High Pressure Gear Pumps and Motors

Cast Iron Gear Housing

Technical/Spare Parts Catalogue

E0.100.0725.02.01IM03

COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV ISO 9001

TÜV Thüringen Italia Certificate
TÜV Thüringen Italia
ISO 14001:2015
04-IT-SAL-200033
TTIC

salami
FLUID POWER SYSTEMS ®

Final revised edition - July 2025

The data in this catalogue refers to the standard product.The policy of Salami S.p.A. consists of a continuous improvement of its products. It reserves the right to change the specifications of the different products whenever necessary and without giving prior information.
If any doubts, please contact our sales department.

Contents

Symbol Designation

INFORMATION:
Indicates reminders and communications to be taken into account for the correct configuration and mounting of the product.

CAUTION:
Indicates the recommendations and rules, to be observed before proceeding with the product's configuration.

REVIEW:
Indicates update or modify data.

High Pressure Gear Pumps

Cast Iron Gear Housing:
2PGE/PG330/PG331

Features

E0.100.0725.02.011M03

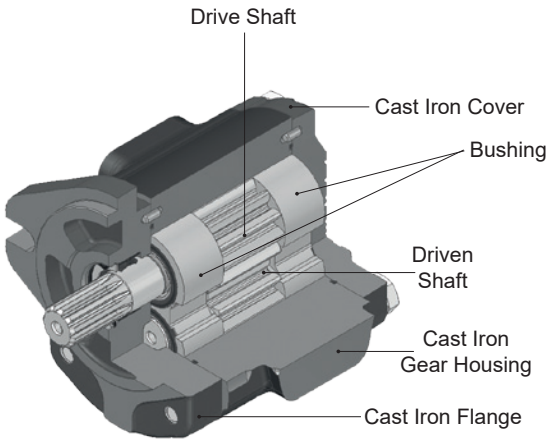
2PGE and PG330/331 Features

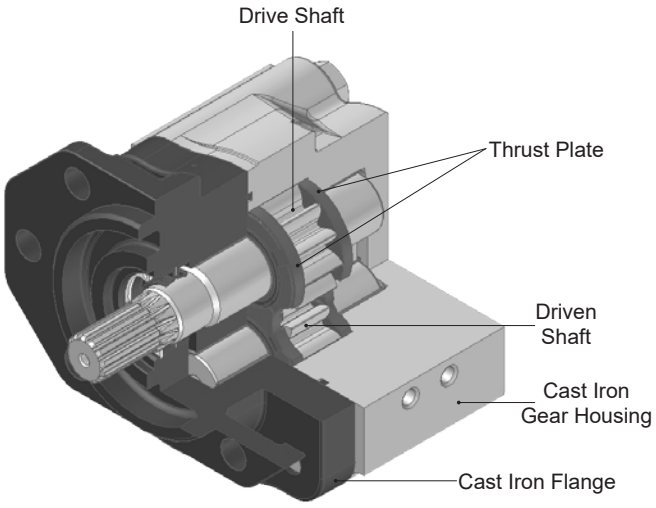
The PG330/PG331 and 2PGE Series Cast Iron Pumps has been specifically designed for high flow applications, demanding peak performance and long life in extreme operating conditions. PG330 optimized for high volume and for OEM's customers. Displacements available:

2PGE: 6.5 cm^3/rev to 28.1 cm^3/rev (from 0.40 cu.in/rev to 1.71 cu.in/rev)
PG330/PG331: 23.4 cm^3/rev to 80.6 cm^3/rev (from 1.43 cu.in/rev to 4.91 cu.in/rev)

Several options of shafts, flanges and ports as for European, German and American standards are available for all the pumps.

- High volumetric efficiency thanks to an innovative design and an accurate control of machining tolerances.
- DU bearings to ensure high pressure capability.
- 12 teeth solid gear shaft.
- Cast iron contruction.
- Double shaft seals.
- Standard nitrile seals and Viton seals for high temperature applications.
- All pumps are hydraulically tested after assembly to ensure the highest standard performance.
- Typical applications: construction, agriculture, material handling, municipality vehicles, light duty equipment, aerial working platforms, hoists, fan drive.





2PGE

- Cast iron body, flange and cover.
- Common parts with 2PE series.
- High resistance.
- Axial compensation achieved by the use of floating bushes that allow high volumetric efficiency throughout the working pressure range.
- Available with SAE 13T splined shaft that allow torque up to 200 Nm.
- Telltale leakage inspection hole on mounting flanges.

PG330

- Two pieces compact construction made with high strenght cast iron. Cast iron offers thermal stability, contamination resistance and strenght for consistent performance and durability in severe duty cycle applications.
- Advanced pressure-balanced thrust plates optimize volumetric efficiency across the range of operating speeds and pressures.
- Heavy duty low friction DU bushes provide long life in low viscosity and high pressure conditions.
- Compact design in single and double configuration is ideal for fitting into narrow spaces.
- PG330 Sharing the same features with PG331, in terms of dimensions and working conditions.
- Multiple pumps and combo with 2PE or 2PGE series available.

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PG331 Features

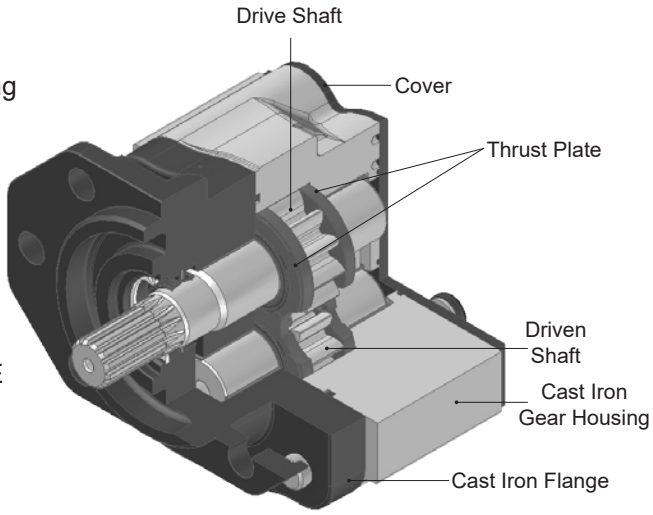
PG331

PG331 has been designed for Distributors and easing local conversion from single to multiple stage pump configuration.

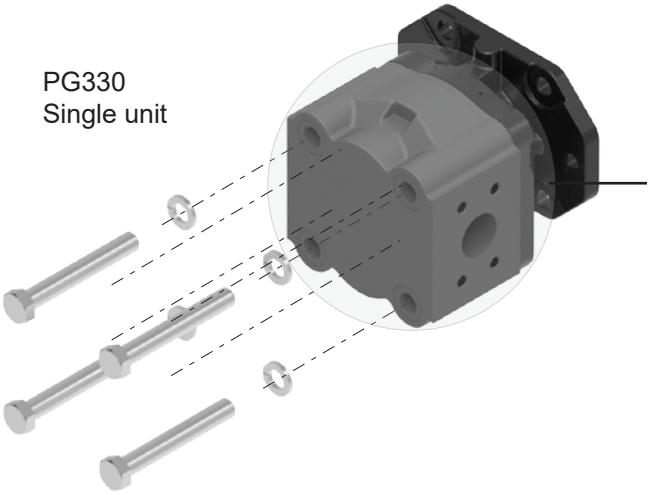
Sharing the same features with PG330:
- dimensions;
- working conditions;
- ports type, flanges and drive shafts.

Is available in single, double (also with 2PE or 2PGE piggy back pump), triple and quadruple version.

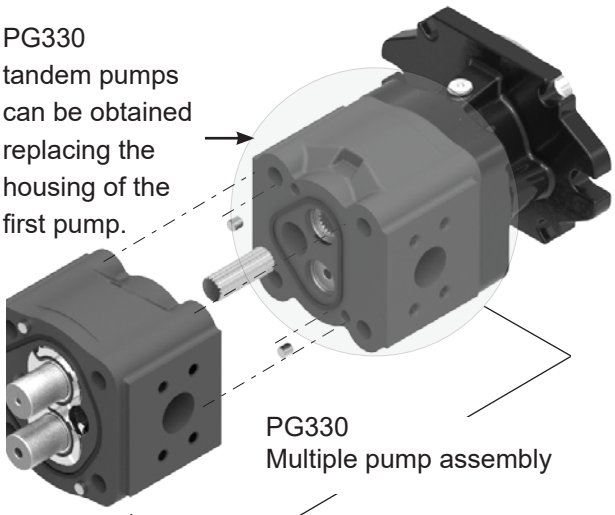
Please see PG331 Product manual at page 87

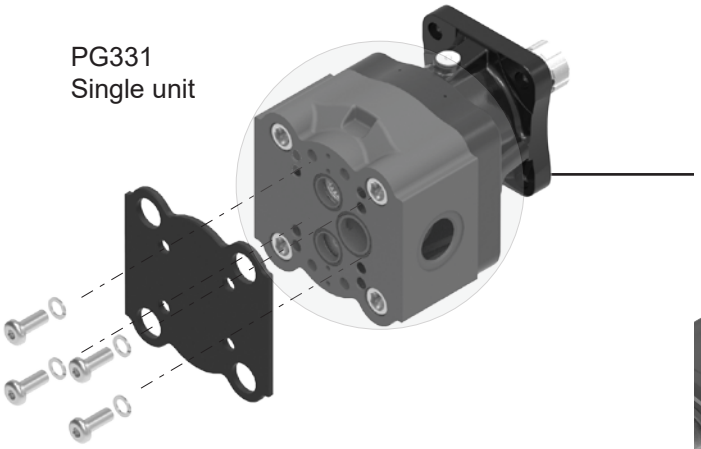


PG330/331 Pump assembly

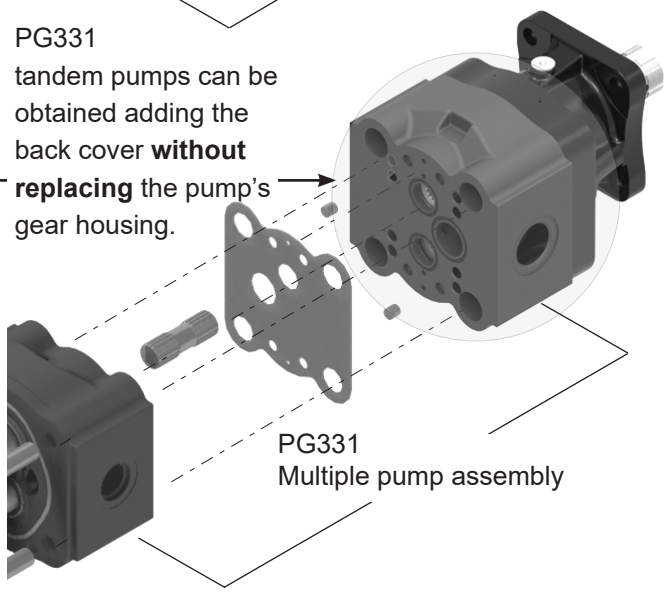


PG330
tandem pumps can be obtained replacing the housing of the first pump.





PG331
tandem pumps can be obtained adding the back cover **without replacing** the pump's gear housing.



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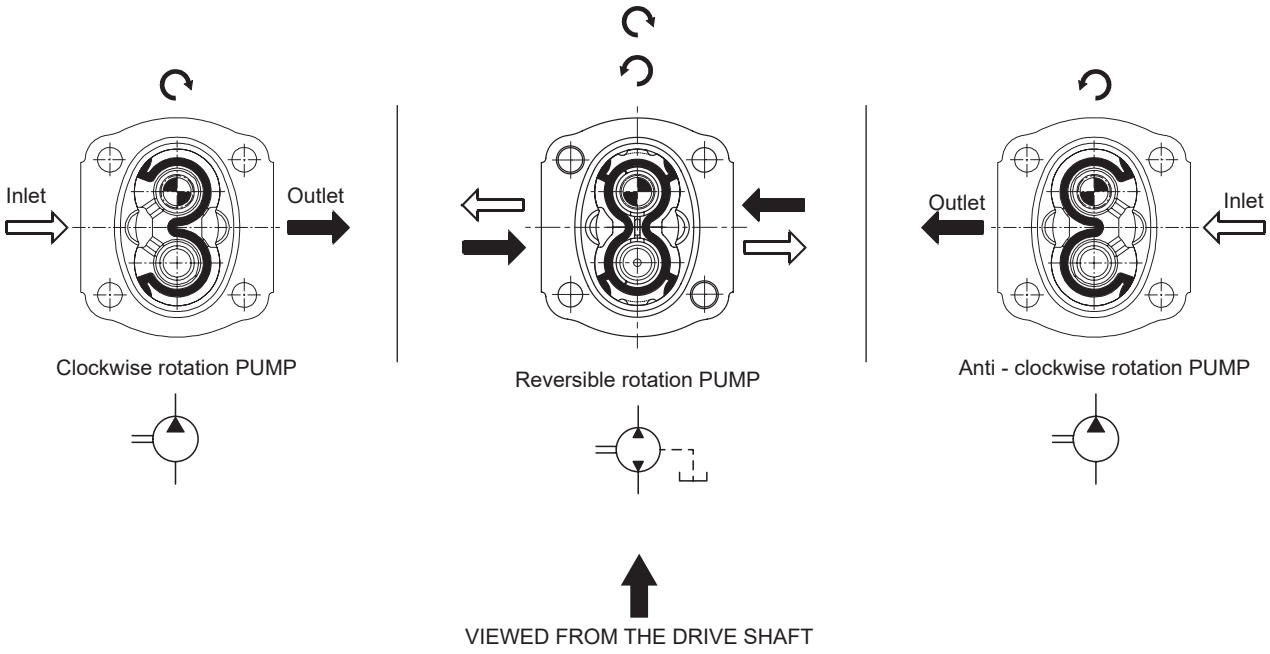
Radial And Axial Loads

Radial and axial loads on the shafts must be avoided since they reduce the life of the unit.
In order to avoid misalignment during the assembly with the primary engine, a connection with “Oldham” coupling (or coupling having convex toothed hub) is recommended.

Pump Rotation



Working Conditions

HYDRAULIC FLUID
Mineral oil according to DIN 51524, other hydraulic fluids on request.

Pump inlet pressure (absolute pressure)		0.8 to 1.5 bar *(11.6 to 21.7 psi)*
Viscosity	Minimum operating fluid viscosity	12 mm^2/sec
	Max starting viscosity	800 mm^2/sec
	Suggested fluid viscosity range	17 ÷ 65 mm^2/sec
Temperature	fluid operating temperature range	-25 ÷ 80 °C
	fluid operating temperature range with FPM seals (Viton)	-20 ÷ 110°C
	fluid operating temperature range with HNBR seals*	-30 ÷ 110°C

* Available on request

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

ⓘ 2PGE: When tandem pumps are supplied by 2 different reservoirs with 2 different fluids it is mandatory to specify “AS” version.

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 β_x=75	15 µm	25 µm

Common Formulas

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

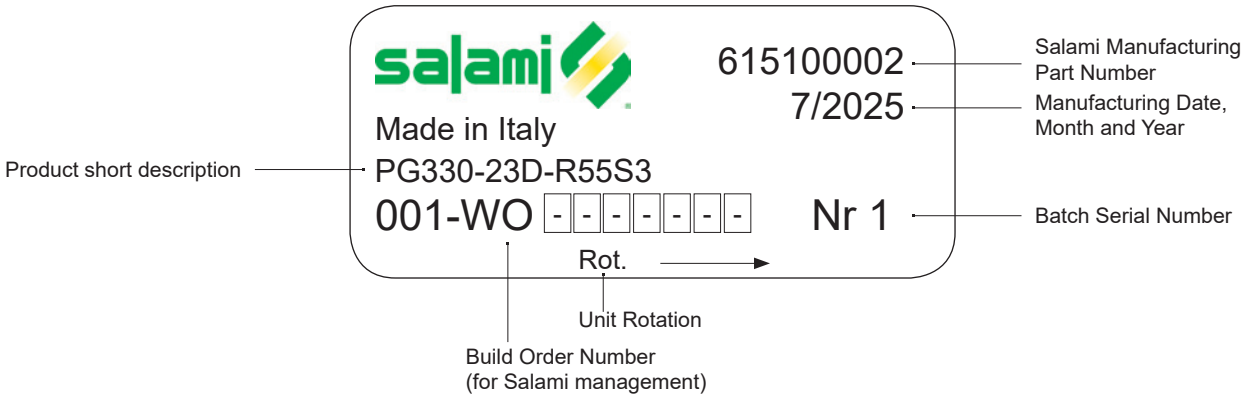
P = Input power $= \dfrac{q \cdot n \cdot \Delta p \ 10^{-3}}{600 \ \eta_m}$ (kW)

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

LEGENDA

Δp= Working pressure	(bar)
q= Displacement	(cm^3/rev)
n= Speed	(min^{-1})
η_m= Mechanical efficiency (0.92)	
η_v= Volumetric efficiency (0.95)	

Identification Label



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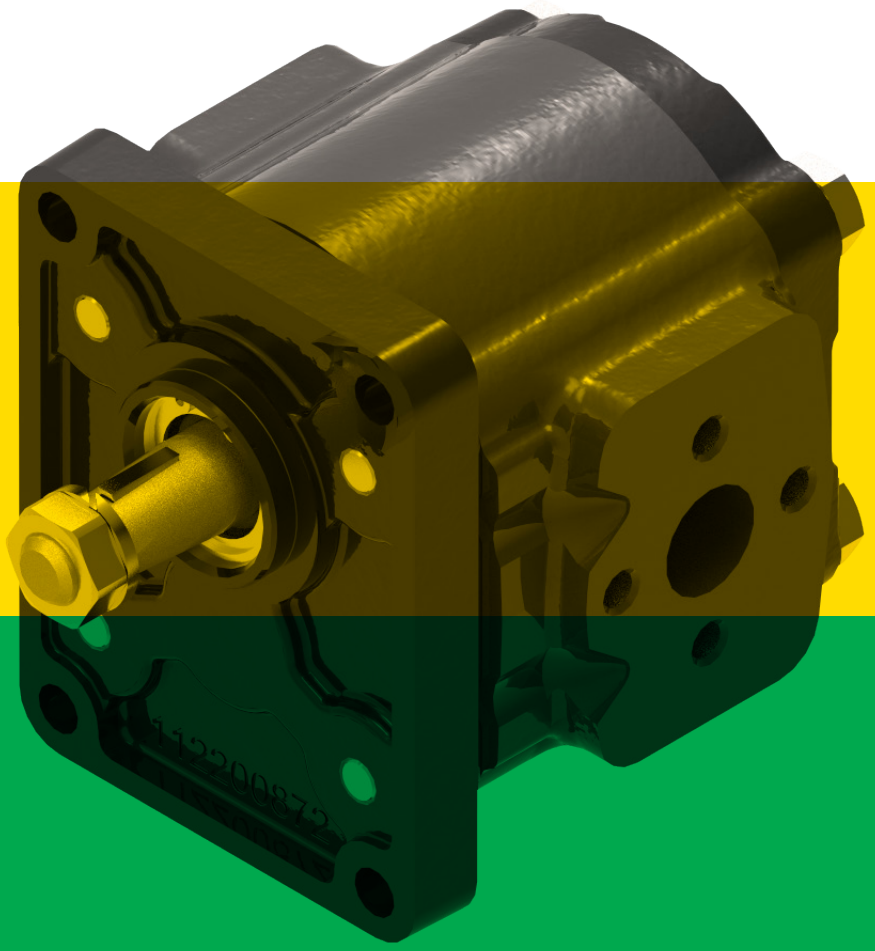
2PGE

High Pressure Cast Iron Gear Pumps

Technical/Spare Parts Catalogue



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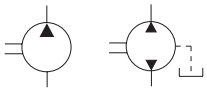
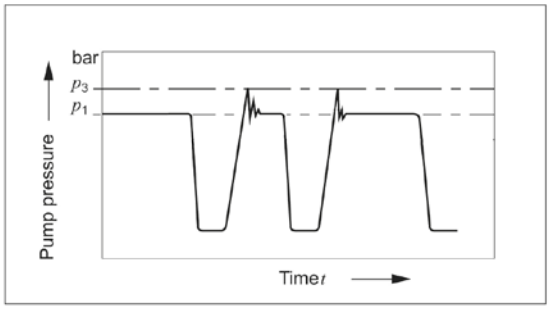
2PGE Single Pump - Dimensions and Technical Data



Displacements up to 28.1 cm³/rev - *1.71 cu.in./rev*
Pressure up to 320 bar - *4650 psi*

TYPE	Displacement		Dimension A		Dimension C		Max. Continuous pressure p_1		Peak pressure p_3		Min. speed at p_1	Max. speed at p_1	Weight	
	cm³/rev	*cu.in/rev*	mm	*in*	mm	*in*	bar	*psi*	bar	*psi*	rpm		kg	*lbs*
2PGE - 6.5	6.5	*0.40*	49.95	*1.97*	25	*0.98*	300	*4350*	320	*4650*	600	4000	4.8	*10.58*
2PGE - 8.3	8.3	*0.51*	52.8	*2.07*	26.4	*1.04*	300	*4350*	320	*4650*	500	3500	5.0	*11.02*
2PGE - 11.3	11.5	*0.68*	59.7	*2.35*	29.75	*1.17*	300	*4350*	320	*4650*	500	3500	5.2	*11.46*
2PGE - 13.8	14	*0.85*	63.5	*2.50*	31.75	*1.25*	300	*4350*	320	*4650*	500	3500	5.4	*11.90*
2PGE - 16	16.6	*1.01*	67.5	*2.65*	39.5	*1.56*	300	*4350*	320	*4650*	500	3000	6.6	*14.55*
2PGE - 19	19.4	*1.18*	75.6	*2.97*	39.5	*1.56*	300	*4350*	320	*4650*	500	3000	7.1	*15.65*
2PGE - 22.5	22.9	*1.37*	81	*3.19*	47.5	*1.87*	280	*4060*	300	*4350*	500	2750	7.5	*16.53*
2PGE - 26	26.7	*1.63*	86.8	*3.42*	47.5	*1.87*	260	*3750*	280	*4060*	500	2500	7.8	*17.20*
2PGE - 28	28.1	*1.71*	89	*3.50*	48	*1.89*	230	*3335*	250	*3625*	500	2500	8.0	*17.64*

Max pressure must be lowered by 10% for bi-directional pump.



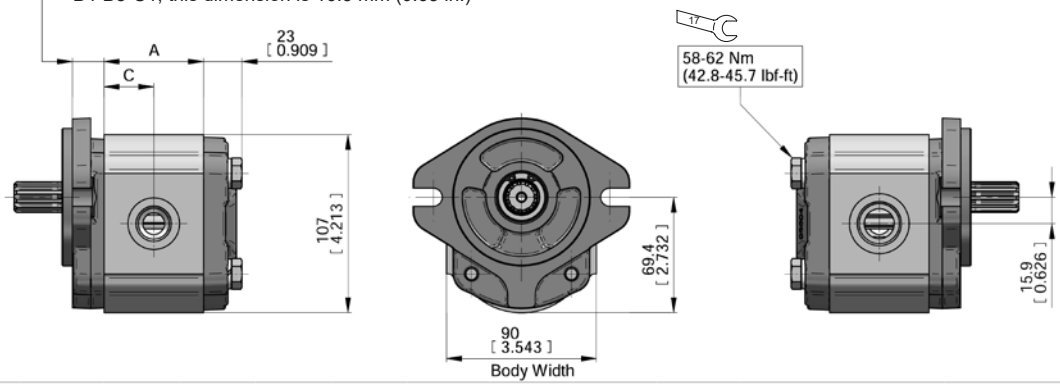
Definition of Pressures

p_3 = Peak pressure

p_1 = Max. Continuous pressure

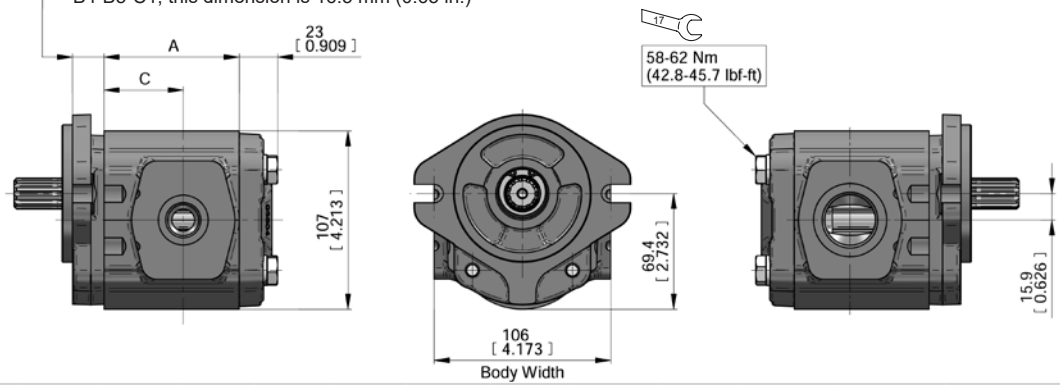
From Displacement 6.5 to 13.8

For flanges code:
P1-B1-S2-S3, this dimension is 19 mm (0.75 in.)
B4-B5-C1, this dimension is 16.5 mm (0.65 in.)



From Displacement 16 to 28

For flanges code:
P1-B1-S2-S3, this dimension is 19 mm (0.75 in.)
B4-B5-C1, this dimension is 16.5 mm (0.65 in.)



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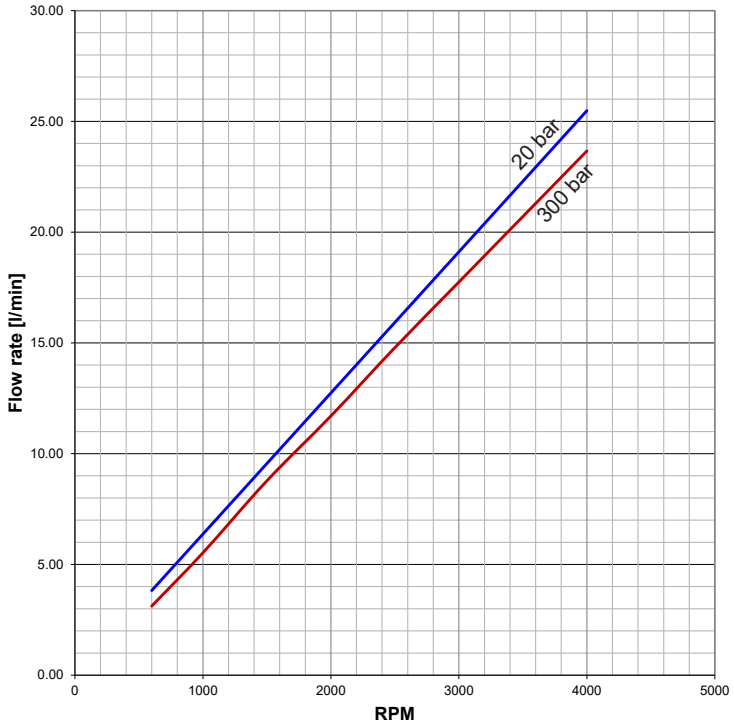
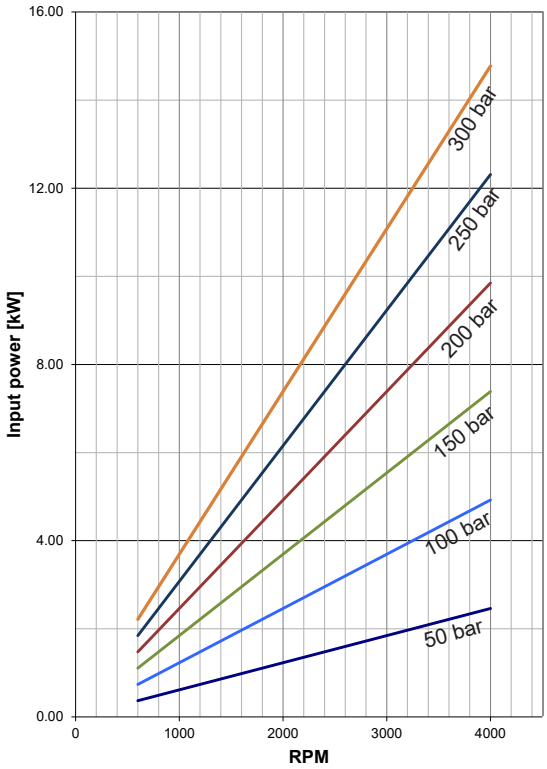
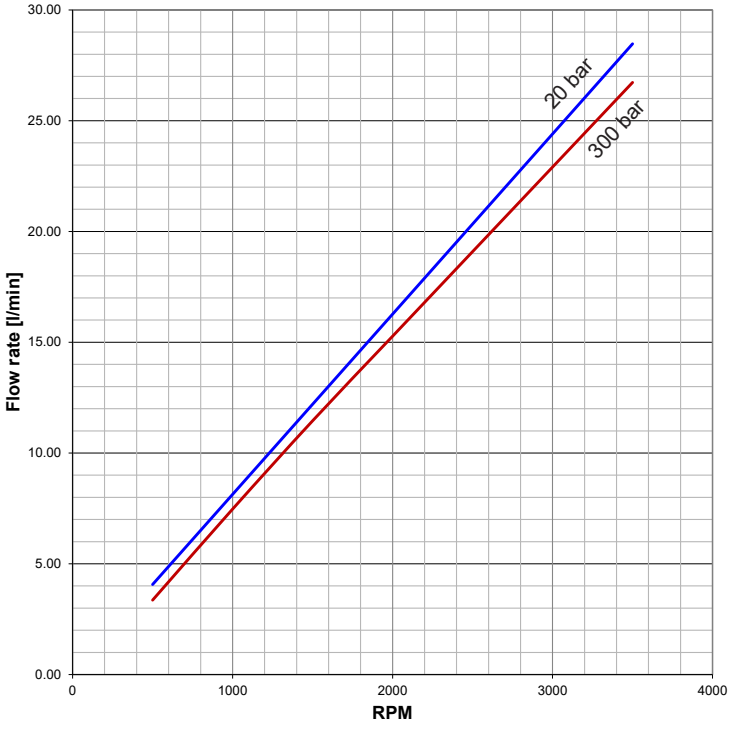
Pump Performance Charts

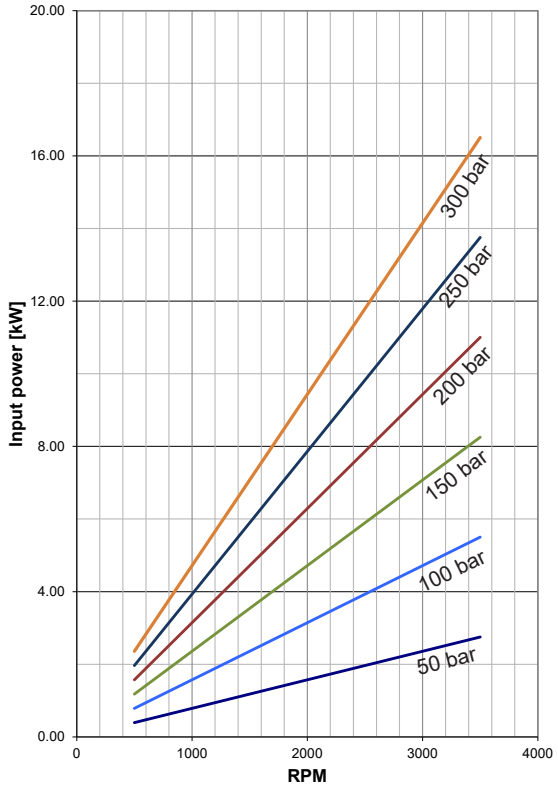
Performance curves carried out with oil viscosity at 21 cSt and oil temperature at 50°C





2PGE - 6.5





2PGE - 8.3

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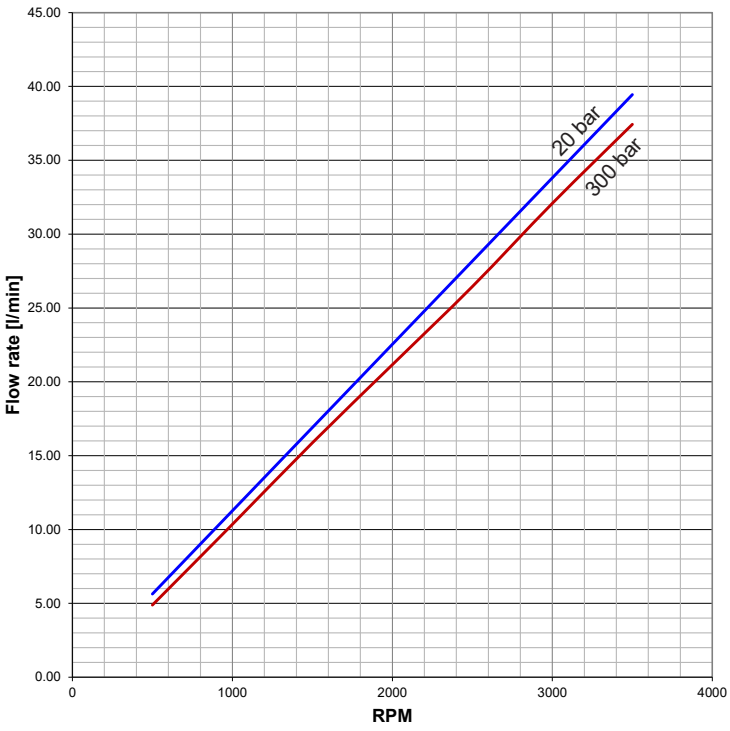
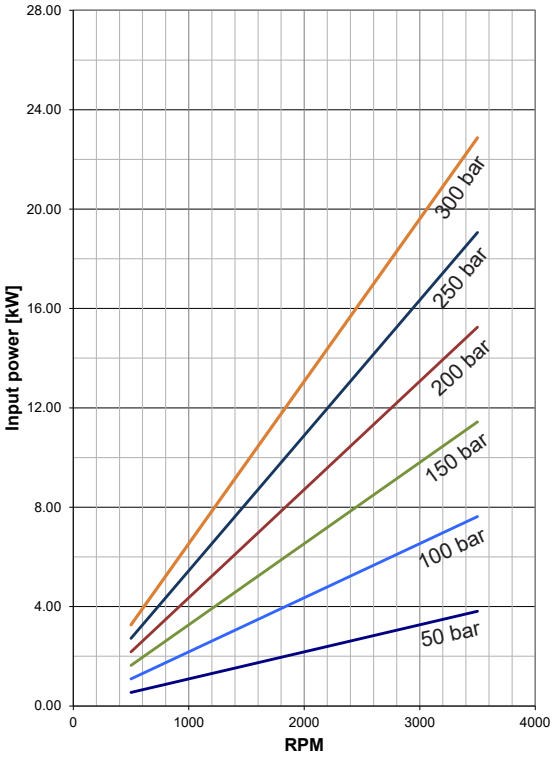
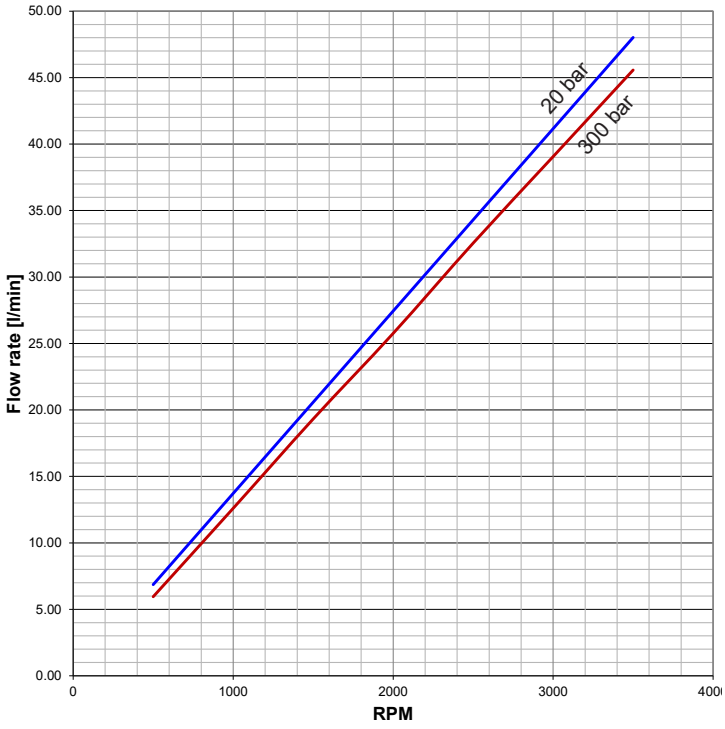
Pump Performance Charts

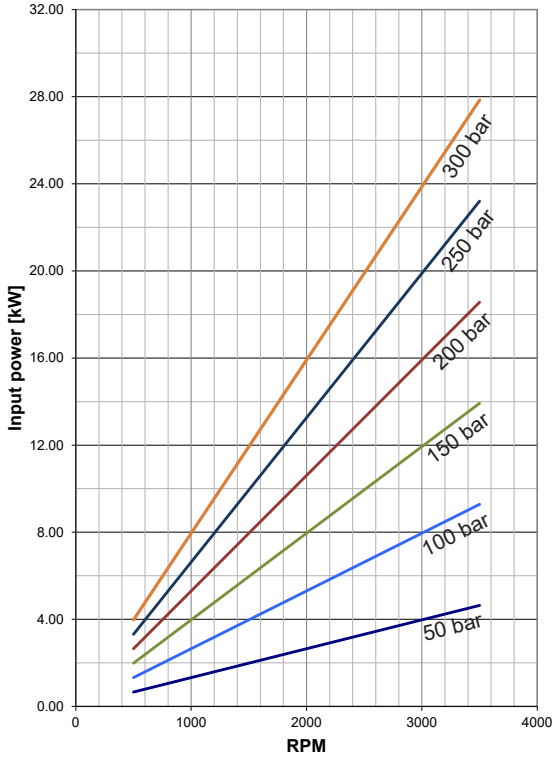
Performance curves carried out with oil viscosity at 21 cSt and oil temperature at 50°C





2PGE - 11.3

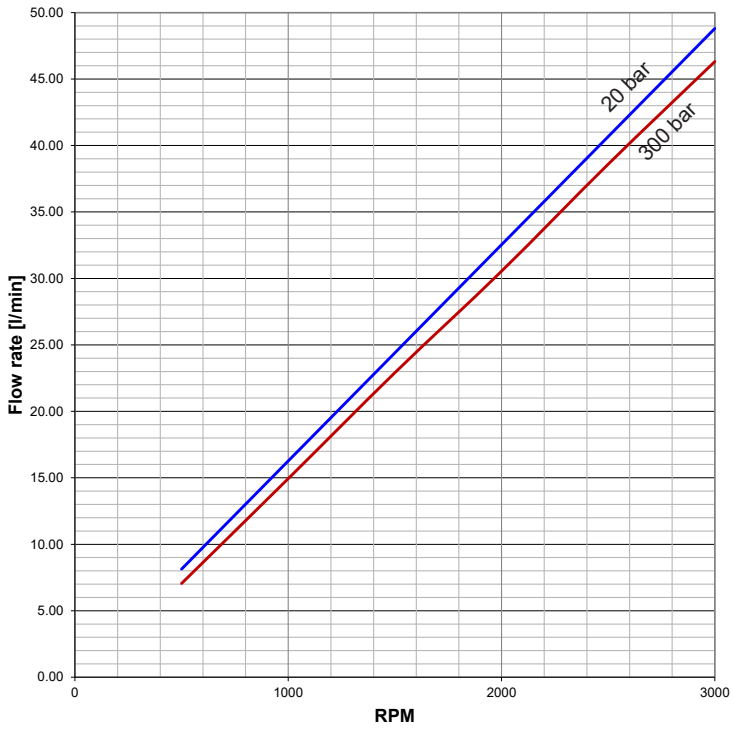


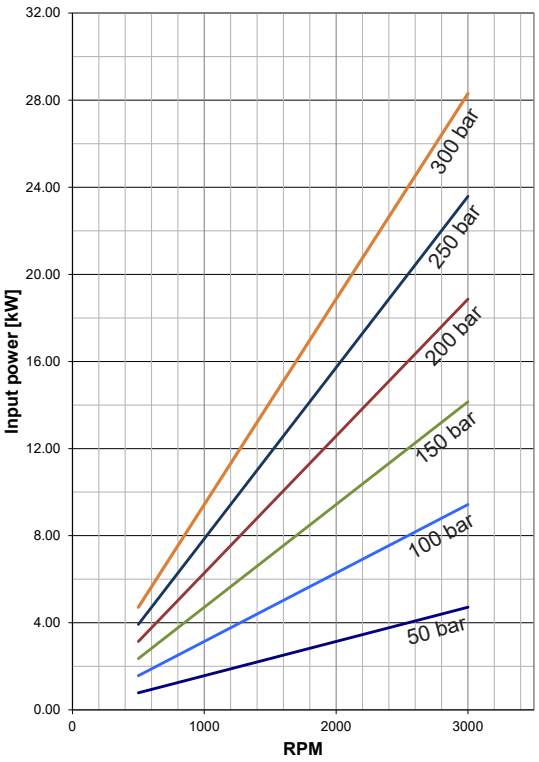


2PGE - 13.8

Pump Performance Charts

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





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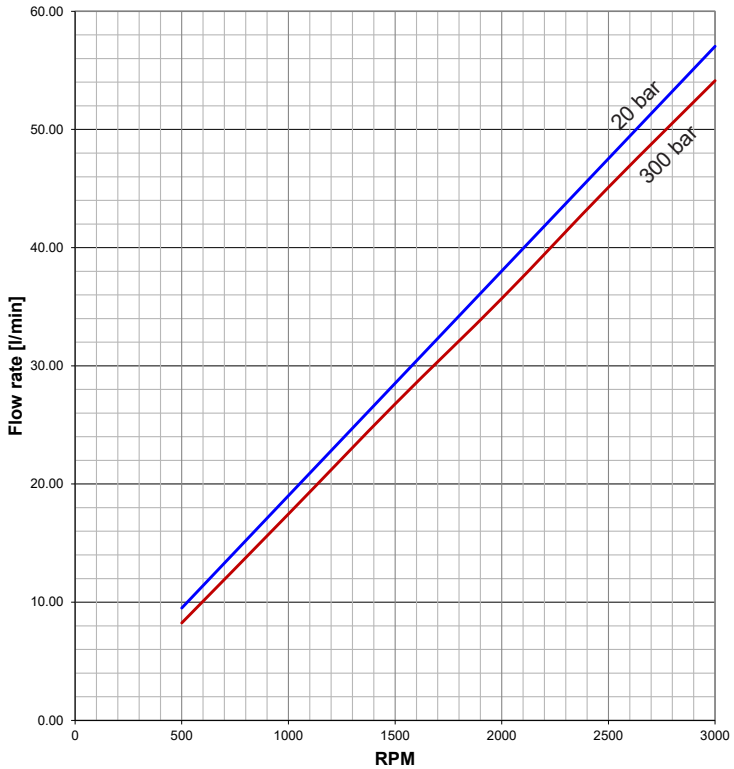

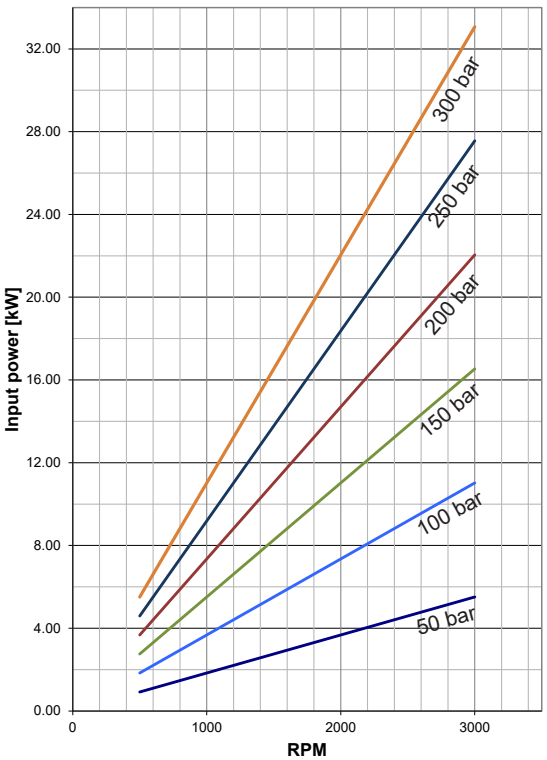

2PGE - 19

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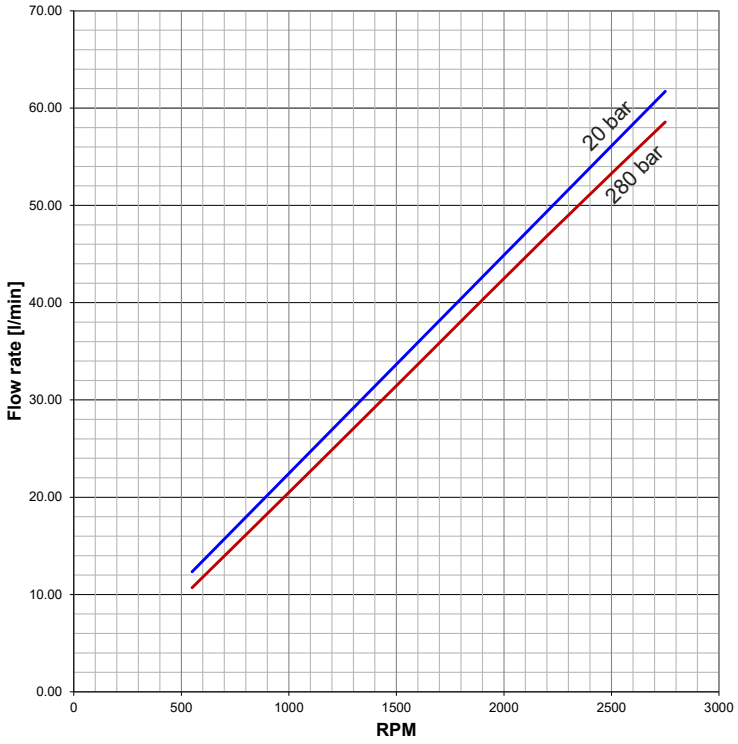
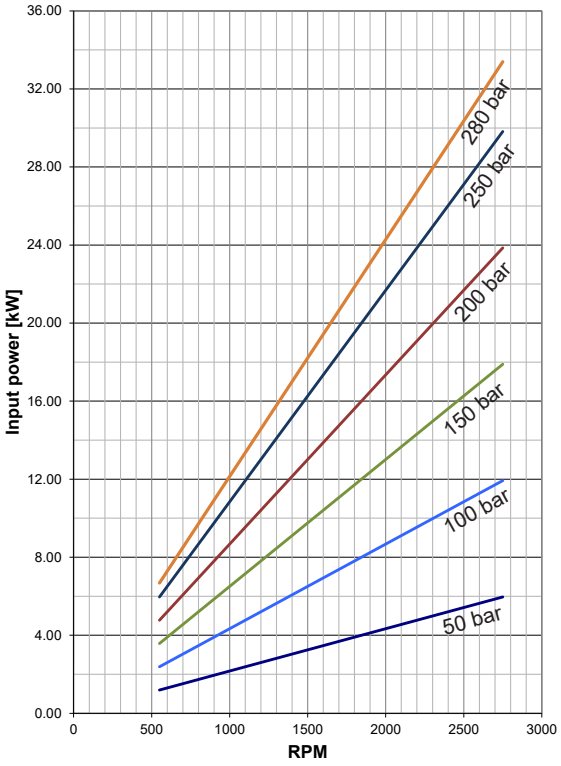
Pump Performance Charts

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





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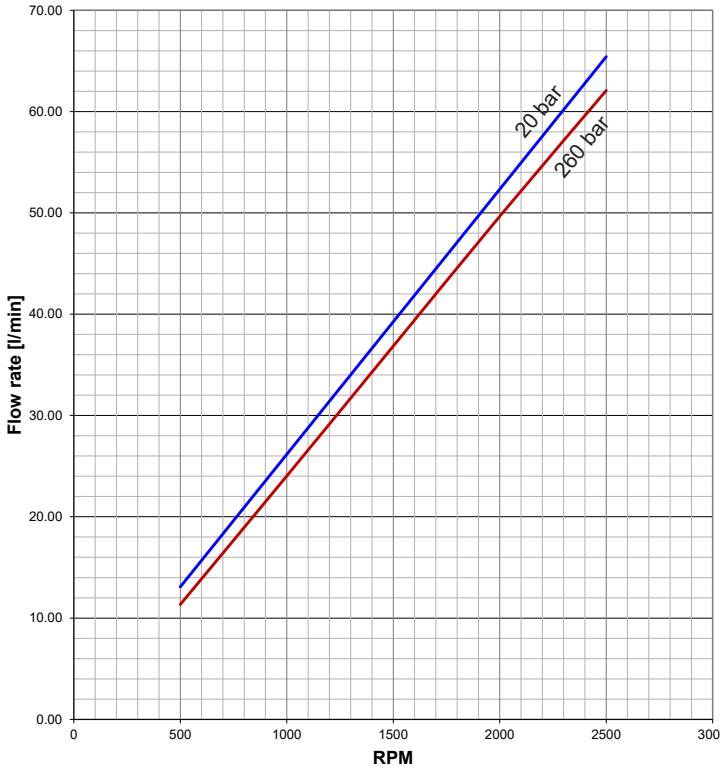
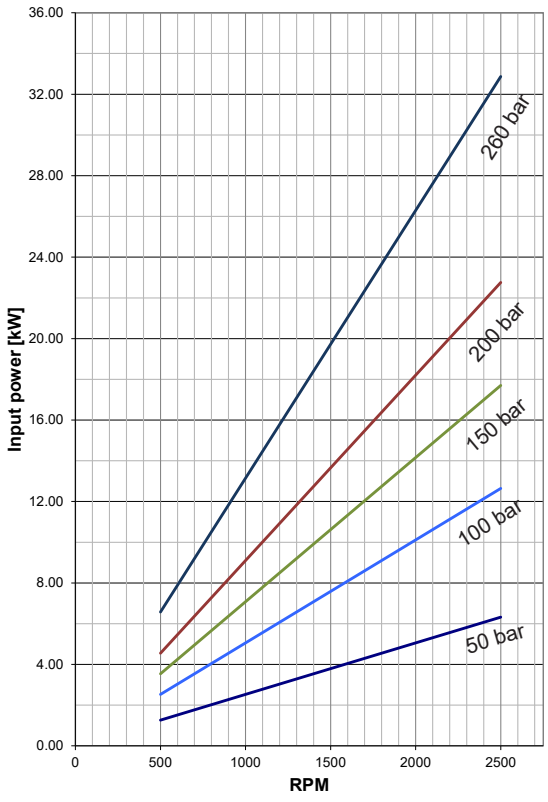
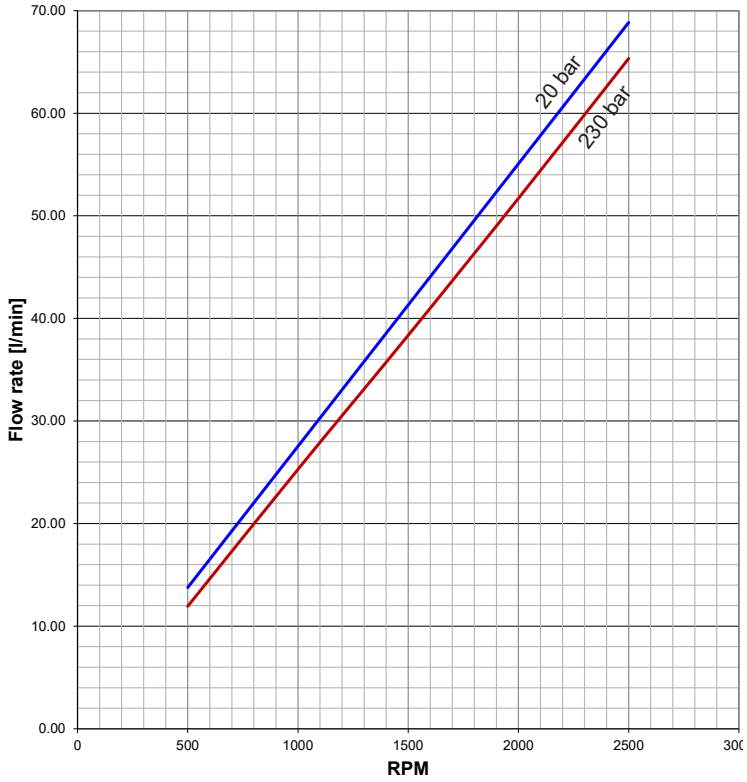


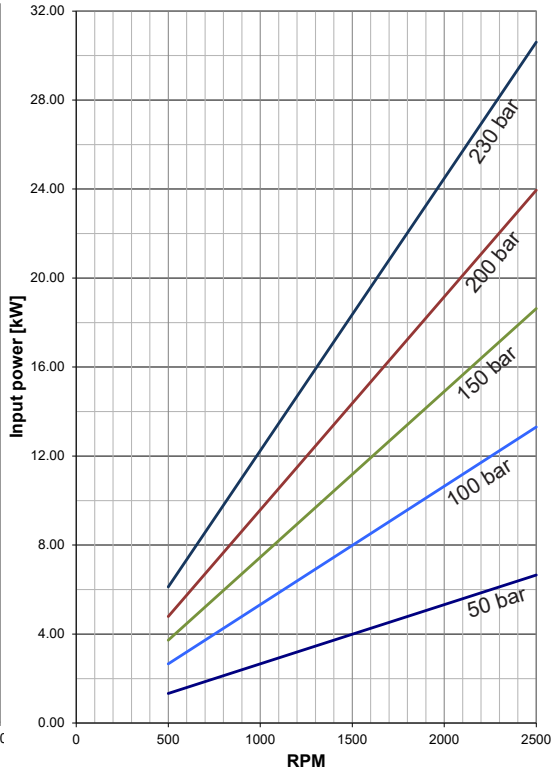


2PGE - 26

Pump Performance Charts

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





2PGE - 28

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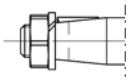
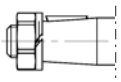
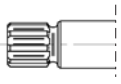
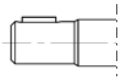
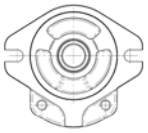
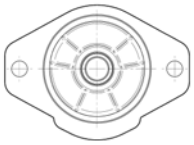
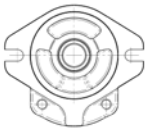
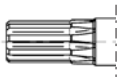
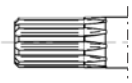
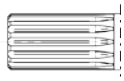
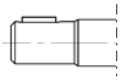
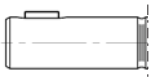
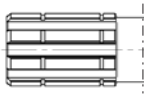
Shaft and Flange Combinations

2PGE						
		CODE **P1**	CODE **B1**	CODE **B2-B3**	CODE **B4-B5**	CODE **C1**
		FLANGES				
SHAFT	 CODE **03**			03B2 03B3		
	 CODE **04**				04B4 04B5	
	 CODE **25**		25B1		25B4 25B5	
	 CODE **28**	28P1				
	 CODE **62**	62P1	62B1		62B4 62B5	62C1
	 CODE **82**	82P1				

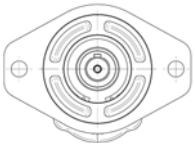
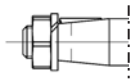
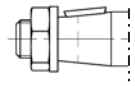
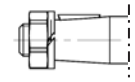
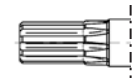
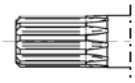
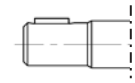
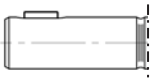
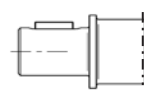
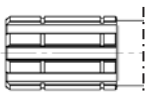
E0.146.0725.14.00IM03

Shaft and Flange Combinations

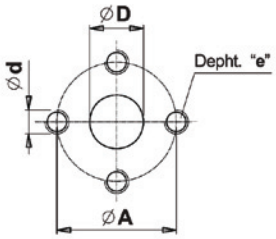
2PGE		 CODE **S2**	 CODE **S3**	 CODE **S6**	 CODE **T1**	 CODE **Z2**
		FLANGES				
SHAFT	 CODE **52**	52S2		52S6		
	 CODE **54**	54S2		54S6		
	 CODE **55**		55S3			
	 CODE **82**	82S2		82S6		
	 CODE **85**	85S2		85S6		
CONTINENTAL SHAFT	 CODE **67**					67Z2
	 CODE **73**				73T1	

E0.146.0725.14.00IM03

Continental Shaft and Flange With Outrigger Bearing Combinations

2PGE								
		CODE **CL**	CODE **CF**	CODE **CS**	CODE **CB**	CODE **CP**	CODE **CSB**	CODE **Z1**
		FLANGES WITH OUTRIGGER BEARING						
CONTINENTAL SHAFT	 CODE **25**	25CL	25CF		25CB			
	 CODE **26**	26CL			26CB			
	 CODE **28**					28CP		
	 CODE **52**			52CS				
	 CODE **54**			54CS				
	 CODE **82**			82CS				
	 CODE **85**			85CS				
	 CODE **87**						87CSB	
	 CODE **66**							66Z1

Flanged Ports



code P

Flanged ports
european standard

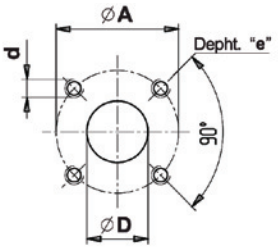
M6	8 Nm (5.9 lbf-ft)
M8	20 Nm (14.7 lbf-ft)

UNI-DIRECTIONAL

PUMPS	INLET				OUTLET			
	Ø D	Ø A	d	e	Ø D	Ø A	d	e
From 6.5 to 8.3	13 *(0.51”)*	30 *(1.18”)*	M6	13 *(0.51”)*	13 *(0.51”)*	30 *(1.18”)*	M6	13 *(0.51”)*
From 11.3 to 22.5	20 *(0.79”)*	40 *(1.57”)*	M8	13 *(0.51”)*	13 *(0.51”)*	30 *(1.18”)*	M6	13 *(0.51”)*
From 26 to 28	22 *(0.87”)*							

BI-DIRECTIONAL

PUMPS	INLET				OUTLET			
	Ø D	Ø A	d	e	Ø D	Ø A	d	e
From 6.5 to 8.3	13 *(0.51”)*	30 *(1.18”)*	M6	13 *(0.51”)*	13 *(0.51”)*	30 *(1.18”)*	M6	13 *(0.51”)*
From 11.3 to 28	20 *(0.79”)*	40 *(1.57”)*	M8	13 *(0.51”)*	20 *(0.79”)*	40 *(1.57”)*	M8	13 *(0.51”)*



code B

Flanged ports
german standard

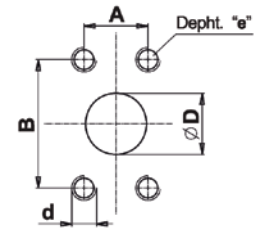
M6	8 Nm (5.9 lbf-ft)

UNI-DIRECTIONAL

PUMPS	INLET				OUTLET			
	Ø D	Ø A	d	e	Ø D	Ø A	d	e
From 6.5 to 22.5	20 *(0.79”)*	40 *(1.57”)*	M6	13 *(0.51”)*	15 *(0.59”)*	35 *(1.38”)*	M6	13 *(0.51”)*
26	22 *(0.87”)*							
28	25 *(0.98”)*	55 *(2.17”)*	M8	13 *(0.51”)*				

BI-DIRECTIONAL

PUMPS	INTLET				OUTLET			
	Ø D	Ø A	d	e	Ø D	Ø A	d	e
From 6.5 to 8.3	15 *(0.59”)*	35 *(1.38”)*	M6	13 *(0.51”)*	15 *(0.59”)*	35 *(1.38”)*	M6	13 *(0.51”)*
From 11.3 to 28	20 *(0.79”)*	40 *(1.57”)*	M6	13 *(0.51”)*	20 *(0.79”)*	40 *(1.57”)*	M6	13 *(0.51”)*



code W

Flanged ports
SAE J518 - METRIC THREAD

M8	20 Nm (14.7 lbf-ft)
M10	35 Nm (25.8 lbf-ft)

UNI-DIRECTIONAL

PUMPS	INLET					OUTLET				
	ØD	B	A	d	e	ØD	B	A	d	e
From 16 to 19	19 *(0.75”)*	47.6 *(1.87”)*	22.2 *(0.87”)*	M10	15 *(0.59”)*	12.7 *(0.50”)*	38.1 *(1.50”)*	17.5 *(0.69”)*	M8	15 *(0.59”)*
From 22.5 to 28	25.4 *(1.00”)*	52.4 *(2.06”)*	26.2 *(1.03”)*	M10	15 *(0.59”)*	19 *(0.75”)*	47.6 *(1.87”)*	22.2 *(0.87”)*	M10	15 *(0.59”)*

BI-DIRECTIONAL

PUMPS	INLET					OUTLET				
	ØD	B	A	d	e	ØD	B	A	d	e
From 16 to 28	19 *(0.75”)*	47.6 *(1.87”)*	22.2 *(0.87”)*	M10	15 *(0.59”)*	19 *(0.75”)*	47.6 *(1.87”)*	22.2 *(0.87”)*	M10	15 *(0.59”)*

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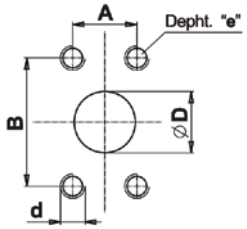
Flanged Ports



code S

Flanged ports
SAE J518
AMERICAN STANDARD THREAD

5/16-18 UNC	20 Nm (14.7 lbf-ft)
3/8-16 UNC	30 Nm (22.1 lbf-ft)

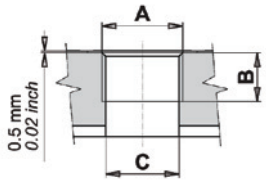
UNI-DIRECTIONAL

PUMPS	INLET					OUTLET				
	ØD	B	A	d	e	ØD	B	A	d	e
From 16 to 19	19 *(0.75”)*	47.6 *(1.87”)*	22.2 *(0.87”)*	3/8-16 UNC	15 (0.59”)	12.7 (0.50”)	38.1 (1.50”)	17.5 (0.69”)	5/16-18 UNC	15 (0.59”)
From 22.5 to 28	25.4 *(1.00”)*	52.4 *(2.06”)*	26.2 *(1.03”)*	3/8-16 UNC	15 *(0.59”)*	19 *(0.75”)*	47.6 *(1.87”)*	22.2 *(0.87”)*	3/8-16 UNC	15 *(0.59”)*

BI-DIRECTIONAL

PUMPS	INLET					OUTLET				
	ØD	B	A	d	e	ØD	B	A	d	e
From 16 to 28	19 *(0.75”)*	47.6 *(1.87”)*	22.2 *(0.87”)*	3/8-16 UNC	15 *(0.59”)*	19 *(0.75”)*	47.6 *(1.87”)*	22.2 *(0.87”)*	3/8-16 UNC	15 *(0.59”)*

Threaded Ports



code G

Threaded ports
GAS (BSPP)

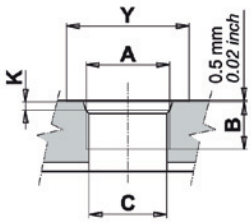
G1/2	60 Nm (44.3 lbf-ft)
G3/4	90 Nm (66.4 lbf-ft)
G1	130 Nm (95.8 lbf-ft)

UNI-DIRECTIONAL

PUMPS	INLET			OUTLET		
	A	B	C	A	B	C
From 6.5 to 19	G 3/4	17 *(0.67”)*	18 *(0.71”)*	G 1/2	15 *(0.59”)*	13 *(0.79”)*
From 22.5 to 28	G1	20 *(0.79”)*	25 *(0.98”)*			

BI-DIRECTIONAL

PUMPS	INLET			OUTLET		
	A	B	C	A	B	C
From 6.5 to 8.3	G 1/2	15 *(0.59”)*	13 *(0.79”)*	G 1/2	15 *(0.59”)*	13 *(0.79”)*
From 11.3 to 28	G 3/4	17 *(0.67”)*	18 *(0.71”)*	G 3/4	17 *(0.67”)*	18 *(0.71”)*



code R

Threaded ports
SAE (ODT)

SAE 10	60 Nm (44.3 lbf-ft)
SAE 12	90 Nm (66.4 lbf-ft)
SAE 16	130 Nm (95.8 lbf-ft)

UNI-DIRECTIONAL

PUMPS	INLET					OUTLET				
	A	B	C	Y	K	A	B	C	Y	K
From 6.5 to 19	1-1/16-12 UN (SAE 12)	19 *(0.75”)*	18 *(0.71”)*	41 *(1.61”)*	3.3 *(0.13”)*	7/8-14 UNF (SAE 10)	17 *(0.67”)*	13 *(0.79”)*	34 *(1.32”)*	2.5 *(0.10”)*
From 22.5 to 28	1-5/16-12 UN (SAE 16)	19 *(0.75”)*	25 *(0.98”)*	49 *(1.93”)*	3.3 *(0.13”)*					

BI-DIRECTIONAL

PUMPS	INLET					OUTLET				
	A	B	C	Y	K	A	B	C	Y	K
From 6.5 to 8.3	7/8-14 UNF (SAE 10)	17 *(0.67”)*	13 *(0.79”)*	34 *(1.32”)*	2.5 *(0.10”)*	7/8-14 UNF (SAE 10)	17 *(0.67”)*	13 *(0.79”)*	34 *(1.32”)*	2.5 *(0.10”)*
From 11.3 to 28	1-1/16-12 UN (SAE 12)	19 *(0.75”)*	20 *(0.79”)*	41 *(1.61”)*	3.3 *(0.13”)*	1-1/16-12UN (SAE 12)	19 *(0.75”)*	20 *(0.79”)*	41 *(1.61”)*	3.3 *(0.13”)*

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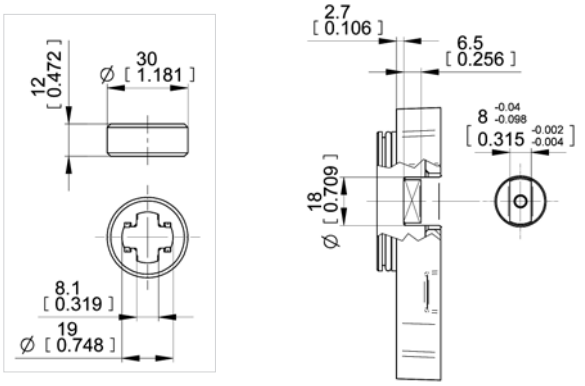
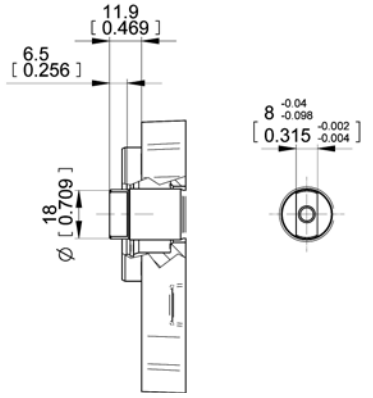
Drive Shaft



code 03	Max torque 70 Nm (620 lbf in)

Tang drive for electric motors (without shaft seal)



code 04	Max torque 70 Nm (620 lbf in)

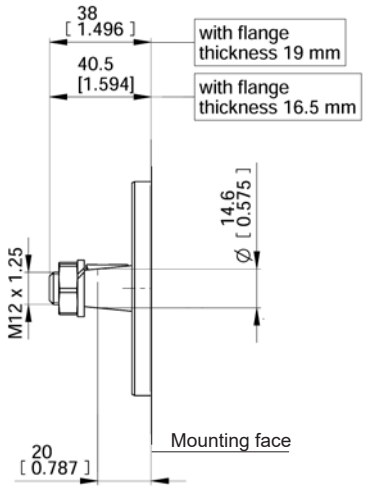
Tang drive

Woodruff Key
3x6,5-UNI 6606
3x5 (for bearing version
CL-CF-CB)

Washer
M12 TE-UNI 1751B

Nut
M12x1,25-UNI 5589
40 Nm-29.7 lbf-ft

Part Number
Kit Woodruff Key+Nut+Washer
R12280180
R12283030 (bearing version)



code 25	Max torque 130 Nm (1151 lbf in)

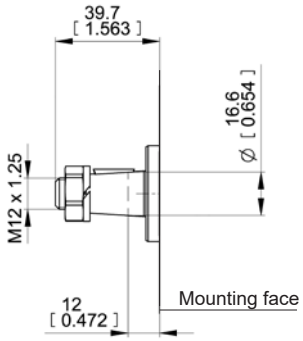
Tapered 1:5

Woodruff Key
3,165x6,2

Washer
M12 TE-UNI 1751B

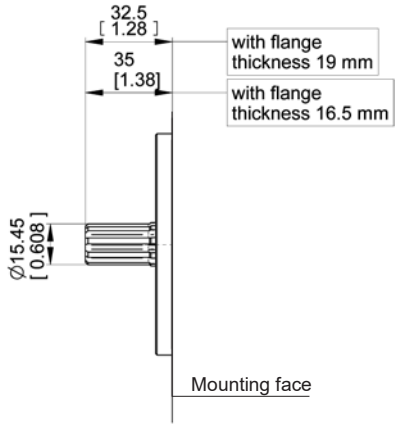
Nut
M12x1,25-UNI 5589
40 Nm-29.7 lbf-ft

Part Number
Kit Woodruff Key+Nut+Washer
R12280170



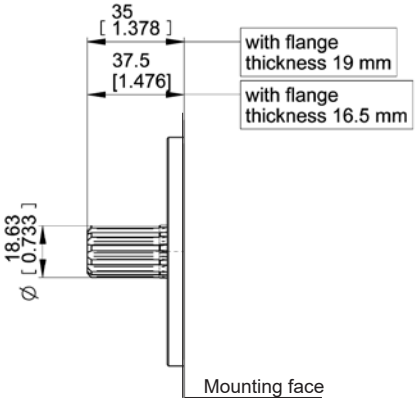
code 28	Max torque 130 Nm (1151 lbf in)

Tapered 1:8



code 52	Max torque 110 Nm (974 lbt in)

SAE A 9T-16/32DP SPLINED



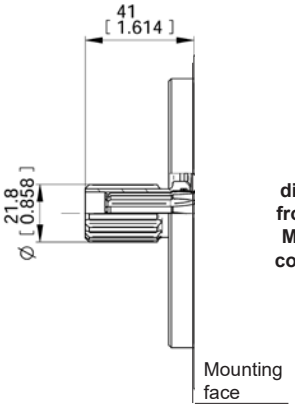
code 54	Max torque 160 Nm (1416 lbt in)

SAE A 11T-16/32DP SPLINED

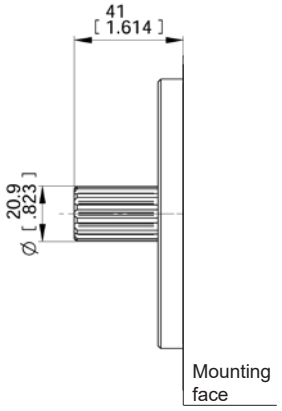
E0.146.0725.14.00IM03

Drive Shaft

Part Number
Coupling Sleeve+O ring
R12040210

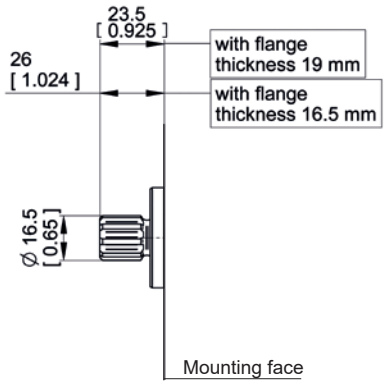


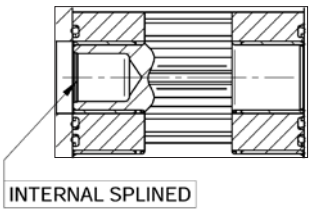
for displacements from 6.5 to 13.8 Mounting with coupling sleeve



for displacements from 16 to 28 Mounting with solid shaft.

code 55	
Max torque 100 Nm (885 lbt in)	Max torque 200 Nm (1770 lbt in)
SAE B 13T-16/32DP SPLINED	

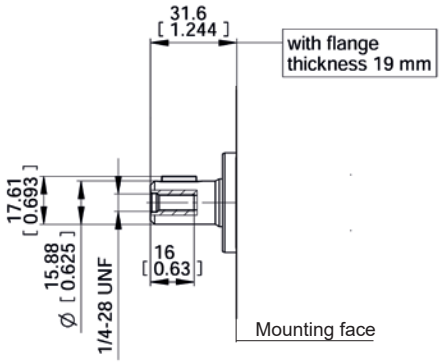




code 62	Max torque 140 Nm (1239 lbt in)	**code 60**	Max torque 100 Nm (885 lbt in)
9 teeth DIN 5482 splined		**DIN 5480 internal splined (only for rear pumps)**	

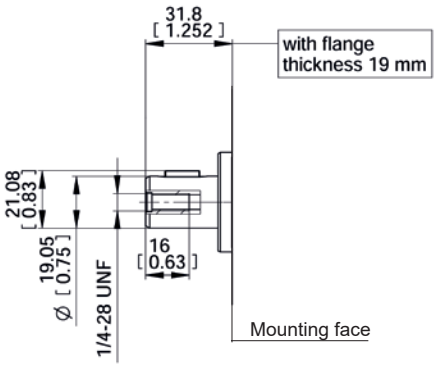
Key
3,97x3.97x12,7

Part Number
Key
796620700



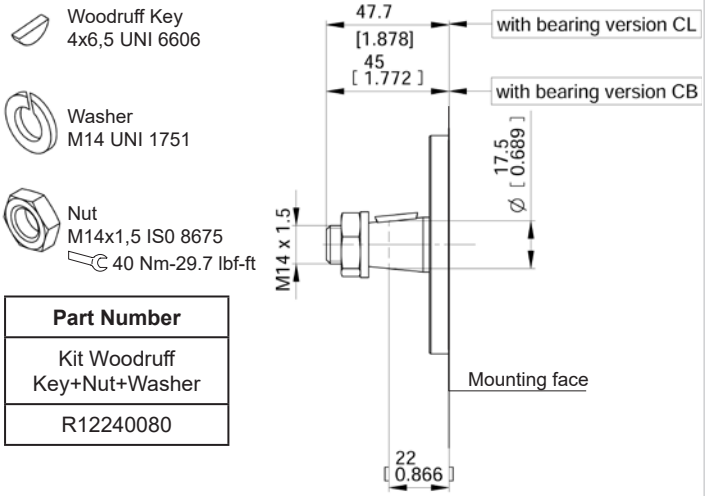
Key
4,76x4,76x12,7

Part Number
Key
796621000

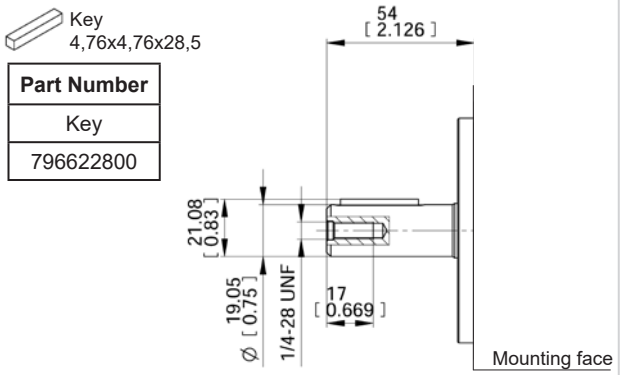


code 82	Max torque 75 Nm (664 lbt in)	**code 85**	Max torque 110 Nm (974 lbt in)
5/8” SAE A parallel		**3/4” SAE A parallel**	

Continental Shaft



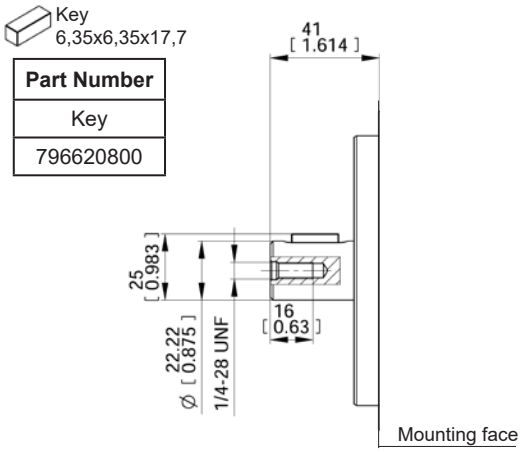
Part Number
Kit Woodruff Key+Nut+Washer
R12240080



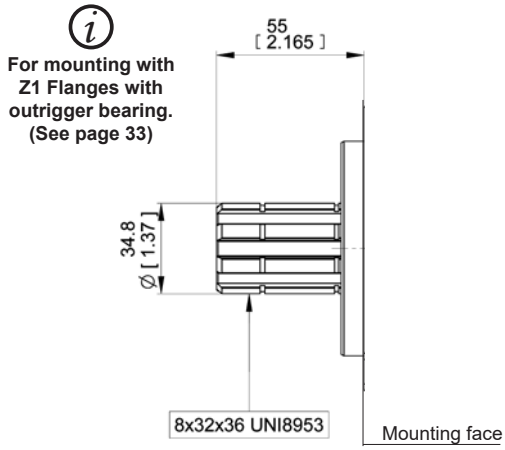
Part Number
Key
796622800

code 26	Max torque 100 Nm (885 lbt in)
Tapered 1:5 (only for CB, CL)	

code 86	Max torque 100 Nm (885 lbt in)
3/4” SAE A parallel	

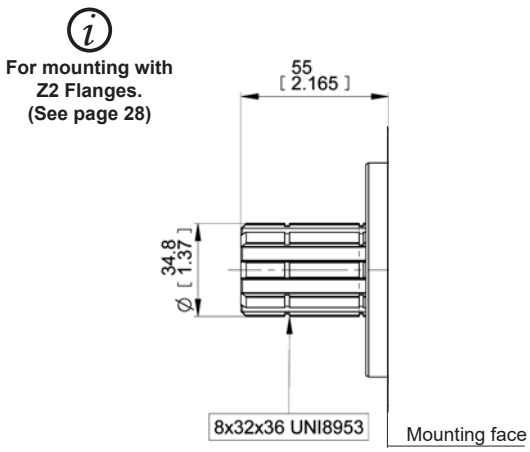


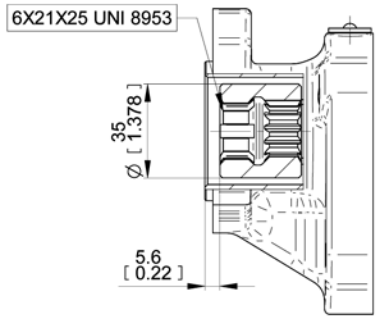
Part Number
Key
796620800



code 87	Max torque 200 Nm (1770 lbt in)
7/8” SAE B parallel	

code 66	Max torque 200 Nm (1770 lbt in)
8x32x36 UNI 8953 SPLINED	



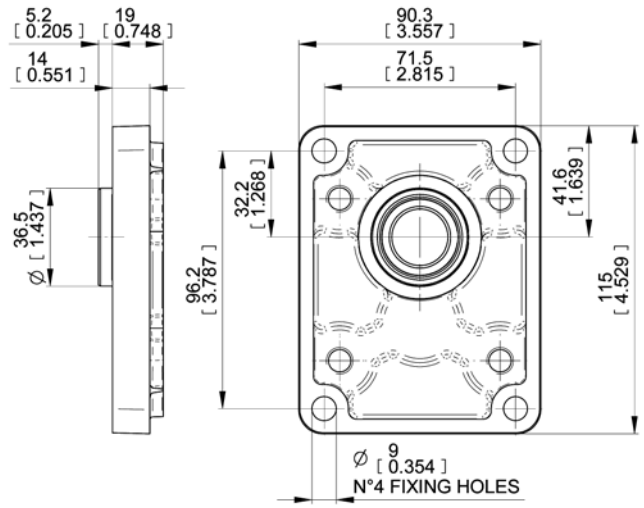


code 67	Max torque 200 Nm (1770 lbt in)
8x32x36 UNI 8953 SPLINED	

code 73	Max torque 200 Nm (1770 lbt in)
6x21x25 UNI 8953 INTERNAL SPLINED	

E0.146.0725.14.00IM03

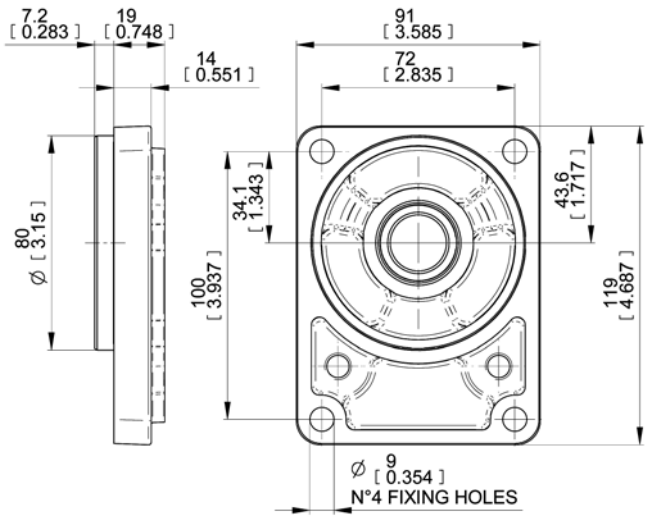
Mounting Flanges



Code	Part Number (Unidirectional Pump)	
	Flange+Shaft seal kit	Shaft seal kit (See page 43-44)
28P1	R12240012 (NBR) R12240420 (FPM)	R12240010 (NBR) R12240021 (FPM)
62P1		
82P1		

code P1 — With shaft code 28-62-82

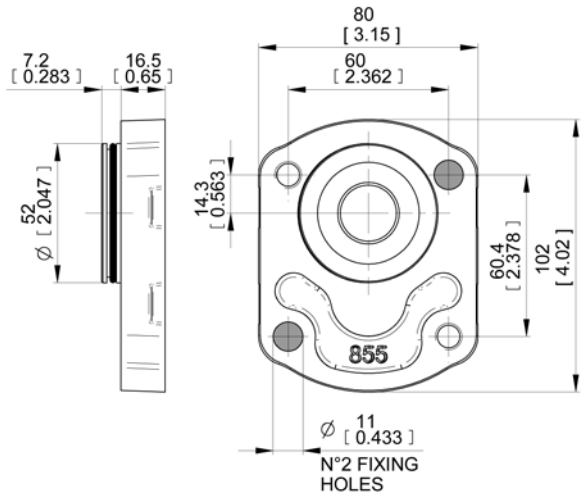
European standard



Code	Part Number (Unidirectional Pump)	
	Flange+Shaft seal kit	Shaft seal kit (See page 43-44)
25B1	R12240610 (NBR) R12240611 (FPM)	R12240010 (NBR) R12240021 (FPM)
62B1		

code B1 — With shaft code 25-62

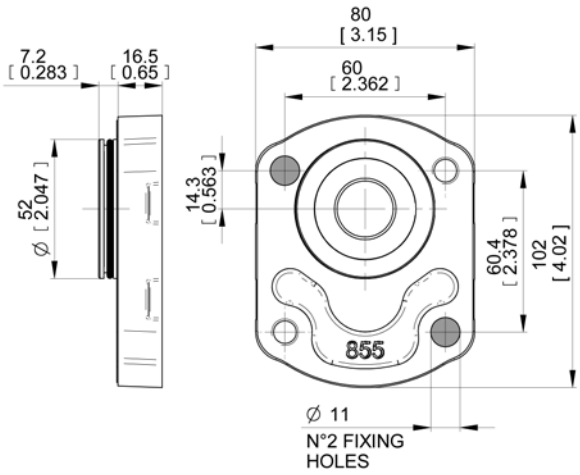
German standard



Code	Part Number (Unidirectional Pump)	
	Flange+O-ring	O-ring (OR3187-AT 47,29x2,62-NBR)
03B2	R12240050	799113400

code B2 — With shaft code 03

German standard



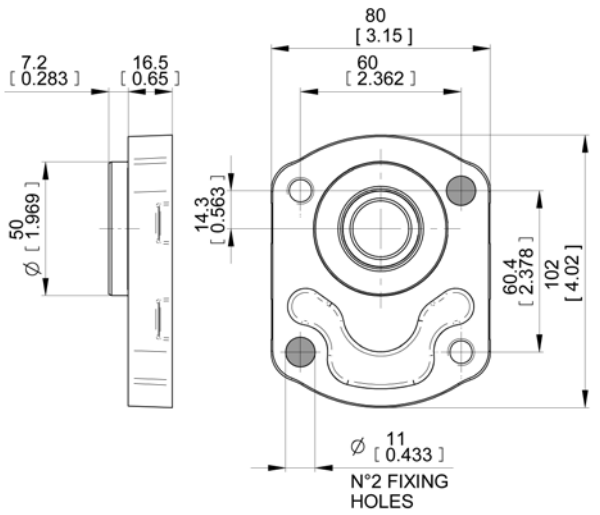
Code	Part Number (Unidirectional Pump)	
	Flange+O-ring	O-ring (OR3187-AT 47,29x2,62-NBR)
03B3	R12240060	799113400

code B3 — With shaft code 03

German standard

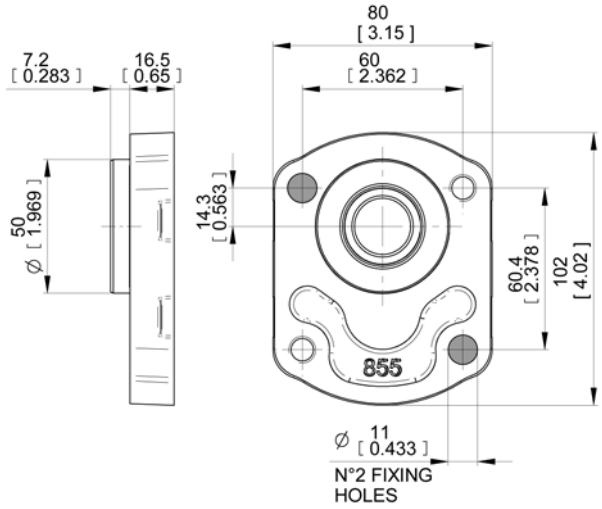
E0.146.0725.14.00IM03

Mounting Flanges



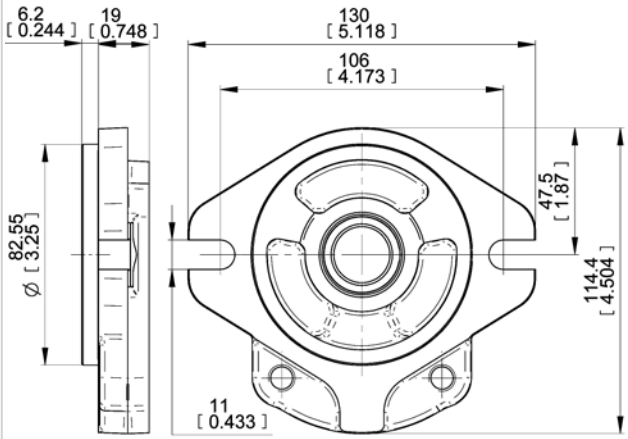
Code	Part Number (Unidirectional Pump)	
	Flange+Shaft seal kit	Shaft seal kit (See page 43-44)
04B4	R12240136 (NBR) R12240137 (FPM)	R12240110 (NBR) R12240115 (FPM)
25B4	R12240100 (NBR) R12240102 (FPM)	R12240010 (NBR) R12240021 (FPM)
62B4		

B4	With shaft code 04-25-62
German standard	



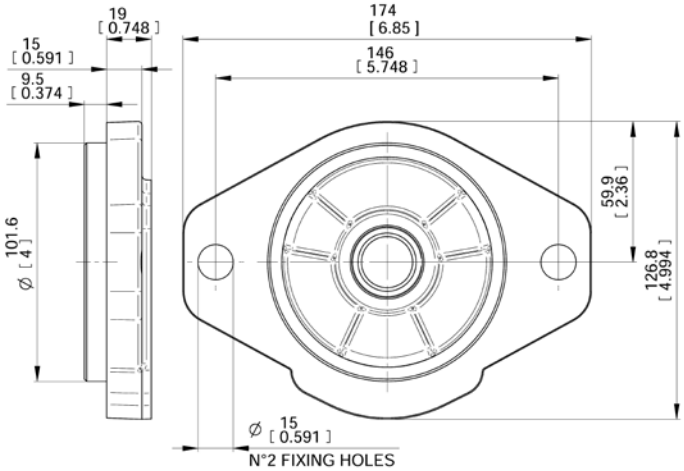
Code	Part Number (Unidirectional Pump)	
	Flange+Shaft seal kit	Shaft seal kit (See page 43-44)
04B5	R12240134 (NBR) R12240138 (FPM)	R12240110 (NBR) R12240115 (FPM)
25B5	R12240130 (NBR) R12240133 (FPM)	R12240010 (NBR) R12240021 (FPM)
62B5		

B5	With shaft code 04-25-62
German standard	



Code	Part Number (Unidirectional Pump)	
	Flange+Shaft seal kit	Shaft seal kit (See page 43-44)
52S2	R14640100 (NBR) R14640101 (FPM)	R12240010 (NBR) R12240021 (FPM)
82S2		
54S2	R14640110 (NBR) R14640111 (FPM)	R12240110 (NBR) R12240115 (FPM)
85S2		

S2	With shaft code 52-54-82-85
SAE A 2 Bolts	



Code	Part Number (Unidirectional Pump)	
	Flange+Shaft seal kit	Shaft seal kit (See page 43-44)
55S3 from cy 6.5 to 13.8	R12040310 (NBR) R12040311 (FPM)	R12240010 (NBR) R12240021 (FPM)
55S3 from cy 16 to 26	R14640050 (NBR) R14640060 (FPM)	R14640010 (NBR) R14640011 (FPM)

S3	With shaft code 55
SAE B 2 Bolts	

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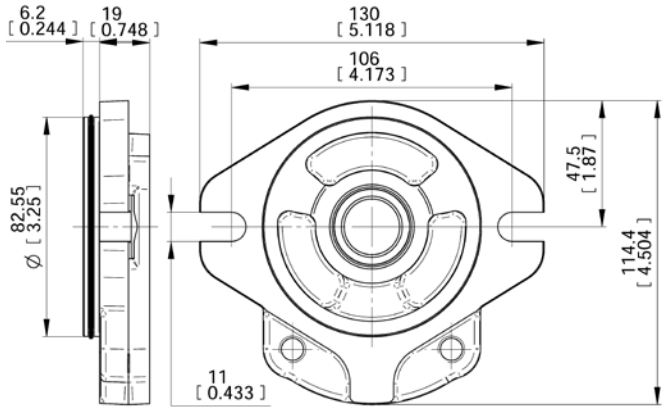
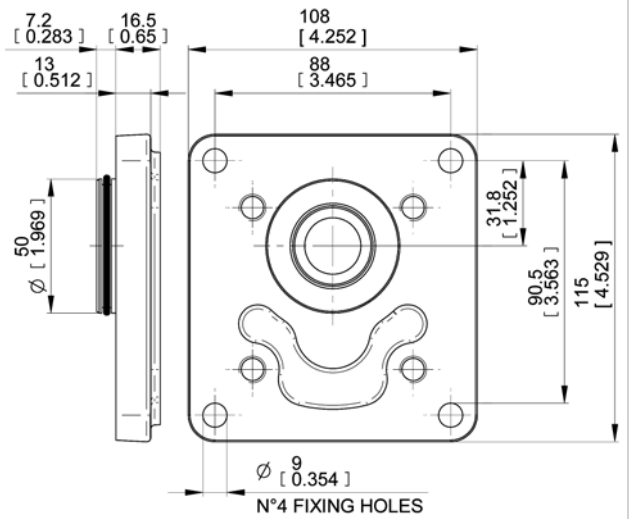
Mounting Flanges



Code	Part Number (Unidirectional Pump)	
	Flange+Shaft seal kit	Shaft seal kit (See page 43-44)
52S6	R14640020 (NBR) R14640021 (FPM)	R12240010 (NBR) R12240021 (FPM)
82S6		
54S6	R14640022 (NBR) R14640023 (FPM)	R12240110 (NBR) R12240115 (FPM)
85S6		

S6 — With shaft code 52-54-82-85

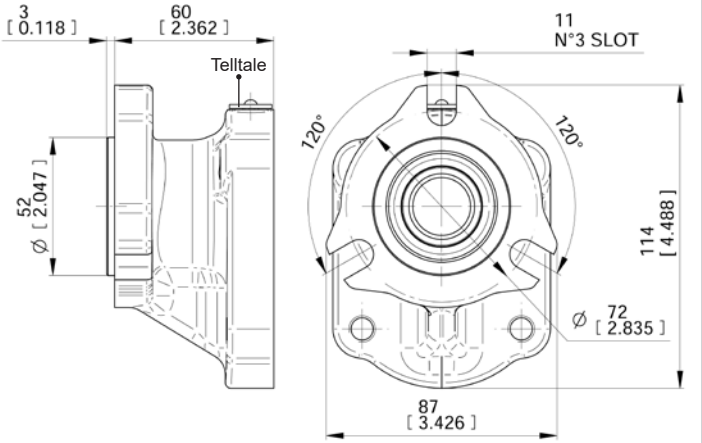
SAE A 2 BOLTS (with O-ring on the centering collar)



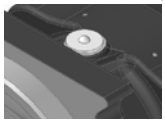
Code	Part Number (Unidirectional Pump)	
	Flange+Shaft seal kit	Shaft seal kit (See page 43-44)
62C1	R12040300 (NBR) R12040301 (FPM)	R12240010 (NBR) R12240021 (FPM)

C1 — With shaft code 62

4 bolts for Iveco engines



Continental shaft 73 included.

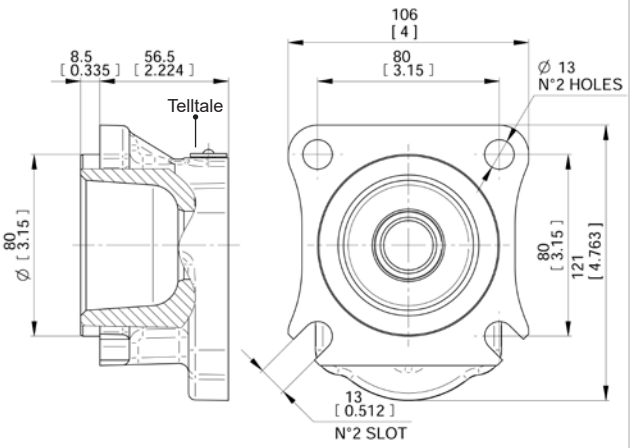


TellTale
drop in plug in case of failure, outside leakage trough the crossing hole is visible.

Code	Part Number (Unidirectional Pump)	
	Flange+Shaft seal kit	Shaft seal kit (See page 43-44)
73T1	R14620030 (NBR) R14620031 (FPM)	R14640010 (NBR) R14640011 (FPM)

T1 — With shaft code 73

3 Bolts UNI 8953 for gear box



Continental shaft 67 included.

Code	Part Number (Unidirectional Pump)	
	Flange+Shaft seal kit	Shaft seal kit (See page 43-44)
67Z2	R14620011 (NBR) R14620012 (FPM)	R14640010 (NBR) R14640011 (FPM)

Z2 — With shaft code 67

4 Bolts for zf gear box

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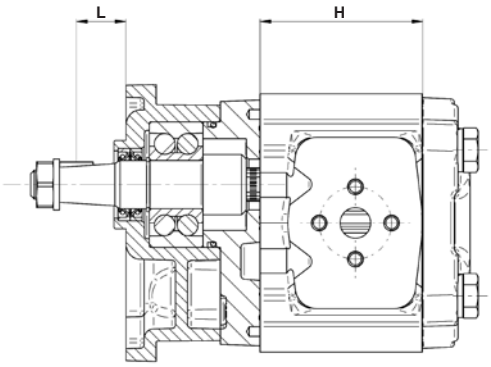
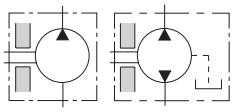
Mounting Flanges with Outrigger Bearing

The following diagrams show radial load capacity of the bearing.
Calculation according to ISO 281 at 10 cSt

L=Distance between mounting flange and radial force point of application [mm-inches]

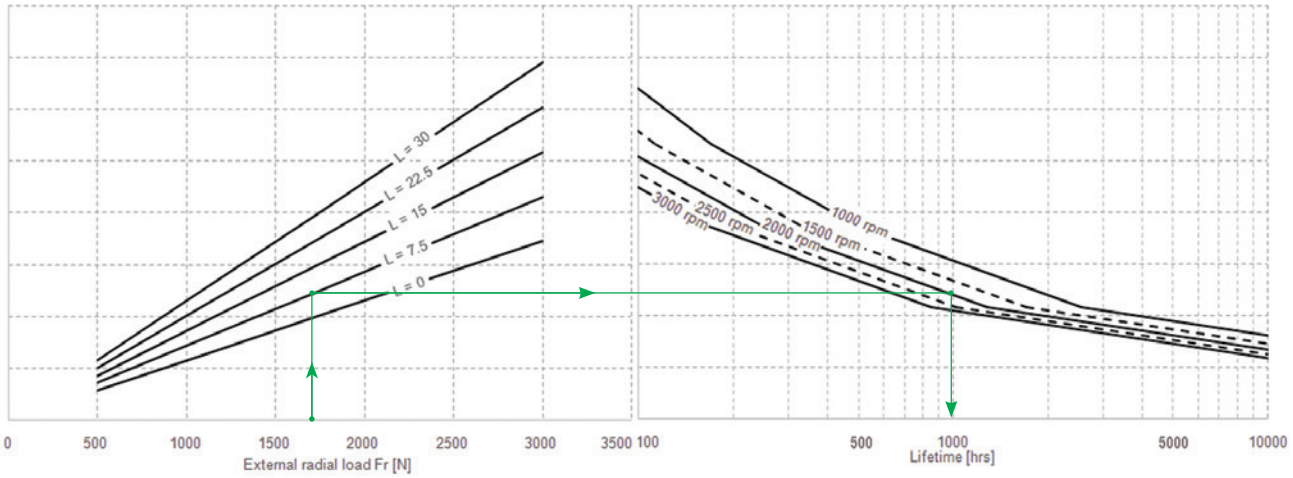




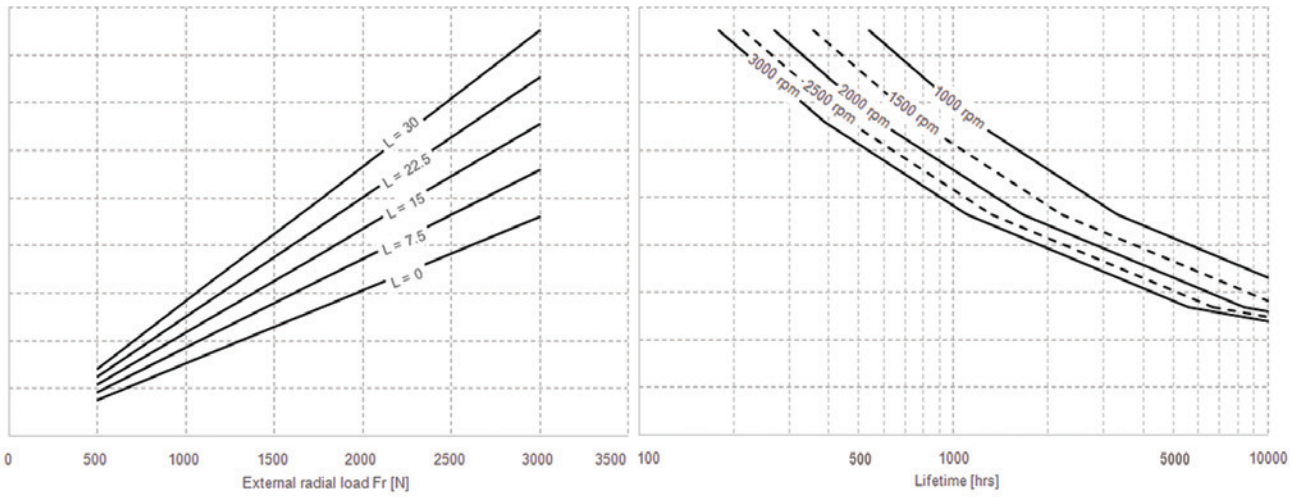
TYPE	H
6.5	49.95 (*1.97”*)
8.3	52.8 (*2.08”*)
11.3	59.7 (*2.35”*)
13.8	63.5 (*2.5”*)
16	67.5 (*2.66”*)
19	75.6 (*2.97”*)
22.5	81 (*3.19”*)
26	86.6 (*3.42”*)

Example:
Fr = 1700 N
L = 7.5 → Expected life: 1000 hrs
Speed = 2000 rpm

For Code CP-CB-CL-CS



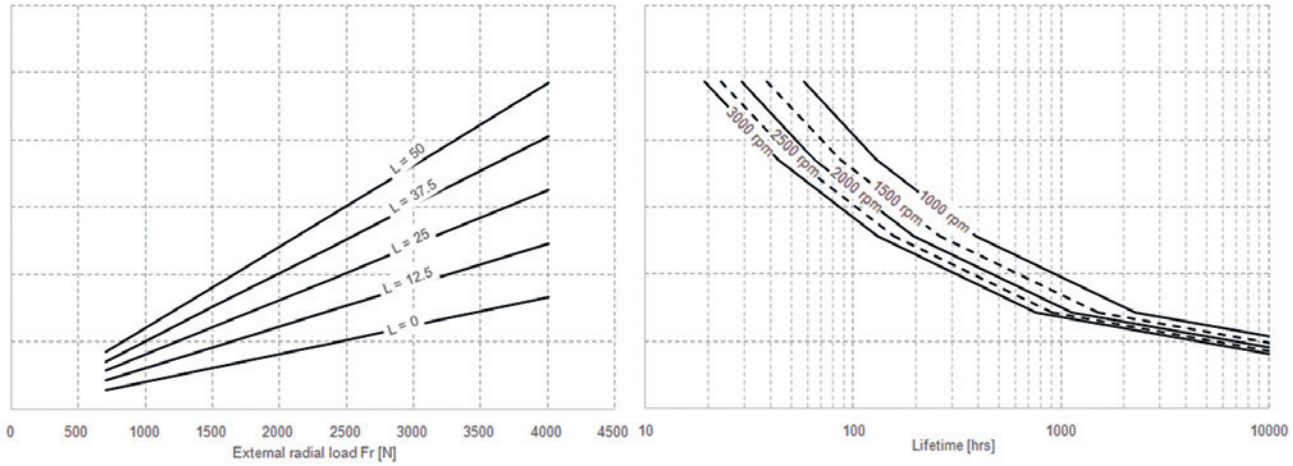
For Code CF



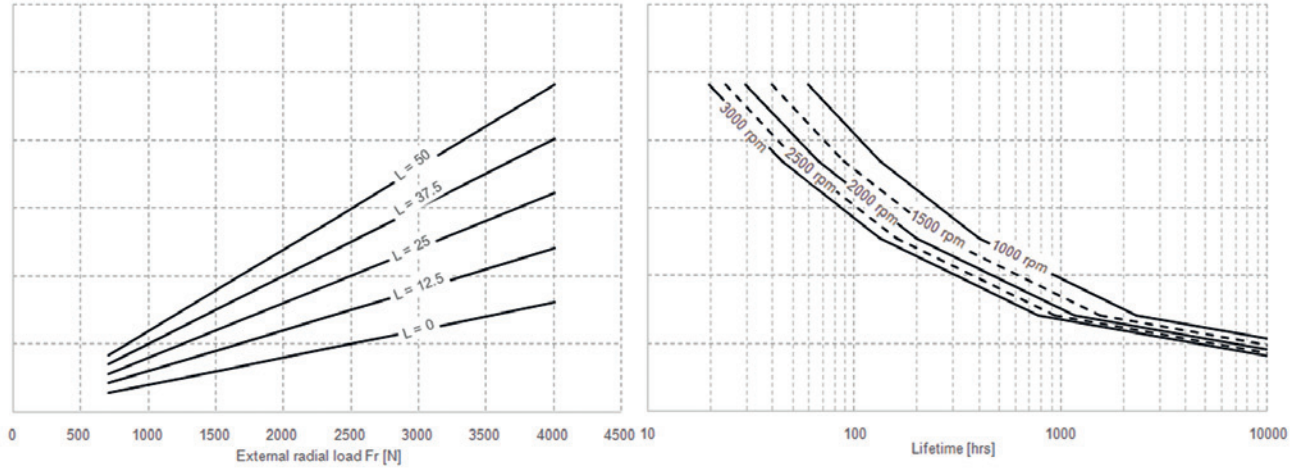
E0.146.0725.14.00IM03

Mounting Flanges with Outrigger Bearing

For Code Z1

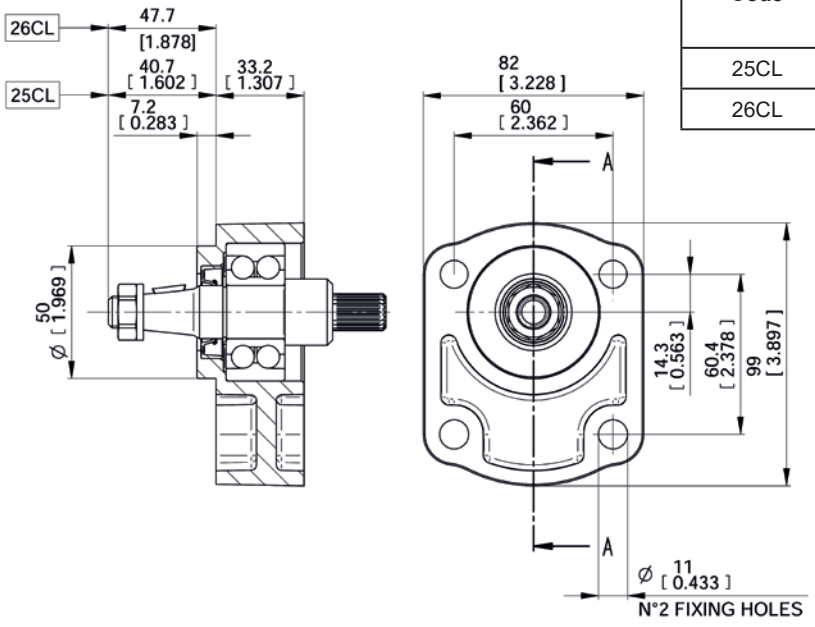


For Code CSB



Aluminium Mounting Flanges with Outrigger Bearing

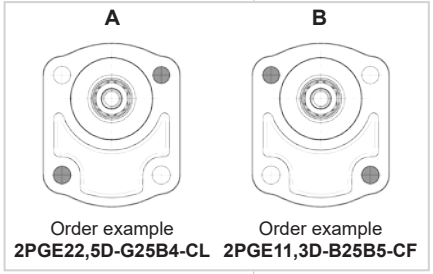
Code	Part Number	
	Flange+Bearing support	Kit Woodruff Key+Nut+Washer
25CL	R12040090	R12283030
26CL	R12040060	R12240080



• Available in two positions: A - B

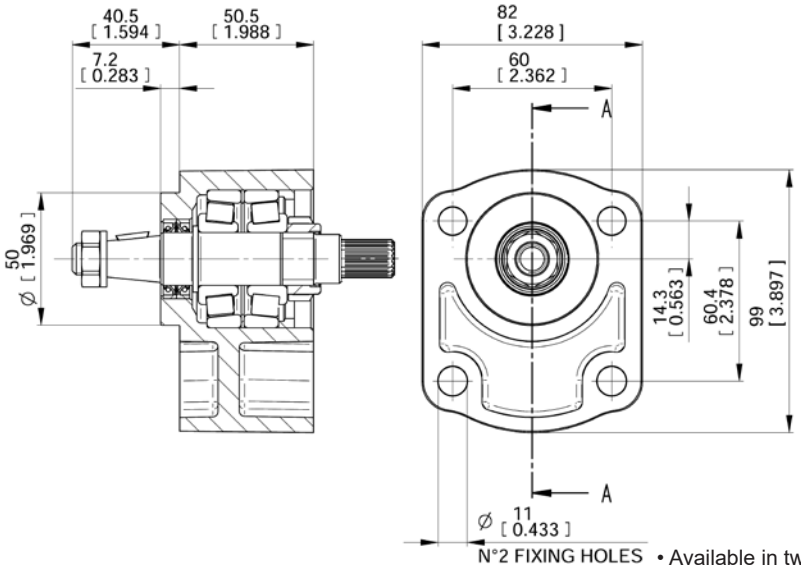
Mounting with shaft code 25

CL	With shaft code 25-26 - Max torque 100 Nm (885 lbt in)
For Internal combustion engines	



Order example
2PGE22,5D-G25B4-CL
R12240050

Order example
2PGE11,3D-B25B5-CF
R12240060



• Available in two positions: A - B

Code	Part Number	
	Flange+Bearing support	Kit Woodruff Key+Nut+Washer
25CF	R12040101	R12283030

CF	With shaft code 25 - Max torque 100 Nm (885 lbt in)
FOR INTERNAL COMBUSTION ENGINES WITH AXIAL AND RADIAL LOADS	

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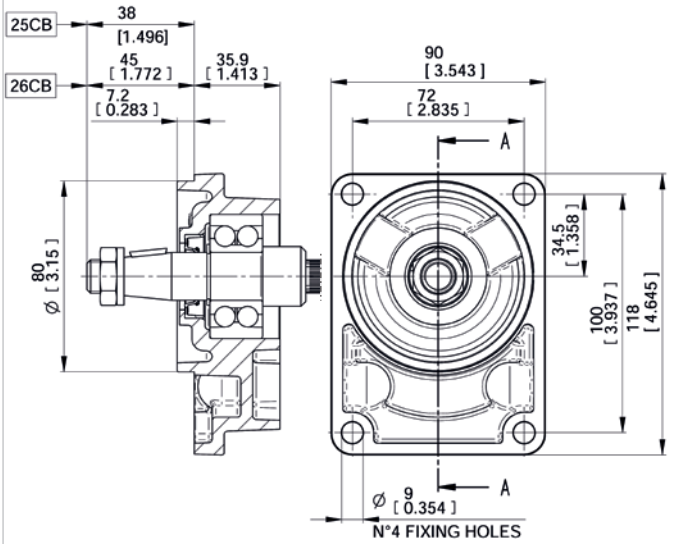
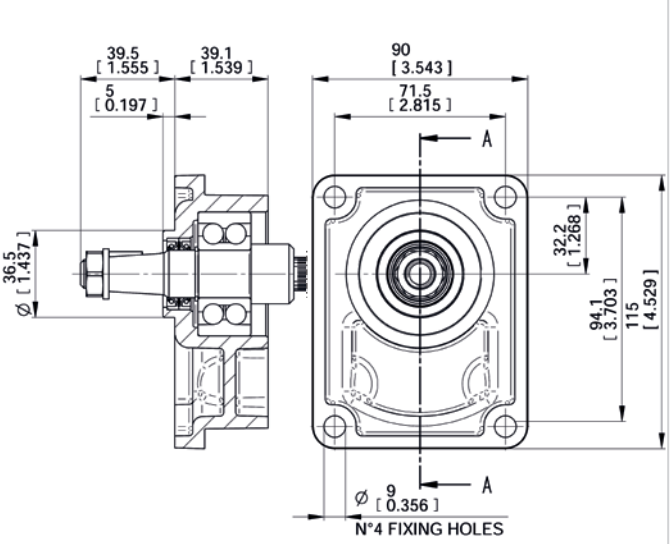
Aluminium Mounting Flanges with Outrigger Bearing



Mounting with shaft code 26

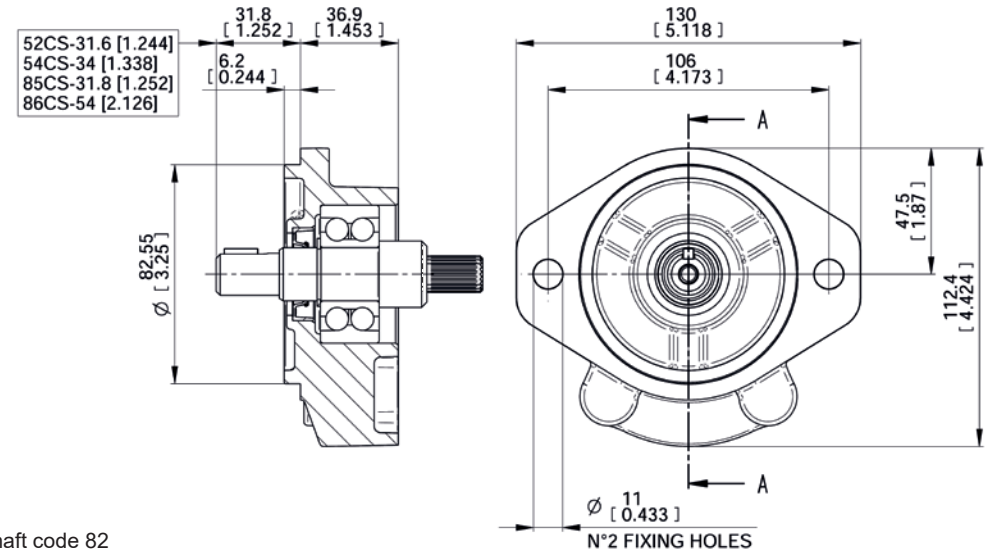
Code	Part Number	
	Flange+Bearing support	Kit Woodruff Key+Nut+Washer
25CB	R12040070	R12283030
26CB	R12040080	R12240080

CB	With shaft code 25-26 Max torque 100 Nm (885 lbt in)
German standard	



Code	Part Number	
	Flange+Bearing support	Kit Woodruff Key+Nut+Washer
28CP	R12040010	R12240070

CP	With shaft code 28 Max torque 100 Nm (885 lbt in)
European standard	



Mounting with shaft code 82

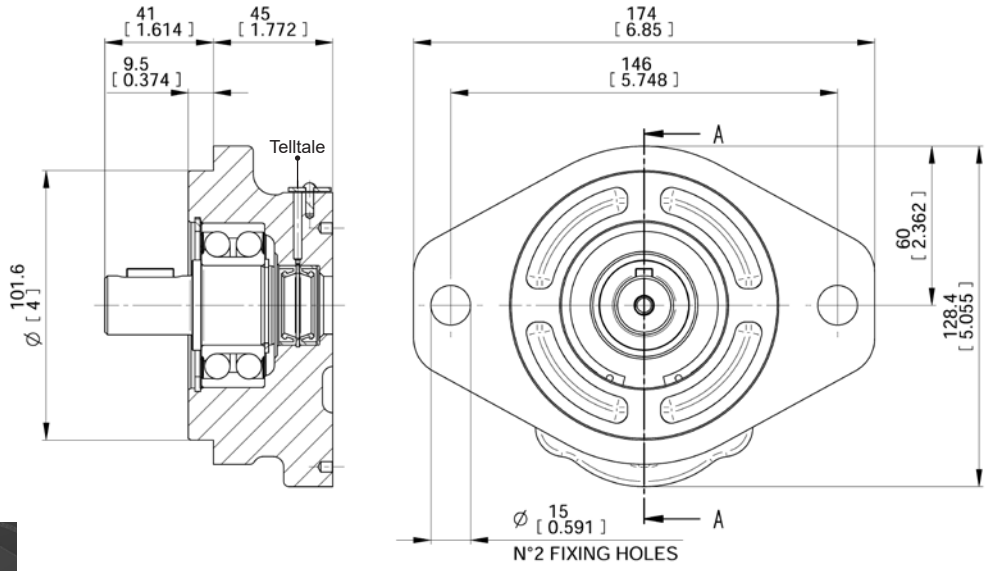
Code	Part Number
	Flange+Bearing support
52CS	R12040030
54CS	R12040020

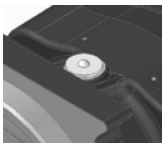
Code	Part Number	
	Flange+Bearing support	Key
82CS	R12040040	796620700
85CS	R12040050	796621000
86CS	R12040130	796622800

CS	With shaft code 52-54-82-85-86 - Max torque 100 Nm (885 lbt in)
SAE A	

E0.146.0725.14.00IM03

Cast Iron Mounting Flanges with Outrigger Bearing

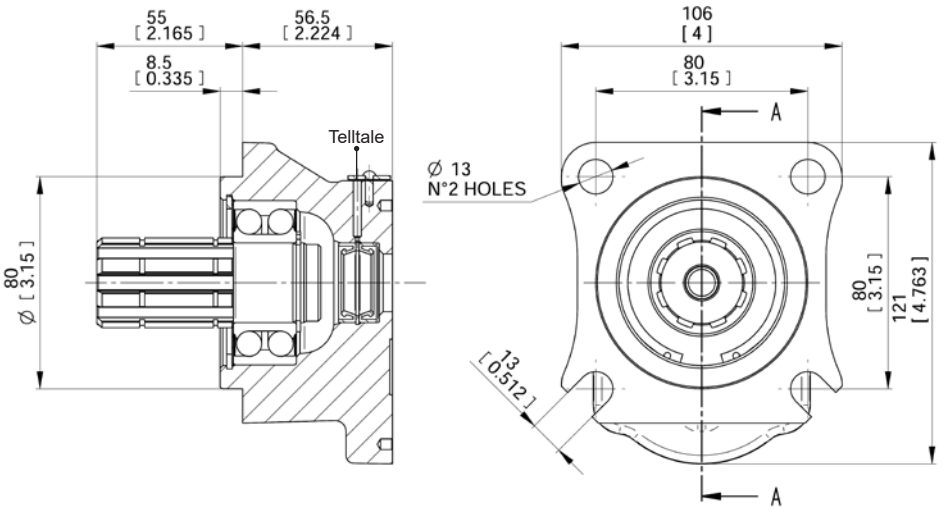




TellTale
drop in plug in case of failure, outside leakage trough the crossing hole is visible.

Code	Part Number	
	Flange+Bearing support	Key
87CSB	R14620020	796620800

CSB	With shaft code 87 - Max torque 200 Nm (1770 lbt in)
SAE B	



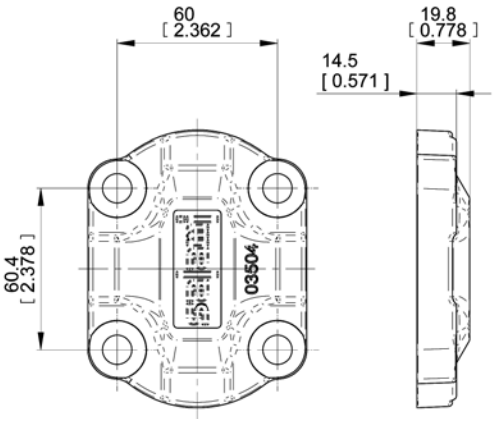
Available only for displacements from 11.3 to 26

Code	Part Number
	Flange+Bearing support
66Z1	R14620010

Z1	With shaft code 66 - Max torque 200 Nm (1770 lbt in)
4 Bolts for ZF gear box	

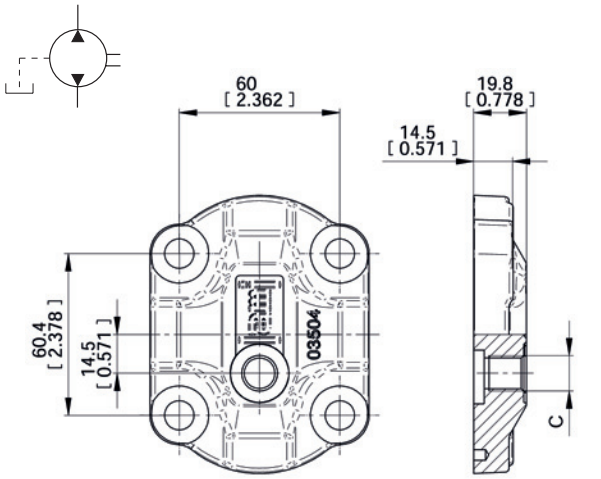
E0.146.0725.14.00IM03

Rear Covers



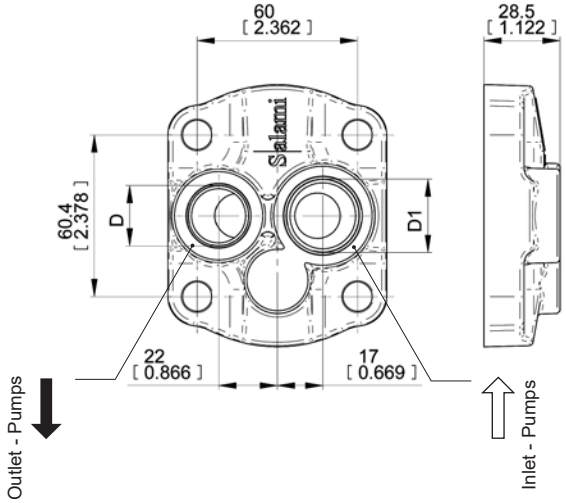
Code	Part Number
Standard Cover	312203529

STANDARD REAR COVER FOR UNIDIRECTIONAL PUMPS



Code	Part Number	Threaded Port
		C (Drain)
Cover with External Drain	312203552	7/16-20 UNF-2B SAE 4
	312203551	G 1/4

STANDARD REAR COVER WITH EXTERNAL DRAIN PORT (C) FOR BIDIRECTIONAL PUMPS

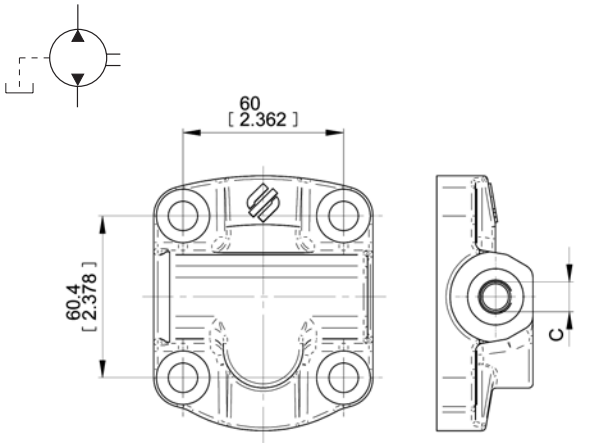


Code	Part Number	Threaded Ports	
		D (Outlet)	D1 (Inlet)
1 Cover with rear ports	312203535	7/8-14 UNF-2B SAE 10	1-1/16-12 UN-2B SAE 12
	312203543	G 1/2	G 3/4

On request outlet port only.

1

REAR COVER WITH PORTS FOR UNIDIRECTIONAL PUMPS

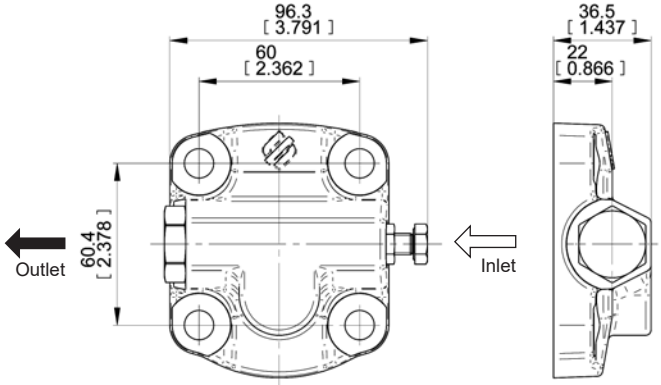


Code	Part Number	Threaded Port
		C (Drain)
LD Cover with External Drain	312203545	7/16-20 UNF-2B SAE 4
	312003509	G 1/4

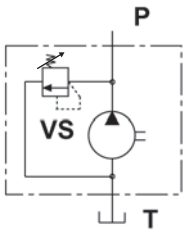
LD

REAR COVER WITH SIDE DRAIN PORT (C) FOR BIDIRECTIONAL PUMPS

Rear Covers with Valves

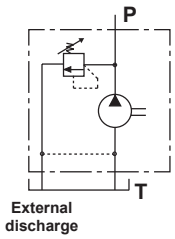


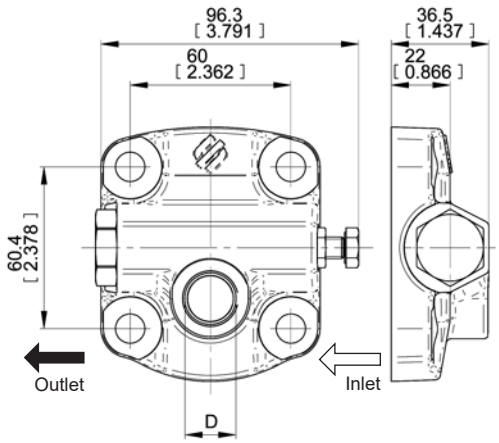
Code	Part Number	Pressure relief valve setting range
VS Internal Discharge	R12275013	15-30 bar
	R12275020	30-60 bar
	R12275040	61-120 bar
	R12275050	121-170 bar
	R12275060	171-250 bar



VS

INTERNAL DISCHARGE FOR UNIDIRECTIONAL PUMPS





Code	Part Number	Pressure relief valve setting range	D (external discharge)
VSE External Discharge for Unidirectional Pumps	R12275014	15-30 bar	SAE 8
	R12275021	30-60 bar	
	R12275041	61-120 bar	
	R12275051	121-170 bar	
	R12275061	171-250 bar	
	R12275015	15-30 bar	M18x1.5
	R12275022	30-60 bar	
	R12275042	61-120 bar	
	R12275052	121-170 bar	
	R12275062	171-250 bar	
	R12275016	15-30 bar	G 3/8
	R12275023	30-60 bar	
	R12275043	61-120 bar	
	R12275053	121-170 bar	
	R12275063	171-250 bar	

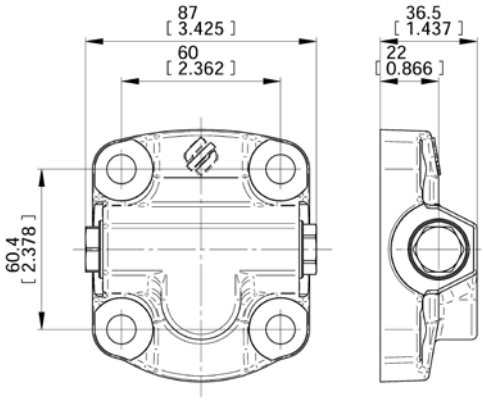
Available VSE version for Bidirectional Pumps.
Please contact our sales department

VSE

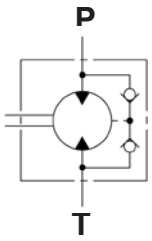
EXTERNAL DISCHARGE FOR UNIDIRECTIONAL PUMPS

E0.146.0725.14.00IM03

Rear Covers with Valves



Code	Part Number
IDV Internal drain	R12203501

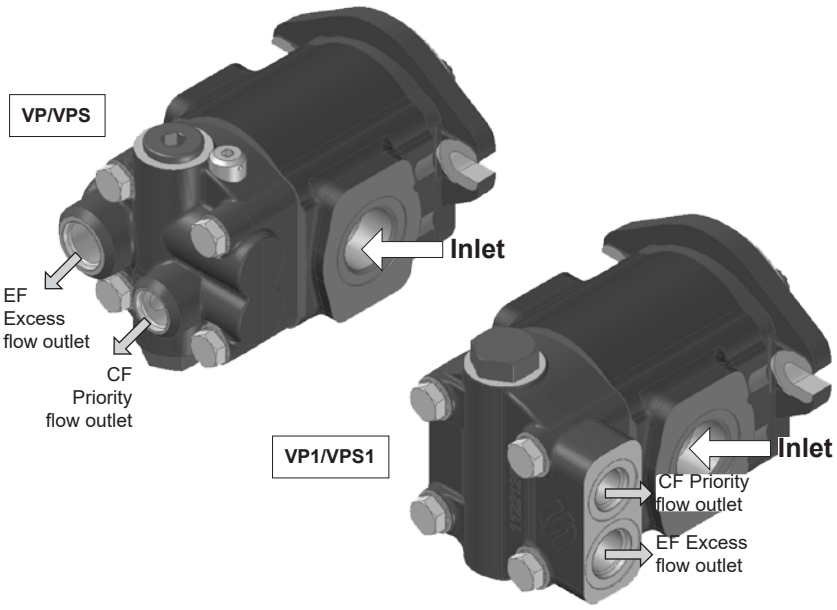


IDV

INTERNAL DRAIN FOR BIDIRECTIONAL PUMPS

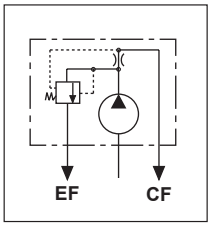
Rear Covers with Valves

Pressure compensated priority flow valve to feed two pressurized circuitat the same time, priority flow CF remains constant regardless of pump speed and system pressure variations. Excess flow EF is directly proportional to pump speed. Priority flow is determined by diameter of calibrated orifice, see table at page 38). The max. pressure of the priority circuit can be limited by valve which relieves into pump suction line.



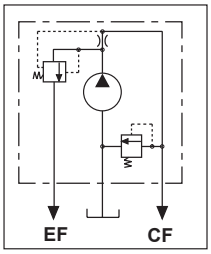
CF= Priority flow port
EF= Excess flow port

VP - VP1

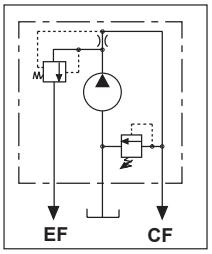


Priority flow valve, excess flow available to second actuator.

VPS



VPS1

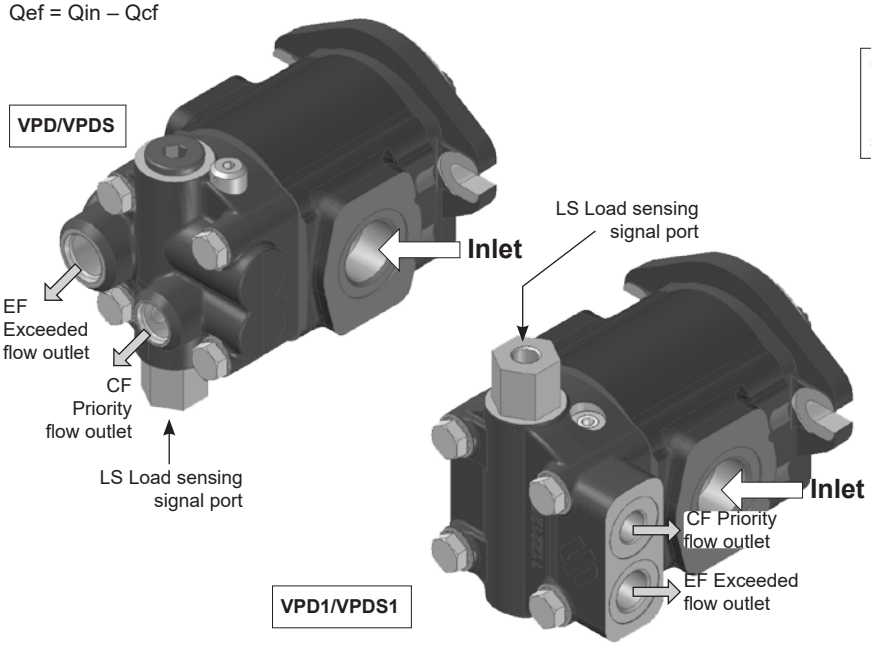


Priority flow valve, excess flow available to second actuator with pressure relief valve on priority flow line.

VP/VP1/VPS/VPS1	PRESSURE COMPENSATED PRIORITY FLOW VALVES

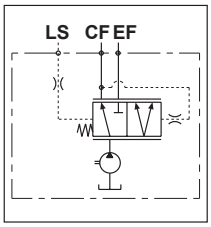
The load sensing priority valve is a control valve able to divide the flow generated by the pump, coming from the port P, in two different flows named Qcf and Qef. The Qcf flow follows the user request, the flow Qef changes according to the equation:
Qin = Qcf + Qef

This valve is used in hydraulic steering systems, the CF port is connected to the inlet of power steering unit while the other functions (lifter etc…) are connected to the EF port. The load sensing LS signal of the valve is connected to the LS of powersteering unit.
The regulated flow Qcf depends on the steering speed, the remaining flow Qef is available for the other funcions and complies with the equation:
Qef = Qin – Qcf



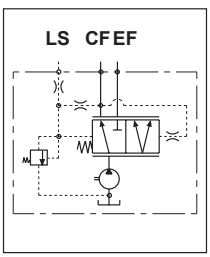
CF= Priority flow port
EF= Excess flow port
LS= Load sensing signal port

VPD - VPD1

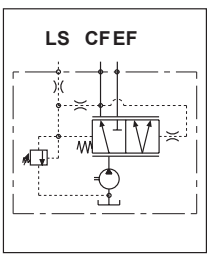


Load sensing priority valve with dynamic signal without pressure relief valve.

VPDS



VPDS1

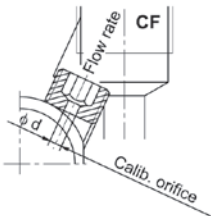


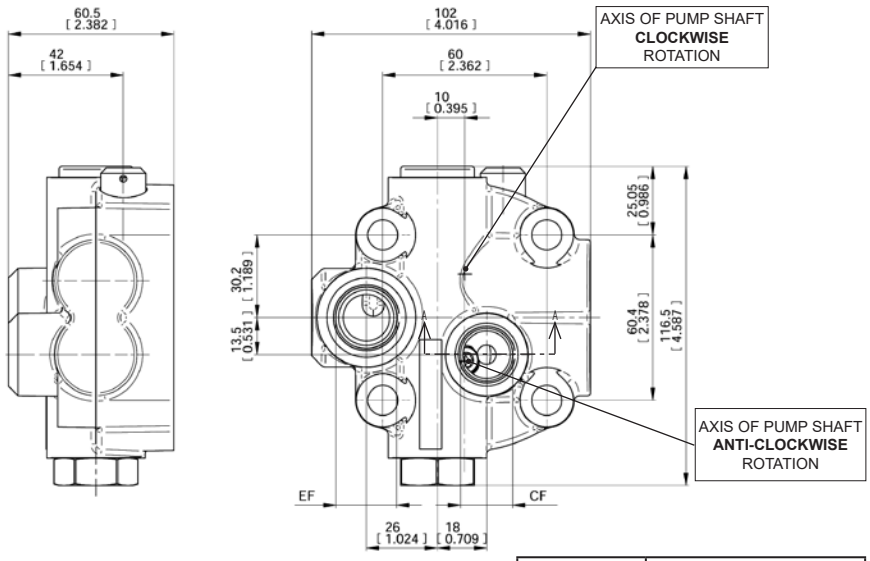
Load sensing priority valve with dinamic signal with pressure relief valve.

VPD/VPD1/VPDS/VPDS1	LOAD SENSING PRIORITY VALVES

E0.146.0725.14.00IM03

Pressure Compensated Priority Flow Valve

Flow Rate Table			
 Det. A-A			
Calibrated Orifice Φ d		**Flow Rate** ± 10%	
mm	*inch*	l/min	*gpm*
1.5	*0.06*	2.5	*0.66*
2	*0.08*	4	*1.06*
2.4	*0.09*	6	*1.59*
2.8	*0.11*	8	*2.11*
3.1	*0.12*	10	*2.64*
3.5	*0.14*	12.5	*3.30*
4	*0.16*	16	*4.23*
4.4	*0.17*	20	*5.28*
4.9	*0.19*	25	*6.61*

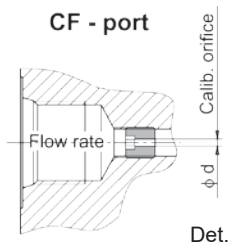


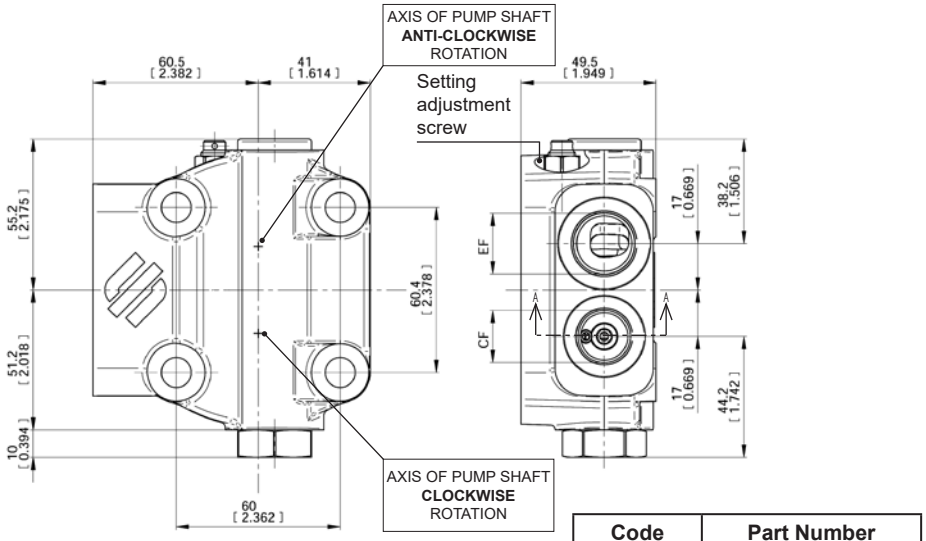
Threaded Port	
CF= Priority flow port	**EF= Excess flow port**
G 3/8	G 1/2
SAE 6 9/16-18 UNF-2B	SAE 8 3/4 - 16 UNF - 2B

Code	Part Number
VP - VPS	Please contact our sales department

Pressure Relief Valve setting range
20-240 bar

VP	**VPS**
Excess flow available to second actuator - REAR PORTS	Excess flow available to second actuator with **fixed setting** pressure relief valve on priority flow line - REAR PORTS

Flow Rate Table			
CF - port  Det. A-A			
Calibrated Orifice Φ d		**Flow Rate** ± 10%	
mm	*inch*	l/min	*gpm*
1.5	*0.06*	2.5	*0.66*
2	*0.08*	4	*1.06*
2.4	*0.09*	6	*1.59*
2.8	*0.11*	8	*2.11*
3.1	*0.12*	10	*2.64*
3.5	*0.14*	12.5	*3.30*
4	*0.16*	16	*4.23*
4.4	*0.17*	20	*5.28*
4.9	*0.19*	25	*6.61*



Threaded Port	
CF= Priority flow port	**EF= Excess flow port**
G 3/8	G 1/2
SAE 8 3/4 - 16 UNF - 2B	SAE 10 7/8 - 14 UNF - 2B

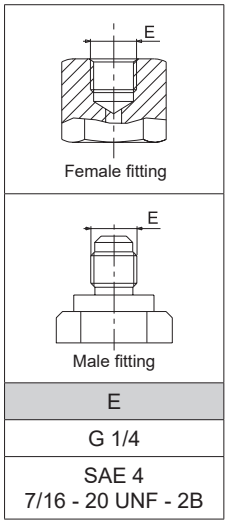
Code	Part Number
VP1 - VPS1	Please contact our sales department

Pressure Relief Valve setting range
30-110 bar
110-380 bar

VP1	**VPS1**
Excess flow available to second actuator - SIDE PORTS	Excess flow available to second actuator with **adjustable setting** pressure relief valve on priority flow line - SIDE PORTS

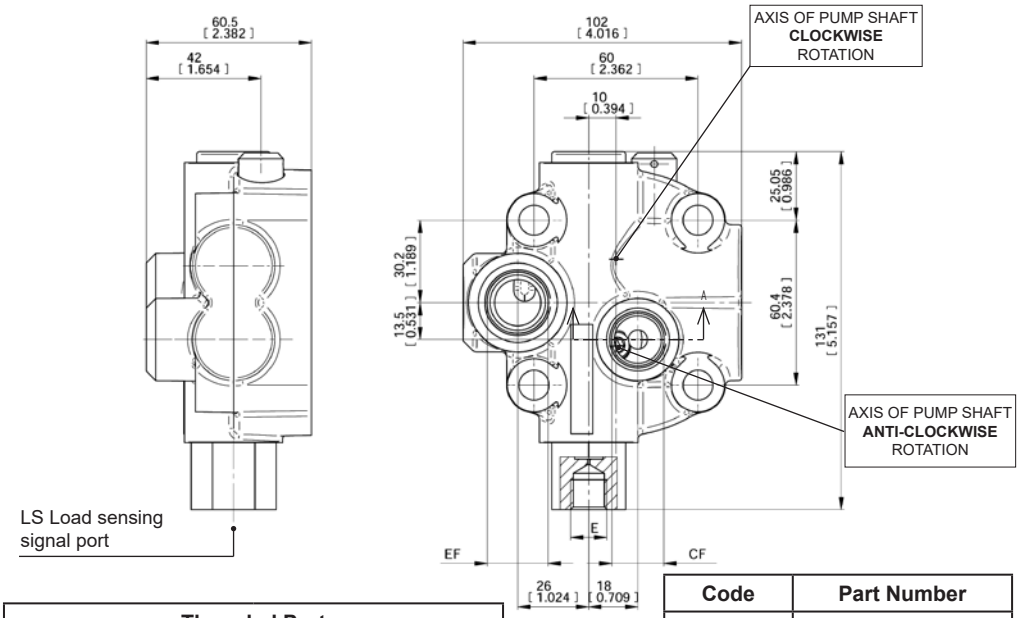
E0.146.0725.14.00IM03

Load Sensing Priority Valve



E
G 1/4
SAE 4 7/16 - 20 UNF - 2B

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

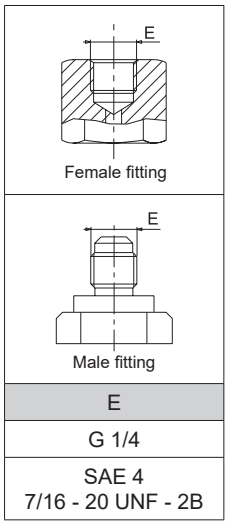


Threaded Port	
CF= Priority flow port	**EF= Excess flow port**
G 3/8	G 1/2
SAE 6 9/16-18 UNF-2B	SAE 8 3/4 - 16 UNF - 2B

Code	Part Number
VPD - VPDS	Please contact our sales department

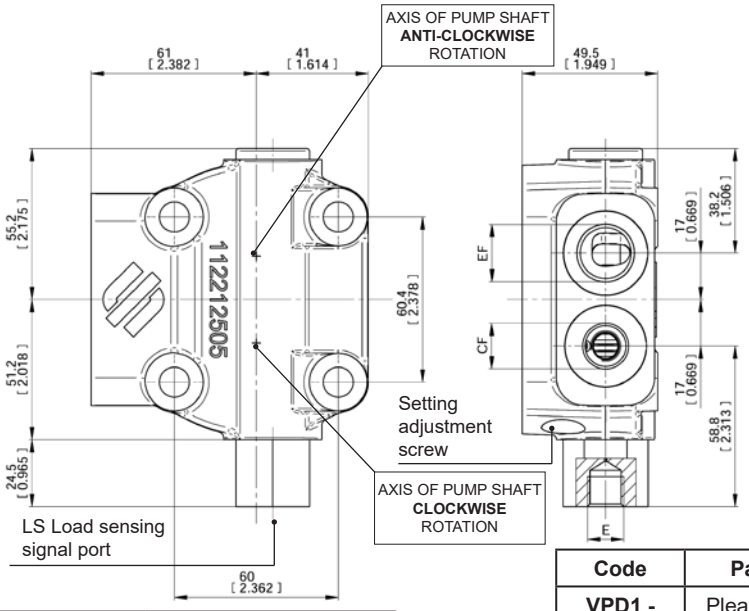
Pressure Relief Valve setting range
20-240 bar

VPD	VPDS
Dynamic signal without pressure relief valve REAR PORTS	Dinamic signal with **fixed setting** pressure relief valve REAR PORTS



E
G 1/4
SAE 4 7/16 - 20 UNF - 2B

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



Threaded Port	
CF= Priority flow port	**EF= Excess flow port**
G 3/8	G 1/2
SAE 8 3/4 - 16 UNF - 2B	SAE 10 7/8 - 14 UNF - 2B

Code	Part Number
VPD1 - VPDS1	Please contact our sales department

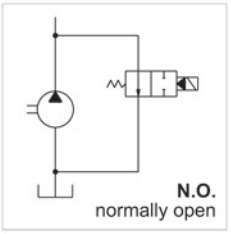
Pressure Relief Valve setting range
30-110 bar
110-380 bar

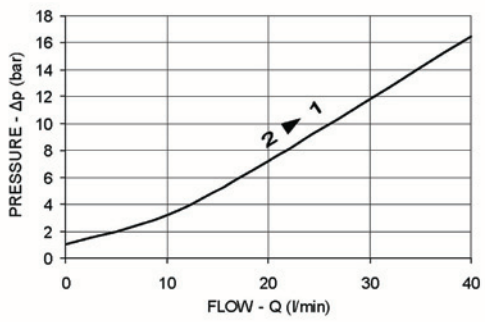
VPD1	VPDS1
Dynamic signal without pressure relief valve SIDE PORTS	Dinamic signal with **adjustable setting** pressure relief valve SIDE PORTS

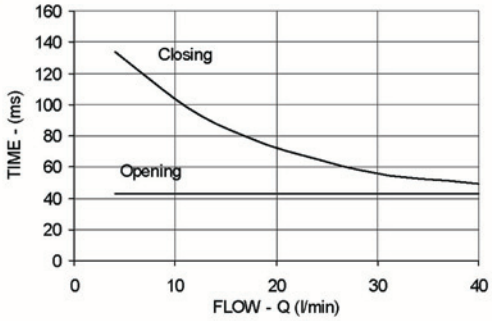
E0.146.0725.14.00IM03

Rear Covers with Valves

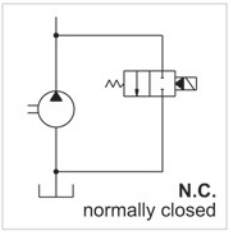
EV1 - 12 Vcc
EV2 - 24 Vcc

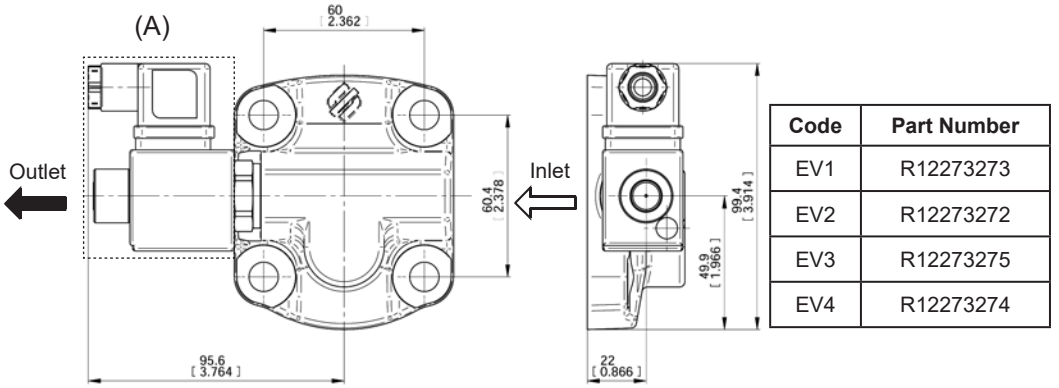






EV3 - 12 Vcc
EV4 - 24 Vcc





Code	Part Number
EV1	R12273273
EV2	R12273272
EV3	R12273275
EV4	R12273274

EV1-EV2-EV3-EV4

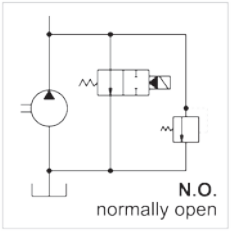
UNLOADING 2W-2P SOLENOID VALVE

Part Number			
(A) Coil+Mech.Part+Connector			
EV1/EVS1	EV2/EVS2	EV3/EVS3	EV4/EVS4
796332680	796332681	412271232	412271233

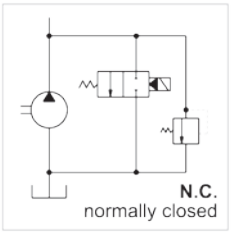
Part Number
Connector DIN 43650 A/ISO 4400
796361600

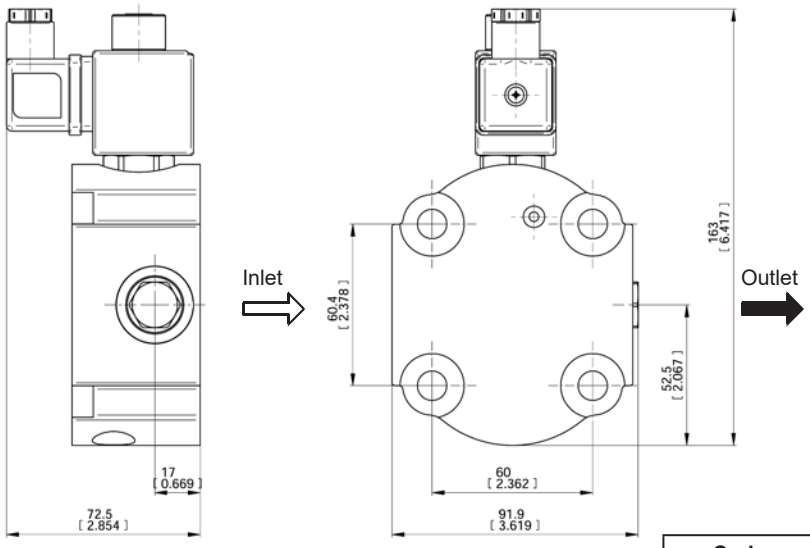
COIL SPECIFICATIONS - EV/EVS
- Coil resistance: 12 Vdc - 24 Vdc
- Coil power: 18W
- Connector: DIN 43650
- Protection index with connector: IP 65
- ED 100%

EVS1 - 12 Vcc
EVS2 - 24 Vcc



EVS3 - 12 Vcc
EVS4 - 24 Vcc





Pressure Relief Valve setting range
25-210 bar

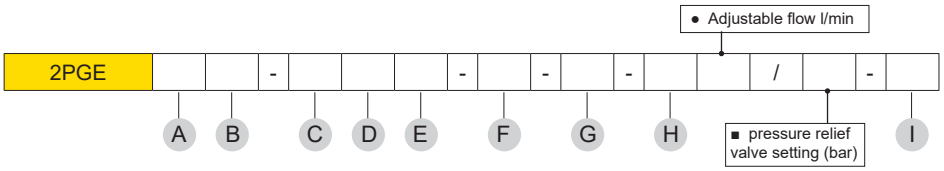
Code	Part Number
EVS1-EVS2 EVS3-EVS4	Please contact our sales department

EVS1-EVS2-EVS3-EVS4

UNLOADING 2W-2P SOLENOID VALVE AND RELIEF

E0.146.0725.14.00IM03

How to order Single Pump
2PGE, displacement (19), clockwise rotation (D), ports SAE (R), drive shaft (54), mounting flange (S2)=
2PGE19D-R54S2



A CODE	DISPLACEMENTS	
6.5	6.5 cm³/rev.	*0.40 cu.in/rev.*
8.3	8.3 cm³/rev.	*0.51 cu.in/rev.*
11.3	11.5 cm³/rev.	*0.68 cu.in/rev.*
13.8	14 cm³/rev.	*0.85 cu.in/rev.*
16	16.6 cm³/rev.	*1.01 cu.in/rev.*
19	19.4 cm³/rev.	*1.18 cu.in/rev.*
22.5	22.9 cm³/rev.	*1.37 cu.in/rev.*
26	26.7 cm³/rev.	*1.63 cu.in/rev.*
28	28.1 cm³/rev.	*1.71 cu.in/rev.*

B ROTATION	CODE
Clockwise	D
Anti-clockwise	S
Reversible	R

C PORTS	CODE
Flanged ports european standard	P
Flanged ports german standard	B
Flanged ports SAE J518 Metric thread	W
Flanged ports SAE J518 American standard thread	S
Threaded ports GAS (BSPP)	G
Threaded ports SAE (ODT)	R

D DRIVE SHAFT	CODE
Tang drive for electric motors	03
Tang drive	04
Tapered 1:5	25
Tapered 1:8	28
SAE A splined 9T	52
SAE A splined 11T	54
SAE B splined 13T	55
9 teeth DIN 5482 splined	62
DIN 5480 internal splined **(only for rear pumps-see page 24)**	60
5/8" SAE A parallel	82
3/4" SAE A parallel (Mounting face 31.8 mm)	85
Tapered 1:5 (only for CB-CL) Continental shaft	26
3/4" SAE A Parallel Continental shaft (Mounting face 54 mm)	86
7/8" SAE B Parallel Continental shaft	87
8x32x36 UNI 8953 splined Continental shaft	66
8x32x36 UNI 8953 splined Continental shaft	67
6x21x25 UNI 8953 splined Continental shaft	73

E MOUNTING FLANGES	CODE
European standard	P1
German standard Ø80	B1
German standard Ø52	B2-B3
German standard Ø50	B4-B5
4 bolts for Iveco engines	C1
SAE A 2 bolts	S2
SAE B 2 bolts	S3
SAE A 2 Bolts (with o-ring on the centering collar)	S6
3 BOLT UNI 8953 for gear box	T1
4 Bolts for ZF gear box	Z2
For Internal combustion engines with Outrigger bearing	CL
For Internal combustion engines with axial and radial loads - with Outrigger bearing	CF
SAE A with Outrigger bearing	CS
German standard with Outrigger bearing	CB
European standard with Outrigger bearing	CP
SAE B with Outrigger bearing	CSB
4 Bolts for ZF gear box with Outrigger bearing	Z1

F SEAL	CODE
Buna standard (standard configuration)	-
Viton	V

G PORTS LAYOUT	CODE
Side ports (standard configuration)	-
Rear ports	1

H REAR COVERS	CODE
Lateral drain	LD
Adjustable pressure relief valve-Internal discharge	■ VS
Adjustable setting pressure relief valve-External discharge	■ VSE
Internal drain valve	IDV
Priority flow valve with excess flow to 2nd actuator	• VP-VP1
Priority flow valve with excess flow to 2nd actuator with pressure relief valve	■ • VPS-VPS1
Load sensing priority valve with dinamic signal	VPD-VPD1
Load sensing priority valve with dinamic signal and pressure relief valve	■ VPDS VPDS1
Electric unloading valve (12V)	EV1/EV3
Electric unloading valve (24V)	EV2/EV4
Pressure relief and electric unloading valves (12V)	EVS1/EVS3
Pressure relief and electric unloading valves (24V)	EVS2/EVS4
Pre-arranged for 1.5PE rear	PD1.5

I PAINTING	CODE
Not painted (standard configuration)	-
Black painted RAL 9005	BP

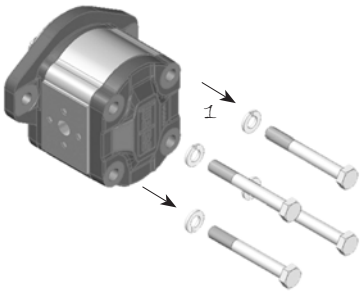
E0.146.0725.14.00IM03

Single Pump Changing Rotation Instructions

Keep the working surface cleaned as well as the exterior of the pump before starting and avoid inner contamination of the pump. The pump shown below is a clockwise rotating pump.
To achieve anti - clockwise rotation, please read the following instructions carefully.

CLOCKWISE ROTATION

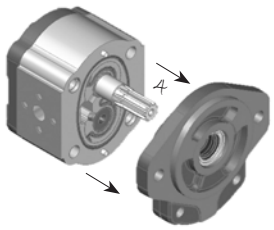
Inlet → Outlet



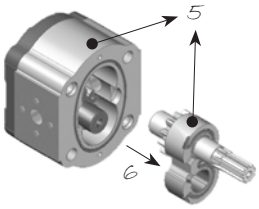
1 - Loosen and fully unscrew the bolts.

2 - Lay the pump on the working area in order to have the mounting flange turned upside.

3 - Coat the shaft end with grease to avoid damaging the shaft seal.

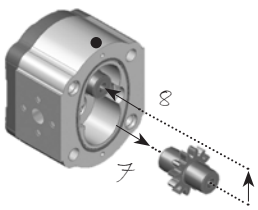


4 - Remove the flange and lay it on the working area; verify that the seal is correctly located in the body seat.



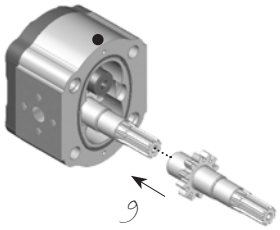
5 - Mark the position of the bushing and eventually of the thrust plate, as well, with reference to the body.

6 - Remove the bushing, thrust plate and the driving gear taking care to avoid driven gear axial shifts.

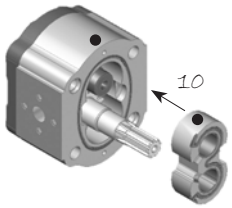


7 - Draw out the driven gear from its housing, taking care to avoid rear cover axial shifts.

8 - Re-locate the driven gear in the position previously occupied by the driving gear.



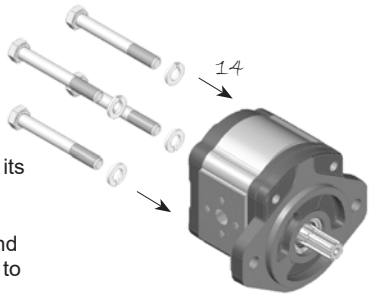
9 - Re-locate the driving gear in the position previously occupied by the driven gear.



10 - Replace the bushing and thrust plate taking care that:
- marks are located as on the picture
- surface containing the seal is visible
- seal and its protection are correctly located.

11 - Clean the body and mounting flange facing surfaces.

12 - Verify that the two plugs are located in the body.



13 - Refit the mounting flange, turned 180° from its original position.

14 - Replace the bolts and tighten clockwise evenly to an appropriate torque.

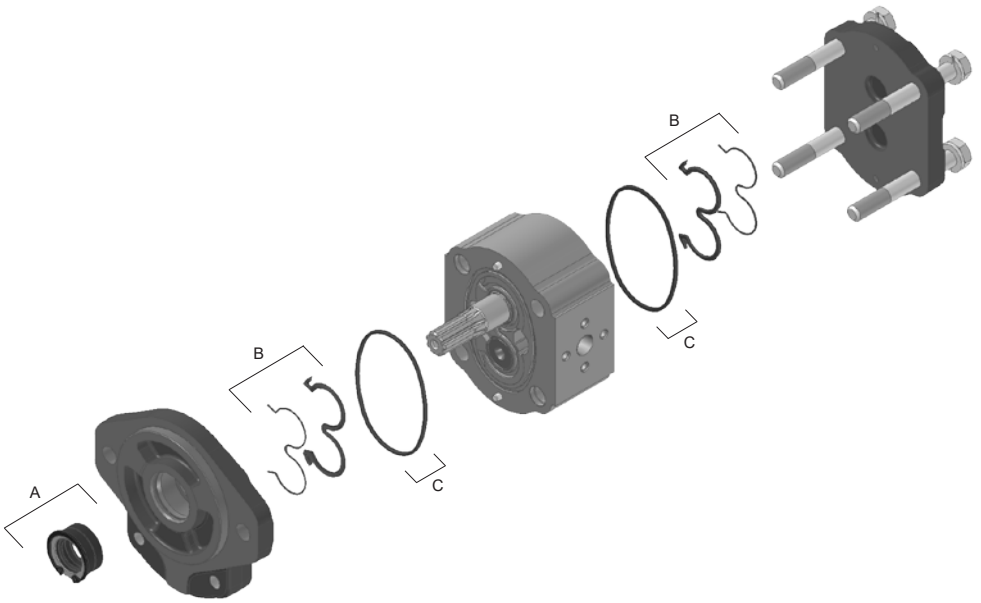
15 - Check that the shaft rotates freely.

16 - Mark on the flange the new direction of rotation.

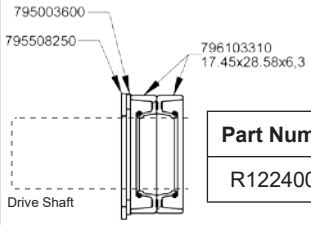
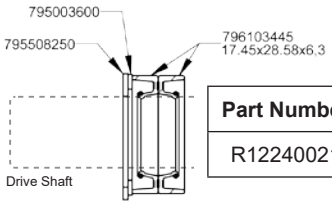
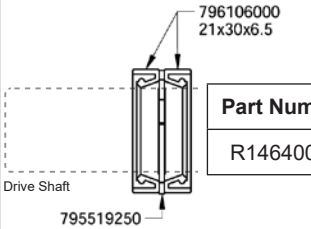
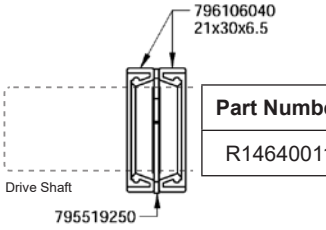
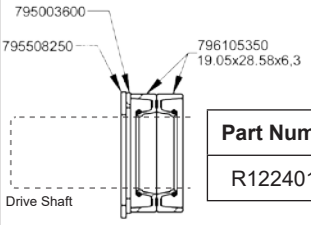
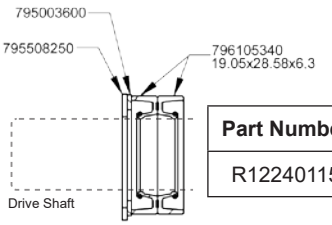
ANTI - CLOCKWISE ROTATION

Outlet ← Inlet

Unidirectional Pump Seal Spare Parts Kit

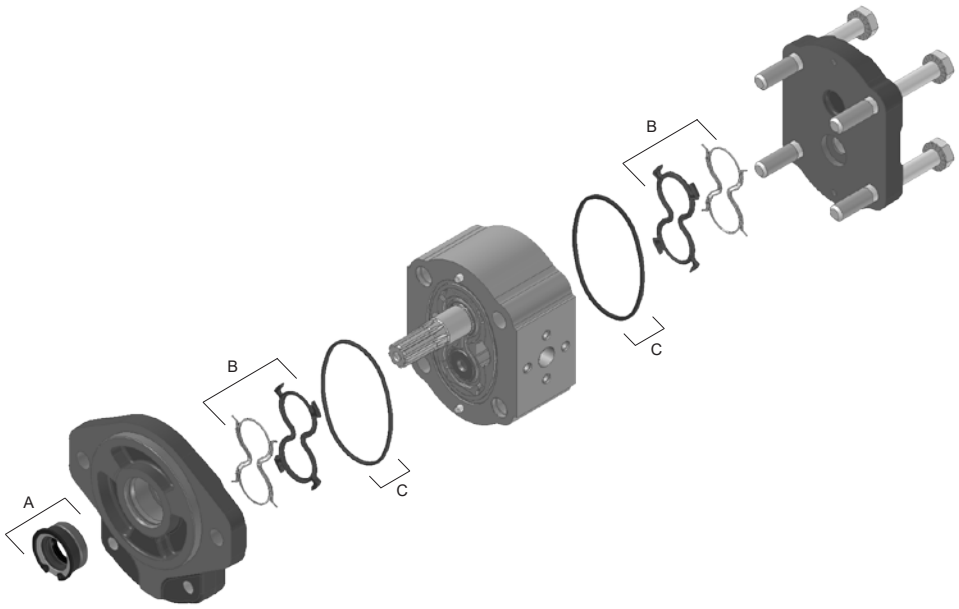


A	*Shaft seal*
B	*Bushing seal kit*
C	*Body seal kit*

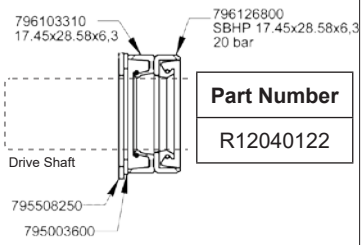
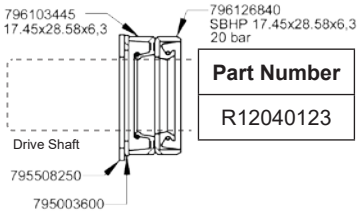
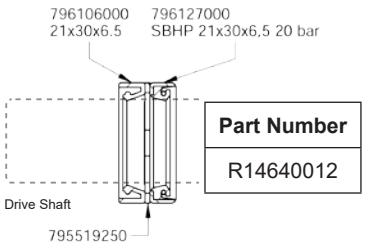
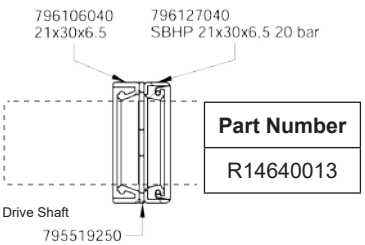
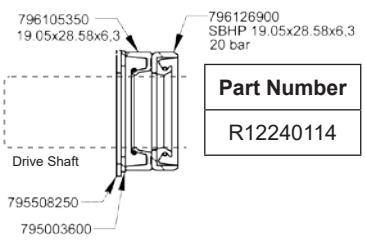
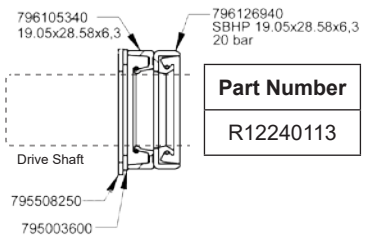
SHAFT & FLANGE TYPE	NBR COMPOUND		FPM COMPOUND	
	Complete seal kit (A+B+C)	Shaft seal kit (A)	Complete seal kit (A+B+C)	Shaft seal kit (A)
28P1 25B1/B4/B5 62P1/B1/B4/B5 82P1/S2/S6 52S2/S6 55S3 (Coupling sleeve)	**Part Number** R12292830	 **Part Number** R12240010	**Part Number** R12292950	 **Part Number** R12240021
55S3 (Solid Shaft) **73T1 67Z2**	**Part Number** R14690010	 **Part Number** R14640010	**Part Number** R14690020	 **Part Number** R14640011
54S2/S6 85S2/S6 04B4/B5	**Part Number** R12292833	 **Part Number** R12240110	**Part Number** R12292834	 **Part Number** R12240115

E0.146.0725.14.00IM03

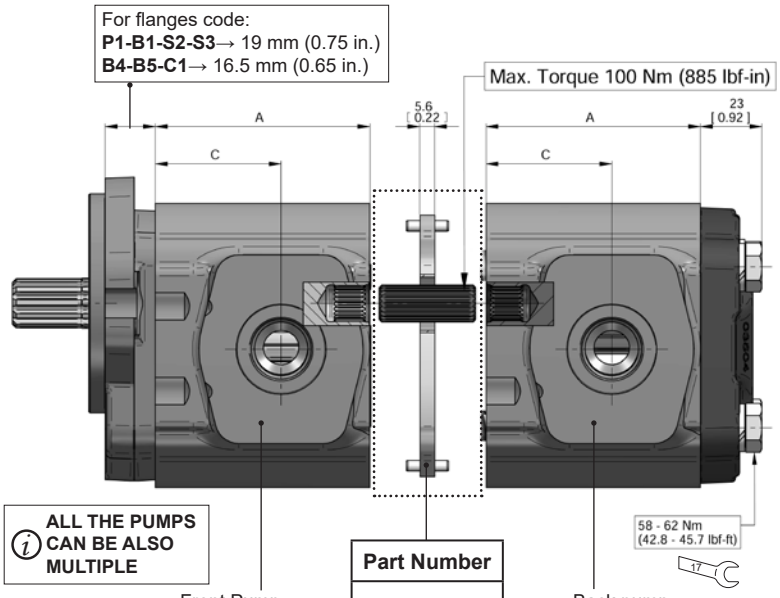
Bidirectional Pump Seal Spare Parts Kit



A	*Shaft seal*
B	*Bushing seal kit*
C	*Body seal kit*

SHAFT & FLANGE TYPE	NBR COMPOUND		FPM COMPOUND	
	Complete seal kit (A+B+C)	Shaft seal kit (A)	Complete seal kit (A+B+C)	Shaft seal kit (A)
28P1 **25B1/B4/B5** **62P1/B1/B4/B5** **82P1/S2/S6** **52S2/S6** **55S3** (Coupling sleeve)	**Part Number** R12081820	 **Part Number** R12040122	**Part Number** R12081830	 **Part Number** R12040123
55S3 (Solid Shaft) **73T1** **67Z2**	**Part Number** R14690031	 **Part Number** R14640012	**Part Number** R14690041	 **Part Number** R14640013
54S2/S6 **85S2/S6**	**Part Number** R12092835	 **Part Number** R12240114	**Part Number** R12092836	 **Part Number** R12240113

2PGE Multiple Pump - Dimensions



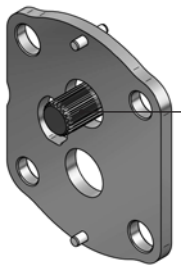
ⓘ **ALL THE PUMPS CAN BE ALSO MULTIPLE**

Front Pump: drive shaft back end pre-arranged for second pump female splined end.

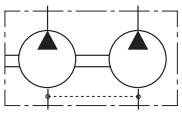
Part Number
Multiple pumps kit
R12030020

Back pump: equipped with drive shaft suitable for multiple pumps, code 60.

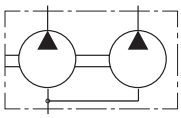
ⓘ **Also available with 2PE Combination (Aluminium gear housing)**



Part Number
Coupling Sleeve Splined W14x0.6x8f DIN 5480
312002515



MULTIPLE GEAR PUMPS with individual inlet port



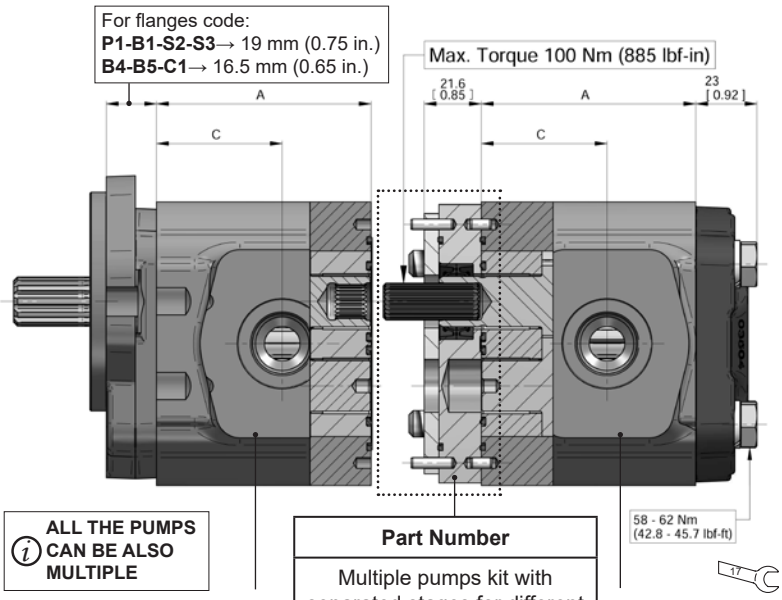
MULTIPLE GEAR PUMPS with common inlet port ⓘ

Recommended to limit the inflow of the downstream pump at 30 l/min MAX to avoid cavitation. Only for common suction port configuration: **Commercial code UA.**

2PGE-Type		6.5	8.3	11.3	13.8	16	19	22.5	26	28
Dimension A 2PGE	mm	49.95	52.8	59.7	63.5	67.5	75.6	81	86.8	89
	in	*1.97*	*2.07*	*2.35*	*2.5*	*2.65*	*2.97*	*3.19*	*3.42*	*3.50*
Dimension C 2PGE	mm	25	26.4	29.75	31.75	39.5	39.5	47.5	47.5	48
	in	0.98	*1.04*	*1.17*	*1.25*	*1.56*	*1.56*	*1.87*	*1.87*	*1.89*

2PE-Type		3.2*	3.9*	4.5	6.5	8.3	10.5	11.3	12.5	13.8	16	19	22.5	26
Dimension A 2PE	mm	47.1			49.95	52.8	56.3	59.7		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 2PE	mm	23.55			25	26.4	28.15	29.75		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*

*Available only as rear pump



ⓘ **ALL THE PUMPS CAN BE ALSO MULTIPLE**

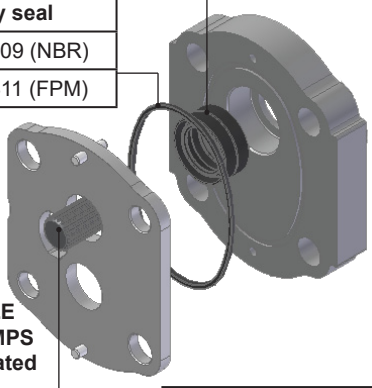
Front Pump: drive shaft back end pre-arranged for second pump female splined end.

Part Number
Multiple pumps kit with separated stages for different fluid (2 tanks) - **Code AS**
R12090020 (NBR)
R12090021 (FPM)

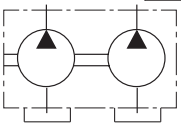
Back pump: equipped with drive shaft suitable for multiple pumps, code 60.

Part Number
Shaft seal 19,05x28,58x6,3
796105350 (NBR)
796105340 (FPM)

Part Number
Body seal
312206409 (NBR)
312206411 (FPM)



MULTIPLE GEAR PUMPS with separated stages



Coupling Sleeve Splined W14x0.6x8f DIN 5480
312002515

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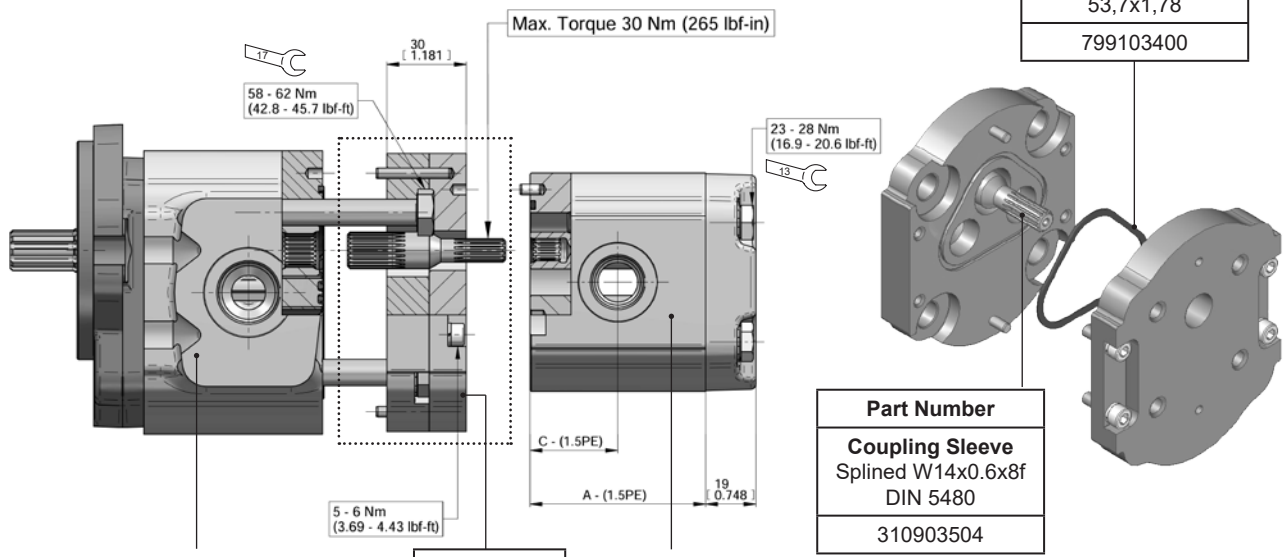
2PGE Combination with Pump 1.5PE (Aluminium gear housing)

PD1.5 Multiple pumps kit
Pre-arranged for 1.5PE rear.



Part Number
O-ring 53,7x1,78
799103400

Part Number
Coupling Sleeve Splined W14x0.6x8f DIN 5480
310903504

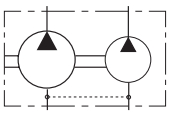
Front Pump:
drive shaft back end pre-arranged for second pump female splined end.

Part Number
Multiple pumps kit
R12090043

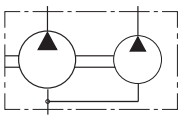
Back pump:
equipped with drive shaft suitable for multiple pumps, code 60.

Not available combinations with flange: B2-B3-B4-B5

ALL THE PUMPS CAN BE ALSO MULTIPLE



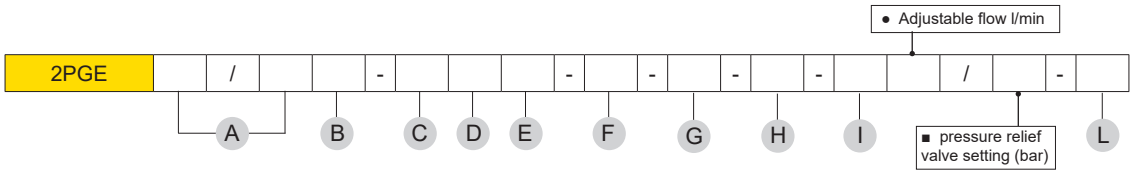
MULTIPLE GEAR PUMPS with individual inlet port



MULTIPLE GEAR PUMPS with common inlet port

Recommended to limit the inflow of the downstream pump at 12 l/min MAX to avoid cavitation. Only for common suction port configuration:
Commercial code UA.

1.5PE-Type		1.4	2.1	2.8	3.5	4.1	5.2	6.2	7.6	9.3	11
Dimension A 1.5PE	mm	44	45.9	47.9	49.9	51.6	54.7	57.5	61.5	66.3	71.1
	in	*1.73*	*1.81*	*1.89*	*1.96*	*2.03*	*2.15*	*2.26*	*2.42*	*2.61*	*2.80*
Dimension C 1.5PE	mm	22	22.95	23.95	24.95	25.8	27.35	28.75	30.75	33.15	35.55
	in	*0.87*	*0.90*	*0.94*	*0.98*	*1.02*	*1.08*	*1.13*	*1.21*	*1.31*	*1.40*



A

CODE	DISPLACEMENTS	
6.5	6.5 cm³/rev.	*0.40 cu.in/rev.*
8.3	8.3 cm³/rev.	*0.51 cu.in/rev.*
11.3	11.5 cm³/rev.	*0.68 cu.in/rev.*
13.8	14 cm³/rev.	*0.85 cu.in/rev.*
16	16.6 cm³/rev.	*1.01 cu.in/rev.*
19	19.4 cm³/rev.	*1.18 cu.in/rev.*
22.5	22.9 cm³/rev.	*1.37 cu.in/rev.*
26	26.7 cm³/rev.	*1.63 cu.in/rev.*
28	28.1 cm³/rev.	*1.71 cu.in/rev.*

B

ROTATION	CODE
Clockwise	D
Anti-clockwise	S

C

PORTS	CODE
Flanged ports european standard	P
Flanged ports german standard	B
Flanged ports SAE J518 Metric thread	W
Flanged ports SAE J518 American standard thread	S
Threaded ports GAS (BSPP)	G
Threaded ports SAE (ODT)	R

D

DRIVE SHAFT	CODE
Tang drive for electric motors	03
Tang drive	04
Tapered 1:5	25
Tapered 1:8	28
SAE A splined 9T	52
SAE A splined 11T	54
SAE B splined 13T	55
9 teeth DIN 5482 splined	62
DIN 5480 internal splined **(only for rear pumps-see page 24)**	60
5/8" SAE A parallel	82
3/4" SAE A parallel (Mounting face 31.8 mm)	85
Tapered 1:5 (only for CB-CL) Continental shaft	26
3/4" SAE A Parallel Continental shaft (Mounting face 54 mm)	86
7/8" SAE B Parallel Continental shaft	87
8x32x36 UNI 8953 splined Continental shaft	66
8x32x36 UNI 8953 splined Continental shaft	67
6x21x25 UNI 8953 splined Continental shaft	73

E

MOUNTING FLANGES	CODE
European standard	P1
German standard Ø80	B1
German standard Ø52	B2-B3
German standard Ø50	B4-B5
4 bolts for Iveco engines	C1
SAE A 2 bolts	S2
SAE B 2 bolts	S3
SAE A 2 Bolts (with o-ring on the centering collar)	S6
3 BOLT UNI 8953 for gear box	T1
4 Bolts for ZF gear box	Z2
For Internal combustion engines with Outrigger bearing	CL
For Internal combustion engines with axial and radial loads - with Outrigger bearing	CF
SAE A with Outrigger bearing	CS
German standard with Outrigger bearing	CB
European standard with Outrigger bearing	CP
SAE B with Outrigger bearing	CSB
4 Bolts for ZF gear box with Outrigger bearing	Z1

F

SEAL	CODE
Buna standard (standard configuration)	-
Viton	V

E0.146.0725.14.00IM03

G	PORTS LAYOUT	CODE
	Side ports (standard configuration)	-
	Rear ports	1

H	INLET PORTS	CODE
	Separated stages: Pump with separated stages for different fluid (2 tanks). *Number 1, 2 or 3* identify the body where Kit AS is mounted.	AS
	Common Inlet: Pump with one inlet port opened, all the other inlet port are closed. *Number 1, 2 or 3* identify the body where inlet port is open.	UA

I	REAR COVERS	CODE
	Lateral drain	LD
	Adjustable pressure relief valve-Internal discharge	■ VS
	Adjustable setting pressure relief valve-External discharge	■ VSE
	Internal drain valve	IDV
	Priority flow valve with excess flow to 2nd actuator	● VP-VP1
	Priority flow valve with excess flow to 2nd actuator with pressure relief valve	■ ● VPS-VPS1
	Load sensing priority valve with dinamic signal	VPD-VPD1
	Load sensing priority valve with dinamic signal and pressure relief valve	■ VPDS VPDS1
	Electric unloading valve (12V)	EV1/EV3
	Electric unloading valve (24V)	EV2/EV4
	Pressure relief and electric unloading valves (12V)	EVS1/EVS3
	Pressure relief and electric unloading valves (24V)	EVS2/EVS4
	Pre-arranged for 1.5PE rear	PD1.5

L	PAINTING	CODE
	Not painted (standard configuration)	-
	Black painted RAL 9005	BP

How to order Multiple pump
2PGE, displacement first stage (16), displacement second stage (16), clockwise rotation (D), ports European (P), drive shaft (55), mounting flange (S3)= **2PGE16/16D-P55S3**

Note

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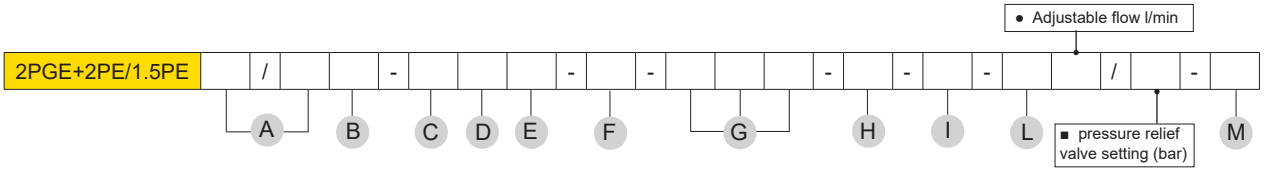
HOW TO ORDER MULTIPLE PUMP WITH 2PE/1.5PE



A

CODE	DISPLACEMENTS	
6.5	6.5 cm³/rev.	*0.40 cu.in/rev.*
8.3	8.3 cm³/rev.	*0.51 cu.in/rev.*
11.3	11.5 cm³/rev.	*0.68 cu.in/rev.*
13.8	14 cm³/rev.	*0.85 cu.in/rev.*
16	16.6 cm³/rev.	*1.01 cu.in/rev.*
19	19.4 cm³/rev.	*1.18 cu.in/rev.*
22.5	22.9 cm³/rev.	*1.37 cu.in/rev.*
26	26.7 cm³/rev.	*1.63 cu.in/rev.*
28	28.1 cm³/rev.	*1.71 cu.in/rev.*

B

ROTATION	CODE
Clockwise	D
Anti-clockwise	S

C

PORTS	CODE
Flanged ports european standard	P
Flanged ports german standard	B
Flanged ports SAE J518 Metric thread	W
Flanged ports SAE J518 American standard thread	S
Threaded ports GAS (BSPP)	G
Threaded ports SAE (ODT)	R

D

DRIVE SHAFT	CODE
Tang drive for electric motors	03
Tang drive	04
Tapered 1:5	25
Tapered 1:8	28
SAE A splined 9T	52
SAE A splined 11T	54
SAE B splined 13T	55
9 teeth DIN 5482 splined	62
DIN 5480 internal splined **(only for rear pumps-see page 24)**	60
5/8" SAE A parallel	82
3/4" SAE A parallel (Mounting face 31.8 mm)	85
Tapered 1:5 (only for CB-CL) Continental shaft	26
3/4" SAE A Parallel Continental shaft (Mounting face 54 mm)	86
7/8" SAE B Parallel Continental shaft	87
8x32x36 UNI 8953 splined Continental shaft	66
8x32x36 UNI 8953 splined Continental shaft	67
6x21x25 UNI 8953 splined Continental shaft	73

E

MOUNTING FLANGES	CODE
European standard	P1
German standard Ø80	B1
German standard Ø52	B2-B3
German standard Ø50	B4-B5
4 bolts for Iveco engines	C1
SAE A 2 bolts	S2
SAE B 2 bolts	S3
SAE A 2 Bolts (with o-ring on the centering collar)	S6
3 BOLT UNI 8953 for gear box	T1
4 Bolts for ZF gear box	Z2
For Internal combustion engines with Outrigger bearing	CL
For Internal combustion engines with axial and radial loads - with Outrigger bearing	CF
SAE A with Outrigger bearing	CS
German standard with Outrigger bearing	CB
European standard with Outrigger bearing	CP
SAE B with Outrigger bearing	CSB
4 Bolts for ZF gear box with Outrigger bearing	Z1

F

SEAL	CODE
Buna standard (standard configuration)	-
Viton	V

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G	COMBINATION WITH 1.5PE or 2PE
	1.5PE Piggy back configuration: ● Displacement at page 46 ● Port type See 1.5PE Technical catalogue at page 17 **2PE** Piggy back configuration: ● Displacement at page 45 ● Port type See 2PE Technical catalogue at page 35

H	INLET PORTS	CODE
	Separated stages: Pump with separated stages for different fluid (2 tanks). *Number 1, 2 or 3* identify the body where Kit AS is mounted.	AS
	Common Inlet: Pump with one inlet port opened, all the other inlet port are closed. *Number 1, 2 or 3* identify the body where inlet port is open.	UA

I	PORTS LAYOUT	CODE
	Side ports (standard configuration)	-
	Rear ports	1

L	REAR COVERS	CODE
	Lateral drain	LD
	Adjustable pressure relief valve-Internal discharge	■ VS
	Adjustable setting pressure relief valve-External discharge	■ VSE
	Internal drain valve	IDV
	Priority flow valve with excess flow to 2nd actuator	● VP-VP1
	Priority flow valve with excess flow to 2nd actuator with pressure relief valve	■ ● VPS-VPS1
	Load sensing priority valve with dinamic signal	VPD-VPD1
	Load sensing priority valve with dinamic signal and pressure relief valve	■ VPDS VPDS1
	Electric unloading valve (12V)	EV1/EV3
	Electric unloading valve (24V)	EV2/EV4
	Pressure relief and electric unloading valves (12V)	EVS1/EVS3
	Pressure relief and electric unloading valves (24V)	EVS2/EVS4

M	PAINTING	CODE
	Not painted (standard configuration)	-
	Black painted RAL 9005	BP

How to order Multiple pump with 2PE or 1.5PE
2PGE, displacement first stage (16), displacement second stage (6.5), anti-clockwise rotation (S), ports European (P), drive shaft (28), mounting flange (P1)+1.5PE, displacement (2.1), ports European (P)=
2PGE16/6.5S-P28P1-1.5PE2.1P

Note

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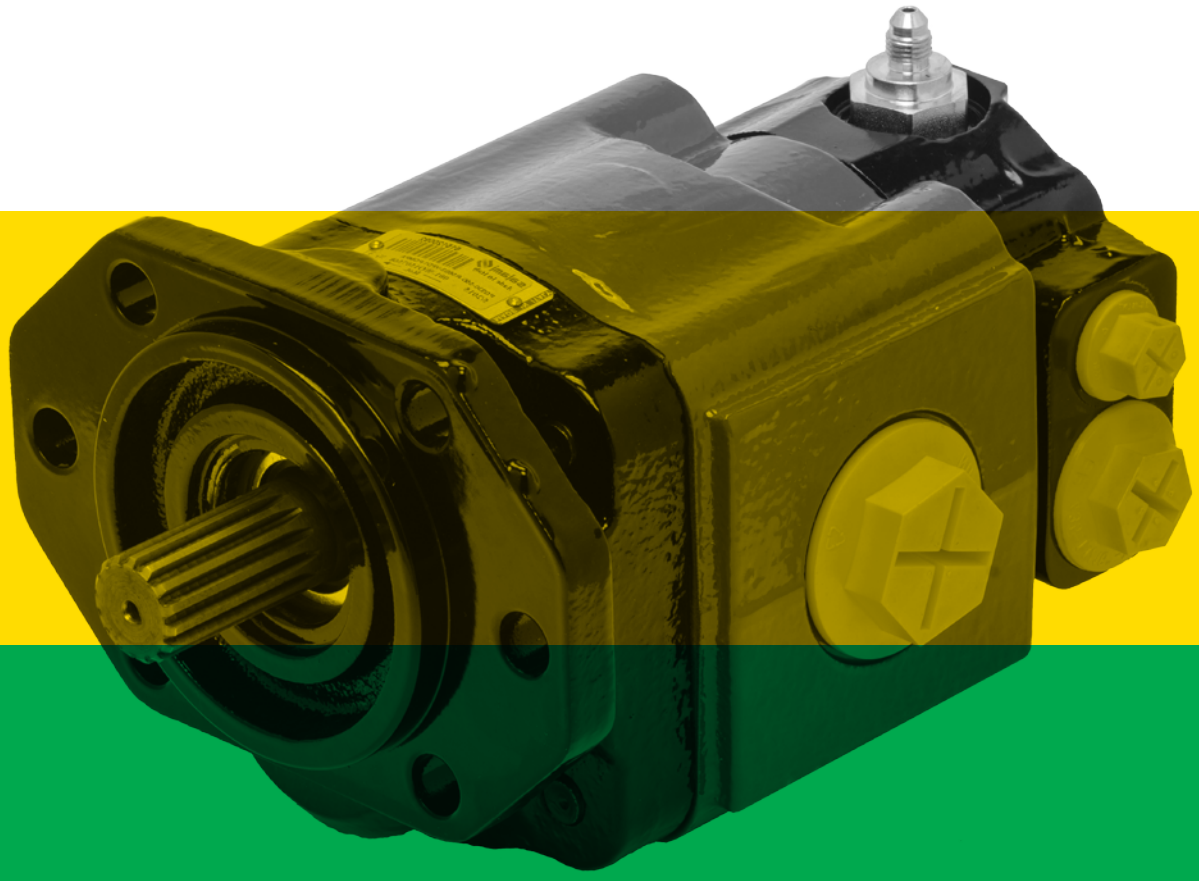
Note

PG330

High Pressure Cast Iron Gear Pumps

Technical/Spare Parts Catalogue



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COMPANY WITH
QUALITY SYSTEM
CERTIFIED BY DNV
ISO 9001

TÜV Thüringen Italia Certificate
TÜV Thüringen Italia
ISO 14001:2015
04-IT-SAL-200033
TTIC

salami
FLUID POWER SYSTEMS ®

Final revised edition - July 2025

The data in this catalogue refers to the standard product.The policy of Salami S.p.A. consists of a continuous improvement of its products. It reserves the right to change the specifications of the different products whenever necessary and without giving prior information.
If any doubts, please contact our sales department.

Contents

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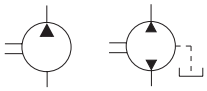
PG330 Single Pump - Dimensions and Technical Data



Displacements up to 80.6 cm3/rev - *4.91 cu.in./rev*
Pressure up to 320 bar - *4650 psi*

TYPE	Displacement		Dimension A		Dimension C		Max. Continuous pressure p_1		Intermittent pressure p_2		Peak pressure p_3		Min. speed at p_1	Max. speed at p_2	Weight	
	cm^3/rev	*cu.in/rev*	mm	*in*	mm	*in*	bar	*psi*	bar	*psi*	bar	*psi*	rpm		kg	*lbs*
PG330 - 23	23.4	*1.43*	77	*3.03*	35	*1.38*	260	*3750*	280	*4060*	300	*4350*	400	3000	13.2	*29.10*
PG330 - 28	28.6	*1.74*	81	*3.19*	38	*1.49*	280	*4060*	300	*4350*	320	*4650*	400	3000	13.7	*30.20*
PG330 - 34	34.4	*2.10*	85.5	*3.36*	42.5	*1.67*	280	*4060*	300	*4350*	320	*4650*	400	3000	14.2	*31.30*
PG330 - 40	40.3	*2.46*	90	*3.54*	47	*1.85*	260	*3750*	280	*4060*	300	*4350*	400	2700	14.7	*32.41*
PG330 - 47	47.4	*2.89*	101.5	*3.40*	50	*1.97*	280	*4060*	300	*4350*	320	*4650*	400	2700	17.0	*37.48*
PG330 - 55	55.2	*3.37*	107.5	*4.23*	56	*2.20*	260	*3750*	280	*4060*	300	*4350*	400	2700	17.7	*39.02*
PG330 - 64	64.3	*3.92*	114.5	*4.51*	58	*2.28*	240	*3480*	260	*3750*	280	*4060*	350	2500	18.5	*40.79*
PG330 - 72	73.4	*4.48*	121.5	*4.78*	61	*2.40*	220	*3190*	240	*3480*	260	*3750*	350	2500	19.4	*42.77*
PG330 - 80	80.6	*4.91*	127.5	*5.02*	65	*2.56*	200	*2900*	220	*3190*	240	*3480*	350	2500	22.5	*49.60*

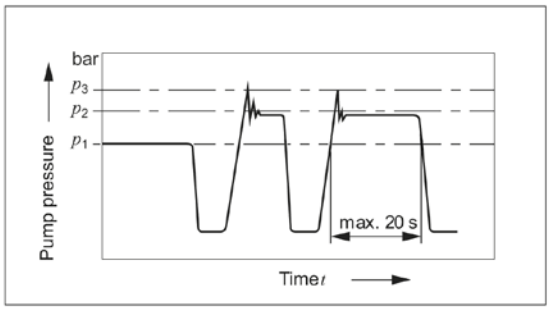
● Technical Data - Shaft 38/Flange P2

TYPE	Displacement		Max. Continuous pressure p_1		Intermittent pressure p_2		Peak pressure p_3		Min. speed at p_1	Max. speed at p_2	Weight	
	cm^3/rev	*cu.in/rev*	bar	*psi*	bar	*psi*	bar	*psi*	rpm		kg	*lbs*
PG330 - 55 ●	55.2	*3.37*	230	*3335*	250	*3625*	270	*3915*	400	2700	17.7	*39.02*
PG330 - 64 ●	64.3	*3.92*	200	*2900*	220	*3190*	240	*3480*	350	2500	18.5	*40.79*
PG330 - 72 ●	73.4	*4.48*	170	*2465*	190	*2755*	210	*3045*	350	2500	19.4	*42.77*

●=Max torque of 250 Nm for the displacements **55-64-72** cc/rev

Max Speed must be lowered by 10% for system working continuosly at p^1 pressure. Max pressure must be lowered by 10% for birectional pump.

Definition of Pressures

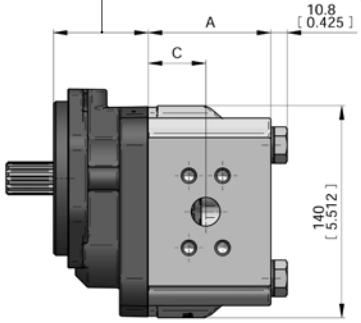


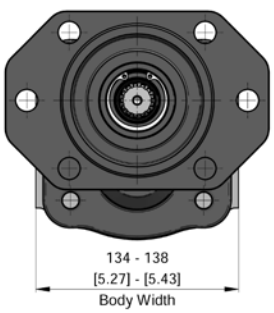
p_3 = Peak pressure

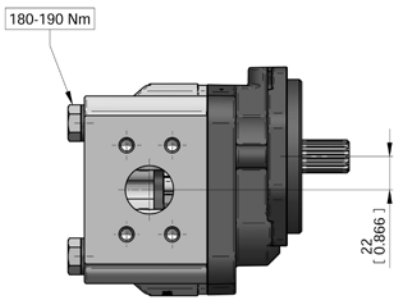
p_2 = Intermittent operating pressure (1/3 of working time)

p_1 = Max. Continuous operating pressure

For flanges code:
S3→ 53 mm (2.09 in.) for displ. 23 to 40
64 mm (2.52 in.) for displ. 47 to 80
P2→ 54 mm (2.13 in.)
S4/R8/Z1/Z2→ 85 mm (3.35 in.)
R3→ 64 mm (2.52 in.)







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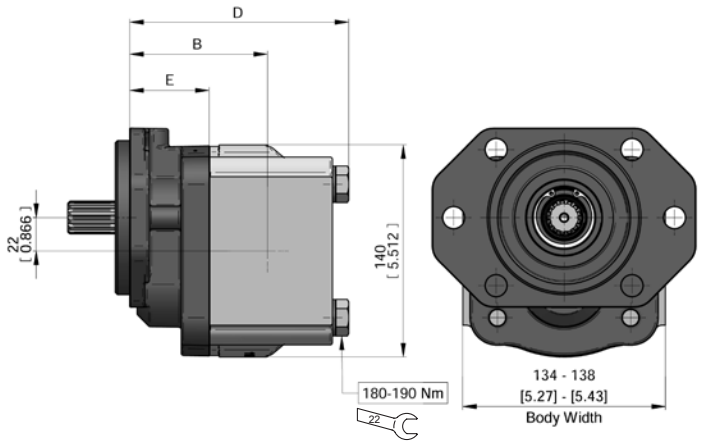
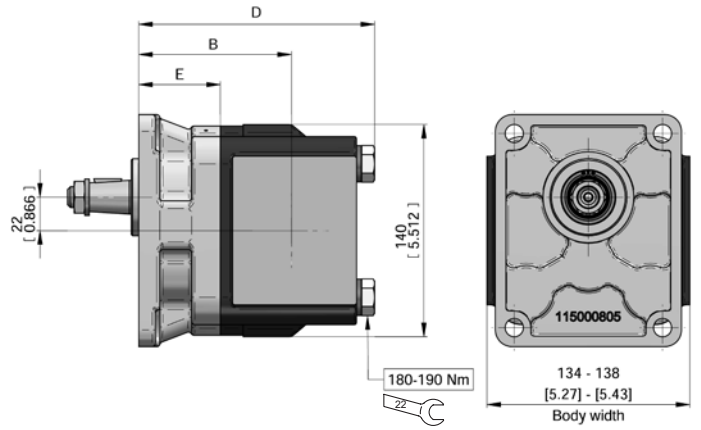
Dimensions - Shaft 55/Flange S3 (SAE B)

TYPE	Dimension D		Dimension B		Dimension E	
	mm	in	mm	in	mm	in
23	140.8	*5.54*	88	*3.46*	53	*2.09*
28	144.8	*5.70*	91	*3.58*		
34	149.3	*5.88*	95.5	*3.76*		
40	153.8	*6.00*	100	*3.94*		
47	176.3	*6.94*	114	*4.49*	64	*2.52*
55	182.3	*7.18*	120	*4.72*		
64	189.3	*7.45*	122	*4.80*		
72	196.3	*7.73*	125	*4.92*		
80	202.3	*7.96*	129	*5.08*		



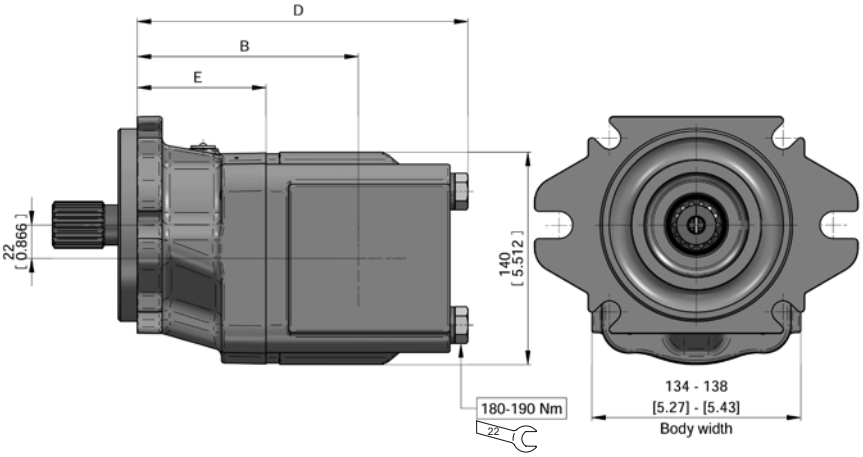
Dimensions - Shaft 38/Flange P2 (European)

TYPE	Dimension D		Dimension B		Dimension E	
	mm	in	mm	in	mm	in
23	141.8	*5.58*	89	*3.50*	54	*2.13*
28	145.8	*5.74*	92	*3.62*		
34	150.3	*5.92*	96.5	*3.80*		
40	154.3	*6.10*	101	*3.98*		
47	166.3	*6.55*	104	*4.10*		
55	172.3	*6.78*	110	*4.33*		
64	179.3	*7.05*	112	*4.41*		
72	186.3	*7.33*	115	*4.53*		



Dimensions - Shaft 58/Flange S4 (SAE C)

TYPE	Dimension D		Dimension B		Dimension E	
	mm	in	mm	in	mm	in
23	172.8	*6.80*	120	*4.72*	85	*3.35*
28	176.8	*6.96*	123	*4.84*		
34	181.3	*7.14*	127.5	*5.02*		
40	185.3	*7.30*	132	*5.20*		
47	197.3	*7.77*	135	*5.31*		
55	203.3	*8.00*	141	*5.55*		
64	210.3	*8.28*	143	*5.63*		
72	217.3	*8.55*	146	*5.75*		
80	223.3	*8.79*	150	*5.91*		



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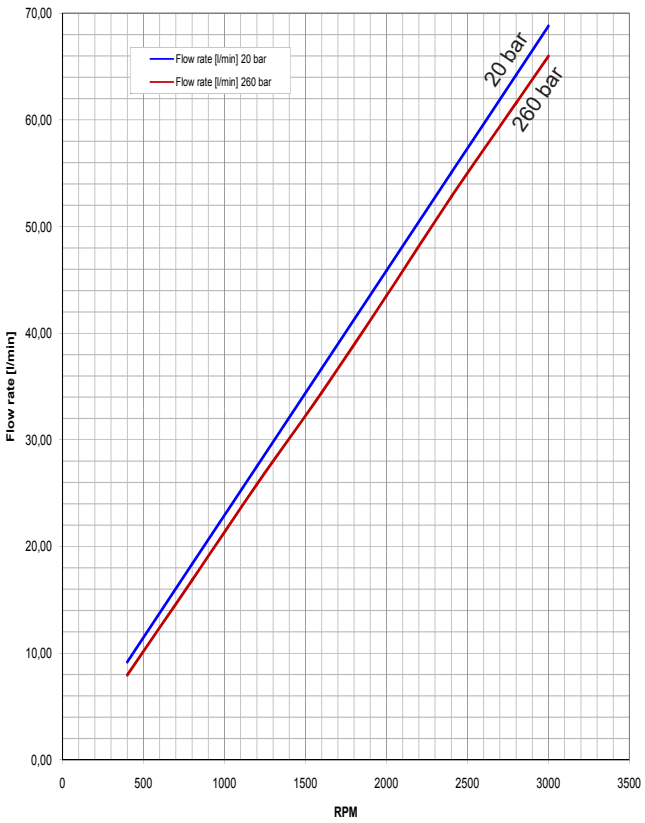
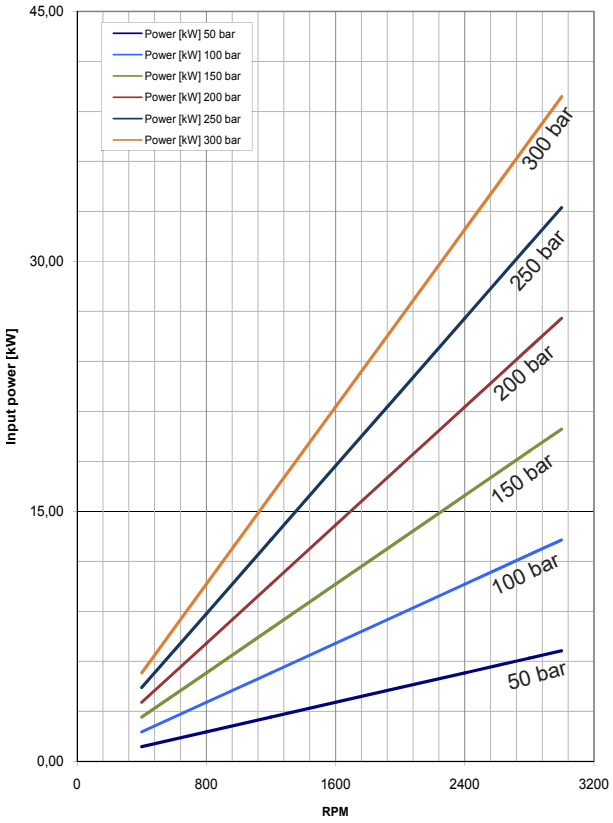
Pump Performance Charts

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





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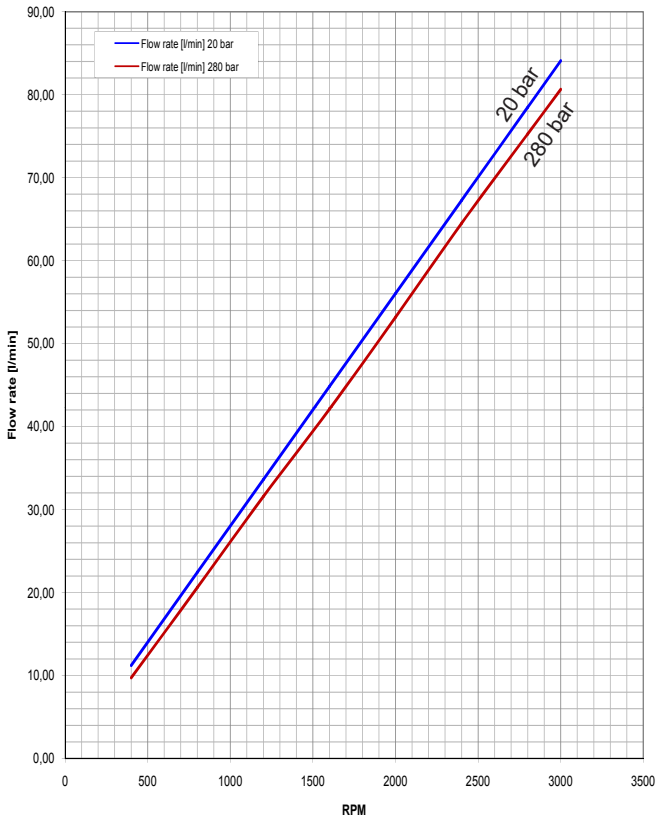

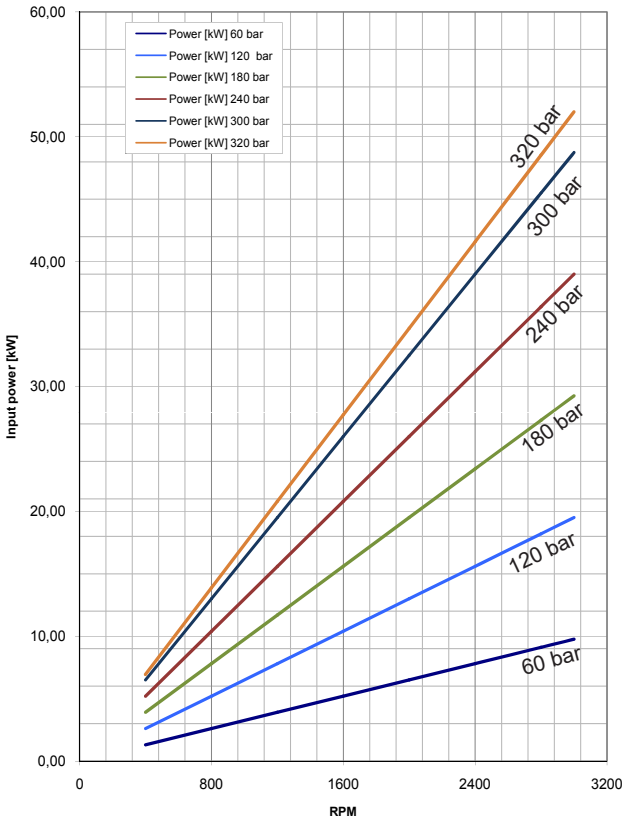

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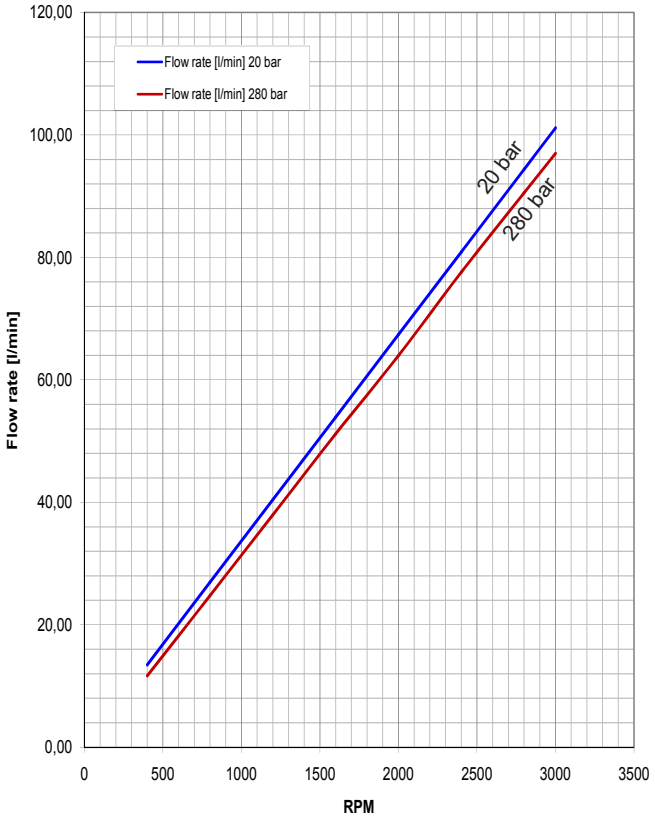
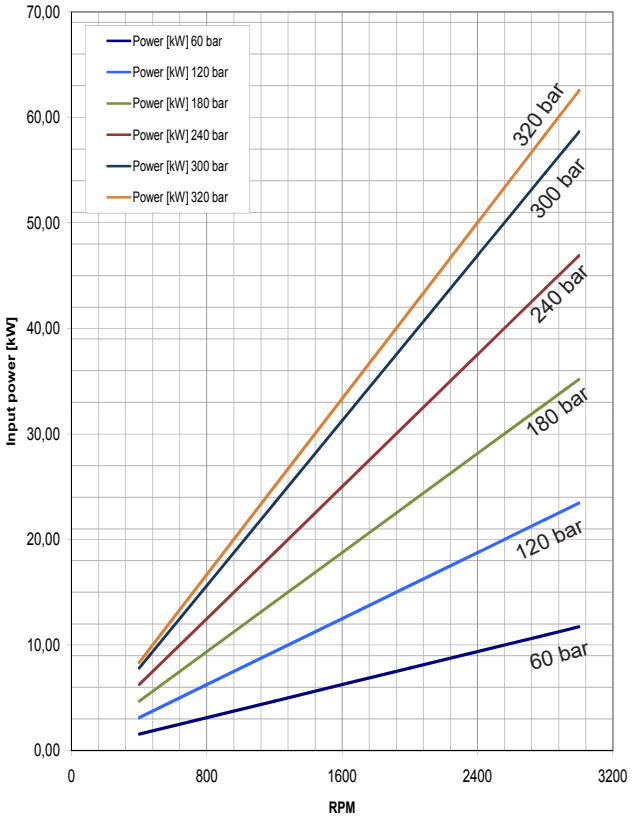
Pump Performance Charts

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





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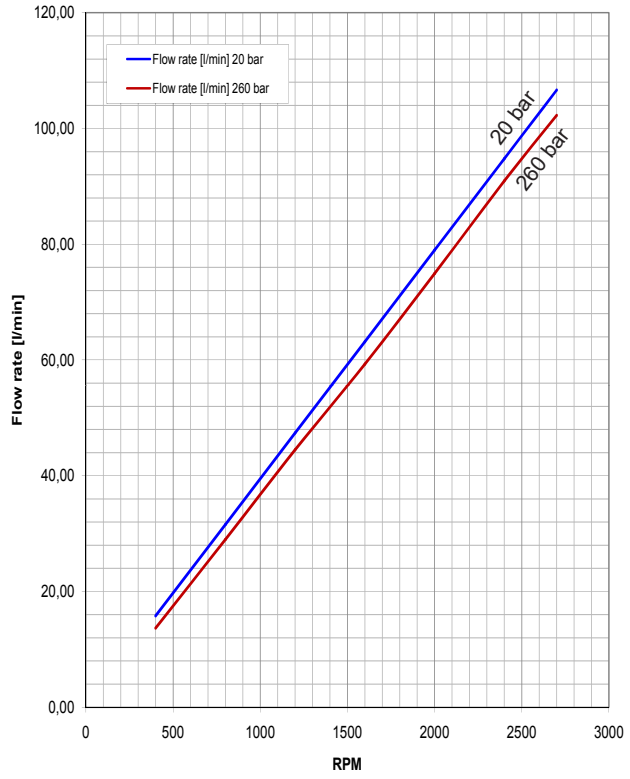

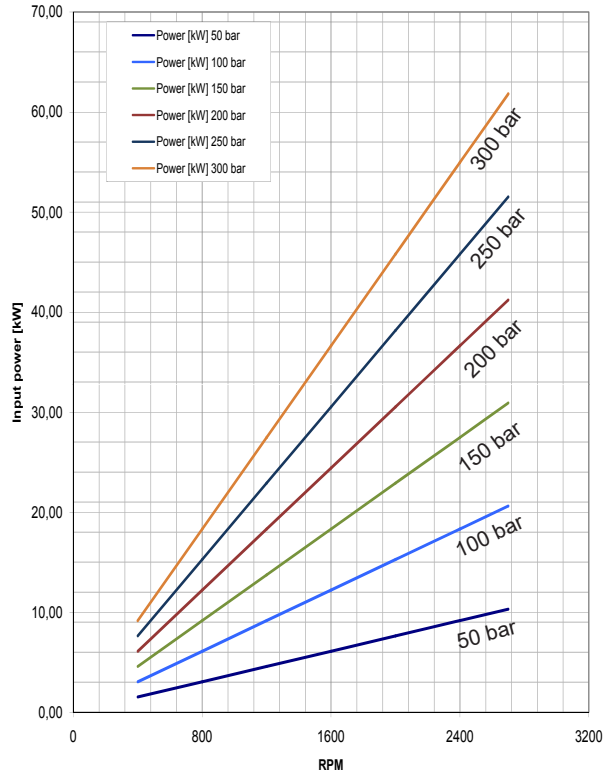

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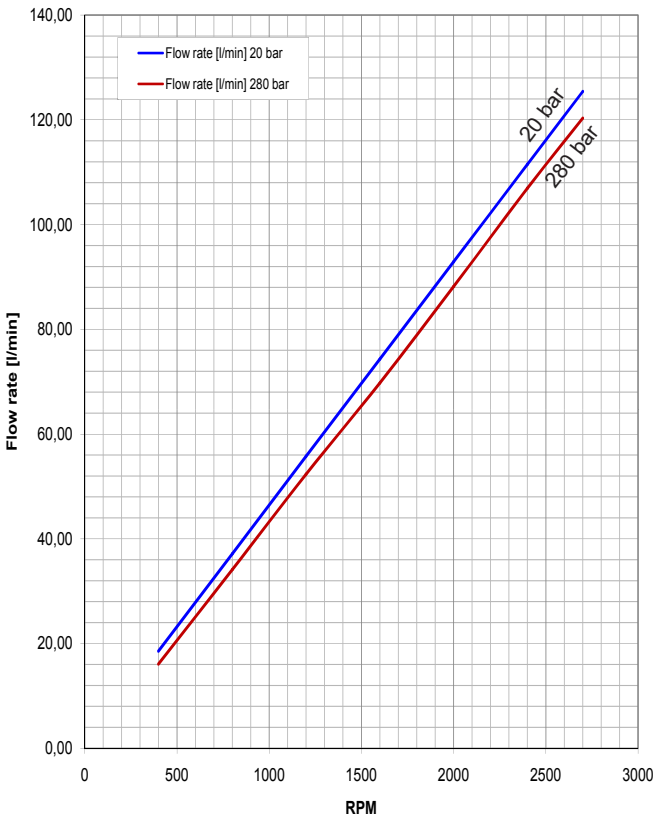
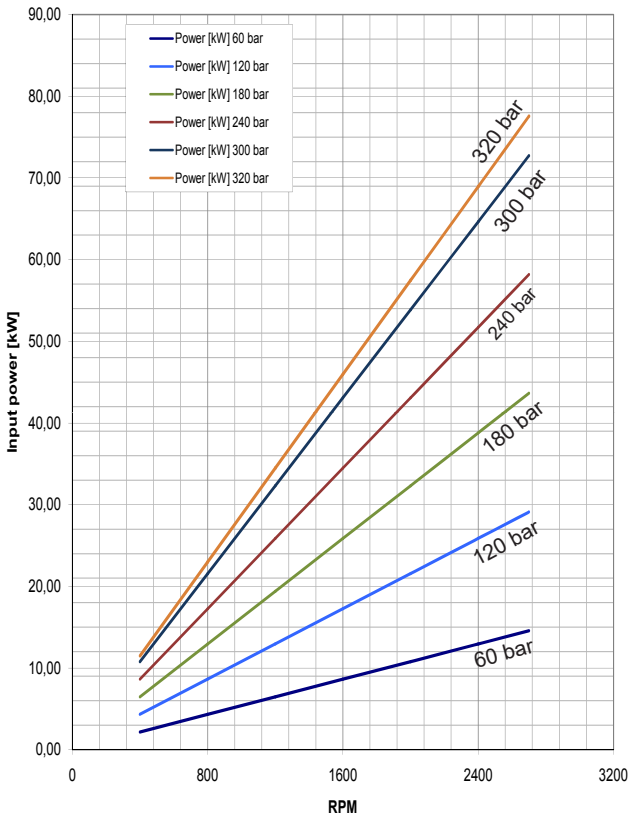
Pump Performance Charts

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





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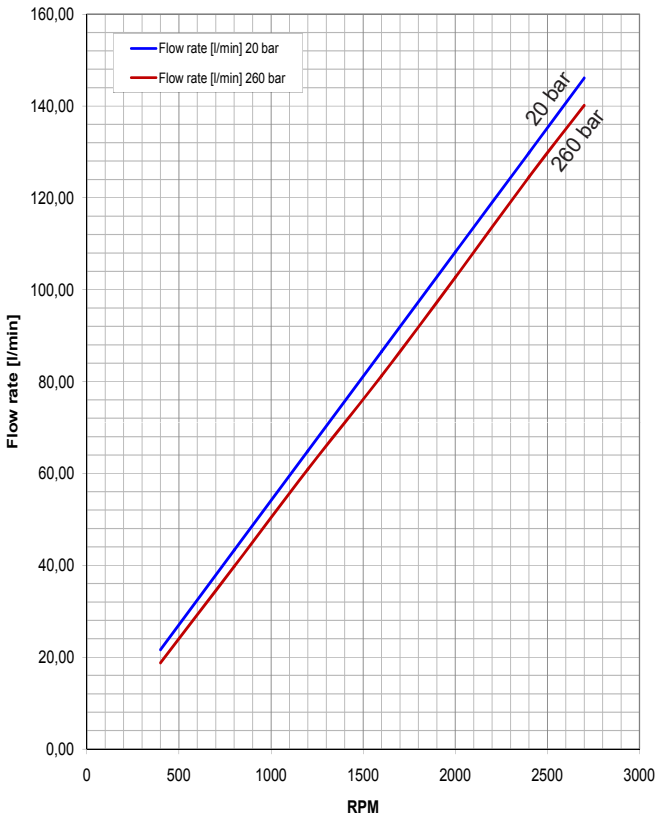

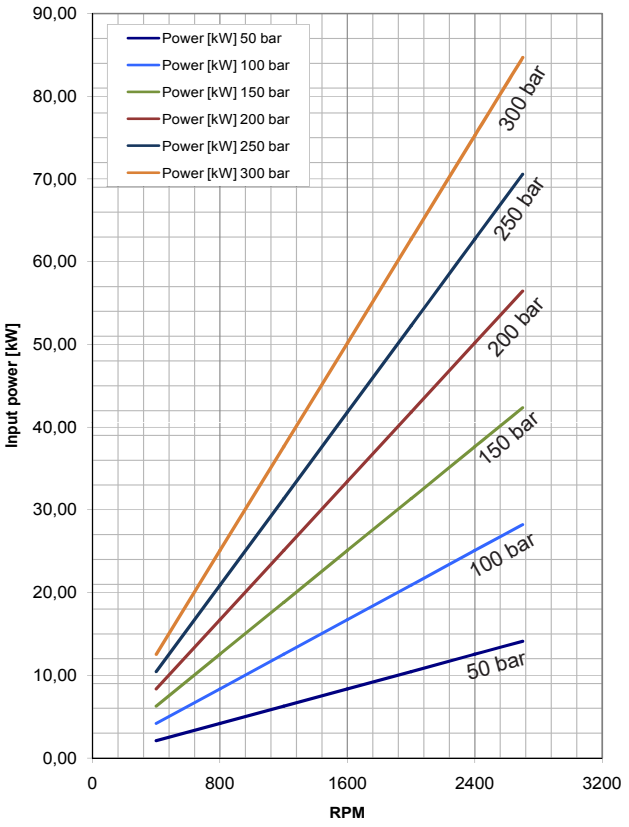

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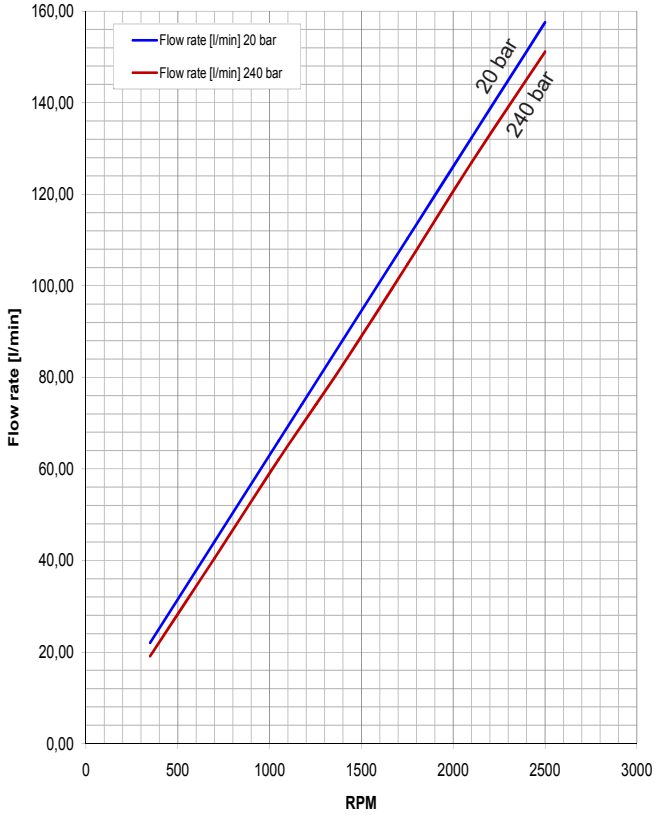
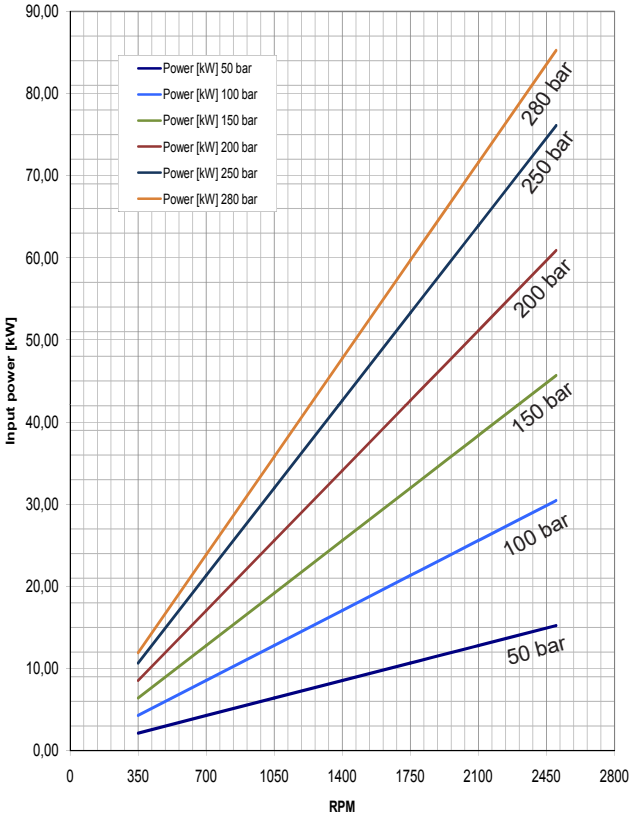
Pump Performance Charts

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





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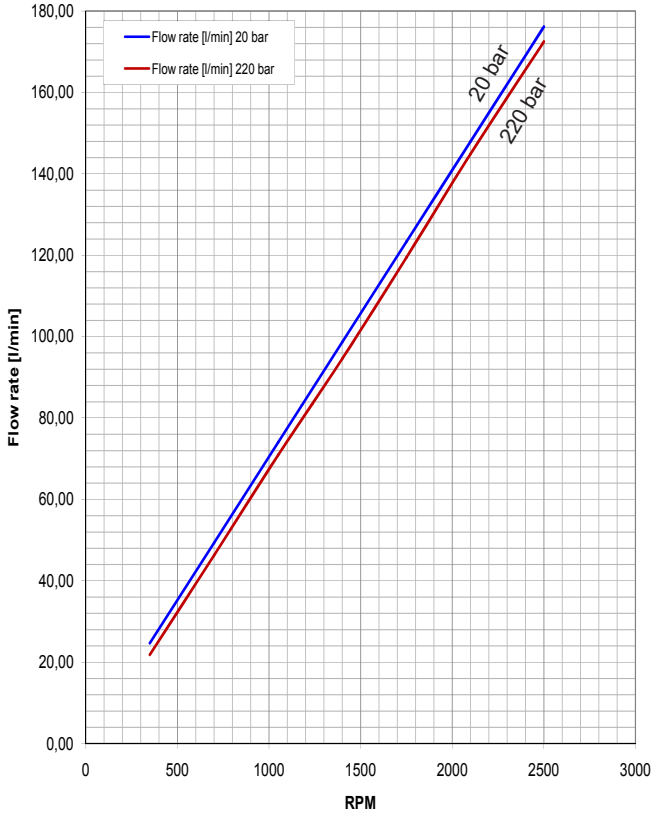

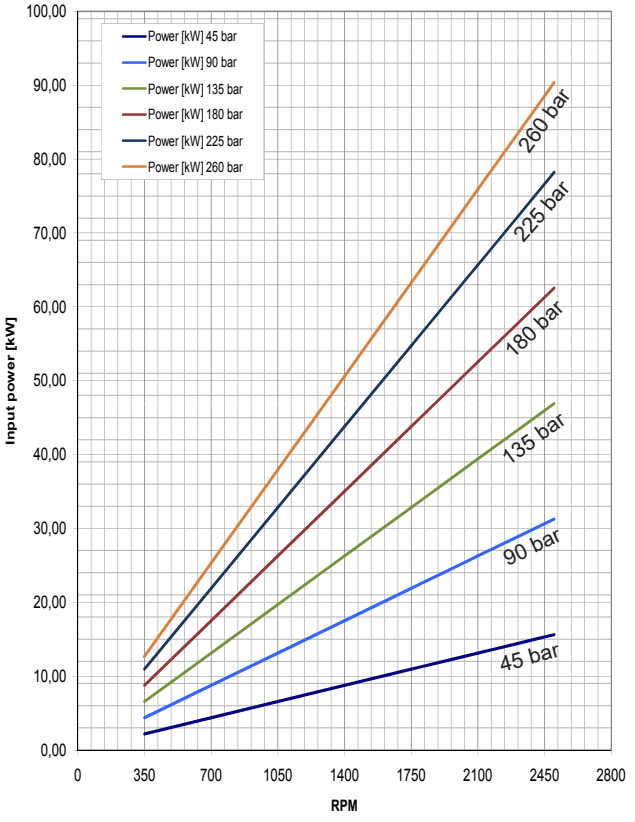

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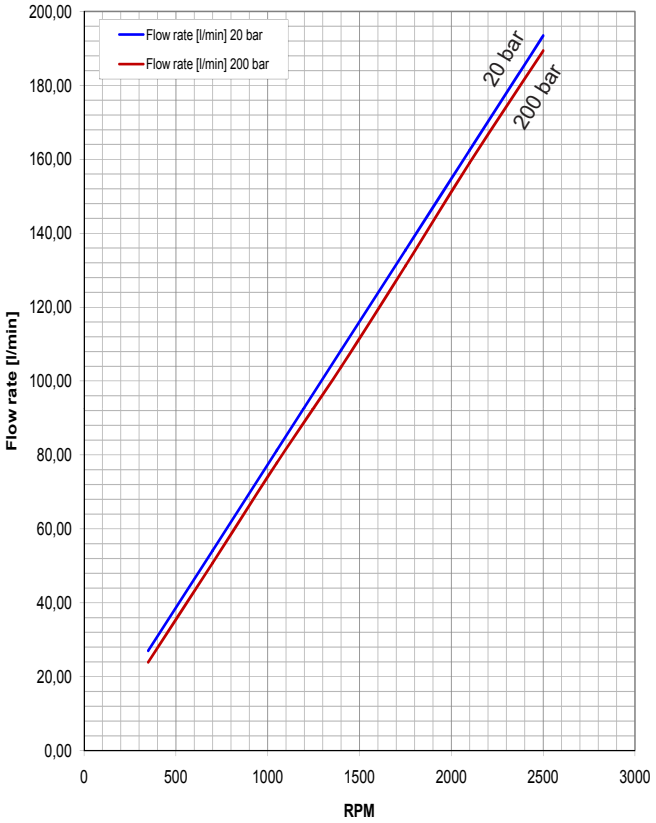
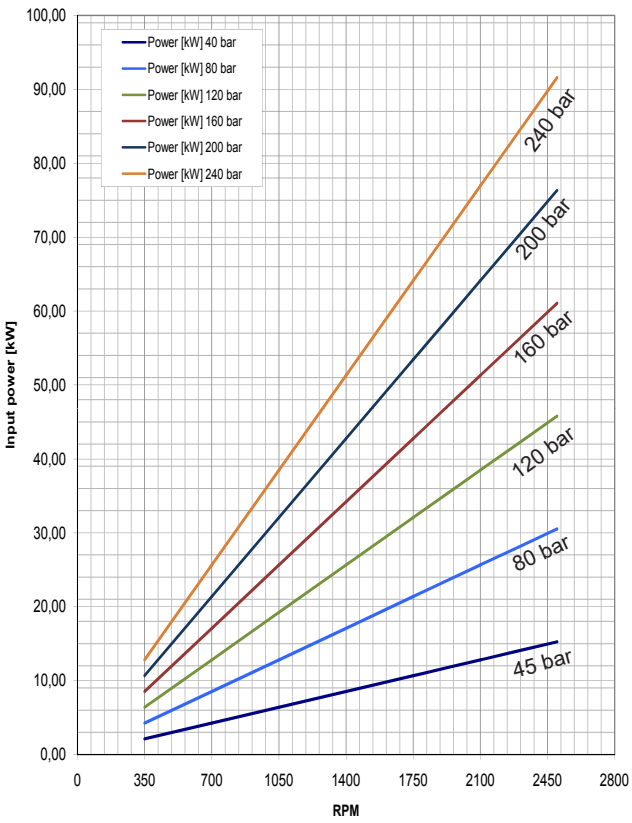
Pump Performance Charts

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





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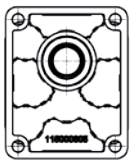
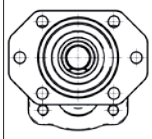
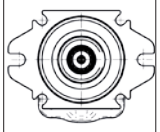
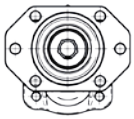
Shaft And Flange Combinations

PG330								
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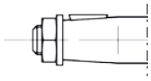
		FLANGES				**FLANGES WITH OUTRIGGER BEARING**		
SHAFT END	 CODE **38**	38P2						
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	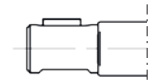 CODE **87**		87S3			87R3		
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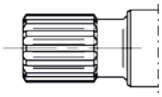
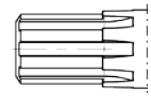
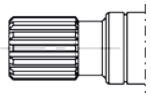
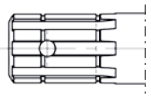
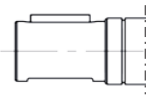
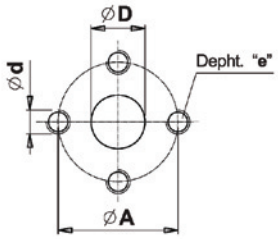
CONTINENTAL SHAFT END	 CODE **58**		58S3	58S4				
	 CODE **67**				67Z2			
	 CODE **57**						57R8	
	 CODE **66**							66Z1
	 CODE **89**						89R8	

E0.151.0725.14.00IM02

Flanged Ports



code P

Flanged ports
european standard

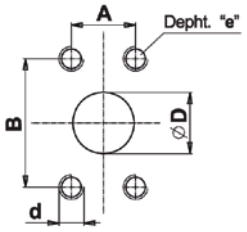
M8	20 Nm (14.7 lbf-ft)
M10	35 Nm (25.8 lbf-ft)
M12	65 Nm (47.9 lbf-ft)

UNI-DIRECTIONAL

PUMPS	INLET				OUTLET			
	Ø D	Ø A	d	e	Ø D	Ø A	d	e
23	20 *(0.79”)*	40 *(1.57”)*	M8	16 *(0.63”)*	16 *(0.63”)*	40 *(1.57”)*	M8	16 *(0.63”)*
From 28 to 47	27 *(1.07”)*	51 *(2.01”)*	M10	16 *(0.63”)*	16 *(0.63”)*	40 *(1.57”)*	M8	16 *(0.63”)*
From 55 to 72	33 *(1.3”)*	62 *(2.44”)*	M12	16 *(0.63”)*	21 *(0.83”)*	51 *(2.01”)*	M10	16 *(0.63”)*

BI-DIRECTIONAL

PUMPS	INLET				OUTLET			
	Ø D	Ø A	d	e	Ø D	Ø A	d	e
23	20 *(0.79”)*	40 *(1.57”)*	M8	16 *(0.63”)*	20 *(0.79”)*	40 *(1.57”)*	M8	16 *(0.63”)*
From 28 to 47	27 *(1.07”)*	51 *(2.01”)*	M10	16 *(0.63”)*	27 *(1.07”)*	51 *(2.01”)*	M10	16 *(0.63”)*
From 55 to 72	33 *(1.3”)*	62 *(2.44”)*	M12	16 *(0.63”)*	33 *(1.3”)*	62 *(2.44”)*	M12	16 *(0.63”)*



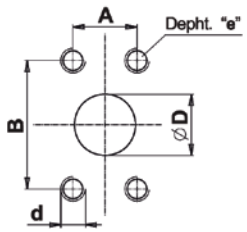
code W

Flanged ports
SAE J518
METRIC THREAD

M10	35 Nm (25.8 lbf-ft)
M12	65 Nm (47.9 lbf-ft)

UNI-DIRECTIONAL

PUMPS	INLET					OUTLET				
	ØD	B	A	d	e	ØD	B	A	d	e
From 23 to 47	32 *(1.26”)*	58.72 *(2.31”)*	38.18 *(1.19”)*	M10	18 *(0.71”)*	19 *(0.75”)*	47.6 *(1.87”)*	22.2 *(0.87”)*	M10	18 *(0.71”)*
From 55 to 80	39.3 *(1.55”)*	69.8 *(2.75”)*	35.7 *(1.40”)*	M12	15 *(0.59”)*	32 *(1.26”)*	58.72 *(2.31”)*	30.18 *(1.19”)*	M10	18 *(0.71”)*



code S

Flanged ports
SAE J518
AMERICAN STANDARD
THREAD

3/8-16 UNC	35 Nm (25.8 lbf-ft)
7/16-14 UNC	45 Nm (33.2 lbf-ft)
1/2-13 UNC	65 Nm (47.9 lbf-ft)

UNI-DIRECTIONAL

PUMPS	INLET					OUTLET				
	ØD	B	A	d	e	ØD	B	A	d	e
From 23 to 47	32 *(1.26”)*	58.72 *(2.31”)*	30.18 *(1.19”)*	7/16-14 UNC	18 *(0.71”)*	19 *(0.75”)*	47.6 *(1.87”)*	22.2 *(0.87”)*	3/8-16 UNC	18 *(0.71”)*
From 55 to 80	39.3 *(1.55”)*	69.8 *(2.75”)*	35.7 *(1.40”)*	1/2-13 UNC	15 *(0.59”)*	32 *(1.26”)*	58.72 *(2.31”)*	30.18 *(1.19”)*	3/8-16 UNC	18 *(0.71”)*

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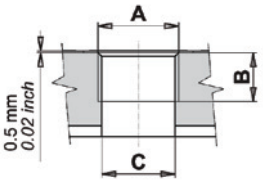
Threaded Ports



code G

Threaded ports
GAS (BSPP)

G3/4	90 Nm (66.4 lbf-ft)
G1	130 Nm (95.8 lbf-ft)
G1 1/4	170 Nm (125.4 lbf-ft)

UNI-DIRECTIONAL

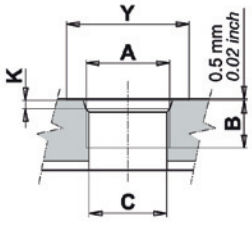
PUMPS	INLET			OUTLET		
	A	B	C	A	B	C
From 23 to 40	G1	22 *(0.87")*	30.5 *(1.2")*	G3/4	16 *(0.62")*	24.4 *(0.96")*
From 47 to 80	G1 1/4	24 *(0.94")*	37 *(1.46")*	G1	22 *(0.87")*	30.5 *(1.2")*

BI-DIRECTIONAL

PUMPS	INLET			OUTLET		
	A	B	C	A	B	C
From 23 to 40	G1	22 *(0.87")*	30.5 *(1.2")*	G1	22 *(0.87")*	30.5 *(1.2")*
From 47 to 80	G1 1/4	24 *(0.94")*	37 *(1.46")*	G1 1/4	24 *(0.94")*	37 *(1.46")*

BI-DIRECTIONAL - REAR PORTS

PUMPS	INLET			OUTLET		
	A	B	C	A	B	C
From 23 to 64	G1	22 *(0.87")*	30.5 *(1.2")*	G1	22 *(0.87")*	30.5 *(1.2")*



code R

Threaded ports
SAE (ODT)

SAE12	90 Nm (66.4 lbf-ft)
SAE16	130 Nm (95.8 lbf-ft)
SAE20	170 Nm (125.4 lbf-ft)

UNI-DIRECTIONAL

PUMPS	INLET					OUTLET				
	A	B	C	Y	K	A	B	C	Y	K
From 23 to 40	1-5/16-12 UN (SAE 16)	19 *(0.75")*	31 *(1.22")*	49 *(1.93")*	3.3 *(0.13")*	1-1/16-12 UN (SAE 12)	19 *(0.75")*	24.7 *(0.97")*	41 *(1.16")*	3.3 *(0.13")*
From 47 to 80	1-5/8-12 UN (SAE 20)	19 *(0.75")*	38.9 *(1.53")*	58 *(2.28")*	3.3 *(0.13")*	1-5/16-12 UN (SAE 16)	19 *(0.75")*	31 *(1.22")*	49 *(1.93")*	3.3 *(0.13")*

BI-DIRECTIONAL

PUMPS	INLET					OUTLET				
	A	B	C	Y	K	A	B	C	Y	K
From 23 to 40	1-5/16-12 UN (SAE 16)	19 *(0.75")*	31 *(1.22")*	49 *(1.93")*	3.3 *(0.13")*	1-5/16-12 UN (SAE 16)	19 *(0.75")*	31 *(1.22")*	49 *(1.93")*	3.3 *(0.13")*
From 47 to 80	1-5/8-12 UN (SAE 20)	19 *(0.75")*	38.9 *(1.53")*	58 *(2.28")*	3.3 *(0.13")*	1-5/8-12 UN (SAE 20)	19 *(0.75")*	38.9 *(1.53")*	58 *(2.28")*	3.3 *(0.13")*

BI-DIRECTIONAL - REAR PORTS

PUMPS	INLET					OUTLET				
	A	B	C	Y	K	A	B	C	Y	K
From 23 to 64	1-5/16-12 UN (SAE 16)	19 *(0.75")*	31 *(1.22")*	49 *(1.93")*	3.3 *(0.13")*	1-5/16-12 UN (SAE 16)	19 *(0.75")*	31 *(1.22")*	49 *(1.93")*	3.3 *(0.13")*

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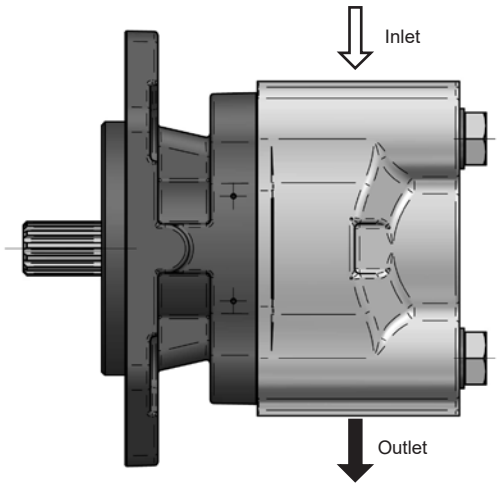
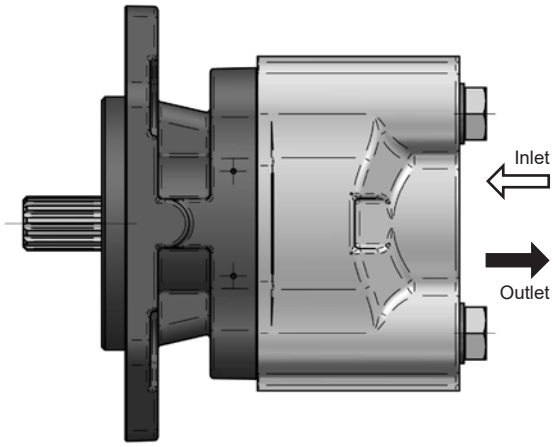
example with clockwise rotation / ✕ = plugged port

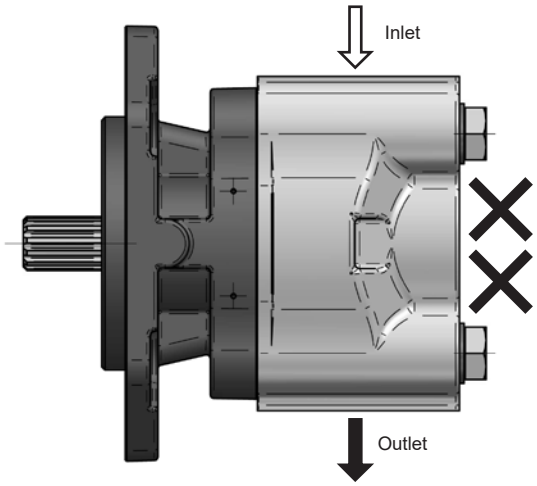
Ports layout - Single Pump



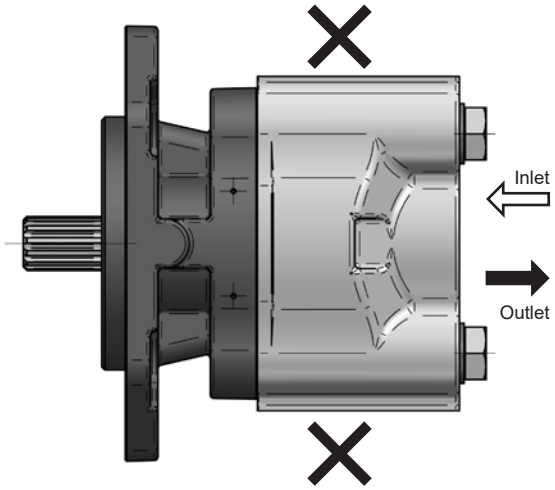
STANDARD CONFIGURATION



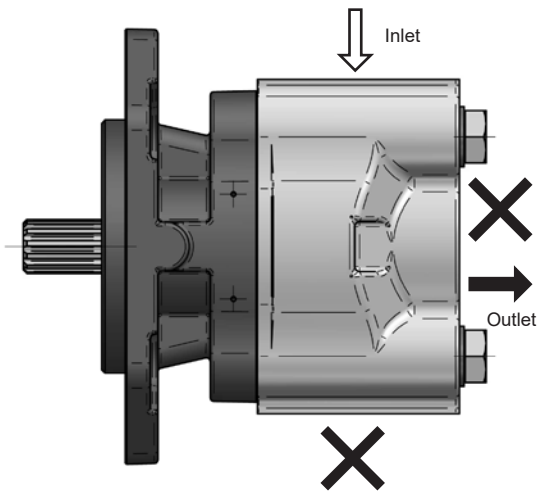
CODE 1



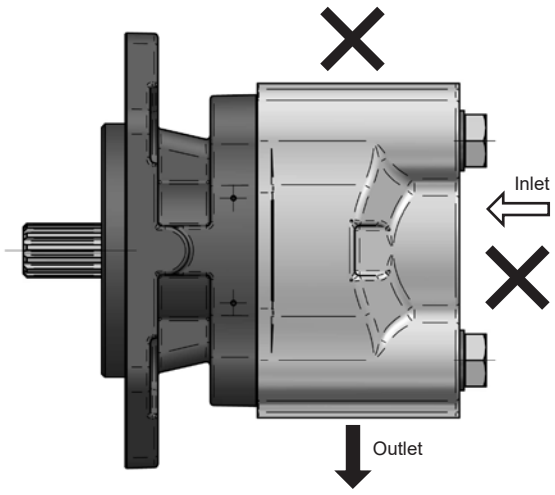
CODE 2



CODE 3

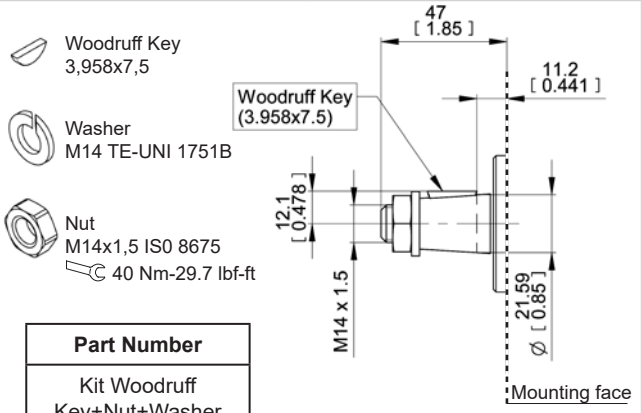


CODE 4



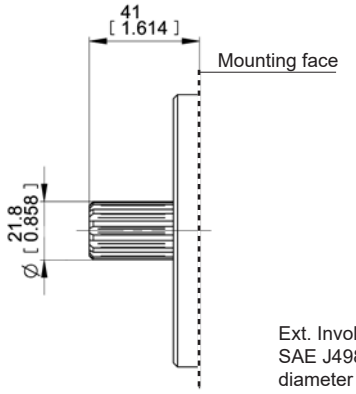
CODE 5

Drive Shaft



Part Number
Kit Woodruff Key+Nut+Washer
R12980070

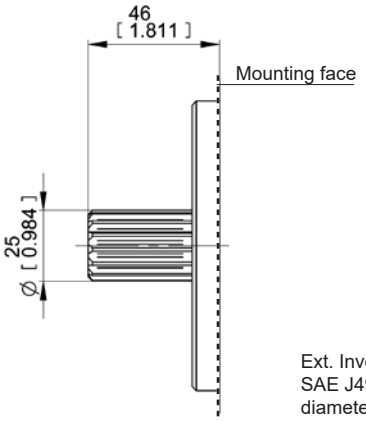
Pressure values are lower for displacement 55-64-72 cc/rev, see page 57.



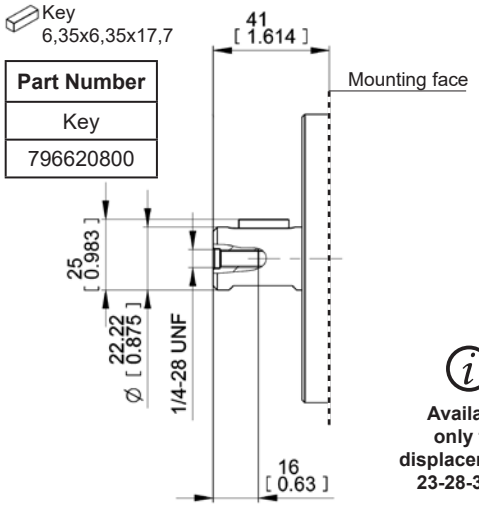
Ext. Involute Spline SAE J498B with outer diameter modified 13 teeth - 16/32 Pitch - 30 deg - Flat Root - Side fit - Class 1

code 38	Max torque 250 Nm (2213 lbf in)
Tapered 1:8	

code 55	Max torque 330 Nm (2921 lbf in)
SAE B 13T-16/32DP SPLINED	



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

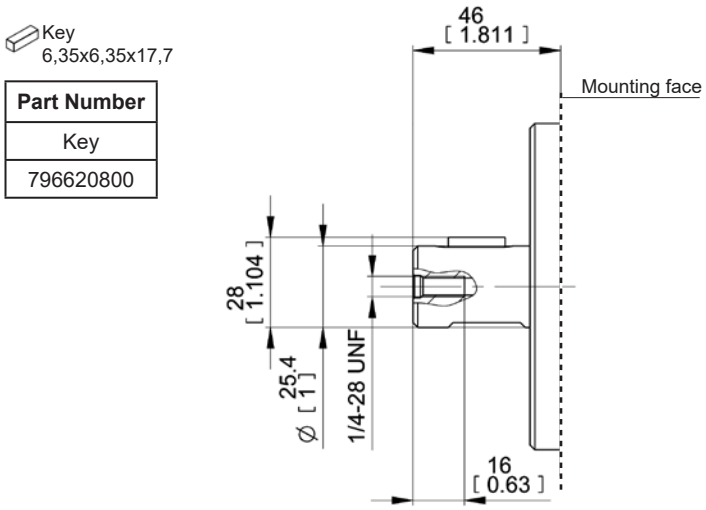


Part Number
Key
796620800

Available only for displacements: 23-28-34-40

code 56	Max torque 480 Nm (4250 lbf in)
SAE BB 15T-16/32DP SPLINED	

code 87	Max torque 220 Nm (1950 lbt in)
SAE B PARALLEL	



Part Number
Key
796620800

code 88	Max torque 320 Nm (2830 lbt in)
SAE BB PARALLEL	

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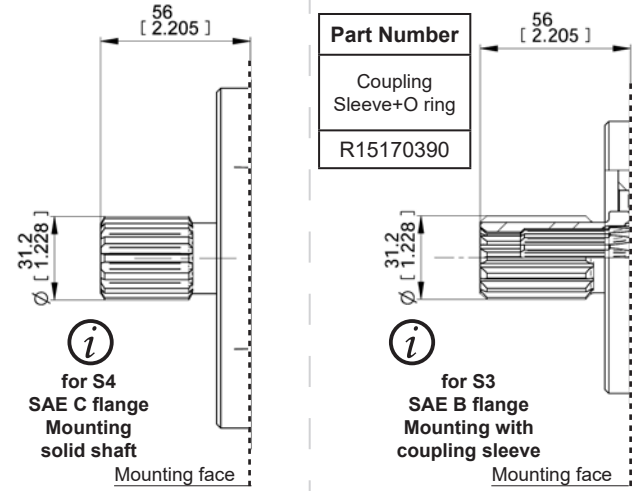
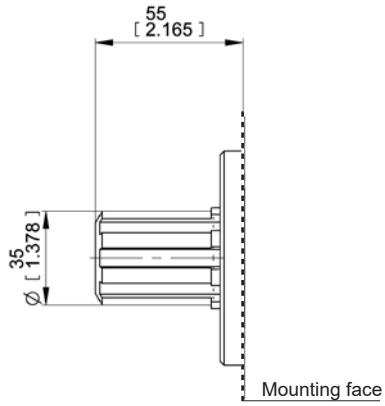
Continental Shaft

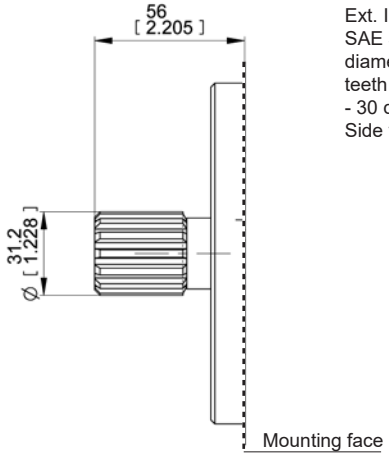


Ext. Involute Spline SAE J498B with outer diameter modified 14 teeth - 12/24 Pitch - 30 deg - Flat Root - Side fit - Class 1

code 58	
Max torque 480 Nm (4250 lbt in)	Max torque 330 Nm (4250 lbt in)
SAE C 14T-12/24DP SPLINED	

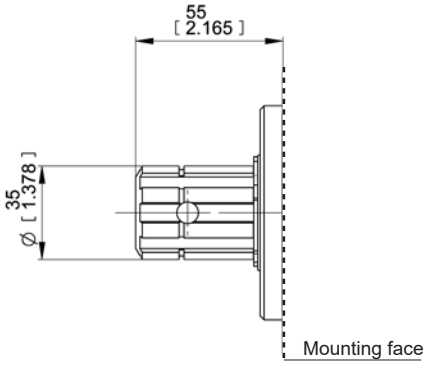


code 67	Max torque 480 Nm (4250 lbt in)
B8x32x36 DIN 5462 SPLINED	

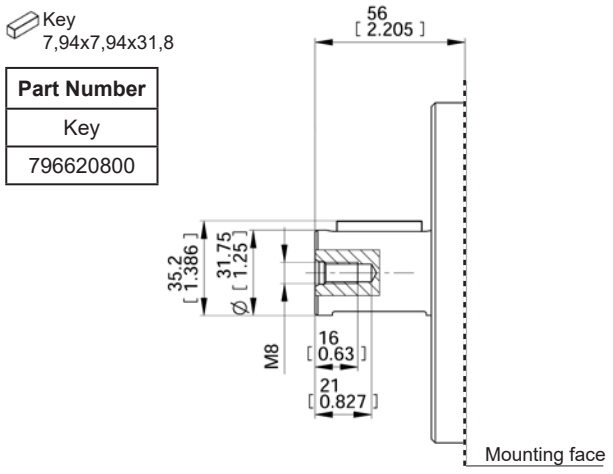


Ext. Involute Spline SAE J498B with outer diameter modified 14 teeth - 12/24 Pitch - 30 deg - Flat Root - Side fit - Class 1

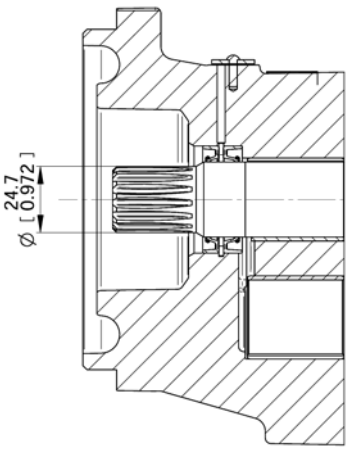
code 57	Max torque 480 Nm (4250 lbt in)
SAE C 14T-12/24DP SPLINED	



code 66	Max torque 480 Nm (4250 lbt in)
B8x32x36 DIN 5462 SPLINED	

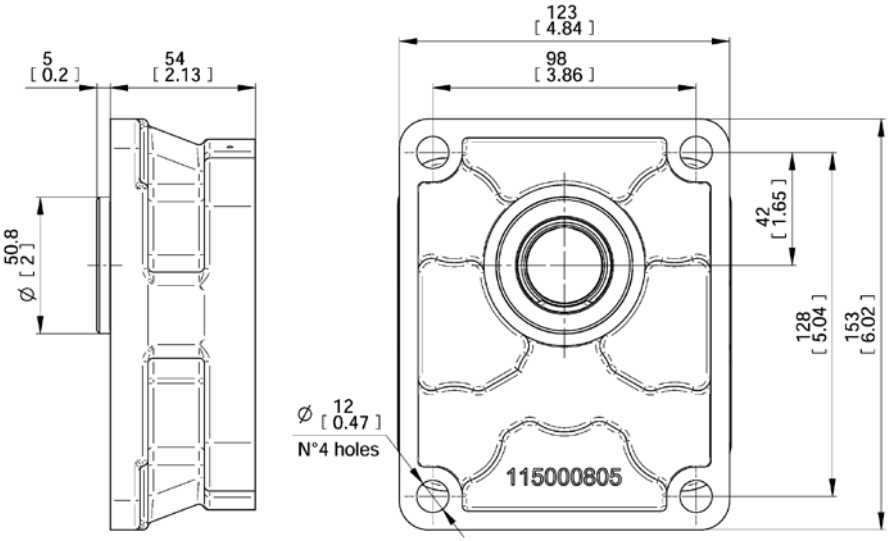


code 89	Max torque 480 Nm (4250 lbt in)
SAE C PARALLEL	



code 70	Max torque 480 Nm (4250 lbt in)
INTERNAL DRIVE SHAFT - W25X1.5X15X8F DIN 5480 SPLINED	

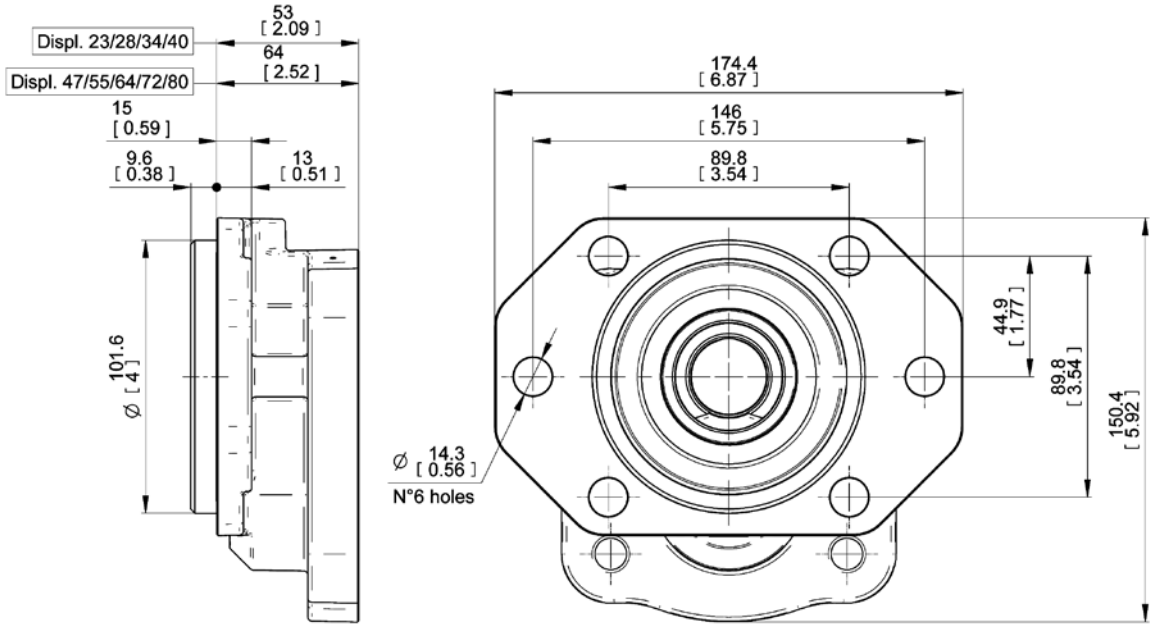
Mounting Flanges



Code	Part Number (Unidirectional Pump)	
	Flange+Shaft seal kit	Shaft seal kit (See page 80-81)
38P2	R15240030 (NBR) R15240031 (FPM)	R12940010 (NBR) R12940020 (FPM)

P2	With shaft code 38

EUROPEAN STANDARD



Code	Part Number (Unidirectional Pump)				
	Flange+Shaft seal kit				Shaft seal kit (See page 80-81)
55S3	Displ. from 23 to 40	R15240010 (NBR) R15240011 (FPM)	Displ. from 47 to 80	R15240020 (NBR) R15240021 (FPM)	R12940030 (NBR) R12940033 (FPM)
56S3					
87S3					
88S3					
58S3		R15240012 (NBR) R15240013 (FPM)		R15240022 (NBR) R15240023 (FPM)	R15020190 (NBR) R15020191 (FPM)

S3	With shaft code 55-56-58-87-88

SAE B 2-4 BOLTS

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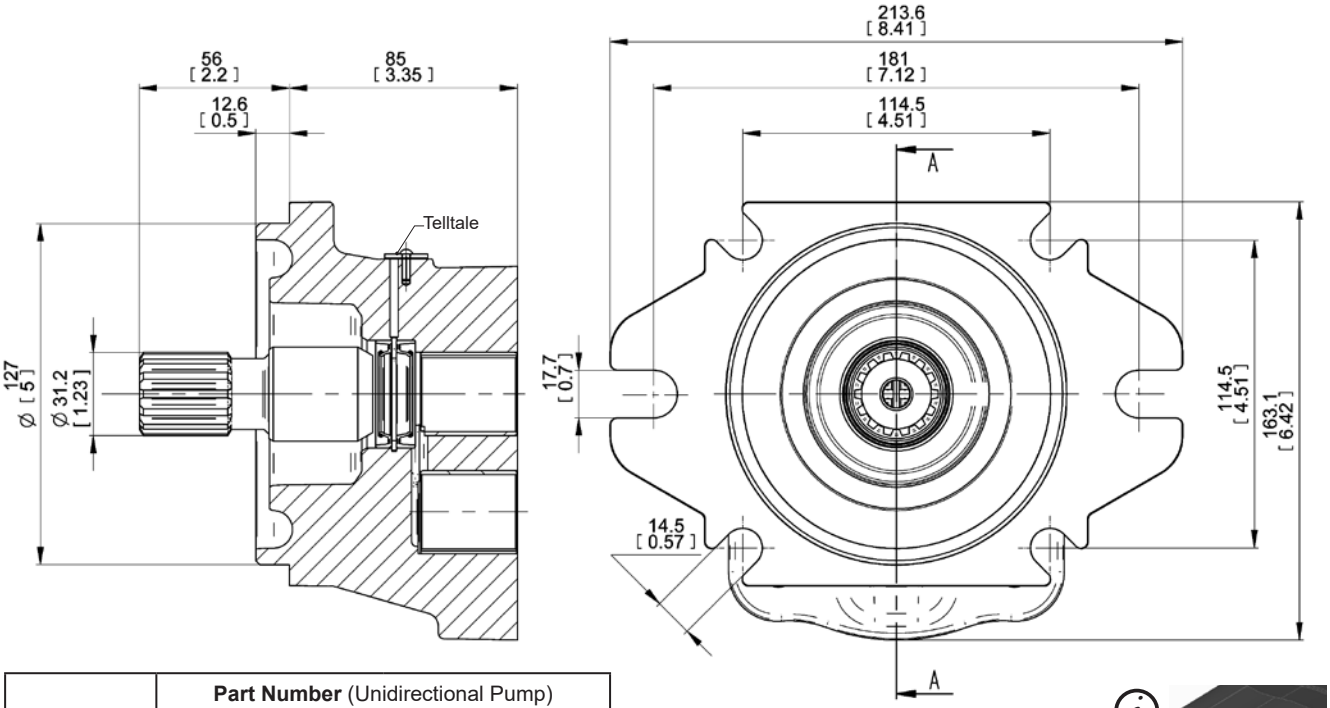
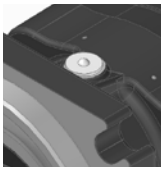
Mounting Flanges



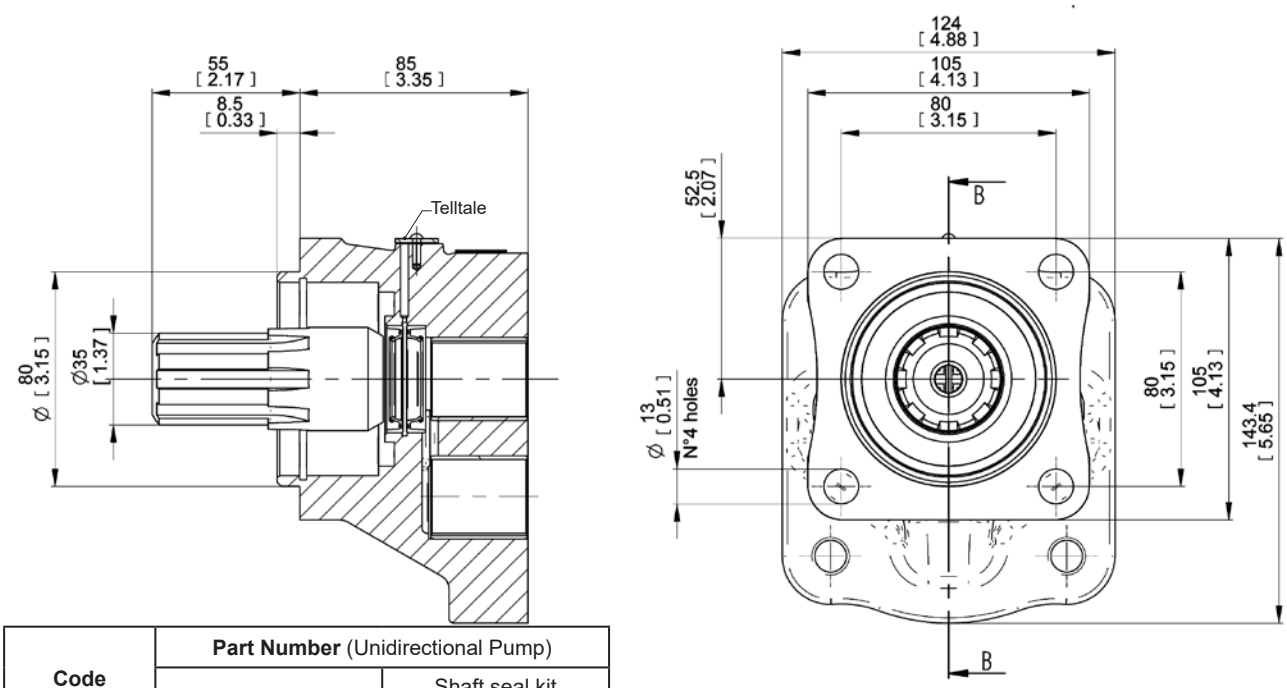
Code	Part Number (Unidirectional Pump)	
	Flange+Shaft seal kit	Shaft seal kit (See page 80-81)
58S4	R15020015 (NBR) R15020017 (FPM)	R15020190 (NBR) R15020191 (FPM)

TellTale
drop in plug in case of failure, outside leakage trough the crossing hole is visible.



S4	With shaft code 58

SAE C 2-4 BOLTS



Code	Part Number (Unidirectional Pump)	
	Flange+Shaft seal kit	Shaft seal kit (See page 80-81)
67Z2	R15020013 (NBR) R15020120 (FPM)	R15020200 (NBR) R15020201 (FPM)

Z2	With shaft code 67

4 Bolts for ZF gear box

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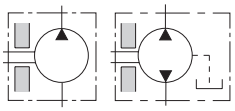
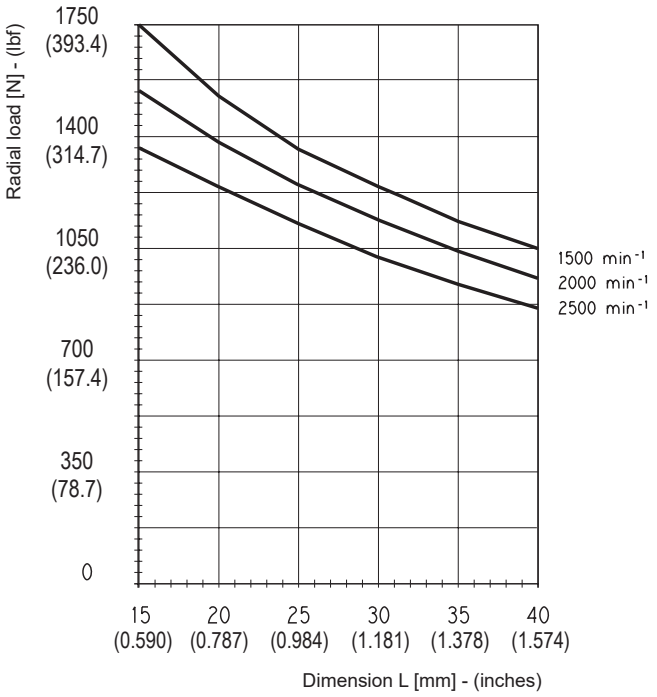
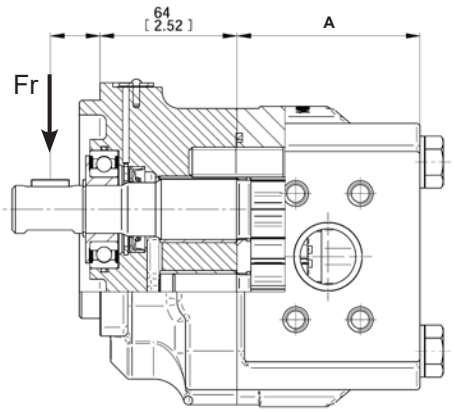
Mounting Flanges with Outrigger Bearing for Medium Loads (R3)

The following diagram shows radial load bearing capacity, in case of parallel axis drag.
The duty life of 3500 - 4000 hours is referred to a tipical mobile application, when duty cycle is less than 100%.



L=Distance between mounting flange and radial force point of application [mm-inches]

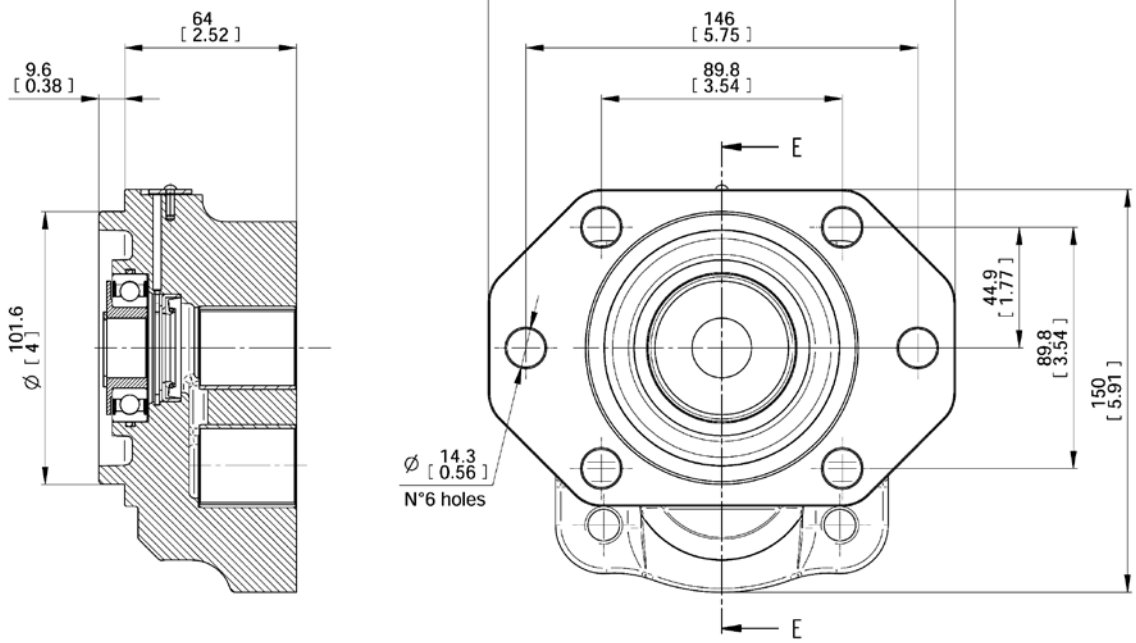




Type	A	
	mm	*in*
PG330 - 23	77	*3.03*
PG330 - 28	81	*3.19*
PG330 - 34	85.5	*3.36*
PG330 - 40	90	*3.54*
PG330 - 47	101.5	*3.40*
PG330 - 55	107.5	*4.23*
PG330 - 64	114.5	*4.51*
PG330 - 72	121.5	*4.78*
PG330 - 80	127.5	*5.02*

Code	Part Number
	Flange+Bearing support
55R3	R15020023 (NBR)
87R3	R15020090 (FPM)
56R3	R15020021 (NBR)
88R3	R15020080 (FPM)

Mounting with special shafts. (Please contact our sales department).



R3	With shaft code 55-56-87-88
SAE B 2-4 BOLTS	

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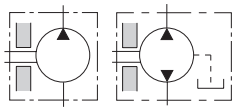
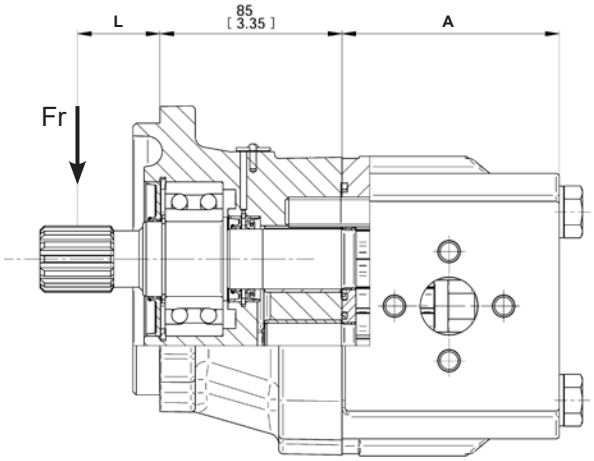
Mounting Flanges with Outrigger Bearing for Heavy Loads (Z1- R8)

The following diagram shows radial load bearing capacity, in case of parallel axis drag.
The duty life of 3500 - 4000 hours is referred to a tipical mobile application, when duty cycle is less than 100%.



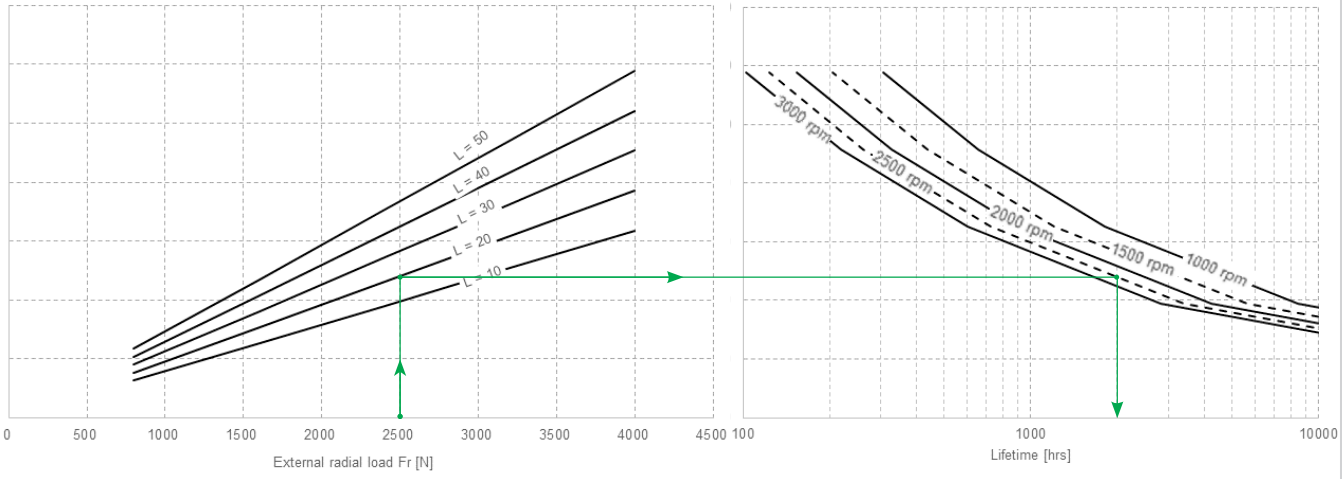
L=Distance between mounting flange and radial force point of application [mm-inches]



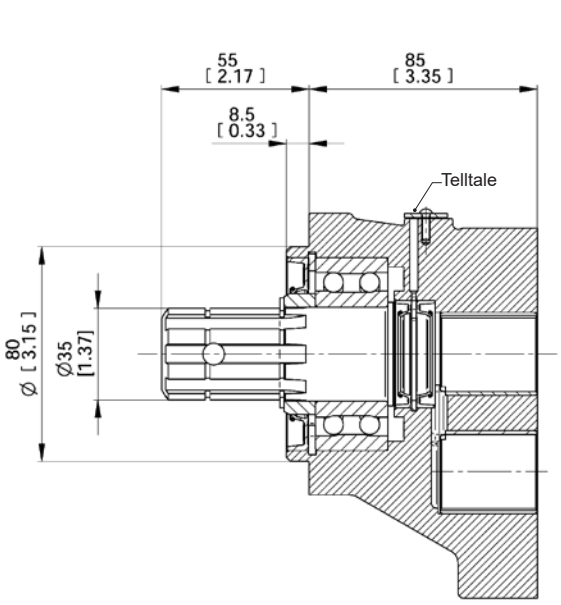
Type	A	
	mm	*in*
PG330 - 23	77	*3.03*
PG330 - 28	81	*3.19*
PG330 - 34	85.5	*3.36*
PG330 - 40	90	*3.54*
PG330 - 47	101.5	*3.40*
PG330 - 55	107.5	*4.23*
PG330 - 64	114.5	*4.51*
PG330 - 72	121.5	*4.78*
PG330 - 80	127.5	*5.02*

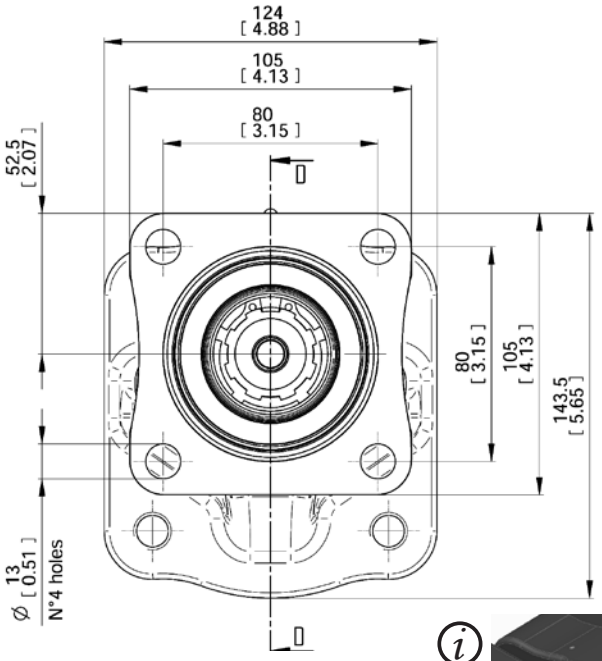
Example:
Fr = 2500 N
L = 20
Speed = 2500 rpm
→ Expected life: 2000 hrs

Code Z1 - R8

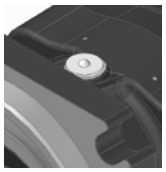


Mounting Flanges with Outrigger Bearing for Heavy Loads (Z1- R8)





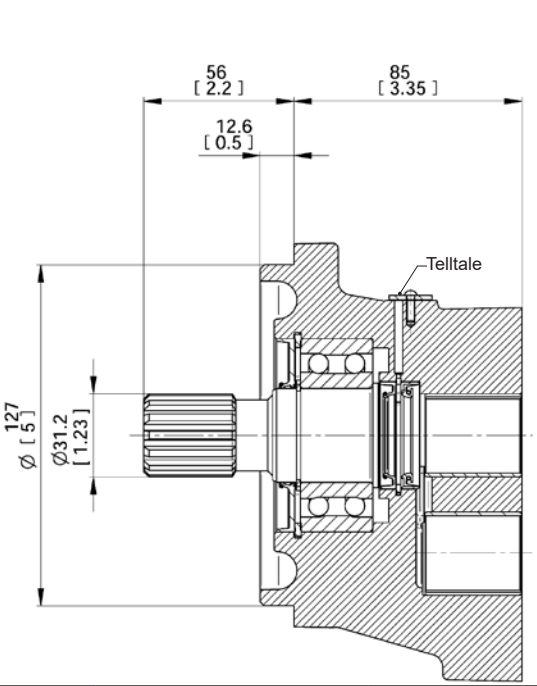
TellTale
drop in plug in case of failure, outside leakage trough the crossing hole is visible.

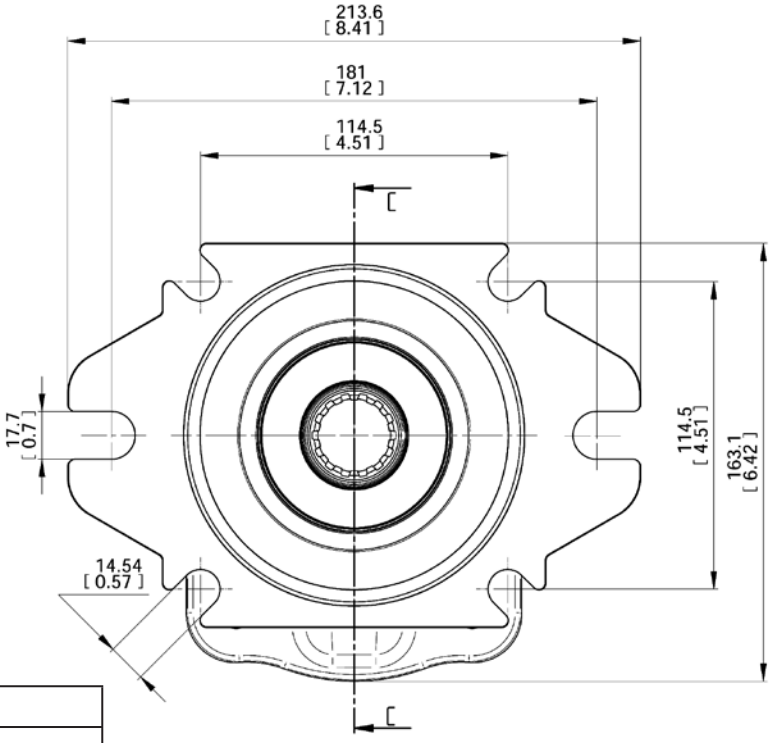


Code	Part Number	
	Flange+Bearing support	
66Z1	R15020012 (NBR)	R15020018 (FPM)

Z1	With shaft code 66

4 BOLTS FOR ZF GEAR





Code	Part Number	
	Flange+Bearing support	
57R8	R15020010 (NBR)	R15020030 (FPM)
89R8	R15020014 (NBR)	R15020040 (FPM)

R8	With shaft code 57-89

SAE C 2-4 BOLTS

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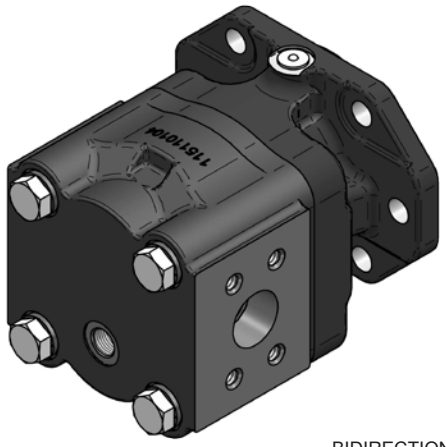
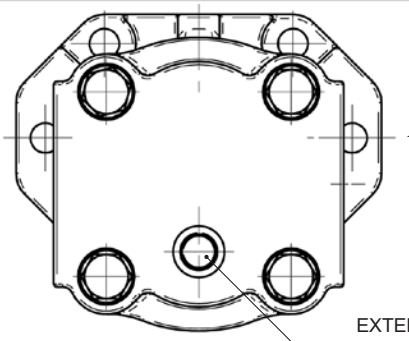
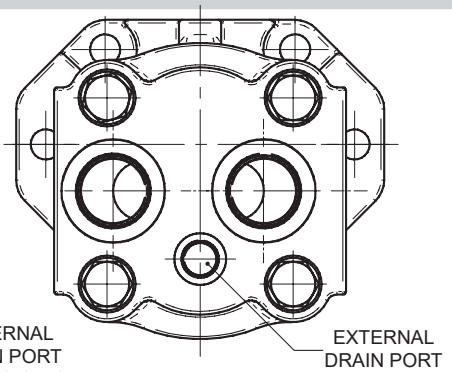
External Drain for Bidirectional Pump





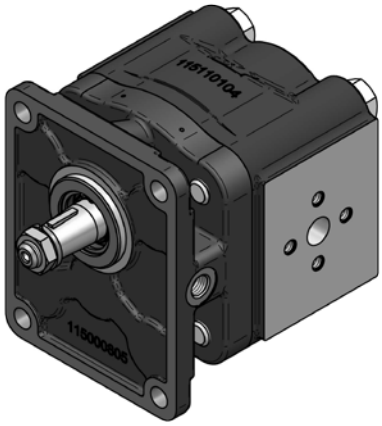


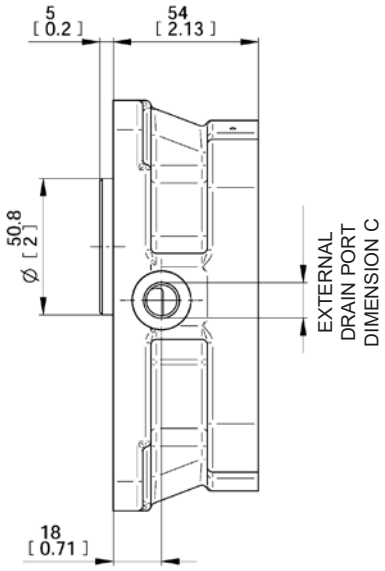
BIDIRECTIONAL ROTATION

Threaded Drain Port
C
9/16-18 UNF-2B SAE 6
G 3/8

Available only threaded ports see page 66

GEAR HOUSING TYPES



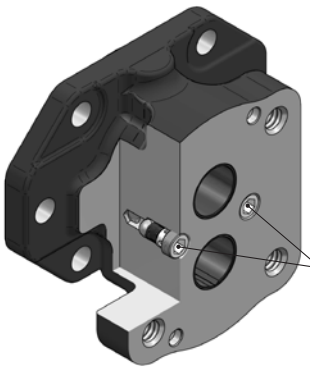


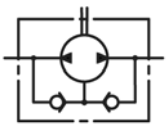
Code	Part Number	Threaded Drain Port
		C
P2 with lateral drain	R15000815	G1/4

BIDIRECTIONAL ROTATION

LD	P2 (EUROPEAN STANDARD) WITH LATERAL DRAIN

Internal Drain Valve for Bidirectional Pump





Part Number
Internal drain valve (A)
R15012501

Code	Part Number			
	Flange+Shaft seal kit+Internal drain valve (A)			
P2-IDV	R15030020 (NBR)		R15030030 (FPM)	
S3-IDV	shafts 55-56-58-87	shaft 88	shafts 55-56-58-87	shaft 88
	R15012503 (NBR) (from 23cc to 40cc) R15012502 (NBR) (from 47cc to 80cc)	R15012511 (NBR) (from 23cc to 40cc) R15012513 (NBR) (from 47cc to 80cc)	R15012505 (FPM) (from 23cc to 40cc) R15012506 (FPM) (from 47cc to 80cc)	R15012512 (FPM) (from 23cc to 40cc) R15012514 (FPM) (from 47cc to 80cc)
S4-IDV	R15012507 (NBR)		R15012508 (FPM)	
R8-IDV	R15012509 (NBR)		R15012510 (FPM)	
Z1-IDV	R15170460 (NBR)		R15170461 (FPM)	
Z2-IDV	R15030040 (NBR)		R15030050 (FPM)	

IDV	INTERNAL DRAIN FOR BI-DIRECTIONAL PUMP

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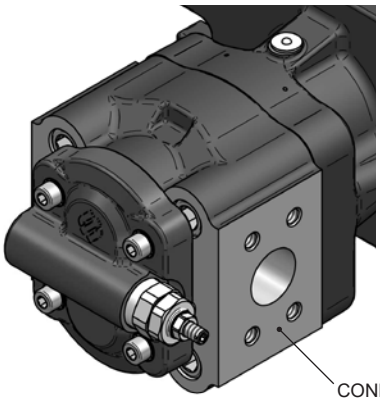
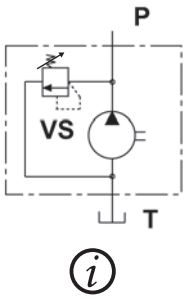
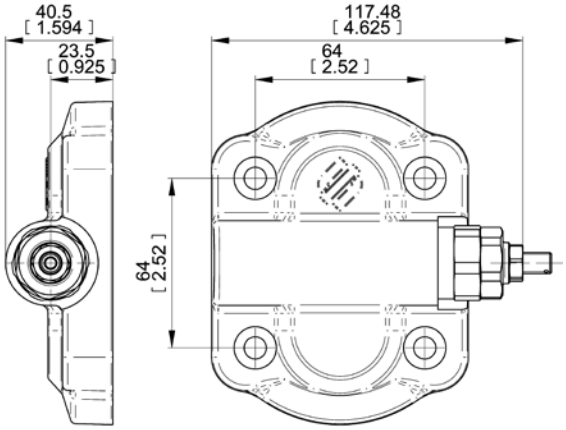
Rear Covers with Valves

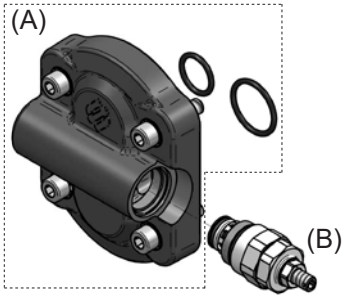




Available up to 80 l/min

CONFIGURATION WITH SPECIAL GEAR HOUSING



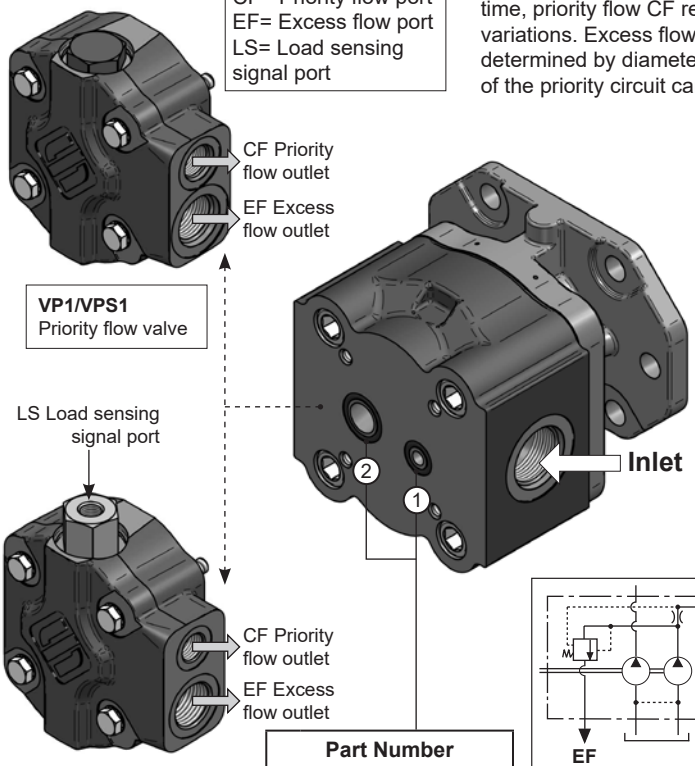


Code	Part Number		
	Cast iron Cover+O-ring (A)	Pressure relief valve (B) setting range	
VS Internal Discharge	R15030010	796366200	20-70 bar
		796366300	71-150 bar
		796366400	151-215 bar
		796366500	216-265 bar

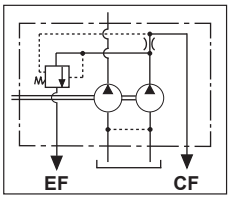
VS — **MAIN RELIEF VALVE**

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

Pressure compensated priority flow valve to feed two pressurized circuitat the same time, priority flow CF remains constant regardless of pump speed and system pressure variations. Excess flow EF is directly proportional to pump speed. Priority flow is determined by diameter of calibrated orifice, see table at page 77). The max. pressure of the priority circuit can be limited by valve which relieves into pump suction line.

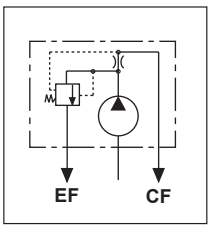


Part Number	
O-Ring	
1	799111200 (NBR)
2	799111900 (NBR)



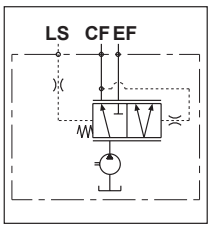
Multiple pump with Priority flow valve available. (Example VP1)

VP1



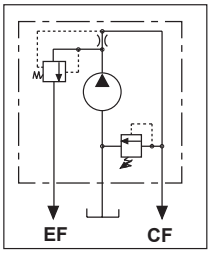
Priority flow valve, excess flow available to second actuator.

VPD1



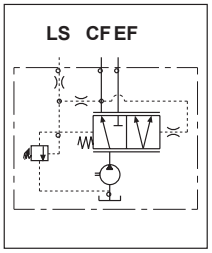
Load sensing priority valve with dynamic signal without main relief valve.

VPS1



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

VPDS1

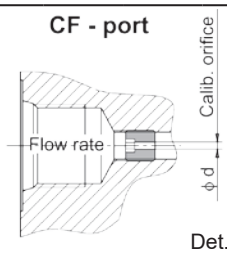


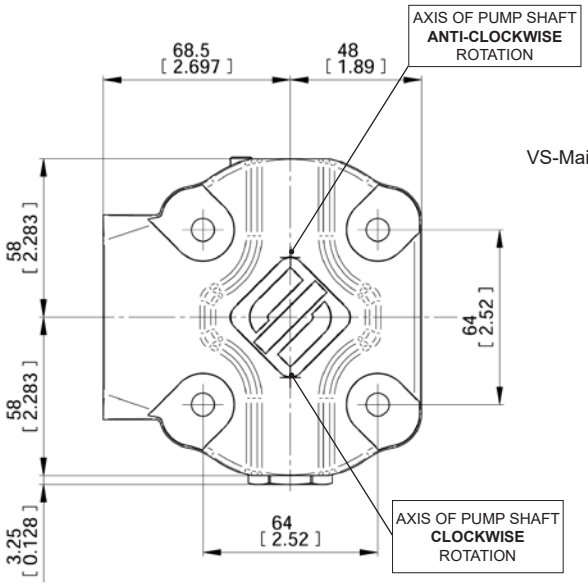
Load sensing priority valve with dinamic signal with main relief valve.

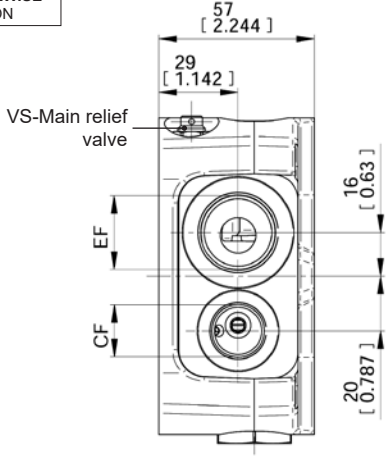
VP1-VPS1	**PRESSURE COMPENSATED PRIORITY FLOW VALVES**
VPD1-VPDS1	**LOAD SENSING PRIORITY VALVES**

E0.151.0725.14.00IM02

Pressure Compensated Priority Flow Valve

Flow Rate Table			
CF - port  Det. A-A			
Calibrated Orifice Φ d		**Flow Rate** ± 10%	
mm	*inch*	l/min	*gpm*
1.5	*0.06*	2.5	*0.66*
2	*0.08*	4	*1.06*
2.4	*0.09*	6	*1.59*
2.8	*0.11*	8	*2.11*
3.1	*0.12*	10	*2.64*
3.5	*0.14*	12.5	*3.30*
4	*0.16*	16	*4.23*
4.4	*0.17*	20	*5.28*
4.9	*0.19*	25	*6.61*





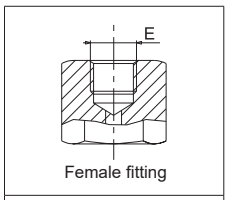
Threaded Port	
CF= Priority flow port	**EF= Excess flow port**
G 3/8	G 3/4
SAE8 3/4 - 16 UNF - 2B	SAE12 1-1/16 - 12 UN - 2A

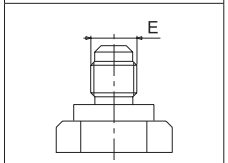
Code	Part Number
VP1 - VPS1	Please contact our sales department

Pressure Relief Valve setting range
30-110 bar
110-380 bar

VP1	**VPS1**
Excess flow available to second actuator - REAR PORTS	Excess flow available to second actuator with **fixed setting** pressure relief valve on priority flow line - REAR PORTS

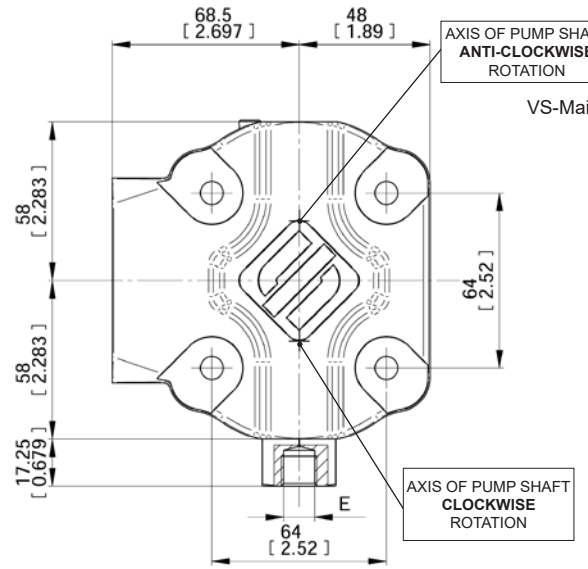
Load Sensing Priority Valve

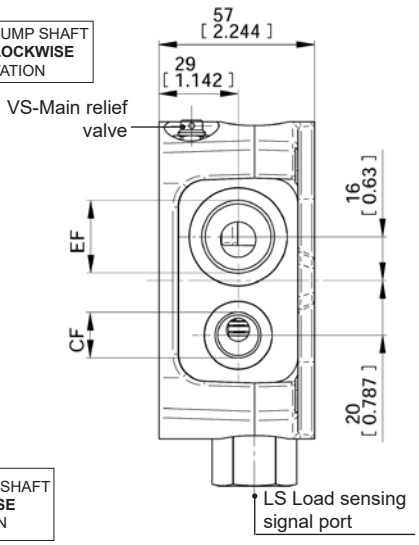




E
G 1/4
SAE4 7/16 - 20 UNF - 2B

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





Threaded Port	
CF= Priority flow port	**EF= Excess flow port**
G 3/8	G 3/4
SAE8 3/4 - 16 UNF - 2B	SAE12 1-1/16 - 12 UN - 2A

Code	Part Number
VPD1 - VPDS1	Please contact our sales department

Pressure Relief Valve setting range
30-110 bar
110-380 bar

VPD1	**VPDS1**
Excess flow available to second actuator - SIDE PORTS	Excess flow available to second actuator with **adjustable setting** pressure relief valve on priority flow line - SIDE PORTS

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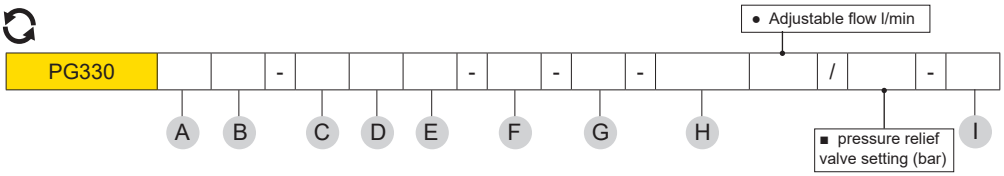


A	CODE	DISPLACEMENTS	
	23	23.4 cm³/rev.	*1.43 cu.in/rev.*
	28	28.6 cm³/rev.	*1.74 cu.in/rev.*
	34	34.4 cm³/rev.	*2.1 cu.in/rev.*
	40	40.3 cm³/rev.	*2.46 cu.in/rev.*
	47	47.5 cm³/rev.	*2.89 cu.in/rev.*
	55	55.2 cm³/rev.	*3.37 cu.in/rev.*
	64	64.3 cm³/rev.	*3.92 cu.in/rev.*
	72	73.4 cm³/rev.	*4.48 cu.in/rev.*
	80	80.6 cm³/rev.	*4.91 cu.in/rev.*

B	ROTATION	CODE
	Clockwise	D
	Anti-clockwise	S
	Reversible	R

C	PORTS	CODE
	Flanged ports european standard	P
	Flanged ports SAE J518 Metric thread	W
	Flanged ports SAE J518 American standard thread	S
	Threaded ports GAS (BSPP)	G
	Threaded ports SAE (ODT)	R

D	DRIVE SHAFT	CODE
	Tapered 1:8	38
	SAE B splined 13T	55
	SAE BB splined 15T	56
	SAE B PARALLEL	87
	SAE BB PARALLEL	88
	SAE C 14T-12/24DP Continental Shaft	58
	8x32x36 UNI 8953 splined Continental Shaft	67
	SAE C 14T-12/24DP Continental Shaft	57
	8x32x36 UNI 8953 splined Continental Shaft	66
	SAE C PARALLEL Continental Shaft	89

E	MOUNTING FLANGES	CODE
	European standard Ø50.8	P2
	SAE B 2-4 BOLTS	S3
	SAE C 2-4 BOLTS	S4
	4 BOLTS FOR ZF GEAR BOX	Z2
	SAE B 2-4 BOLTS - Medium Loads with Outrigger bearing	R3
	SAE C 2-4 BOLTS - Heavy Loads with Outrigger bearing	R8
	4 BOLTS FOR ZF GEAR with Outrigger bearing	Z1

F	SEAL	CODE
	Buna standard (standard configuration)	-
	Viton	V

G	PORTS LAYOUT	CODE
	Side ports (standard configuration)	-
	Rear ports	1
	Side ports - Rear ports plugged	2
	Rear ports - Side ports plugged	3
	Side Inlet port - Rear outlet port	4
	Rear Inlet port - Side outlet port	5

H	FLANGES AND REAR COVERS	CODE
	Priority flow valve with excess flow to 2nd actuator	• VP1
	Priority flow valve with excess flow to 2nd actuator with main relief valve	■ VPS1
	Load sensing priority valve with dinamic signal	• VPD1
	Load sensing priority valve with dinamic signal and main relief valve	■ VPDS1
	Adjustable main relief valve	■ VS
	Internal drain valve (Flange)	IDV
	Lateral drain on P2 (Flange European standard)	LD

I	PAINTING	CODE
	Not painted (standard configuration)	-
	Black painted RAL 9005	BP

How to order Single pump
PG330, displacement (28), clockwise rotation (D), ports European (P), drive shaft (38), mounting flange (P2)= **PG330-28D-P38P2**

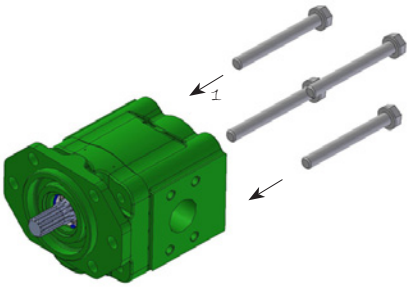
E0.151.0725.14.00IM02

Single Pump Changing Rotation Instructions

Keep the working surface cleaned as well as the exterior of the pump before starting and avoid inner contamination of the pump. The pump shown below is a anti - clockwise rotating pump.
To achieve clockwise rotation, please read the following instructions carefully.

ANTI - CLOCKWISE ROTATION

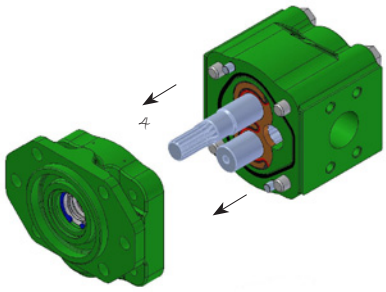
Outlet ⟲ Inlet



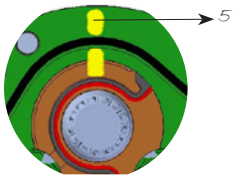
1 - Loosen and fully unscrew the bolts.

2 - Lay the pump on the working area in order to have the mounting flange turned upside.

3 - Coat the shaft end with grease to avoid damaging the shaft seal.

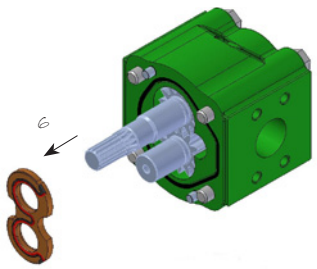


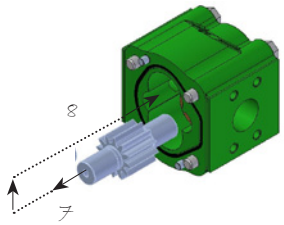
4 - Remove the flange and lay it on the working area; verify that the seal is correctly located in the body seat.



5 - Mark the position of the bushing and eventually of the thrust plates, as well with reference to the body.

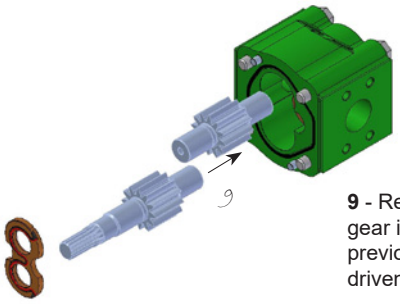
6 - Remove the bushing, thrust plate and the driving gear taking care to avoid driven gear axial shifts.



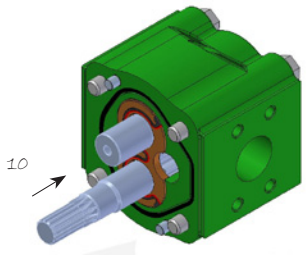


7 - Draw out the driven gear from its housing, taking care to avoid rear cover axial shifts.

8 - Re-locate the driven gear in the position previously occupied by the driving gear.



9 - Re-locate the driving gear in the position previously occupied by the driven gear.



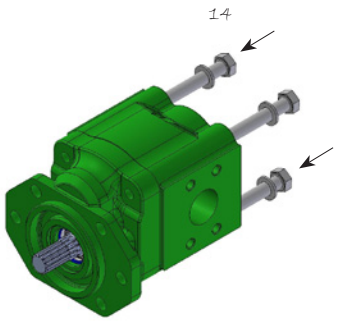
10 - Replace the bushing and thrust plate taking care that:
- marks are located as on the picture
- surface containing the seal is visible
- seal and its protection are correctly located.

11 - Clean the body and mounting flange facing surfaces.

12 - Verify that the two plugs are located in the body.

13 - Refit the mounting flange, turned 180° from its original position.

14 - Replace the bolts and tighten clockwise evenly to an appropriate torque.



15 - Check that the shaft rotates freely.

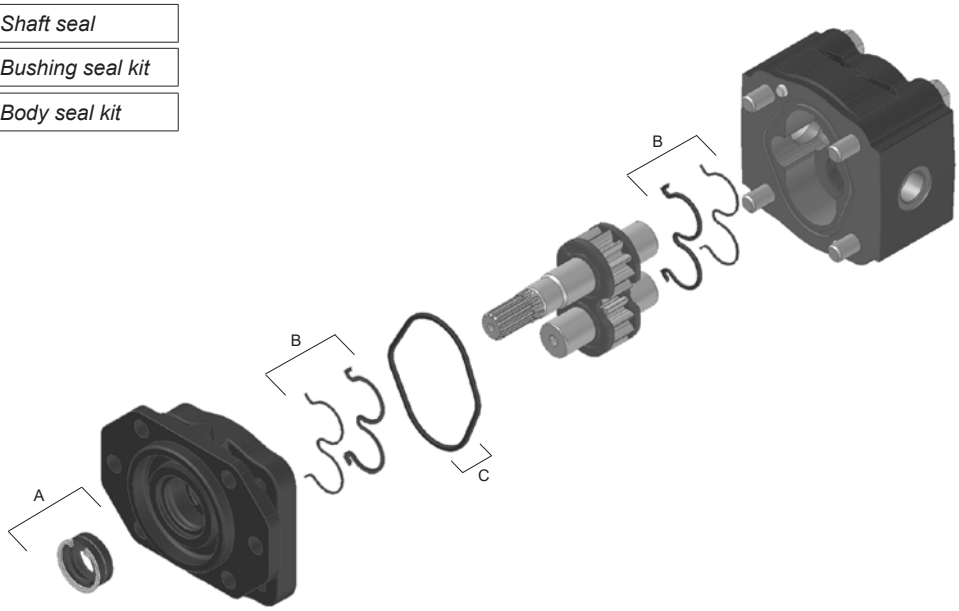
16 - Mark on the flange the new direction of rotation.

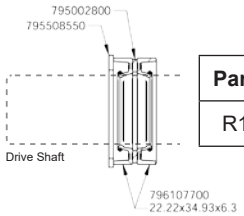
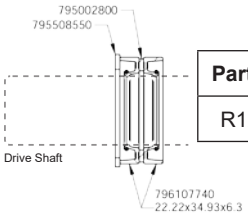
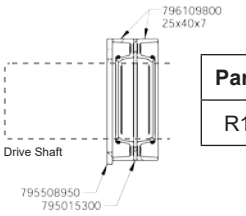
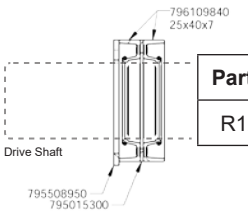
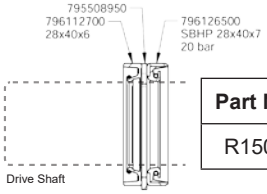
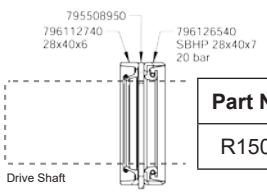
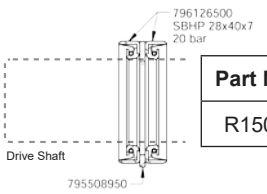
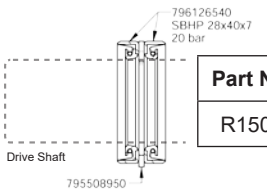
CLOCKWISE ROTATION

Inlet ⟳ Outlet

Unidirectional Pump Seal Spare Parts Kit

A	*Shaft seal*
B	*Bushing seal kit*
C	*Body seal kit*

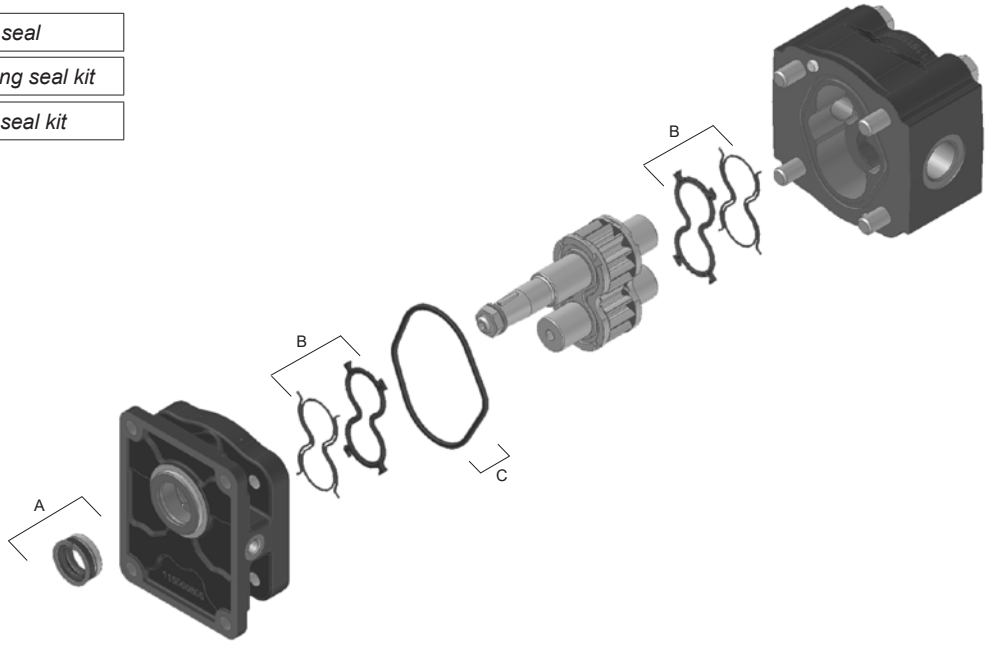


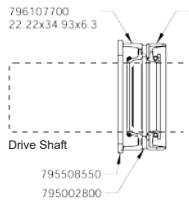
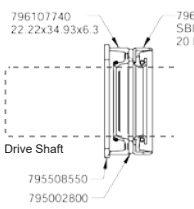
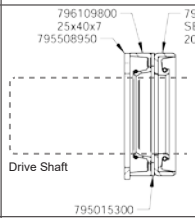
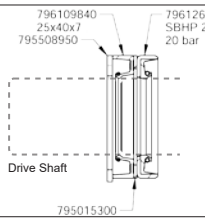
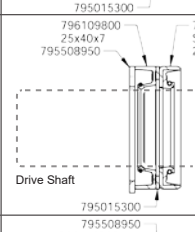
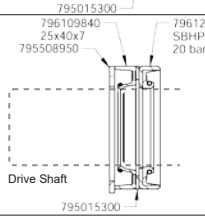
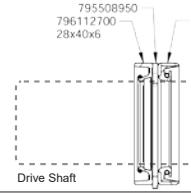
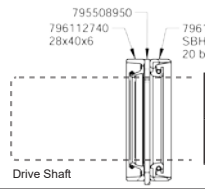
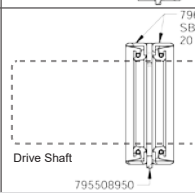
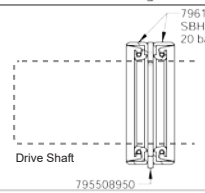
SHAFT & FLANGE TYPE	NBR COMPOUND		FPM COMPOUND	
	Complete seal kit (A+B+C)	Shaft seal kit (A)	Complete seal kit (A+B+C)	Shaft seal kit (A)
38P2	**Part Number** R15170010	 **Part Number** R12940010	**Part Number** R15170013	 **Part Number** R12940020
55S3 56S3 58S3 87S3 88S3	**Part Number** R15170020	 **Part Number** R12940030	**Part Number** R15170023	 **Part Number** R12940033
58S4	**Part Number** R15170030	 **Part Number** R15020190	**Part Number** R15170031	 **Part Number** R15020191
67Z2	**Part Number** R15170430	 **Part Number** R15020200	**Part Number** R15170431	 **Part Number** R15020201

E0.151.0725.14.00IM02

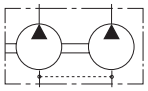
Bidirectional Pump Seal Spare Parts Kit

A	*Shaft seal*
B	*Bushing seal kit*
C	*Body seal kit*

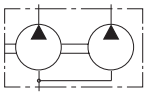


SHAFT & FLANGE TYPE	NBR COMPOUND		FPM COMPOUND	
	Complete seal kit (A+B+C)	Shaft seal kit (A)	Complete seal kit (A+B+C)	Shaft seal kit (A)
38P2	**Part Number** R15170350	 **Part Number** R12940080	**Part Number** R15170360	 **Part Number** R12940083
55S3 56S3 58S3 87S3	**Part Number** R15170370	 **Part Number** R15170140	**Part Number** R15170380	 **Part Number** R15170080
88S3	**Part Number** R15170160	 **Part Number** R15170130	**Part Number** R15170400	 **Part Number** R15170131
58S4	**Part Number** R15170410	 **Part Number** R15020190	**Part Number** R15170420	 **Part Number** R15020191
67Z2	**Part Number** R15170470	 **Part Number** R15020200	**Part Number** R15170471	 **Part Number** R15020201

PG330 Multiple Pump - Dimensions and Technical Data



DOUBLE GEAR PUMPS with individual inlet port



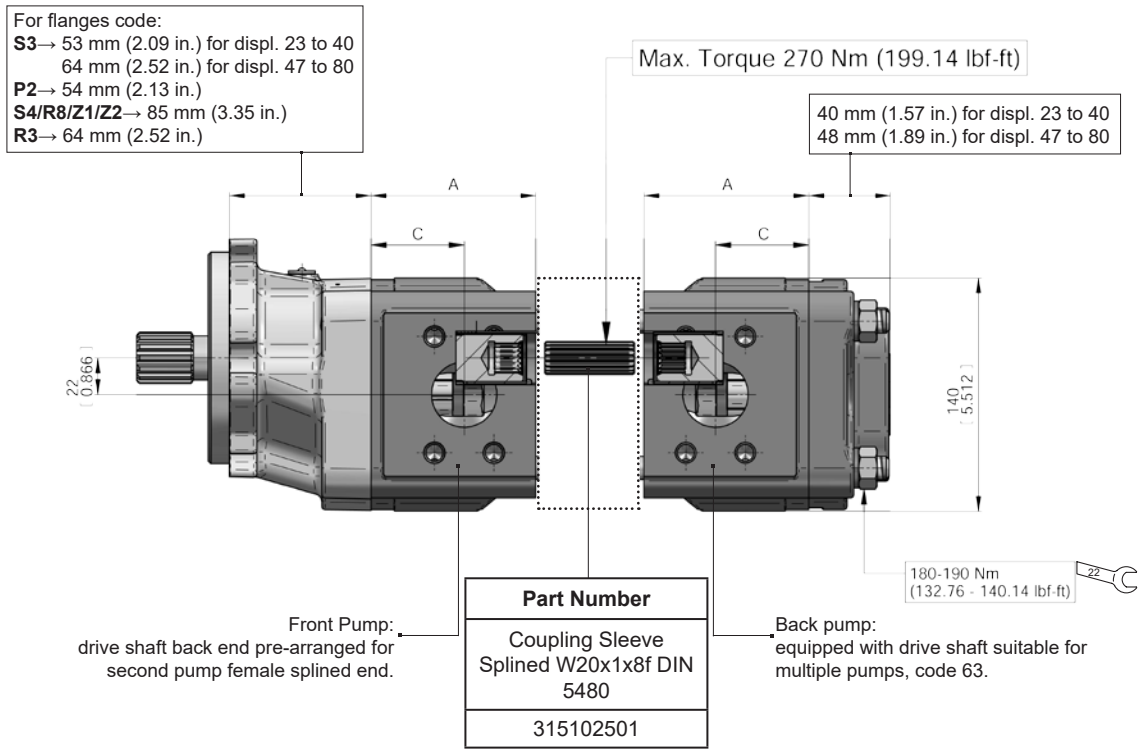
DOUBLE GEAR PUMPS with common inlet port

Recommended to limit the inflow of the downstream pump at 60 l/min MAX to avoid cavitation. Only for common suction port configuration: **Commercial code UA.**

TYPE	Displacement		Dimension A		Dimension C (Front and Back pump)						Max. Continuous pressure p_1		Intermittent pressure p_2		Peak pressure p_3		Min. speed at p_1	Max. speed at p_2
					Type port G-R		Type port P		Type port W-S									
	cm^3/rev	*cu.in/rev*	mm	*in*	mm	*in*	mm	*in*	mm	*in*	bar	*psi*	bar	*psi*	bar	*psi*	rpm	
PG330 - 23	23.4	*1.43*	68	*2.68*	35	*1.38*	35	*1.38*	33	*1.30*	260	*3750*	280	*4060*	300	*4350*	400	3000
PG330 - 28	28.6	*1.74*	72	*2.83*	38	*1.49*	34	*1.34*	36	*1.42*	280	*4060*	300	*4350*	320	*4650*	400	3000
PG330 - 34	34.4	*2.10*	76.5	*3.01*	42.5	*1.67*	37.5	*1.48*	40	*1.57*	280	*4060*	300	*4350*	320	*4650*	400	3000
PG330 - 40	40.3	*2.46*	81	*3.19*	47	*1.85*	42	*1.65*	44.5	*1.75*	260	*3750*	280	*4060*	300	*4350*	400	2700
PG330 - 47	47.4	*2.89*	93	*3.66*	50	*1.97*	50	*1.97*	50	*1.97*	280	*4060*	300	*4350*	320	*4650*	400	2700
PG330 - 55	55.2	*3.37*	99	*6.78*	56	*2.20*	52	*2.05*	56	*2.20*	260	*3750*	280	*4060*	300	*4350*	400	2700
											230*	*3335**	250*	*3625**	270*	*3915**		
PG330 - 64	64.3	*3.92*	106	*7.05*	58	*2.28*	58	*2.28*	58	*2.28*	240	*3480*	260	*3750*	280	*4060*	350	2500
											200*	*2900**	220*	*3190**	240*	*3480**		
PG330 - 72	73.4	*4.48*	113	*7.33*	61	*2.40*	61	*2.40*	61	*2.40*	220	*3190*	240	*3480*	260	*3750*	350	2500
											170*	*2465**	190*	*2755**	210*	*3045**		
PG330 - 80	80.6	*4.91*	119	*7.57*	65	*2.56*	65	*2.56*	65	*2.56*	200	*2900*	220	*3190*	240	*3480*	350	2500

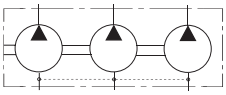
*Values of pressure with configuration **with Shaft 38-Flange P2** on the displacement 55-64-72, due to max Torque of 250 Nm.
Displacement 80 not available.

Max Speed must be lowered by 10% for system working continuosly at p^1 pressure.
Max pressure must be lowered by 10% for birectional pump.

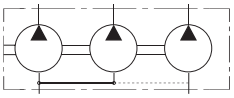


E0.151.0725.14.00IM02

PG330 Triple Pump - Dimensions and Technical Data



TRIPLE GEAR PUMPS
with individual inlet port

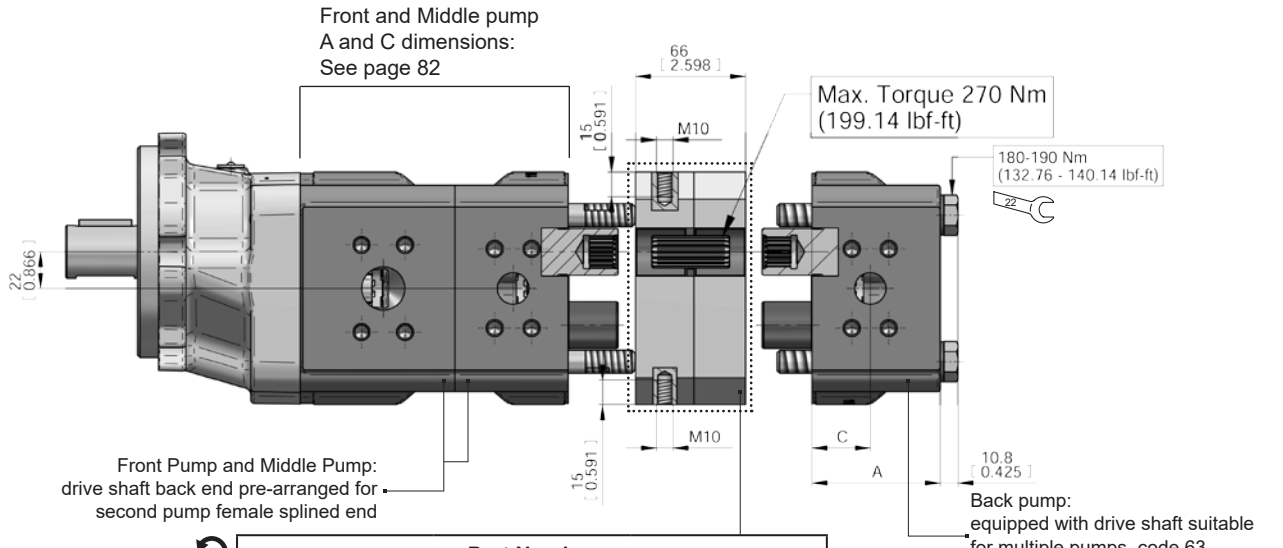


TRIPLE GEAR PUMPS
with common inlet port

TYPE	Displacement		Dimension A (Back pump)		Dimension C (Back pump)		Max. Continuous pressure p_1		Intermittent pressure p_2		Peak pressure p_3		Min. speed at p_1	Max. speed at p_2
	cm^3/rev	*cu.in/rev*	mm	*in*	mm	*in*	bar	*psi*	bar	*psi*	bar	*psi*	rpm	
PG330 - 23	23.4	*1.43*	77	*3.03*	35	*1.38*	260	*3750*	280	*4060*	300	*4350*	400	3000
PG330 - 28	28.6	*1.74*	81	*3.19*	38	*1.49*	280	*4060*	300	*4350*	320	*4650*	400	3000
PG330 - 34	34.4	*2.10*	85.5	*3.36*	42.5	*1.67*	280	*4060*	300	*4350*	320	*4650*	400	3000
PG330 - 40	40.3	*2.46*	90	*3.54*	47	*1.85*	260	*3750*	280	*4060*	300	*4350*	400	2700
PG330 - 47	47.4	*2.89*	101.5	*3.40*	50	*1.97*	280	*4060*	300	*4350*	320	*4650*	400	2700
PG330 - 55	55.2	*3.37*	107.5	*4.23*	56	*2.20*	260	*3750*	280	*4060*	300	*4350*	400	2700
							230*	*3335**	250*	*3625**	270*	*3915**		
PG330 - 64	64.3	*3.92*	114.5	*4.51*	58	*2.28*	240	*3480*	260	*3750*	280	*4060*	350	2500
							200*	*2900**	220*	*3190**	240*	*3480**		
PG330 - 72	73.4	*4.48*	121.5	*4.78*	61	*2.40*	220	*3190*	240	*3480*	260	*3750*	350	2500
							170*	*2465**	190*	*2755**	210*	*3045**		
PG330 - 80	80.6	*4.91*	127.5	*5.02*	65	*2.56*	200	*2900*	220	*3190*	240	*3480*	350	2500

*Values of pressure with configuration **with Shaft 38-Flange P2** on the displacement 55-64-72, due to max Torque of 250 Nm.
Displacement 80 not available.

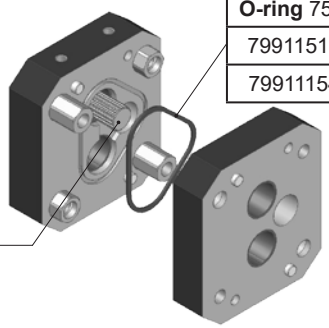
Max Speed must be lowered by 10% for system working continuosly at p¹ pressure.
Max pressure must be lowered by 10% for birectional pump.



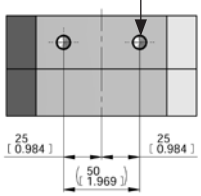
Part Number		
Multiple pumps kit		
R15160030 1° - 2° - 3° Stage= Displ. 23-40 cc	R15160040 1° - 2° - 3° Stage= Displ. 47-72 cc	R15160041 1° - 2° Stage= Displ. 47-72 cc 3° Stage= Displ. 23-40 cc

Part Number
Coupling Sleeve Splined W20x1x8f DIN 5480
315002501

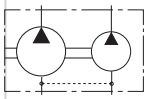
Part Number
O-ring 75,87 x 2,62
799115100 (NBR)
799111540 (FPM)



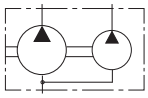
Top and bottom
fixing holes (M10)
for pump support.



PG330 with Pump 2PE or 2PGE piggy back pump - Dimensions



MULTIPLE GEAR PUMPS with individual inlet port



MULTIPLE GEAR PUMPS with common inlet port

Recommended to limit the inflow of the downstream pump at 30 l/min MAX to avoid cavitation. Only for common suction port configuration: **Commercial code UA.**

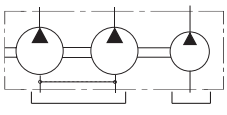
TYPE	Displacement		Dimension A		Dimension C (Front and Back pump)					
					Type port G-R		Type port P		Type port W-S	
	cm³/ rev	*cu.in/ rev*	mm	*in*	mm	*in*	mm	*in*	mm	*in*
PG330 - 23	23.4	*1.43*	72	*2.83*	35	*1.38*	35	*1.38*	*33*	*1.30*
PG330 - 28	28.6	*1.74*	76	*2.99*	38	*1.49*	34	*1.34*	*36*	*1.42*
PG330 - 34	34.4	*2.10*	80.5	*3.17*	42.5	*1.67*	37.5	*1.48*	*40*	*1.57*
PG330 - 40	40.3	*2.46*	85	*3.35*	47	*1.85*	42	*1.65*	*44.5*	*1.75*
PG330 - 47	47.4	*2.89*	96	*3.78*	50	*1.97*	50	*1.97*	*50*	*1.97*
PG330 - 55	55.2	*3.37*	102	*4.02*	56	*2.20*	52	*2.05*	*56*	*2.20*
PG330 - 64	64.3	*3.92*	109	*4.29*	58	*2.28*	58	*2.28*	*58*	*2.28*
PG330 - 72	73.4	*4.48*	116	*4.57*	61	*2.40*	61	*2.40*	*61*	*2.40*
PG330 - 80	80.6	*4.91*	122	*4.80*	65	*2.56*	65	*2.56*	*65*	*2.56*

TYPE		Displacement		Dimension A (2PGE-2PE)		Dimension C (2PGE-2PE)	
		cm³/ rev	*cu.in/ rev*	mm	*in*	mm	*in*
-	2PE - 3.2	3.2	*0.19*	47.1	*1.83*	23.55	*0.93*
-	2PE - 3.9	3.9	*0.24*				
-	2PE - 4.5	4.6	*0.27*				
2PGE - 6.5	2PE - 6.5	6.5	*0.40*	49.95	*1.97*	25	*0.98*
2PGE - 8.3	2PE - 8.3	8.2	*0.50*	52.8	*2.07*	26.4	*1.04*
-	2PE - 10.5	10.6	*0.65*	56.3	*2.35*	28.15	*1.11*
2PGE - 11.3	2PE - 11.3	11.5	*0.68*	59.7	*2.35*	29.75	*1.17*
-	2PE - 12.5	12.7	*0.77*				
2PGE - 13.8	2PE - 13.8	13.8	*0.84*	63.5	*2.5*	31.75	*1.25*
2PGE - 16	2PE - 16	16.6	*1.01*	67.5	*2.65*	33.75	*1.25*
2PGE - 19	2PE - 19	19.4	*1.15*	75.6	*2.97*	37.80	*1.49*
2PGE - 22.5	2PE - 22.5	22.9	*1.37*	81	*3.19*	40.5	*1.59*
2PGE - 26	2PE - 26	25.8	*1.58*	86.8	*3.42*	43.4	*1.71*
2PGE - 28	-	28.71	*1.71*	89	*3.50*	48	*1.89*

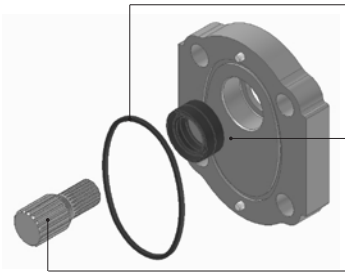
2PE and 2PGE can be single or multiple and/or with built in valve in the rear cover.

Available AS configuration

Part Number
Multiple pumps kit with separated stages for different fluid (2 tanks) - **Code AS**
R15190010 (NBR)
R15190011 (FPM)

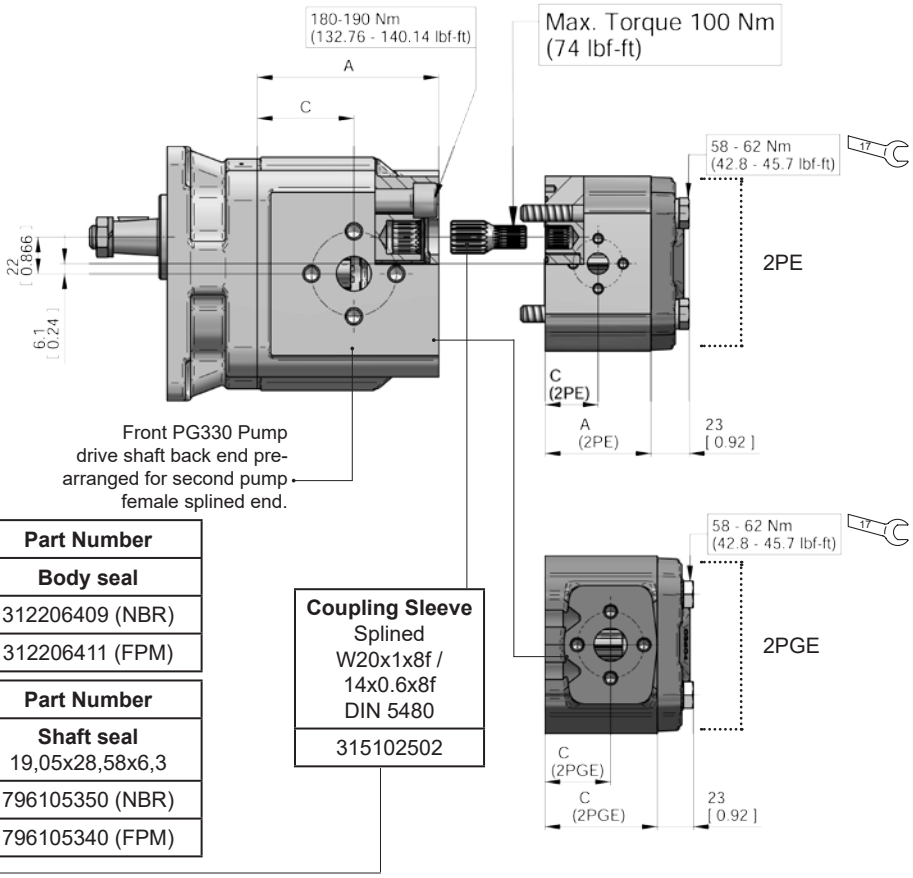


MULTIPLE GEAR PUMPS with separated stages
(Example: **Code AS2**= Separated inlet between second and third stage.)



Part Number
Body seal
312206409 (NBR)
312206411 (FPM)

Part Number
Shaft seal 19,05x28,58x6,3
796105350 (NBR)
796105340 (FPM)



Front PG330 Pump drive shaft back end pre-arranged for second pump female splined end.

Coupling Sleeve
Splined W20x1x8f / 14x0.6x8f DIN 5480
315102502

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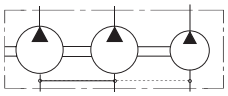
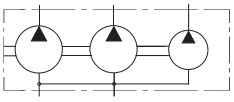
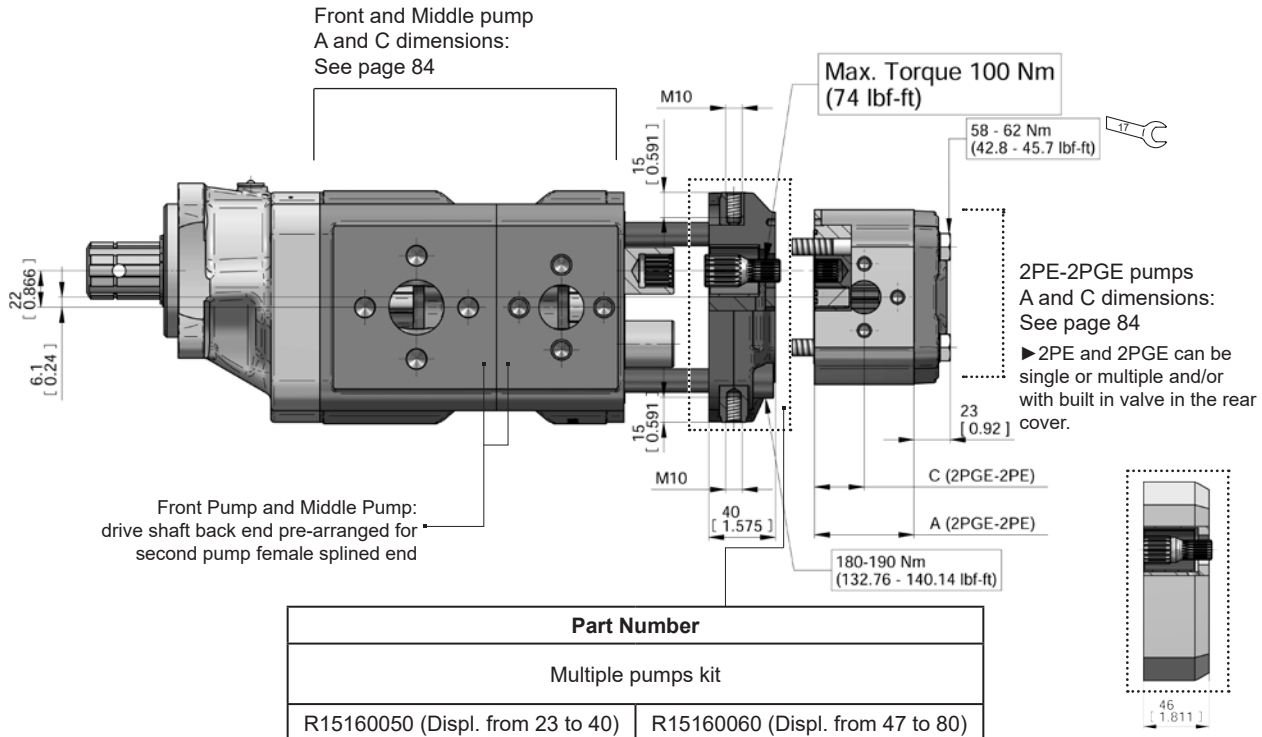
PG330 Multiple with Pump 2PE or 2PGE piggy back pump - Dimensions



MULTIPLE GEAR PUMPS
with individual inlet port

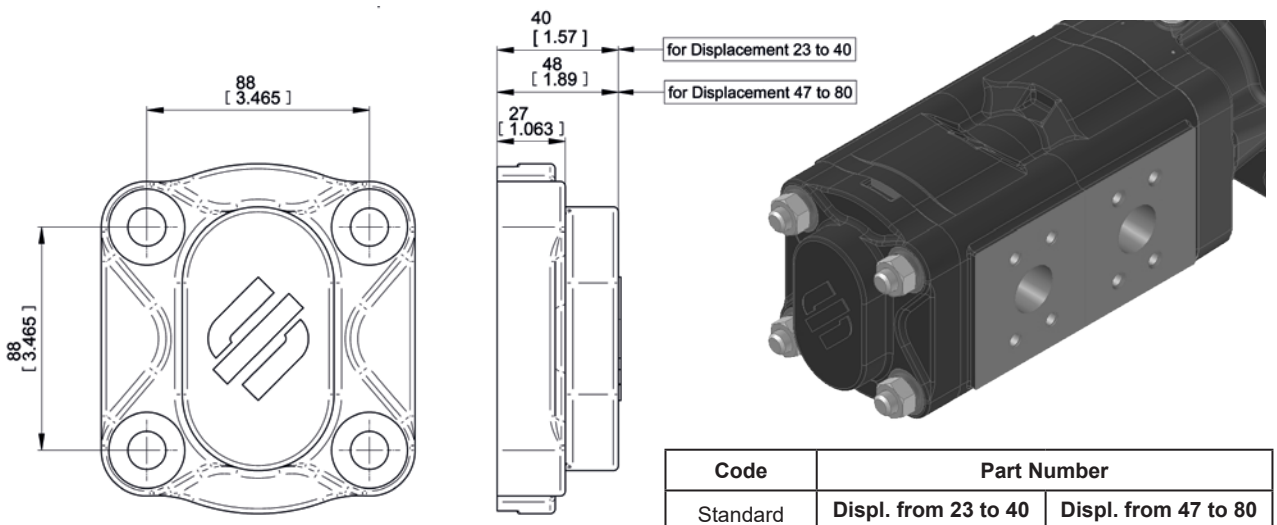


MULTIPLE GEAR PUMPS
with common inlet port on first two stages



Part Number	
Multiple pumps kit	
R15160050 (Displ. from 23 to 40)	R15160060 (Displ. from 47 to 80)

Rear Cover - Dimensions



Code	Part Number	
Standard Cover	Displ. from 23 to 40	Displ. from 47 to 80
	R15003501	R15003508

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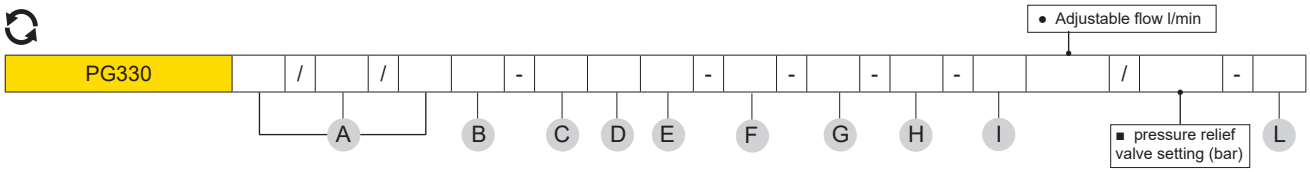

A

CODE	DISPLACEMENTS	
23	23.4 cm³/rev.	*1.43 cu.in/rev.*
28	28.6 cm³/rev.	*1.74 cu.in/rev.*
34	34.4 cm³/rev.	*2.1 cu.in/rev.*
40	40.3 cm³/rev.	*2.46 cu.in/rev.*
47	47.5 cm³/rev.	*2.89 cu.in/rev.*
55	55.2 cm³/rev.	*3.37 cu.in/rev.*
64	64.3 cm³/rev.	*3.92 cu.in/rev.*
72	73.4 cm³/rev.	*4.48 cu.in/rev.*
80	80.6 cm³/rev.	*4.91 cu.in/rev.*

B

ROTATION	CODE
Clockwise	D
Anti-clockwise	S

C

PORTS	CODE
Flanged ports european standard	P
Flanged ports SAE J518 Metric thread	W
Flanged ports SAE J518 American standard thread	S
Threaded ports GAS (BSPP)	G
Threaded ports SAE (ODT)	R

D

DRIVE SHAFT	CODE
Tapered 1:8	38
SAE B splined 13T	55
SAE BB splined 15T	56
SAE B PARALLEL	87
SAE BB PARALLEL	88
SAE C 14T-12/24DP Continental Shaft	58
8x32x36 UNI 8953 splined Continental Shaft	67
SAE C 14T-12/24DP Continental Shaft	57
8x32x36 UNI 8953 splined Continental Shaft	66
SAE C PARALLEL Continental Shaft	89

How to order Multiple pump
PG330, displacement first stage (40), displacement second stage (28), clockwise rotation (D), ports European (P), drive shaft (38), mounting flange (P2)= **PG330-40/28D-P38P2**

E

MOUNTING FLANGES	CODE
European standard Ø50.8	P2
SAE B 2-4 BOLTS	S3
SAE C 2-4 BOLTS	S4
4 BOLTS FOR ZF GEAR BOX	Z2
SAE B 2-4 BOLTS - Medium Loads with Outrigger bearing	R3
SAE C 2-4 BOLTS - Heavy Loads with Outrigger bearing	R8
4 BOLTS FOR ZF GEAR with Outrigger bearing	Z1

F

SEAL	CODE
Buna standard (standard configuration)	-
Viton	V

G

PORTS LAYOUT	CODE
Side ports (standard configuration)	-
Rear ports	1
Side ports - Rear ports plugged	2
Rear ports - Side ports plugged	3
Side Inlet port - Rear outlet port	4
Rear Inlet port - Side outlet port	5

H

INLET PORTS	CODE
Common Inlet: Pump with one inlet port opened, all the other inlet port are closed. *Number 1, 2 or 3* identify the body where inlet port is open.	UA

I

FLANGES AND REAR COVERS	CODE
Priority flow valve with excess flow to 2nd actuator	● VP1
Priority flow valve with excess flow to 2nd actuator with main relief valve	■ VPS1
Load sensing priority valve with dinamic signal	● VPD1
Load sensing priority valve with dinamic signal and main relief valve	■ VPDS1
Adjustable main relief valve	■ VS
Internal drain valve (Flange)	IDV
Lateral drain on P2 (Flange European standard)	LD

L

PAINTING	CODE
Not painted (standard configuration)	-
Black painted RAL 9005	BP

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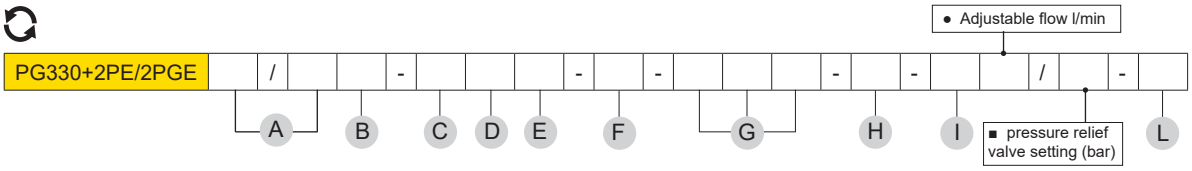

A CODE	DISPLACEMENTS	
23	23.4 cm³/rev.	*1.43 cu.in/rev.*
28	28.6 cm³/rev.	*1.74 cu.in/rev.*
34	34.4 cm³/rev.	*2.1 cu.in/rev.*
40	40.3 cm³/rev.	*2.46 cu.in/rev.*
47	47.5 cm³/rev.	*2.89 cu.in/rev.*
55	55.2 cm³/rev.	*3.37 cu.in/rev.*
64	64.3 cm³/rev.	*3.92 cu.in/rev.*
72	73.4 cm³/rev.	*4.48 cu.in/rev.*
80	80.6 cm³/rev.	*4.91 cu.in/rev.*

B ROTATION	CODE
Clockwise	D
Anti-clockwise	S

C PORTS	CODE
Flanged ports european standard	P
Flanged ports SAE J518 Metric thread	W
Flanged ports SAE J518 American standard thread	S
Threaded ports GAS (BSPP)	G
Threaded ports SAE (ODT)	R

D DRIVE SHAFT	CODE
Tapered 1:8	38
SAE B splined 13T	55
SAE BB splined 15T	56
SAE B PARALLEL	87
SAE BB PARALLEL	88
SAE C 14T-12/24DP Continental Shaft	58
8x32x36 UNI 8953 splined Continental Shaft	67
SAE C 14T-12/24DP Continental Shaft	57
8x32x36 UNI 8953 splined Continental Shaft	66
SAE C PARALLEL Continental Shaft	89

How to order Multiple pump with 2PE or 2PGE
PG330, displacement first stage (47), displacement second stage (28), clockwise rotation (D), ports European (P), drive shaft (55), mounting flange (S3) + 2PE, displacement (8.3), ports European (P)= **PG330-47/28D-P55S3-2PE8.3P**

E MOUNTING FLANGES	CODE
European standard Ø50.8	P2
SAE B 2-4 BOLTS	S3
SAE C 2-4 BOLTS	S4
4 BOLTS FOR ZF GEAR BOX	Z2
SAE B 2-4 BOLTS - Medium Loads WITH OUTRIGGER BEARING	R3
SAE C 2-4 BOLTS - Heavy Loads with Outrigger bearing	R8
4 BOLTS FOR ZF GEAR with Outrigger bearing	Z1

F SEAL	CODE
Buna standard (standard configuration)	-
Viton	V

G COMBINATION WITH 2PE or 2PGE

2PE Piggy back configuration:
● Displacement at page 84
● Port type See 2PE Technical catalogue at page 35

2PGE Piggy back configuration:
● Displacement at page 84
● Port type See 2PE Technical catalogue at page 21/22

H INLET PORTS	CODE
Separated stages: Pump with separated stages for different fluid (2 tanks). *Number 1, 2 or 3* identify the body where Kit AS is mounted.	AS
Common Inlet: Pump with one inlet port opened, all the other inlet port are closed. *Number 1, 2 or 3* identify the body where inlet port is open.	UA

I FLANGES AND REAR COVERS	CODE
Priority flow valve with excess flow to 2nd actuator	● VP1
Priority flow valve with excess flow to 2nd actuator with main relief valve	■ VPS1
Load sensing priority valve with dinamic signal	● VPD1
Load sensing priority valve with dinamic signal and main relief valve	■ VPDS1
Adjustable main relief valve	■ VS
Internal drain valve (Flange)	IDV
Lateral drain on P2 (Flange European standard)	LD

L PAINTING	CODE
Not painted (standard configuration)	-
Black painted RAL 9005	BP

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Note

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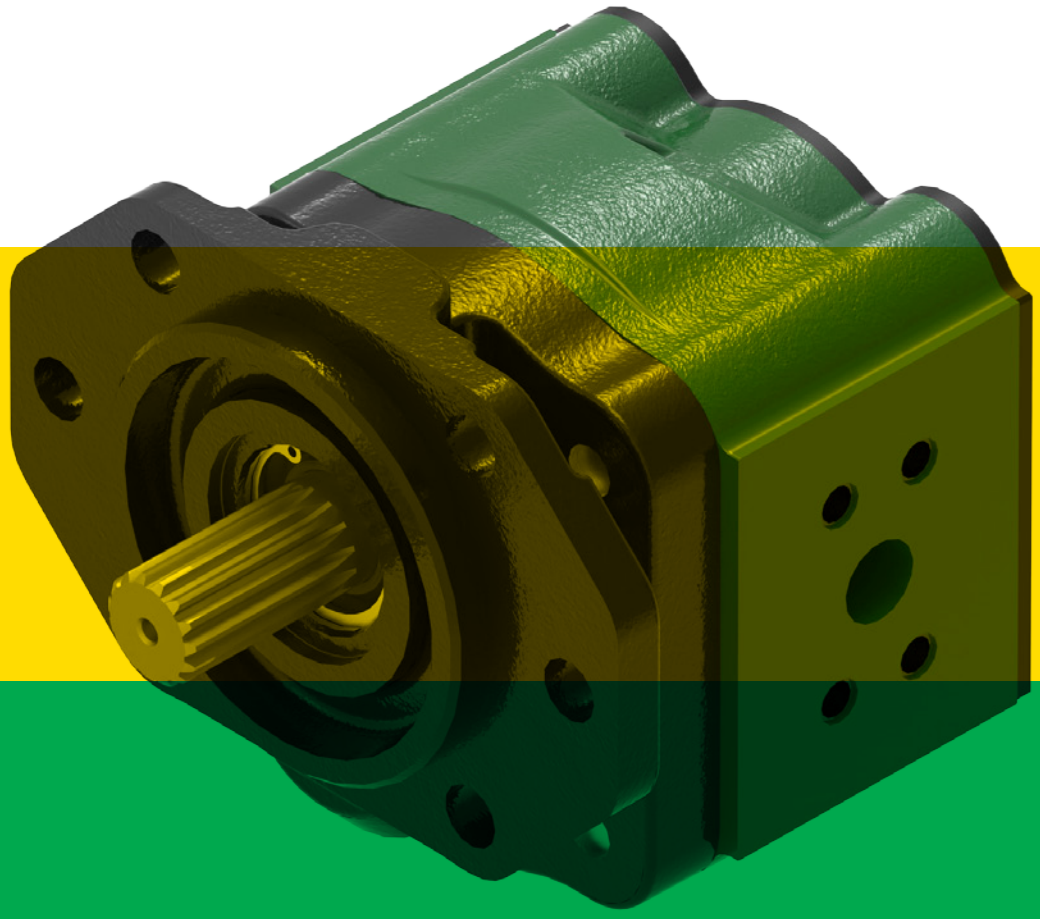
PG331

High Pressure Cast Iron Gear Pumps

Product Manual



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COMPANY WITH
QUALITY SYSTEM
CERTIFIED BY DNV
ISO 9001

TÜV Thüringen Italia Certificate
TÜV Thüringen Italia
ISO 14001:2015
04-IT-SAL-200033
TTIC

salami
FLUID POWER SYSTEMS ®

Final revised edition - July 2025

The data in this catalogue refers to the standard product.The policy of Salami S.p.A. consists of a continuous improvement of its products. It reserves the right to change the specifications of the different products whenever necessary and without giving prior information.
If any doubts, please contact our sales department.

Contents

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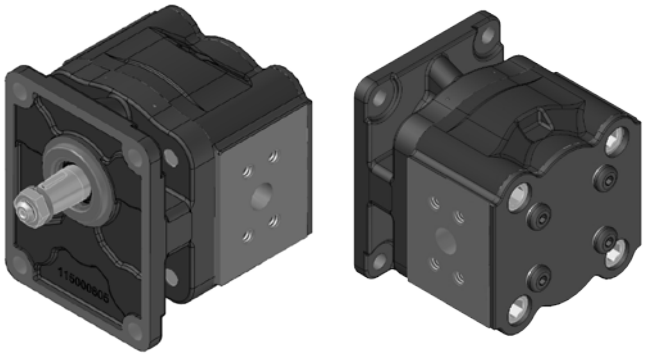
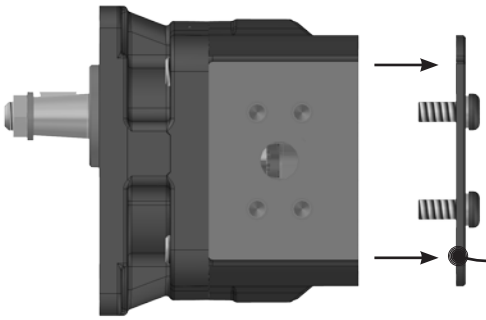
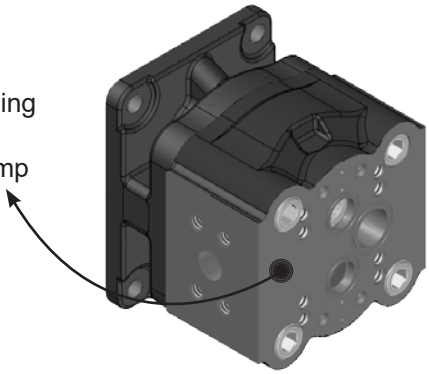
Features

It’s never been so easy to build multiple stage pumps, until the PG331 Series arrived in the market.
Unlike the PG330, the PG331 Series has been designed to provide Salami’s Distributors the possibility of an easy build of multiple stage pumps, without compromising the compact design of the PG330 Series.
To accomplish this flexible option, in the rear side of the gear housing, the PG331 Series employs all the machining required for an easy fit of a second PG331 as well as a 2PE or 2PGE Series second pump.
Cost effective dedicated assembling kits are provided for all the different multiple stage pump assemblies.

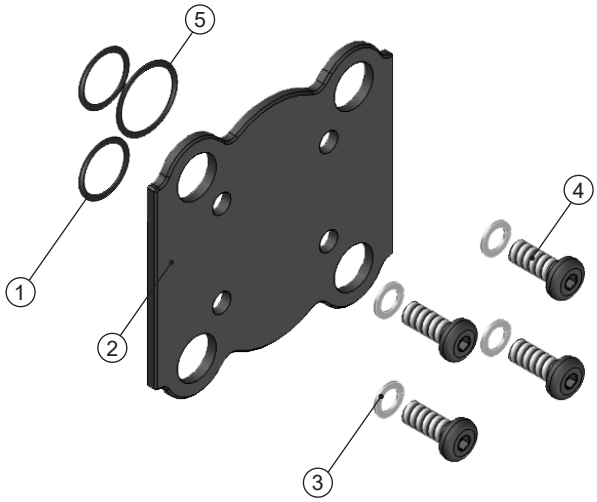




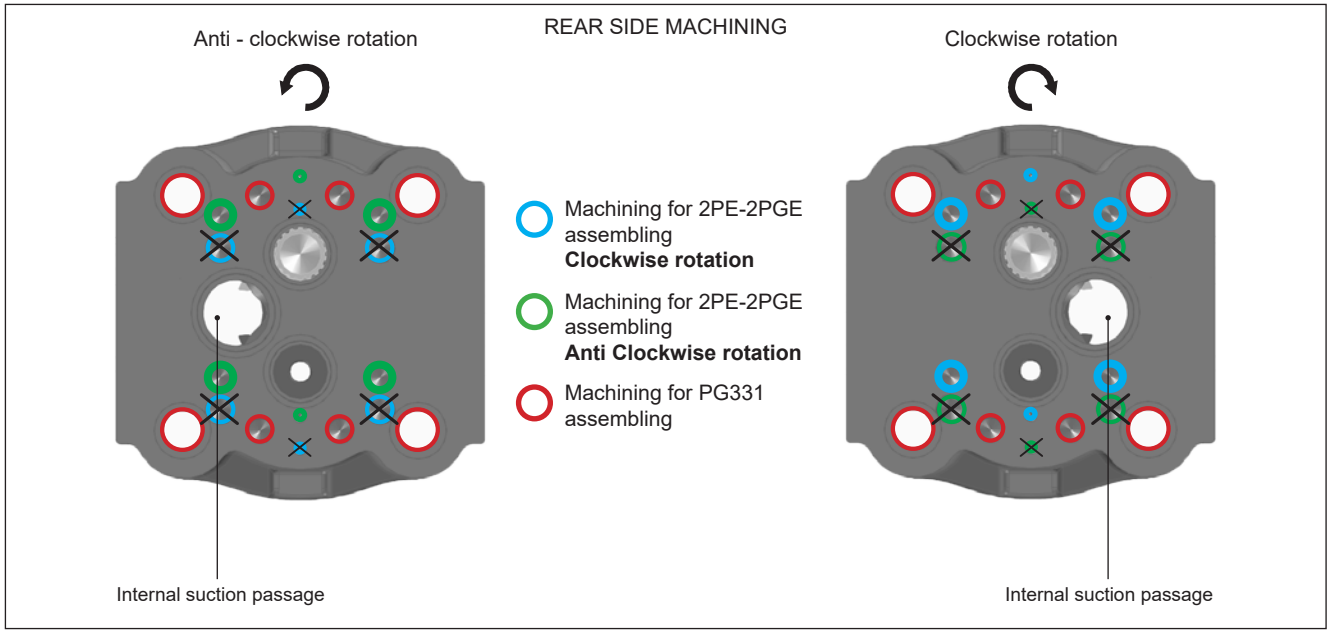
Cover plate: always assembled on the rear side.



Rear side: machining with provision for a PG331 second pump or Group 2 pumps (2PE-2PGE).



Code	Part Number	
Cover Plate Kit	R15200004	**1) 2x** O-Ring 2093 **2) 1x** Cover plate **3) 4x** Washer DIN7980 **4) 4x** Screw M10x25 ISO 7380 **5) 1x** O-Ring 2118



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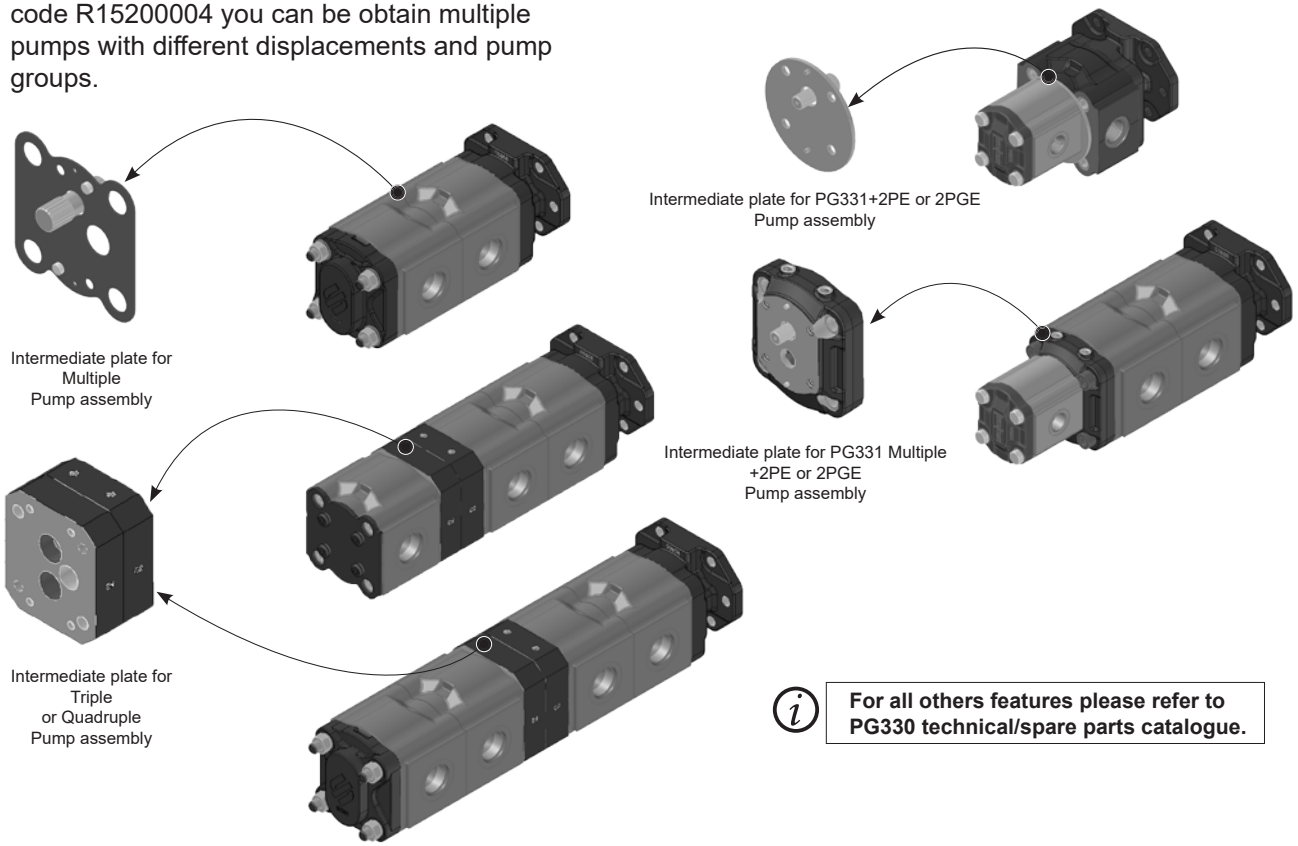
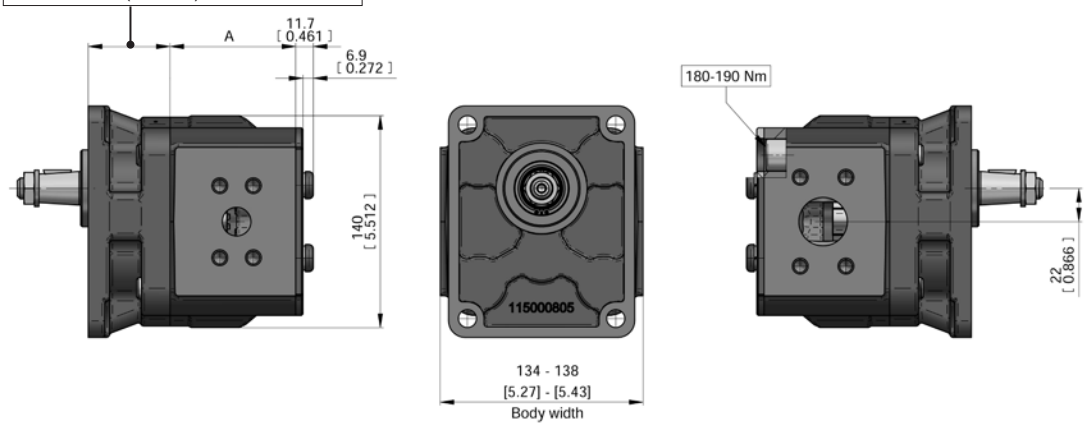
Features

Intermediate plates: by replacing the rear cover code R15200004 you can be obtain multiple pumps with different displacements and pump groups.



For all others features please refer to PG330 technical/spare parts catalogue.

For flanges code:
S3→ 53 mm (2.09 in.) for displ. 23 to 40
64 mm (2.52 in.) for displ. 47 to 80
P2→ 54 mm (2.13 in.)
S4/R8/Z1/Z2→ 85 mm (3.35 in.)
R3→ 64 mm (2.52 in.)



TYPE	Displacement		Dimension A	
	cm³/rev	*cu.in/rev*	mm	*in*
PG331 - 23	23.4	*1.43*	70	*2.75*
PG331 - 28	28.6	*1.74*	74	*2.91*
PG331 - 34	34.4	*2.10*	78.5	*3.10*
PG331 - 40	40.3	*2.46*	83	*3.27*

TYPE	Displacement		Dimension A	
	cm³/rev	*cu.in/rev*	mm	*in*
PG331 - 47	47.4	*2.89*	94.5	*3.72*
PG331 - 55	55.2	*3.37*	100.5	*3.96*
PG331 - 64	64.3	*3.92*	107.5	*4.23*
PG331 - 72	73.4	*4.48*	114.5	*4.50*
PG331 - 80	80.6	*4.91*	120.5	*4.74*

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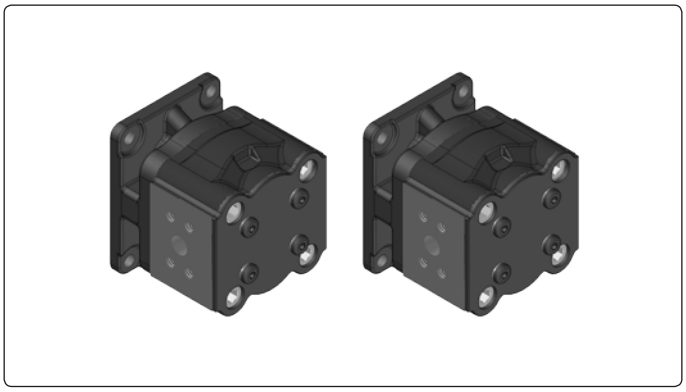
Assembling Multiple pumps

What you need from stock

2x PG331D Single Pumps**
(with requested cc/rev)

Part Number
see configurations at pages 118-121



1x Drive shaft for rear pump
(with same cc/rev)

Part Number
see table below

Drive shaft for rear pump dimensions

MODELLO	A	B	C	D	CODICE
23	91	18	36.5	36.5	3150 003 41
28	95	22	36.5	36.5	3150 003 42
34	99.5	26.5	36.5	36.5	3150 003 43
40	104	31	36.5	36.5	3150 003 44
47	121.5	36.5	42.5	42.5	3150 003 45
55	127.5	42.5	42.5	42.5	3150 003 46
64	134.5	49.5	42.5	42.5	3150 003 47
72	141.5	56.5	42.5	42.5	3150 003 48

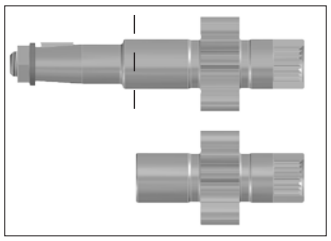
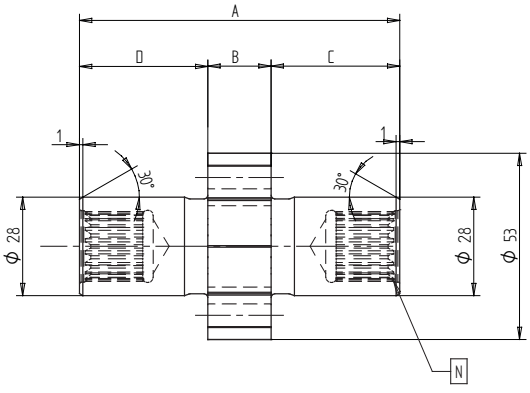


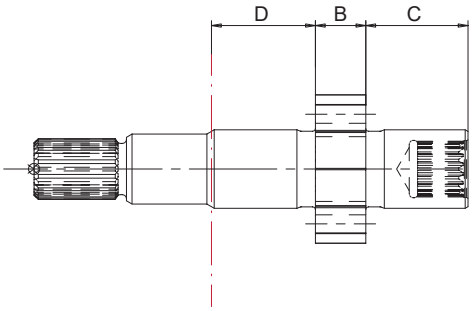
Figure A

If not available, cut the Drive shaft of the second single pump as indicated in figure A. See instructions below.



Cutting instructions:

First measure the dimension “C” and then cut the drive end in order to get the requested “D” dimension.



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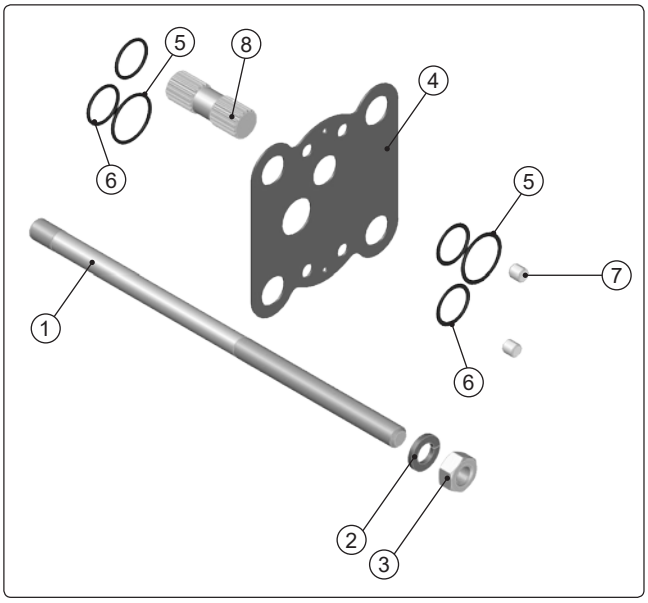
Assembling Multiple pumps

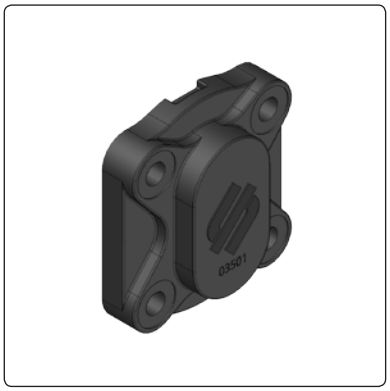
1x Multiple pump kit

Code	Part Number	
Multiple pump kit	R15200002	1) **4x** Tie rods M14x310 CL.10.9 2) **4x** Washer UNI 9195 3) **4x** Nut M14 UNI 5588 - CL.10 4) **1x** Intermediate plate PG331/PG331 5) **2x** O-Ring 2118 6) **4x** O-Ring 2093 7) **2x** Pin - DIN 5402 8) **1x** PG331-Coupling Sleeve



1x Rear cover

Part Number
Displ. from 23 to 40
R15003501
Displ. from 47 to 80
R15003508



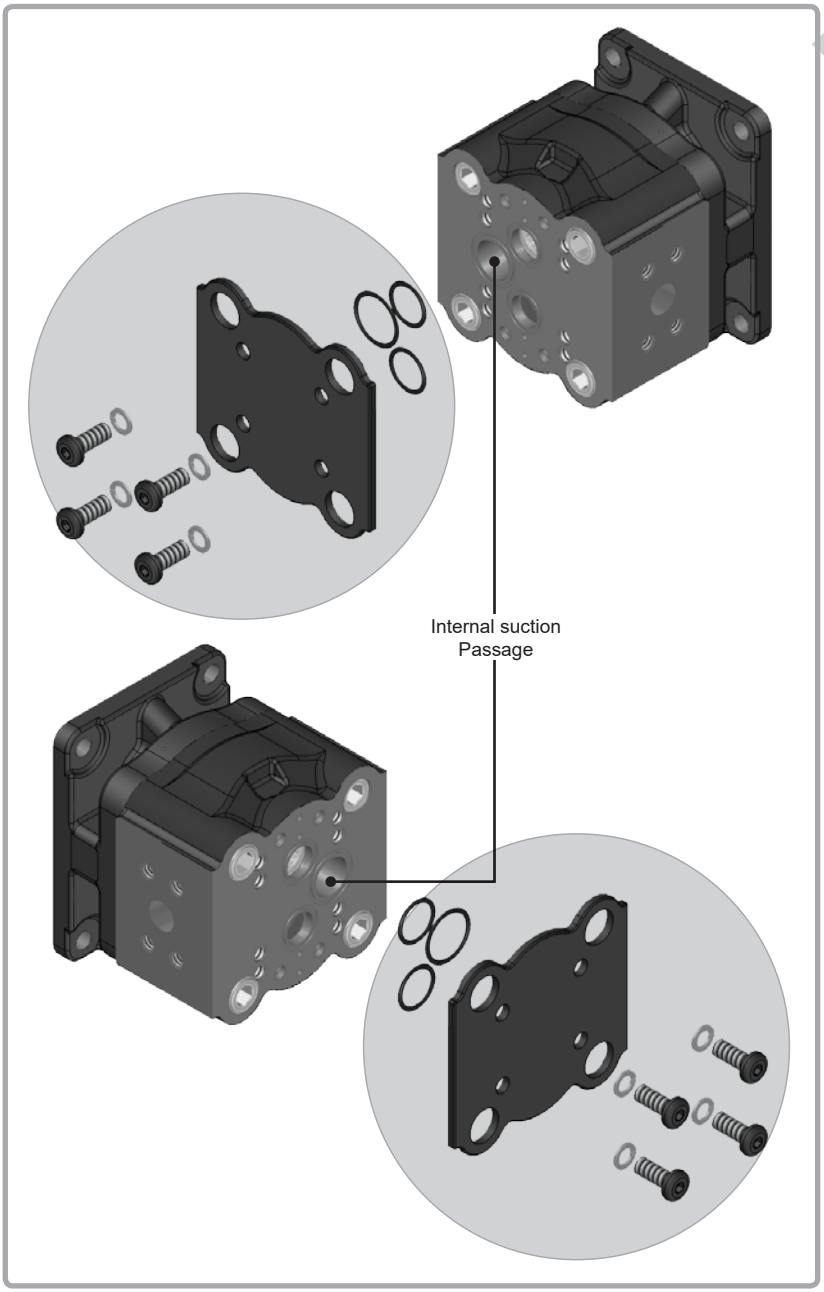
see page 85 (PG330 technical/spare parts catalogue)

Assembling Multiple pumps

What you return to stock:

The disassembly and re-assembly operations must be carried out on a clean bench and away from any dirty areas.

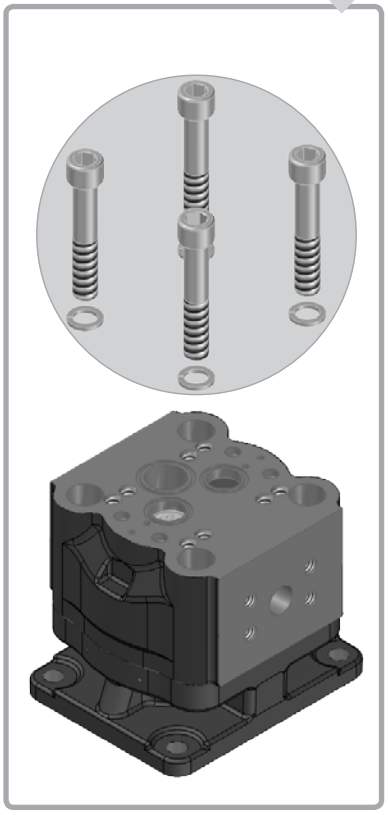
Proceed as follows:



STEP 1 - Single pumps:
Remove cover plate from both pumps.

During assembling of multiple pumps, the internal suction passage must always be aligned. In this case, the rear pump must be rotated upside down, in order to have the internal suction passage aligned with the first stage.

STEP 2:
Clamp the first pump in vertical position. Loosen and fully unscrew the 4xM14 screws. Do not yet disassemble the pump. Repeat the operation for the second pump.



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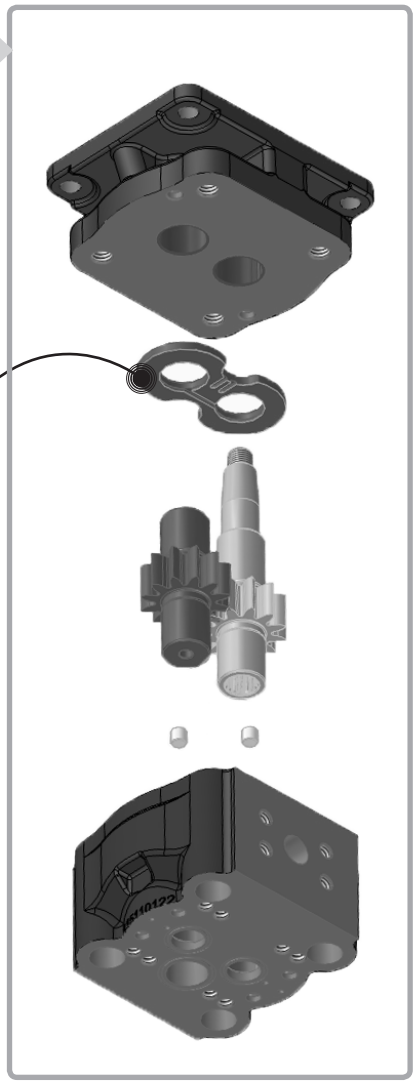
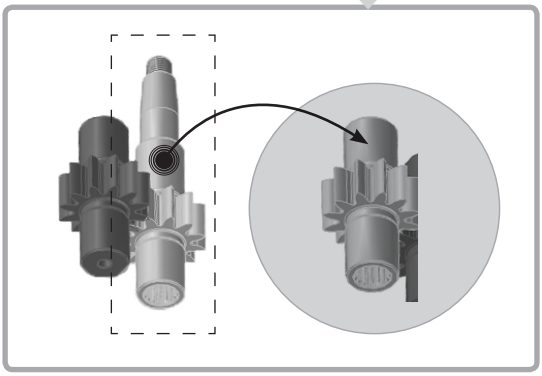
Assembling Multiple pumps

STEP 3:
Place the second pump on a flat and clean surface, remove the front flange but don’t disassemble shaft seals and circlip. Remove the thrust plate with his seals, the drive and driven shafts. After assembly is completed, the thrust plate must be relocated exactly in the same position.



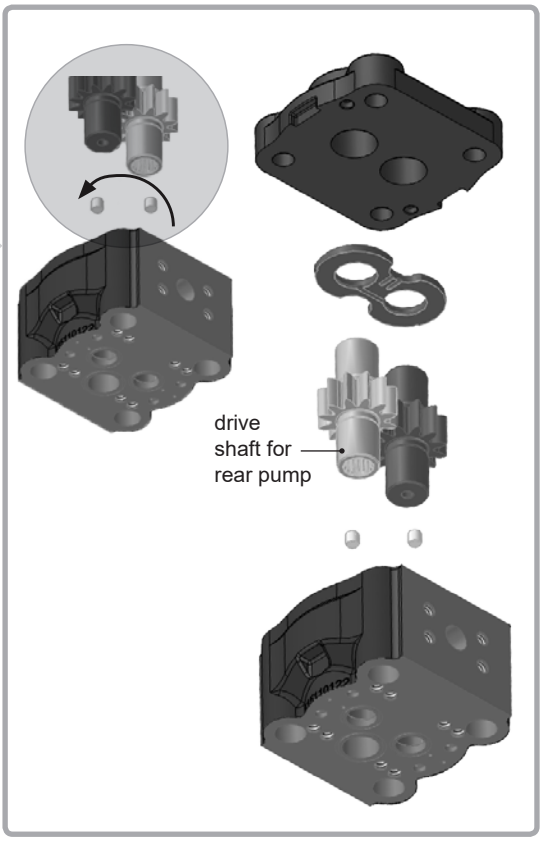
Mark the position of the trust plate with reference to the body.

STEP 4:
Swap the drive shaft with the drive shaft for second pump of the same cc/rev.



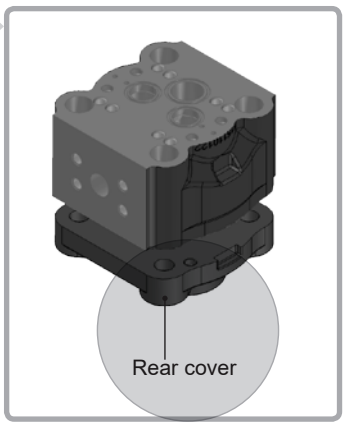
STEP 5:
Reverse the shaft positions and mount the drive shaft for rear pump. Insert the dowel pins, if not already in place.

After assembly is completed, the thrust plate must be relocated exactly in the same position.

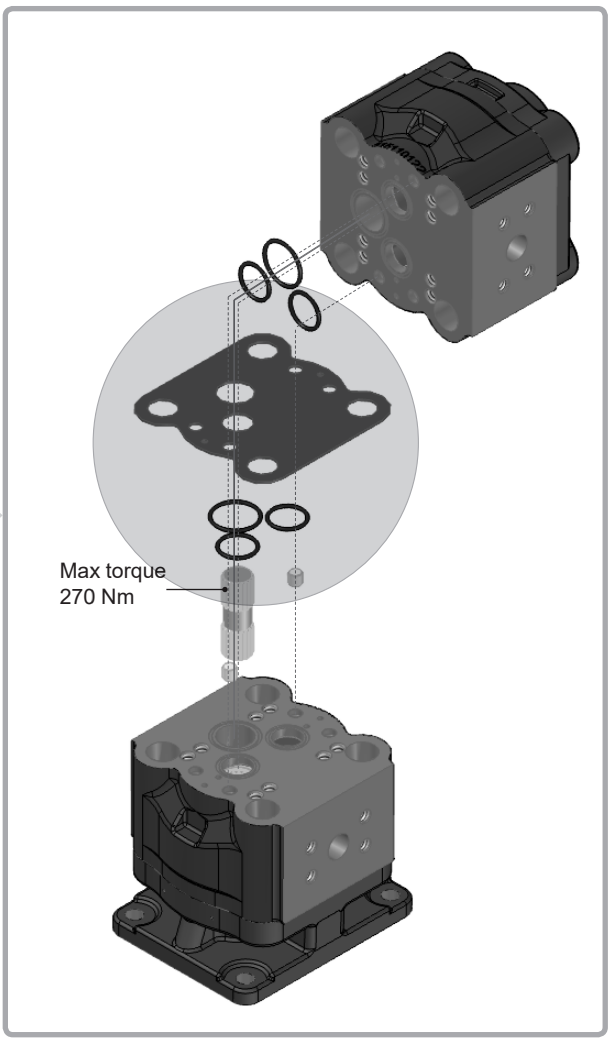


Assembling Multiple pumps

STEP 6:
By using the dowel pins as a reference, fit the rear end cover in the right position on the pump’s body.



STEP 7:
Clamp the front pump in vertical position, fit the dowel pins and in case replace the o-rings, fit the intermediate plate and the coupling shaft.
Be careful to not damage the pins when installing the rear pump on the front pump.



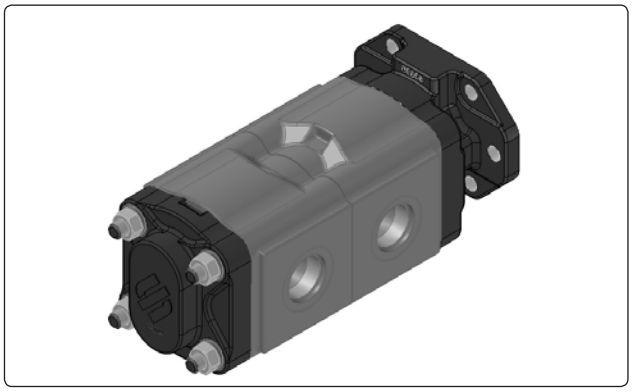
STEP 8:
Cut tie rods at right lenght (see Appendix A at page 126) screw tie rods into the front flange and make sure that the shorter threaded end is fit into the front flange proceed with washers and nuts. Tight at torque.

E0.152.0725.05.00IM03

Assembling Triple pumps

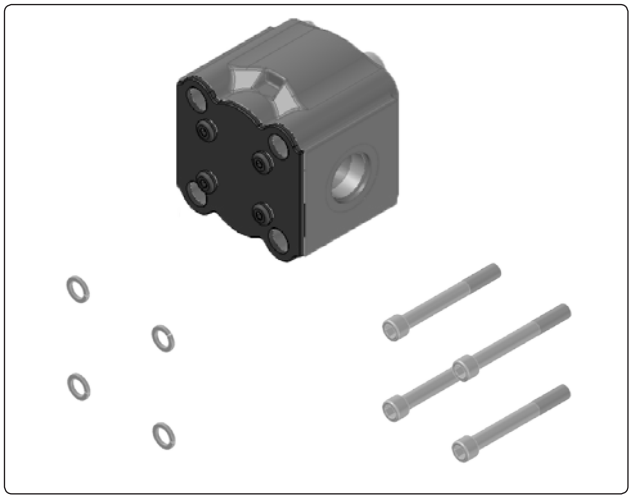
What you need from stock

1x PG331D Multiple Pump**
(with requested cc/rev)



1x Rear pump

Part Number
see configurations at pages 122-125

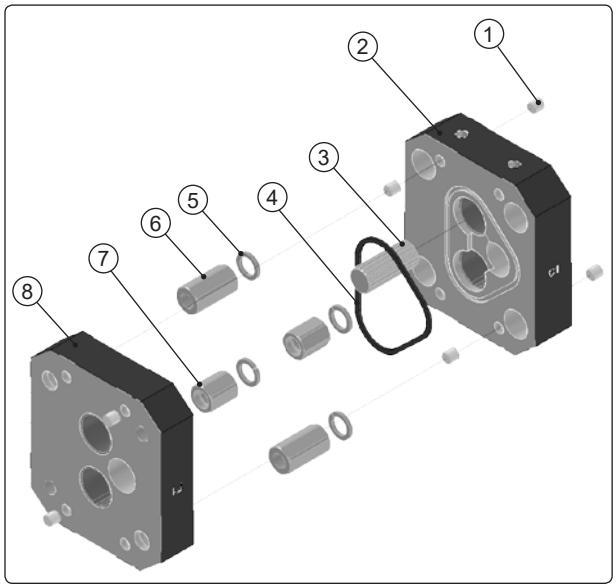


4x Washer DIN 7980

4x Hex socket head cup M14 x
(see Appendix B at page 127)

1x Triple pump kit

Code	Part Number	
Triple pump Kits	R15160030 1° - 2° - 3° Stage= Displ. 23-40 cc	1) **6x** Pin - DIN 5402 2) **1x** Plate for Displ. 23-40 cc (H=35) or for Displ. 47-72 cc (H=41) 3) **1x** PG331-Coupling Sleeve 4) **1x** O-RING 2-151 5) **4x** Washer DIN 7980 6) **2x** Special Nut M14 (longer) 7) **2x** Special Nut M14 (shorter) 8) **1x** Plate for Displ. 23-40 cc (H=31) or for Displ. 47-72 cc (H=37)
	R15160040 1° - 2° - 3° Stage= Displ. 47-72 cc	
	R15160041 1° - 2° Stage =Displ. 47-72 cc 3° Stage = Displ. 23-40 cc	



Nut (7) are partially threaded and shorter
Nut (6) are completely threaded and longer

E0.152.0725.05.00IM03

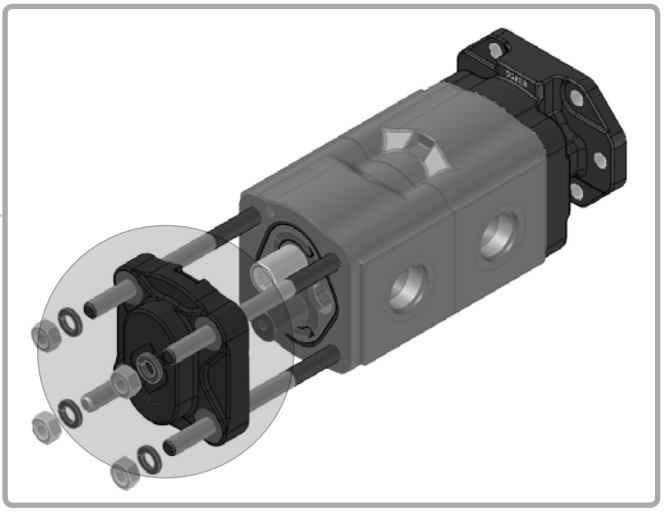
Assembling Triple pumps

What you return to stock:

The disassembly and re-assembly operations must be carried out on a clean bench and away from any dirty areas.

Proceed as follows:

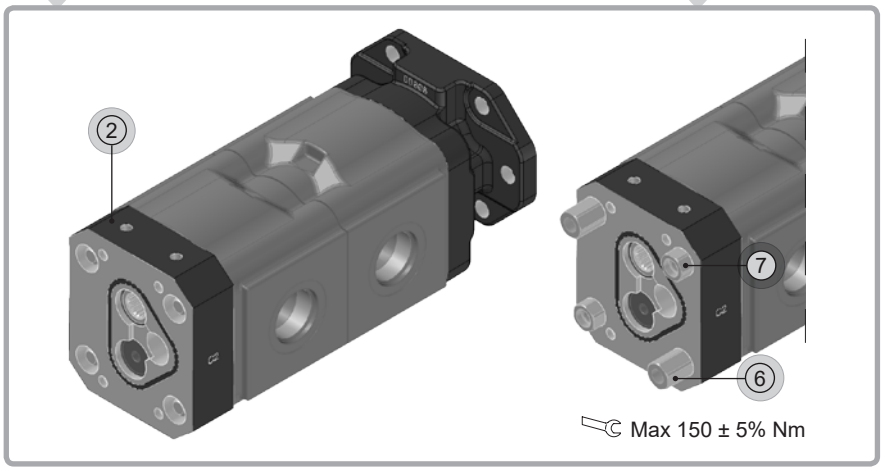
STEP 1 - Multiple pump:
Remove the cover and screw the tie rods to the front flange.
Cut tie rods at right lenght.
(See Appendix B at page 127)

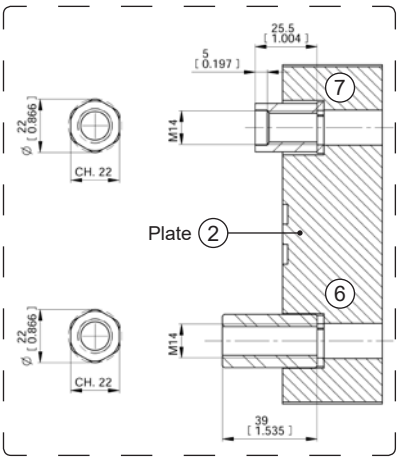


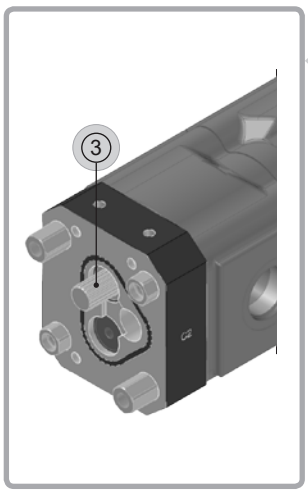
Assembling instructions Double pump at page 94.

STEP 2:
Fit the plate (2) on the rear pump

STEP 3:
Screw special nuts (6) and (7)

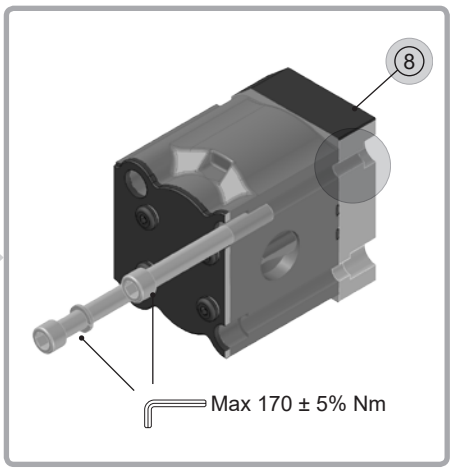






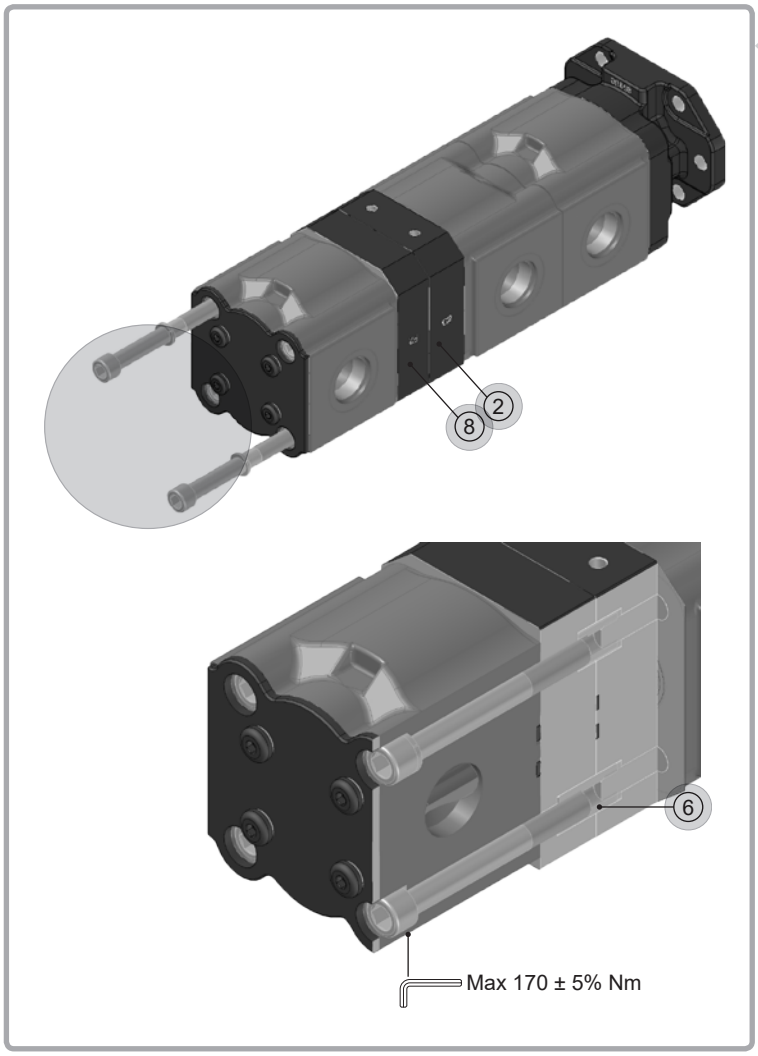
STEP 4:
Insert the coupling shaft (3).

STEP 5:
By using the dowel pins as a reference, fit the rear pump on the plate (8). The plate has four assembling holes, two are threaded M14, two are through holes Ø 14.5 mm. Insert washers and screw the screws into the threaded holes (see Appendix B page 127 for right lenght).



E0.152.0722.05.00IM02

Assembling Triple pumps

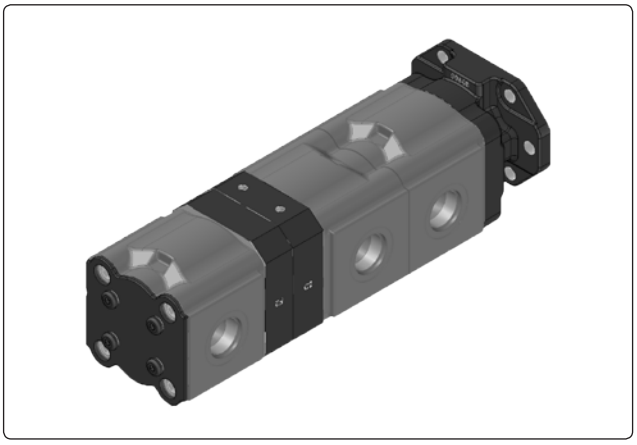


STEP 6:
By using the dowel pins as a reference, fit the third stage with plate (8) prepared, on the rear plate (2). Match properly the coupling shaft with the inner shaft of the rear pump. Insert washers and screw the two screws into the special longer nuts (6).

Assembling Quadruple pumps

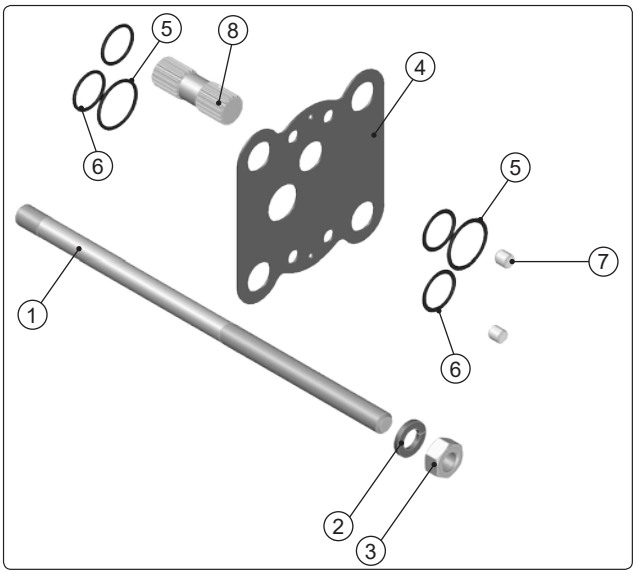
What you need from stock

1x PG331D Triple Pump**
(with requested cc/rev)



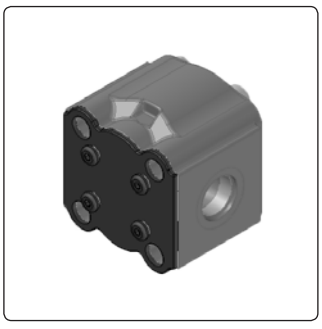
1x Multiple pump kit

Code	Part Number	
Multiple pump Kit	R15200002	1) **4x** Tie rods M14x310 CL.10.9 2) **4x** Washer UNI 9195 3) **4x** Nut M14 UNI 5588 - CL.10 4) **1x** Intermediate plate PG331/PG331 5) **2x** O-Ring 2118 6) **4x** O-Ring 2093 7) **2x** Pin - DIN 5402 8) **1x** PG331-Coupling Sleeve



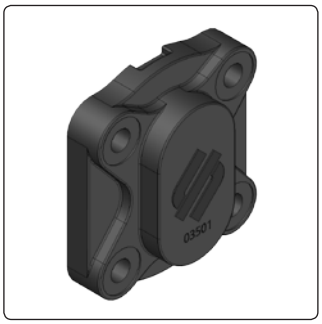
1x Rear pump

Part Number
see configurations at pages 122-125



1x Rear cover

Part Number
Displ. from 23 to 40
R15003501
Displ. from 47 to 80
R15003508



see page 85 (PG330 technical/spare parts catalogue)

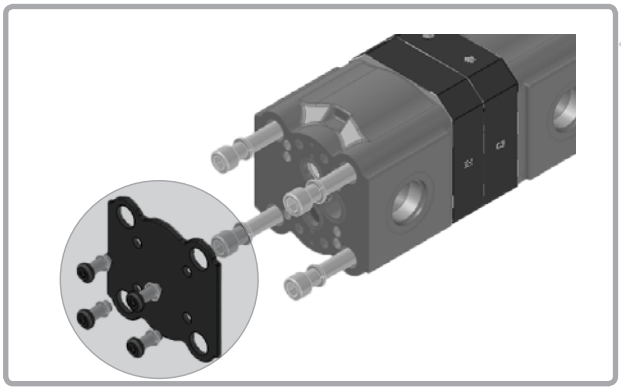
E0.152.0725.05.00IM03

Assembling Quadruple pumps

What you return to stock:

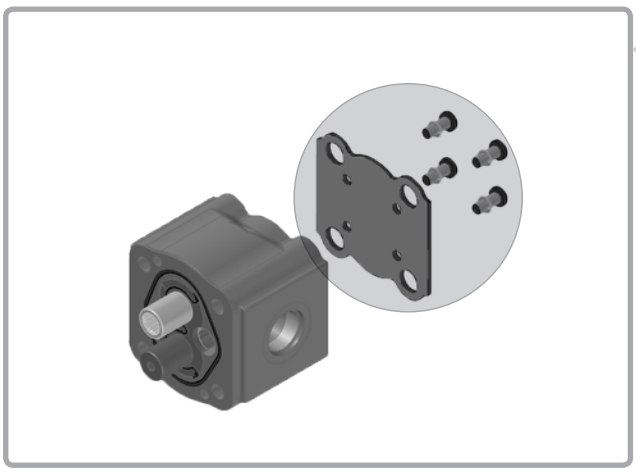
The disassembly and re-assembly operations must be carried out on a clean bench and away from any dirty areas.

Proceed as follows:



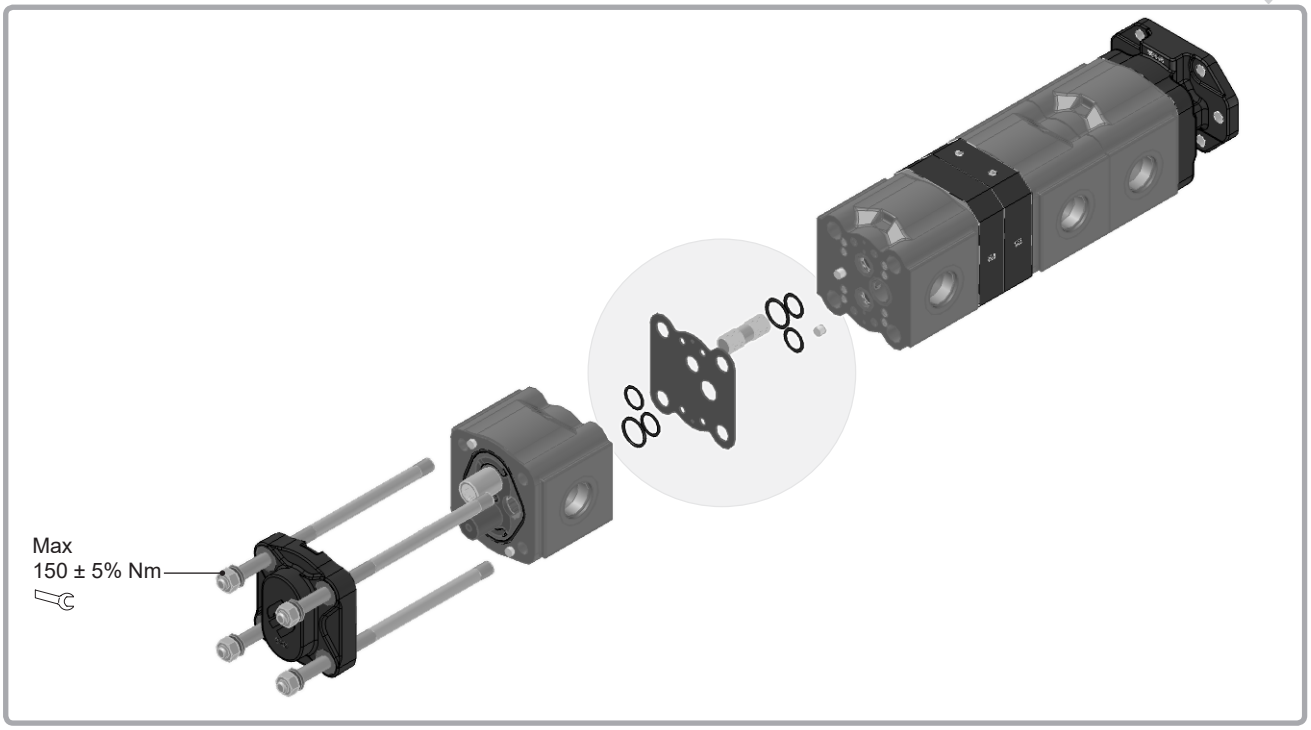
STEP 1 - Triple pump:
Remove cover plate from last stage.

Assembling instructions Triple pump at page 99.



STEP 2 - Rear pump:
Remove cover plate.

STEP 3:
Fit the fourth stage on the triple pump by using the same instruction already given on page 98 (Step 7).
Cut tie rods at right lenght.
(See Appendix C at page 128).

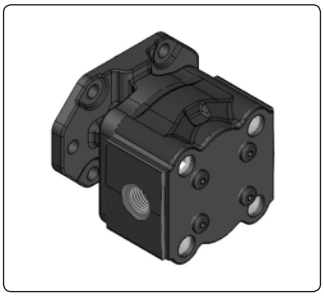


Assembling Single pump with 2PE

What you need from stock

1x PG331D Single Pump**
(with requested cc/rev)

Part Number
see configurations at pages 118-121

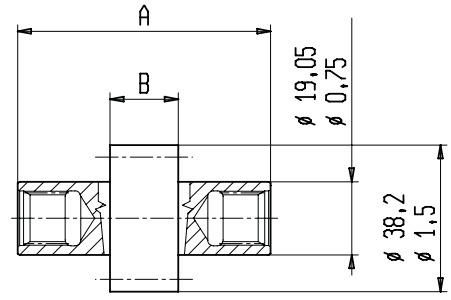


1x 2PED-Rear pump**
(with requested cc/rev)

If not available, use a 2PE single pump. The full list of 2PE Single and Rear Pumps are available on our DEALER 2PE SPARE PARTS CATALOGUE.

1x 2PE**D -*60-R
Rear Pump

1x 2PE**D
Single Pump



Displacement		Dimensions				Part Number
		A		B		
cm³/rev	*cu.in/rev*	mm	*in*	mm	*in*	
3.2	*0.19*	46.7	*1.84*	5.1	*0.20*	312000310
3.9	*0.24*			6.1	*0.24*	312050306
4.6	*0.27*			7.1	*0.28*	312000314
6.5	*0.40*	49.55	*1.95*	9.95	*0.39*	312060302
8.2	*0.50*	52.4	*2.06*	12.8	*0.50*	312050309
11.5	*0.68*	59.3	*2.33*	17.7	*0.70*	312050312
13.8	*0.84*	63.1	*2.48*	21.5	*0.85*	312000315
16.6	*1.01*	67.1	*2.64*	25.5	*1.00*	312000316
19.4	*1.18*	75.2	*2.96*	29.8	*1.17*	312000317
22.9	*1.37*	80.6	*3.17*	35.2	*1.39*	312000318
26.6	*1.62*	86.4	*3.40*	41	*1.61*	312000319

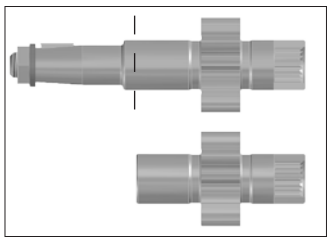
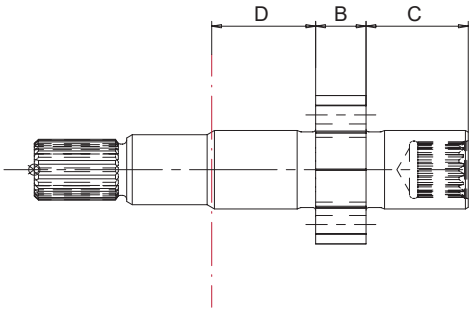


Figure A

Cut the Drive shaft of 2PE single pump as indicated in figure A to obtein a rear drive shaft. See instructions below.

Cutting instructions:

First measure the dimension “C” and then cut the drive end in order to get the requested “D” dimension.



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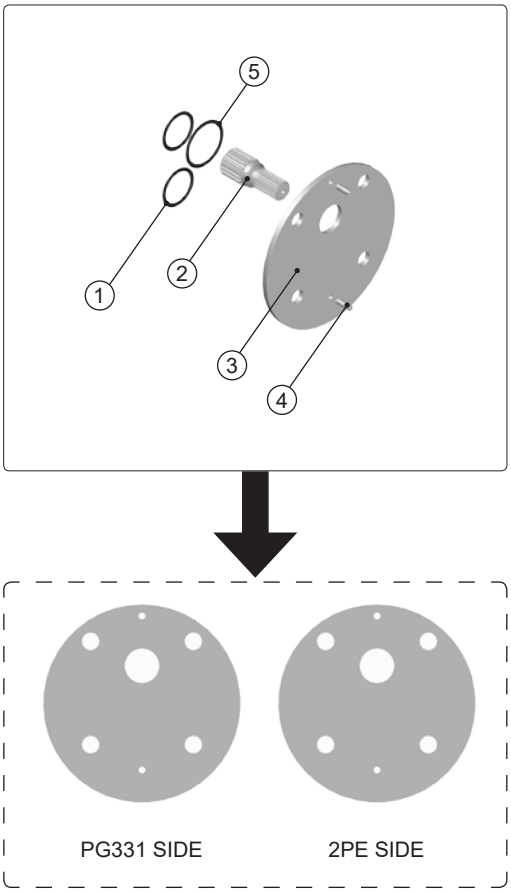
Assembling Single pump with 2PE

1x Multiple pump kit 2PE-2PGE

Code	Part Number	
Multiple pump kit	R15200001	1) **4x** O-Ring 2093 2) **1x** PG331/2PE-Coupling Sleeve 3) **1x** Intermediate plate PG331/2PE-2PGE 4) **2x** Pin - UNI 1707 5) **2x** O-Ring 2118



Multiple pump kit doesn’t provide the Common Suction Option. As shown in the picture, it doesn’t have a preferred mounting orientation.

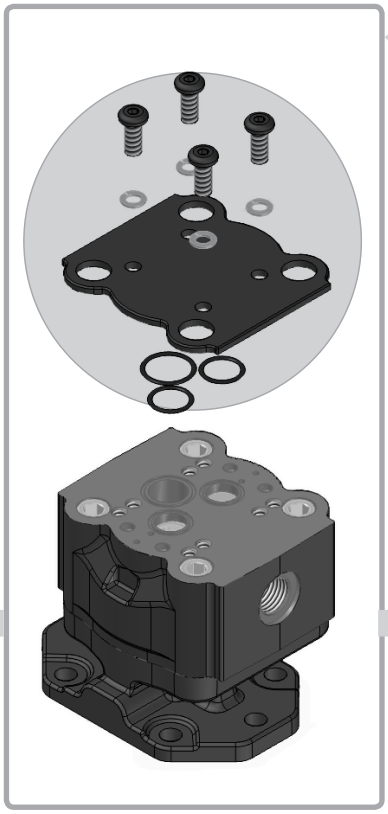
E0.152.0725.05.00IM03

Assembling Single pump with 2PE

What you return to stock:

The disassembly and re-assembly operations must be carried out on a clean bench and away from any dirty areas.

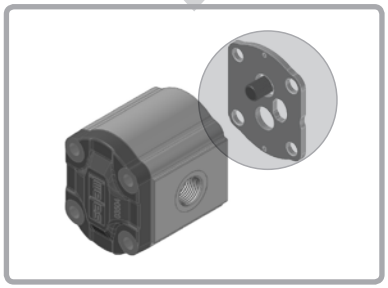
Proceed as follows:



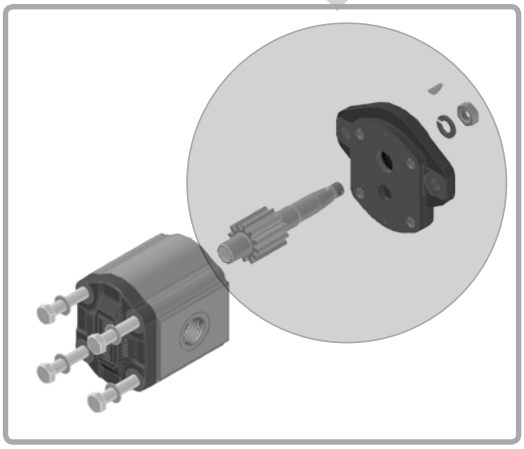
STEP 1 - Single pump PG331 and 2PE:
Clamp the pump in vertical position (front flange down) and remove cover plate.

The Intermediate Plate PG331/2PE is made for different suctions, one for PG331 and one for 2PE. PG331/2PE common suction configuration is not possible, unless by using special plate.

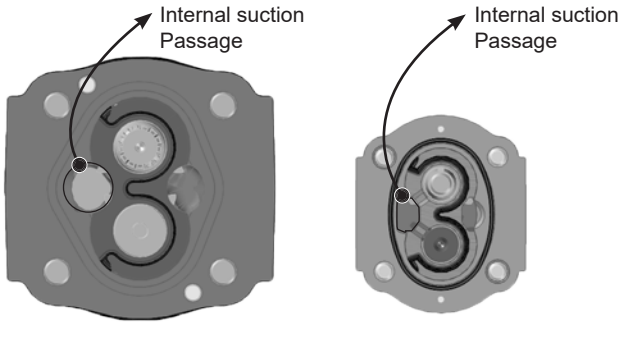
STEP 2 - 2PE/Rear pump:
Remove the plate and the coupling sleeve. The assembling screws lenghts and codes needed, are listed on the Appendix D at page 129.



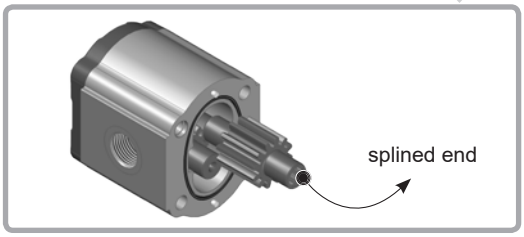
STEP 2 - 2PE/Single pump:
Loosen and fully unscrew the 4xM10 screws. Disassemble the front flange and remove the drive shaft.



2PE internal suction passage it must be aligned with the PG331 internal suction passage. Below highlighted passages both in clockwise rotation.



STEP 3 - Single pump:
Remove 2PE drive shaft and cut as indicated in figure A. Rotate the cut drive shaft with the female splined end visible and fit into the 2PE body.



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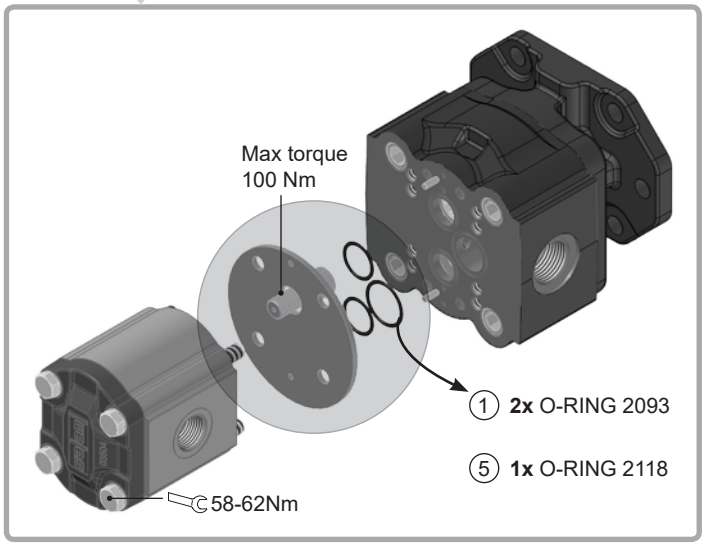
Assembling Single pump with 2PE

STEP 4: Fit the coupling shaft and the two dowel pins into the central top and bottom dowel pin holes. Fit the multiple pump kit and the 2PE rear pump.

Replace damaged O-Rings by using brand news ones (items 1&5 in the PG331/2PE assembling kit).



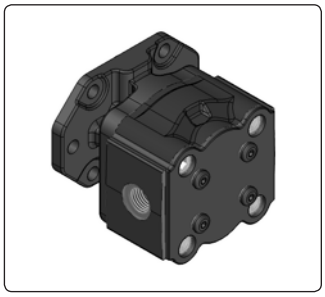
The PG331/2PE build employ individual suction ports. In case you want to build a PG331/2PE for different fluids you need to assemble a 2PE rear pump “AS” type.

Assembling Single pump with 2PGE

What you need from stock

1x PG331D Single Pump**
(with requested cc/rev)

Part Number
see configurations at pages 118-121

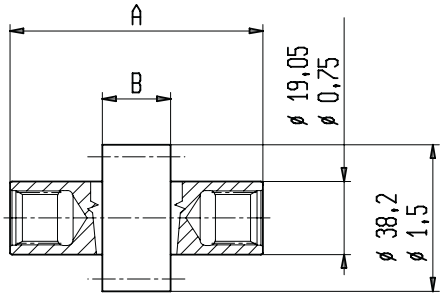


1x 2PGED -*60-R Rear Pump**

1x 2PGED Single Pump**

1x 2PGED-Rear pump**
(with requested cc/rev)

If not available, use a 2PGE single pump.



Displacement		Dimensions				Part Number
		A		B		
cm³/rev	*cu.in/rev*	mm	*in*	mm	*in*	
3.2	*0.19*	46.7	*1.84*	5.1	*0.20*	312000310
3.9	*0.24*			6.1	*0.24*	312050306
4.6	*0.27*			7.1	*0.28*	312000314
6.5	*0.40*	49.55	*1.95*	9.95	*0.39*	312060302
8.2	*0.50*	52.4	*2.06*	12.8	*0.50*	312050309
11.5	*0.68*	59.3	*2.33*	17.7	*0.70*	312050312
13.8	*0.84*	63.1	*2.48*	21.5	*0.85*	312000315
16.6	*1.01*	67.1	*2.64*	25.5	*1.00*	312000316
19.4	*1.18*	75.2	*2.96*	29.8	*1.17*	312000317
22.9	*1.37*	80.6	*3.17*	35.2	*1.39*	312000318
26.6	*1.62*	86.4	*3.40*	41	*1.61*	312000319

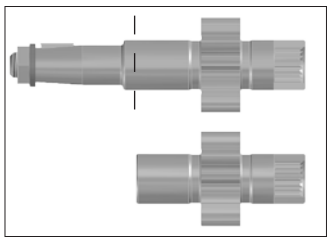
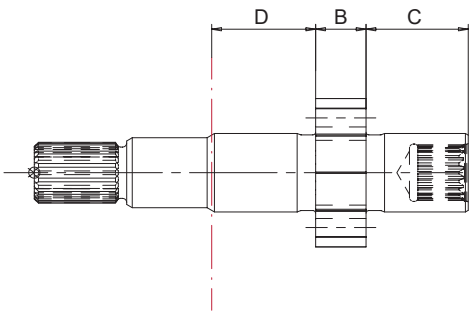


Figure A

Cut the Drive shaft of 2PGE single pump as indicated in figure A to obtein a rear drive shaft. See instructions below.

Cutting instructions:

First measure the dimension “C” and then cut the drive end in order to get the requested “D” dimension.



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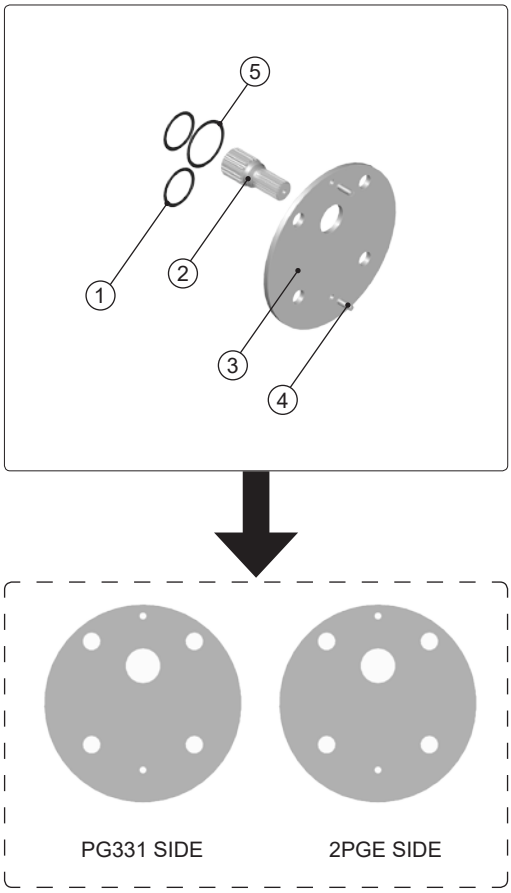
Assembling Single pump with 2PGE

1x Multiple pump kit 2PE-2PGE

Code	Part Number	
Multiple pump kit	R15200001	1) **4x** O-Ring 2093 2) **1x** PG331/2PE-Coupling Sleeve 3) **1x** Intermediate plate PG331/2PE-2PGE 4) **2x** Pin - UNI 1707 5) **2x** O-Ring 2118



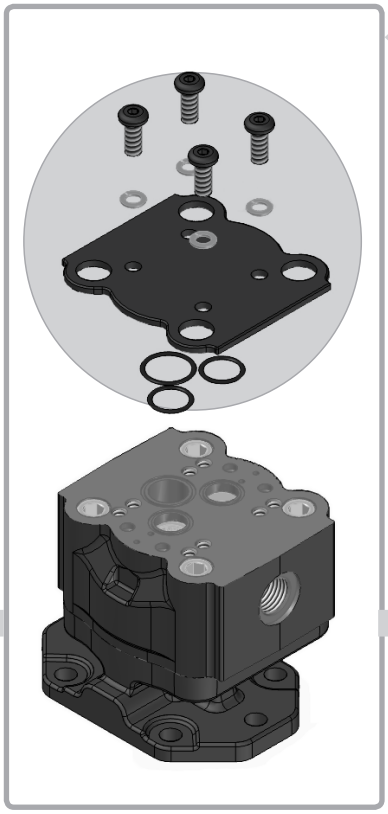
Multiple pump kit doesn’t provide the Common Suction Option. As shown in the picture, it doesn’t have a preferred mounting orientation.

Assemble Single pump with 2PGE

What you return to stock:

The disassembly and re-assembly operations must be carried out on a clean bench and away from any dirty areas.

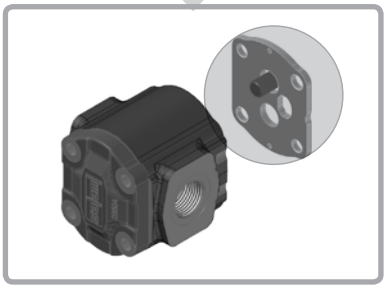
Proceed as follows:



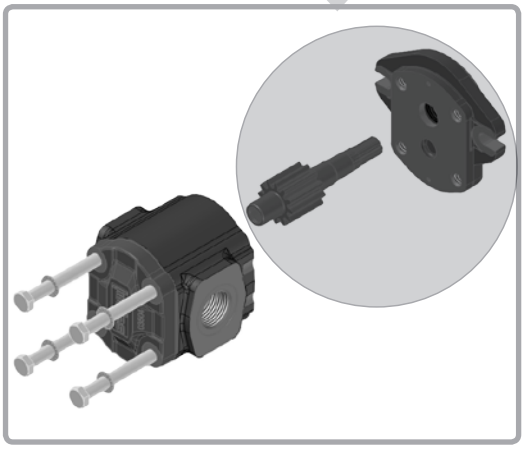
STEP 1 - Single pump PG331 and 2PGE:
Clamp the pump in vertical position (front flange down) and remove cover plate.

The Intermediate Plate PG331/2PE is made for different suctions, one for PG331 and one for 2PE. PG331/2PE common suction configuration is not possible, unless by using special plate.

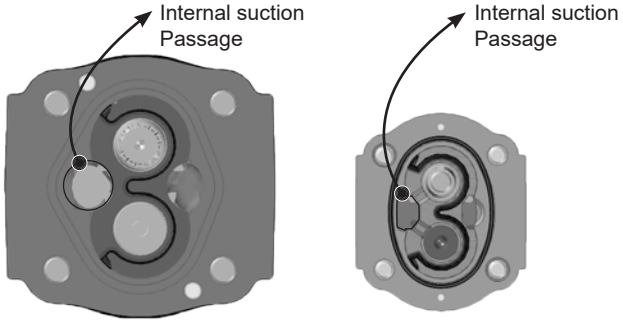
STEP 2 - 2PGE/Rear pump:
If you use 2PGE**S-*60-R (Rear Pump Configuration) remove the plate and the coupling sleeve. The assembling screws lenghts and codes needed, are listed on the Appendix D at page 129.



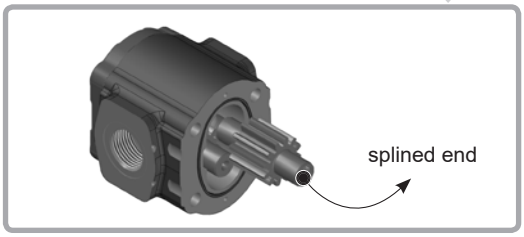
STEP 2 - 2PGE/Single pump:
If you use 2PGE**D Single Pump (Standard Pump Configuration) Loosen and fully unscrew the 4xM10 screws. Disassemble the front flange and remove the drive shaft.



2PE internal suction passage it must be aligned with the PG331 internal suction passage. Below highlighted passages both in clockwise rotation.



STEP 3 - Single pump:
Remove 2PGE drive shaft and cut as indicated in figure A. Rotate the cut drive shaft with the female splined end visible and fit into the 2PGE body.

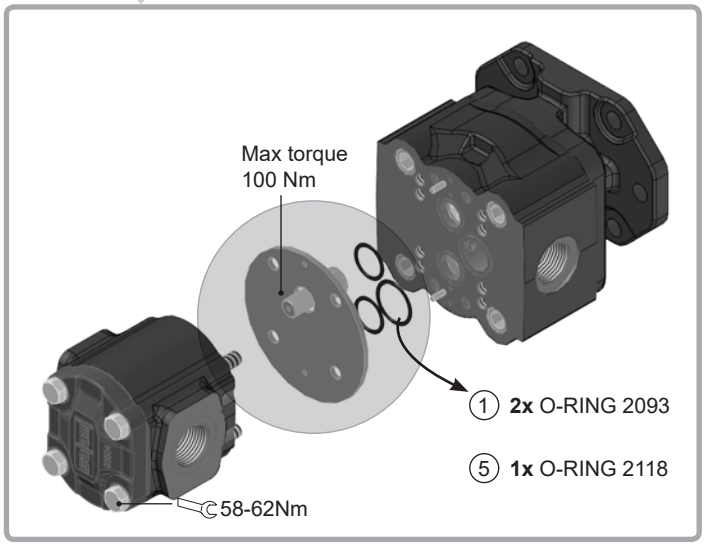


E0.152.0725.05.00IM03

Assemble Single pump with 2PGE

STEP 4: Fit the coupling shaft and the two dowel pins into the central top and bottom dowel pin holes. Fit the multiple pump kit and the 2PGE rear pump.

Replace damaged O-Rings by using brand news ones (items 1&5 in the PG331/2PE assembling kit).



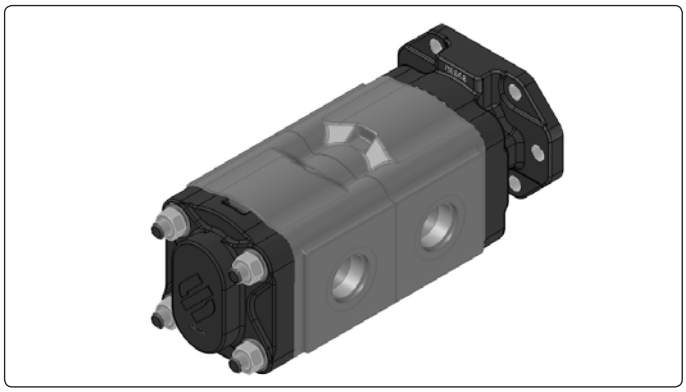
The PG331/2PGE build employ individual suction ports. In case you want to build a PG331/2PGE for different fluids you need to assemble a 2PGE rear pump “AS” type.

E0.152.0725.05.00IM03

Assembling multiple pump with 2PE

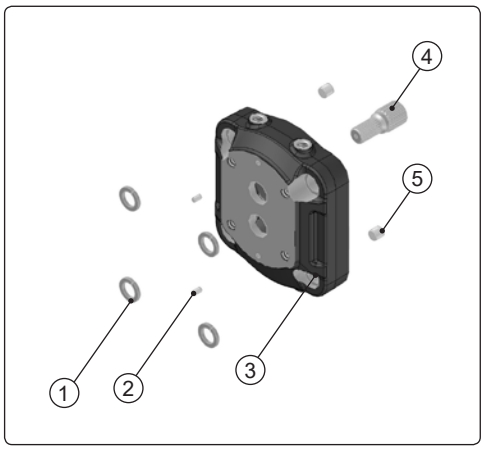
What you need from stock

1x PG331D Multiple Pump**
(with requested cc/rev)



1x Multiple pump kit 2PE/2PGE

Code	Part Number	
Multiple pump Kit	R15160050 Displ. 23-40 cc	1) **4x** Washer DIN 7980 2) **2x** Pin - UNI 1707 3) **1x** Plate for Displ. 23-40 cc or for Displ. 47-72 cc 4) **1x** PG331/2PE-Coupling Sleeve 5) **2x** Pin - DIN 5402
	R15160060 Displ. 47-72 cc	



1x 2PED-Rear pump**
(with requested cc/rev)

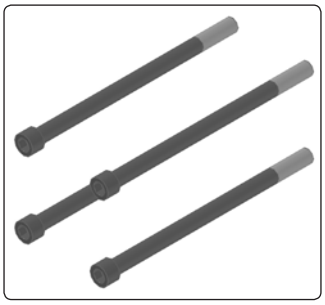
If not available, use a 2PE single pump. The full list of 2PE Single and Rear Pumps are available on our DEALER 2PE SPARE PARTS CATALOGUE.

Mounting also available with 2PGE pump.

1x 2PE**D -*60-R
Rear Pump

1x 2PE**D
Single Pump

4x Screw M14 x
(see Appendix D at page 129)



E0.152.0725.05.00IM03

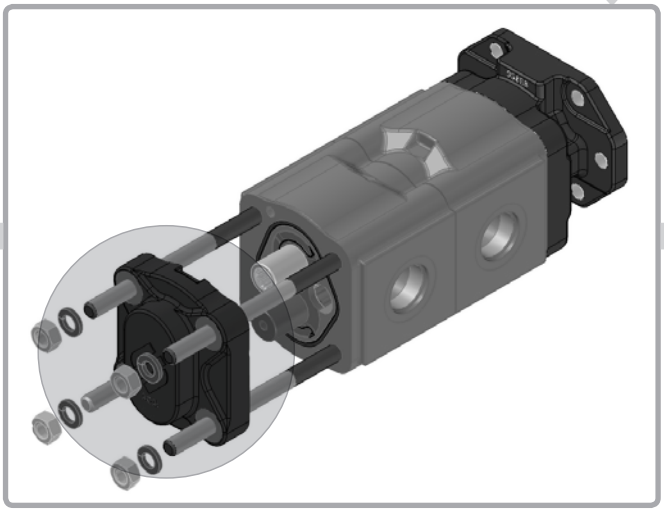
Assembling multiple pump with 2PE

What you return to stock:

The disassembly and re-assembly operations must be carried out on a clean bench and away from any dirty areas.

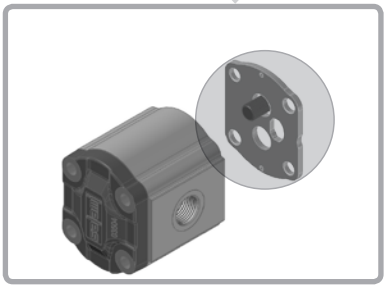
Proceed as follows:

STEP 1 - Multiple pump:
Remove the rear cover, tie rods, nuts and washers.

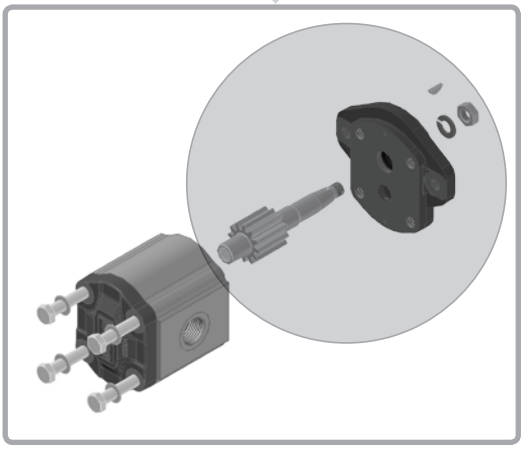


Assembling instructions Double pump at page 94.

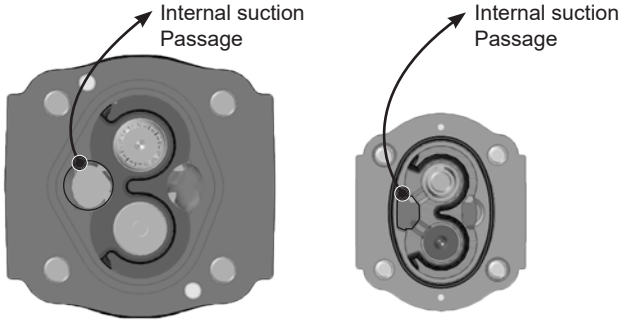
STEP 2 - 2PE/Rear pump:
Remove the plate and the coupling sleeve. The assembling screws lenghts and codes needed, are listed on the Appendix D at page 129.



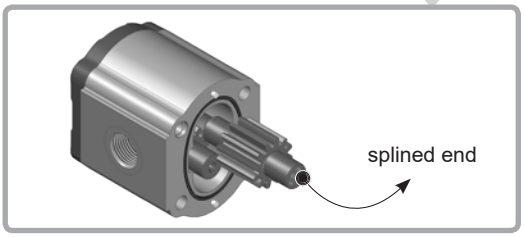
STEP 2 - 2PE/Single pump:
Loosen and fully unscrew the 4xM10 screws. Disassemble the front flange and remove the drive shaft.



2PE internal suction passage it must be aligned with the PG331 internal suction passage. Below highlighted passages both in clockwise rotation.

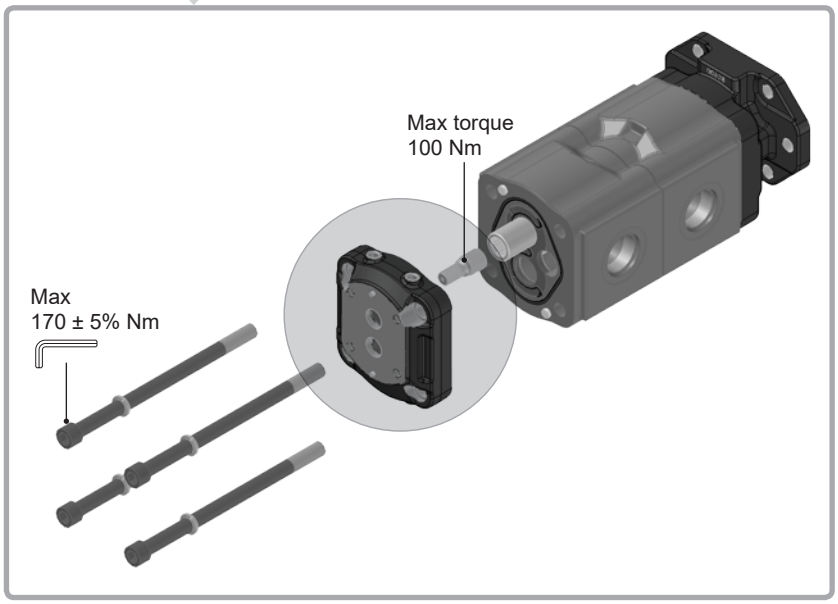


STEP 3 - Single pump:
Remove 2PE drive shaft and cut as indicated in figure A. Rotate the cut drive shaft with the female splined end visible and fit into the 2PE body.

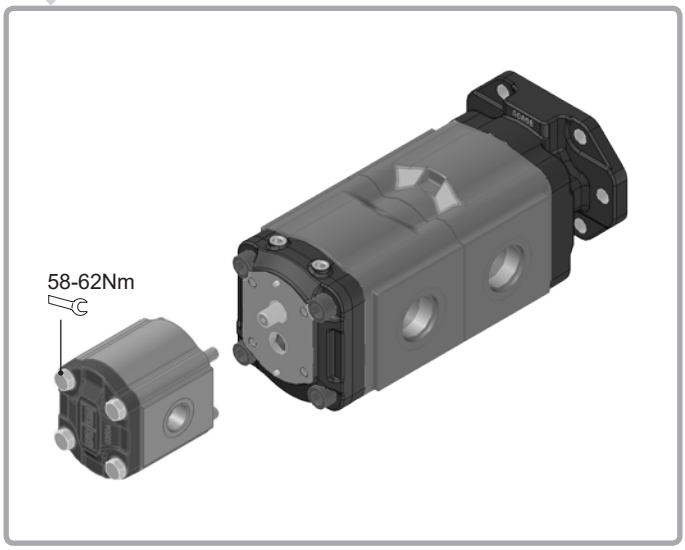


Assembling multiple pump with 2PE

STEP 4: Insert the coupling shaft (4) into the drive shaft on the second stage of the PG331.
By using the dowel pins (5) as a reference, assemble the plate (3) to the Multiple pump fit washers and screws M14.



STEP 5:
By using the dowel pins as a reference, assemble 2PE pump on the plate. Match properly the coupling shaft with the inner shaft of the 2PE pump.



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Replacing mounting flange with outrigger bearing

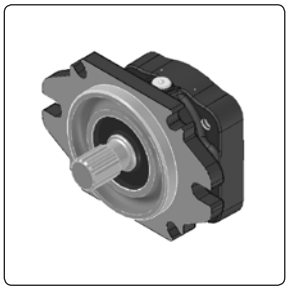
What you need from stock

1x PG331D Single Pump**
(with requested cc/rev)

Part Number
see configurations at pages 118-121

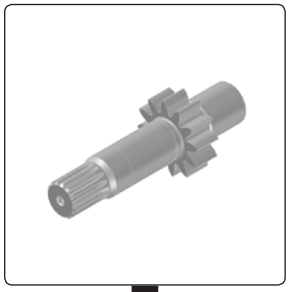
1x Mounting flange with bearing type R8 or Z1.

see page 73 (PG330 technical/spare parts catalogue)

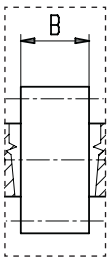


1x Drive shaft type 70
(with same cc/rev)

see page 68 (PG330 technical/spare parts catalogue)



Code	Displacement	B	Part Number
70	23	18	315000371
	28	22	315000372
	34	26.5	315000373
	40	31	315000374
	47	36.5	315000375
	55	42.5	315000376
	64	49.5	315000377
	72	56.5	315000378
	80	62	315000379



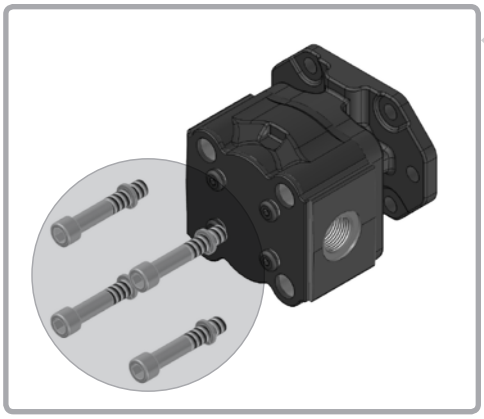
E0.152.0725.05.00IM03

Replacing mounting flange with outrigger bearing

What you return to stock:

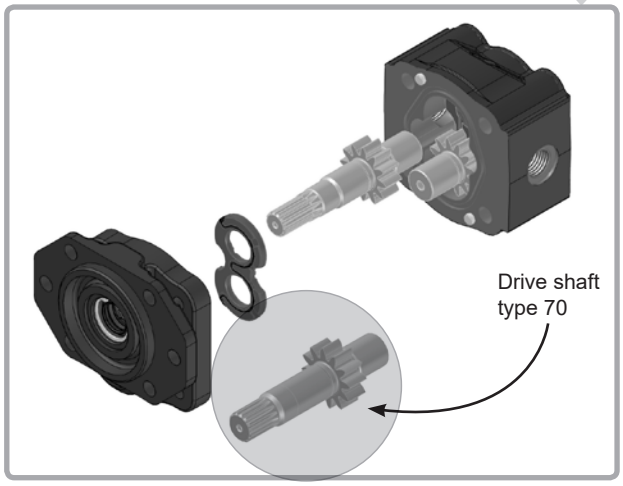
The disassembly and re-assembly operations must be carried out on a clean bench and away from any dirty areas.

Proceed as follows:

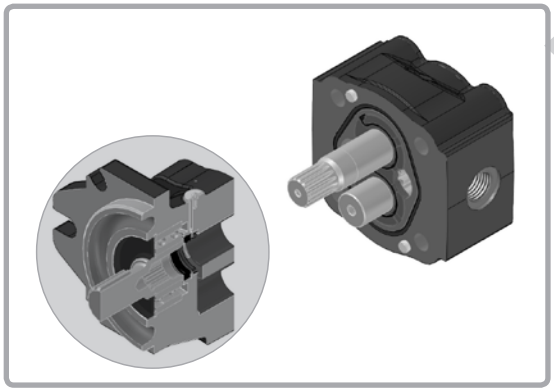


STEP 1 - Single pump PG331 (with mounting flange type P2/S3/S4/Z2):
Unscrew the screws and remove the washers.

STEP 2: Disassemble the front flange, mark the position of the trust plate with reference to the body. Remove the thrust plate with seals and the drive shaft.
Replace it with the shaft code 70 please see the table below.
Reassemble the thrust plate with seals in the same position you found it.

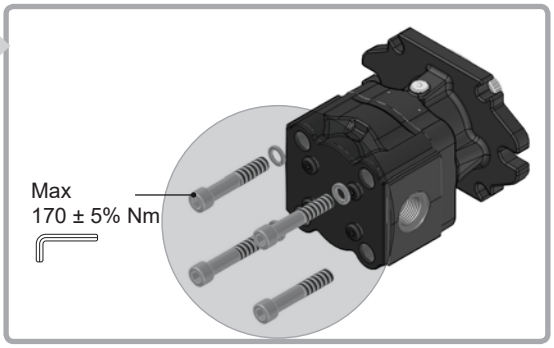


Mark the position of the trust plate with reference to the body.



STEP 3: Replace the flange with the outrigger bearing type and by using the dowel pins as a reference.
Apply grease on the shaft code 70, by pay attention to not damage the shaft seals.
Match the male splined end of shaft code 70 with the female spline of the continental shaft already assembled on the outrigger bearing kit.

STEP 4: Fit the screws and washers disassembled before.



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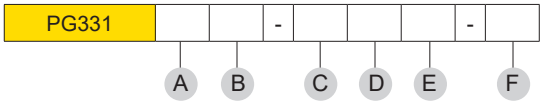

A

CODE	DISPLACEMENTS	
23	23.4 cm³/rev.	*1.43 cu.in/rev.*
28	28.6 cm³/rev.	*1.74 cu.in/rev.*
34	34.4 cm³/rev.	*2.1 cu.in/rev.*
40	40.3 cm³/rev.	*2.46 cu.in/rev.*
47	47.5 cm³/rev.	*2.89 cu.in/rev.*
55	55.2 cm³/rev.	*3.37 cu.in/rev.*
64	64.3 cm³/rev.	*3.92 cu.in/rev.*
72	73.4 cm³/rev.	*4.48 cu.in/rev.*
80	80.6 cm³/rev.	*4.91 cu.in/rev.*

B

ROTATION	CODE
Clockwise	D
Anti-clockwise	S

C

PORTS	CODE
Flanged ports european standard	P
Flanged ports SAE J518 Metric thread	W
Flanged ports SAE J518 American standard thread	S
Threaded ports GAS (BSPP)	G
Threaded ports SAE (ODT)	R

D

DRIVE SHAFT END	CODE
Tapered 1:8	38
SAE B splined 13T	55
SAE BB splined 15T	56
SAE B PARALLEL	87
SAE BB PARALLEL	88
SAE C 14T-12/24DP Continental Shaft	58
8x32x36 UNI 8953 splined Continental Shaft	67
SAE C 14T-12/24DP Continental Shaft	57
8x32x36 UNI 8953 splined Continental Shaft	66
SAE C PARALLEL Continental Shaft	89

E

MOUNTING FLANGES	CODE
European standard Ø50.8	P2
SAE B 2-4 BOLTS	S3
SAE C 2-4 BOLTS	S4
SAE B 2-4 BOLTS (Medium Loads)	R3
SAE C 2-4 BOLTS (Heavy Loads)	R8
4 BOLTS FOR ZF GEAR	Z1
4 Bolts for ZF gear box	Z2

F

SEAL	CODE
Buna standard (standard configuration)	-
Viton	V

How to order Single pump
PG331, displacement first stage (28), clockwise rotation (D), ports European (P), drive shaft (38), mounting flange (P2)=
PG331-28D-P38P2

PG330 Technical/Spare parts catalogue reference	
C	Flanged and Threaded Port see pages 65/66
D	Drive shaft see pages 68/69
E	Mounting flanged see pages 70/74

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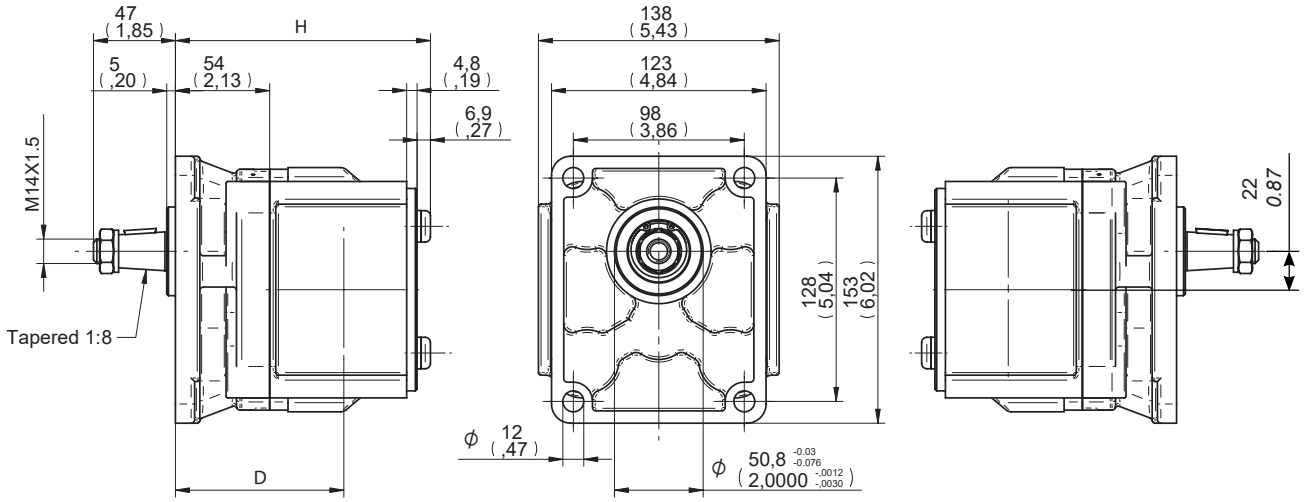
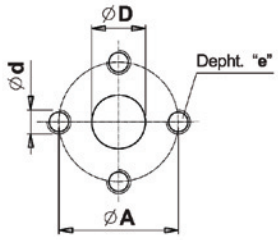
Configuration - P38P2





code P

Flanged ports
european standard

UNI-DIRECTIONAL								
PUMPS	**INLET**				**OUTLET**			
	Ø D	**Ø A**	**d**	**e**	**Ø D**	**Ø A**	**d**	**e**
23	20 *(0.79”)*	40 *(1.57”)*	M8	16 *(0.63”)*	16 *(0.63”)*	40 *(1.57”)*	M8	16 *(0.63”)*
From 28 to 47	27 *(1.07”)*	51 *(2.01”)*	M10	16 *(0.63”)*	16 *(0.63”)*	40 *(1.57”)*	M8	16 *(0.63”)*
From 55 to 72	33 *(1.3”)*	62 *(2.44”)*	M12	16 *(0.63”)*	21 *(0.83”)*	51 *(2.01”)*	M10	16 *(0.63”)*

M8	20 Nm (14.7 lbf-ft)
M10	35 Nm (25.8 lbf-ft)
M12	65 Nm (47.9 lbf-ft)

Displacement		**Dimensions**				**ANTI-CLOCKWISE**	**CLOCKWISE**
		D		**H**			
cm³/rev	*cu.in/rev*	mm	*in*	mm	*in*		
23.4	*1.43*	89	*3.50*	135.8	*5.35*	615200201	615200202
28.6	*1.74*	88	*3.46*	139.8	*5.50*	615200211	615200212
34.4	*2.10*	91.5	*3.60*	144.3	*5.68*	615200221	615200222
40.3	*2.46*	96	*3.80*	148.8	*5.85*	615200231	615200232
47.4	*2.89*	104	*4.09*	160.3	*6.31*	615200241	615200242
55.2	*3.37*	106	*4.17*	167.3	*6.59*	615200251	615200252
64.3	*3.92*	112	*4.41*	173.3	*6.82*	615200261	615200262
73.4	*4.48*	115	*4.53*	180.3	*7.10*	615200271	615200272

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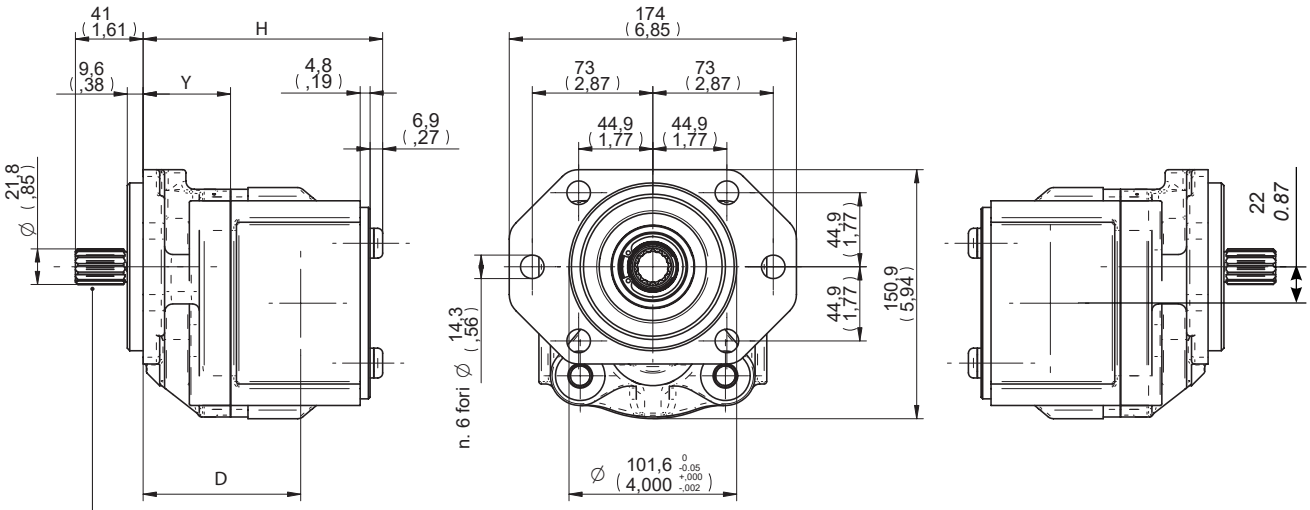
Configuration - G55S3

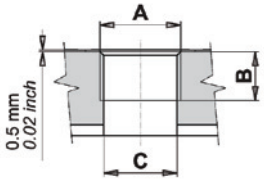


Ext. Involute Spline SAE J498B with outer diameter modified 13 teeth - 16/32 Pitch - 30 deg - Flat Root - Side fit - Class 1

Y→ 53 mm (2.09 in.) for displ. 23 to 40
64 mm (2.52 in.) for displ. 47 to 80

UNI-DIRECTIONAL						
PUMPS	**INLET**			**OUTLET**		
	A	**B**	**C**	**A**	**B**	**C**
From 23 to 40	G1	22 *(0.87")*	30.5 *(1.2")*	G3/4	16 *(0.62")*	24.4 *(0.96")*
From 47 to 80	G1 1/4	24 *(0.94")*	37 *(1.46")*	G1	22 *(0.87")*	30.5 *(1.2")*

G3/4	90 Nm (66.4 lbf-ft)
G1	130 Nm (95.8 lbf-ft)
G1 1/4	170 Nm (125.4 lbf-ft)



code G

Threaded ports GAS (BSPP)

Displacement		**Dimensions**				**ANTI-CLOCKWISE**	**CLOCKWISE**
		D		**H**			
cm³/rev	*cu.in/rev*	mm	*in*	mm	*in*		
23.4	*1.43*	88	*3.46*	136.7	*5.38*	615200101	615200102
28.6	*1.74*	91	*3.58*	140.7	*5.54*	615200111	615200112
34.4	*2.10*	95.5	*3.76*	145.2	*5.72*	615200121	615200122
40.3	*2.46*	100	*3.94*	149.7	*5.89*	615200131	615200132
47.4	*2.89*	114	*4.49*	172.2	*6.78*	615200141	615200142
55.2	*3.37*	120	*4.72*	179.2	*7.06*	615200151	615200152
64.3	*3.92*	122	*4.80*	185.2	*7.29*	615200161	615200162
73.4	*4.48*	125	*4.92*	192.2	*7.57*	615200171	615200172
80.6	*4.92*	129	*5.08*	198.2	*7.80*	615200181	615200182

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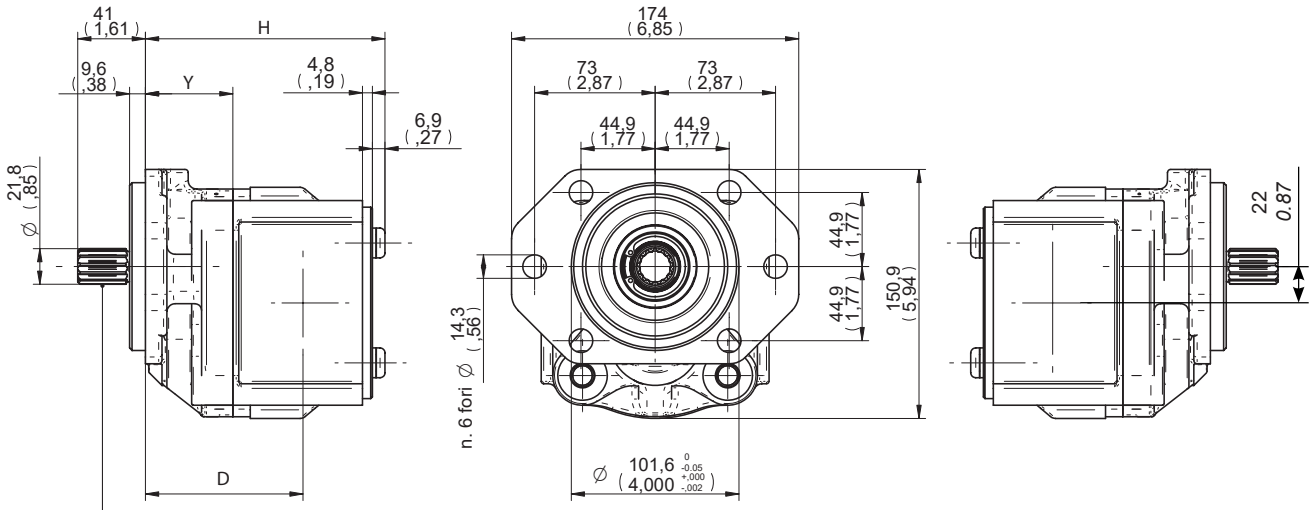
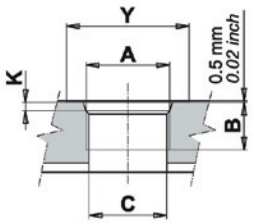
Configuration - R55S3



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

Y→ 53 mm (2.09 in.) for displ. 23 to 40
64 mm (2.52 in.) for displ. 47 to 80



code R

Threaded ports
SAE (ODT)

UNI-DIRECTIONAL										
PUMPS	**INLET**					**OUTLET**				
	A	**B**	**C**	**Y**	**K**	**A**	**B**	**C**	**Y**	**K**
From 23 to 40	1-5/16-12 UN (SAE 16)	19 *(0.75")*	31 *(1.22")*	49 *(1.93")*	3.3 *(0.13")*	1-1/16-12 UN (SAE 12)	19 *(0.75")*	24.7 *(0.97")*	41 *(1.16")*	3.3 *(0.13")*
From 47 to 80	1-5/8-12 UN (SAE 20)	19 *(0.75")*	38.9 *(1.53")*	58 *(2.28")*	3.3 *(0.13")*	1-5/16-12 UN (SAE 16)	19 *(0.75")*	31 *(1.22")*	49 *(1.93")*	3.3 *(0.13")*

SAE12	90 Nm (66.4 lbf-ft)
SAE16	130 Nm (95.8 lbf-ft)
SAE20	170 Nm (125.4 lbf-ft)

Displacement		**Dimensions**				**ANTI-CLOCKWISE**	**CLOCKWISE**
		D		**H**			
cm³/rev	*cu.in/rev*	mm	*in*	mm	*in*		
23.4	*1.43*	88	*3.46*	136.7	*5.38*	615200001	615200002
28.6	*1.74*	91	*3.58*	140.7	*5.54*	615200011	615200012
34.4	*2.10*	95.5	*3.76*	145.2	*5.72*	615200021	615200022
40.3	*2.46*	100	*3.94*	149.7	*5.89*	615200031	615200032
47.4	*2.89*	114	*4.49*	172.2	*6.78*	615200041	615200042
55.2	*3.37*	120	*4.72*	179.2	*7.06*	615200051	615200052
64.3	*3.92*	122	*4.80*	185.2	*7.29*	615200061	615200062
73.4	*4.48*	125	*4.92*	192.2	*7.57*	615200071	615200072
80.6	*4.92*	129	*5.08*	198.2	*7.80*	615200081	615200082

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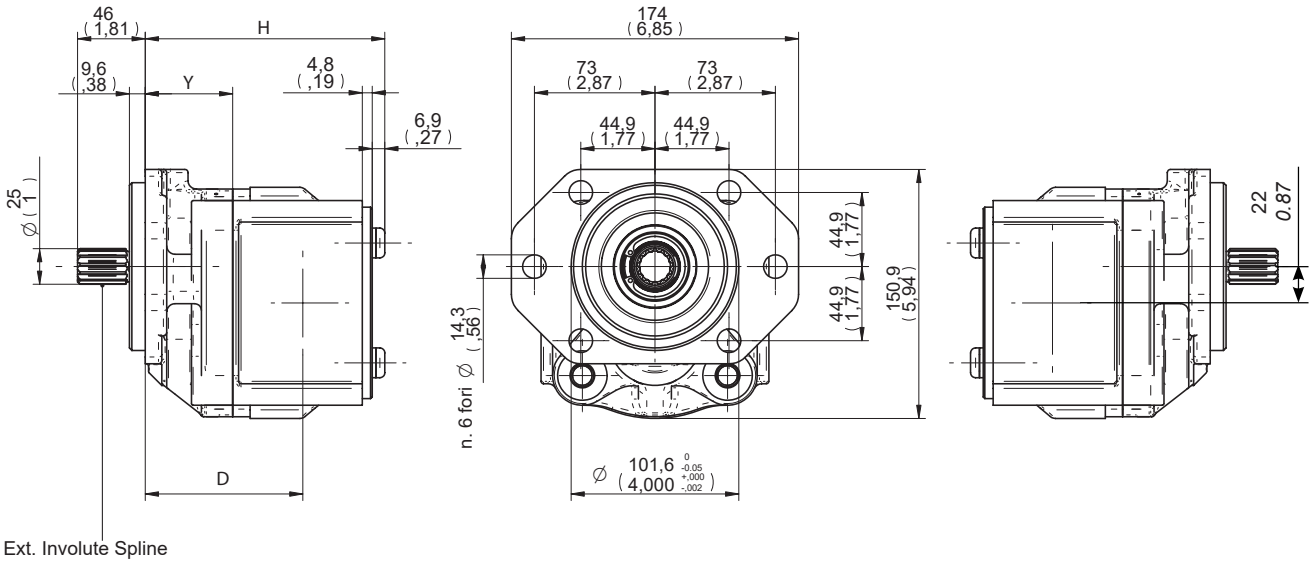
Configuration - W56S3

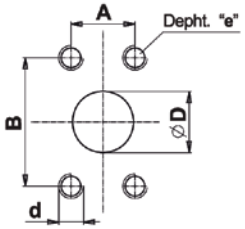


Ext. Involute Spline
SAE J498B with outer diameter modified 15 teeth - 16/32 Pitch - 30 deg - Flat Root - Side fit - Class 1

Y→ 53 mm (2.09 in.) for displ. 23 to 40
64 mm (2.52 in.) for displ. 47 to 80

UNI-DIRECTIONAL										
PUMPS	**INLET**					**OUTLET**				
	ØD	**B**	**A**	**d**	**e**	**ØD**	**B**	**A**	**d**	**e**
From 23 to 47	32 *(1.26”)*	58.72 *(2.31”)*	38.18 *(1.19”)*	M10	18 *(0.71”)*	19 *(0.75”)*	47.6 *(1.87”)*	22.2 *(0.87”)*	M10	18 *(0.71”)*
From 55 to 80	39.3 *(1.55”)*	69.8 *(2.75”)*	35.7 *(1.40”)*	M12	15 *(0.59”)*	32 *(1.26”)*	58.72 *(2.31”)*	30.18 *(1.19”)*	M10	18 *(0.71”)*

M10	35 Nm (25.8 lbf-ft)
M12	65 Nm (47.9 lbf-ft)



code W

Flanged ports
SAE J518
METRIC THREAD

Displacement		**Dimensions**				**ANTI-CLOCKWISE**	**CLOCKWISE**
		D		**H**			
cm³/rev	*cu.in/rev*	mm	*in*	mm	*in*		
23.4	*1.43*	84	*3.31*	136.7	*5.38*	615200411	615200412
28.6	*1.74*	88	*3.46*	140.7	*5.54*	615200421	615200422
34.4	*2.10*	92.5	*3.64*	145.2	*5.72*	615200431	615200432
40.3	*2.46*	97	*3.82*	149.7	*5.89*	615200441	615200442
47.4	*2.89*	114	*4.49*	172.2	*6.78*	615200451	615200452
55.2	*3.37*	120	*4.72*	178.2	*7.02*	615200461	615200462
64.3	*3.92*	122	*4.80*	185.2	*7.29*	615200471	615200472
73.4	*4.48*	125	*4.92*	192.2	*7.57*	615200481	615200482
80.6	*4.92*	129	*5.08*	198.2	*7.80*	615200491	615200492

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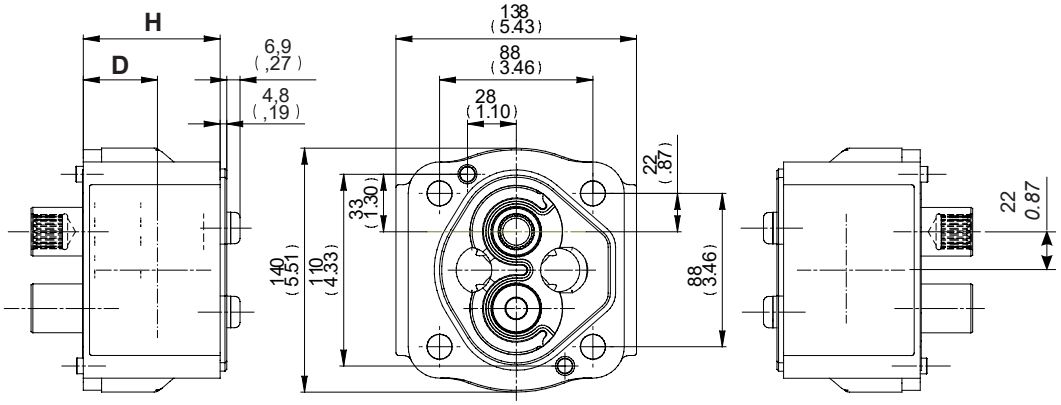
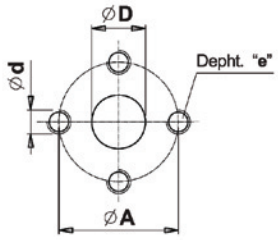
Configuration - P63-R





code P

Flanged ports
european standard

UNI-DIRECTIONAL								
PUMPS	**INLET**				**OUTLET**			
	Ø D	**Ø A**	**d**	**e**	**Ø D**	**Ø A**	**d**	**e**
23	20 *(0.79”)*	40 *(1.57”)*	M8	16 *(0.63”)*	16 *(0.63”)*	40 *(1.57”)*	M8	16 *(0.63”)*
From 28 to 47	27 *(1.07”)*	51 *(2.01”)*	M10	16 *(0.63”)*	16 *(0.63”)*	40 *(1.57”)*	M8	16 *(0.63”)*
From 55 to 72	33 *(1.3”)*	62 *(2.44”)*	M12	16 *(0.63”)*	21 *(0.83”)*	51 *(2.01”)*	M10	16 *(0.63”)*

M8	20 Nm (14.7 lbf-ft)
M10	35 Nm (25.8 lbf-ft)
M12	65 Nm (47.9 lbf-ft)

Displacement		**Dimensions**				**ANTI-CLOCKWISE**	**CLOCKWISE**
		D		**H**			
cm³/rev	*cu.in/rev*	mm	*in*	mm	*in*		
23.4	*1.43*	35	*1.38*	70	*2.76*	615210011	615210012
28.6	*1.74*	34	*1.34*	74	*2.91*	615210021	615210022
34.4	*2.10*	37.5	*1.48*	78.5	*3.09*	615210031	615210032
40.3	*2.46*	42	*1.65*	83	*3.27*	615210041	615210042
47.4	*2.89*	50	*1.97*	94.5	*3.72*	615210051	615210052
55.2	*3.37*	52	*2.05*	100.5	*3.96*	615210061	615210062
64.3	*3.92*	58	*2.28*	107.5	*4.23*	615210071	615210072
73.4	*4.48*	61	*2.40*	114.5	*4.51*	615210081	615210082

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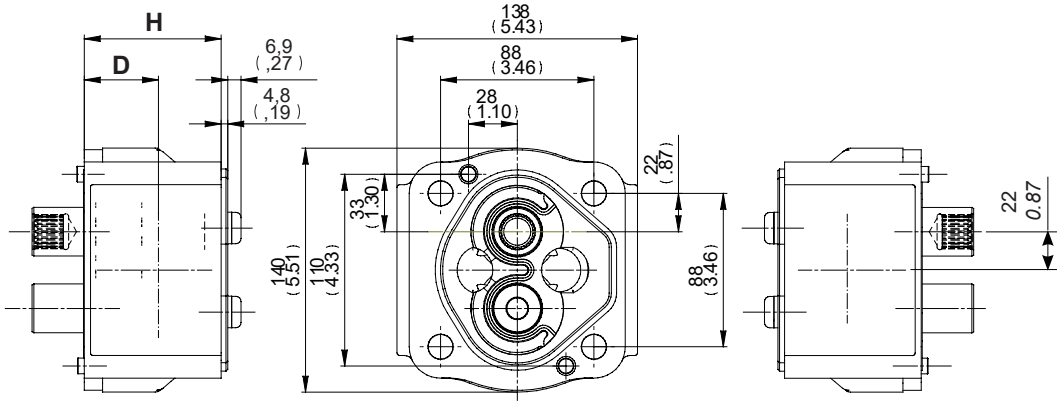
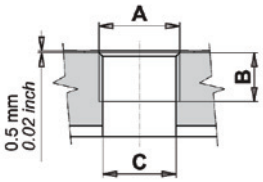
Configuration - G63-R



UNI-DIRECTIONAL						
PUMPS	INLET			OUTLET		
	A	B	C	A	B	C
From 23 to 40	G1	22 *(0.87”)*	30.5 *(1.2”)*	G3/4	16 *(0.62”)*	24.4 *(0.96”)*
From 47 to 80	G1 1/4	24 *(0.94”)*	37 *(1.46”)*	G1	22 *(0.87”)*	30.5 *(1.2”)*

G3/4	90 Nm (66.4 lbf-ft)
G1	130 Nm (95.8 lbf-ft)
G1 1/4	170 Nm (125.4 lbf-ft)



code G

Threaded ports
GAS (BSPP)

Displacement		Dimensions				ANTI-CLOCKWISE	CLOCKWISE
		D		H			
cm³/rev	*cu.in/rev*	mm	*in*	mm	*in*		
23.4	*1.43*	35	*1.38*	70	*2.76*	615210091	615210092
28.6	*1.74*	38	*1.50*	74	*2.91*	615210101	615210102
34.4	*2.10*	42.5	*1.67*	78.5	*3.09*	615210111	615210112
40.3	*2.46*	47	*1.85*	83	*3.27*	615210121	615210122
47.4	*2.89*	50	*1.97*	94.5	*3.72*	615210131	615210132
55.2	*3.37*	56	*2.20*	100.5	*3.96*	615210141	615210142
64.3	*3.92*	58	*2.28*	107.5	*4.23*	615210151	615210152
73.4	*4.48*	61	*2.40*	114.5	*4.51*	615210161	615210162

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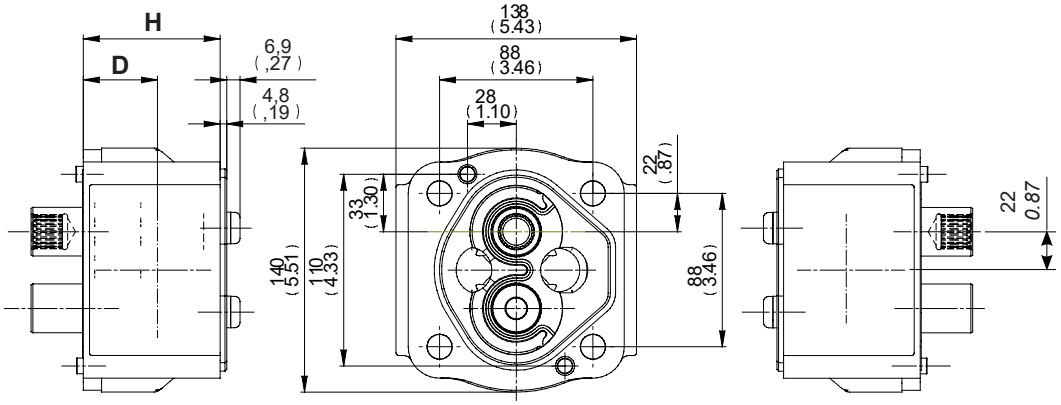
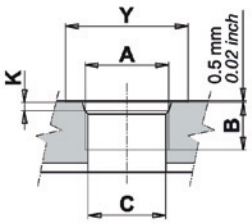
Configuration - R63-R





code R

Threaded ports
SAE (ODT)

UNI-DIRECTIONAL										
PUMPS	INLET					OUTLET				
	A	B	C	Y	K	A	B	C	Y	K
From 23 to 40	1-5/16-12 UN (SAE 16)	19 *(0.75”)*	31 *(1.22”)*	49 *(1.93”)*	3.3 *(0.13”)*	1-1/16-12 UN (SAE 12)	19 *(0.75”)*	24.7 *(0.97”)*	41 *(1.16”)*	3.3 *(0.13”)*
From 47 to 80	1-5/8-12 UN (SAE 20)	19 *(0.75”)*	38.9 *(1.53”)*	58 *(2.28”)*	3.3 *(0.13”)*	1-5/16-12 UN (SAE 16)	19 *(0.75”)*	31 *(1.22”)*	49 *(1.93”)*	3.3 *(0.13”)*

SAE12	90 Nm (66.4 lbf-ft)
SAE16	130 Nm (95.8 lbf-ft)
SAE20	170 Nm (125.4 lbf-ft)

Displacement		Dimensions				ANTI-CLOCKWISE	CLOCKWISE
		D		H			
cm³/rev	*cu.in/rev*	mm	*in*	mm	*in*		
23.4	*1.43*	35	*1.38*	70	*2.76*	615210171	615210172
28.6	*1.74*	38	*1.50*	74	*2.91*	615210181	615210182
34.4	*2.10*	42.5	*1.67*	78.5	*3.09*	615210191	615210192
40.3	*2.46*	47	*1.85*	83	*3.27*	615210201	615210202
47.4	*2.89*	50	*1.97*	94.5	*3.72*	615210211	615210212
55.2	*3.37*	56	*2.20*	100.5	*3.96*	615210221	615210222
64.3	*3.92*	58	*2.28*	107.5	*4.23*	615210231	615210232
73.4	*4.48*	61	*2.40*	114.5	*4.51*	615210241	615210242

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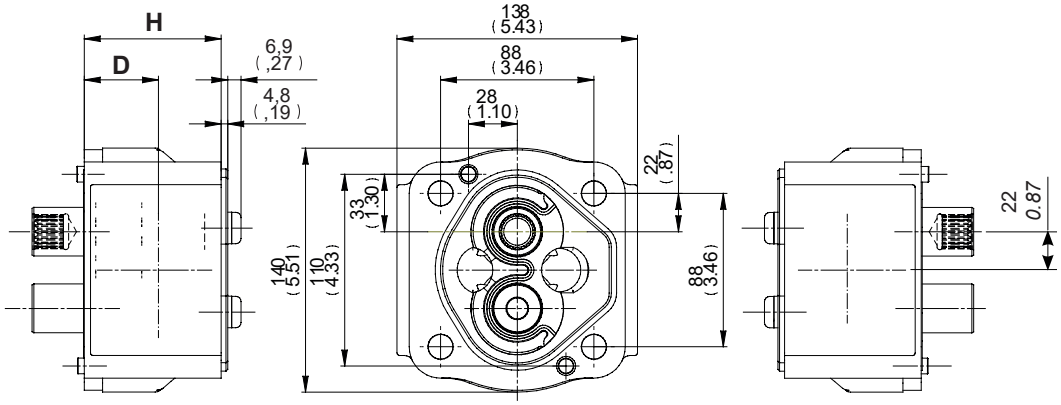
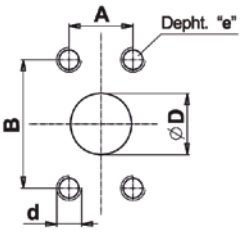
Configuration - W63-R



UNI-DIRECTIONAL										
PUMPS	INLET					OUTLET				
	ØD	B	A	d	e	ØD	B	A	d	e
From 23 to 47	32 *(1.26”)*	58.72 *(2.31”)*	38.18 *(1.19”)*	M10	18 *(0.71”)*	19 *(0.75”)*	47.6 *(1.87”)*	22.2 *(0.87”)*	M10	18 *(0.71”)*
From 55 to 80	39.3 *(1.55”)*	69.8 *(2.75”)*	35.7 *(1.40”)*	M12	15 *(0.59”)*	32 *(1.26”)*	58.72 *(2.31”)*	30.18 *(1.19”)*	M10	18 *(0.71”)*

M10	35 Nm (25.8 lbf-ft)
M12	65 Nm (47.9 lbf-ft)



code W

Flanged ports
SAE J518
METRIC THREAD

Displacement		Dimensions				ANTI-CLOCKWISE	CLOCKWISE
		D		H			
cm³/rev	*cu.in/rev*	mm	*in*	mm	*in*		
23.4	*1.43*	31	*1.22*	70	*2.76*	615210251	615210252
28.6	*1.74*	35	*1.38*	74	*2.91*	615210261	615210262
34.4	*2.10*	39.5	*1.56*	78.5	*3.09*	615210271	615210272
40.3	*2.46*	44	*1.73*	83	*3.27*	615210281	615210282
47.4	*2.89*	50	*1.97*	94.5	*3.72*	615210291	615210292
55.2	*3.37*	56	*2.20*	100.5	*3.96*	615210301	615210302
64.3	*3.92*	58	*2.28*	107.5	*4.23*	615210311	615210312
73.4	*4.48*	61	*2.40*	114.5	*4.51*	615210321	615210322

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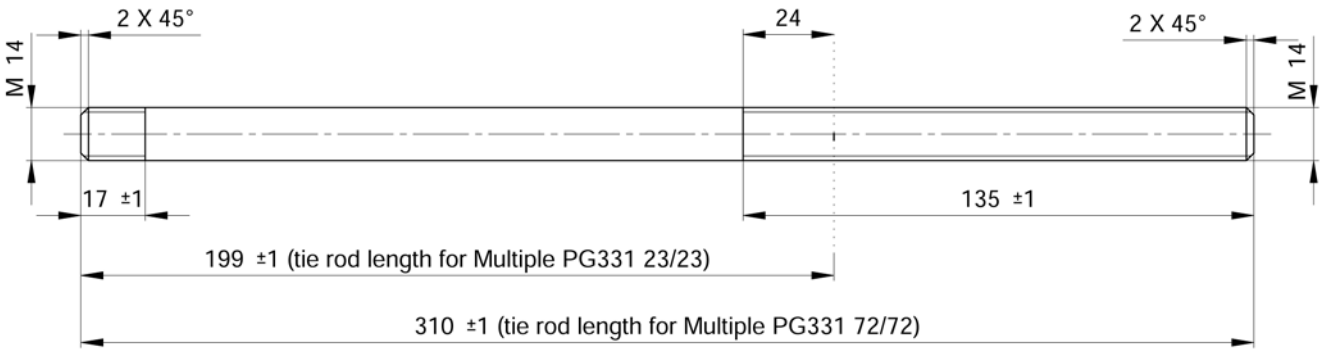
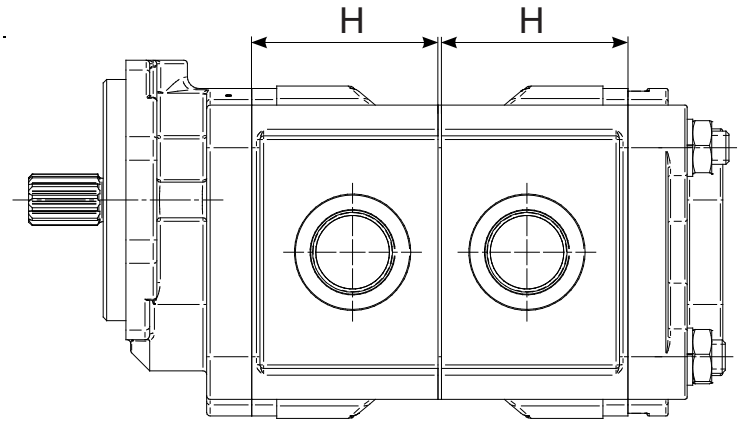
Appendix A - Tie rods length calculation (Multiple pump)

1°- 2° Stages (tie rods 339514937 M14X310 CL. 10.9)





To calculate the lenght of tie rods, you have to make the sum of all these lenghts:
(H)+H)+(1)+(2)+(3)+(4)+(5)+(6)

For cutting lenght calculationan automatic excel file is available, please contact our sales department.

Table for the double PG331 tie-rod calculation

	TYPE		23	28	34	40	47	55	64	72
(H)	Dimension H	mm	70	74	78.5	83	94.5	100.5	107.5	114.5
		in	*2.76*	*2.91*	*3.09*	*3.27*	*3.72*	*3.96*	*4.23*	*4.51*
(1)	Spessore filetto in presa sulla flangia	mm	22							
	Grip length	*in*	*0.87*							
(2)	Spessore coperchio std.	mm	26.5							
	Thickness of the std. cover	*in*	*1.04*							
(3)	Spessore dado M14 UNI5588	mm	11							
	Thickness of the nut M14 UNI5588	*in*	*0.43*							
(4)	Spessore rondella UNI9195	mm	3.5							
	Thickness of the washer UNI9195	*in*	*0.14*							
(5)	Spessore piastra PG331/PG331	mm	1.5							
	Thickness of the plate PG331/PG331	*in*	*0.06*							
(6)	Sporgenza sulle estremità del tirante	mm	8							
	Overhang on the tie-rods	*in*	*0.31*							

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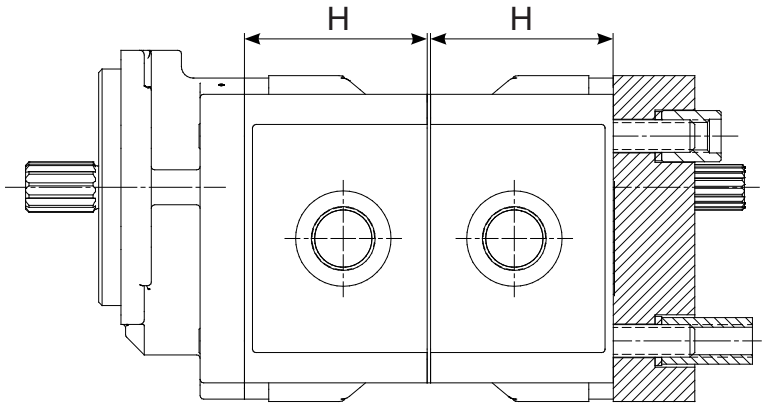
Appendix B - Tie rods length calculation and Screws (Triple pump)

1°- 2° Stages (tie rods 339514937 M14X310 CL. 10.9)



To calculate the lenght of tie rods, you have to make the sum of all these lenghts:
(H)+(H)+(1)+[(2) Displ. 23-40 cc or **(3)** Displ. 47-72 cc **]+(4)**

Table for tie-rod calculation of a double PG331 pre-arranged to become a triple or quadruple PG331

	TYPE		23	28	34	40	47	55	64	72
(H)	Dimension H	mm	70	74	78.5	83	94.5	100.5	107.5	114.5
		in	*2.76*	*2.91*	*3.09*	*3.27*	*3.72*	*3.96*	*4.23*	*4.51*
(1)	Spessore filetto in presa sulla flangia	mm	22							
	Grip length	*in*	*0.87*							
(2)	Lunghezza fissa cil. 23 - 40	mm	34.5							
	Fixed length for displ. 23 - 40	*in*	*1.36*							
(3)	Lunghezza fissa cil. 47 - 72	mm	40.5							
	Fixed length for displ. 47 - 72	*in*	*1.59*							
(4)	Spessore piastra PG331/PG331	mm	1.5							
	Thickness of the plate PG331/PG331	*in*	*0.06*							

3°Stage/Rear pump (screws M14 TCEI UNI 5931 - CL. 12.9 - Burnished)

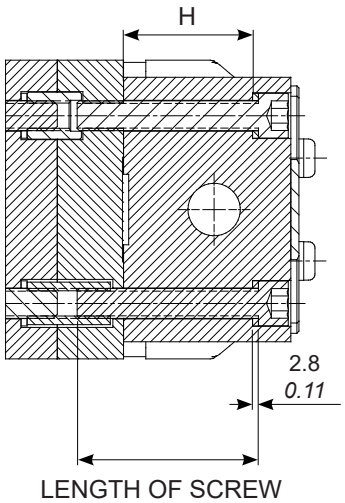


Tabella lunghezze viti TCEI PG331 terzo stadio
Table for third stage PG331 length of TCEI screws

DISPLACEMENT OF THE THIRD STAGE	LENGTH OF SCREW	CODE
23	75 *2.95*	790677900
28	80 *3.15*	790622900
34	85 *3.35*	790623000
40	90 *3.54*	790623100
47	110 *4.33*	790677431
55	110 *4.33*	790677431
64	120 *4.72*	790623400
72	130 *5.12*	790623500

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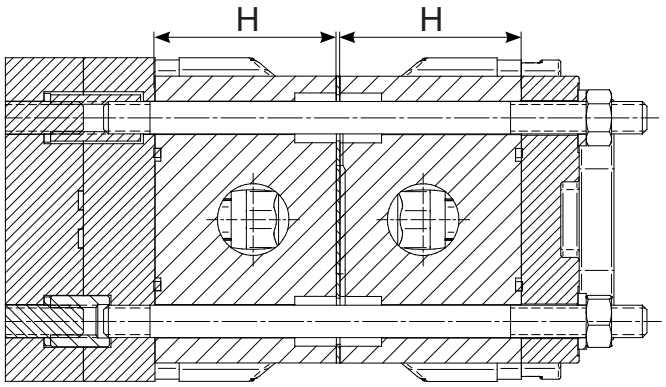
Appendix C - Tie rods length calculation (Quadruple pump)

3°- 4° Stages (tie rods 339514937 M14X310 CL. 10.9)



To calculate the lenght of tie rods, you have to make the sum of all these lenghts:
(H)+H)+(1)+(2)+(3)+(4)+(5)+(6)

Table for the double PG331 tie-rod calculation

	TYPE		23	28	34	40	47	55	64	72
(H)	Dimension H	mm	70	74	78.5	83	94.5	100.5	107.5	114.5
		in	*2.76*	*2.91*	*3.09*	*3.27*	*3.72*	*3.96*	*4.23*	*4.51*
(1)	Spessore filetto in presa sulla flangia	mm	22							
	Grip length	*in*	*0.87*							
(2)	Spessore coperchio std.	mm	26.5							
	Thickness of the std. cover	*in*	*1.04*							
(3)	Spessore dado M14 UNI5588	mm	11							
	Thickness of the nut M14 UNI5588	*in*	*0.43*							
(4)	Spessore rondella UNI9195	mm	3.5							
	Thickness of the washer UNI9195	*in*	*0.14*							
(5)	Spessore piastra PG331/PG331	mm	1.5							
	Thickness of the plate PG331/PG331	*in*	*0.06*							
(6)	Sporgenza sulle estremità del tirante	mm	8							
	Overhang on the tie-rods	*in*	*0.31*							

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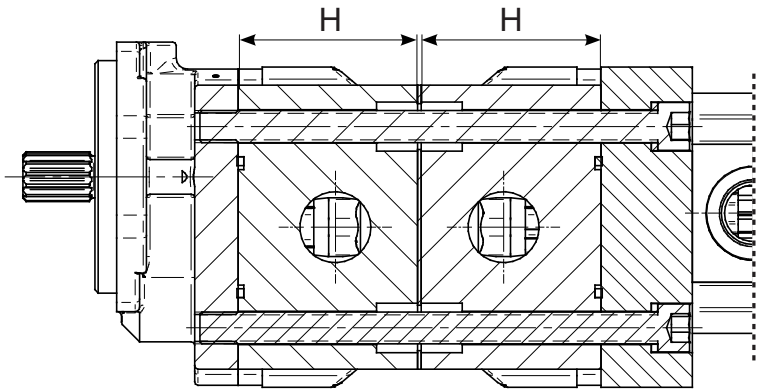
Appendix D - Screws (Multiple PG331+2PE)

1°- 2° Stages (screws M14 TCEI UNI 5931 - CL. 12.9 - Burnished)

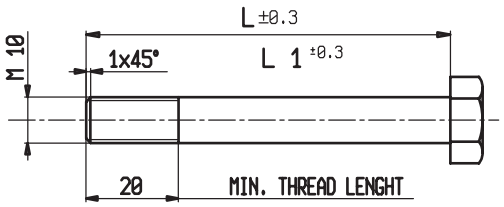


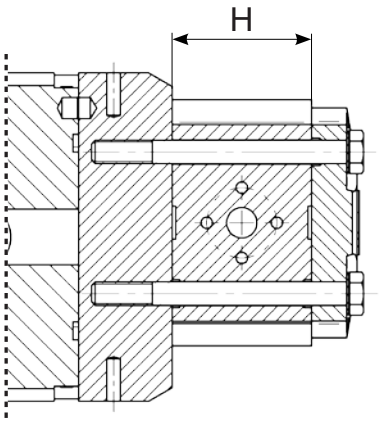
To calculate the lenght of tie rods, you have to make the sum of all these lenghts:
(H)+(H)+(1)+[(2) Displ. 23-40 cc or **(3)** Displ. 47-72 cc **]**

Table for double PG331 with 2PE TCEI screw calculation

TYPE			23	28	34	40	47	55	64	72
(H)	Dimension H	mm	70	74	78.5	83	94.5	100.5	107.5	114.5
		in	*2.76*	*2.91*	*3.09*	*3.27*	*3.72*	*3.96*	*4.23*	*4.51*
(1)	Spessore filetto in presa sulla flangia	mm	20							
	Grip length	*in*	*0.79*							
(2)	Lunghezza fissa cil. 23 - 40	mm	25							
	Fixed length for displ. 23 - 40	*in*	*0.98*							
(3)	Lunghezza fissa cil. 47 - 72	mm	31							
	Fixed length for displ. 47 - 72	*in*	*1.22*							

2PE Rear pump (screws M10 UNI 5737 - CL. 10.9)

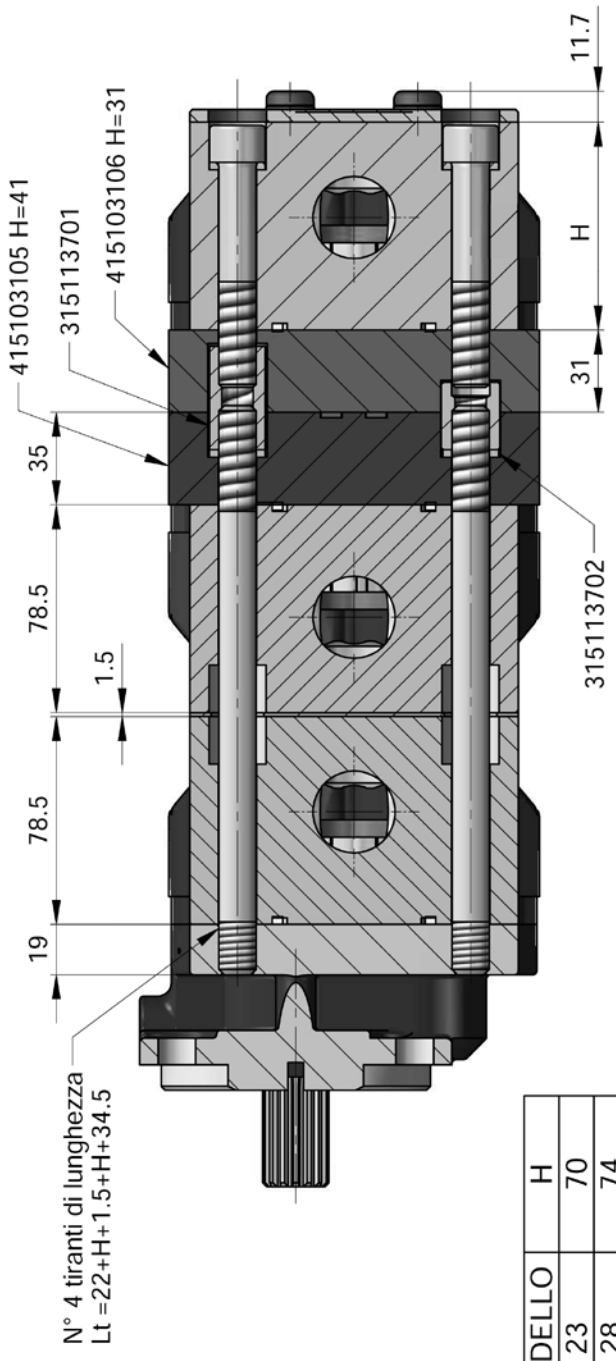


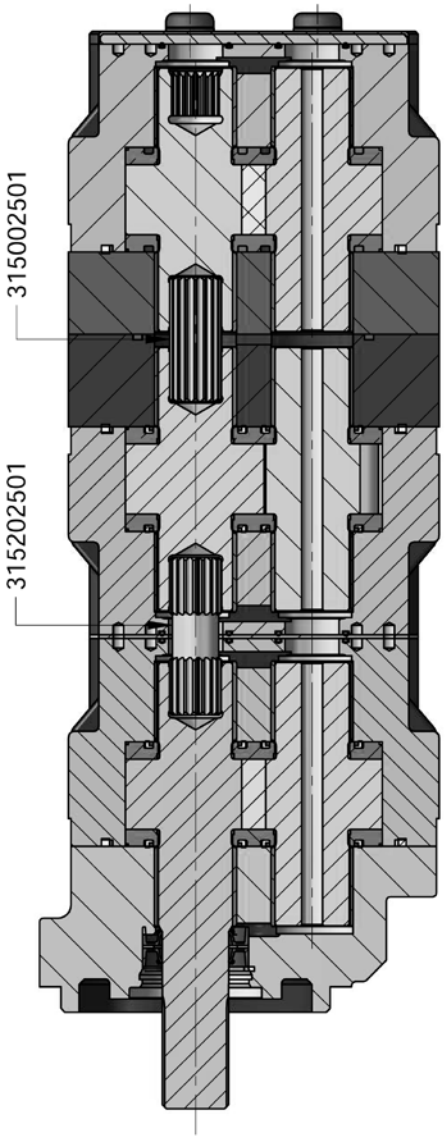


DISPLACEMENT	BODY H	FLANGE (H=19) SCREW LENGHT M 10 L1	CODE	"SR" WASHER THICKN. "SR"	CODE
3.2-3.9-4.5-6.2	47.1	80	7901 170 31	1	7952 524 51
5.5	48.6	80	7901 170 31	1	7952 524 51
8.3	52.8	85	7901 171 31	1	7952 524 51
10.5	56.3	90	7901 172 31	2.2	7952 396 51
11.3-12.5	59.7	90	7901 172 31	1	7952 524 51
13.8	63.5	95	7901 173 31	1	7952 524 51
16	67.5	100	7901 174 31	1	7952 524 51
19	75.6	110	7901 176 31	2.2	7952 396 51
22.5	81	115	7901 177 31	2.2	7952 396 51
26	86.8	120	7901 178 31	1	7952 524 51

E0.152.0725.05.00IM03

Appendix E - (Triple pump) 1°/2°/3° Stage Displ. 23-40 cc

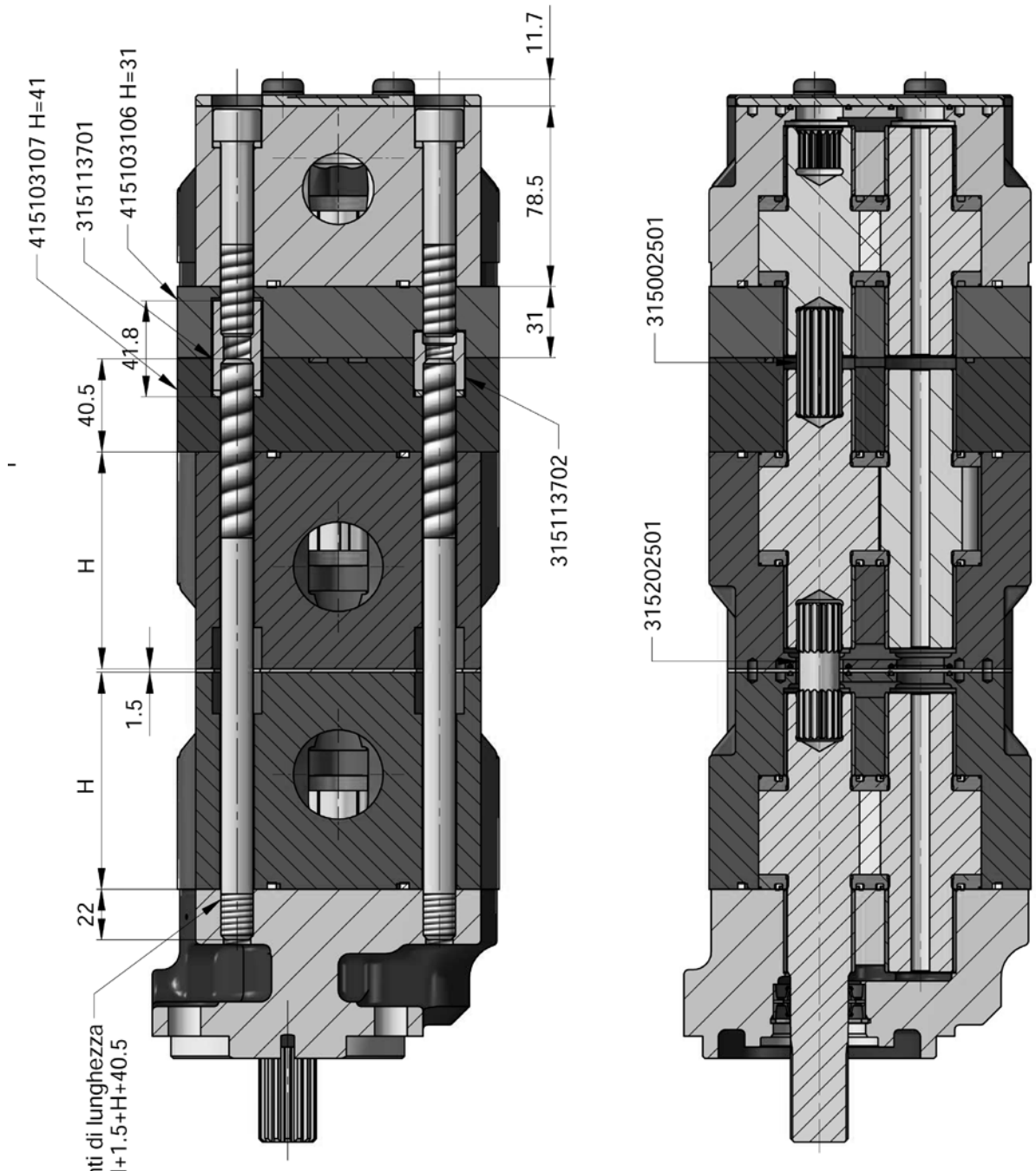




MODELLO	H
23	70
28	74
34	78.5
40	83

E0.152.0725.05.00IM03

Appendix E - (Triple pump) 1°/2° Stage Displ. 47-80 cc/3° Stage Displ. 23-40 cc



1° e 2° stadio

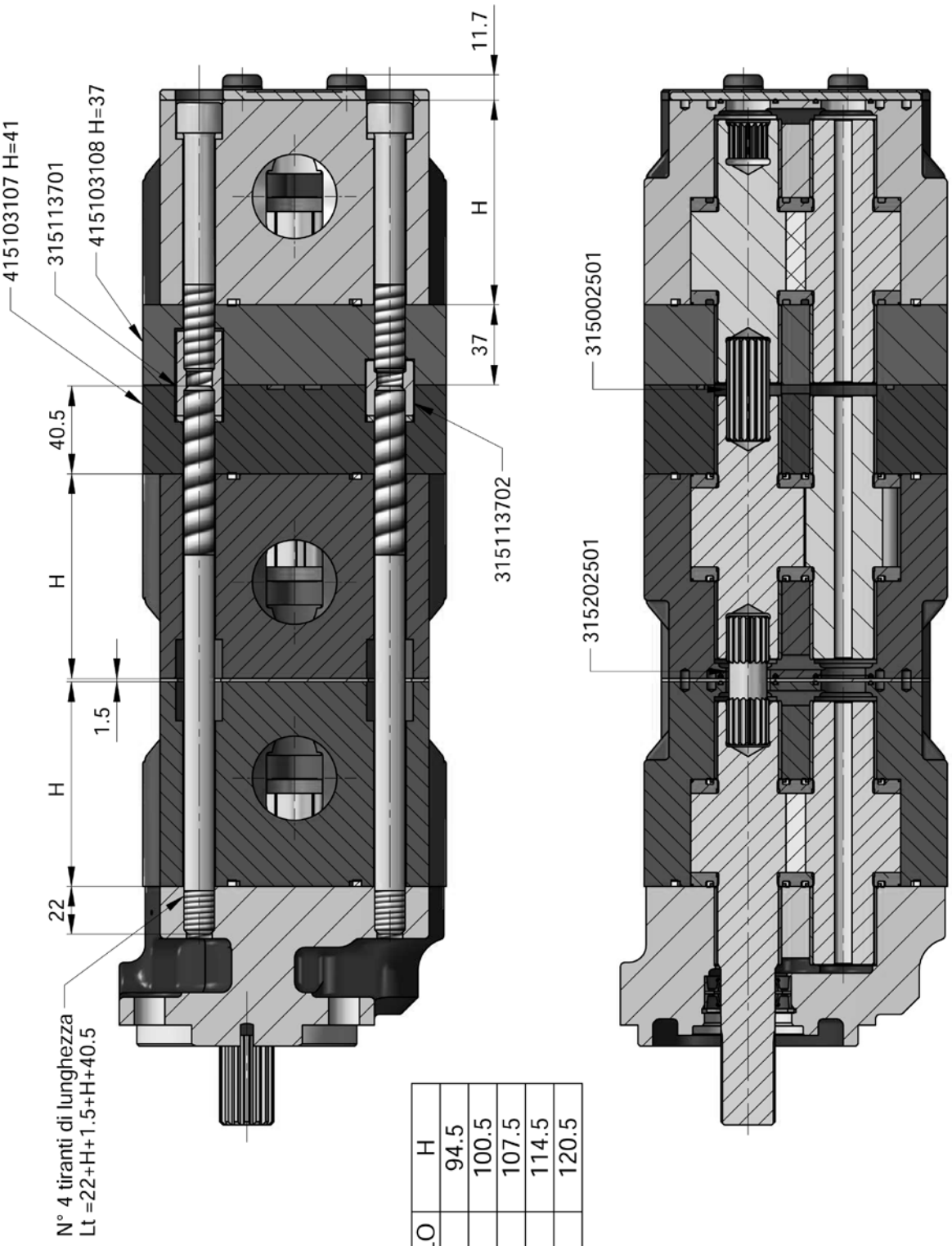
MODELLO	H
47	94.5
55	100.5
64	107.5
72	114.5
80	120.5

3° stadio

MODELLO	H
23	70
28	74
34	78.5
40	83

E0.152.0725.05.00IM03

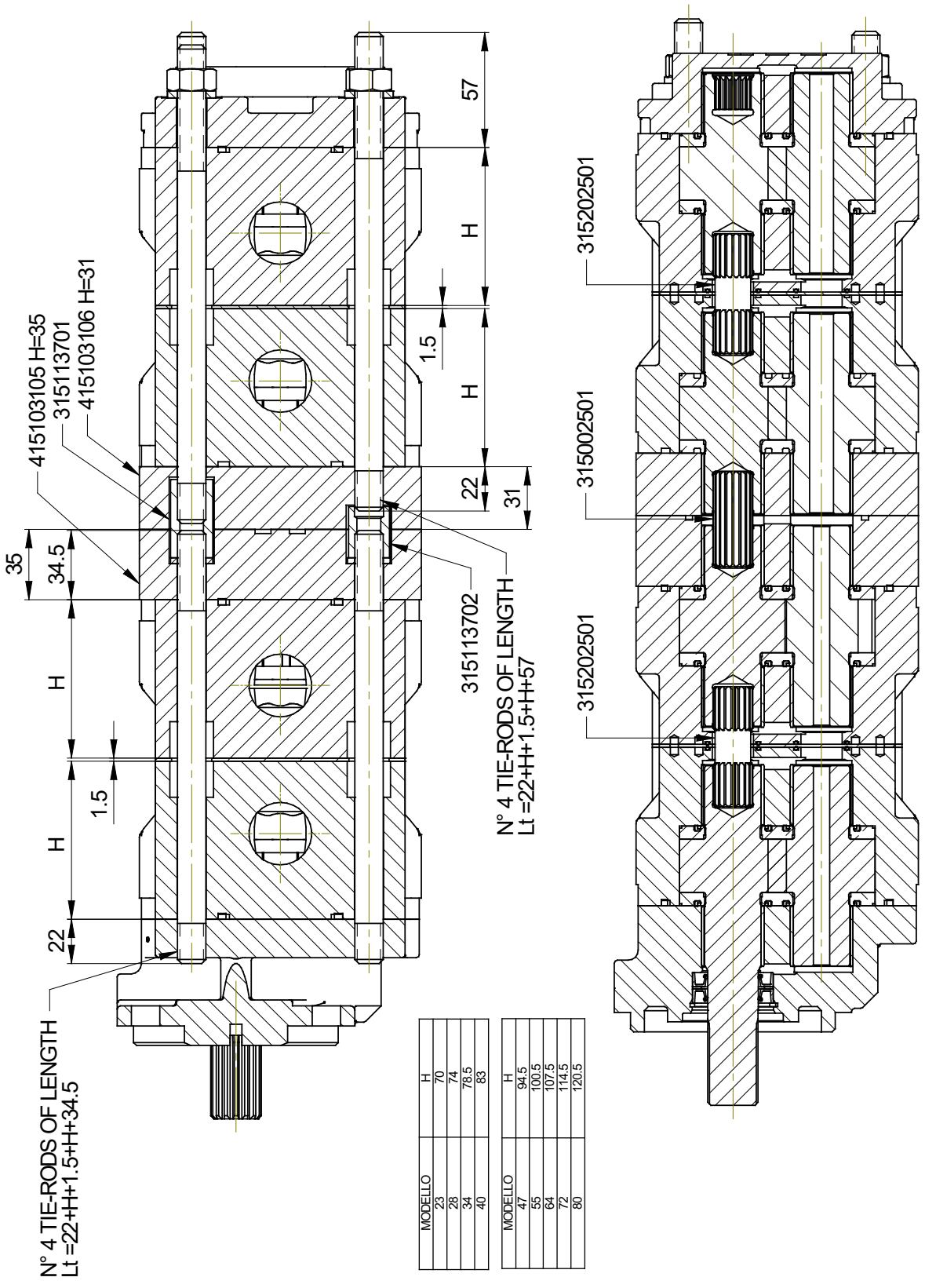
Appendix E - (Triple pump) 1°/2°+3° Stage Displ. 47-80 cc



MODELLO	H
47	94.5
55	100.5
64	107.5
72	114.5
80	120.5

E0.152.0725.05.00IM03

Appendix F - (Quadruple pump) 1°/2°+3°/4° Stage Displ. 23-40 cc

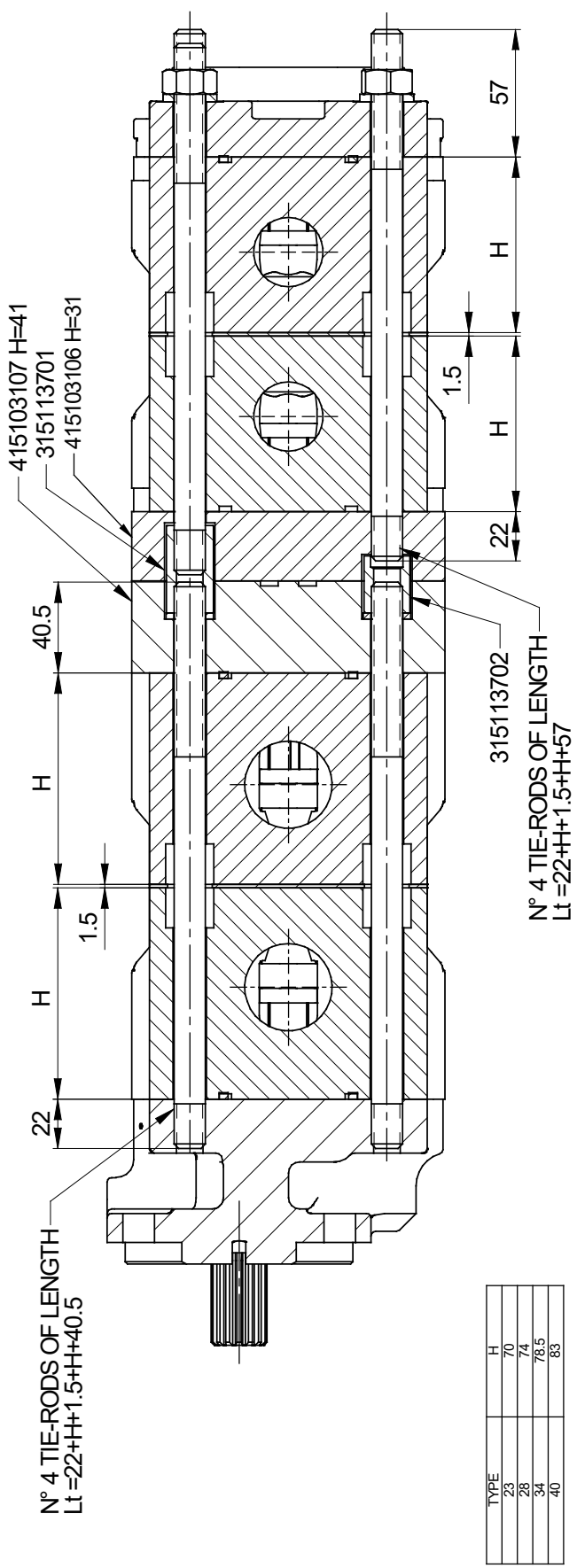


MODELLO	H
23	70
28	74
34	78.5
40	83

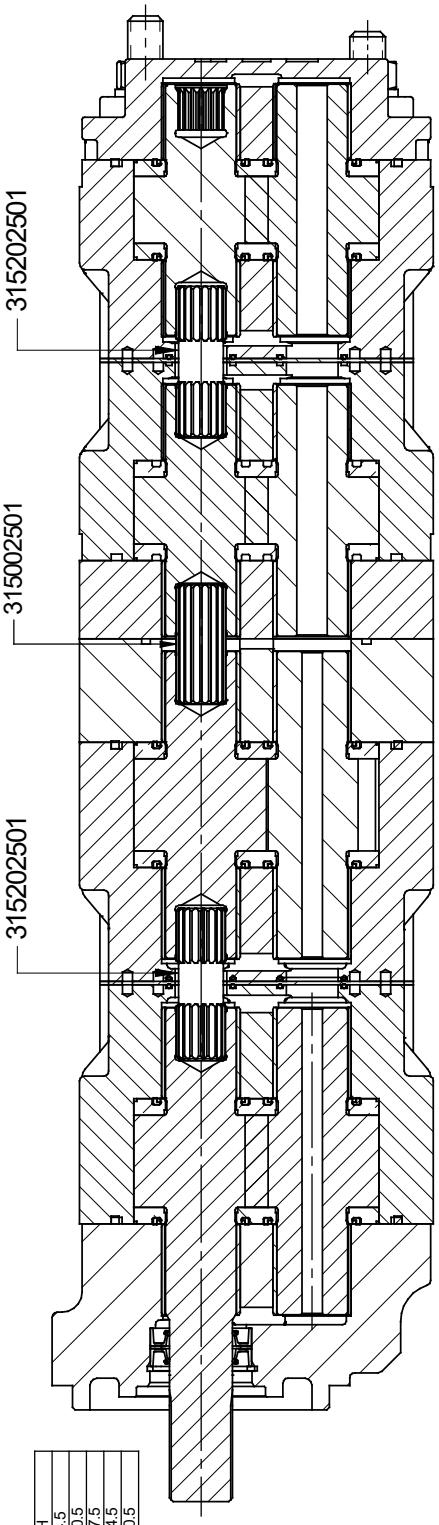
MODELLO	H
47	94.5
55	100.5
64	107.5
72	114.5
80	120.5

E0.152.0725.05.00IM03

Appendix F - (Quadruple pump) 1°/2° Stage Displ. 47-80 cc+3°/4° Stage Displ. 23-40 cc



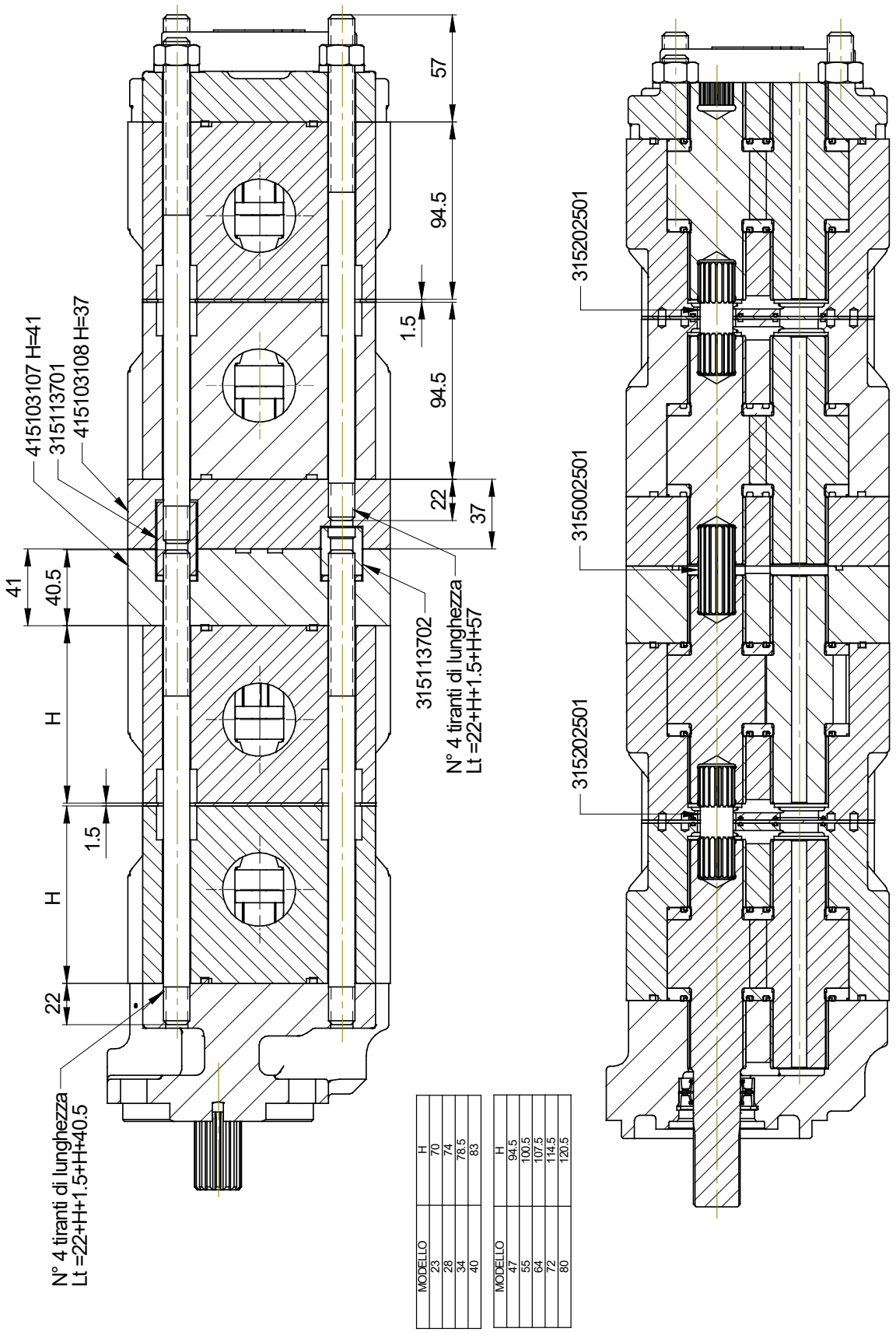
TYPE	H
23	70
28	74
34	78.5
40	83



TYPE	H
47	94.5
55	100.5
64	107.5
72	114.5
80	120.5

E0.152.0725.05.00IM03

Appendix F - (Quadruple pump) 1°/2°+3°/4° Stage Displ. 47-80 cc



MODELLO	H
23	70
28	74
34	78.5
40	83

MODELLO	H
47	94.5
55	100.5
64	107.5
72	114.5
80	120.5

E0.152.0725.05.00IM03

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