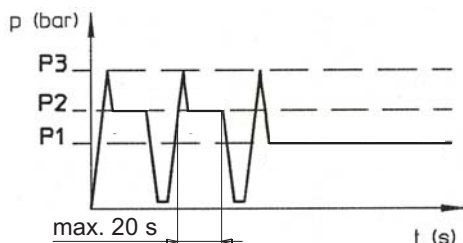

PG330 - MG 330

Cast Iron Gear Pumps and Motors

SECTION A - Technical Catalogue

EO.151.0113.02.00/IM00

DEFINITION OF PRESSURES



P3 = Peak pressure
 P2 = Intermittent operating pressure
 P1 = Continuous operating pressure

GENERAL

- Superior performance and reliability in heavy-duty hydraulic application.
- Construction with large area, low-friction bushings provide strength, high efficiency, and long life in severe operating environments.
- The design includes an advanced thrust plate and seal configuration, which optimizes performance even in high temperature and low viscosity conditions.
- Double pump with common suction reduces mounting costs, allow for a small package size.

WORKING CONDITIONS

- Pump inlet pressure (absolute pressure)	0,7 to 2,5 bar 10 to 36 psi
- Minimum operating fluid viscosity ¹	12 mm ² / sec
- Max starting viscosity	800 mm ² / sec
- Suggested fluid viscosity range	17 - 65 mm ² / sec
- Fluid operating temperature range	- 15 to 85 °C
- Fluid operating temperature range with FPM seals(Viton) ...	- 20 to 110°C
- Hydraulic fluid	mineral oil

Important:

in case of assembling of pumps without shaft seals, you have to keep the value of min. suction pressure (0.7 bar (abs)) in the vane between pump and coupling too. Lower pressure can lead to suction of oil through the front flange (seat of the shaft without seal); this can damage seriously the pump.

¹ - With reduction 80% of working pressure and at minimum speed.

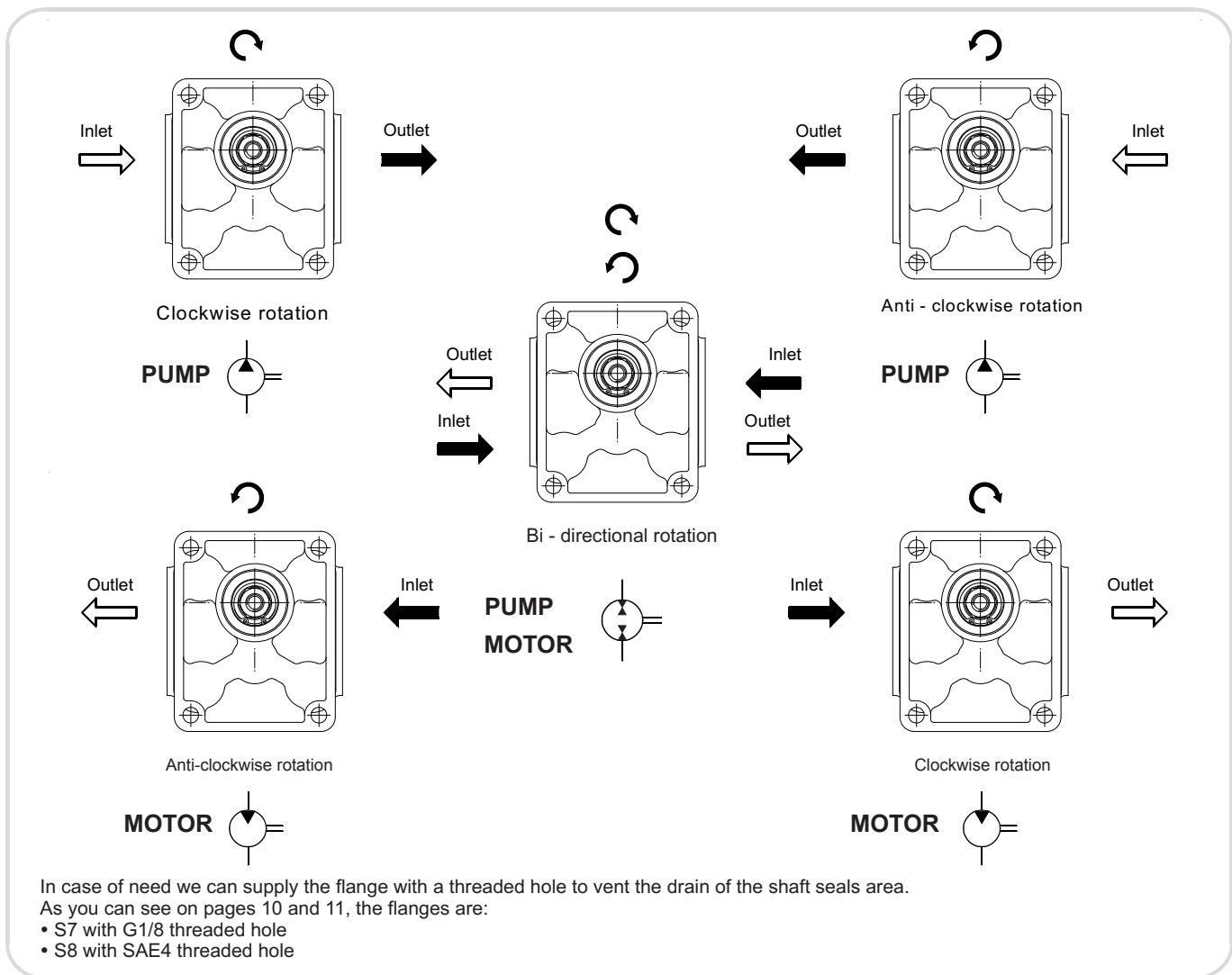
Suggestion:

to have the best behaviour and duty life of the pump/motor, use a cooling system in order to keep the fluid temperature at 60°C and viscosity at 20 cSt. In addition to the recommended filtration index of page 3.

DRIVE SHAFTS

Radial and axial loads on the shafts must be avoided since they reduce the life of the unit.

DIRECTION VIEWED AT THE DRIVE SHAFT



HYDRAULIC PIPE LINE

To ensure favorable suction conditions it is important to keep pressure drop in suction pipe line to a minimum value (see WORKING CONDITIONS).

To calculate hydraulic pipe line size, the designer can use; as an approximate guide, the following fluid speed figures:

From 1 to 2 m/sec on suction pipe line
From 6 to 10 m/sec on pressure pipe line

From 3.28 to 6.36 ft/sec on suction pipe line
From 19.7 to 32.8 ft/sec on pressure pipe line

The lowest fluid speed values in pipe lines is recommended when the operating temperature range is high and/or for continuous duty.

The highest value is recommended when the temperature difference is low and/or for intermittent duty.



FILTRATION INDEX RECOMMENDED

Working pressure	> 200 bar / 2900 psi	< 200 bar / 2900 psi
Contamination class NAS 1638	9	10
Contamination class ISO 4406	19/18/15	20/19/16
Achieved with filter $\beta_x = 75$	15 μm	25 μm

FIRE RESISTENT FLUID

Type	Description	Max pressure	Max speed (rpm)	Temperature
HFB	oil emulsion with 40% water	130 bar/1880 psi	2500	3°C +65°C
HFC	Water glycol	180 bar/2600 psi	1500	-20°C +65°C
HFD	Phosphate esters		1750	-10°C +80°C

COMMON FORMULAS FOR PUMPS

$$C = \text{Input torque} = \frac{q \cdot \Delta p}{62.8 \cdot \eta_m} \text{ (Nm)}$$

$$P = \text{Input power} = \frac{q \cdot n \cdot \Delta p \cdot 10^{-3}}{600 \eta_m} \text{ (kW)}$$

$$Q = \text{Outlet flow} = \frac{q \cdot n \cdot \eta_v}{1000} \text{ (l/min)}$$

LEGENDA

Δp = Working pressure (bar)

q = Displacement (cm^3/rev)

n = Speed (min^{-1})

η_m = Mechanical eff. (0.92)

η_v = Volumetric eff. (0.95)

COMMON FORMULAS FOR MOTORS

$$\text{Input flow: } Q = \frac{V \cdot n}{1000 \cdot \eta_v} \text{ l/min}$$

$$\text{Output torque: } M = \frac{V \cdot \Delta p \cdot \eta_m}{20 \cdot \pi} \text{ Nm}$$

$$\text{Output power: } P = \frac{M \cdot n}{9550} = \frac{Q \cdot \Delta p \cdot \eta_t}{600} \text{ kW}$$

V = Displacement cm^3/rev [in^3/rev]

P_{out} = Outlet pressure bar [psi]

P_{in} = Inlet pressure bar [psi]

ΔP = $P_{\text{out}} - P_{\text{in}}$ (system pressure) bar [psi]

n = Speed min^{-1} (rpm)

η_v = Volumetric efficiency

η_m = Mechanical efficiency

η_t = Overall efficiency ($\eta_v \cdot \eta_m$)



DESCRIPTION OF THE NEW PRODUCT IDENTIFICATION LABEL

Based on the firm certification ISO 9001 - UNI EN 29001, section 4.8 (identification and traceability of the product), we have adopted a new identification label starting from the 1st march 1995. Pls, see following example:

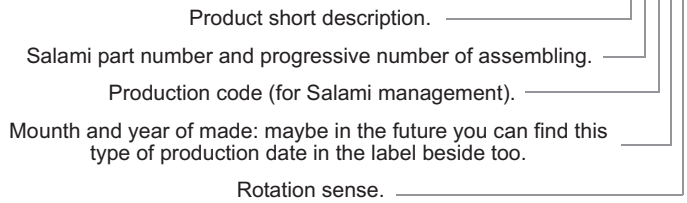
A			
B			
C		D	
E	salami	F	G

- A = Product short description (eg. VD8A/FDD/U4G).**
- B = Customer part number.**
- C = Salami part number (eg. 6235 0025 0).**
- D = Production code (for Salami management)**
- E = Rotation sense (only for pumps).**
- F = Production date (see data sheet here below)**
- G = Progressive number of assembling.**

Only for pumps 2PB and 2PZ (except triple 2PB) the identification product is marked on the top of the pump body as shown here below:



SALAMI 09/02
MADE IN ITALY 4010998
612271211 nr. 13
2PB 19S B25 B5



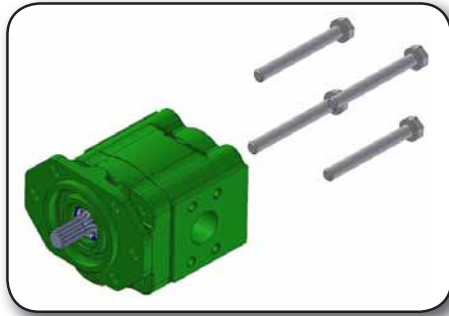
CONSTRUCTION	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
JANUARY	1M	2M	3M	4M	5M	6M	7M	8M	9M	10M	11M	12M	13M	14M	15M	16M
FEBRUARY	1N	2N	3N	4N	5N	6N	7N	8N	9N	10N	11N	12N	13N	14N	15N	16N
MARCH	1P	2P	3P	4P	5P	6P	7P	8P	9P	10P	11P	12P	13P	14P	15P	16P
APRIL	1Q	2Q	3Q	4Q	5Q	6Q	7Q	8Q	9Q	10Q	11Q	12Q	13Q	14Q	15Q	16Q
MAY	1R	2R	3R	4R	5R	6R	7R	8R	9R	10R	11R	12R	13R	14R	15R	16R
JUNE	1S	2S	3S	4S	5S	6S	7S	8S	9S	10S	11S	12S	13S	14S	15S	16S
JULY	1T	2T	3T	4T	5T	6T	7T	8T	9T	10T	11T	12T	13T	14T	15T	16T
AUGUST	1U	2U	3U	4U	5U	6U	7U	8U	9U	10U	11U	12U	13U	14U	15U	16U
SEPTEMBER	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	11V	12V	13V	14V	15V	16V
OCTOBER	1Z	2Z	3Z	4Z	5Z	6Z	7Z	8Z	9Z	10Z	11Z	12Z	13Z	14Z	15Z	16Z
NOVEMBER	1X	2X	3X	4X	5X	6X	7X	8X	9X	10X	11X	12X	13X	14X	15X	16X
DECEMBER	1Y	2Y	3Y	4Y	5Y	6Y	7Y	8Y	9Y	10Y	11Y	12Y	13Y	14Y	15Y	16Y



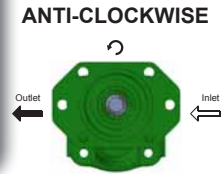
**GEAR PUMPS "PG" SERIES
GEAR MOTORS "MG" SERIES**

PG330 - MG330

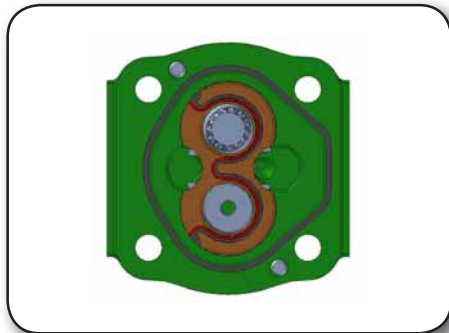
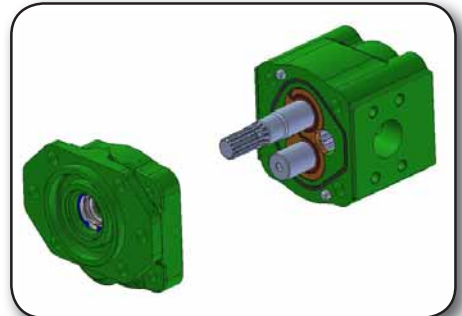
ROTATION CHANGE INSTRUCTION



Step 1:
unscrew and take off the 4 assembling bolts.

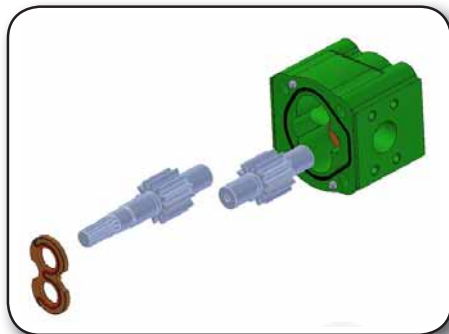
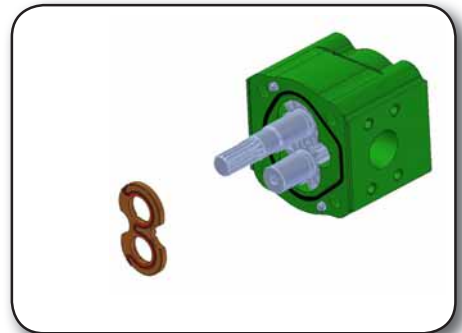


Step 2:
take off the front flange, complete of shaft seals.



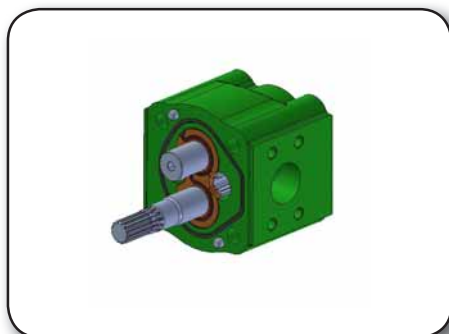
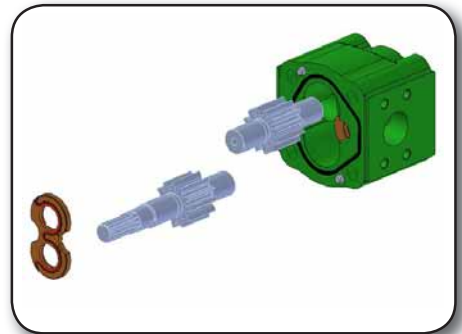
Step 3:
take note of the assembling position of the bronze thrust plate. If necessary, you can put a mark which help you remembering the position of the plate related to the body. This is very important, because at the end you must re-assemble it in this way.

Step 4:
take off the thrust plate.



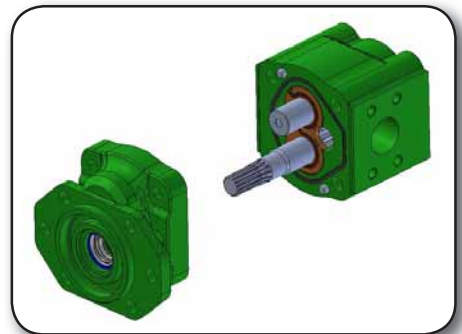
Step 5:
take off both the shafts, drive and driven.

Step 6:
reverse their position and re-assemble them.

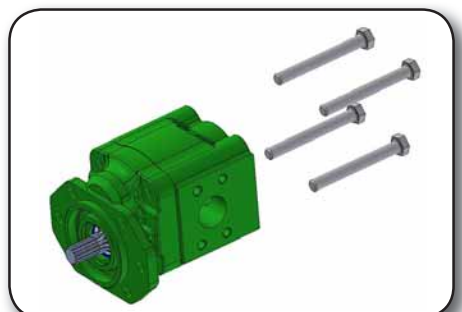
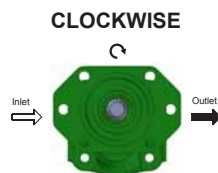


Step 7:
re-assemble the thrust plate in the same position it was at the beginning. Reference step 3.

Step 8:
reverse and re-assemble the front flange.



Step 9:
re-place and screw the bolts, taking care of the torque 180 Nm.



THIS INSTRUCTION IS APPROPRIATE FOR BOTH,
UNIDIRECTIONAL PUMPS AND MOTORS.





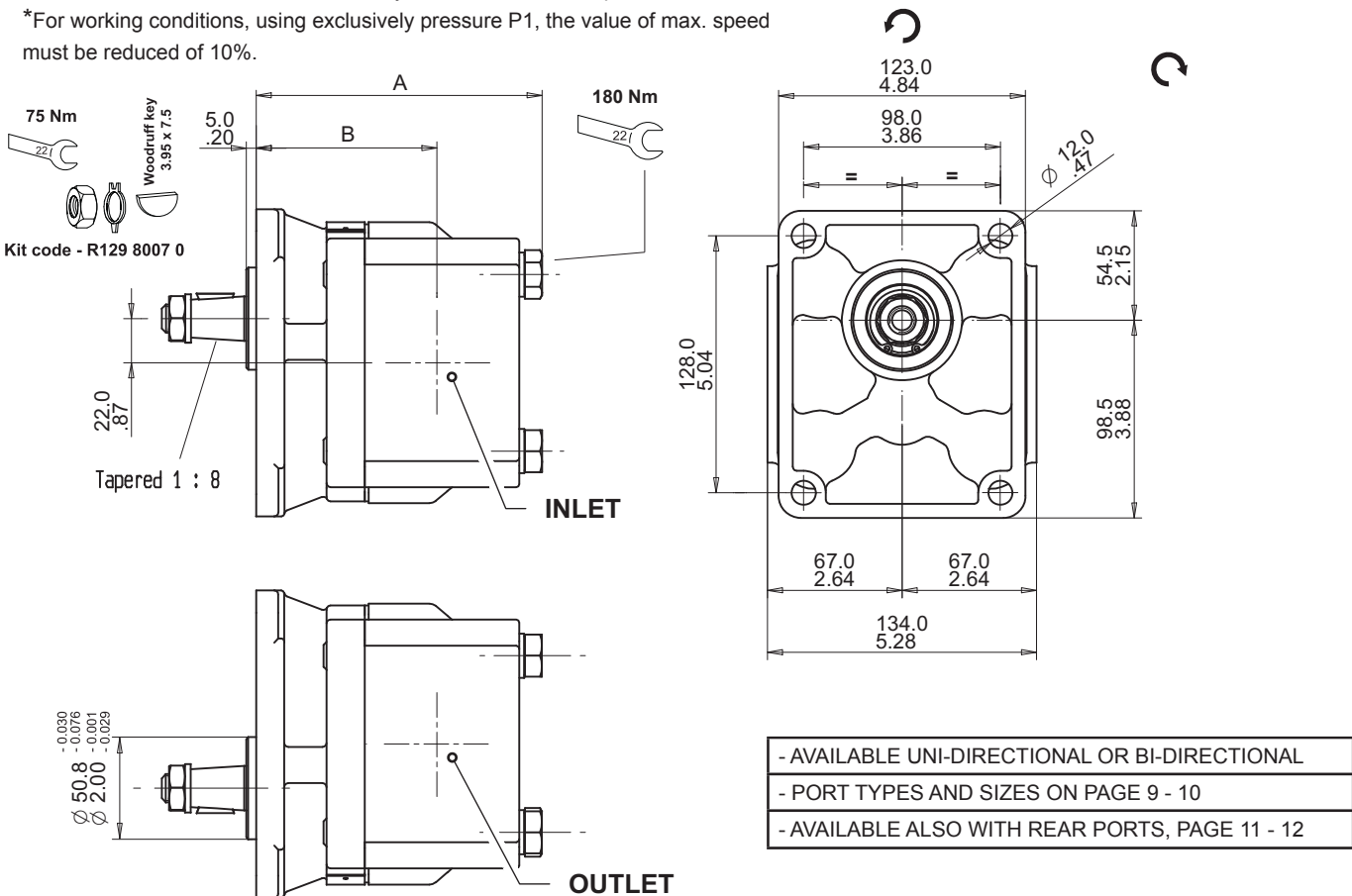
Release with flange P2 and shaft 38

ASSEMBLING DIMENSIONS AND VALUES OF PRESSURE AND SPEED

TYPE		23	28	34	40	47	55	64	72
Displacements	cm ³ /rev	23.4	28.6	34.4	40.3	47.4	55.2	64.3	73.4
	cu.in./rev	1.43	1.74	2.1	2.46	2.89	3.37	3.92	4.48
Dimension A	mm	141.8	145.8	150.3	154.8	166.3	172.3	179.3	186.3
	in	5.58	5.74	5.92	6.1	6.55	6.78	7.05	7.33
Dimension B	mm	89	92	96.5	101	104	110	112	115
	in	3.5	3.62	3.8	3.98	4.1	4.33	4.41	4.53
Working pressure P1*	bar	260	280	280	260	280	260	240	220
	psi	3800	4000	4000	3800	4000	3800	3500	3200
Intermittent pressure P2	bar	280	300	300	280	300	280	260	240
	psi	4000	4350	4350	4000	4350	4000	3800	3500
Peak pressure P3	bar	300	320	320	300	320	300	280	260
	psi	4350	4650	4650	4350	4650	4350	4000	3800
Max. speed at P2	rpm	3000			2700			2500	
Min. speed at P1	rpm	400			400			350	
Weight	kg	12.77	13.18	13.59	13.99	15.2	15.8	16.5	17.17
	lbs	28.15	29.06	29.96	30.84	33.51	34.83	36.37	37.85

Performance carried out with oil viscosity at 16 cSt and oil temperature at 60°C.

*For working conditions, using exclusively pressure P1, the value of max. speed must be reduced of 10%.



**GEAR PUMPS "PG" SERIES
GEAR MOTORS "MG" SERIES**

PG330 - MG330

Release with flange S3 and shaft 56

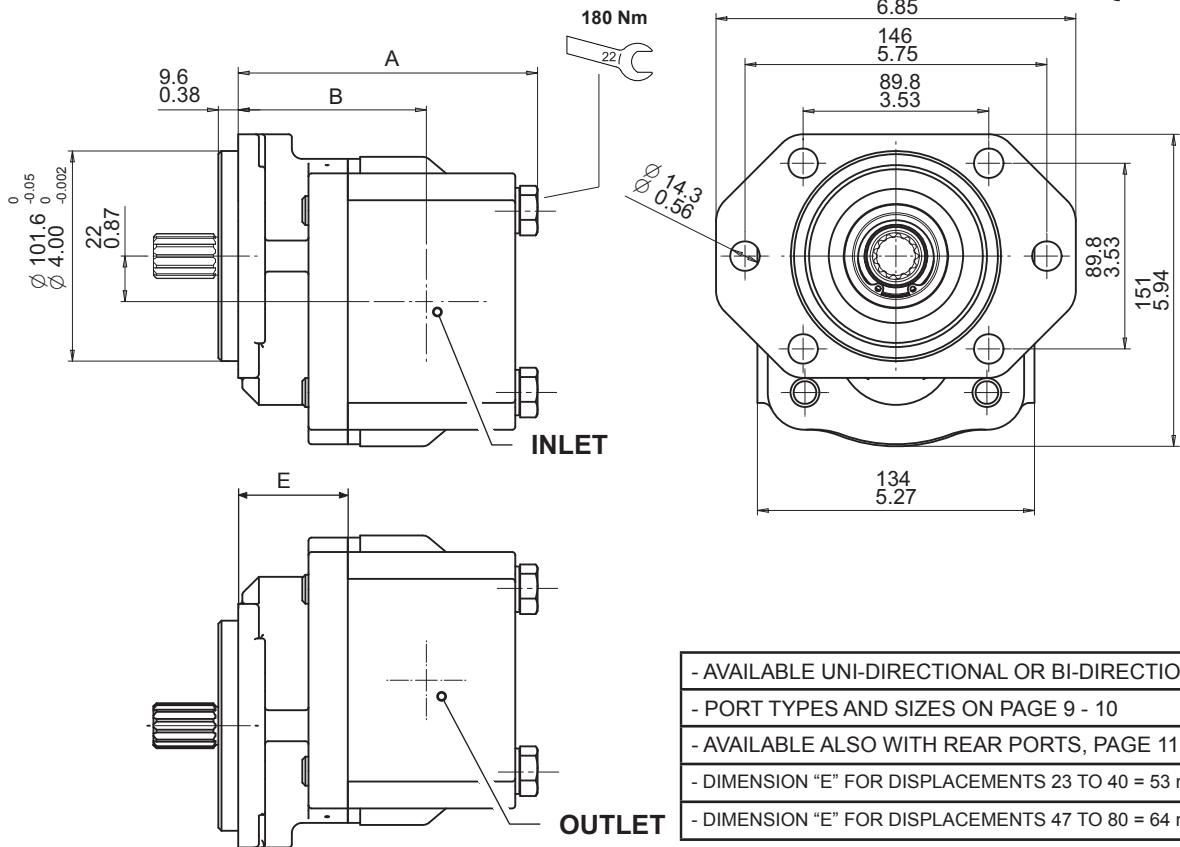


ASSEMBLING DIMENSIONS AND VALUES OF PRESSURE AND SPEED

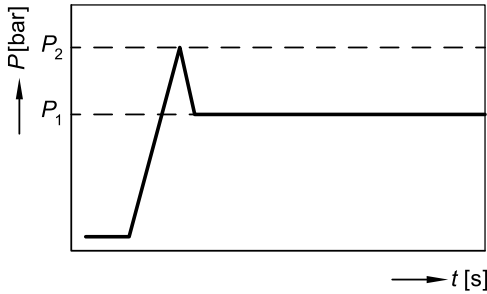
TYPE		23	28	34	40	47	55	64	72	80
Displacements	cm ³ /rev	23.4	28.6	34.4	40.3	47.4	55.2	64.3	73.4	80.6
	cu.in./rev	1.43	1.74	2.1	2.46	2.89	3.37	3.92	4.48	4.91
Dimension A	mm	140.8	144.8	149.3	153.8	176.3	182.3	189.3	196.3	202.3
	in	5.54	5.70	5.88	6	6.94	7.18	7.45	7.73	7.96
Dimension B	mm	88	91	95.5	100	114	120	122	125	129
	in	3.46	3.58	3.76	3.94	4.49	4.72	4.80	4.92	5.08
Working pressure P1 *	bar	260	280	280	260	280	260	240	220	200
	psi	3800	4000	4000	3800	4000	3800	3500	3200	2900
Intermittent pressure P2	bar	280	300	300	280	300	280	260	240	220
	psi	4000	4350	4350	4000	4350	4000	3800	3500	3200
Peak pressure P3	bar	300	320	320	300	320	300	280	260	240
	psi	4350	4650	4650	4350	4650	4350	4000	3800	3500
Max. speed at P2	rpm	3000			2700			2500		
Min. speed at P1	rpm	400			400			350		
Weight	kg	12.88	13.28	13.67	14.1	16.6	17.2	17.92	18.59	19.1
	lbs	28.4	29.3	30.14	31.1	36.6	37.92	39.51	40.98	42.11

Performance carried out with oil viscosity at 16 cSt and oil temperature at 60°C.
*For working conditions, using exclusively pressure P1, the value of max. speed must be reduced of 10%.

Anti-clockwise rotation pump. In case of use as a motor, the same construction is a clockwise motor.



DEFINITION OF PRESSURES



P_1 max. continuous pressure
 P_2 starting pressure (depending on the application, this must be taken into consideration when setting the pressure of the hydraulic system's pressure-relief valve).

WORKING CONDITIONS

MG330										
Type		23	28	34	40	47	55	64	72	80
max. continuous pressure P_1	bar (psi)	220 (3200)	240 (3500)	240 (3500)	220 (3200)	240 (3500)	220 (3200)		200 (2900)	
max. starting pressure P_2		300 (4350)			280 (4050)			260 (3800)		
min. rotational speed	min ⁻¹	600			550			500		
max. rotational speed P_1		3000			2700			2500		
Motor outlet pressure P_{out} Leakage-oil line pressure P_{drain}	bar (psi)	<p>$P_{out} \leq 5 \text{ bar}$ (43 psi)</p>		<p>$P_{drain} < 5 \text{ bar}$ (43 psi) $P_{out} \leq 120 \text{ bar}$ (1740 psi)</p>						

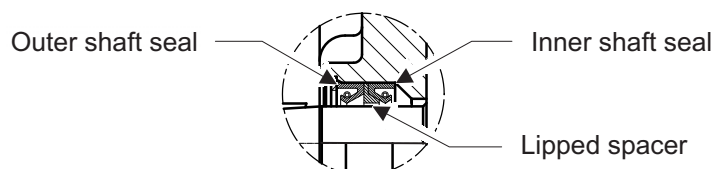
TECHNICAL DATA

- Minimum operating fluid viscosity	12 mm ² / sec
- Permitted viscosity range	12 - 800 mm ² / sec
- Recommended viscosity range	20 - 80 mm ² / sec
- Permitted viscosity for starting	2000 mm ² / sec
- Fluid operating temperature range	-15 to 85 °C
- Fluid temperature range with FPM seals	-20 to 110° C
- The standard fluids are all the mineral oil-based corresponding to DIN/ISO, for other fluids, please get in touch with our technical dept.	

*) During the application of control systems or devices with critical counter-reaction, such as steering and brake valves, the type of filtration selected must be adapted to the sensitivity of these devices/systems. Safety requirements pertaining to the whole systems are to be observed. In the case of applications with frequent load cycles please consult us.

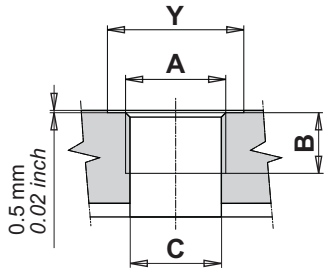
MOTOR ASSEMBLING FEATURES

All our standard motors have a double shaft seal, the one which faces the inner of the motor is reinforced by a lipped washer.



THREADED PORTS

Type	OUTLET				INLET			
	A	B	C	Y	A	B	C	Y
From 23 to 40	G1	22 (0.87")	30.5 (1.2")	44 (1.73")	G3/4	16 (0.62")	24.4 (0.96")	36 (1.42")
From 40 to 80	G1 1/4	24 (0.94")	37 (1.46")	54 (2.12")	G1	22 (0.87")	30.5 (1.2")	44 (1.73")

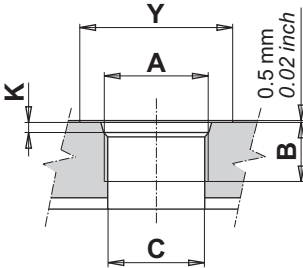


Type	INLET				OUTLET			
	A	B	C	Y	A	B	C	Y
From 23 to 40	G3/4	16 (0.62")	24.4 (0.96")	36 (1.42")	G3/4	16 (0.62")	24.4 (0.96")	36 (1.42")
From 28 to 44	G1	22 (0.87")	30.5 (1.2")	44 (1.73")	G1	22 (0.87")	30.5 (1.2")	44 (1.73")

British standard pipe parallel (BSPP)

code G

Type	OUTLET					INLET				
	A	B	C	Y	K	A	B	C	Y	K
From 23 to 40	1-5/16 12 UN	19 (0.74")	31 (1.22")	49 (1.93")	3.3 (0.12")	1-1/16 12 UN	19 (0.74")	24.7 (0.97")	41 (1.16")	3.3 (0.12")
From 47 to 80	1-5/8 12 UN	19 (0.74")	38.9 (1.53")	58 (2.28")	3.3 (0.12")	1-5/16 12 UN	19 (0.74")	31 (1.22")	49 (1.93")	3.3 (0.12")



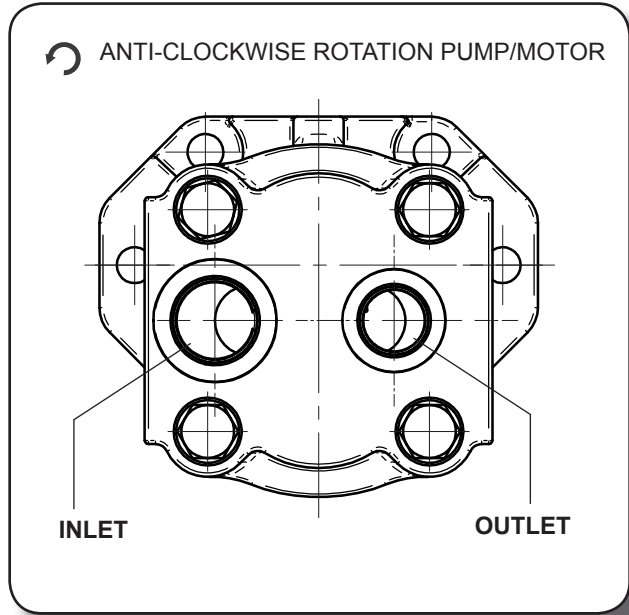
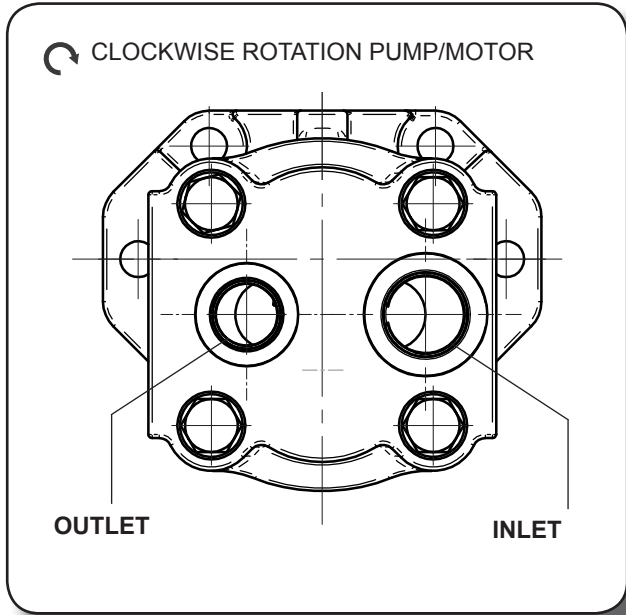
Type	INLET					OUTLET				
	A	B	C	Y	K	A	B	C	Y	K
From 16 to 25	1-1/16 12 UN	19 (0.74")	24.7 (0.97")	41 (1.16")	3.3 (0.12")	1-1/16 12 UN	19 (0.74")	24.7 (0.97")	41 (1.16")	3.3 (0.12")
From 28 to 44	1-5/16 12 UN	19 (0.74")	31 (1.22")	49 (1.93")	3.3 (0.12")	1-5/16 12 UN	19 (0.74")	31 (1.22")	49 (1.93")	3.3 (0.12")

SAE threaded (ODT)

code R



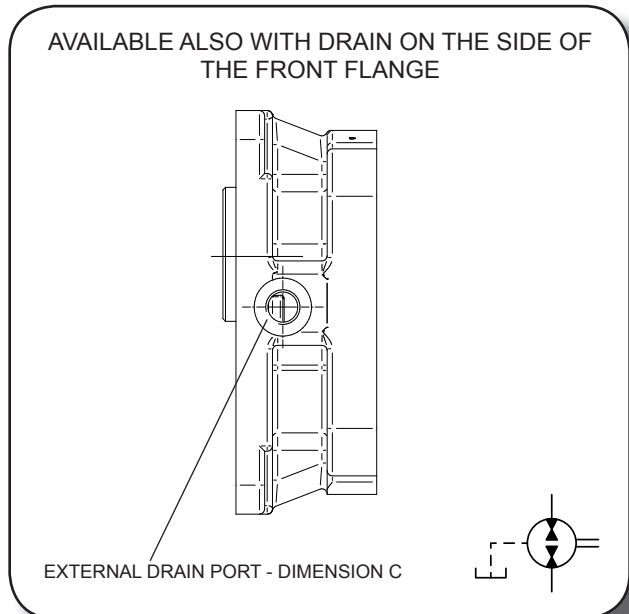
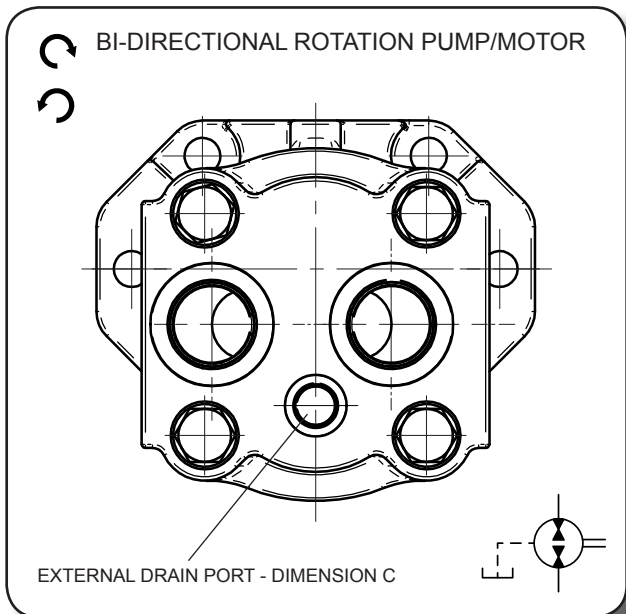
RELEASE WITH REAR PORTS



IN CASE OF USE AS A UNIDIRECTIONAL MOTOR:

- ANTI-CLOCKWISE PUMP BECOMES A CLOCKWISE MOTOR
- CLOCKWISE PUMP BECOMES AN ANTICLOCKWISE MOTOR

THE POSITION OF THE PORTS IS THE SAME BUT THE INLET BECOMES OUTLET AND VICEVERSA

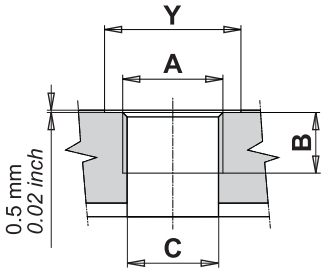


C
9/16-18UNF-2B (SAE 6)
G 3/8

C
7/16 - 20 UNF (SAE 4)
G 1/4



THREADED REAR PORTS

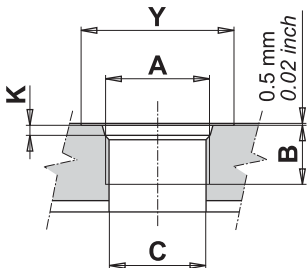


Type	OUTLET				INLET			
	INLET				OUTLET			
	A	B	C	Y	A	B	C	Y
From 23 to 40	G1	22 (0.87")	30.5 (1.2")	44 (1.73")	G3/4	16 (0.62")	24.4 (0.96")	36 (1.42")
From 40 to 80	G1"1/4	24 (0.94")	37 (1.46")	54 (2.12")	G1	22 (0.87")	30.5 (1.2")	44 (1.73")

Type	INLET				OUTLET			
	A	B	C	Y	A	B	C	Y
From 23 to 40	G3/4	16 (0.62")	24.4 (0.96")	36 (1.42")	G3/4	16 (0.62")	24.4 (0.96")	36 (1.42")
From 28 to 80	G1	22 (0.87")	30.5 (1.2")	44 (1.73")	G1	22 (0.87")	30.5 (1.2")	44 (1.73")

code G

British standard pipe parallel (BSPP)



Type	OUTLET					INLET				
	INLET					OUTLET				
	A	B	C	Y	K	A	B	C	Y	K
From 23 to 40	1-5/16 12 UN	19 (0.74")	31 (1.22")	49 (1.93")	3.3 (0.12")	1-1/16 12 UN	19 (0.74")	24.7 (0.97")	41 (1.16")	3.3 (0.12")
From 47 to 80	1-5/8 12 UN	19 (0.74")	38.9 (1.53")	58 (2.28")	3.3 (0.12")	1-5/16 12 UN	19 (0.74")	31 (1.22")	49 (1.93")	3.3 (0.12")

Type	INLET					OUTLET				
	A	B	C	Y	K	A	B	C	Y	K
From 16 to 25	1-1/16 12 UN	19 (0.74")	24.7 (0.97")	41 (1.16")	3.3 (0.12")	1-1/16 12 UN	19 (0.74")	24.7 (0.97")	41 (1.16")	3.3 (0.12")
From 28 to 80	1-5/16 12 UN	19 (0.74")	31 (1.22")	49 (1.93")	3.3 (0.12")	1-5/16 12 UN	19 (0.74")	31 (1.22")	49 (1.93")	3.3 (0.12")

code R

SAE threaded (ODT)



GEAR PUMPS "PG" SERIES

PG330



Release with flange P2 and shaft 38

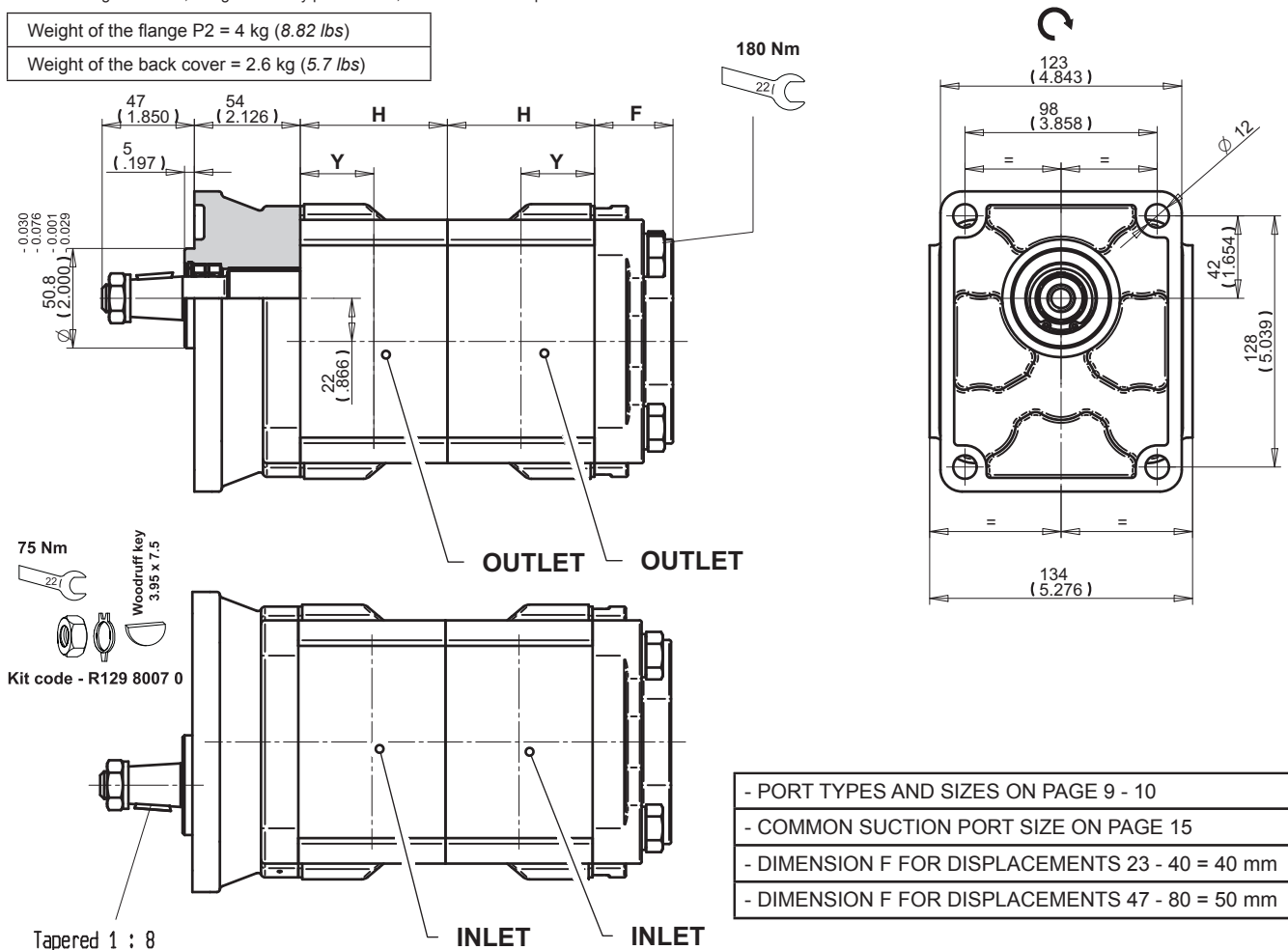
In case of common inlet port, to avoid too high value of oil speed, 40l/min is the max. sucked flow for the downstream pump.

Performance carried out with oil viscosity at 16 cSt and oil temperature at 60°C.

TYPE		23	28	34	40	47	55	64	72
Displacements	cm ³ /rev	23.4	28.6	34.4	40.3	47.4	55.2	64.3	73.4
	cu.in./rev	1.43	1.74	2.1	2.46	2.89	3.37	3.92	4.48
Dimension H	mm	72	76	80,5	85	93	99	106	113
	in	2.83	2.99	3.17	3.35	3.66	6.78	7.05	7.33
Dimension Y	mm	35	38	42,5	47	50	56	58	61
	in	1.38	1.49	1.67	1.85	1.97	2,2	2,28	2,4
Working pressure P1	bar	260	280	280	260	280	260	240	220
	psi	3800	4000	4000	3800	4000	3800	3500	3200
Intermittent pressure P2	bar	280	300	300	280	300	280	260	240
	psi	4000	4350	4350	4000	4350	4000	3800	3500
Peak pressure P3	bar	300	320	320	300	320	300	280	260
	psi	4350	4650	4650	4350	4650	4350	4000	3800
Max. speed at P2	rpm	3000			2700			2500	
Min. speed at P1*	rpm	400			400			350	
Weight	kg	8.8	9.18	9.6	10	11.2	11.8	12,5	13,2
	lbs	19.4	20,2	21.16	22	24,7	26	27.5	29.1

*For working conditions, using exclusively pressure P1, the value of max. speed must be reduced of 10%.

Weight of the flange P2 = 4 kg (8.82 lbs)
 Weight of the back cover = 2.6 kg (5.7 lbs)



- PORT TYPES AND SIZES ON PAGE 9 - 10
- COMMON SUCTION PORT SIZE ON PAGE 15
- DIMENSION F FOR DISPLACEMENTS 23 - 40 = 40 mm
- DIMENSION F FOR DISPLACEMENTS 47 - 80 = 50 mm



Release with flange S3 and shaft 56



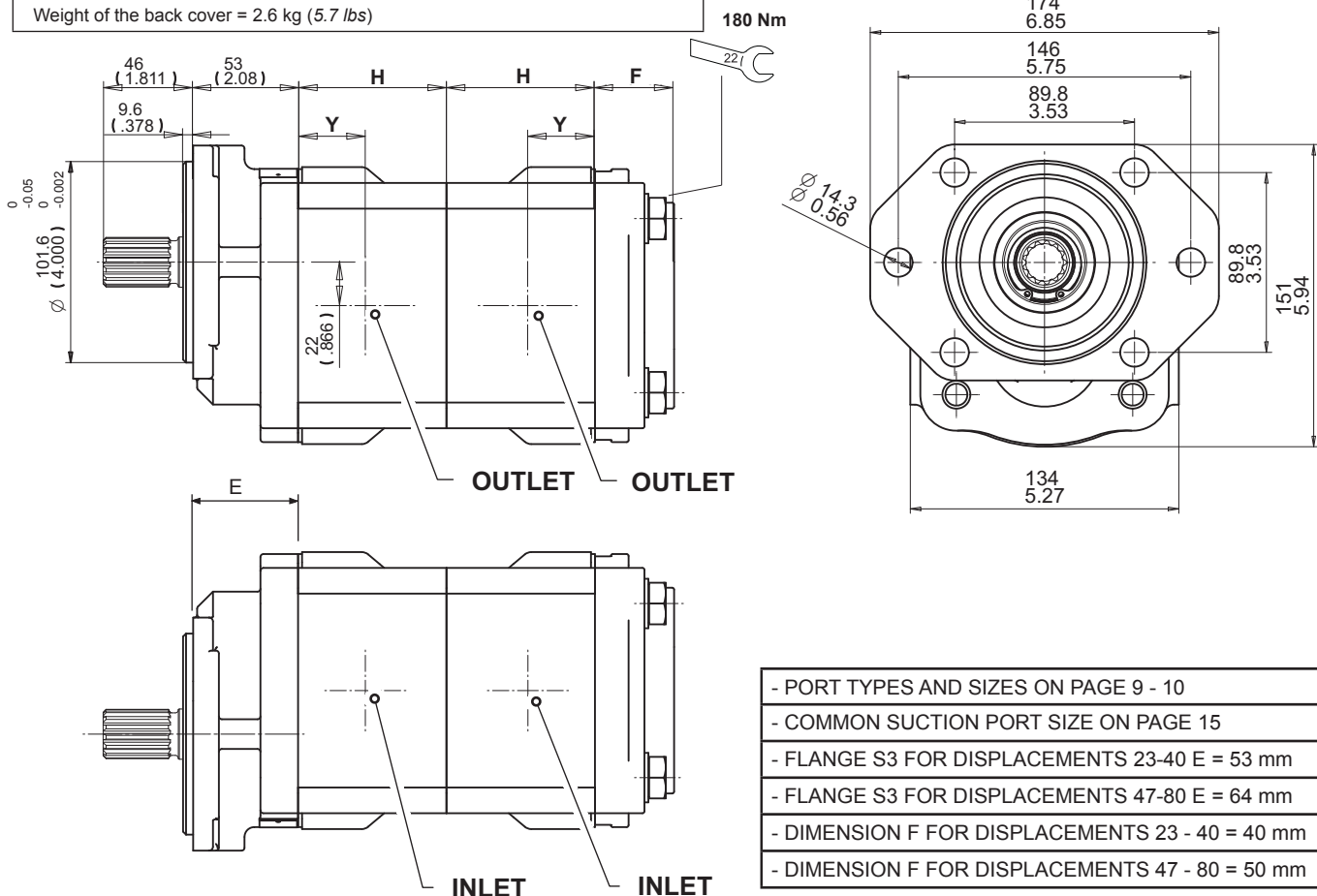
In case of common inlet port, to avoid too high value of oil speed, 40l/min is the max. sucked flow for the downstream pump.

Performance carried out with oil viscosity at 16 cSt and oil temperature at 60°C.

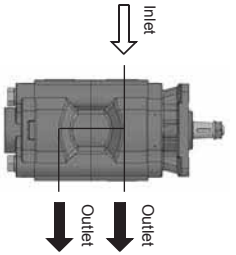
TYPE		23	28	34	40	47	55	64	72	80
Displacements	cm ³ /rev	23.4	28.6	34.4	40.3	47.4	55.2	64.3	73.4	80.6
	cu.in./rev	1.43	1.74	2.1	2.46	2.89	3.37	3.92	4.48	4.91
Dimension H	mm	72	76	80,5	85	93	99	106	113	119
	in	2.83	2.99	3.17	3.35	3.66	6.78	7.05	7.33	7.57
Dimension Y	mm	35	38	42,5	47	50	56	58	61	65
	in	1.38	1.49	1.67	1.85	1.97	2,2	2,28	2,4	2.56
Working pressure P1	bar	260	280	280	260	280	260	240	220	200
	psi	3800	4000	4000	3800	4000	3800	3500	3200	2900
Intermittent pressure P2	bar	280	300	300	280	300	280	260	240	220
	psi	4000	4350	4350	4000	4350	4000	3800	3500	3200
Peak pressure P3	bar	300	320	320	300	320	300	280	260	240
	psi	4350	4650	4650	4350	4650	4350	4000	3800	3500
Max. speed at P2	rpm	3000			2700			2500		
Min. speed at P1	rpm	400			400			350		
Weight	kg	8.8	9.18	9.6	10	11.2	11.8	12,5	13,2	13.7
	lbs	19.4	20,2	21.16	22	24,7	26	27.5	29.1	30.2

*For working conditions, using exclusively pressure P1, the value of max. speed must be reduced of 10%.

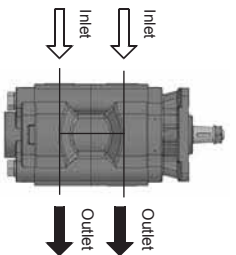
Weight of the flange S3(E=53 mm) = 4 kg (8.82 lbs)/ S3(E=64 mm) = 5.4 (11.9 lbs)
Weight of the back cover = 2.6 kg (5.7 lbs)



FOR REASON OF READABILITY, IN CASE OF INTENSIVE USE, WE CAN PROVIDE THE FOLLOWING TABLE AS A STANDALONE FILE.



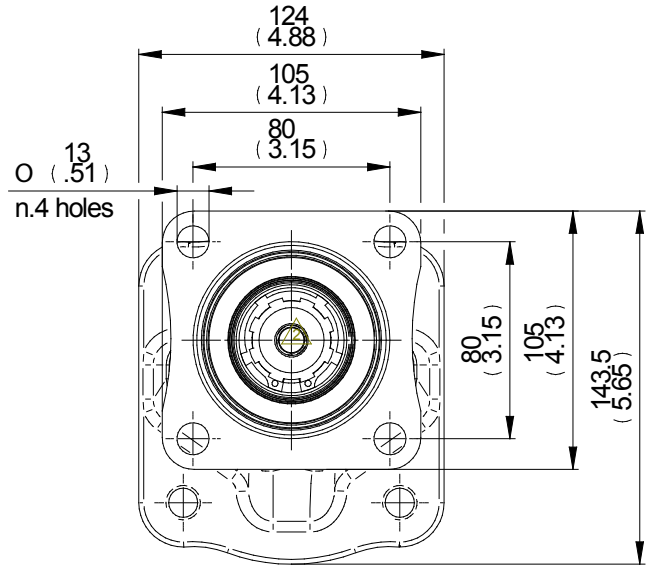
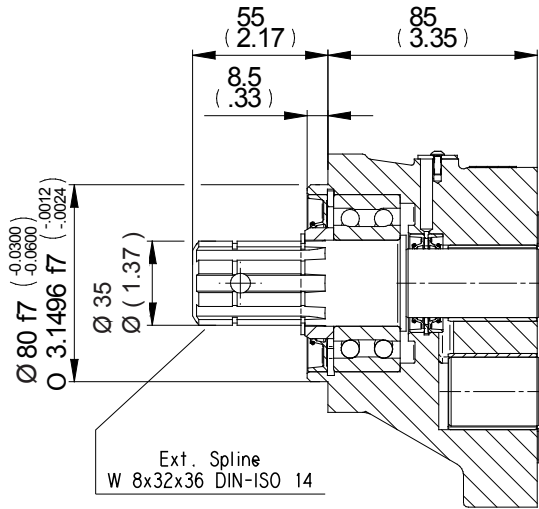
In case of common suction configuration, we have to take care of the area of the common suction port to avoid cavitation. The suggested speed of the oil at suction line is 1.5 m/sec, using this table and according of which is the total flow which goes into the pump, you can obtain the value of the proper diameter (mm) and proper area (cm²).



In case of suction on both the stages, the size of the ports are the ones listed on pages 9 and 10.

SPEED m/sec	PRESSURE LINE															BACK TO TANK															SUCTION															FLOW - l/min																																																																						
	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150
0.5	20.6	25.2	29.1	32.6	35.7	38.5	41.2	43.7	46.0	48.3	50.4	52.5	54.5	56.4	58.2	60.0	61.8	63.5	65.1	66.7	68.3	69.8	71.3	72.8	74.2	75.7	77.0	78.4	79.7	20.6	25.2	29.1	32.6	35.7	38.5	41.2	43.7	46.0	48.3	50.4	52.5	54.5	56.4	58.2	60.0	61.8	63.5	65.1	66.7	68.3	69.8	71.3	72.8	74.2	75.7	77.0	78.4	79.7	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150
1	17.8	20.6	23.0	25.2	27.2	29.1	30.9	32.6	34.1	35.7	37.1	38.5	39.9	41.2	42.4	43.7	44.9	46.0	47.2	48.3	49.4	50.4	51.5	52.5	53.5	54.5	55.4	56.4	17.8	20.6	23.0	25.2	27.2	29.1	30.9	32.6	34.1	35.7	37.1	38.5	39.9	41.2	42.4	43.7	44.9	46.0	47.2	48.3	49.4	50.4	51.5	52.5	53.5	54.5	55.4	56.4	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150		
1.3	15.9	17.8	19.9	21.7	23.3	24.8	26.2	27.5	28.8	30.0	31.2	32.4	33.6	34.8	35.9	37.1	38.2	39.3	40.4	41.5	42.6	43.7	44.8	45.9	47.0	48.1	49.2	50.3	15.9	17.8	19.9	21.7	23.3	24.8	26.2	27.5	28.8	30.0	31.2	32.4	33.6	34.8	35.9	37.1	38.2	39.3	40.4	41.5	42.6	43.7	44.8	45.9	47.0	48.1	49.2	50.3	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150		
1.5	14.6	16.8	18.8	20.6	22.2	23.7	25.1	26.5	27.8	29.1	30.4	31.7	33.0	34.3	35.6	36.9	38.2	39.5	40.8	42.1	43.4	44.7	46.0	47.3	48.6	49.9	51.2	52.5	14.6	16.8	18.8	20.6	22.2	23.7	25.1	26.5	27.8	29.1	30.4	31.7	33.0	34.3	35.6	36.9	38.2	39.5	40.8	42.1	43.4	44.7	46.0	47.3	48.6	49.9	51.2	52.5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150		
1.8	13.3	15.3	17.2	18.8	20.3	21.7	23.0	24.3	25.5	26.6	27.7	28.8	29.9	31.0	32.1	33.2	34.3	35.4	36.5	37.6	38.7	39.8	40.9	42.0	43.1	44.2	45.3	46.4	13.3	15.3	17.2	18.8	20.3	21.7	23.0	24.3	25.5	26.6	27.7	28.8	29.9	31.0	32.1	33.2	34.3	35.4	36.5	37.6	38.7	39.8	40.9	42.0	43.1	44.2	45.3	46.4	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150		
2	12.6	14.6	16.3	17.8	19.3	20.6	21.8	23.0	24.1	25.2	26.2	27.2	28.2	29.1	30.0	30.9	31.7	32.6	33.4	34.1	34.9	35.7	36.4	37.1	37.8	38.5	39.2	39.9	12.6	14.6	16.3	17.8	19.3	20.6	21.8	23.0	24.1	25.2	26.2	27.2	28.2	29.1	30.0	30.9	31.7	32.6	33.4	34.1	34.9	35.7	36.4	37.1	37.8	38.5	39.2	39.9	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150		
2.5	11.3	13.0	14.6	15.9	17.2	18.4	19.5	20.6	21.6	22.6	23.5	24.4	25.2	26.0	26.8	27.6	28.4	29.1	29.8	30.5	31.2	31.9	32.6	33.2	33.8	34.5	35.1	35.7	11.3	13.0	14.6	15.9	17.2	18.4	19.5	20.6	21.6	22.6	23.5	24.4	25.2	26.0	26.8	27.6	28.4	29.1	29.8	30.5	31.2	31.9	32.6	33.2	33.8	34.5	35.1	35.7	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150		
3	10.3	11.9	13.3	14.6	15.7	16.8	17.8	18.8	19.7	20.6	21.4	22.2	23.0	23.8	24.5	25.2	25.9	26.6	27.2	27.9	28.5	29.1	29.7	30.3	30.9	31.5	32.0	32.6	10.3	11.9	13.3	14.6	15.7	16.8	17.8	18.8	19.7	20.6	21.4	22.2	23.0	23.8	24.5	25.2	25.9	26.6	27.2	27.9	28.5	29.1	29.7	30.3	30.9	31.5	32.0	32.6	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150		
3.5	9.5	11.0	12.3	13.5	14.6	15.6	16.5	17.4	18.3	19.1	19.8	20.6	21.3	22.0	22.7	23.3	24.0	24.6	25.2	25.8	26.4	27.0	27.5	28.1	28.6	29.1	29.6	30.1	9.5	11.0	12.3	13.5	14.6	15.6	16.5	17.4	18.3	19.1	19.8	20.6	21.3	22.0	22.7	23.3	24.0	24.6	25.2	25.8	26.4	27.0	27.5	28.1	28.6	29.1	29.6	30.1	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150		
4	8.4	9.7	10.9	11.9	12.8	13.7	14.6	15.3	16.1	16.8	17.5	18.2	18.8	19.4	20.0	20.6	21.2	21.7	22.2	22.8	23.3	23.8	24.3	24.7	25.2	25.7	26.2	8.4	9.7	10.9	11.9	12.8	13.7	14.6	15.3	16.1	16.8	17.5	18.2	18.8	19.4	20.0	20.6	21.2	21.7	22.2	22.8	23.3	23.8	24.3	24.7	25.2	25.7	26.2	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150				
4.5	7.3	8.4	9.4	10.3	11.1	11.9	12.6	13.3	13.9	14.6	15.2	15.7	16.3	16.8	17.3	17.8	18.3	18.8	19.3	19.7	20.2	20.6	21.0	21.4	21.8	22.2	7.3	8.4	9.4	10.3	11.1	11.9	12.6	13.3	13.9	14.6	15.2	15.7	16.3	16.8	17.3	17.8	18.3	18.8	19.3	19.7	20.2	20.6	21.0	21.4	21.8	22.2	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150						
5	6.5	7.6	8.4	9.2	10.3	11.3	12.2	13.0	13.8	14.6	15.3	15.9	16.6	17.2	17.8	18.4	19.0	19.5	20.1	20.6	21.1	21.6	22.1	22.6	23.0	6.5	7.6	8.4	9.2	10.3	11.3	12.2	13.0	13.8	14.6	15.3	15.9	16.6	17.2	17.8	18.4	19.0	19.5	20.1	20.6	21.1	21.6	22.1	22.6	23.0	10	15	20	25	30	35	40	45	50	55	60																																																							

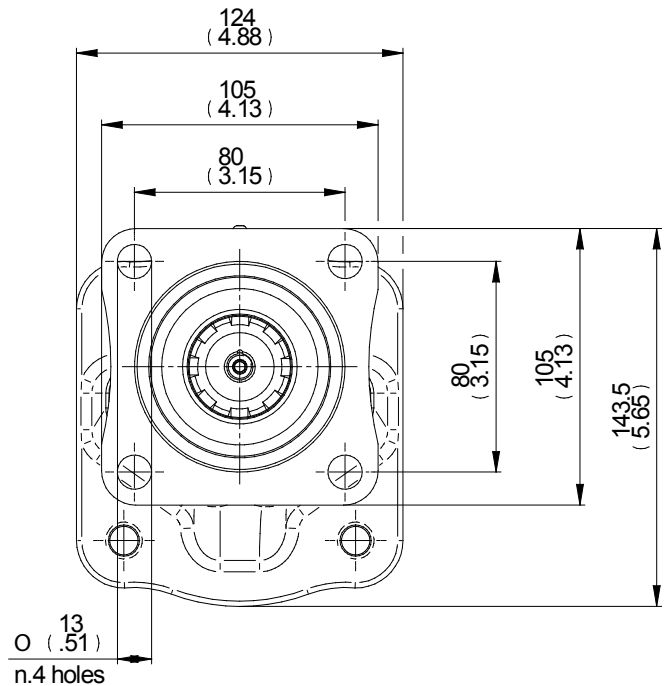
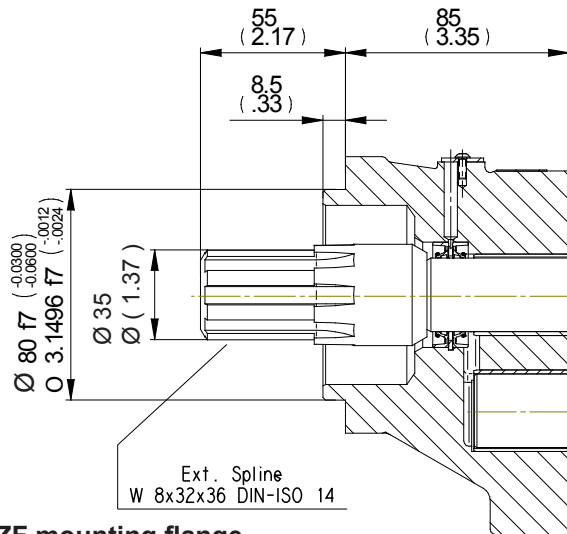
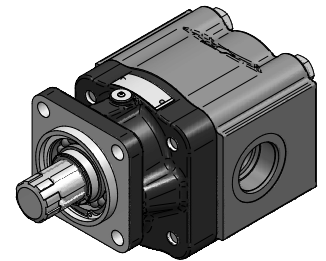
OUTRIGGER BEARING (heavy load)



ZF mounting flange

Z1	Available assembling shafts			
Splined	66			
Tapered				
Straight				

Max. torque 480 Nm



Max. torque 480 Nm

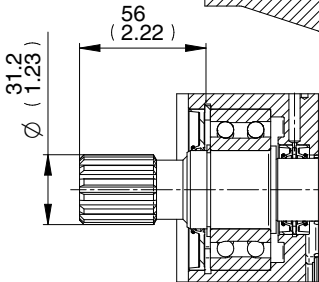
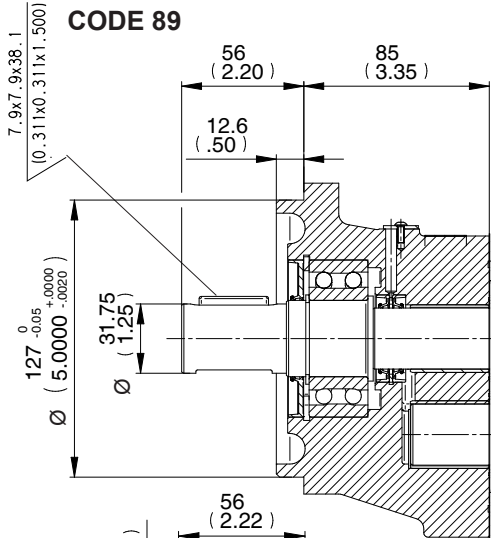
ZF mounting flange

Z2	Available assembling shafts			
Splined	67			
Tapered				
Straight				



OUTRIGGER BEARING (heavy loads)

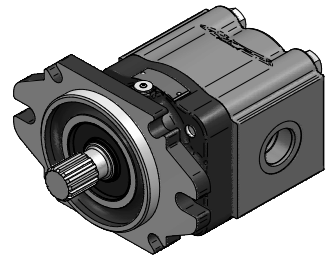
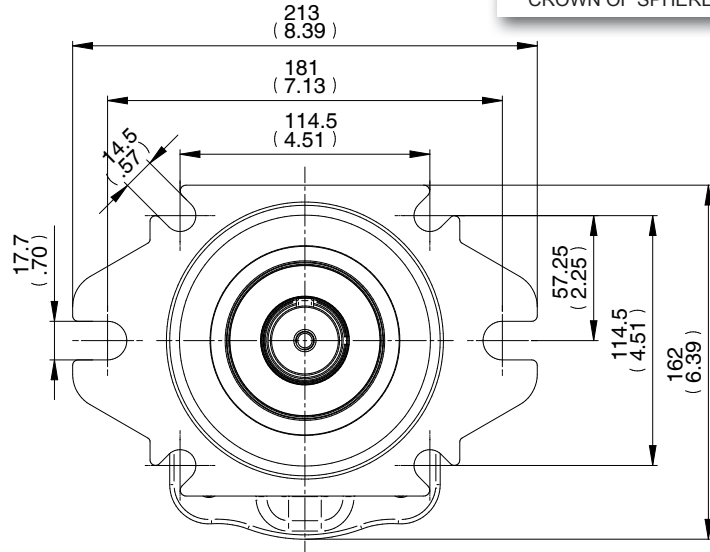
SAE "C" STRAIGHT CODE 89



SAE "C" SPLINE CODE 57

Ext. Involute Spline SAE J498B
with major diameter modified
14 teeth - 12/24 Pitch - 30 deg
Flat Root - Side fit - Class 1

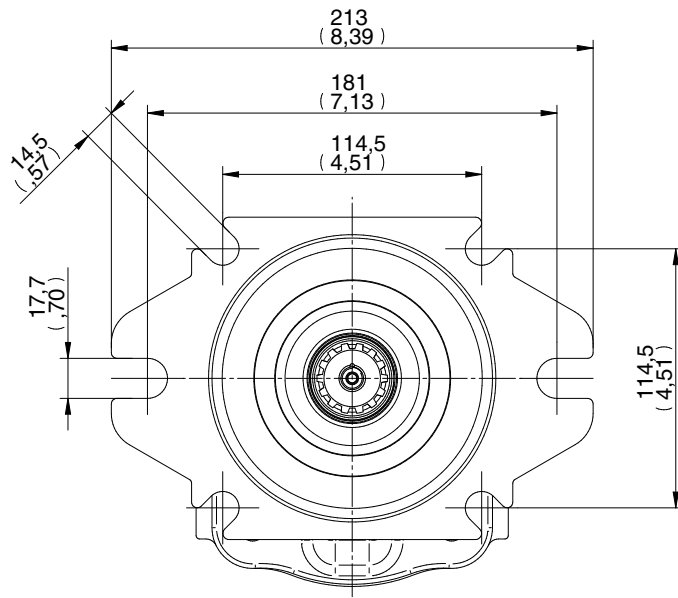
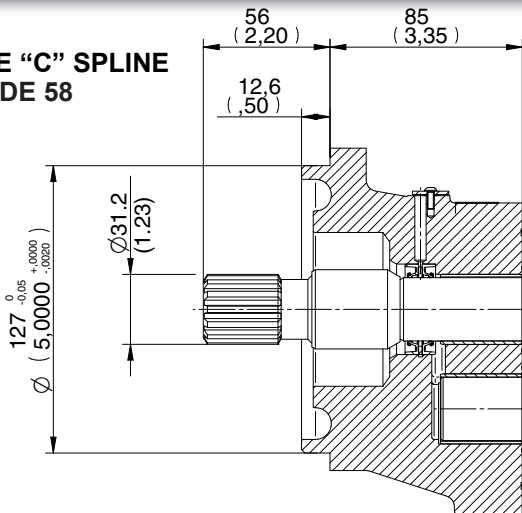
BEARING WITH DOUBLE-CROWN OF SPHERES



Max. torque 480 Nm

R8	Available assembling shafts		
Splined	57		
Tapered			
Straight	89		

SAE "C" SPLINE CODE 58



Max. torque 480 Nm

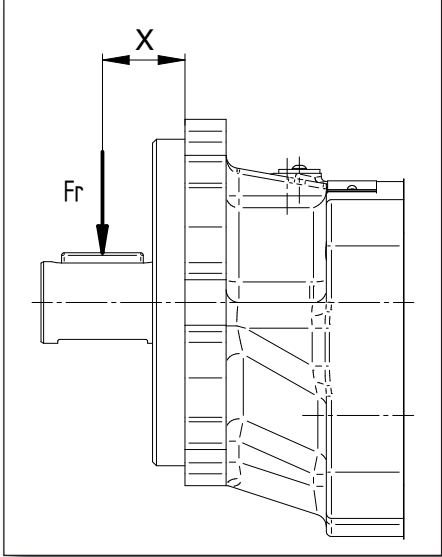
Ext. Involute Spline SAE J498B
with major diameter modified
14 teeth - 12/24 Pitch - 30 deg
Flat Root - Side fit - Class 1

S4	Available assembling shafts		
Splined	58		
Tapered			
Straight			

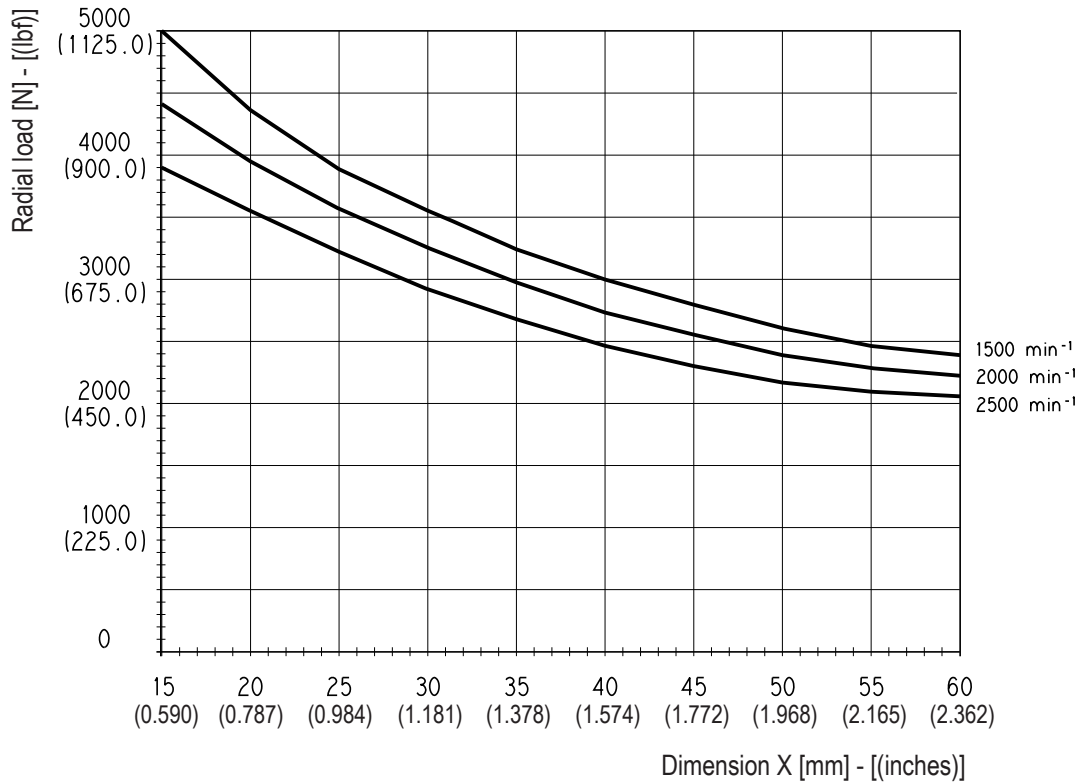


OUTRIGGER BEARING (DUTY LIFE)

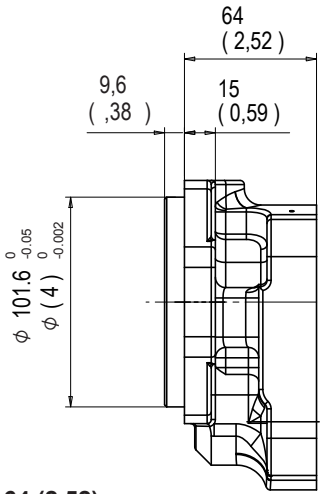
The diagram shows the values of admissible radial loads, in case of parallel axis drag. The duty life of 4000 - 5000 hours is referred to a typical mobile application, where the use is not continuous for long periods of time.



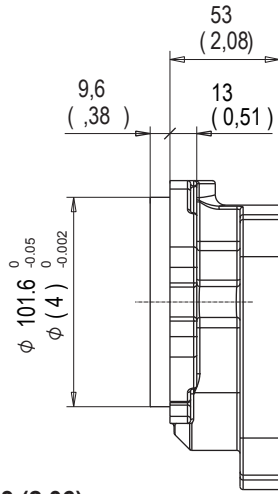
X = Distance of the radial load result from the mounting flange [mm (in)].



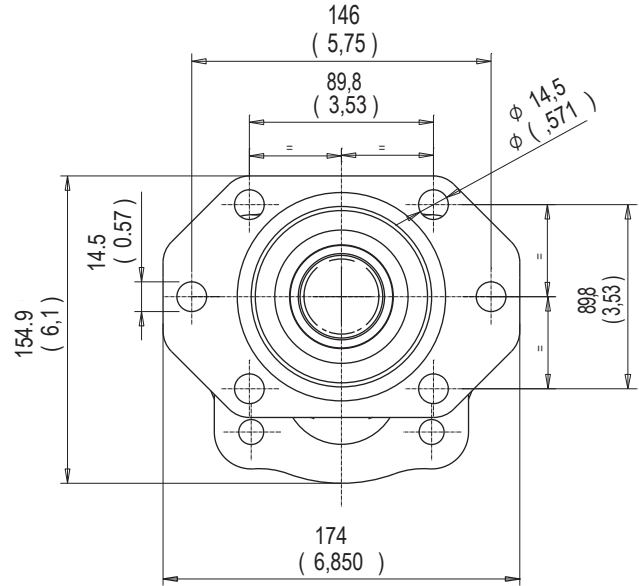
OUTRIGGER BEARING (medium loads)



64 (2.52)
THICKNESS OF THE FLANGE
ASSEMBLED WITH DISPLACE-
MENTS: 47 - 55 - 64 - 72 - 80



53 (2.06)
THICKNESS OF THE FLANGE
ASSEMBLED WITH DISPLACE-
MENTS: 23 - 28 - 34 - 40

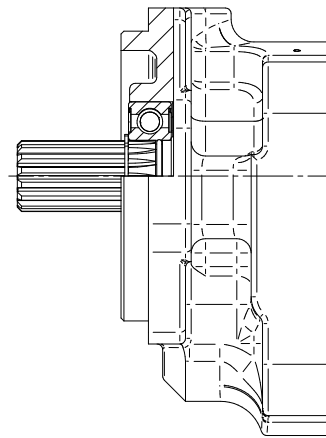
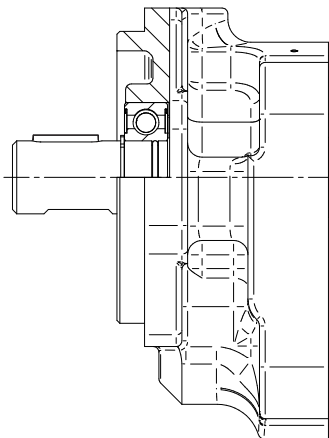


SAE B mounting flange

R3	Available assembling shafts		
Splined	55	56	
Tapered			
Straight	87	88*	

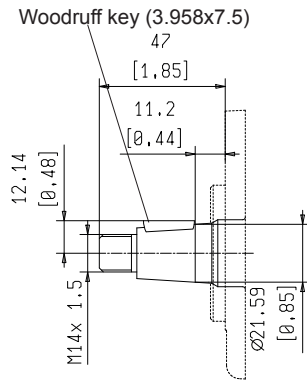
*For this option, please get in touch with our sales dept. before to place an order.

**BEARING WITH SINGLE
CROWN OF SPHERES**



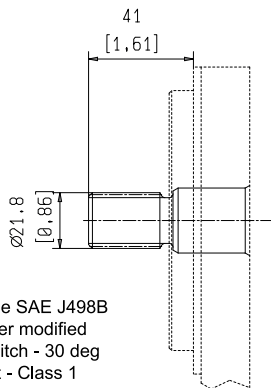
AVAILABLE SHAFTS

EUROPEAN TAPERED 1:8 Code 38



MAX 250 Nm (2213 lbf in)

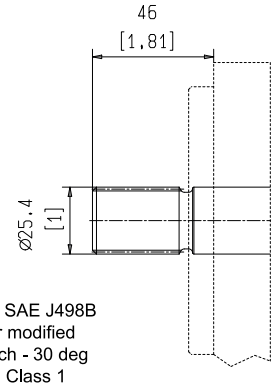
SAE "B" SPLINE Code 55



Ext. Involute Spline SAE J498B with major diameter modified 13 teeth - 16/32 Pitch - 30 deg Flat Root - Side fit - Class 1

MAX 330 Nm (2921 lbf in)

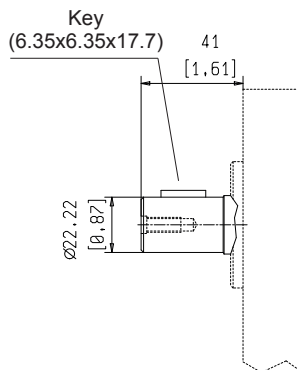
SAE "BB" SPLINE Code 56



Ext. Involute Spline SAE J498B with major diameter modified 15 teeth - 16/32 Pitch - 30 deg Flat Root - Side fit - Class 1

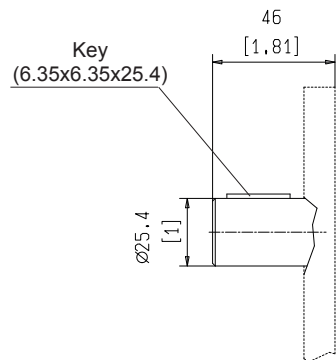
MAX 480 Nm (4250 lbf in)

SAE "B" STRAIGHT Code 87



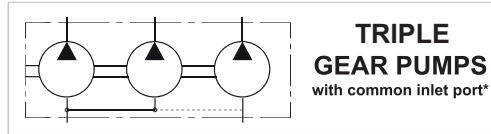
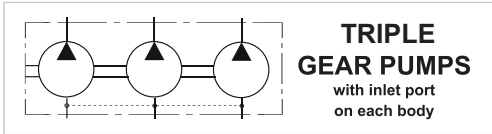
MAX 220 Nm (1950 lbf in)

SAE "BB" STRAIGHT Code 88



MAX 320 Nm (2830 lbf in)





Release with flange S3 and shaft 56

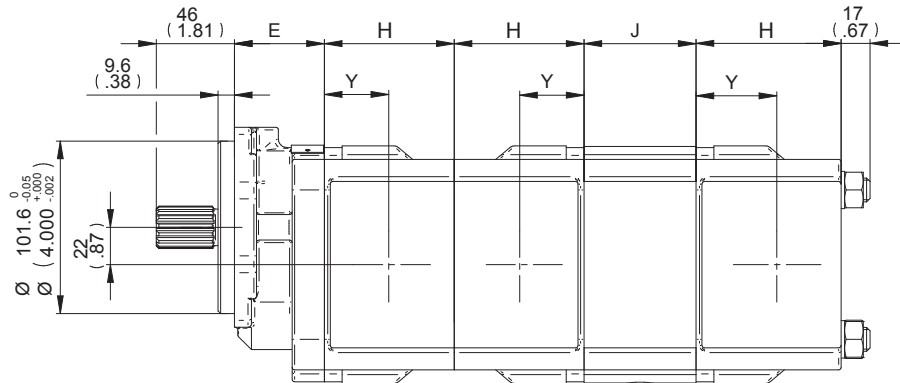
*In case of common inlet port on the first two stages, to avoid too high oil speed, please check on page 15 the proper size.

Performance carried out with oil viscosity at 16 cSt and oil temperature at 60°C.

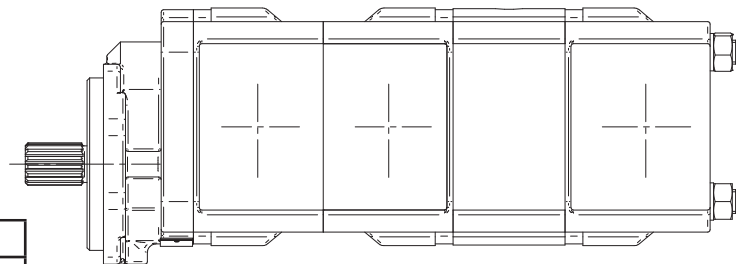
TYPE		23	28	34	40	47	55	64	72	80
Displacements	cm ³ /rev	23.4	28.6	34.4	40.3	47.4	55.2	64.3	73.4	80.6
	cu.in./rev	1.43	1.74	2.1	2.46	2.89	3.37	3.92	4.48	4.91
Dimension H	mm	68	72	76.5	81	93	99	106	113	119
	in	2.68	2.83	3.01	3.19	3.66	6.78	7.05	7.33	7.57
Dimension Y	mm	35	38	42.5	47	50	56	58	61	65
	in	1.38	1.49	1.67	1.85	1.97	2.2	2.28	2.4	2.56
Working pressure P1*	bar	260	280	280	260	280	260	240	220	200
	psi	3800	4000	4000	3800	4000	3800	3500	3200	2900
Intermittent pressure P2	bar	280	300	300	280	300	280	260	240	220
	psi	4000	4350	4350	4000	4350	4000	3800	3500	3200
Peak pressure P3	bar	300	320	320	300	320	300	280	260	240
	psi	4350	4650	4650	4350	4650	4350	4000	3800	3500
Max. speed at P2	rpm	3000			2700			2500		
Min. speed at P1	rpm	400			400			350		
Weight	kg	8.8	9.18	9.6	10	11.2	11.8	12.5	13.2	13.7
	lbs	19.4	20.2	21.16	22	24.7	26	27.5	29.1	30.2

*For working conditions, using exclusively pressure P1, the value of max. speed must be reduced of 10%.

Weight of the flange P2 = 4 kg (8.82 lbs)
Weight of the flange S3(E=53 mm) = 4 kg (8.82 lbs)
Weight of the flange S3(E=64 mm) = 5.4 kg (11.9 lbs)
Weight of the intermediate plate H = 66 mm - 6.3 kg
Weight of the intermediate plate H = 72 mm - 6.9 kg
Weight of the intermediate plate H = 78 mm - 7.4 mm



COMMON SUCTION FEASIBLE ONLY BETWEEN 1ST AND 2ND STAGE.



- PORT TYPES AND SIZES ON PAGE 9 - 10
- COMMON SUCTION PORT SIZE ON PAGE 15
- FLANGE S3 FOR DISPLACEMENTS 23-40 E = 53 mm
- FLANGE S3 FOR DISPLACEMENTS 47-80 E = 64 mm
- DIMENSION J FOR DISPLACEMENTS 23 - 40 = 66 mm
- DIMENSION J FOR DISPLACEMENTS 47 - 80 = 78 mm
- DIMENSION J FOR DISPLACEMENTS MIXED = 72 mm



PG330 single pump with 2PE

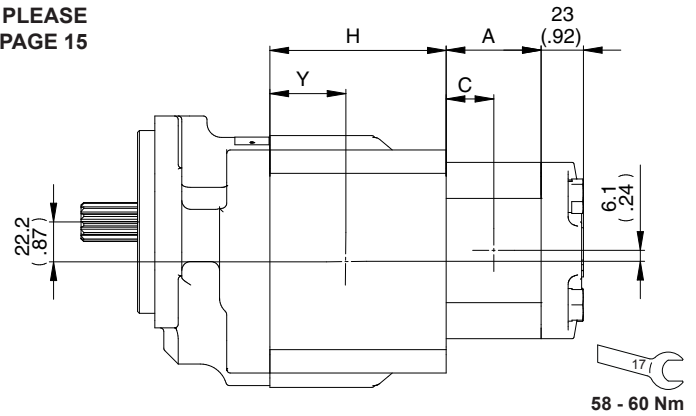


THE 2PE CAN BE ALSO MULTIPLE

Release with flange S3 and shaft 56



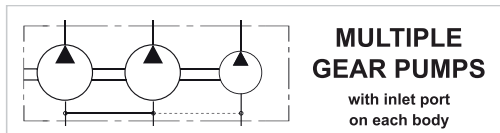
THE 2PE CAN BE ALSO MULTIPLE FOR THE COMMON INLET, PLEASE REFER TO THE TABLE OF PAGE 15



- PORT TYPES AND SIZES ON PAGE 9 - 10
- COMMON SUCTION PORT SIZE ON PAGE 15
- DIMENSION Y SEE PAGES 13-14
- DIMENSION H SEE PAGES 13-14 + 4 mm (0.16 in)
- DIMENSIONS A AND C, SEE TABLE BELOW

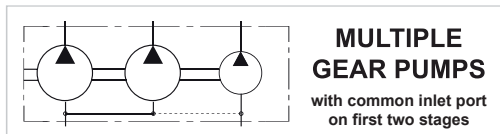
Type		3.2*	3.9*	4.5	6.5	8.3	10.5	11.3	12.5	13.8	16	19	22.5	26
Displacement	cm ³ /rev	3.2	3.9	4.6	6.5	8.2	10.6	11.5	12.7	13.8	16.6	19.4	22.9	25.8
	cu.in./rev	0.19	0.24	0.27	0.40	0.50	0.65	0.68	0.77	0.84	1.01	1.15	1.37	1.58
Dimension A	mm		47.1		49.95	52.8	56.3		59.6	63.5	67.5	75.6	81	86.8
	in		1.83		1.97	2.07	2.22		2.35	2.5	2.65	2.97	3.19	3.42
Dimension C	mm		23.55		25	26.4	28.15		29.8	31.75	33.75	37.80	40.5	43.4
	in		0.93		0.98	1.04	1.11		1.17	1.25	1.33	1.49	1.59	1.71

PG330 double pump with 2PE

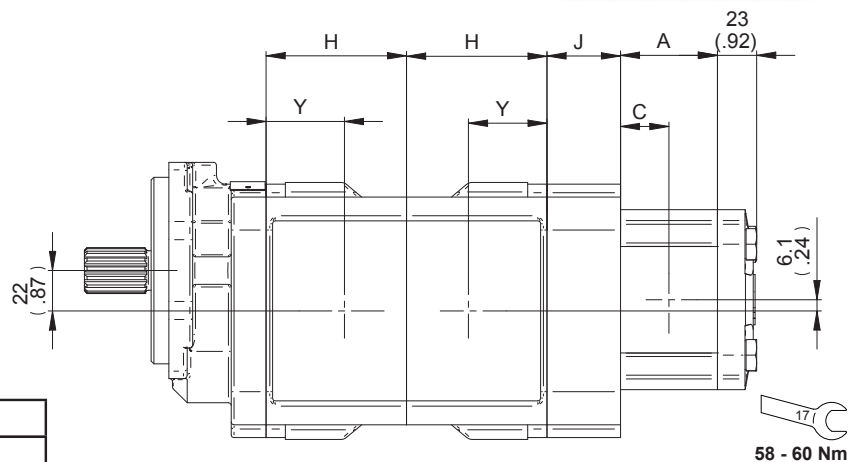


THE 2PE CAN BE ALSO MULTIPLE

Release with flange S3 and shaft 56



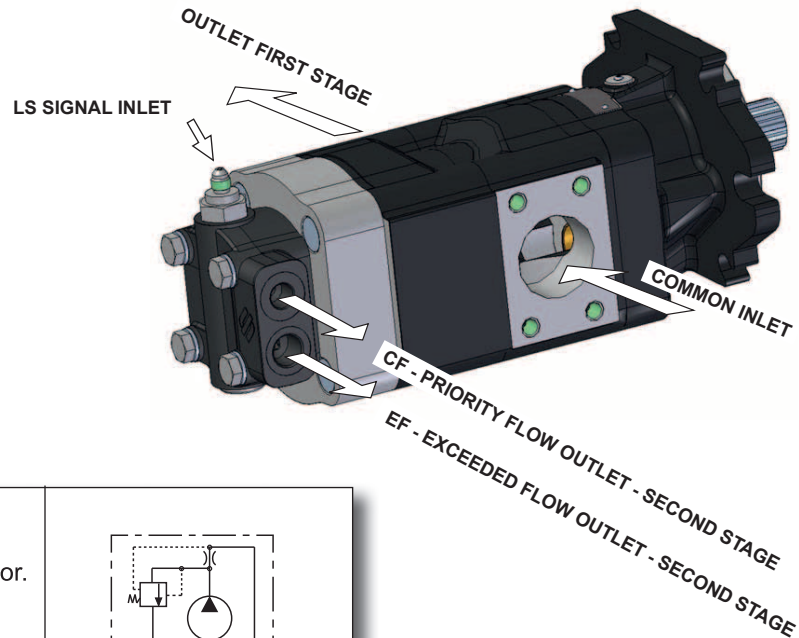
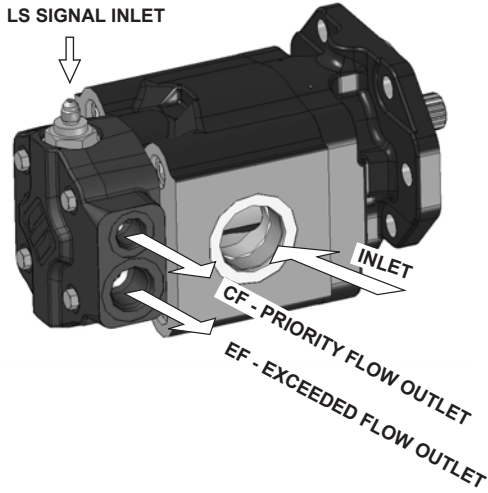
THE 2PE CAN BE ALSO MULTIPLE FOR THE COMMON INLET, PLEASE REFER TO THE TABLE OF PAGE 15



- PORT TYPES AND SIZES ON PAGE 9 - 10
- COMMON SUCTION PORT SIZE ON PAGE 15
- DIMENSION Y SEE PAGES 13-14
- DIMENSION J = 46.5 mm (1.83 in)
- DIMENSIONS A AND C, SEE TABLE ABOVE

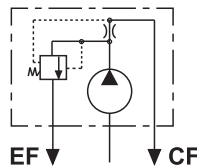


AVAILABLE CONFIGURATIONS WITH PRIORITY FLOW VALVE



code VP1

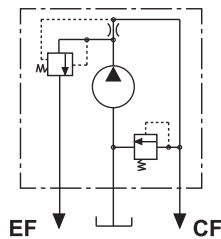
Priority flow valve, excess flow to second actuator.



CF = Priority flow port
EF = Excess flow port

code VPS1

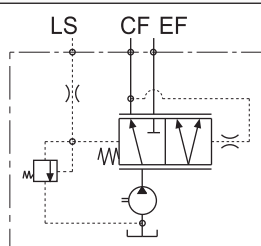
Priority flow valve, excess flow to second actuator with pressure relief valve on priority flow line.



CF = Priority flow port
EF = Excess flow port

code VPL1

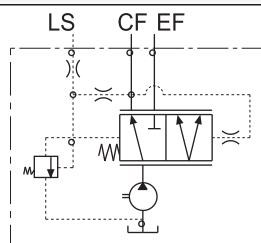
Load sensing priority valve with main relief valve



CF = Priority flow port
EF = Excess flow port
LS = Load sensing signal port

code VDP1

Load sensing priority valve with dynamic signal and main relief valve

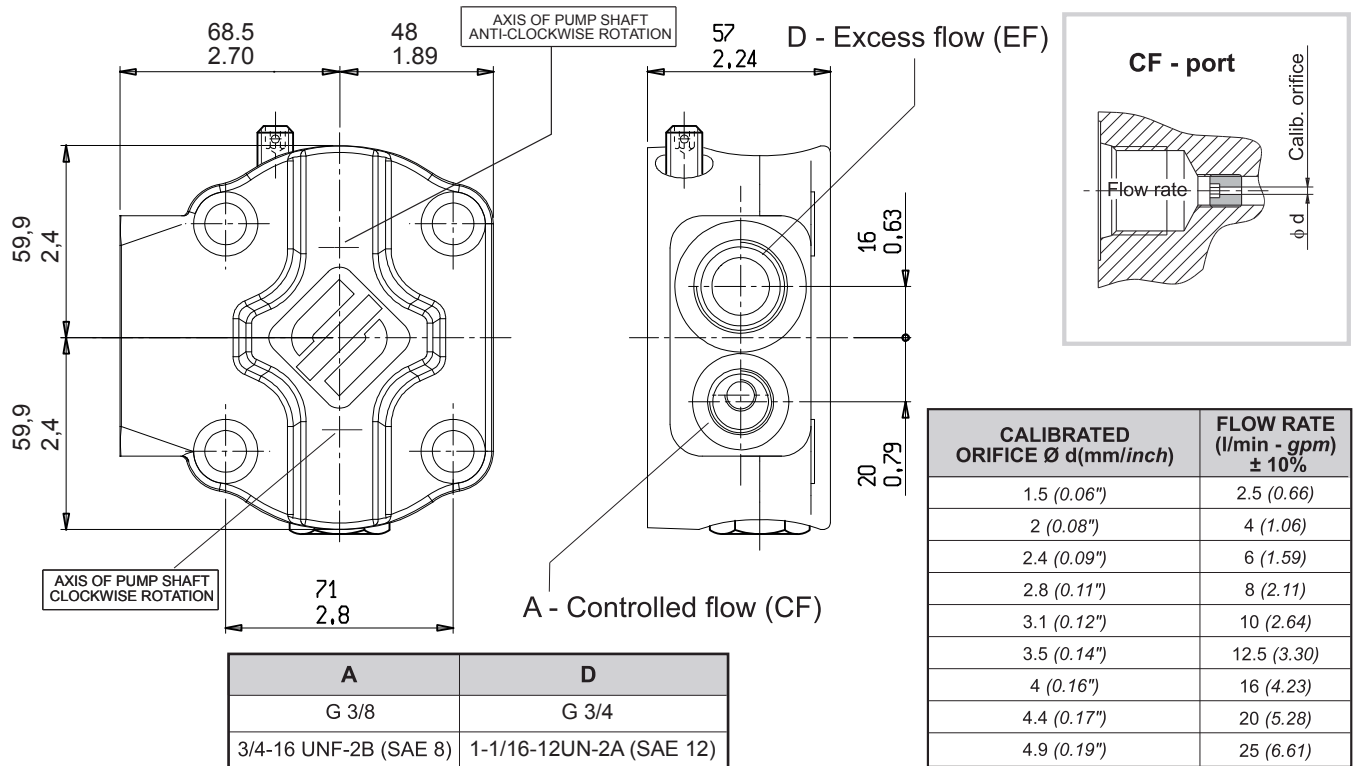


CF = Priority flow port
EF = Excess flow port
LS = Load sensing signal port

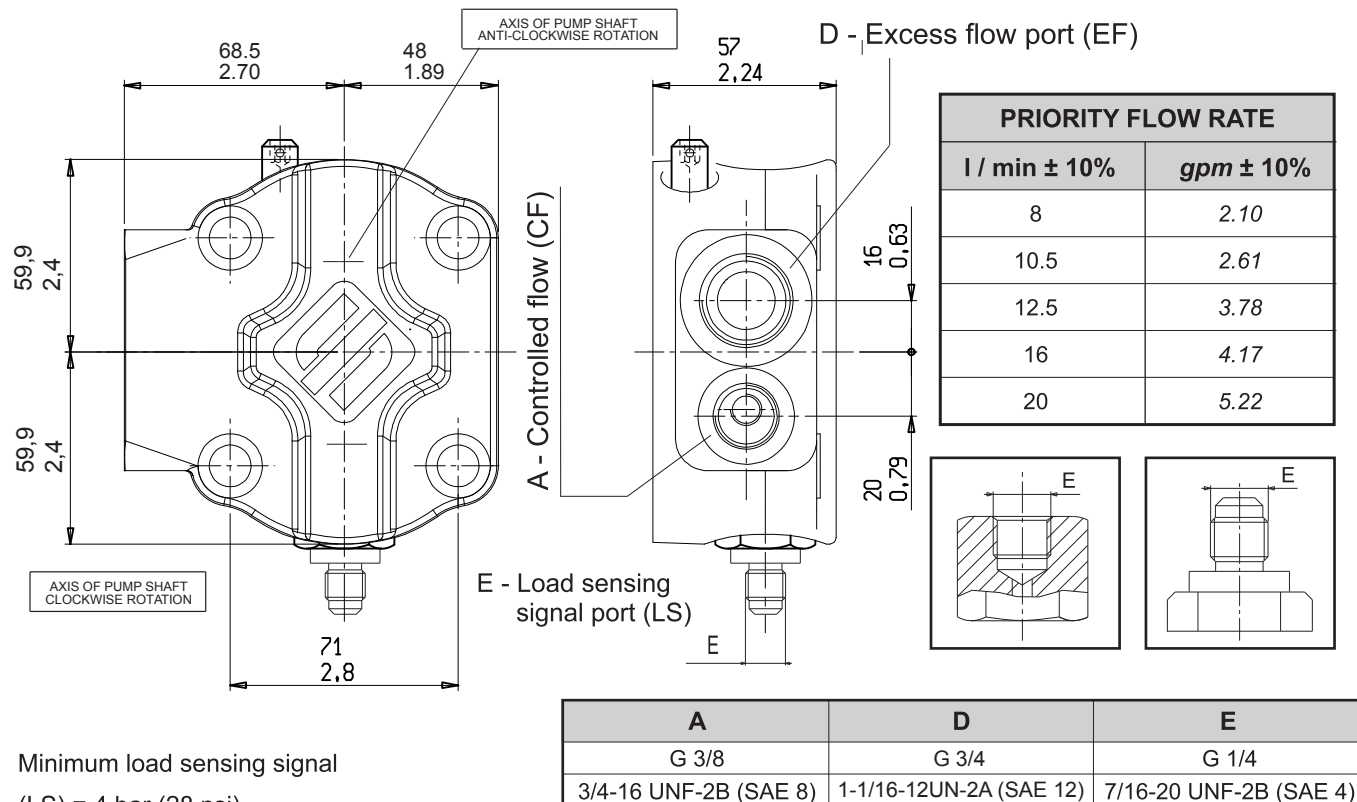
The double or triple pumps can be configured with priority flow valve too.
The stage which has its flow divided into priority and exceeded flows is always the back one.



VP1 - VPS1 (FEATURES)



VPL1 - VPD1 (FEATURES)



Minimum load sensing signal (LS) = 4 bar (28 psi)

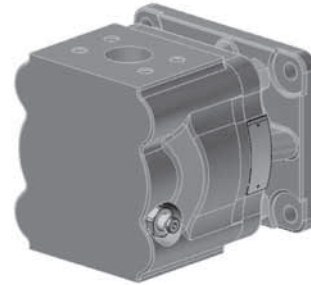
Side ports also available. Please specify with note.



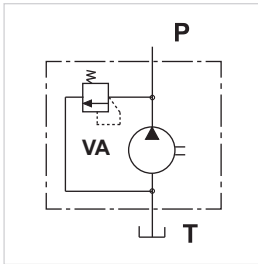
RELEASE WITH RELIEF VALVE INTEGRATED INTO THE BODY

By now, this release is available just for uni-directional pumps and motors.

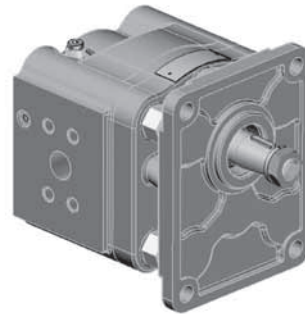
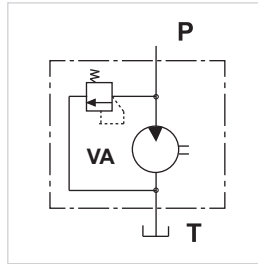
VA	Available setting ranges
Yellow spring	20 - 70 bar (290 - 1000 psi)
Blue spring	71 - 130 bar (1000 - 1900 psi)
Green spring	131 - 205 bar (1900 - 3000 psi)
Red spring	206 - 300 bar (3000 - 4400 psi)



PUMPS



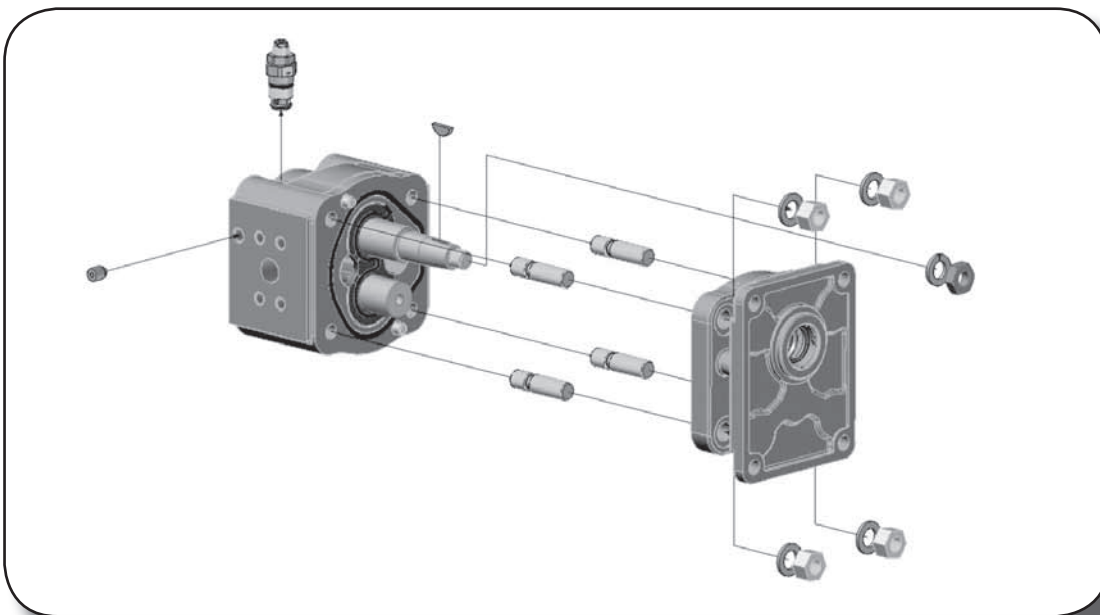
MOTORS



As you can see, from these pictures, this is a special assembly.

In fact, to be able to place the valve into the body, we have avoided to drill the body for the standard screws.

In this assembly, the pump is closed by the way of 4 studs and their nuts.

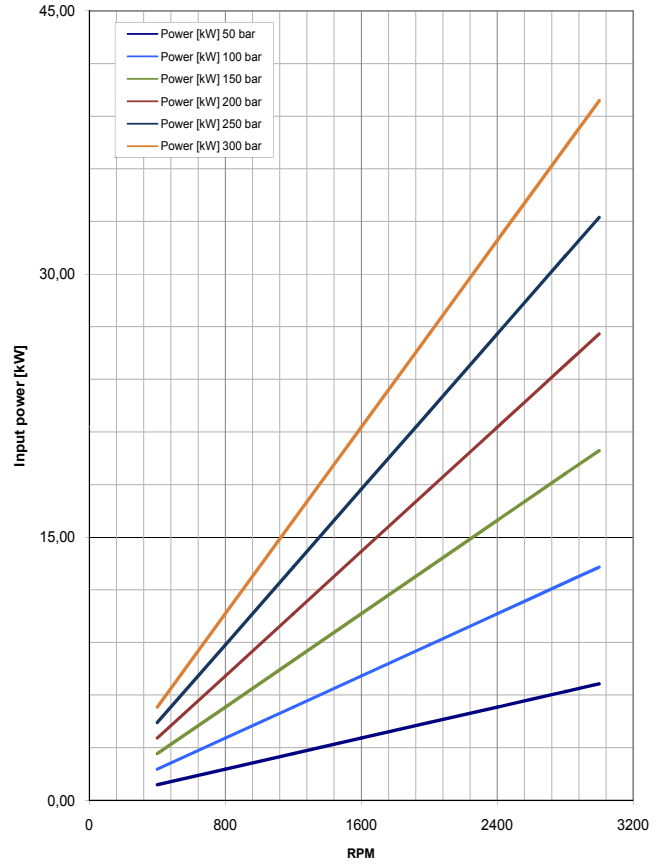
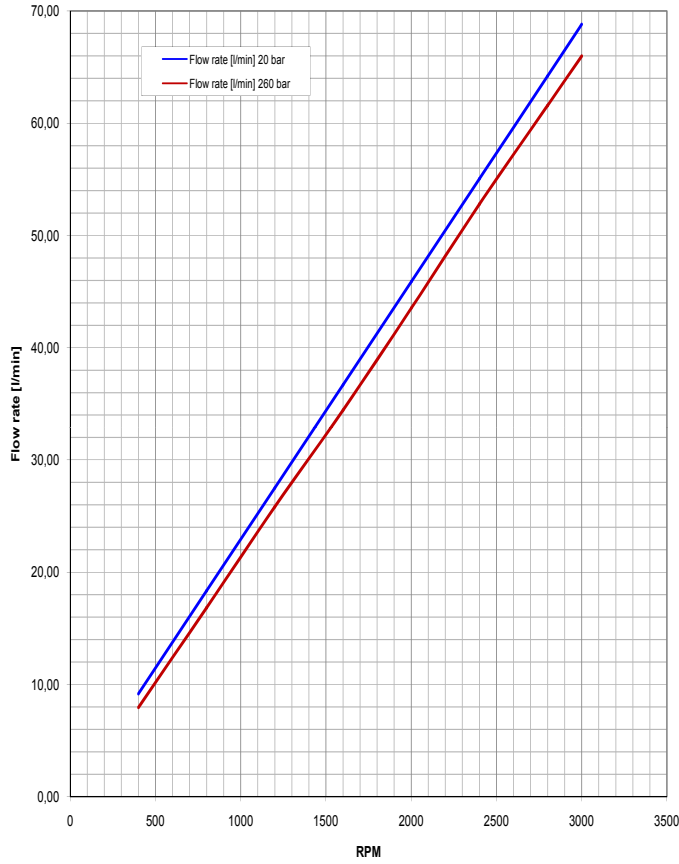


GEAR PUMPS "PG" SERIES

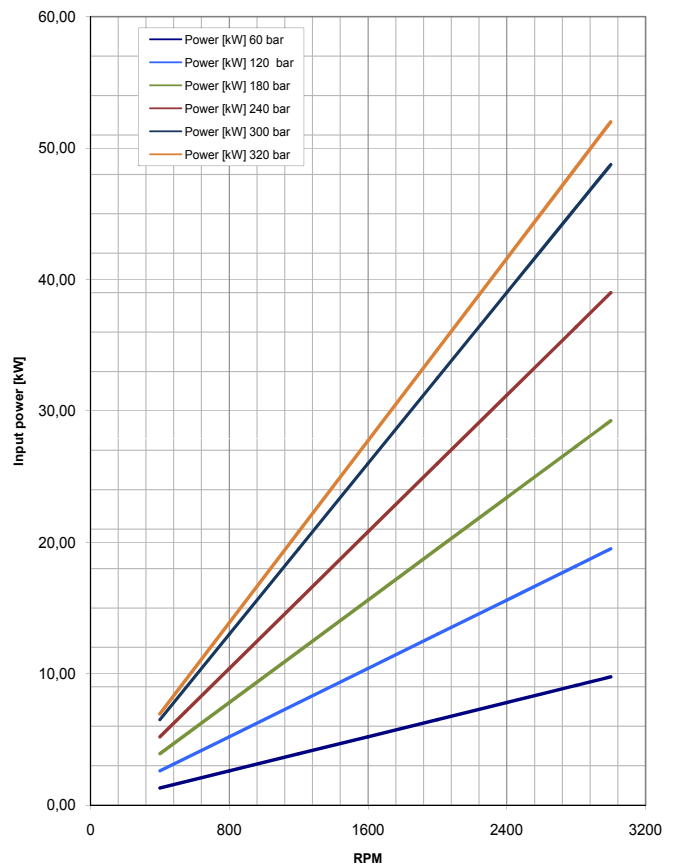
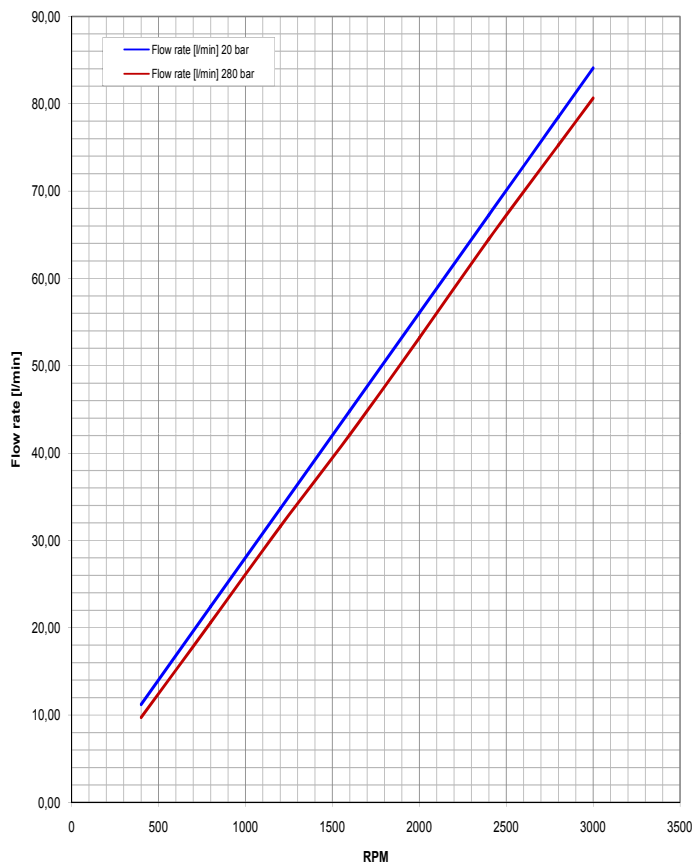
PG330

Performance curves carried out with oil viscosity at 21 cSt and oil temperature at 50°C
 The performance of these diagrams are approximate. In case you need approved values, please get in touch with our technical dept.

PG330 - 23



PG330 - 28

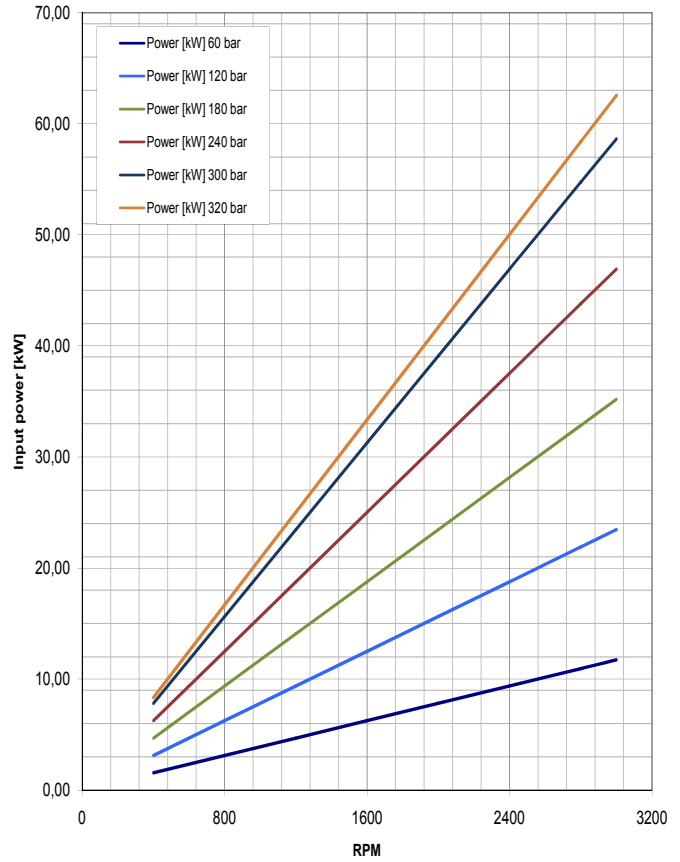
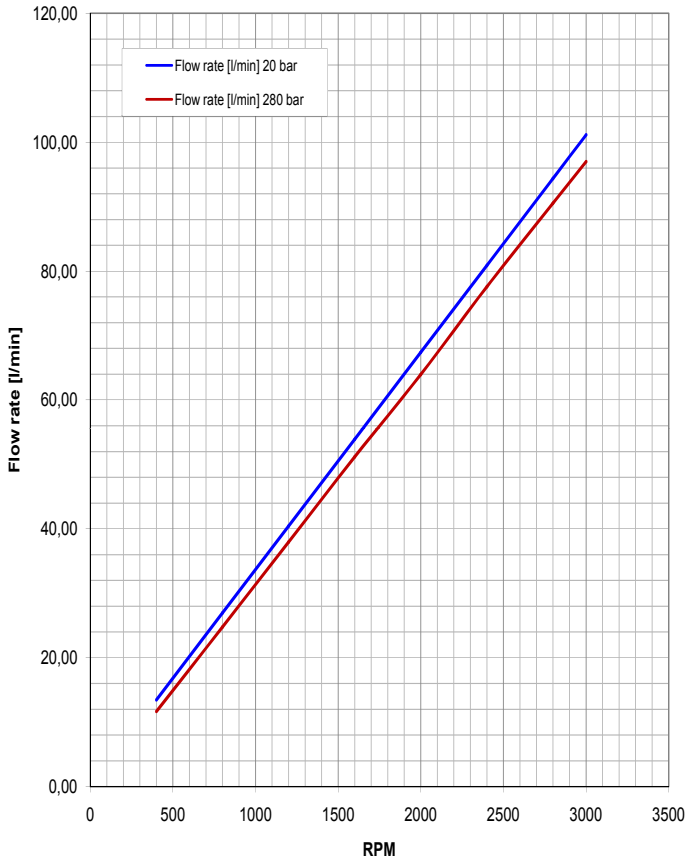


Performance curves carried out with oil viscosity at 21 cSt and oil temperature at 50°C

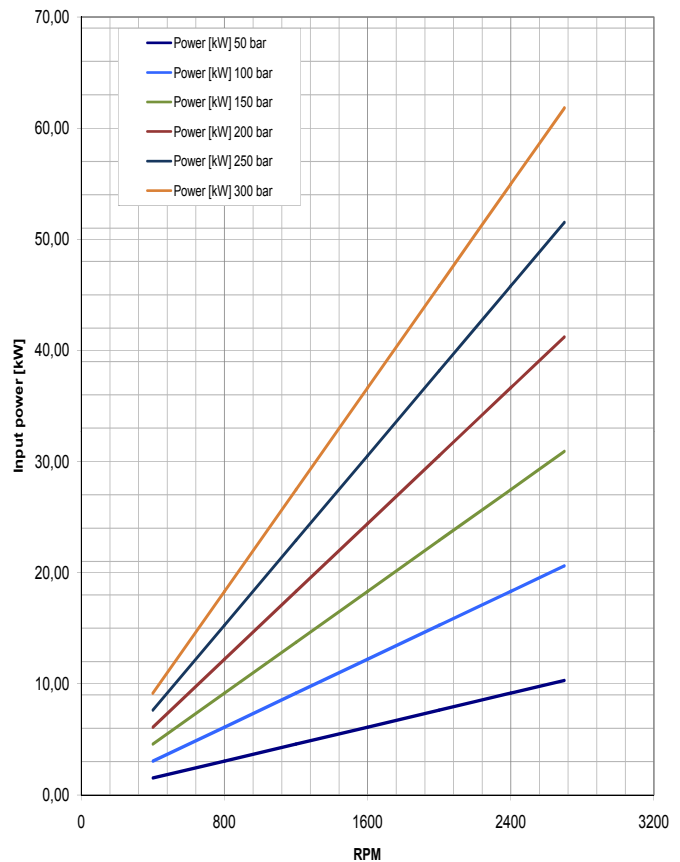
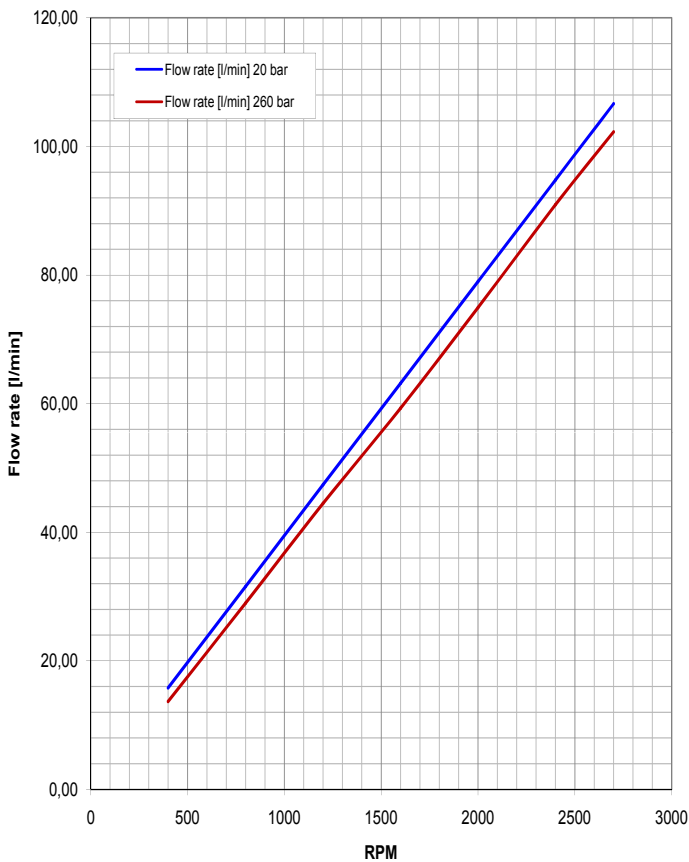
The performance of these diagrams are approximate. In case you need approved values, please get in touch with our technical dept.

E0.151.0113.02.00/IM00

PG330 - 34



PG330 - 40



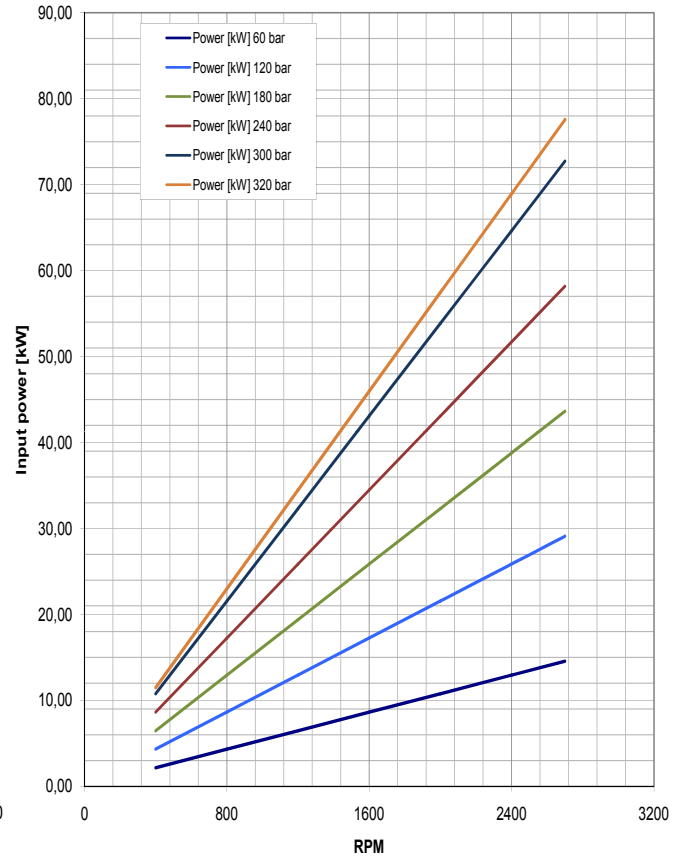
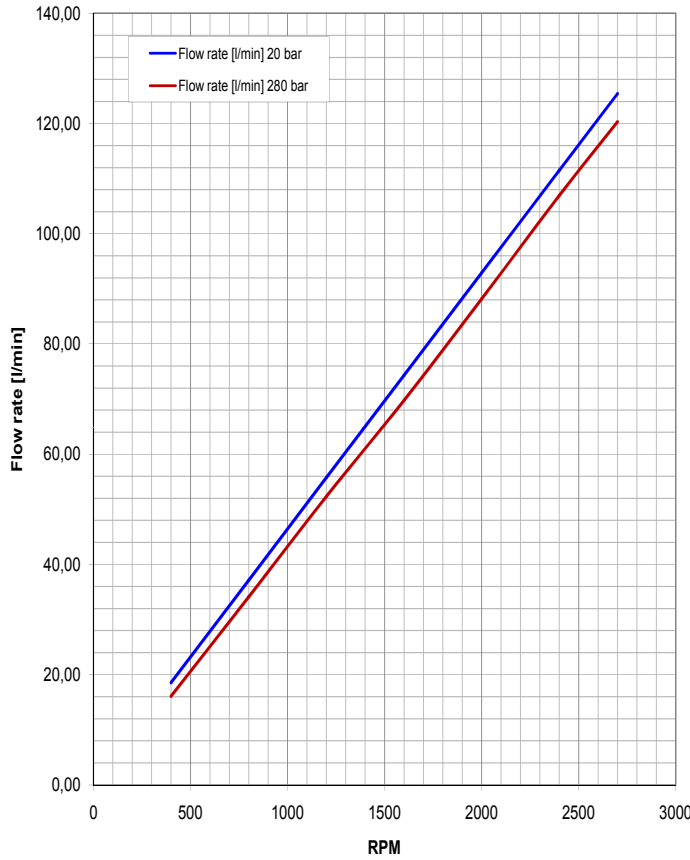
GEAR PUMPS "PG" SERIES

PG330

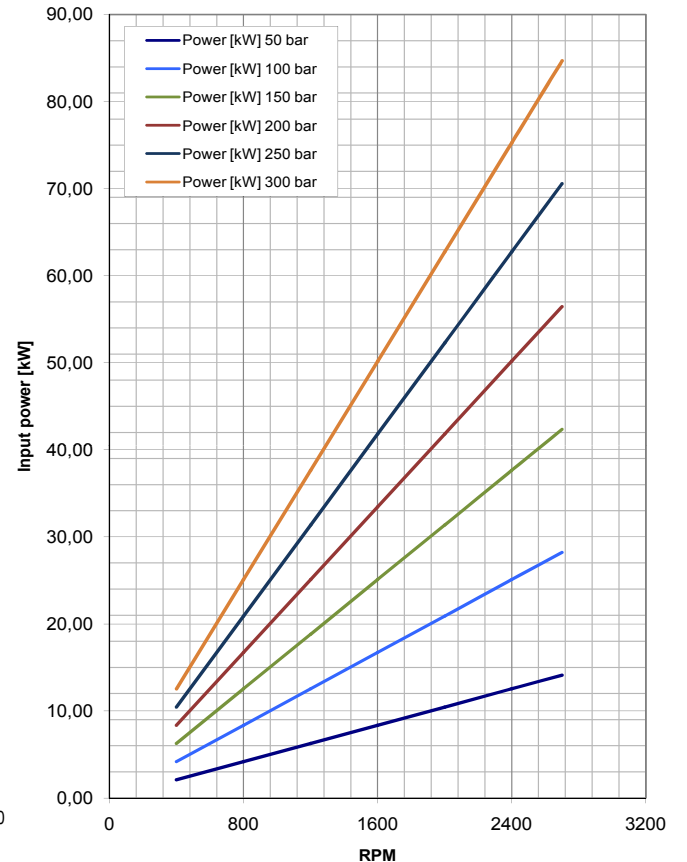
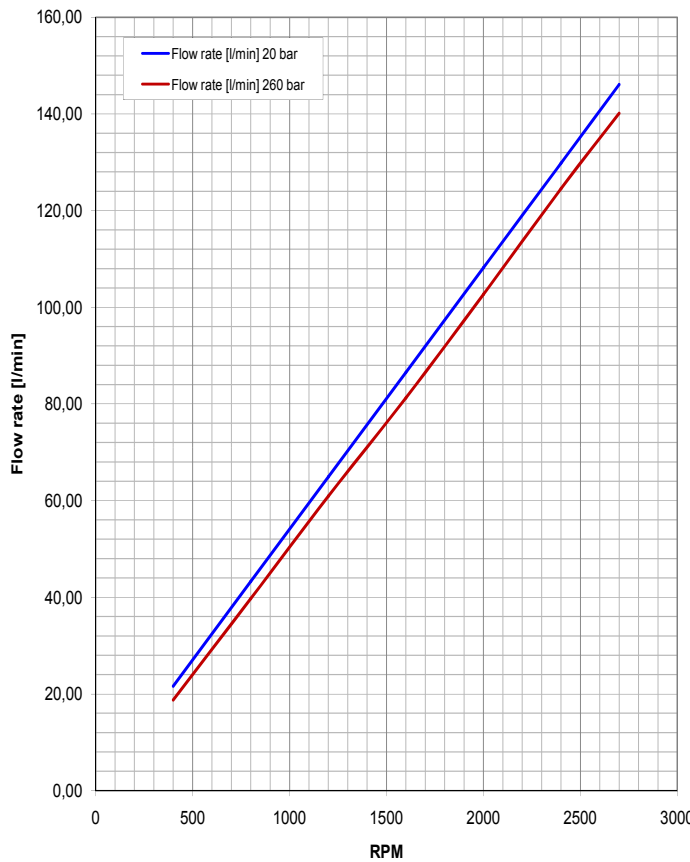
Performance curves carried out with oil viscosity at 21 cSt and oil temperature at 50°C

The performance of these diagrams are approximate. In case you need approved values, please get in touch with our technical dept.

PG330 - 47



PG330 - 55



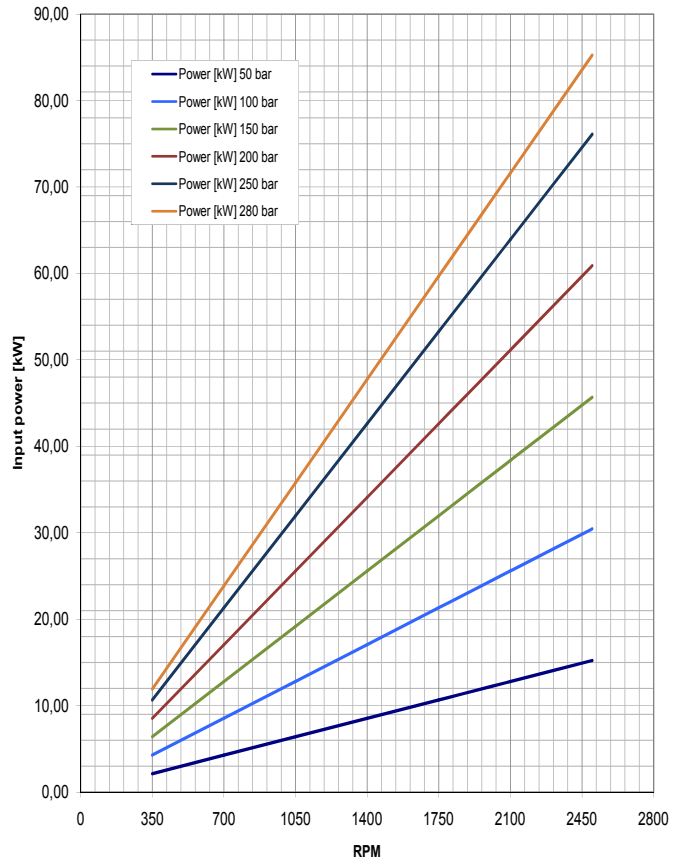
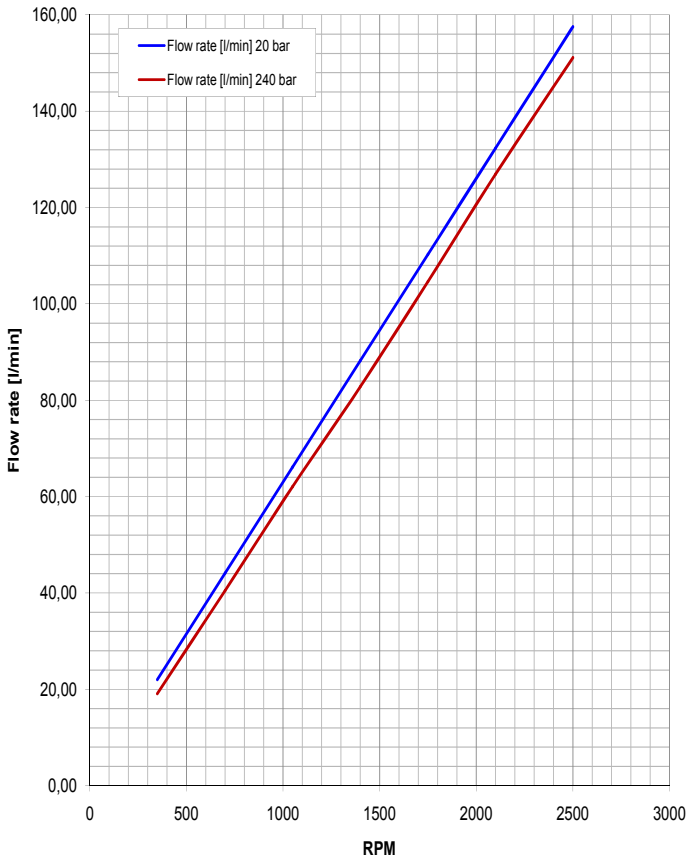
PG330

GEAR PUMPS "PG" SERIES

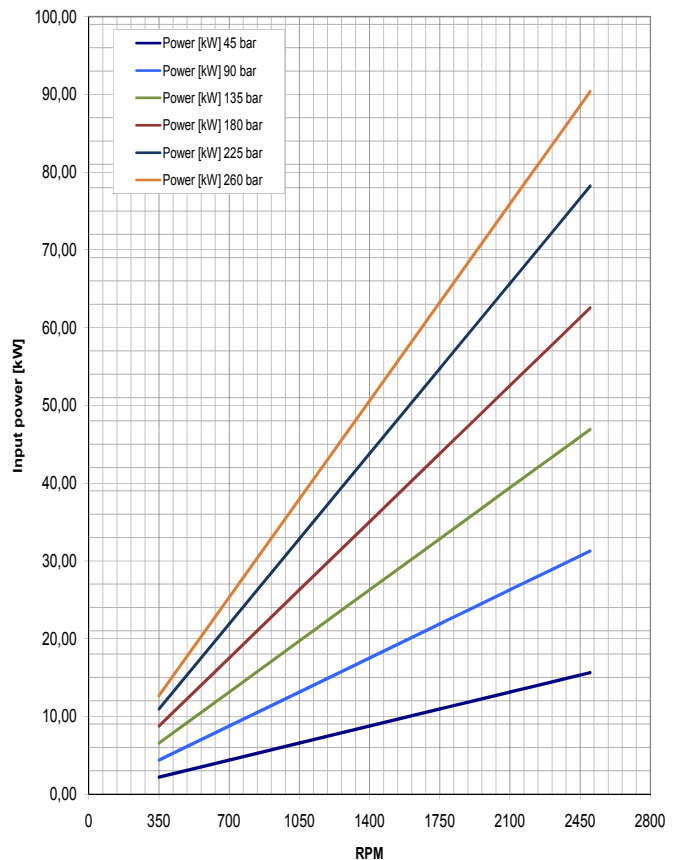
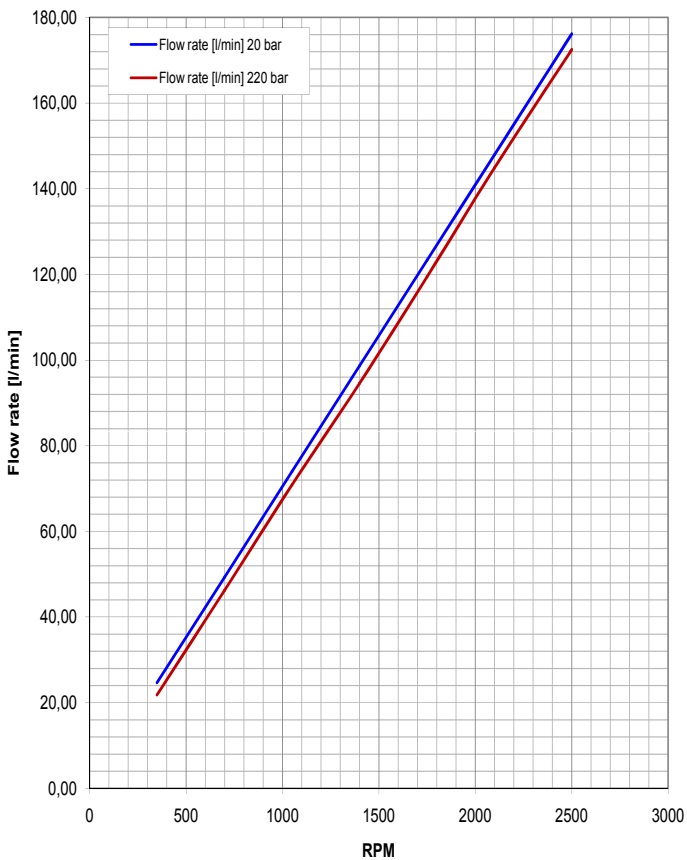
Performance curves carried out with oil viscosity at 21 cSt and oil temperature at 50°C
 The performance of these diagrams are approximate. In case you need approved values, please get in touch with our technical dept.

E0.151.0113.02.00/IM00

PG330 - 64



PG330 - 72

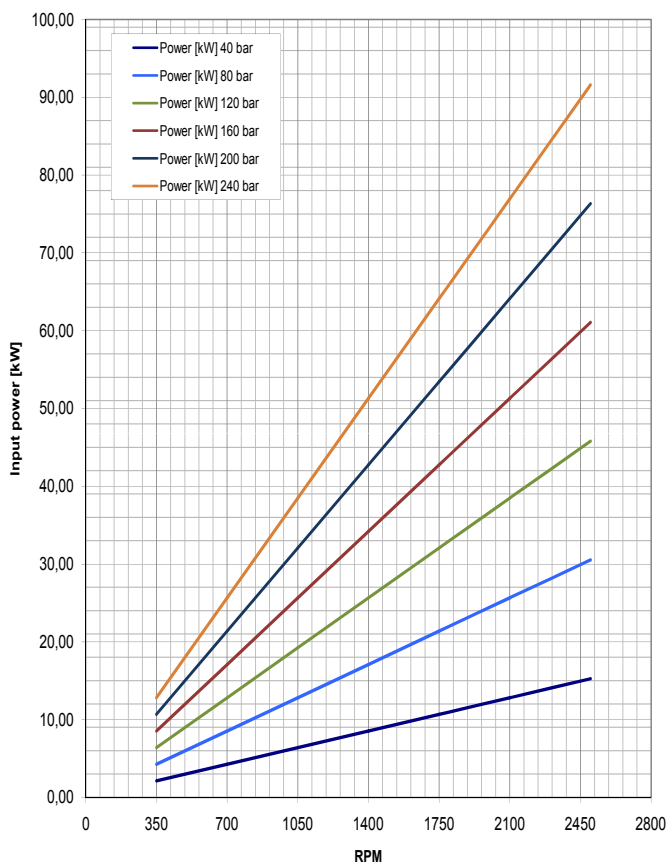
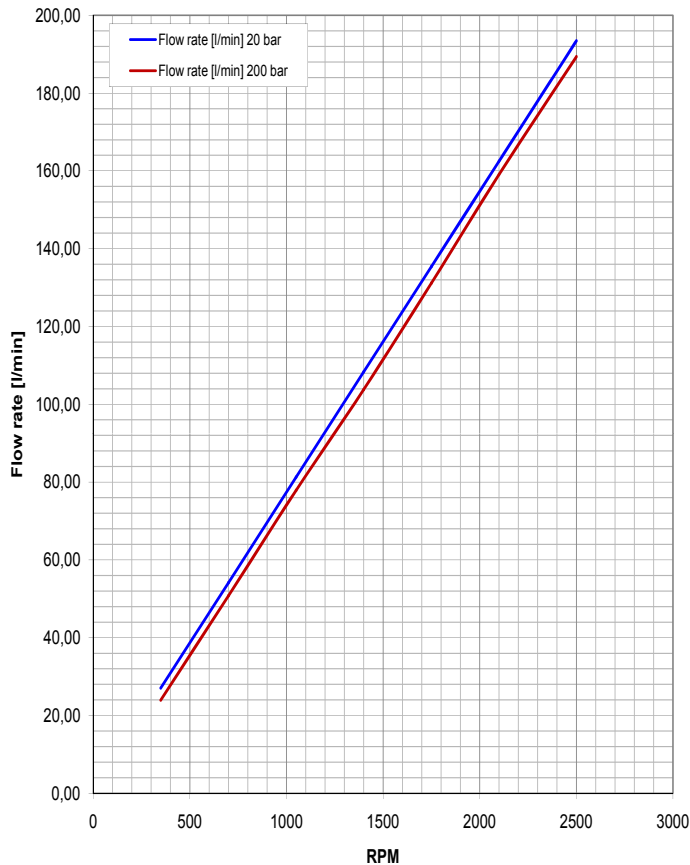


GEAR PUMPS "PG" SERIES

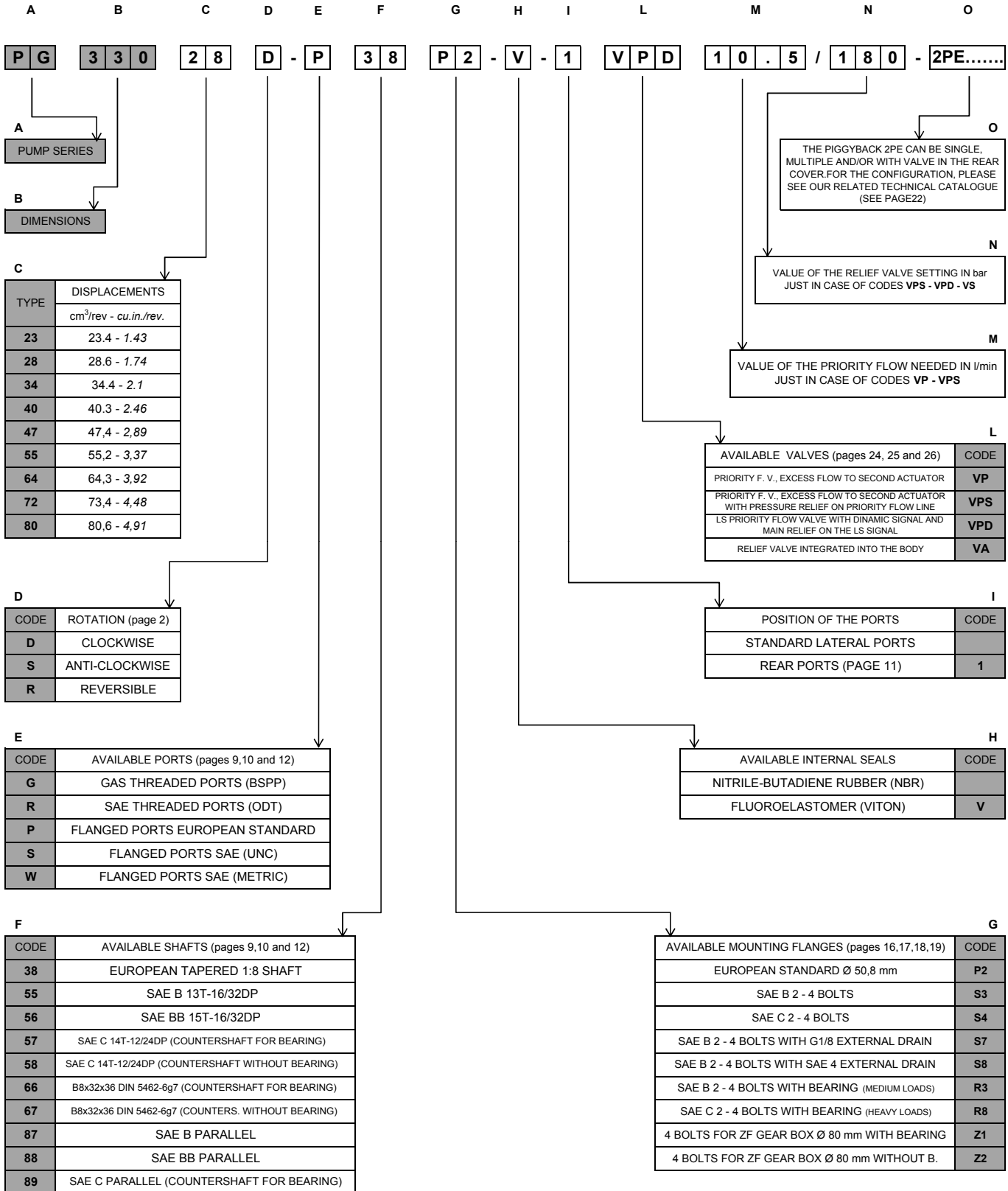
PG330

Performance curves carried out with oil viscosity at 21 cSt and oil temperature at 50°C
 The performance of these diagrams are approximate. In case you need approved values, please get in touch with our technical dept.

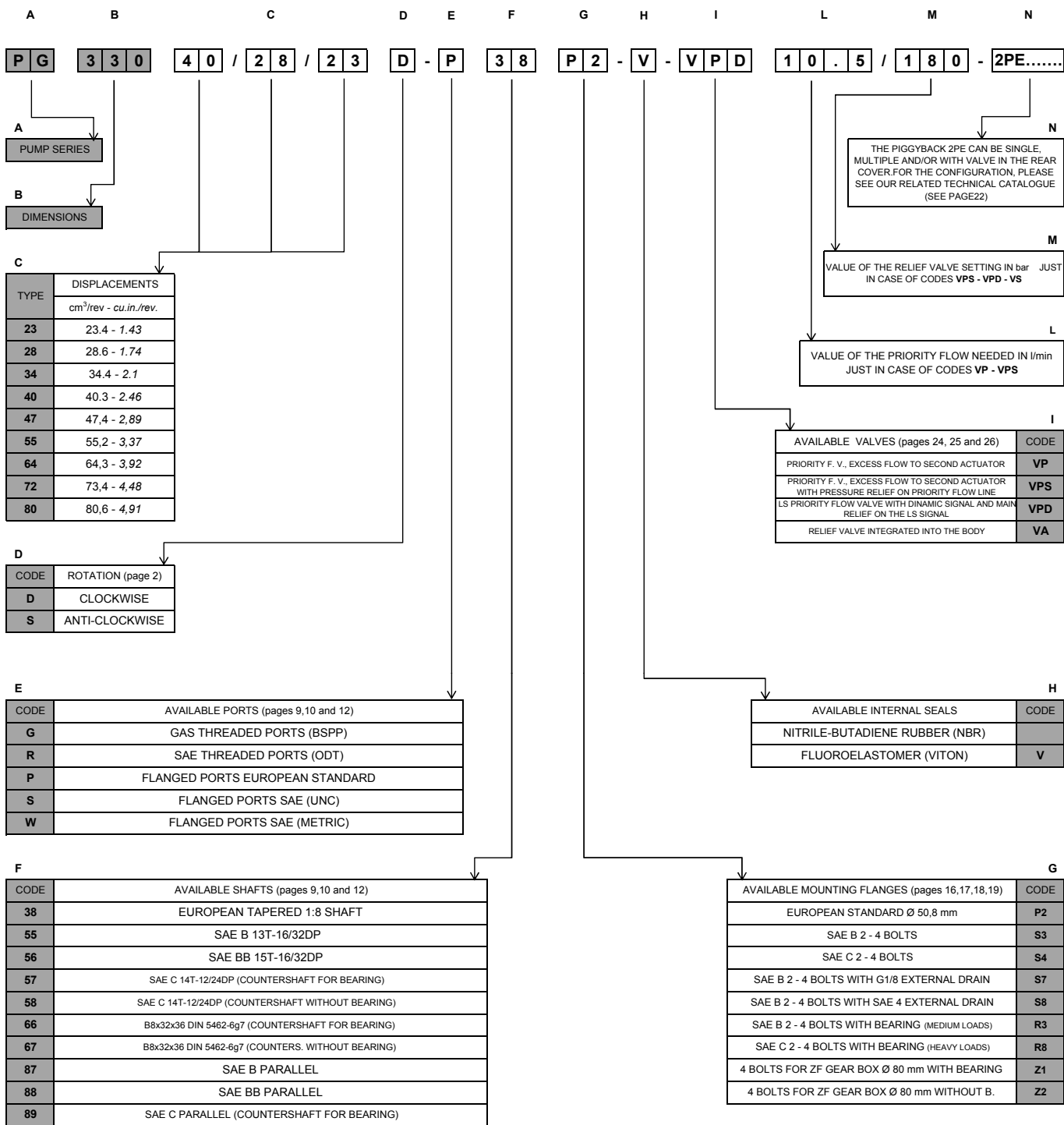
PG330 - 80



HOW TO ORDER PG330 SINGLE PUMP



HOW TO ORDER PG330 DOUBLE OR TRIPLE PUMP



HOW TO ORDER MG330 MOTOR

