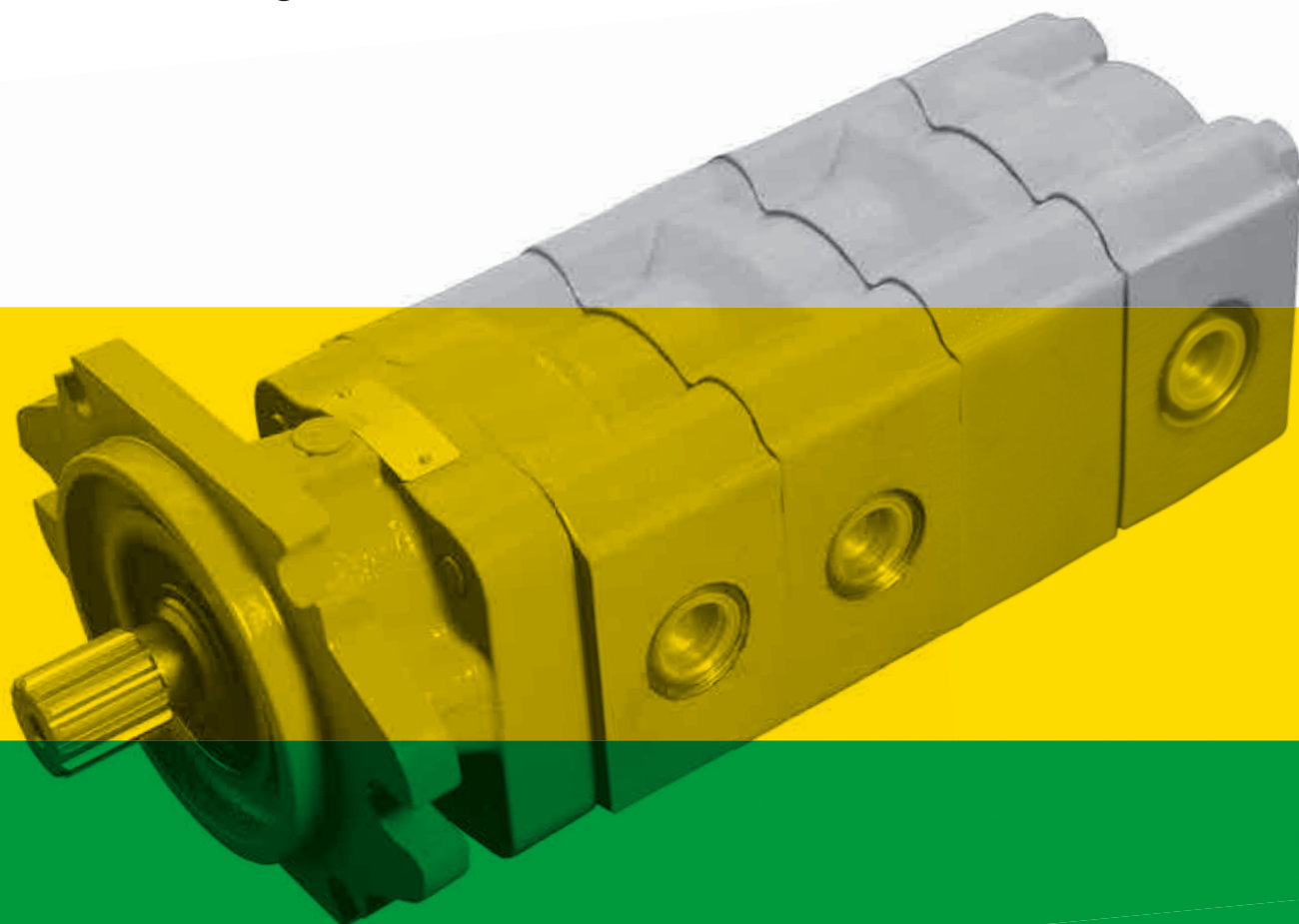


PG330 - MG330

Cast Iron Gear Pumps and Motors

Technical Catalogue

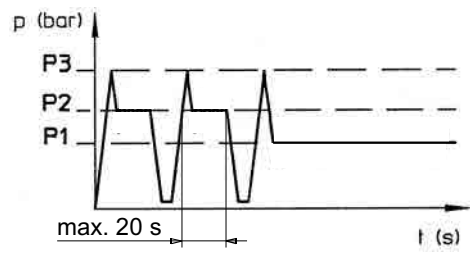
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Company
with quality system
certified by DNV
UNI EN ISO 9001/2008



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)	0.75 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 (0.75 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.

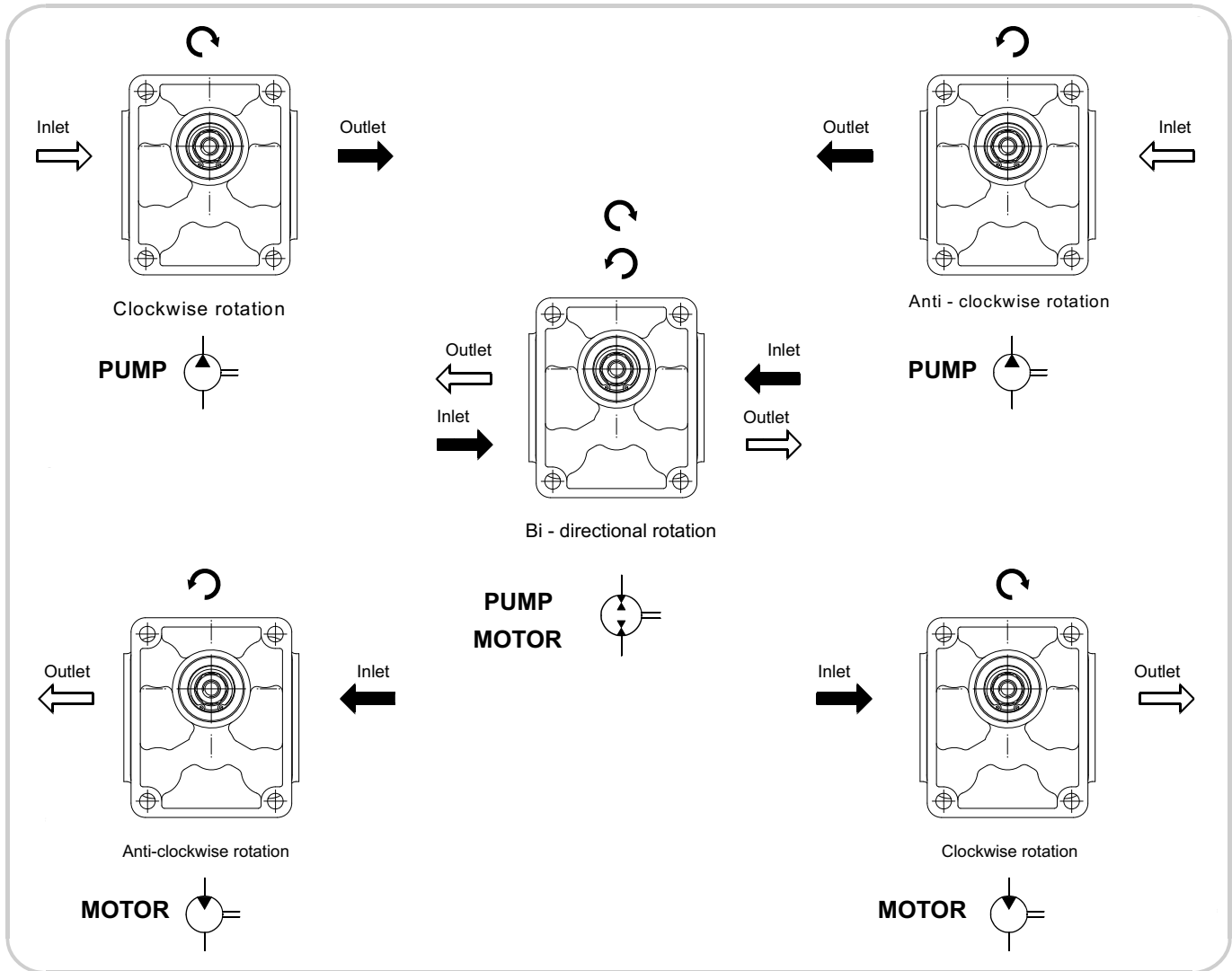
1 - With reduction 80% of working pressure and at minimum speed.
 Suggestion:
 to have the best behaviour and duty life of the pump/motor, use a cooling system in order to keep the fluid temperature at 60°C and viscosity at 20 cSt. In addition to the recommended filtration index of page 3.



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

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

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

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

LEGENDA

Δp = Working pressure (bar)

q = Displacement (cm³/rev)

n = Speed (min⁻¹)

η_m = Mechanical eff. (0.92)

η_v = Volumetric eff. (0.95)

COMMON FORMULAS FOR MOTORS

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

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

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

V = Displacement cm³/rev [in³/rev]
 P_{out} = Outlet pressure bar [psi]
 P_{in} = Inlet pressure bar [psi]
 ΔP = $P_{out} - P_{in}$ (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

A			
B			
C		D	
sa am		E	F

A = Product short description (ex. PG330-34D-R55S3).

B = Customer part number (In case it is required).

C = Salami part number (ex. 615100032).

D = Production code (ex. 1304234)

E = Production date (see data sheet here below)

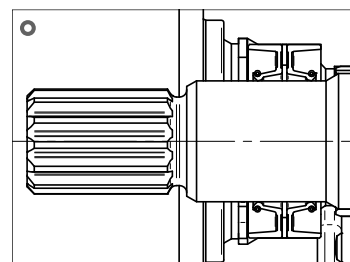
F = Progressive number of assembly.

CONSTRUCTION	2013	2014	2015	2016	2017	2018	2019	2020
JANUARY	13M	14M	15M	16M	17M	18M	19M	20M
FEBRUARY	13N	14N	15N	16N	17N	18N	19N	20N
MARCH	13P	14P	15P	16P	17P	18P	19P	20P
APRIL	13Q	14Q	15Q	16Q	17Q	18Q	19Q	20Q
MAY	13R	14R	15R	16R	17R	18R	19R	20R
JUNE	13S	14S	15S	16S	17S	18S	19S	20S
JULY	13T	14T	15T	16T	17T	18T	19T	20T
AUGUST	13U	14U	15U	16U	17U	18U	19U	20U
SEPTEMBER	13V	14V	15V	16V	17V	18V	19V	20V
OCTOBER	13Z	14Z	15Z	16Z	17Z	18Z	19Z	20Z
NOVEMBER	13X	14X	15X	16X	17X	18X	19X	20X
DECEMBER	13Y	14Y	15Y	16Y	17Y	18Y	19Y	20Y

SHAFT SEALS DESIGN, PRESSURE AND MATERIAL AVAILABLE

Only regarding the assemblies as pump (for motor assembly, please see page 8).

Max. pressure	3 bar (44 psi)
Material BUNA (NBR)	-15° C - 85° C
Material VITON (FPM)	-20° C - 110° C



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

PG330 - MG330

ROTATION CHANGE INSTRUCTION

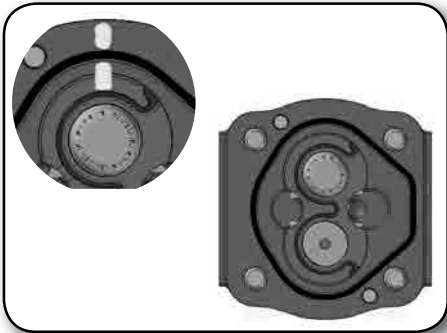


Step 1:
unscrew and take off the 4 assembling bolts.

ANTI-CLOCKWISE



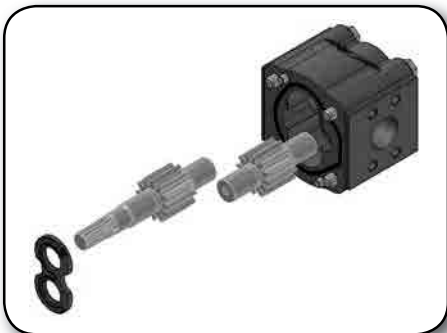
Step 2:
take off the front flange, complete of shaft seals.



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.



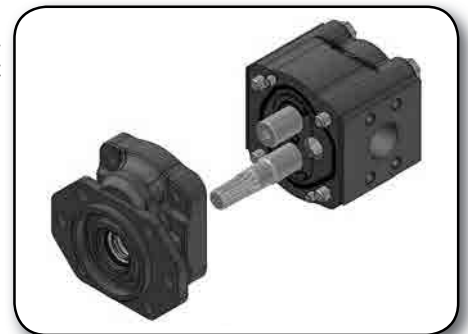
Step 5:
take off both the shafts, drive and driven.



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.

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

Step 9:
re-place and screw the bolts with the torque of 170-180Nm.

CLOCKWISE



Release with flange S3 and shaft 56



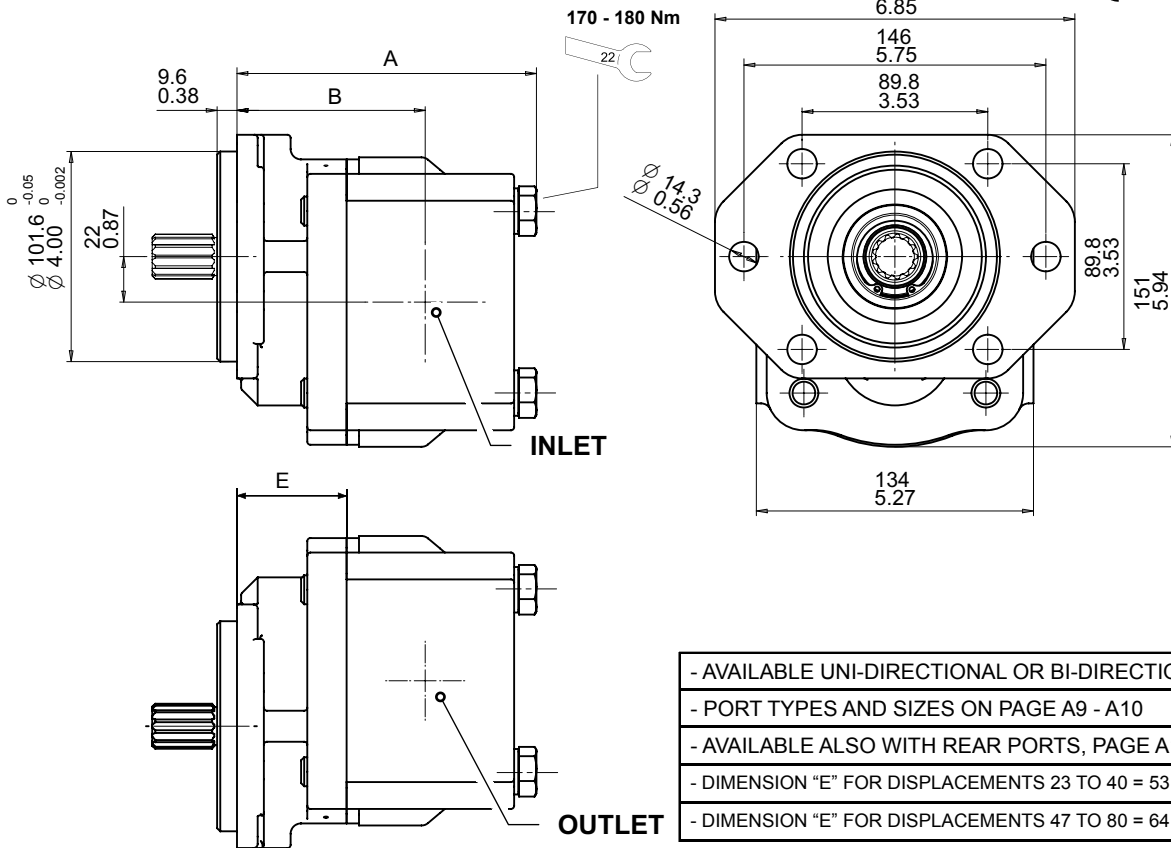
ASSEMBLING DIMENSIONS AND VALUES OF PRESSURE AND SPEED

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.



- AVAILABLE UNI-DIRECTIONAL OR BI-DIRECTIONAL
- PORT TYPES AND SIZES ON PAGE A9 - A10
- AVAILABLE ALSO WITH REAR PORTS, PAGE A11 - A12
- DIMENSION "E" FOR DISPLACEMENTS 23 TO 40 = 53 mm
- DIMENSION "E" FOR DISPLACEMENTS 47 TO 80 = 64 mm



The data has been modified on 02/2014

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

PG330 - MG330



GEAR PUMPS AND MOTORS

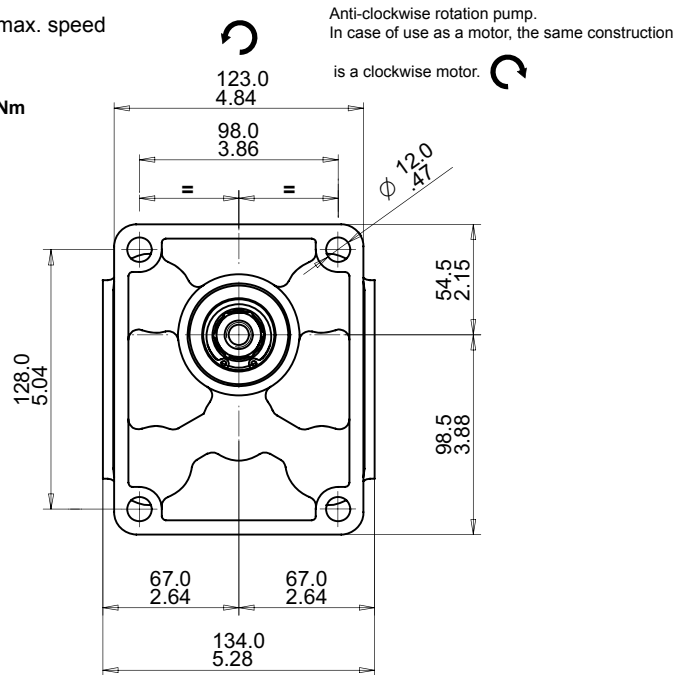
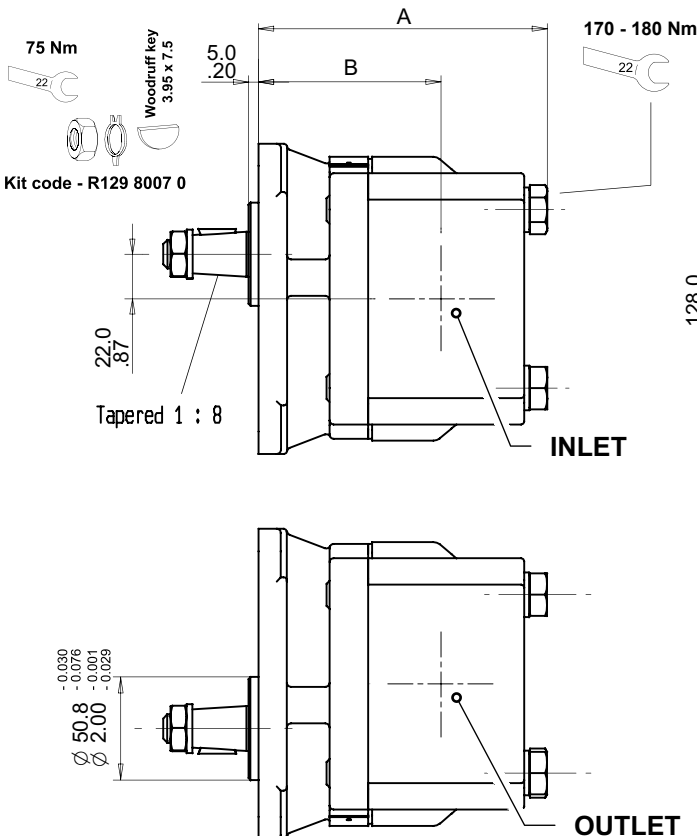
Release with flange P2 and shaft 38

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	230	200	170
	psi	3800	4000	4000	3800	4000	3335	2900	2465
Intermittent pressure P2	bar	280	300	300	280	300	250	220	190
	psi	4000	4350	4350	4000	4350	3625	3190	2755
Peak pressure P3	bar	300	320	320	300	320	270	240	210
	psi	4350	4650	4650	4350	4650	3915	3480	3045
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

This configuration, with shaft 38, has a max torque of 250 Nm. For this reason, on the displacements 55 - 64 - 72, the values of pressure have been reduced compared with configurations with other shafts.

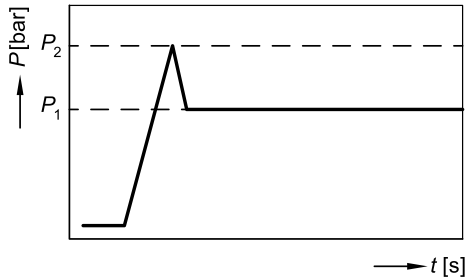
Performance carried out with oil viscosity at 16 cSt and oil temperature at 60°C.
*For working conditions, using exclusively pressure P1, the value of max. speed must be reduced of 10%.



- AVAILABLE UNI-DIRECTIONAL OR BI-DIRECTIONAL
- PORT TYPES AND SIZES ON PAGE A9 - A10
- AVAILABLE ALSO WITH REAR PORTS, PAGE A11 - A12



DEFINITION OF PRESSURES



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).

P_1 max. continuous pressure

WORKING CONDITIONS

MG330		34	40	47	55	64	72
Type							
Displacements	cm ³ /rev	34.4	40.3	47.4	55.2	64.3	73.4
	cu.in./rev	2.1	2.46	2.89	3.37	3.92	4.48
Max. continuous pressure P_1	bar	240	220	240	220	200	
	psi	3480	3190	3480	3190	2900	
Max. starting pressure P_2	bar	300	280		260		
	psi	4350	4060		3770		
Max. speed at P_2	rpm	3000		2700		2500	
Min. speed at P_1	rpm	600		550		500	
Weight	kg	13.59	13.99	15.2	15.8	16.5	17.17
	lbs	29.96	30.84	33.51	34.83	36.37	37.85
Motor outlet pressure P_{out}	bar (psi)						
Leakage-oil line pressure P_{drain}							

TECHNICAL DATA

- Minimum operating fluid viscosity 12 mm² / sec
- Permitted viscosity range 12 - 800 mm² / sec
- Recommended viscosity range 20 - 80 mm² / sec
- Permitted viscosity for starting 2000 mm² / 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.

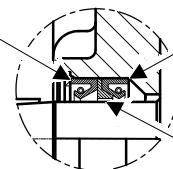
*) During the application of control systems or devices with critical counter-reaction, such as steering and brake valves, the type of filtration selected must be adapted to the sensitivity of these devices/systems. Safety requirements pertaining to the whole systems are to be observed. In the case of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

MOTOR ASSEMBLING FEATURES

Material BUNA (NBR)	-15° C - 85° C
Material VITON (FPM)	-20° C - 110° C

All our standard motors have a double shaft seal, the one which faces the inner of the motor is reinforced by a spacer with anti-extrusion lip.

Outer shaft seal



Inner shaft seal

Spacer with anti-extrusion lip

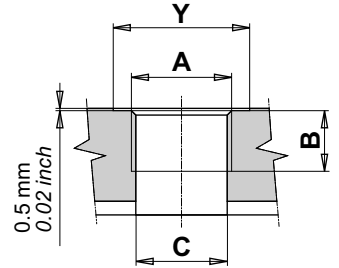


**GEAR PUMPS "PG" SERIES
GEAR MOTORS "MG" SERIES**

PG330 - MG330

THREADED 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 47 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")



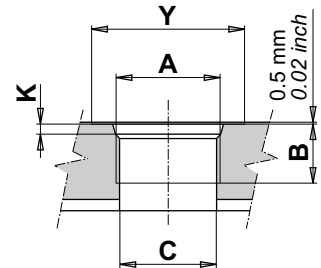
Type	INLET				OUTLET			
	A	B	C	Y	A	B	C	Y
	From 23 to 40	G3/4	16 (0.62")	24.4 (0.96")	36 (1.42")	G3/4	16 (0.62")	24.4 (0.96")
From 47 to 80	G1	22 (0.87")	30.5 (1.2")	44 (1.73")	G1	22 (0.87")	30.5 (1.2")	44 (1.73")

Type	INLET				OUTLET			
	A	B	C	Y	A	B	C	Y
	From 23 to 40	G1	22 (0.87")	30.5 (1.2")	44 (1.73")	G1	22 (0.87")	30.5 (1.2")
From 47 to 80	G1"1/4	24 (0.94")	37 (1.46")	54 (2.12")	G1"1/4	24 (0.94")	37 (1.46")	54 (2.12")

British standard pipe parallel (BSPP)

code G

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 23 to 40	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")
From 47 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")

Type	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")	1-5/16 12 UN	19 (0.74")	31 (1.22")	49 (1.93")
From 47 to 80	1-5/8 12 UN	19 (0.74")	38.9 (1.53")	58 (2.28")	3.3 (0.12")	1-5/8 12 UN	19 (0.74")	38.9 (1.53")	58 (2.28")	3.3 (0.12")

SAE threaded (ODT)

code R

