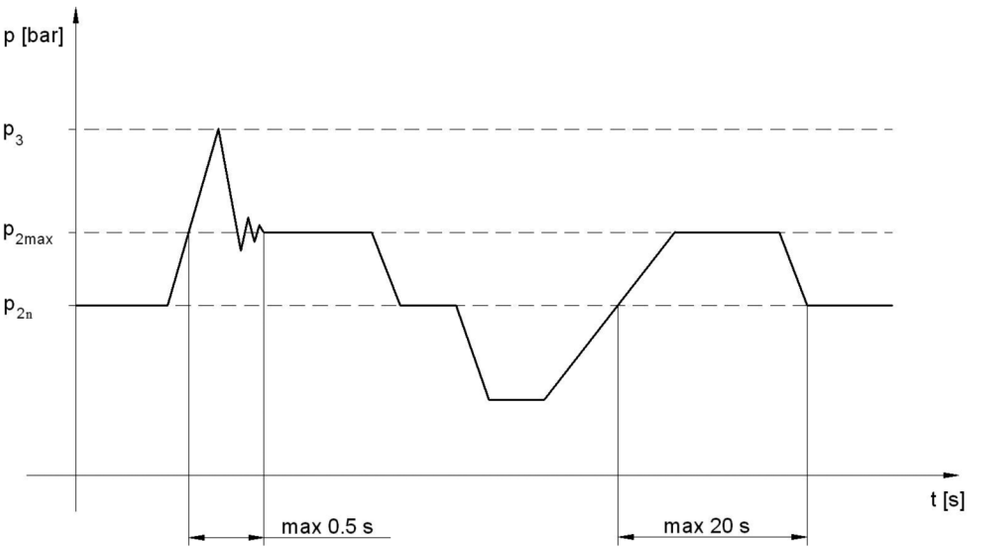
Liquid contamination class according to ISO 4406

21/18/15 (for pressure $p_2 < 200$ bar)
20/17/14 (for pressure $p_2 > 200$ bar)

Liquid contamination class according to NAS 1638

10 (for pressure $p_2 < 200$ bar)
8 (for pressure $p_2 > 200$ bar)

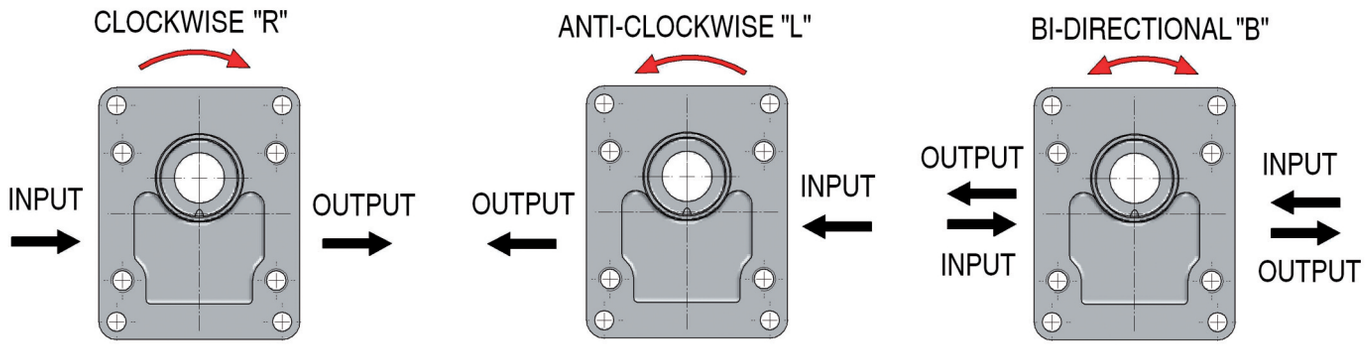
PRESSURE LOAD



p_{2n}	**max. contin. pressure**	Max. working pressure, at which the pump can be operated without time limitation.
p_{2max}	**max. pressure**	Maximum pressure permissible for a short time, max. 20s.
p_3	**peak pressure**	Short-time pressure (fractions of a second) arising in case of a sudden change of the operating mode; any excess of this pressure during operation is impermissible.

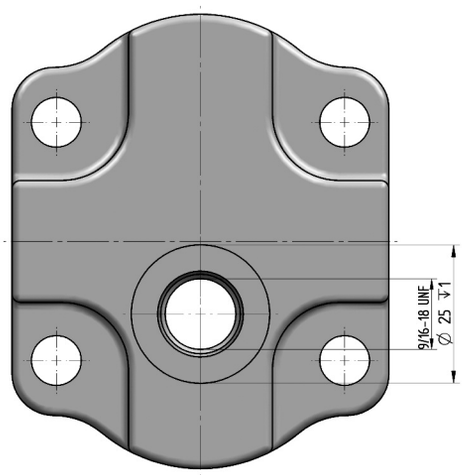
DIRECTION OF ROTATION

- Determine direction of rotation by looking at the drive shaft. The motor can only be used in the specified direction of rotation.

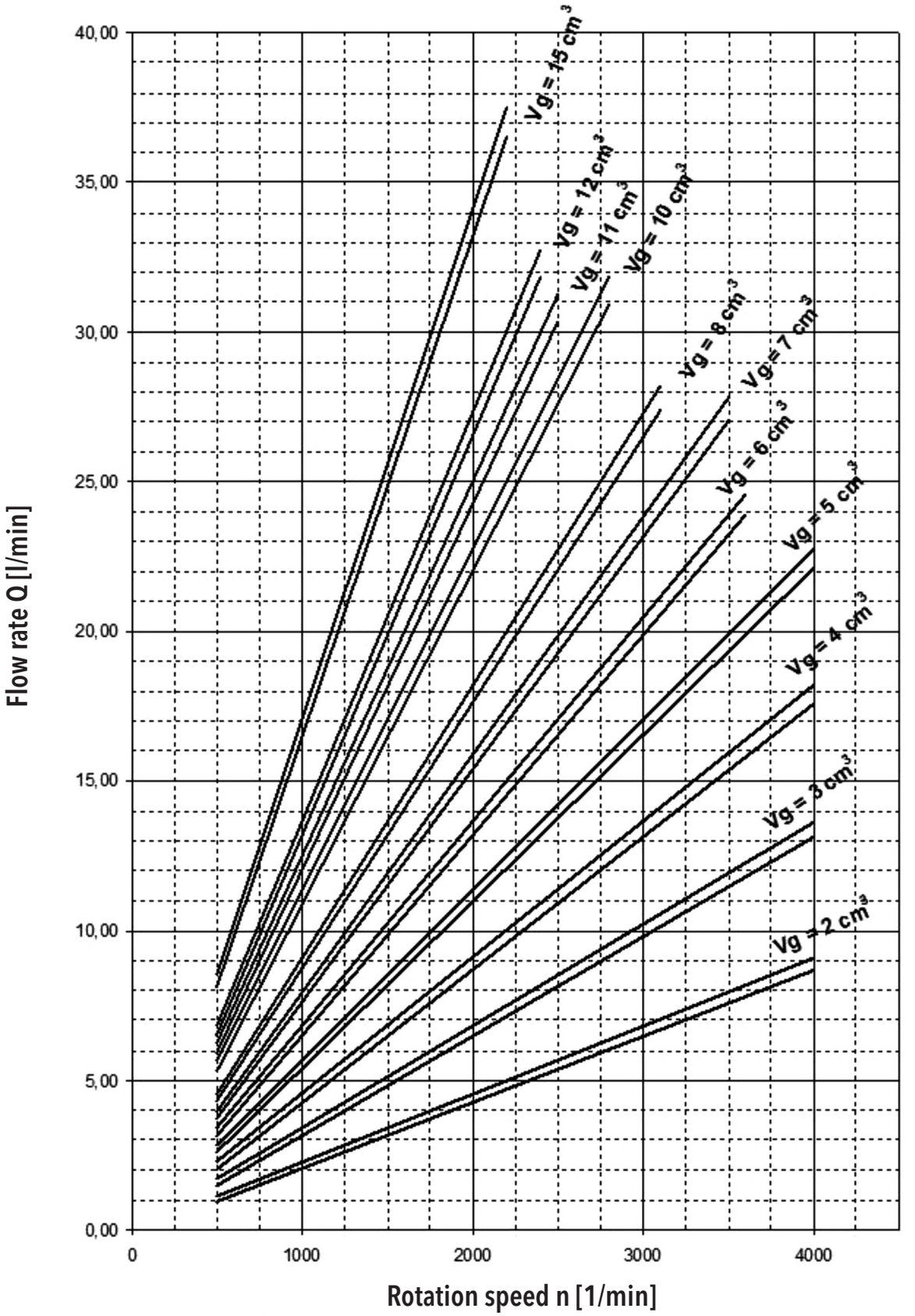


REVERSIBLE DESIGN

- The motors with the possibility of bidirectional rotation have a different internal arrangement requiring drainage. Two types are used - internal and external. The internal drainage is always interconnected with the outlet by means of valves. The external drainage is solved by an orifice located in the cover opposite the driven gear.

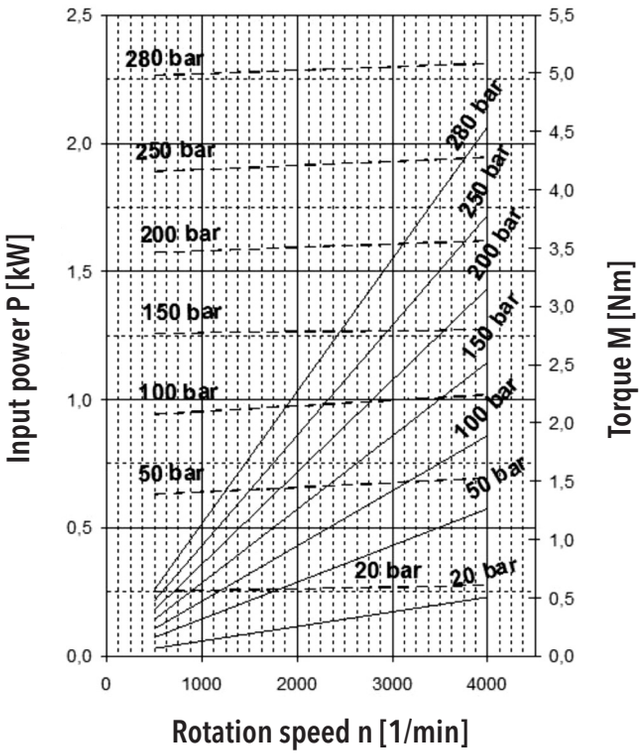


JM FLOW RATE AND POWER CURVES

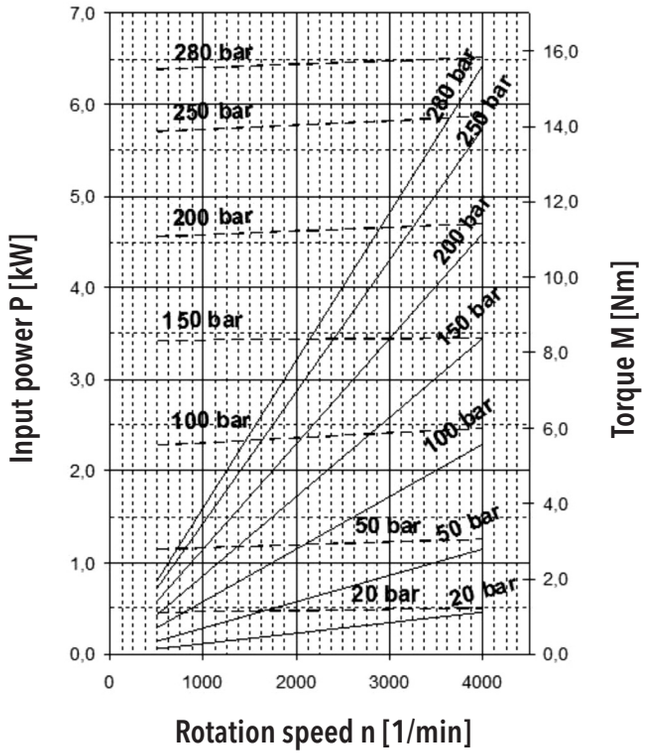


Above curves apply to ISO V_g 46 oil at temperature t = 45°C.

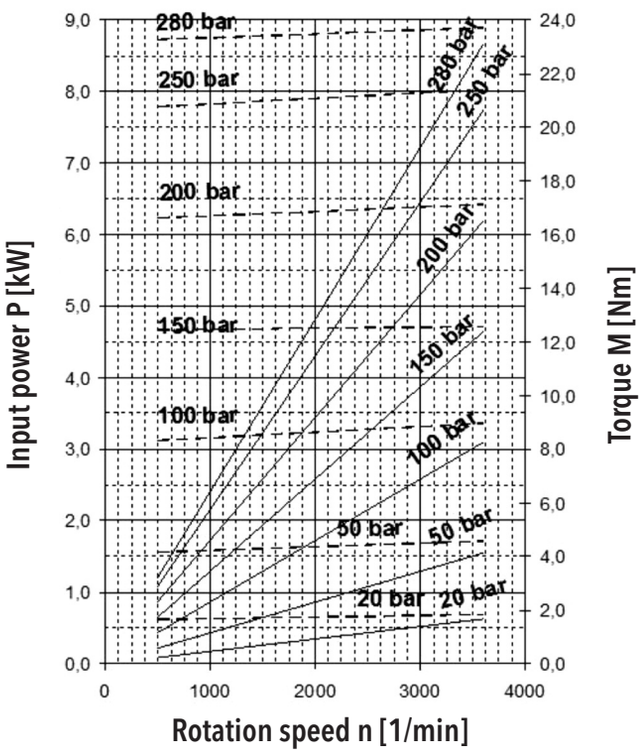
2,00 cm³



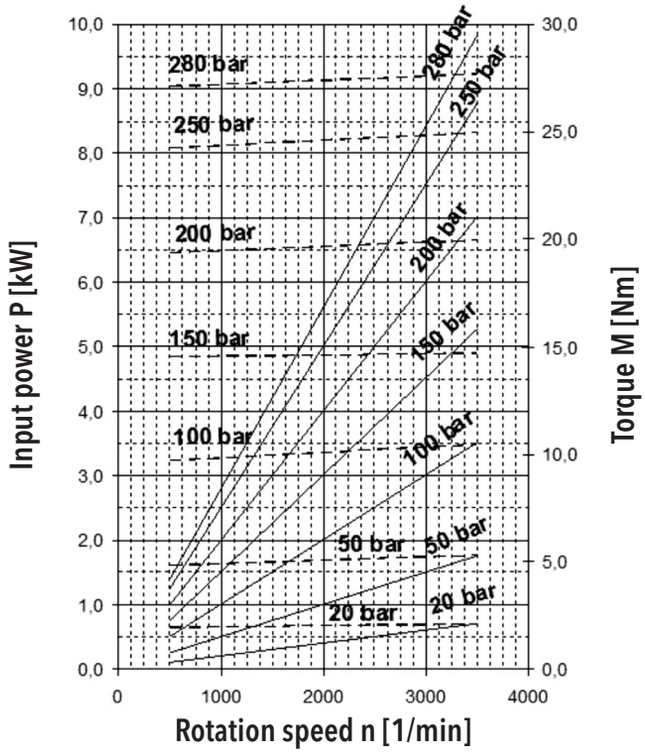
4,00 cm³



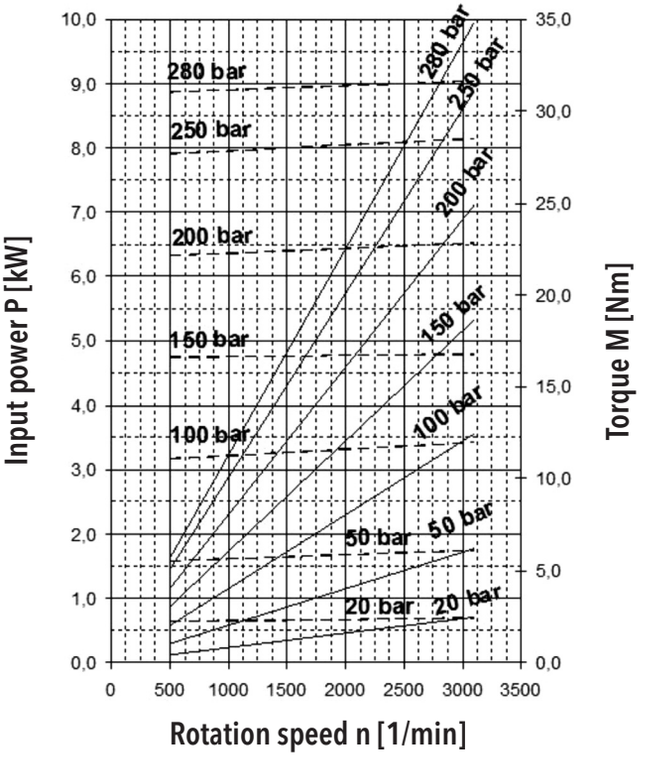
6,00 cm³



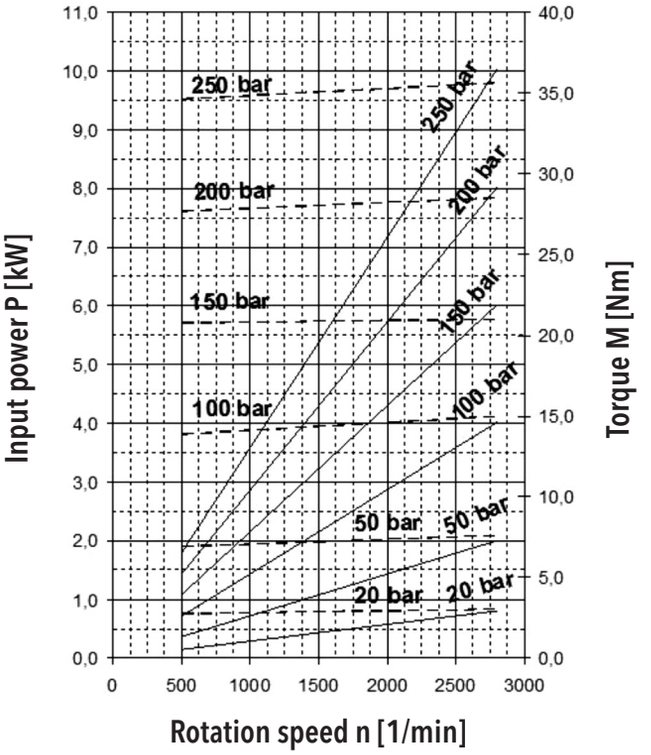
7,00 cm³



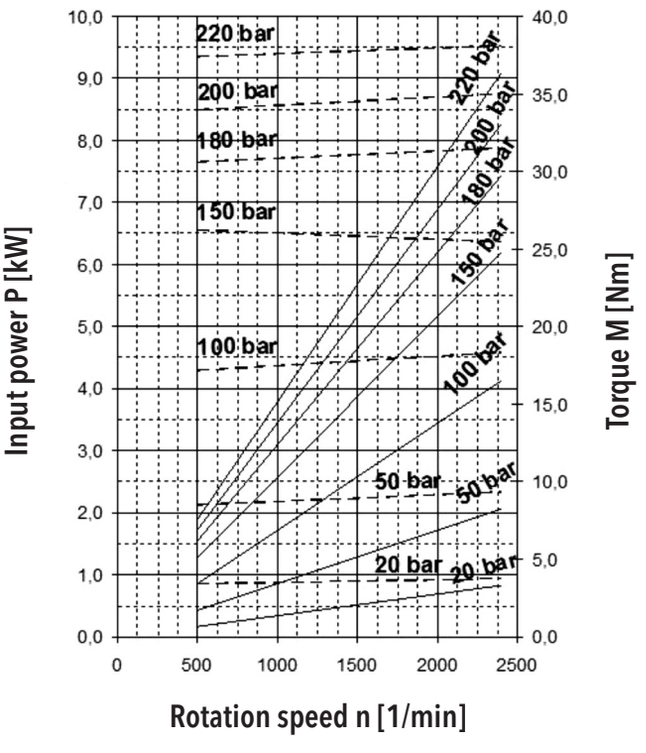
8,00 cm³



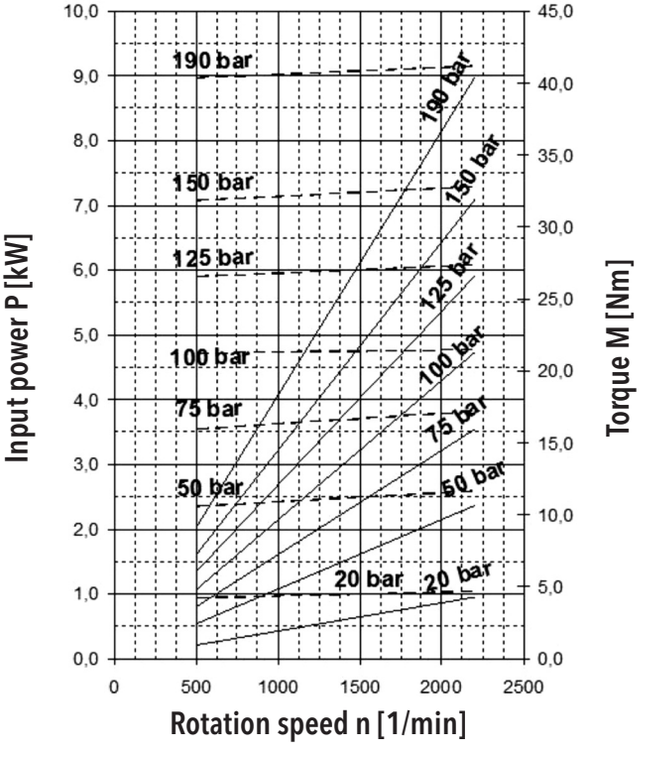
10,00 cm³



12,00 cm³



15,00 cm³



ORDER KEY

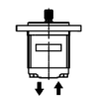
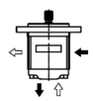
JM - 2 R - S01 D03 - S G04 G03 - V . 001

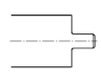
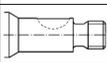
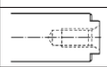
Code	Type
JM	JM Series Gear Motor
JMK	JM Series Gear Motor short version

Code	Displacement [cm³]
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
18	18
XX	Other displacements on request

Code	Direction of rotation
R	Clockwise
L	Anti-clockwise
B	Bi–directional

Code	Flange design	
R03		Square flange, centre ring ∅80
R05		Rectangular flange, centre ring ∅36,5
S01		SAE AA, centre ring ∅50,8
S02		SAE A, centre ring ∅82,5
F01		ISO, centre ring ∅45,25
Z		Special desing

Code	Location of inlets and outlets	
S		Side (in the body)
R		Axial (in the cover)
C		Combination

Code	Drive shaft desing	
C05		Cone 1:8 Key width 3
C06		Cone 1:8 Key width 2,4
D02		Spline 20/40 – 30° SAE 9T; l=9
D03		Spline 20/40 – 30° SAE 9T; l=27
D04		Spline 16/32 – 30° SAE 9T; l=32
D05		Spline 16/32 – 30° SAE 8T; l=32
K05		Cross coupling 4,37
K06		Cross coupling 5
V06		Cylindric ∅ 12 Key 3; M10; l=31,5
V07		Cylindric ∅ 12,7 Key 3,18; l=27
V08		Cylindric ∅ 12,7 Key 3,18; l=38,2
V09		Cylindric ∅ 15,88 Key 3,97; l=32
V10		Cylindric ∅ 16 1/4" – 20UNC THD
Z		Special desing

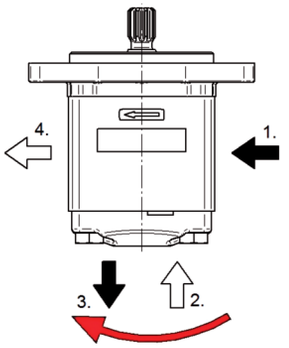
Code	Liquid inlet and outlet connection shape	
M03		Thread M 14x1,5
M05		Thread M 18x1,5
M07		Thread M 22x1,5
G01		Thread BSP G1/4
G02		Thread BSP G3/8
G03		Thread BSP G1/2
G04		Thread BSP G3/4
U02		Thread 9/16-18 UNF-2B
U03		Thread 3/4-16 UNF-2B
U04		Thread 7/8-14 UNF-2B
R02		Thread 3/8-18NPT
R03		Thread 1/2-14NPT
H03		Fitting ∅8; Square 4xM6 ∅30
H04		Fitting ∅12; Square 4xM6 ∅30
H05		Fitting ∅15; Square 4xM6 ∅35
H06		Fitting ∅20; Square 4xM6 ∅40
S02		Fitting Square 4xM8/25 15x25, 15
Z		Special desing

Code	Seal material
N	NBR
V	FKM (VITON)
H	HNBR

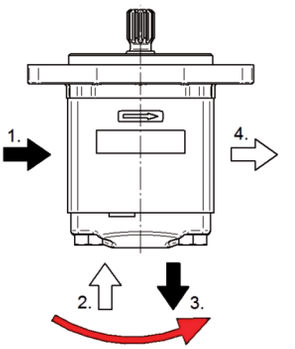
Code	Special arrangements
–	No special arrangements
001	With front-end bearing
004	Without shaft seal

An example of designation for the JM clockwise motor with displacement of 2 cm³, Rectangular flange with centre ring ∅ 50.8, Cylindric ∅12, BSP side inlets, FKM seal and with front-end bearing: **JM-2R-R03V06-SG04G03-V.001**

Note: In case of combination inlets, with the code „C" is respected following sequence of inlets and outlets:



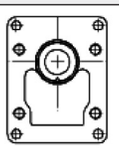
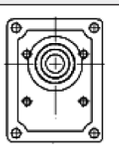
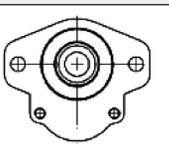
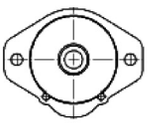
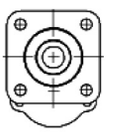
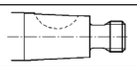
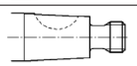
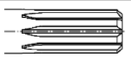
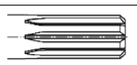
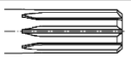
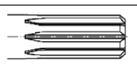
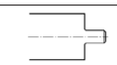
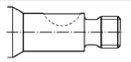
For clockwise and reverse gear motor,
in direction clockwise



For anti-clockwise gear motor,
in direction anti-clockwise

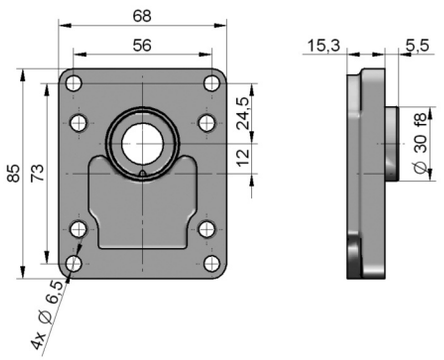
For. ex...: JM-12R-S01D03-C<u>G03 G03 G04 G04</u> -N
1. 2. 3. 4.

COMBINATIONS OF FLANGES AND SHAFTS

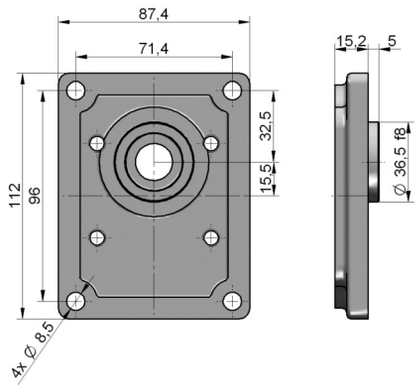
			FLANGE DESIGN				
			R03	R05	S01	S02	F01
							
DRIVE SHAFT	C05		●	●	●		
	C06		●	●		●	
	D02				●		●
	D03				●	●	●
	D04				●	●	
	D05				●	●	
	K05						●
	K06				●		
	V06		●				
	V07				●		
	V08		●		●	●	●
	V09			●		●	●
	V10						●

FLANGES DESIGN

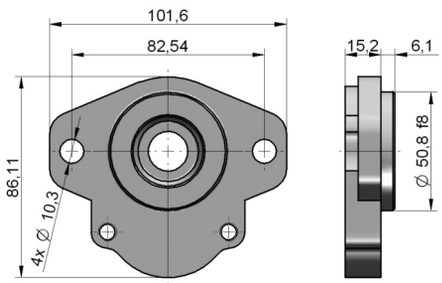
R03:



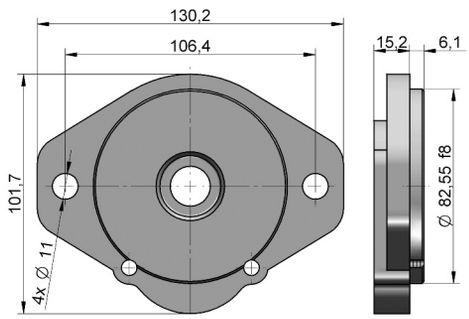
R05:



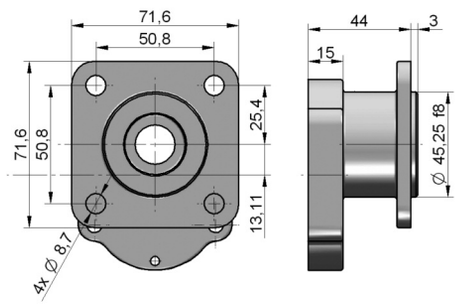
S01:



S02:

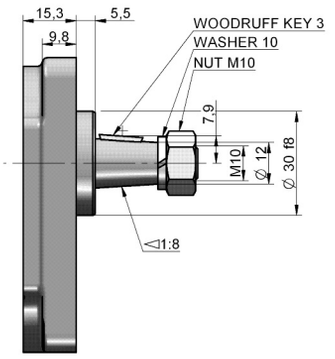


F01:

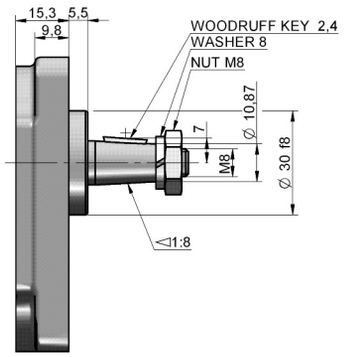


DRIVE SHAFTS

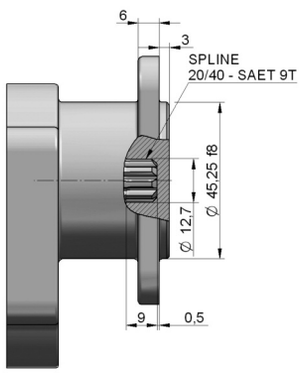
C05:



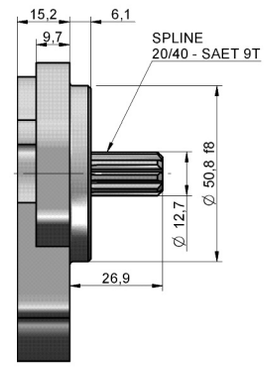
C06:



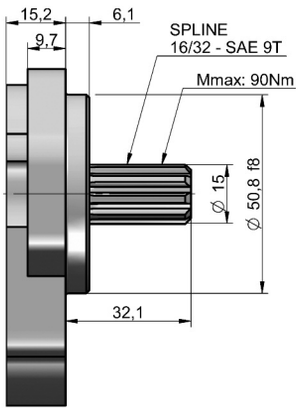
D02:



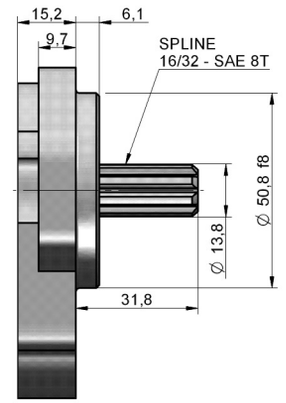
D03:



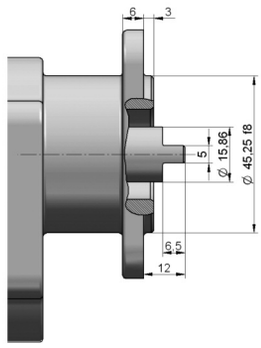
D04:



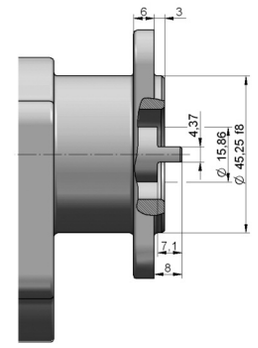
D05:



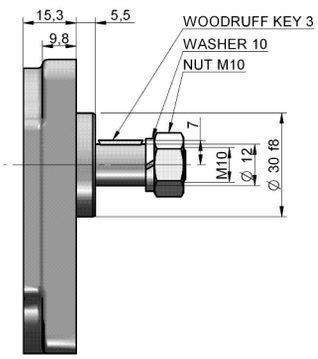
K05:



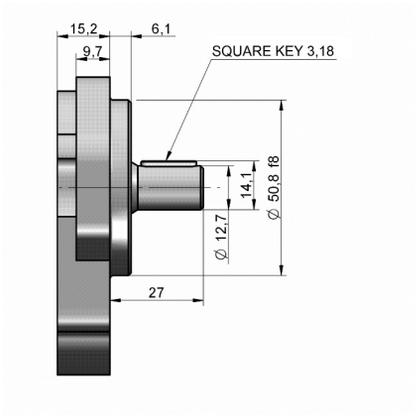
K06:



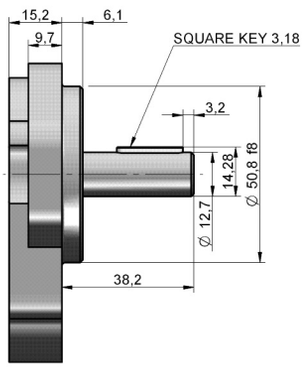
V06:



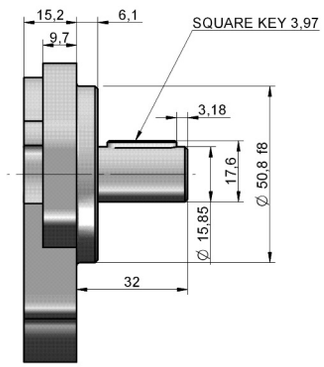
V07:



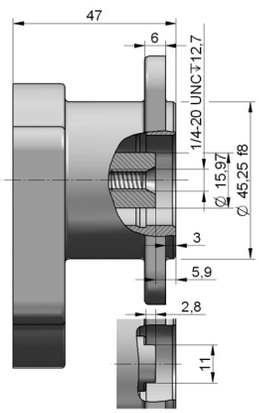
V08:



V09:

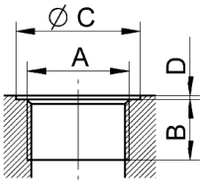


V10:



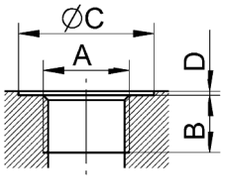
LIQUID INLET AND OUTLET CONNECTION

Metric thread according to ISO 6149



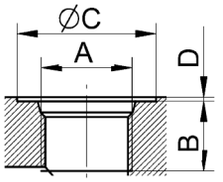
Code	A	B	C	D
M03	M 14 x 1.5	13	22	1
M05	M 18 x 1.5	13	24	1
M07	M 22 x 1.5	14	28	1

BSPP pipe thread according to ISO 228-1



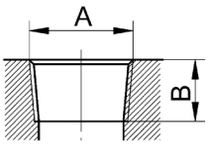
Code	A	B	C	D
G01	G 1/4	12	18	1
G02	G 3/8	13	24	1
G03	G 1/2	14	33	1
G04	G 3/4	16	39	1

UNF thread according to SAE



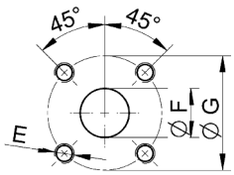
Code	A	B	C	D
U02	9/16 – 18 UNF	13	25	1
U03	3/4 – 16 UNF	15	30	1
U04	7/8 – 14 UNF	17	34	1

Tapered thread NPT



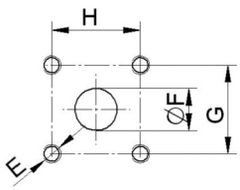
Code	A	B
R02	3/8 – 18 NPF	16.0
R03	1/2 – 14 NPF	20.8

Flanged fittings according to DIN 8901/8902



Code	A	B	C
H03	M6	8	30
H04	M6	12	30
H05	M6	15	35
H06	M6	20	40

Flanged fittings ISO

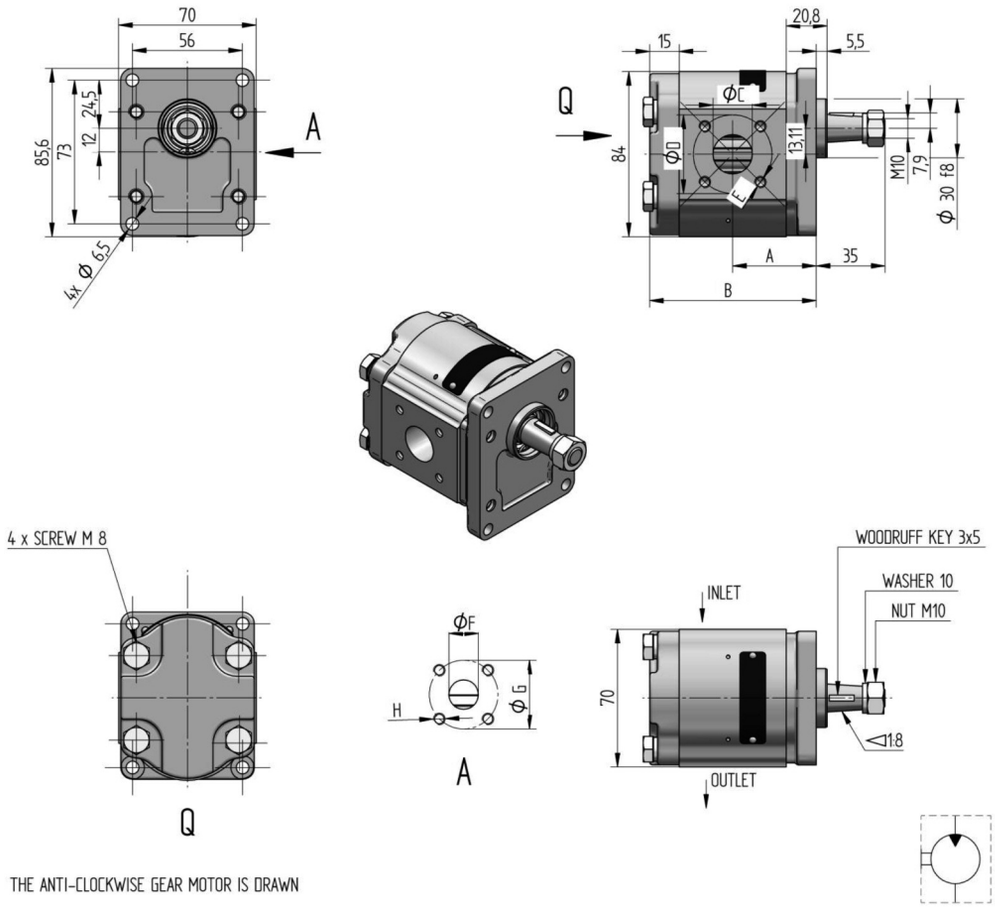


Code	E	F	G	H
S02	1/4 UNC	14.2	25.15	25.15
S03	M8	14.2	25.15	25.15

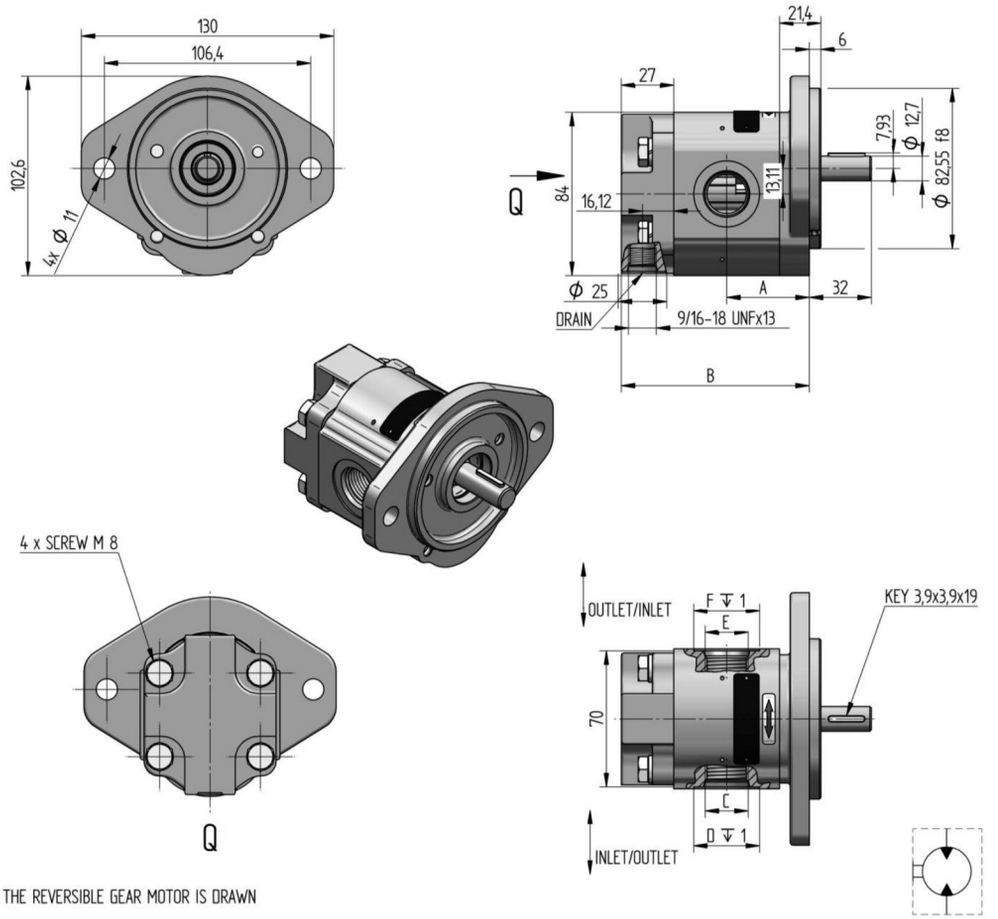
Drains

Code	A	B	C	D
U01	7/16-20 UNF 2B	13	21	1
G01	G 1/4	12	18	1

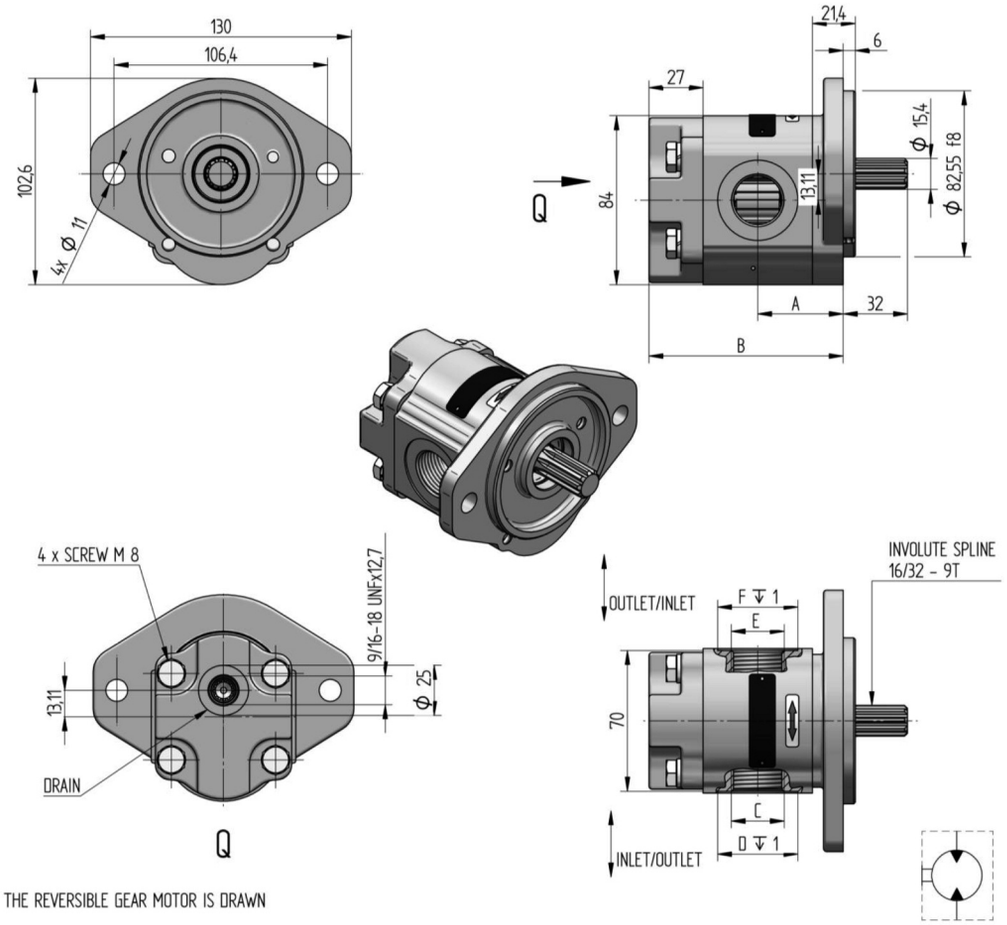
CATALOGUE SHETS OF JM SERIES BASIC DESIGNS



Order key	purch. code	direct. of rot.	displa-cement [cm³/1]	nom. press. [bar]	speed MIN. [min⁻¹]	speed MAX. [min⁻¹]	dimension A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]
JM-15R-R03C05-S H06H05-N		R	15	190	500	2200	51.86	103.42	20	40	M6x13	15	35	M6x13
JM-15L- R03C05-S H06H05-N		L												
JM-12R- R03C05-S H06H05-N		R	12	220	500	2400	47.88	95.46	20	40	M6x13	15	35	M6x13
JM-12L- R03C05-S H06H05-N		L												
JM-11R- R03C05-S H06H05-N		R	11	235	500	2500	46.55	92.80	20	40	M6x13	15	35	M6x13
JM-11L- R03C05-S H06H05-N		L												
JM-10R- R03C05-S H06H05-N		R	10	250	500	2800	45.21	90.12	20	40	M6x13	15	35	M6x13
JM-10L- R03C05-S H06H05-N		L												
JM-8R- R03C05-S H06H05-N		R	8	280	500	3100	42.54	84.79	20	40	M6x13	15	35	M6x13
JM-8L- R03C05-S H06H05-N		L												
JM-7R- R03C05-S H06H05-N		R	7	280	500	3500	41.21	82.12	20	40	M6x13	15	35	M6x13
JM-7L- R03C05-S H06H05-N		L												
JM-6R- R03C05-S H06H05-N		R	6	280	500	3600	39.87	79.44	20	40	M6x13	15	35	M6x13
JM-6L- R03C05-S H06H05-N		L												
JM-5R- R03C05-S H06H05-N		R	5	280	500	4000	38.54	76.78	20	40	M6x13	15	35	M6x13
JM-5L- R03C05-S H06H05-N		L												
JM-4R- R03C05-S H06H05-N		R	4	280	500	4000	37.20	74.11	20	40	M6x13	15	35	M6x13
JM-4L- R03C05-S H06H05-N		L												
JM-3R- R03C05-S H06H05-N		R	3	280	500	4000	35.87	71.44	20	40	M6x13	15	35	M6x13
JM-3L- R03C05-S H06H05-N		L												
JM-2R- R03C05-S H06H05-N		R	2	280	500	4000	34.53	68.76	20	40	M6x13	15	35	M6x13
JM-2L- R03C05-S H06H05-N		L												

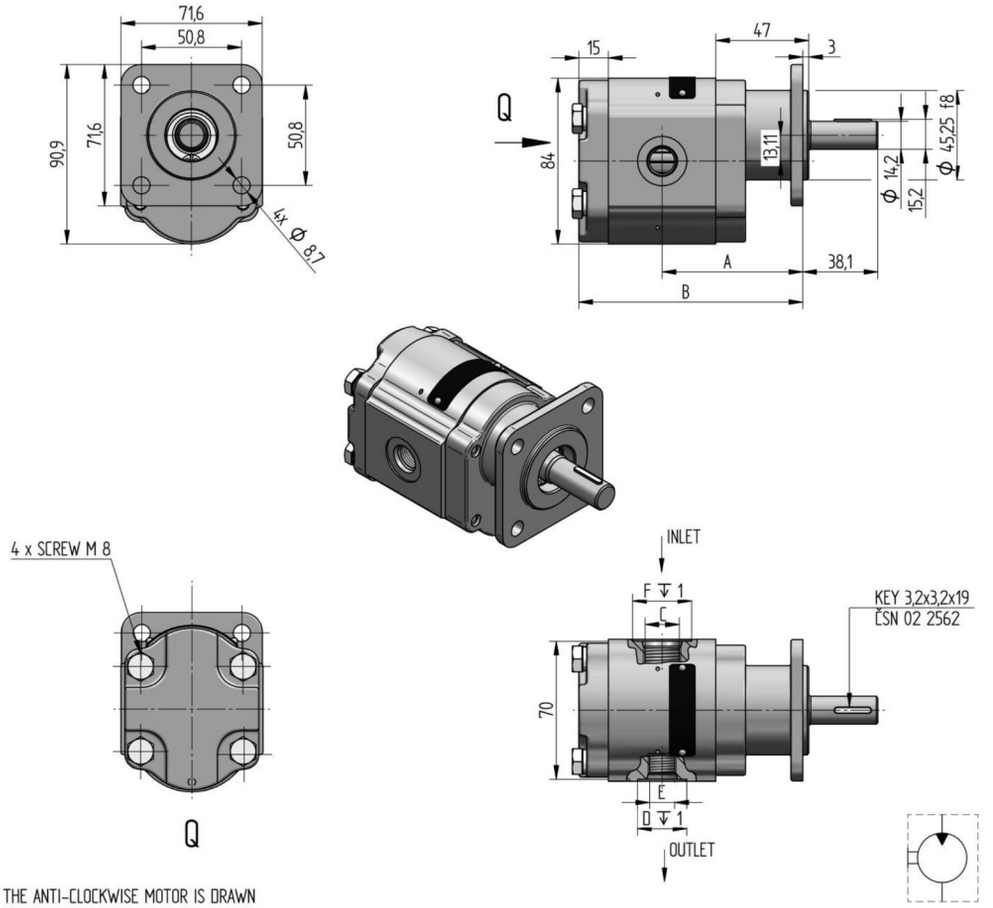


Order key	purch. code	direct. of rot.	displa-cement [cm³/1]	nom. press. [bar]	speed MIN. [min⁻¹]	speed MAX. [min⁻¹]	dimension A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]
JM-15B- S02V08-SU04U04-N		B	15	190	500	2200	80,56	132,12	7/8-14UNFx17	∅ 34	7/8-14UNFx17	∅ 30
JM-12B- S02V08-SU04U04-N		B	12	220	500	2400	76,58	124,16	7/8-14UNFx17	∅ 34	7/8-14UNFx17	∅ 30
JM-11B- S02V08-SU04U04-N		B	11	235	500	2500	75,25	121,50	7/8-14UNFx17	∅ 34	7/8-14UNFx17	∅ 30
JM-10B- S02V08-SU04U04-N		B	10	250	500	2800	73,91	118,82	7/8-14UNFx17	∅ 34	7/8-14UNFx17	∅ 30
JM-8B- S02V08-SU04U04-N		B	8	280	500	3100	71,24	113,49	7/8-14UNFx17	∅ 34	7/8-14UNFx17	∅ 30
JM-7B- S02V08-SU04U04-N		B	7	280	500	3500	69,91	110,82	7/8-14UNFx17	∅ 34	7/8-14UNFx17	∅ 30
JM-6B- S02V08-SU04U04-N		B	6	280	500	3600	68,57	108,14	7/8-14UNFx17	∅ 34	7/8-14UNFx17	∅ 30
JM-5B- S02V08-SU04U04-N		B	5	280	500	4000	67,24	105,48	7/8-14UNFx17	∅ 34	7/8-14UNFx17	∅ 30
JM-4B- S02V08-SU04U04-N		B	4	280	500	4000	65,90	102,81	7/8-14UNFx17	∅ 34	7/8-14UNFx17	∅ 30
JM-3B- S02V08-SU04U04-N		B	3	280	500	4000	64,57	100,14	7/8-14UNFx17	∅ 34	7/8-14UNFx17	∅ 30
JM-2B- S02V08-SU04U04-N		B	2	280	500	4000	63,23	97,46	7/8-14UNFx17	∅ 34	7/8-14UNFx17	∅ 30



THE REVERSIBLE GEAR MOTOR IS DRAWN

Order key	purch. code	direct. of rot.	displa-cement [cm³/1]	nom. press. [bar]	speed MIN. [min⁻¹]	speed MAX. [min⁻¹]	dimension A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]
JM-15B- S02D04-S G04G04-N		B	15	190	500	2200	80,56	132,12	G 3/4 x 16	∅ 39	G 3/4 x 16	∅ 39
JM-12B- S02D04-S G04G04-N		B	12	220	500	2400	76,58	124,16	G 3/4 x 16	∅ 39	G 3/4 x 16	∅ 39
JM-11B- S02D04-S G04G04-N		B	11	235	500	2500	75,25	121,50	G 3/4 x 16	∅ 39	G 3/4 x 16	∅ 39
JM-10B- S02D04-S G04G04-N		B	10	250	500	2800	73,91	118,82	G 3/4 x 16	∅ 39	G 3/4 x 16	∅ 39
JM-8B- S02D04-S G04G04-N		B	8	280	500	3100	71,24	113,49	G 3/4 x 16	∅ 39	G 3/4 x 16	∅ 39
JM-7B- S02D04-S G04G04-N		B	7	280	500	3500	69,91	110,82	G 3/4 x 16	∅ 39	G 3/4 x 16	∅ 39
JM-6B- S02D04-S G04G04-N		B	6	280	500	3600	68,57	108,14	G 3/4 x 16	∅ 39	G 3/4 x 16	∅ 39
JM-5B- S02D04-S G04G04-N		B	5	280	500	4000	67,24	105,48	G 3/4 x 16	∅ 39	G 3/4 x 16	∅ 39
JM-4B- S02D04-S G04G04-N		B	4	280	500	4000	65,90	102,81	G 3/4 x 16	∅ 39	G 3/4 x 16	∅ 39
JM-3B- S02D04-S G04G04-N		B	3	280	500	4000	64,57	100,14	G 3/4 x 16	∅ 39	G 3/4 x 16	∅ 39
JM-2B- S02D04-S G04G04-N		B	2	280	500	4000	63,23	97,46	G 3/4 x 16	∅ 39	G 3/4 x 16	∅ 39



Order key	purch. code	direct. of rot.	displa-cement [cm³/1]	nom. press. [bar]	speed MIN. [min⁻¹]	speed MAX. [min⁻¹]	dimension A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]
JM-15R- F01V08-S U03U02-N		R	15	190	500	2200	80.56	132.12	3/4-16UNFx15	∅ 30	9/16-18UNFx13	∅ 25
JM-15L- F01V08-S U03U02-N		L										
JM-12R- F01V08-S U03U02-N		R	12	220	500	2400	76.58	124.16	3/4-16UNFx15	∅ 30	9/16-18UNFx13	∅ 25
JM-12L- F01V08-S U03U02-N		L										
JM-11R- F01V08-S U03U02-N		R	11	235	500	2500	75.25	121.50	3/4-16UNFx15	∅ 30	9/16-18UNFx13	∅ 25
JM-11L- F01V08-S U03U02-N		L										
JM-10R- F01V08-S U03U02-N		R	10	250	500	2800	73.91	118.82	3/4-16UNFx15	∅ 30	9/16-18UNFx13	∅ 25
JM-10L- F01V08-S U03U02-N		L										
JM-8R- F01V08-S U03U02-N		R	8	280	500	3100	71.24	113.49	3/4-16UNFx15	∅ 30	9/16-18UNFx13	∅ 25
JM-8L- F01V08-S U03U02-N		L										
JM-7R- F01V08-S U03U02-N		R	7	280	500	3500	69.91	110.82	3/4-16UNFx15	∅ 30	9/16-18UNFx13	∅ 25
JM-7L- F01V08-S U03U02-N		L										
JM-6R- F01V08-S U03U02-N		R	6	280	500	3600	68.57	108.14	3/4-16UNFx15	∅ 30	9/16-18UNFx13	∅ 25
JM-6L- F01V08-S U03U02-N		L										
JM-5R- F01V08-S U03U02-N		R	5	280	500	4000	67.24	105.48	3/4-16UNFx15	∅ 30	9/16-18UNFx13	∅ 25
JM-5L- F01V08-S U03U02-N		L										
JM-4R- F01V08-S U03U02-N		R	4	280	500	4000	65.90	102.81	3/4-16UNFx15	∅ 30	9/16-18UNFx13	∅ 25
JM-4L- F01V08-S U03U02-N		L										
JM-3R- F01V08-S U03U02-N		R	3	280	500	4000	64.57	100.14	3/4-16UNFx15	∅ 30	9/16-18UNFx13	∅ 25
JM-3L- F01V08-S U03U02-N		L										
JM-2R- F01V08-S U03U02-N		R	2	280	500	4000	63.23	97.46	3/4-16UNFx15	∅ 30	9/16-18UNFx13	∅ 25
JM-2L- F01V08-S U03U02-N		L										

jihostroj
AERO TECHNOLOGY & HYDRAULICS

JIHOSTROJ a.s.
Budějovická 148
CZ 382 32 Velešín
Czech Republic
tel.: +420 380 340 511
fax: +420 380 340 612
e-mail: mailbox@jihostroj.cz
http: //**www.jihostroj.com**
GPS 48°49'51.748" N 14°27'40.770" E