2PE

Aluminium gear pumps

Technical Catalogue

E0.120.0219.02.00IM04

salami®

GEAR PUMPS

SALAMI gear pumps are available with displacements from 1.4 cm³/rev to 99 cm³/rev *(from 0.09 cu.in/rev to 6.03 cu.in/rev)*.
Multiple pumps can always be relized combining stages taken from different or same series.
Several options of shafts, flanges and ports as for European, German and American standards are available for all the pumps.

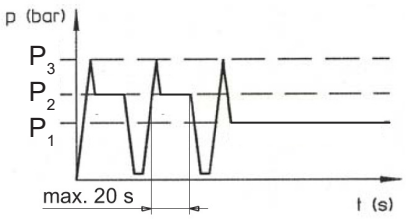
SALAMI gear pumps offer:
•High volumetric efficiency thanks to an innovative design and an accurate control of machining tolerances.
•Axial compensation achieved by the use of floating bushes that allow high volumetric efficiency throughout the working pressure range.
•DU bearings to ensure high pressure capability.
•12 teeth integral gear and shaft.
•Aluminium body.
•Cast iron flange and cover.
•Double shaft seals.
•Nitrile seals as standard and Viton seals in high temperature applications.
•All pumps are hydraulically tested after assembly to ensure the highest standard performance.
•Gear pumps are ideal for mobile equipment including: snow plows, light duty equipment, farm vehicles, town trucks, cherry pickers, lift gates, utility vehicles, aerial devices, hoists, spreaders, fan drive.
•Also available Bidirectional rotation.

WORKING CONDITIONS

- Pump inlet pressure (absolute pressure)	0.8 to 1.5 bar *(11.6 to 21.7 psi)*
- Minimum operating fluid viscosity	12 mm² / sec
- Max starting viscosity	800 mm² / sec
- Suggested fluid viscosity range	17 - 65 mm² / sec
- Fluid operating temperature range	-20 to 80 °C
- Fluid operating temperature range with FPM seals (Viton)	-15 to 110°C
- Fluid operating temperature range with HNBR seals*	-30 to 110°C
- Hydraulic fluid	Mineral oil according to DIN 51524. Other hydraulic fluids on request.

*Available on request.

DEFINITION OF PRESSURES



P_3 = Peak pressure

P_2 = Intermittent operating pressure (1/3 of working time)

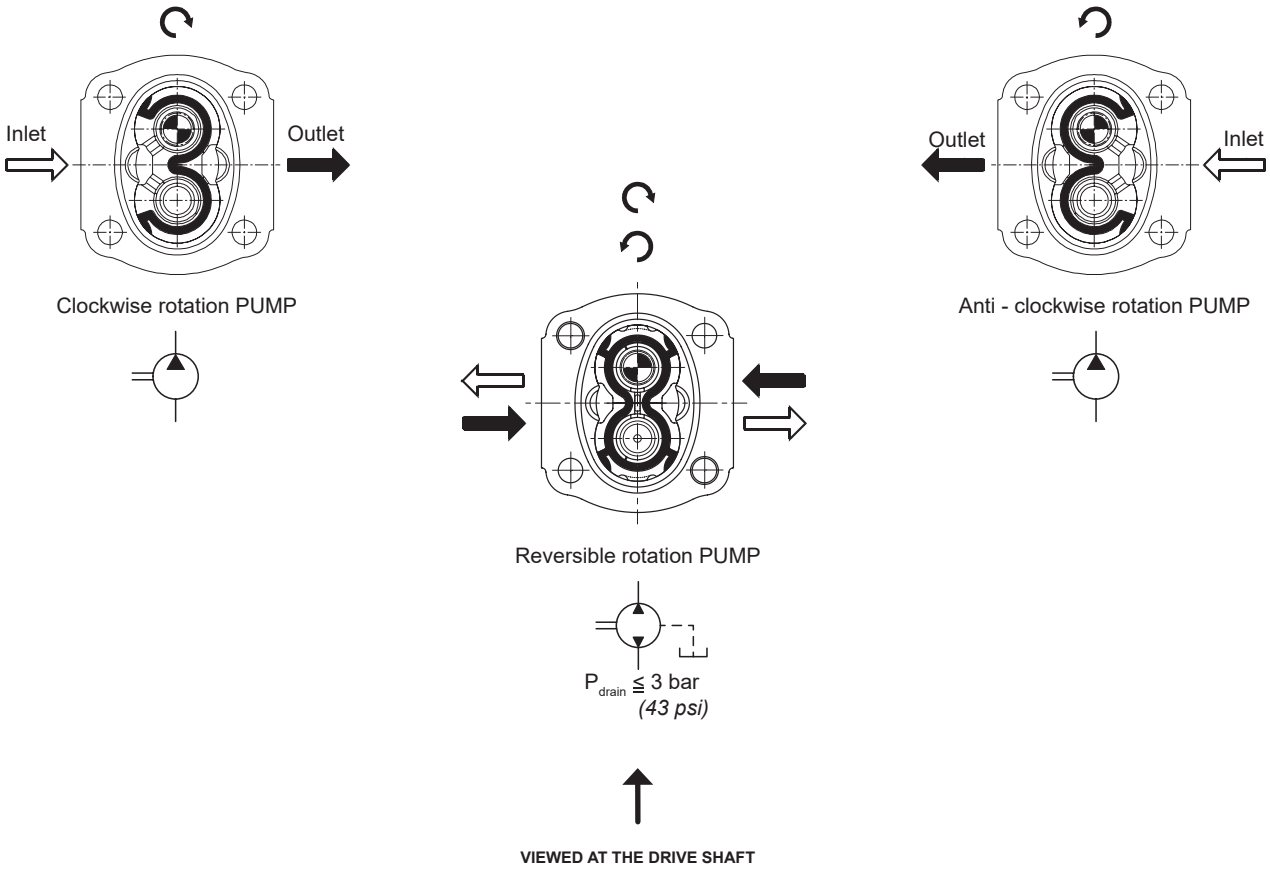
P_1 = Continuous operating pressure

General Features

DRIVE SHAFTS

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.

ROTATION



HYDRAULIC PIPE LINE

To ensure favorable suction conditions it is important to keep pressure drop in suction pipe line to a minimum value (see TECHNICAL DATA).
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.
When tandem pumps are supplied by 2 different reservoirs with 2 different fluids it is necessary to specify “AS” version.

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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 FOR PUMPS

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

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

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

LEGENDA

Δp = Working pressure (bar)

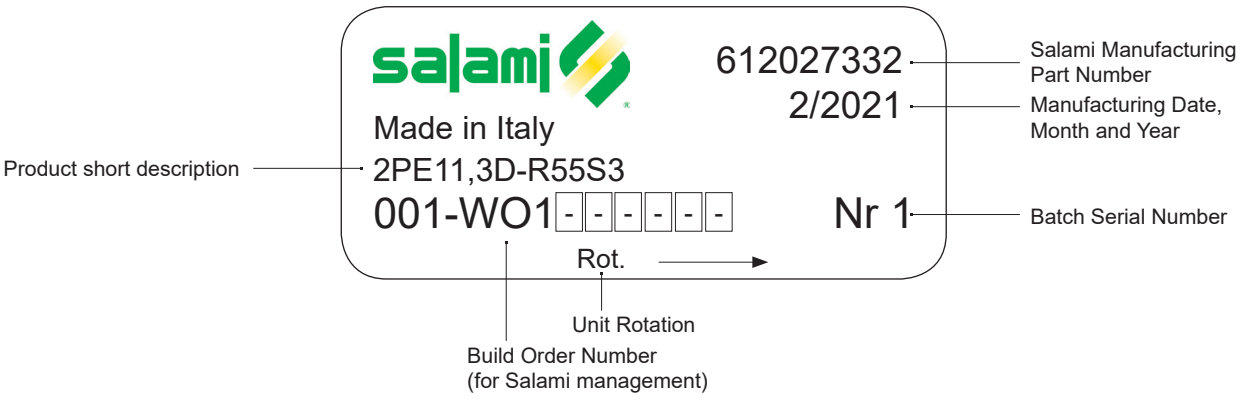
q = Displacement (cm^3/rev)

n = Speed (min^{-1})

η_m = Mechanical eff. (0.92)

η_v = Volumetric eff. (0.95)

IDENTIFICATION LABEL



General Features

GEAR PUMPS “E”- “B”- “C” SERIES
Aluminium Body

TECHNICAL DATA

	Displacement		Continuous pressure P1		Intermittent pressure P2		Peak pressure P3		Max. speed	Min. speed
GROUP 1.5 - E SERIES	cm³/rev	*cu.in/rev*	bar	*psi*	bar	*psi*	bar	*psi*	rpm	
1.5PE - 1.4	1.4	*0.09*	250	*3625*	270	*3915*	290	*4205*	5000	700
1.5PE - 2.1	2.1	*0.13*	250	*3625*	270	*3915*	290	*4205*	5000	700
1.5PE - 2.8	2.8	*0.17*	250	*3625*	270	*3915*	290	*4205*	4500	700
1.5PE - 3.5	3.5	*0.21*	250	*3625*	270	*3915*	290	*4205*	4500	700
1.5PE - 4.1	4.1	*0.25*	250	*3625*	270	*3915*	290	*4205*	4000	700
1.5PE - 5.2	5.2	*0.32*	230	*3335*	250	*3625*	270	*3915*	4000	700
1.5PE - 6.2	6.2	*0.38*	230	*3335*	250	*3625*	270	*3915*	3600	600
1.5PE - 7.6	7.6	*0.46*	200	*2900*	220	*3190*	250	*3625*	3300	600
1.5PE - 9.3	9.3	*0.57*	180	*2610*	200	*2900*	240	*3480*	3000	600
1.5PE - 11	11	*0.67*	170	*2465*	190	*2755*	220	*3190*	3000	600

GROUP 2 - E SERIES	cm³/rev	*cu.in/rev*	bar	*psi*	bar	*psi*	bar	*psi*	rpm	
2PE - 3.2*	3.2	*0.19*	250	*3625*	280	*4060*	300	*4350*	4000	600
2PE - 3.9*	3.9	*0.24*	250	*3625*	280	*4060*	300	*4350*	4000	600
2PE - 4.5	4.6	*0.27*	250	*3625*	280	*4060*	300	*4350*	4000	600
2PE - 6.5	6.5	*0.4*	250	*3625*	280	*4060*	300	*4350*	4000	600
2PE - 8.3	8.2	*0.5*	250	*3625*	280	*4060*	300	*4350*	3500	500
2PE - 10.5	10.6	*0.65*	250	*3625*	280	*4060*	300	*4350*	3500	500
2PE - 11.3	11.5	*0.68*	250	*3625*	280	*4060*	300	*4350*	3500	500
2PE - 12.5	12.7	*0.77*	250	*3625*	280	*4060*	300	*4350*	3500	500
2PE - 13.8	13.8	*0.84*	250	*3625*	280	*4060*	300	*4350*	3500	500
2PE - 16	16.6	*1.01*	250	*3625*	280	*4060*	300	*4350*	3000	400
2PE - 19	19.4	*1.15*	220	*3190*	240	*3480*	260	*3750*	3000	400
2PE - 22.5	22.9	*1.37*	200	*2900*	220	*3190*	240	*3480*	2750	400
2PE - 26	26.6	*1.62*	180	*2610*	200	*2900*	220	*3190*	2500	400

*Available only as rear pump

GROUP 2.5 - B SERIES	cm³/rev	*cu.in/rev*	bar	*psi*	bar	*psi*	bar	*psi*	rpm	
2.5PB - 5.5*	5.97	*0.36*	250	*3625*	280	*4060*	300	*4350*	3000	600
2.5PB - 8.3*	8.29	*0.50*	250	*3625*	280	*4060*	300	*4350*	3000	600
2.5PB - 11.5*	11.76	*0.72*	250	*3625*	280	*4060*	300	*4350*	3000	600
2.5PB - 13.8*	14.07	*0.86*	250	*3625*	280	*4060*	300	*4350*	3000	600
2.5PB - 16	16	*0.97*	250	*3625*	280	*4060*	300	*4350*	3000	600
2.5PB - 19	19.3	*1.17*	250	*3625*	280	*4060*	300	*4350*	3000	600
2.5PB - 22	22.2	*1.35*	250	*3625*	280	*4060*	300	*4350*	3000	500
2.5PB - 25	25.2	*1.53*	250	*3625*	280	*4060*	300	*4350*	3000	500
2.5PB - 28	27.6	*1.68*	250	*3625*	280	*4060*	300	*4350*	3000	500
2.5PB - 32	32.4	*1.97*	230	*3335*	250	*3625*	260	*3750*	3000	500
2.5PB - 38	38.1	*2.32*	200	*2900*	220	*3190*	240	*3480*	2750	400
2.5PB - 44	44.2	*2.69*	170	*2465*	190	*2755*	210	*3040*	2500	400

*Available only as rear pump. Displacements **11.5-13.8** are available as single pump only with drive shaft “55”.

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GEAR PUMPS “E”- “B”- “C” SERIES
Aluminium Body

General Features

TECHNICAL DATA

	Displacement		Continuous pressure P[1]		Intermittent pressure P[2]		Peak pressure P[3]		Max. speed	Min. speed
GROUP 3 - E SERIES	cm^3/rev	*cu.in/rev*	bar	*psi*	bar	*psi*	bar	*psi*	rpm	
3PE - 21	20.6	*1.26*	250	*3625*	280	*4060*	300	*4350*	3000	600
3PE - 27	27	*1.65*	250	*3625*	280	*4060*	300	*4350*	3000	600
3PE - 33	33.5	*2.04*	250	*3625*	280	*4060*	300	*4350*	3000	600
3PE - 38	38.7	*2.36*	250	*3625*	280	*4060*	300	*4350*	2750	500
3PE - 46	46.9	*2.86*	250	*3625*	270	*3915*	280	*4060*	2750	500
3PE - 55	54.1	*3.3*	220	*3190*	240	*3480*	250	*3625*	2500	400
3PE - 65	63.1	*3.85*	200	*2900*	220	*3190*	240	*3480*	2500	400
3PE - 75	73.4	*4.48*	180	*2610*	200	*2900*	220	*3190*	2500	400

GROUP 3.5 - C SERIES	cm^3/rev	*cu.in/rev*	bar	*psi*	bar	*psi*	bar	*psi*	rpm	
3.5PC - 55	54.8	*3.34*	250	*3625*	280	*4060*	300	*4350*	2750	400
3.5PC - 64	63.2	*3.85*	250	*3625*	280	*4060*	300	*4350*	2750	350
3.5PC - 75	74.7	*4.55*	230	*3335*	250	*3625*	280	*4060*	2500	300
3.5PC - 87	88	*5.36*	210	*3040*	230	*3330*	260	*3750*	2250	300
3.5PC - 98*	99	*6.03*	200	*2900*	220	*3190*	250	*3625*	2000	300

*Displacement 98 are special release, please contact sales department.

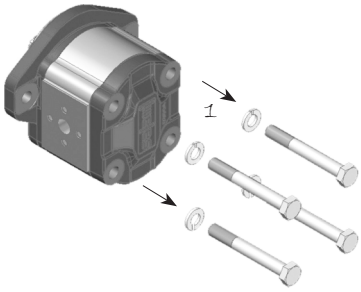
Max Speed must be lowered by 10% for system working continuosly at p^1 pressure.
Max pressure must be lowered by10% for bi-directional pump.

General Features

GEAR PUMPS “E”- “B”- “C” SERIES
Aluminium Body

ROTATION CHANGING INSTRUCTIONS FOR UNITS

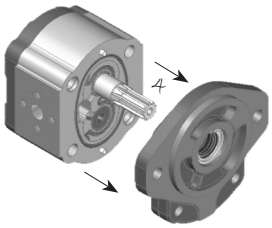
Keep the working surface cleaned as well as the exterior of the pump before starting and avoid inner contamination of the pump. The pump shown below is a clockwise rotating pump.
To achieve anti - clockwise rotation, please read the following instructions carefully.



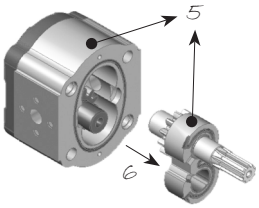
1 - Loosen and fully unscrew the bolts.

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.

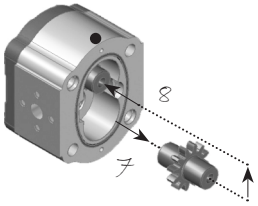


4 - Remove the flange and lay it on the working area; verify that the seal is correctly located in the body seat.



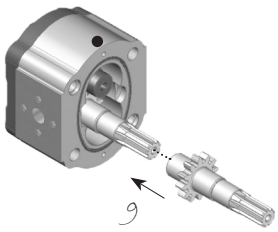
5 - Mark the position of the bushing and eventually of the thrust plate, as well, with reference to the body.

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

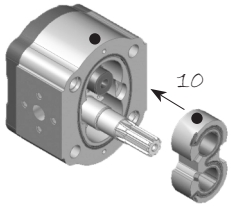


7 - Draw out the driven gear from its housing, taking care to avoid rear cover axial shifts.

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.



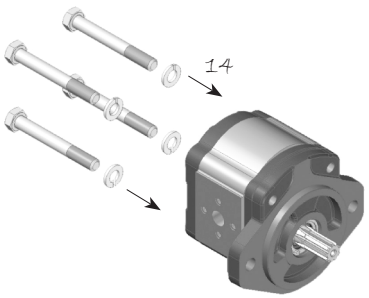
10 - Replace the bushing and thrust plate taking care that:
- marks are located as on the picture
- surface containing the seal is visible
- seal and its protection are correctly located.

11 - Clean the body and mounting flange facing surfaces.

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

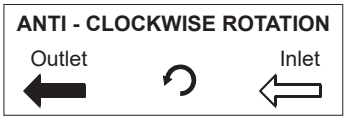
13 - Refit the mounting flange, turned 180° from its original position.

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.



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INDEX

Shafts And Flanges Combination 33
Assembling Dimensions And Working Conditions 34
Flanged And Threaded Ports.....35
Drive Shafts.....36
Mounting Flanges.....38
Outrigger Bearing 41
Rear Covers 45
High-Low Multiple Pump.....47
Pressure Compensated Priority Flow Valve 48
Load Sensing Priority Valve.....49
Electric Unloading Valve.....50
Multiple Gear Pumps Assembling Dimensions.....51
2PE Combination With Pump 1.5PE 52
Performance Curves.....53
How To Order Single Pumps 60
How To Order Multiple Pumps.....61

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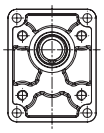
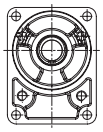
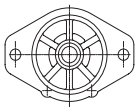
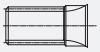
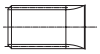
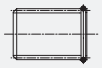
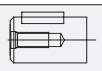
The data in this catalogue refers to the standard product.
The policy of Salami S.p.A. consists of a continuous improvement of its products. It reserves the right to change the specifications of the different products whenever necessary and without giving prior information.
If any doubts, please contact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

GEAR PUMPS "E" SERIES
Aluminium Body

2PE

SHAFTS AND FLANGES COMBINATION

2PE							
	CODE **P1** European Standard	CODE **B1** German Standard	CODE **B2-B3** German Standard	CODE **B4-B5** German Standard	CODE **S2** SAE A 2 Bolts	CODE **C1** 4 Bolts Iveco	CODE **S3** SAE B 2 Bolts
 CODE **25** Tapered 1:5		25B1		25B4 25B5			
 CODE **28** Tapered 1:8	28P1						
 CODE **03** Tang drive for electric motors			03B2 03B3				
 CODE **04** Tang drive				04B4 04B5			
 CODE **62** DIN 5482 splined 9 T	62P1	62B1		62B4 62B5		62C1	
 CODE **52** SAE A splined 9T					52S2		
 CODE **54** SAE A splined 11T					54S2		
 CODE **55** SAE B splined 13T							55S3
 CODE **85** SAE A parallel shaft Ø19.05					85S2		
 CODE **82** SAE A parallel shaft Ø15.87	82P1				82S2		

Note: other versions available, see shafts and flanges information.

2PE

GEAR PUMPS "E" SERIES
Aluminium Body

Displacements up to 1.58 cu.in./rev
Pressure up to 4350 psi

GEAR PUMPS

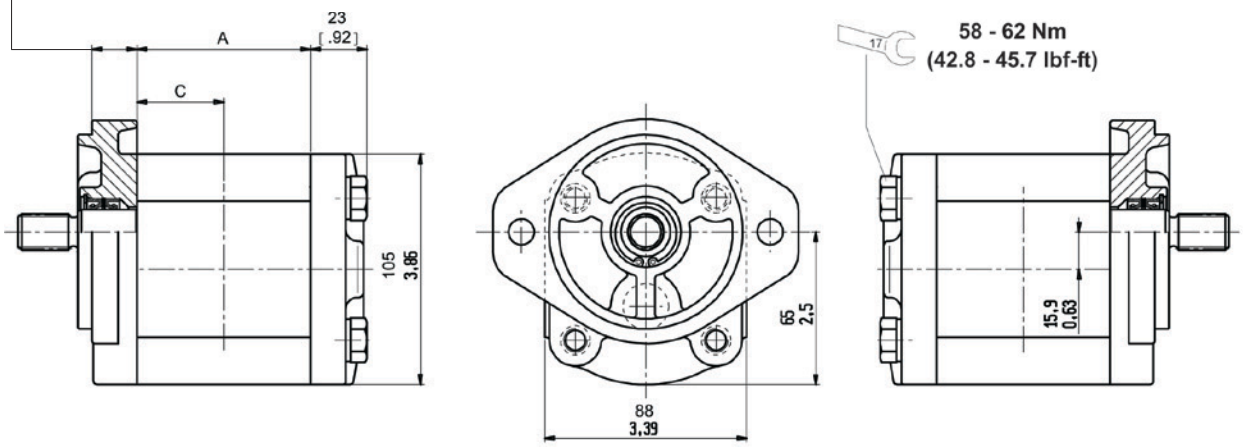
Displacements up to 25.8 cm³/rev
Pressure up to 300 bar

ASSEMBLING DIMENSIONS AND WORKING CONDITIONS

Type			3.2*	3.9*	4.5	6.5	8.3	10.5	11.3	12.5	13.8	16	19	22.5	26
Displacement	cm³/rev *cu.in./rev*		3.2 *0.19*	3.9 *0.24*	4.6 *0.27*	6.5 *0.40*	8.2 *0.50*	10.6 *0.65*	11.5 *0.68*	12.7 *0.77*	13.8 *0.84*	16.6 *1.01*	19.4 *1.15*	22.9 *1.37*	25.8 *1.58*
Dimension A	mm *in*		47.1 *1.83*			49.95 *1.97*	52.8 *2.07*	56.3 *2.22*	59.7 *2.35*		63.5 *2.5*	67.5 *2.65*	75.6 *2.97*	81 *3.19*	86.8 *3.42*
Dimension C	mm *in*		23.55 *0.93*			25 0.98	26.4 *1.04*	28.15 *1.11*	29.75 *1.17*		31.75 *1.25*	33.75 *1.33*	37.80 *1.49*	40.5 *1.59*	43.4 *1.71*
Continuous pressure	P[1]	bar *psi*	250 *3625*	250 *3625*	250 *3625*	250 *3625*	250 *3625*	250 *3625*	250 *3625*	250 *3625*	250 *3625*	250 *3625*	220 *3190*	200 *2900*	180 *2610*
Intermittent pressure	P[2]	bar *psi*	280 *4060*	280 *4060*	280 *4060*	280 *4060*	280 *4060*	280 *4060*	280 *4060*	280 *4060*	280 *4060*	280 *4060*	240 *3480*	220 *3190*	200 *2900*
Peak pressure	P[3]	bar *psi*	300 *4350*	300 *4350*	300 *4350*	300 *4350*	300 *4350*	300 *4350*	300 *4350*	300 *4350*	300 *4350*	300 *4350*	260 *3750*	240 *3480*	220 *3190*
Max speed		rpm	4000	4000	4000	4000	3500	3500	3500	3500	3500	3000	3000	2750	2500
Min speed		rpm	600	600	600	600	500	500	500	500	500	400	400	400	400
Weight		kg *lbs*	3.00 *6.61*	3.05 *6.72*	3.10 *6.83*	3.50 *7.72*	3.60 *7.94*	3.70 *8.16*	3.75 *8.27*	3.78 *8.33*	3.86 *8.51*	4.00 *8.82*	4.18 *9.22*	4.29 *9.46*	4.54 *10.1*

*Available only as rear pump

For flanges code:
P1-B1-S2-S6, this dimension is 19 mm *(0.75 in.)*
B2-B3-B4-B5, this dimension is 16.5 mm *(0.65 in.)*



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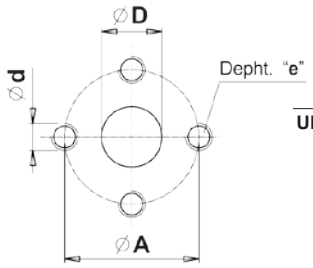
FLANGED AND THREADED PORTS

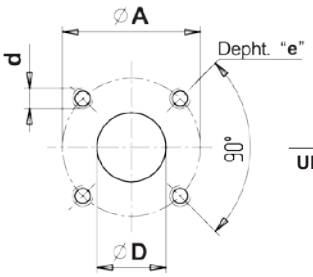


code P

Flanged ports
european standard

TYPE	INLET				OUTLET			
UNI-DIRECTIONAL PUMPS	Ø D	Ø A	d	e	Ø D	Ø A	d	e
From 3.2 to 8.3	13 *(0.51")*	30 *(1.19")*	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					
26	22 *(0.87")*							

BI-DIRECTIONAL PUMPS Special version available on request.

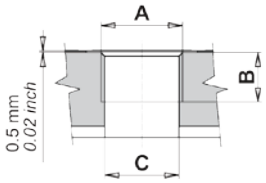


code B

Flanged ports
german standard

TYPE	INLET				OUTLET			
UNI-DIRECTIONAL PUMPS	Ø D	Ø A	d	e	Ø D	Ø A	d	e
From 3.2 to 22.5	20 *(0.78")*	40 *(1.56")*	M6	13 *(0.51")*	15 *(0.59")*	35 *(1.38")*	M6	13 *(0.51")*
26	22 *(0.87")*							

BI-DIRECTIONAL PUMPS Special version available on request.

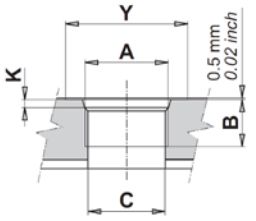


code G

Threaded ports
GAS (BSPP)

TYPE	INLET			OUTLET		
UNI-DIRECTIONAL PUMPS	A	B	ØC	A	B	ØC
From 3.2 to 26	G3/4	16 *(0.62")*	20 *(0.78")*	G1/2	14 *(0.54")*	13 *(0.51")*

BI-DIRECTIONAL PUMPS Special version available on request.



code R

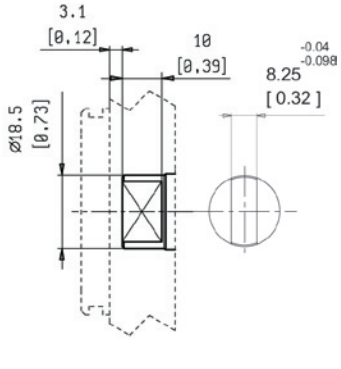
Threaded ports
SAE (ODT)

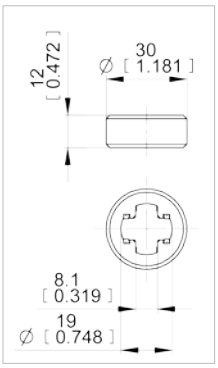
TYPE	INLET					OUTLET				
UNI-DIRECTIONAL PUMPS	A	B	ØC	Y	K	A	B	ØC	Y	K
From 3.2 to 26	1-1/16-12 UN (SAE 12)	16 *(0.62")*	20 *(0.78")*	41 *(1.61")*	3.3 *(0.12")*	7/8-14 UNF (SAE 10)	14 *(0.54")*	13 *(0.78")*	34 *(1.32")*	2.5 *(0.10")*

BI-DIRECTIONAL PUMPS Special version available on request.

E0.120.0219.02.00IM04

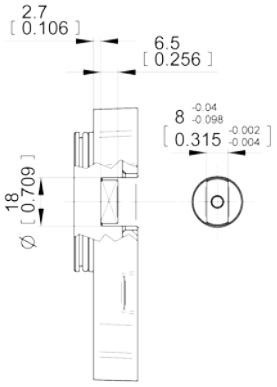
DRIVE SHAFTS





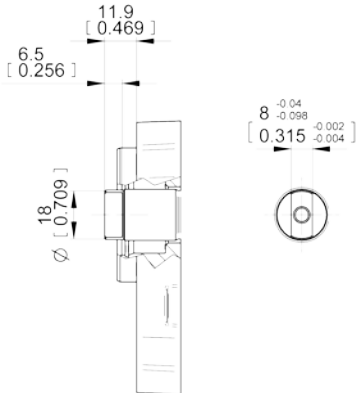
code 02 Max torque 70 (620 lbf in)

Tang drive for engine driven
For flange K1 without shaft seal



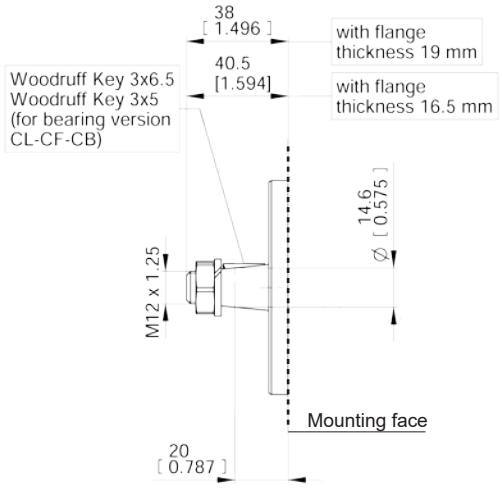
code 03 Max torque 70 Nm (620 lbf in)

Tang drive for electric motors
Without shaft seal



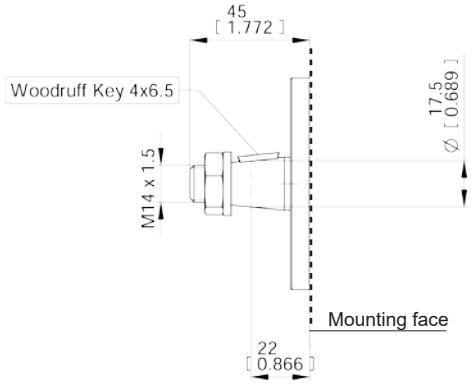
code 04 Max torque 70 Nm (620 lbf in)

Tang drive



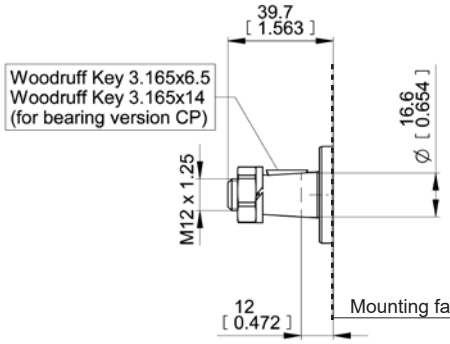
code 25 Max torque 130 Nm (1151 lbf in)

Tapered 1:5



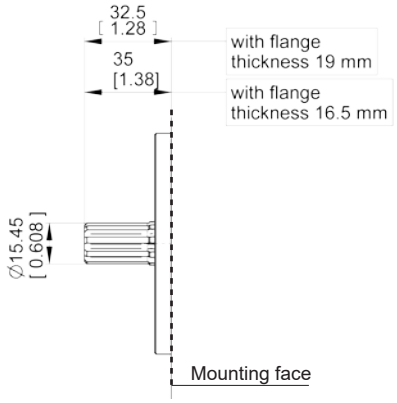
code 26 Max torque 100 Nm (885 lbt in)

Tapered 1:5 (only for CB)



code 28 Max torque 130 Nm (1151 lbf in)

Tapered 1:8



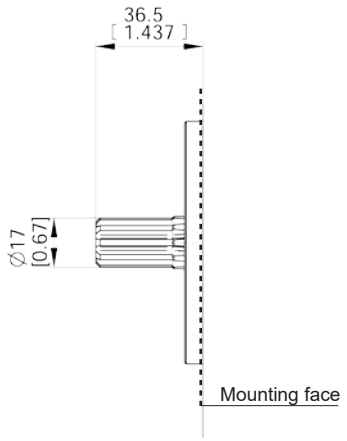
code 52 Max torque 100 Nm (885 lbt in)

SAE A 9T-16/32DP Ansi B92 1a 1976

E0.120.0219.02.00IM04

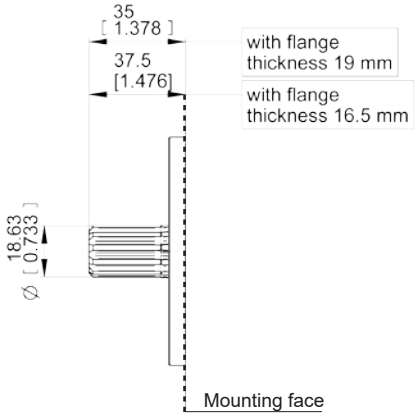
GEAR PUMPS "E" SERIES
Aluminium Body

2PE



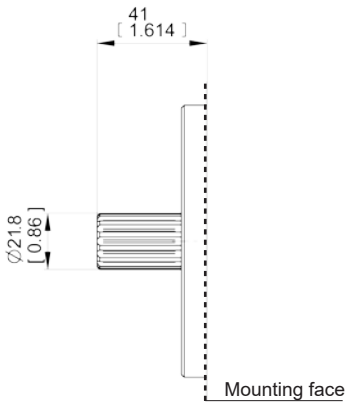
code 53 Max torque 125 Nm (1106 lbt in)

SAE A 10T-16/32DP Ansi B92 1a 1976



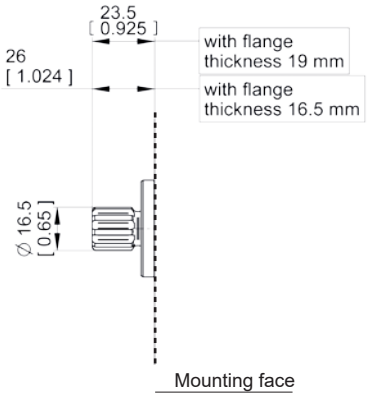
code 54 Max torque 150 Nm (1327 lbt in)

SAE A 11T-16/32DP Ansi B92 1a 1976



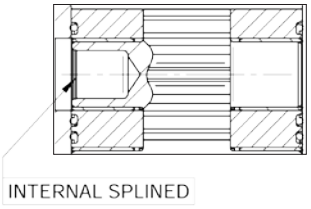
code 55 Max torque 100 Nm (885 lbt in)

SAE B 13T-16/32DP Ansi B92 1a 1976



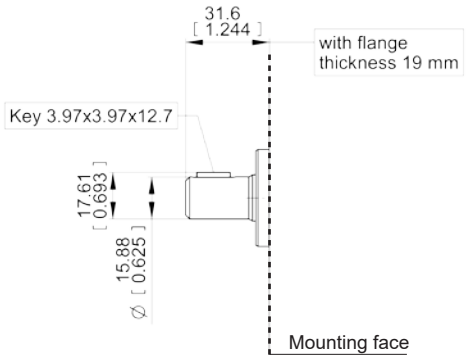
code 62 Max torque 120 Nm (1062 lbt in)

9 teeth DIN 5482 splined



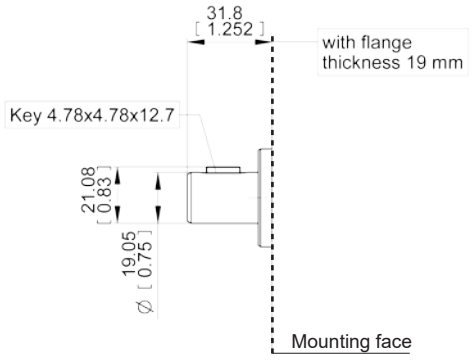
code 60 Max torque 100 Nm (885 lbt in)

DIN 5480 internal splined
(only for rear pumps)



code 82 Max torque 70 Nm (620 lbt in)

5/8" SAE A parallel



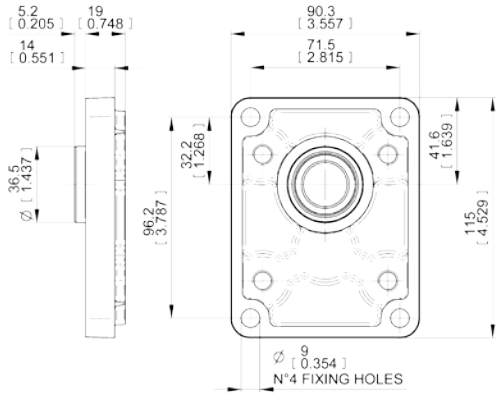
code 85 Max torque 130 Nm (1151 lbt in)

3/4" SAE A parallel

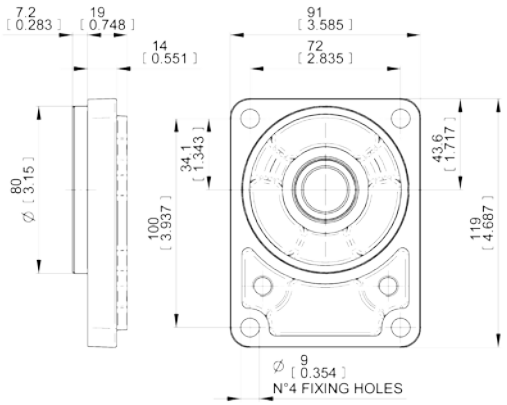
2PE

GEAR PUMPS "E" SERIES
Aluminium Body

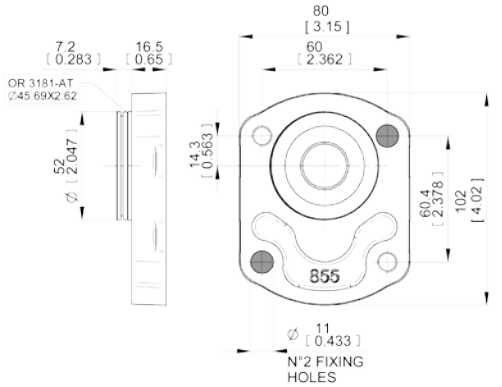
MOUNTING FLANGES



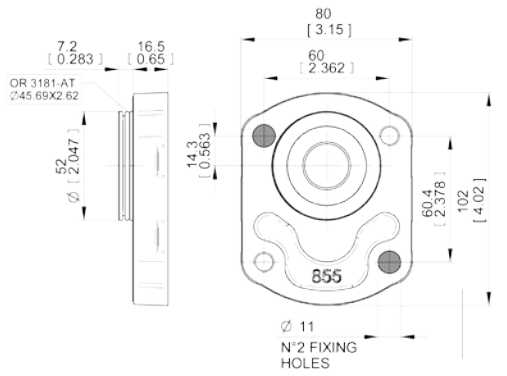
P1	European standard
With shaft code 28-62-82	



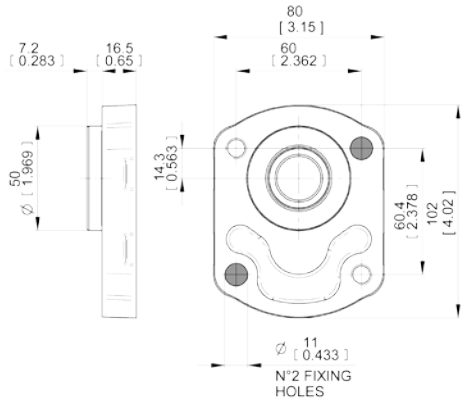
B1	German standard
With shaft code 25-62	



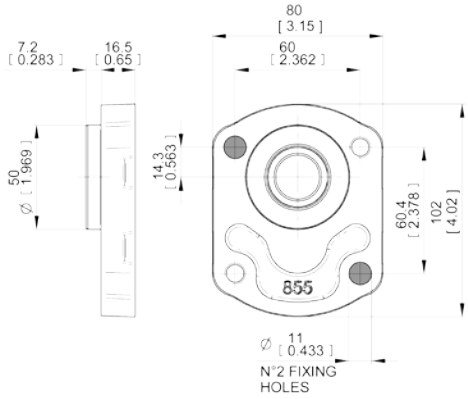
B2	German standard
With shaft code 03	



B3	German standard
With shaft code 03	



B4	German standard
With shaft code 25-62-04	



B5	German standard
With shaft code 25-62-04	

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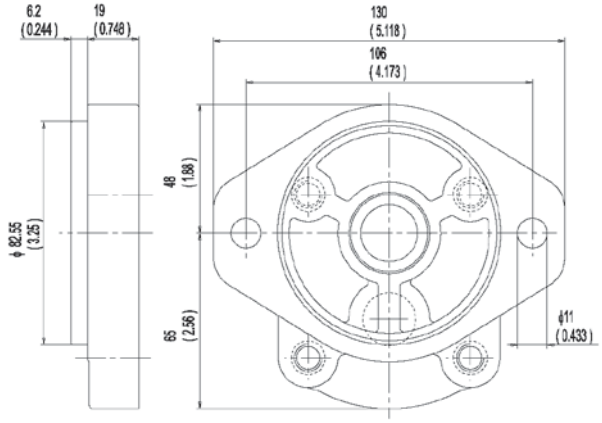
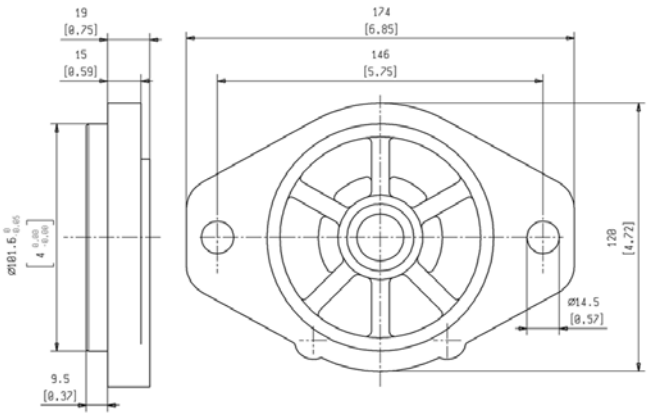
GEAR PUMPS "E" SERIES
Aluminium Body

2PE



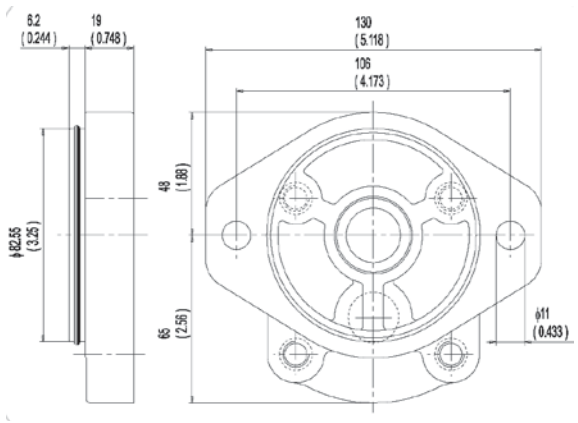
S2 SAE A 2 bolts

With shaft code 52-53-54-82-85



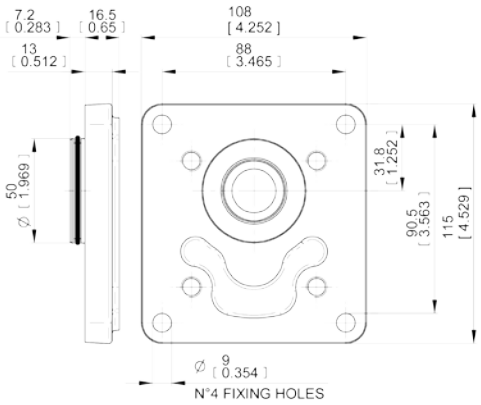
S3 SAE B 2 bolts

With shaft code 55



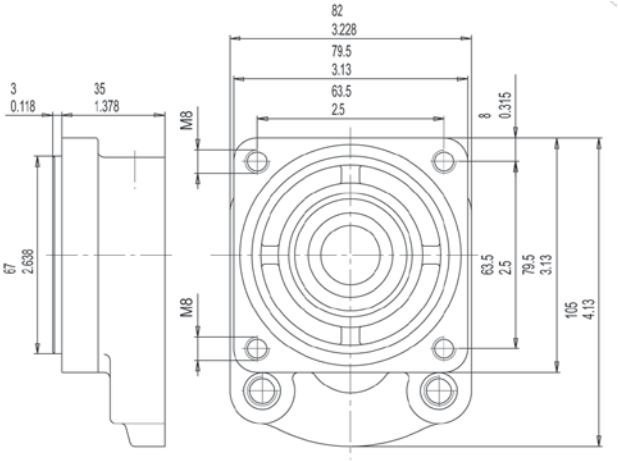
S6 SAE A 2 bolts (with O-ring on the centering collar)

With shaft code 52-54-82-85



C1 4 bolts for Iveco engines

With shaft code 62



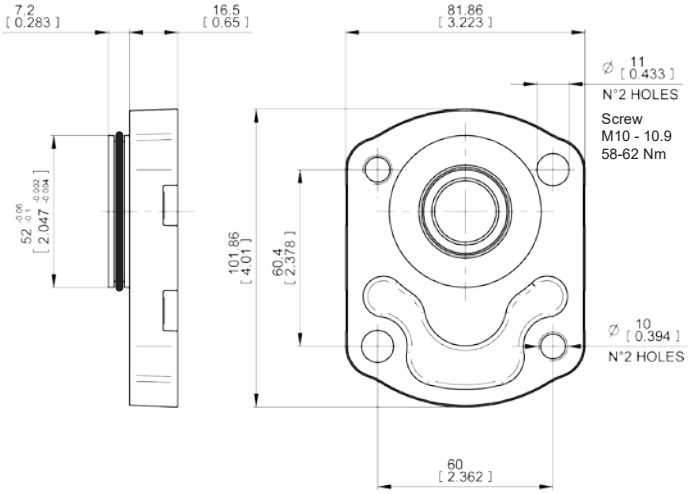
K1 4 bolts for Perkins Motor

With shaft code 02

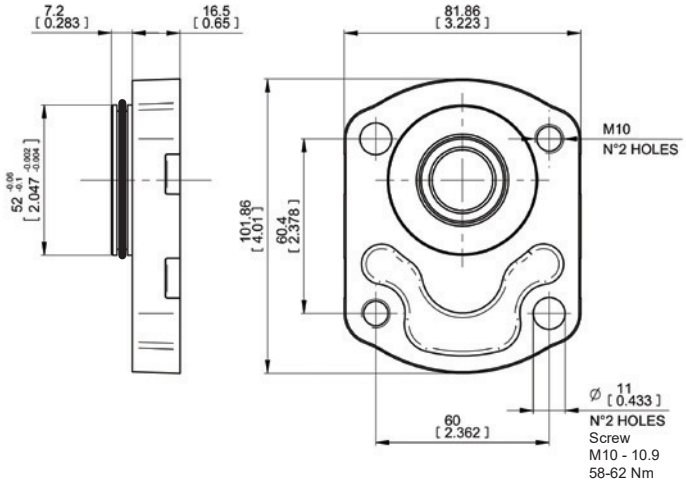
E0.120.0219.02.00IM04

2PE

GEAR PUMPS "E" SERIES
Aluminium Body

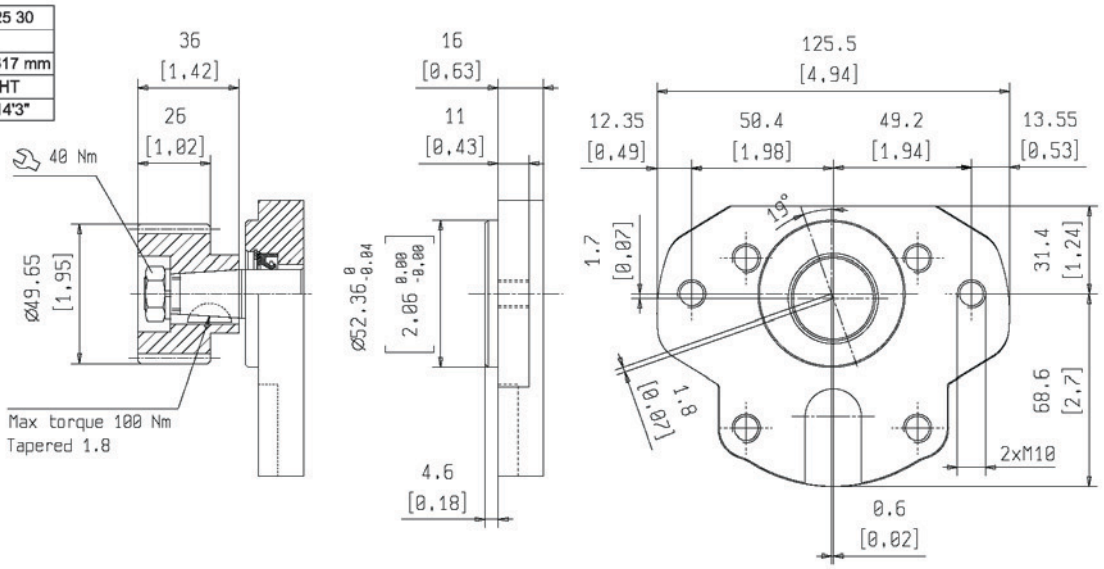


K3	German standard with shaft seal
With shaft code 52	



K4	German standard with shaft seal
With shaft code 52	

PINION GEAR CODE 3122 025 30	
NUMBER OF TEETH	20
BASE CIRCLE DIAMETER	42.617 mm
HAND OF HELIX	RIGHT
HELIX ANGLE	13°14'3"



MF	Perkins Motor
With shaft code 28	

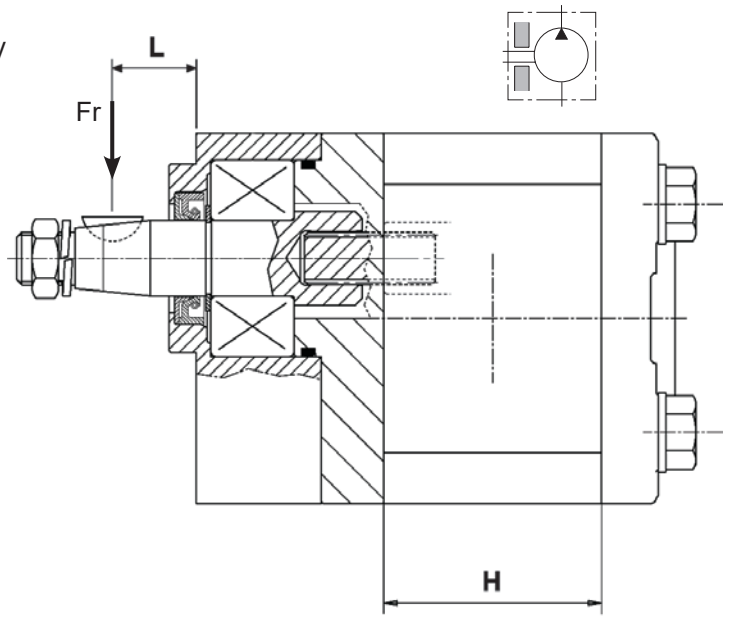
E0.120.0219.02.00IM04

OUTRIGGER BEARING

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

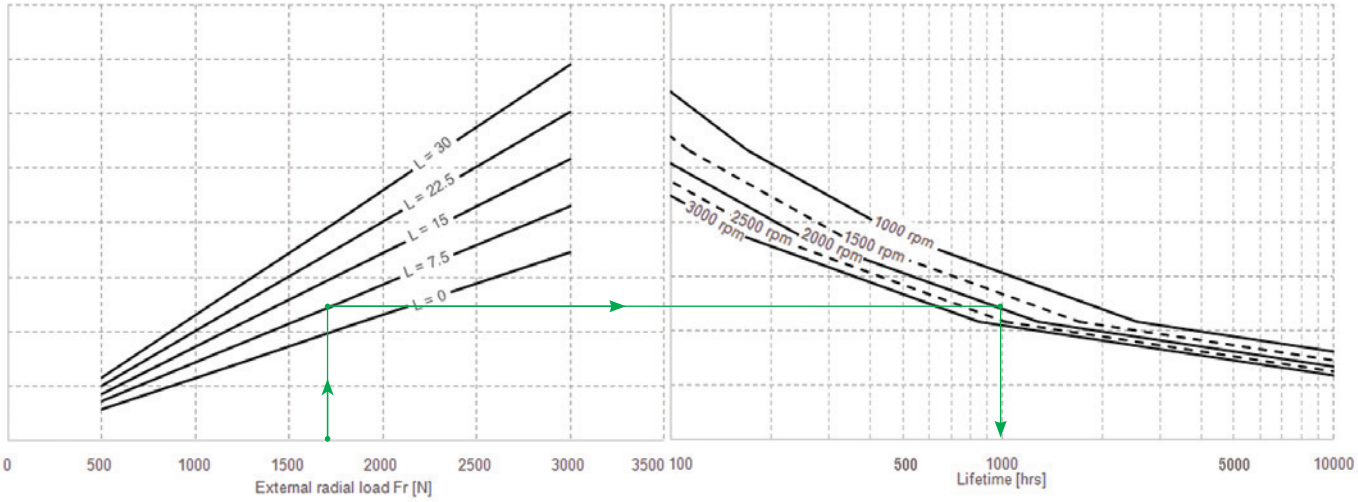
TYPE	H
4.5	47.1 (*1.83"*)
6.5	49.95 (*1.97"*)
8.3	52.8 (*2.08"*)
10.5	56.3 (*2.22"*)
11.3-12.5	59.7 (*2.35"*)
13.8	63.5 (*2.5"*)
16	67.5 (*2.66"*)
19	75.6 (*2.97"*)
22.5	81 (*3.19"*)
26	86.6 (*3.42"*)

L=Distance between mounting flange and radial force point of application.

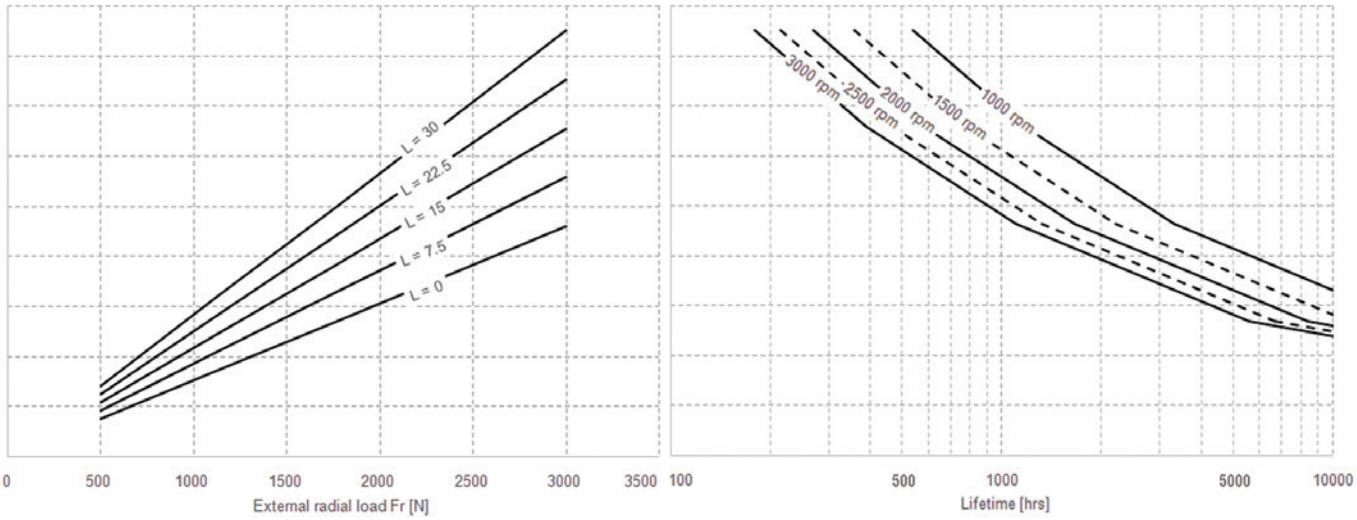


Example:
Fr = 1700 N
L = 7.5 → Expected life: 1000 hrs
Speed = 2000 rpm

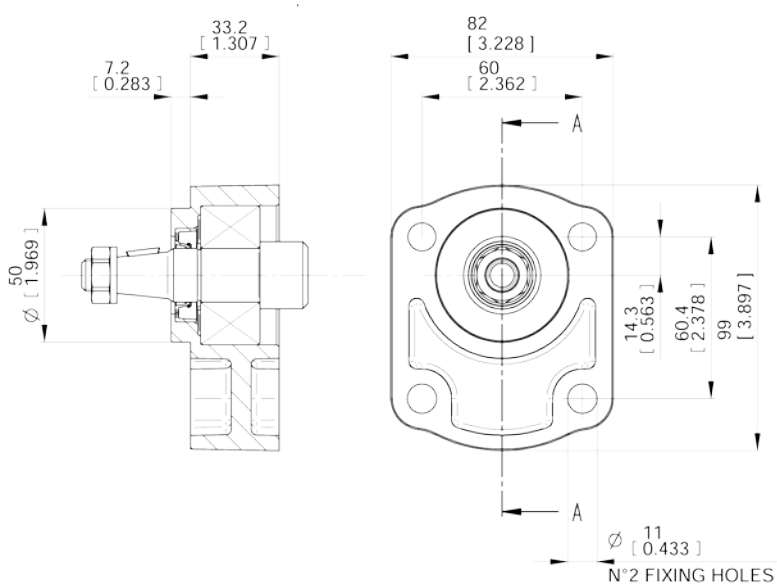
For Code CP-CB-CL-CS



For Code CF

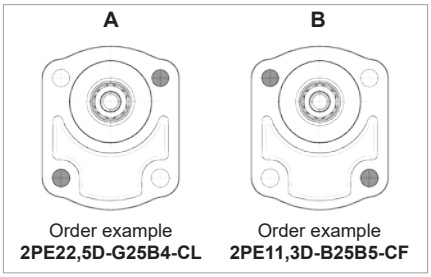


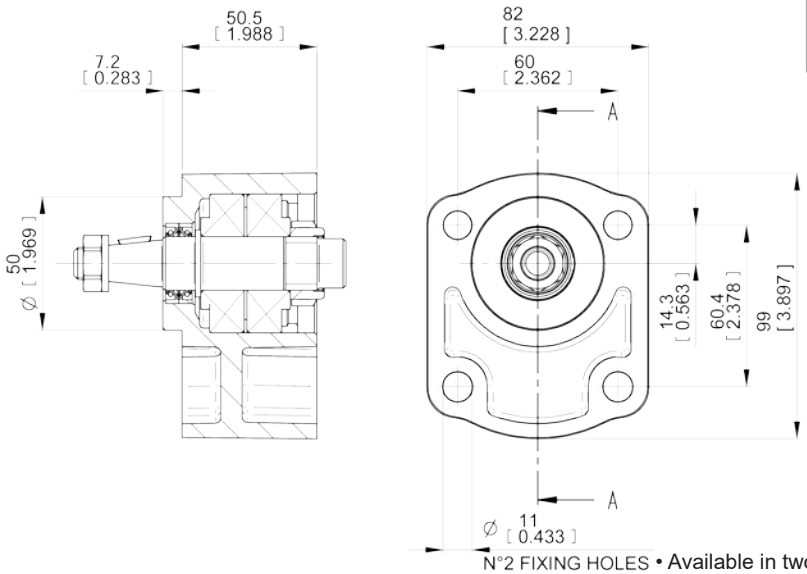
ALUMINIUM MOUNTING FLANGES WITH BEARING



N°2 FIXING HOLES • Available in two positions: A - B

CL	For engine endothermic motors
With shaft code 25, 26 (see page 36)	





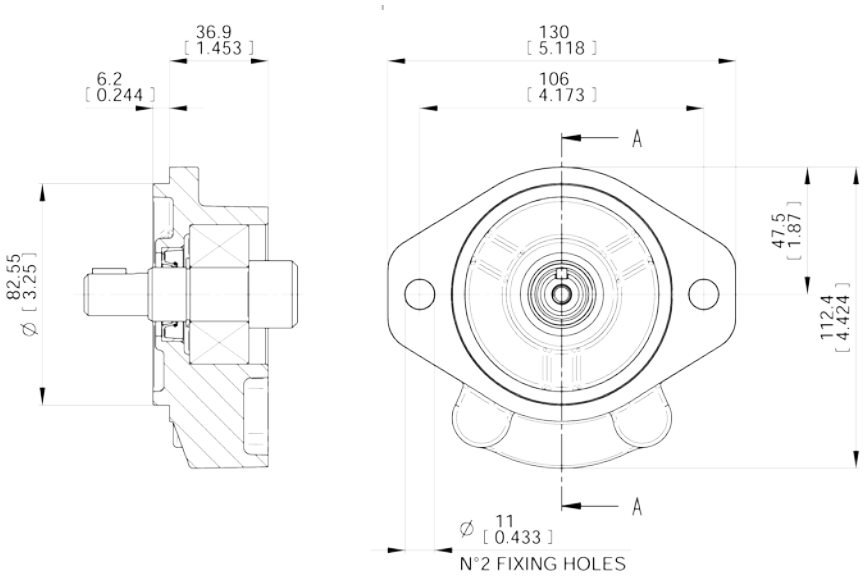
N°2 FIXING HOLES • Available in two positions: A - B

CF	For endothermic motors
With shaft code 25-26 (see page 36)	

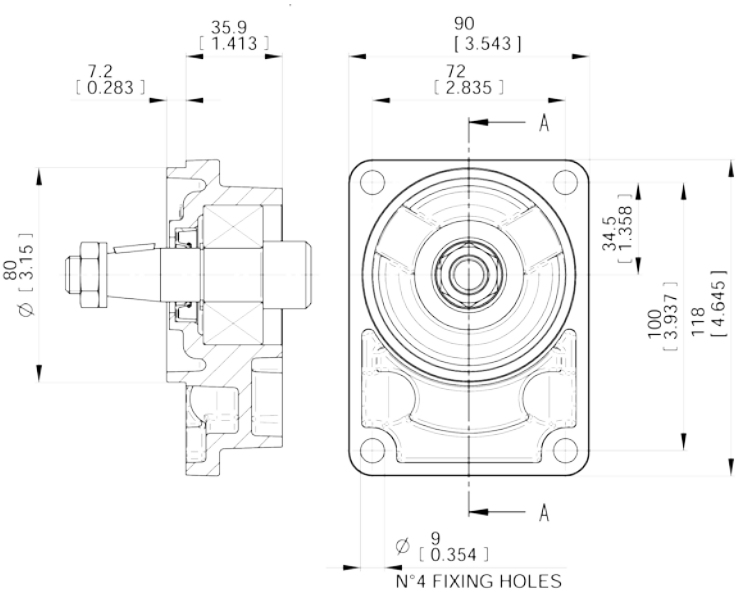
E0.120.0219.02.00IM04

GEAR PUMPS "E" SERIES
Aluminium Body

2PE



CS	SAE A
With shaft code 52-54-82-85 (see page 37)	

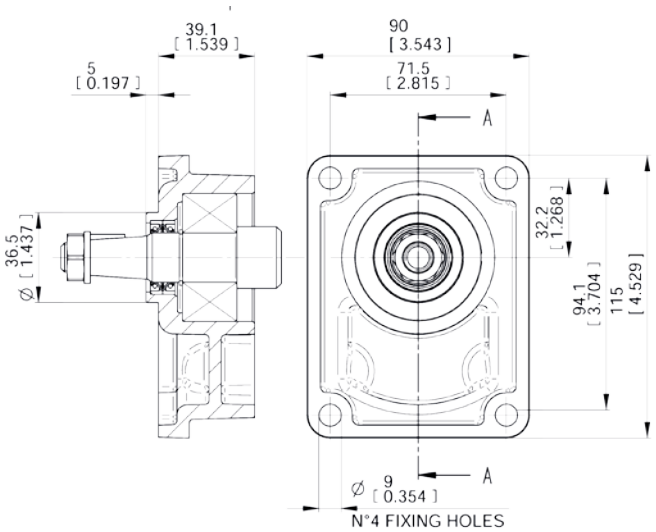


CB	German standard
With shaft code 25-26 (see page 37)	

E0.120.0219.02.00IM04

2PE

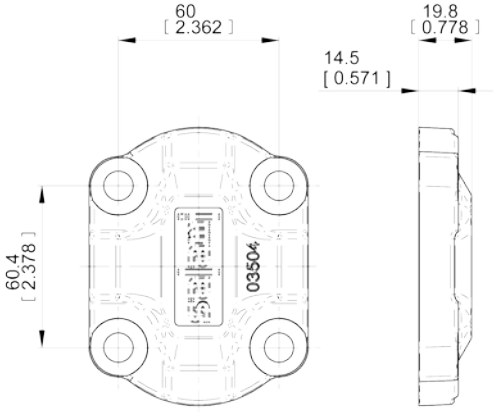
GEAR PUMPS “E” SERIES
Aluminium Body



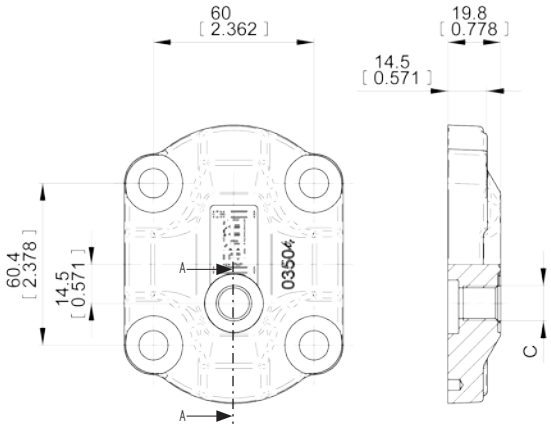
CP	European standard
With shaft code 28 (see page 36)	

E0.120.0219.02.00IM04

REAR COVERS

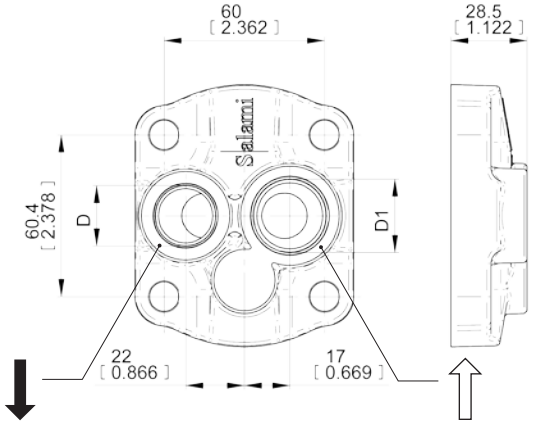


STANDARD REAR COVER



STANDARD REAR COVER WITH EXTERNAL DRAIN C
FOR BIDIRECTIONAL PUMPS

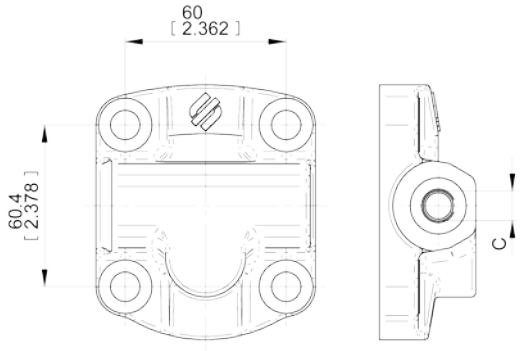
C
7/16-20 UNF-2B (SAE4)
G1/4



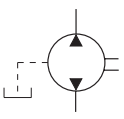
On request outlet port only.

D	D1
7/8-14 UNF-2B (SAE10)	1-1/16-12 UN-2B (SAE12)
G1/2	G3/4

code 1 REAR COVER WITH REAR PORTS



C
7/16-20 UNF-2B (SAE4)
G1/4



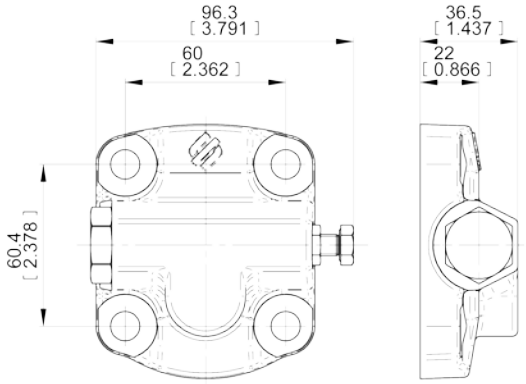
code LD REAR COVER WITH LATERAL DRAIN

2PE

GEAR PUMPS "E" SERIES
Aluminium Body

REAR COVERS WITH VALVE

code VS INTERNAL DISCHARGE



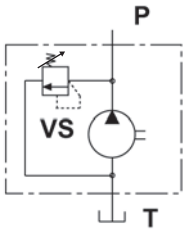
MAIN RELIEF VALVE
setting ranges

30-60 bar

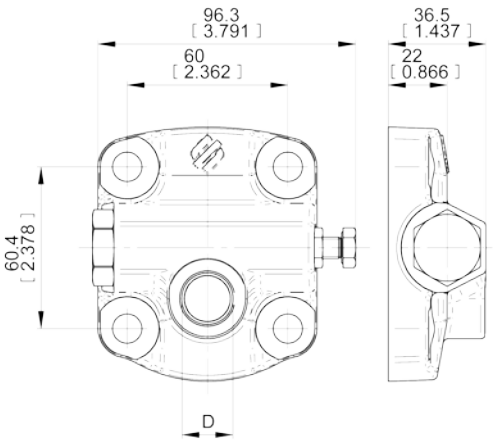
61-120 bar

121-170 bar

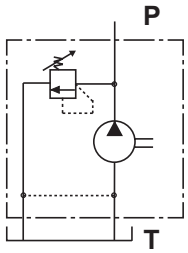
171-250 bar



code VSE EXTERNAL DISCHARGE

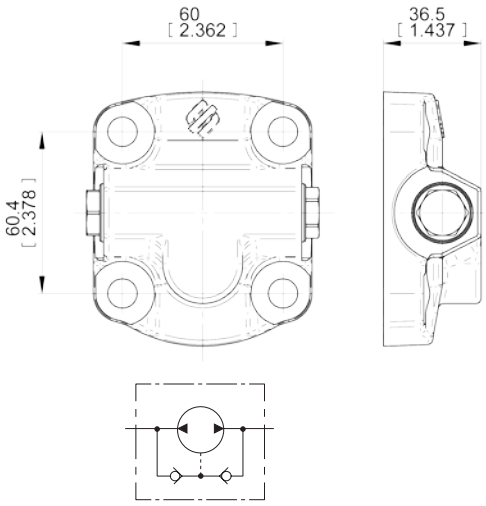


D (external discharge)
M18x1.5 (METRIC)
3/4-16 UNF-2B (SAE 8)
G3/8 (BSPP)



External discharge

code IDV REAR COVERS WITH INTERNAL DRAIN



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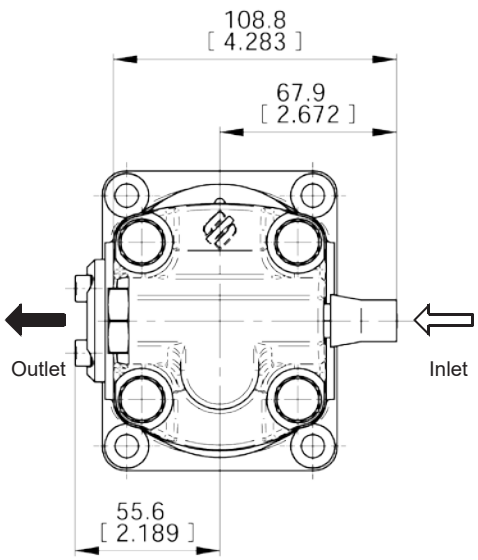
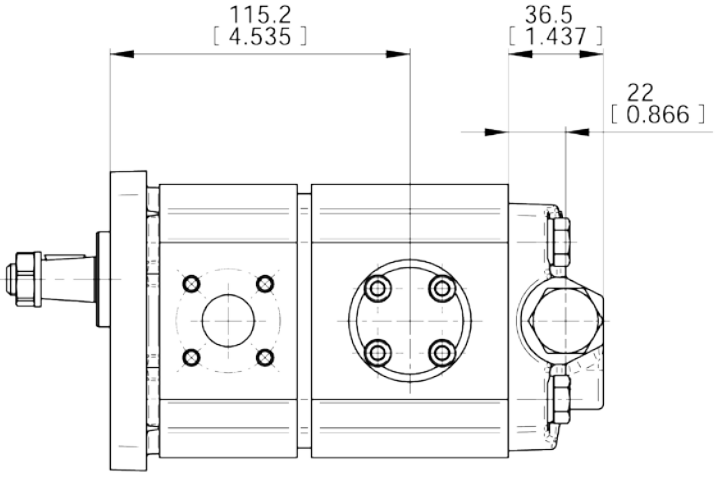
HIGH-LOW MULTIPLE PUMP

High-Low Multiple Pump is the very ideal pump for applications which require a quick approach and/or return of the actuator at low loads and slow motion of the actuator at high loads. This model offers the advantage of requiring lower power of the motor. High-Low Multiple Pumps is a special double stage pump with integrated valves and has been specially designed for applications such as trash compactors, log splitters, clamping mechanisms, crimping machines, metal forming machines etc.

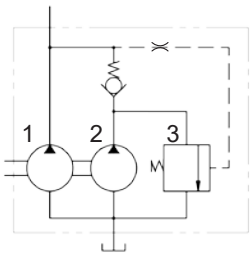




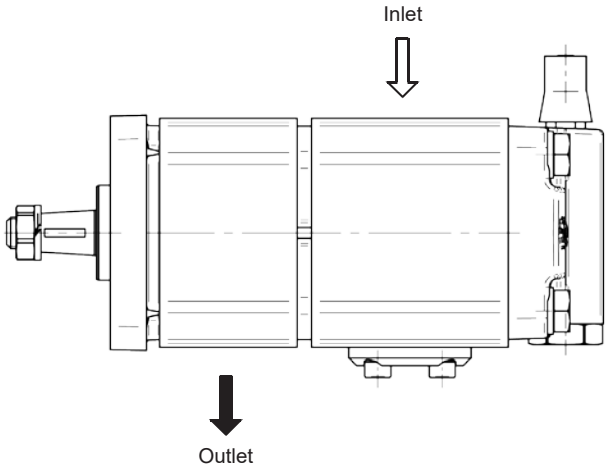
code VSQ

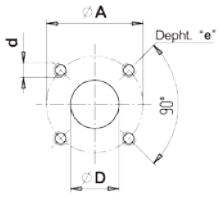
For this Unloading valve you can choice four setting ranges:

(30-60 bar)
(60-120 bar)



1_Stage high pressure
2_Stage low pressure
3_Unloading valve

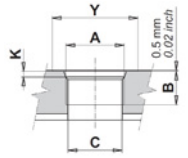




code B

Flanged ports
german standard

REAR STAGE LOW PRESSURE					FIRST STAGE HIGH PRESSURE				
TYPE	INLET				TYPE	OUTLET			
	Ø D	Ø A	d	e		Ø D	Ø A	d	e
From 8.3 to 19	20 *(0.78")*	40 *(1.56")*	M6	13 *(0.51")*	From 4.5 to 6.5	15 *(0.59")*	35 *(1.38")*	M6	13 *(0.51")*
From 22 to 26	22 *(0.87")*	55 *(2.16")*	M8		From 8.3 to 16	20 *(0.78")*	40 *(1.56")*		

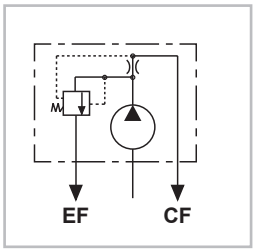


code R

Threaded ports
SAE (ODT)

REAR STAGE LOW PRESSURE						FIRST STAGE HIGH PRESSURE					
TYPE	INLET					TYPE	OUTLET				
	A	B	ØC	Y	K		A	B	ØC	Y	K
From 8.3 to 26	1-5/16 12 UN (SAE16)	16 *(0.62")*	20 *(0.78")*	41 *(1.61")*	3.3 *(0.12")*	From 4.5 to 16	7/8-14 UNF (SAE 10)	14 *(0.54")*	13 *(0.78")*	34 *(1.32")*	2.5 *(0.10")*

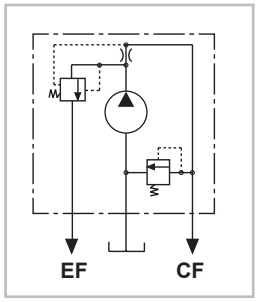
PRESSURE COMPENSATED PRIORITY FLOW VALVE

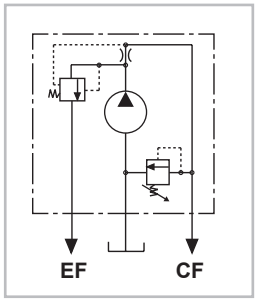


code VP code VP1

Priority flow valve, excess flow to second actuator.

CF = Priority flow port
EF = Excess flow port





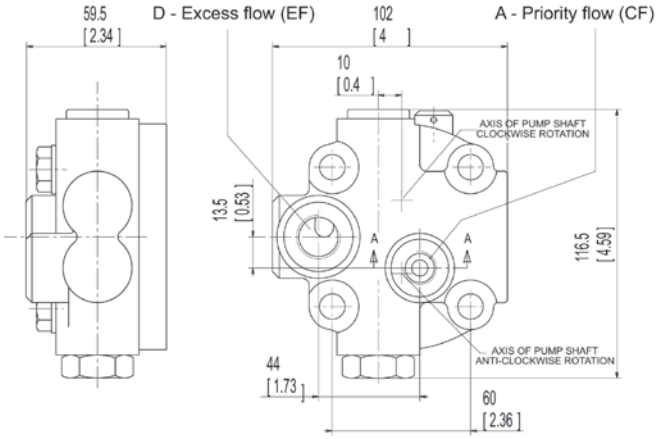
code VPS code VPS1

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

CALIBRATED ORIFICE Φ d (mm/*inch*)	FLOW RATE (l/min - gpm) ± 10%
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)*

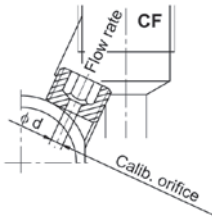
PRIORITY FLOW VALVE (VP - VPS)

3 Ways flow control priority valve. It ensures a constant flow to CF port, given by the screwed control orifice (see table) and regardless of the pump speed; the excess flow is available for other functions at the EF port.
The two lines CF and EF can be loaded simultaneously and the max pressure of the priority line can be limited by a relief valve connected to the suction port.

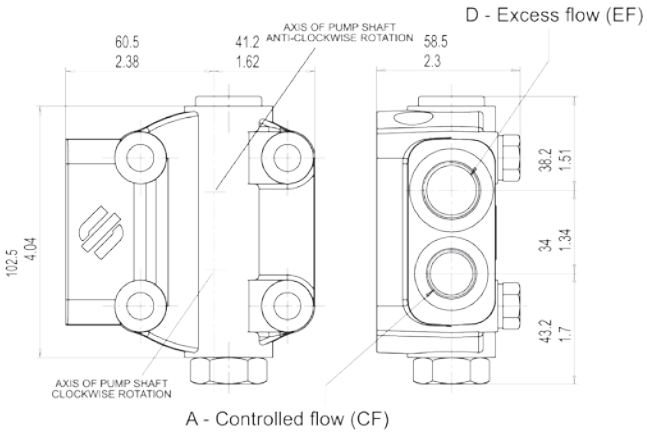


VP - VPS
REAR PORTS

A	D
G 3/8	G 1/2
SAE6 9/16-18 UNF-2B	SAE8 3/4 - 16 UNF - 2B

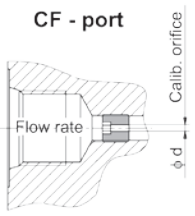


Det. SECT.A-A



VP1 - VPS1
SIDE PORTS

A	D
G 3/8	G 1/2
SAE8 3/4 - 16 UNF - 2B	SAE10 7/8 - 14 UNF - 2B



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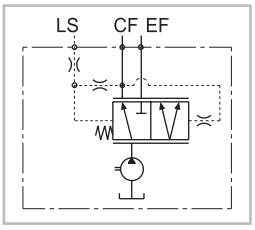
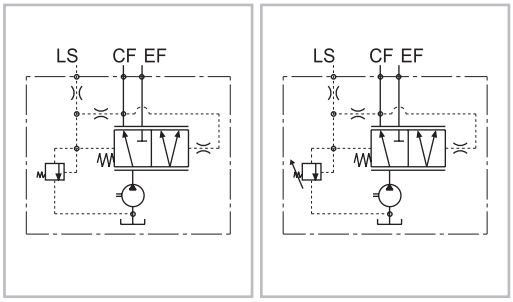
LOAD SENSING PRIORITY VALVE



code VPD **code VPD1**

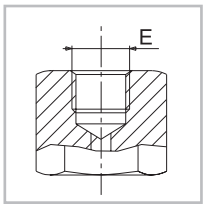
Load sensing priority valve with dynamic signal without main relief valve.

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

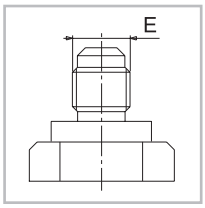


code VPDS **code VPDS1**

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



Female fitting



Male fitting

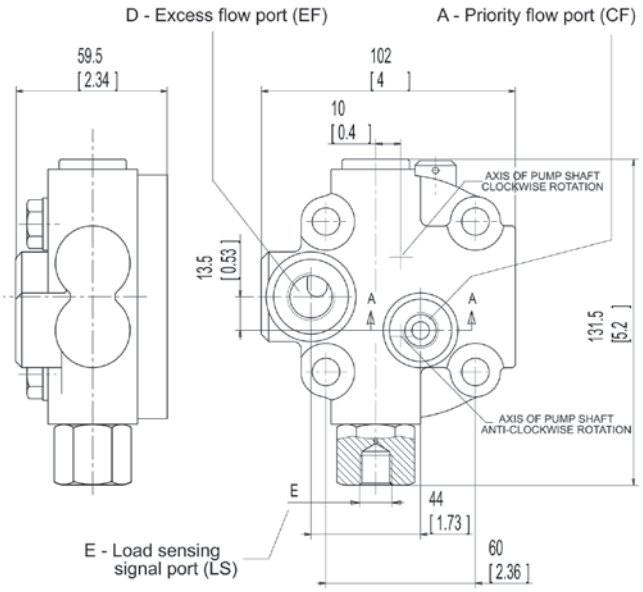
LOAD SENSING PRIORITY VALVES (VPD1-VPDS1)

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 Qefchanges according to the equation:

Qin = Qcf + Qef

This valve is used in hydraulic steering systems, theCF 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

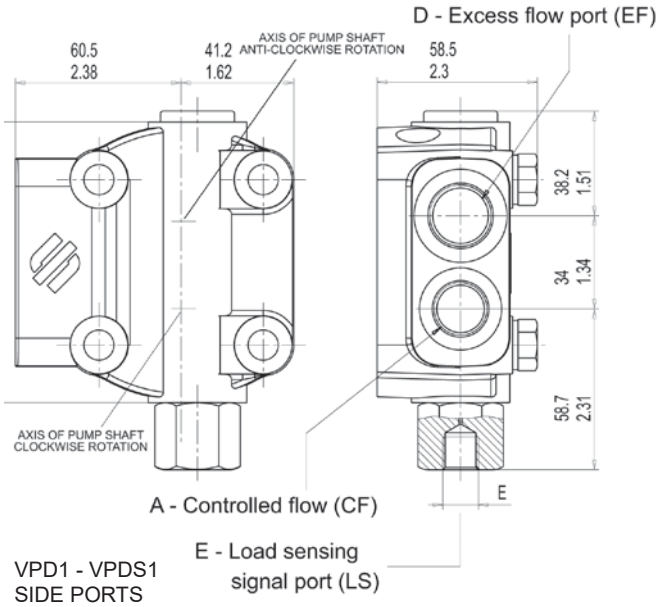
Qef = Qin – Qcf



VPD - VPDS
REAR PORTS

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

A	D	E
G 3/8	G 1/2	G 1/4
SAE6 9/16 - 18 UNF - 2B	SAE8 3/4 - 16 UNF - 2B	SAE4 7/16 - 20 UNF - 2B



VPD1 - VPDS1
SIDE PORTS

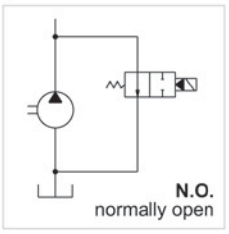
Minimum load sensing signal (LS) = 4 bar (28 psi)

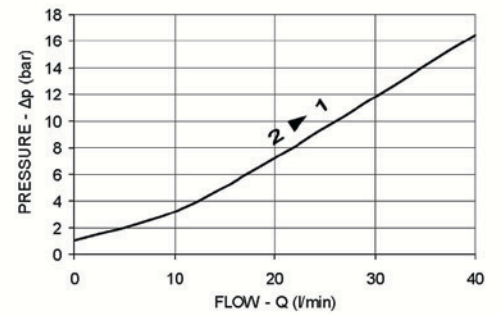
A	D	E
G 3/8	G 1/2	G 1/4
SAE8 3/4 - 16 UNF - 2B	SAE10 7/8 - 14 UNF - 2B	SAE4 7/16 - 20 UNF - 2B

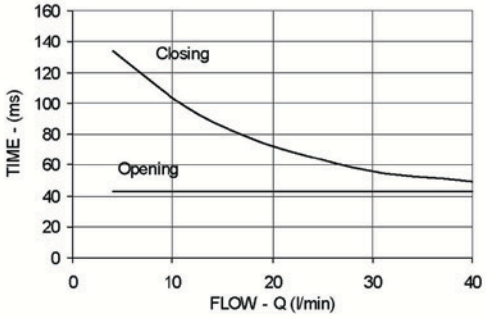
ELECTRIC UNLOADING VALVE

code EV

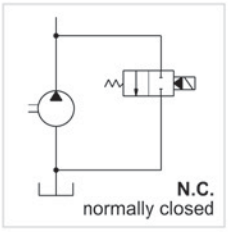
EV1 - 12 Vcc
EV2 - 24 Vcc

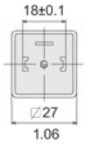




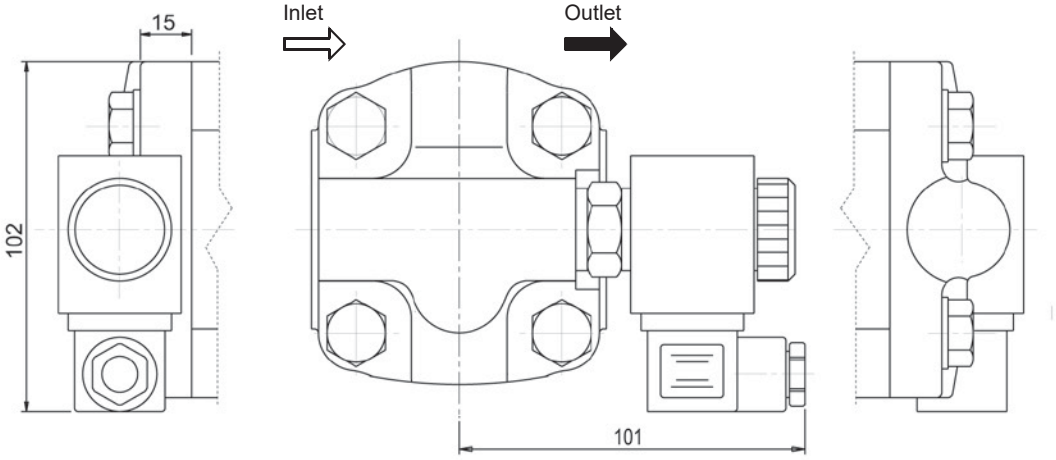


EV3 - 12 Vcc
EV4 - 24 Vcc





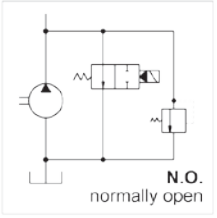
CONNECTOR DIN 43650 A/ISO 4400



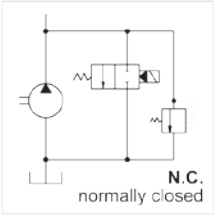
Cover with built-in relief and electric unloading valve

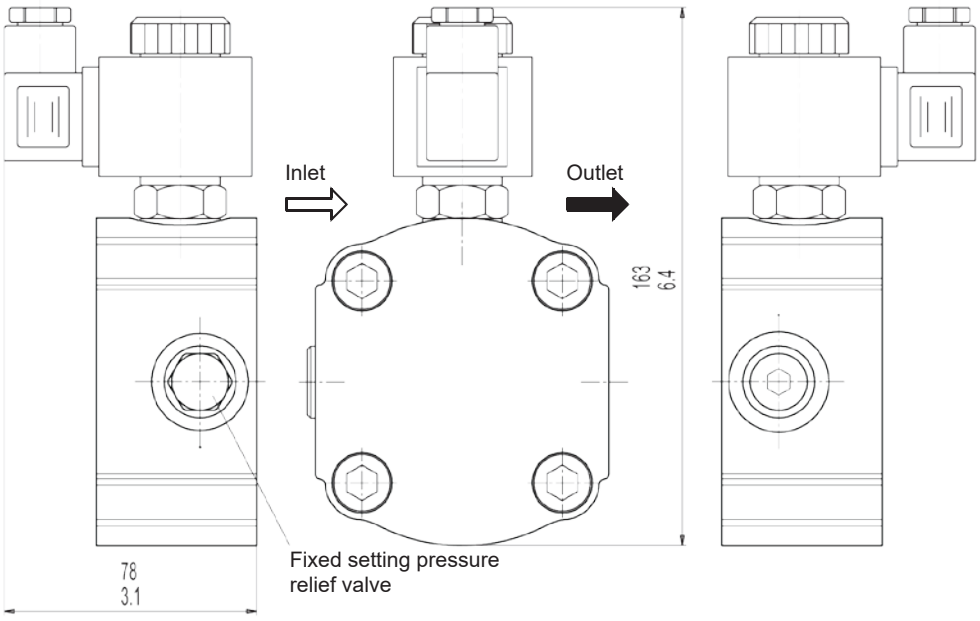
code EVS

EVS1 - 12 Vcc
EVS2 - 24 Vcc



EVS3 - 12 Vcc
EVS4 - 24 Vcc





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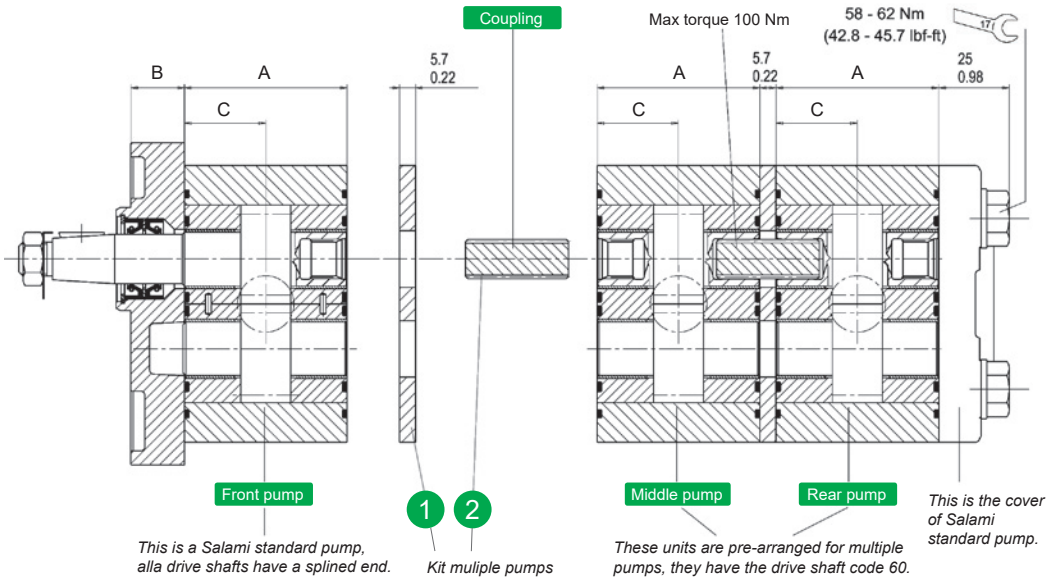
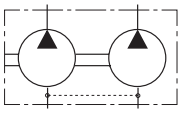
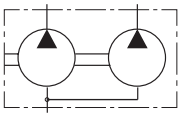
MULTIPLE GEAR PUMPS ASSEMBLING DIMENSIONS





MULTIPLE GEAR PUMPS with inlet port on each body



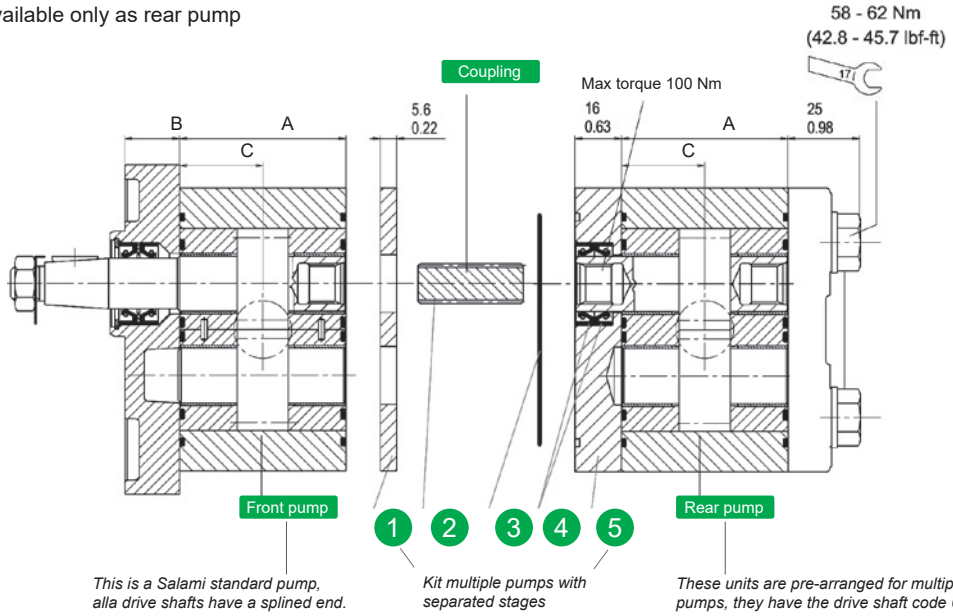
MULTIPLE GEAR PUMPS with common inlet port*

*In case of common inlet port, to avoid too high value of oil speed, 30 l/min is the max. sucked flow for the downstream pump. Commercial code **UA**.

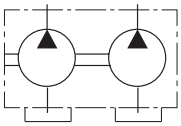
The 2PE pumps can be easily transformed into front pump in the multiple units. All drive shafts are pre-arranged and have a splined end according DIN 5480. The first unit must always be the same size or bigger than following units. The features and performances are the same of the corresponding single units: only in the case of simultaneous operating you have to verify that the inlet torque is lower than the max. transmissible by the drive shaft. Finally to assembly the multiple pump you need to order bolts of the right length.

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 B (flanges B2 - B3)	mm *in*	16.5 *0.65*												
Dimension B (flanges P1 - S2 - B1)	mm *in*	19 *0.75*												
Dimension C	mm *in*	23.55 *0.91*			25 *0.98*	26.4 *1.04*	28.15 *1.11*	29.75 *1.17*		31.75 *1.25*	33.75 *1.33*	37.8 *1.49*	40.5 *1.59*	43.4 *1.71*
Dimension A	mm *in*	47.1 *1.83*			49.95 *1.97*	52.8 *2.07*	56.3 *2.22*	59.7 *2.35*		63.5 *2.5*	67.5 *2.65*	75.6 *2.97*	81 *3.19*	86.8 *3.42*

*Available only as rear pump



code AS



MULTIPLE GEAR PUMPS with separated stages

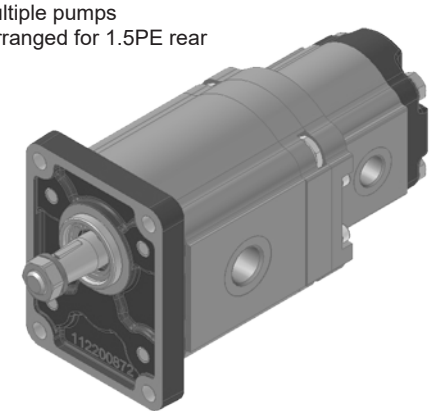
2PE

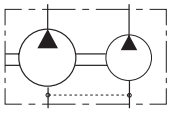
GEAR PUMPS “E” SERIES
Aluminium Body

2PE COMBINATION WITH PUMP 1.5PE

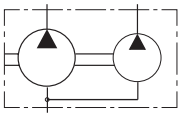
PD1.5

Kit multiple pumps
Pre-arranged for 1.5PE rear





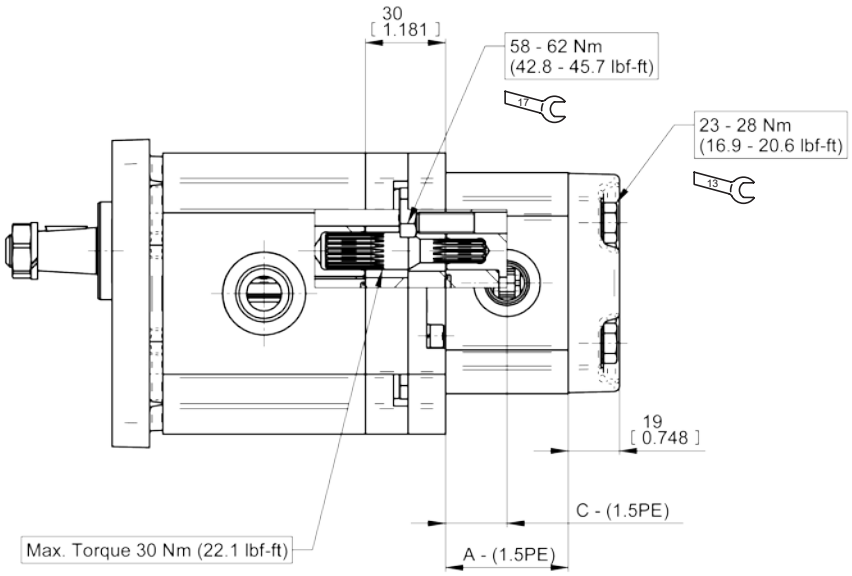
MULTIPLE GEAR PUMPS with inlet port on each body



MULTIPLE GEAR PUMPS with common inlet port*

*In case of common inlet port, to avoid too high value of oil speed, 12 l/min is the max. sucked flow for the downstream pump. Commercial code **UA**.

ALL THE PUMPS CAN BE ALSO MULTIPLE



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*

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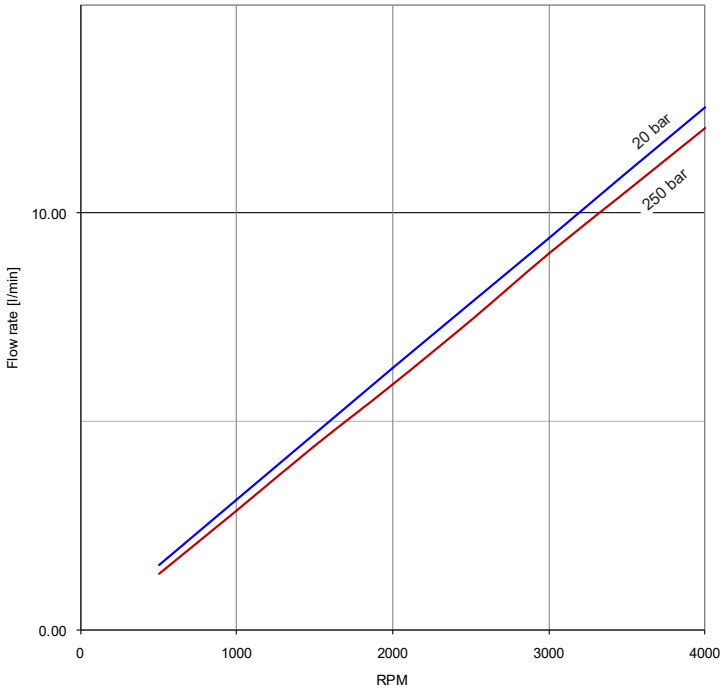
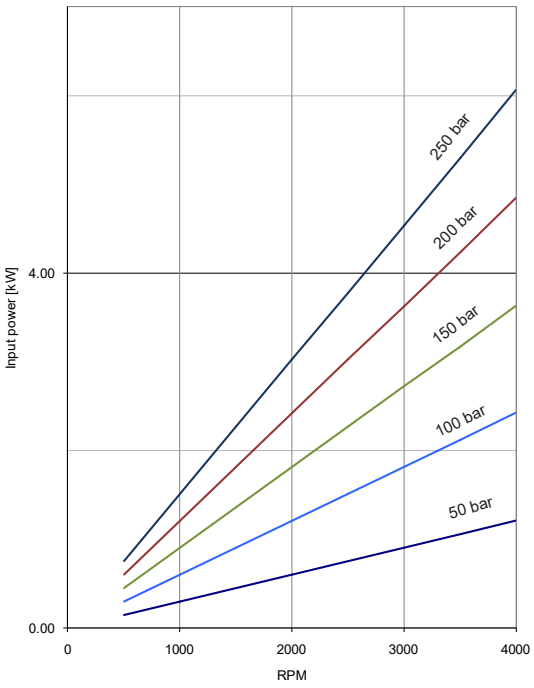
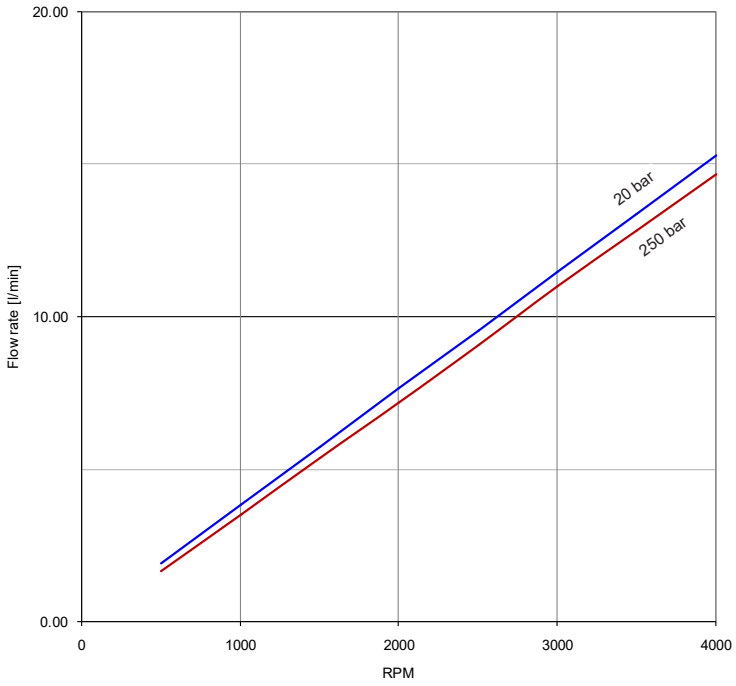
PERFORMANCE CURVES

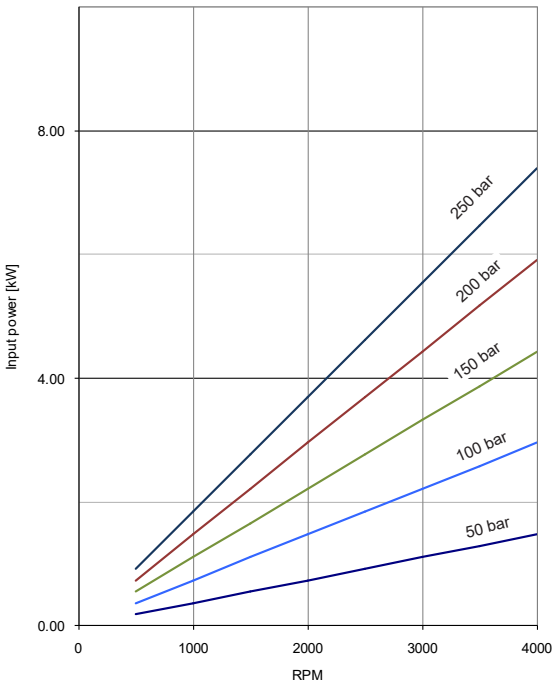
Performance curves carried out with oil viscosity at 21 cSt and oil temperature at 50°C





2PE - 3.2





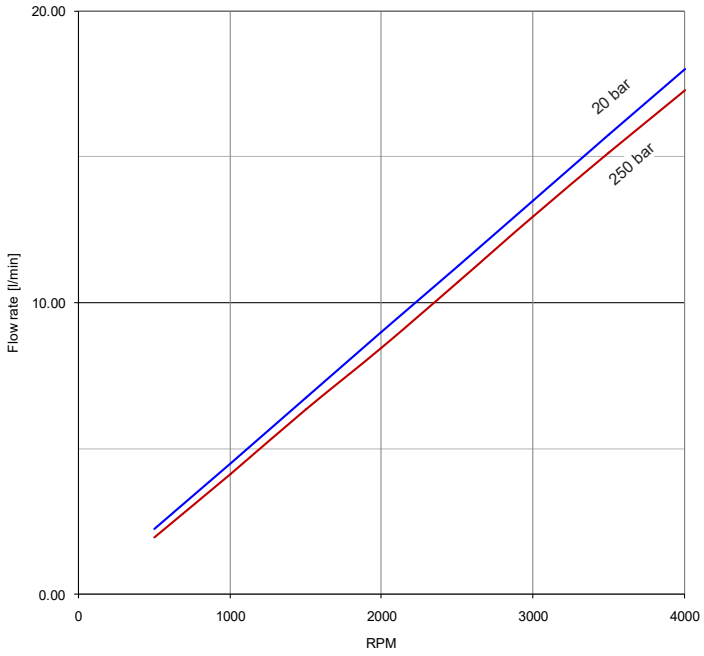
2PE - 3.9

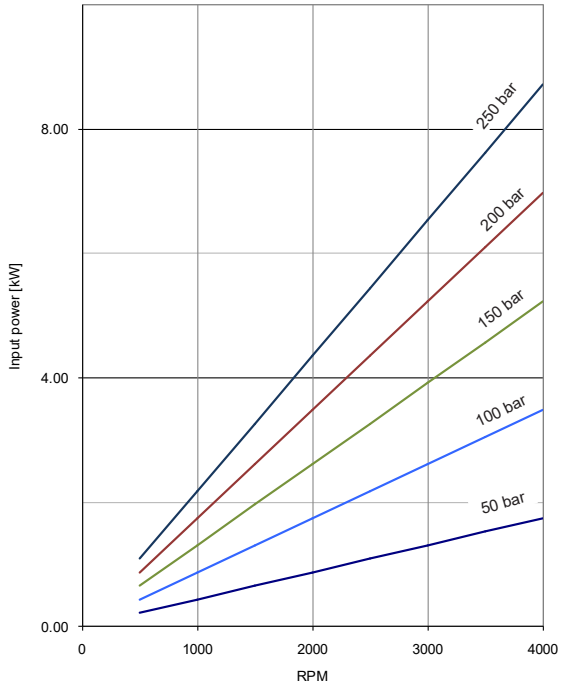
2PE

GEAR PUMPS "E" SERIES
Aluminium Body

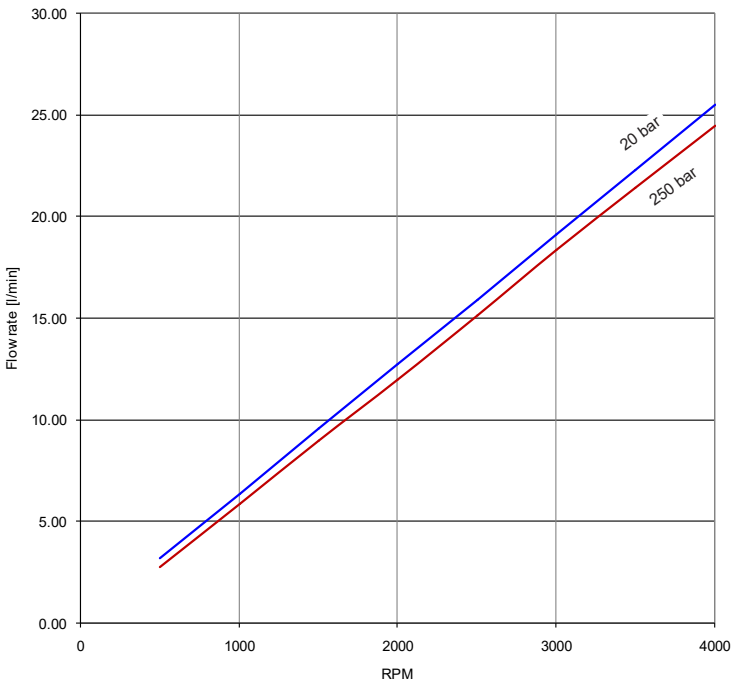
PERFORMANCE CURVES

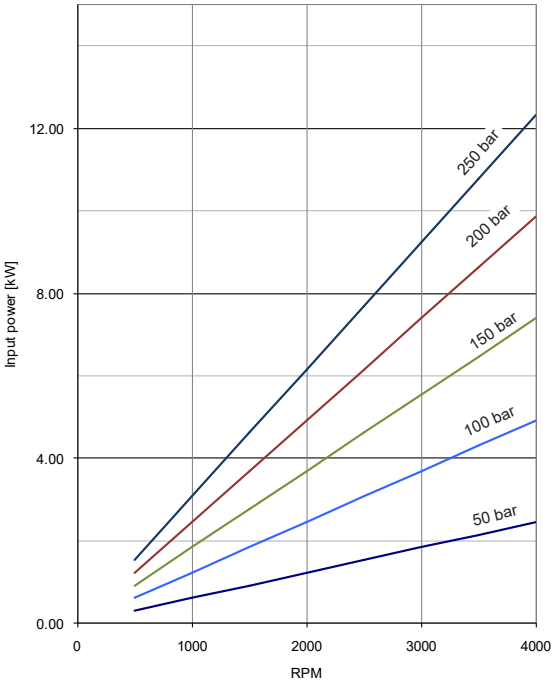
Performance curves carried out with oil viscosity at 21 cSt and oil temperature at 50°C





2PE - 4.5





2PE - 6.5

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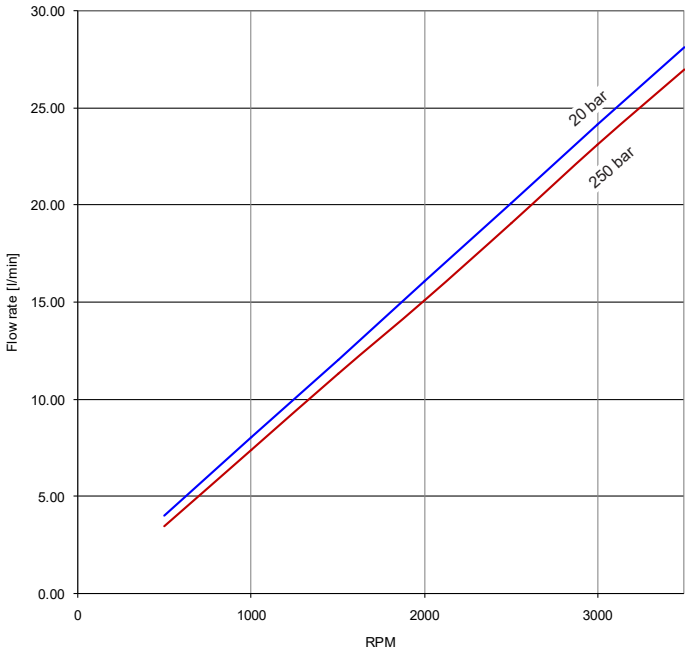
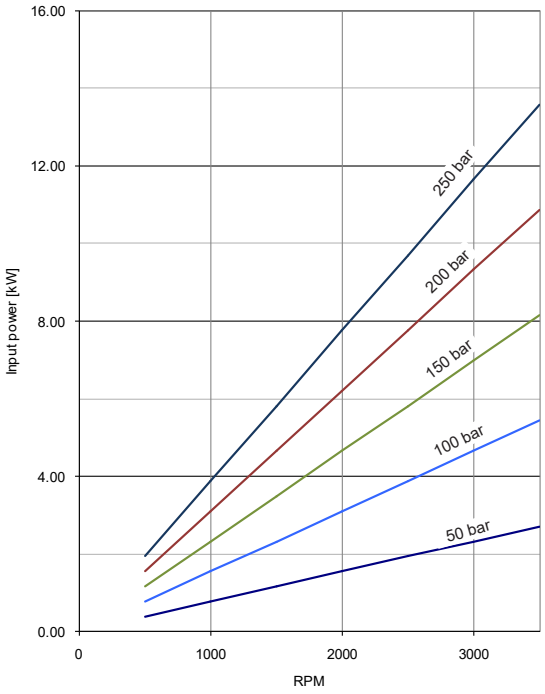
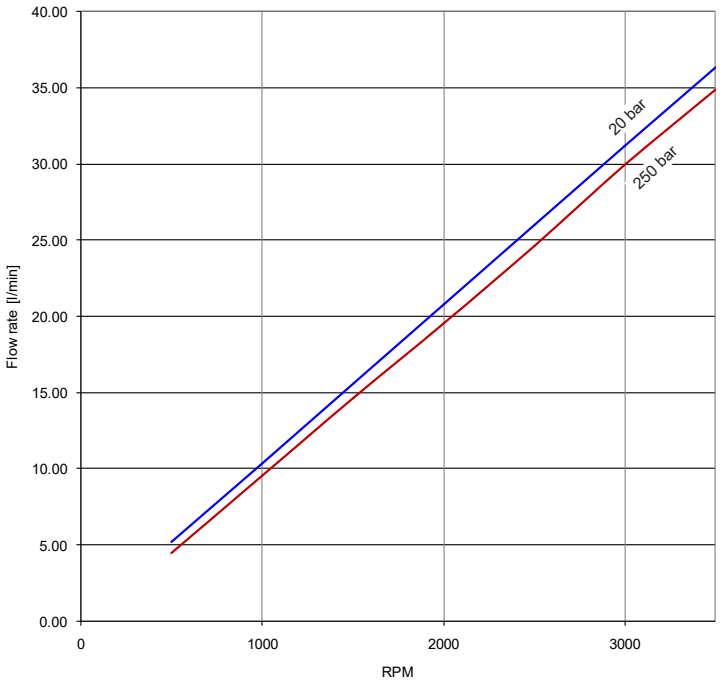
PERFORMANCE CURVES

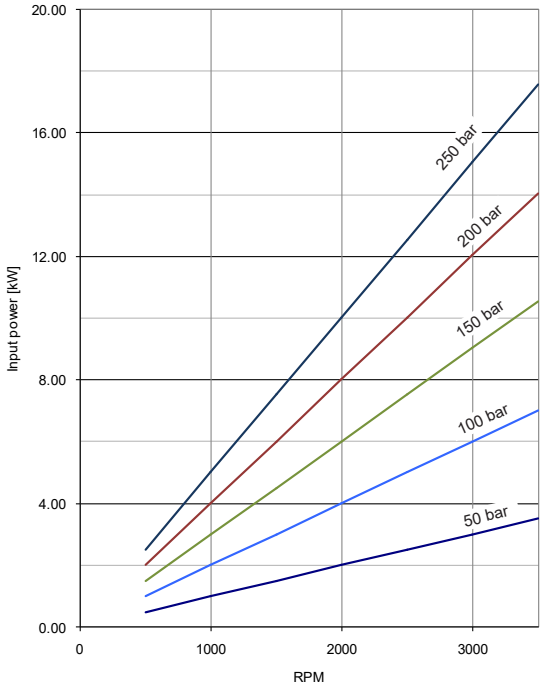
Performance curves carried out with oil viscosity at 21 cSt and oil temperature at 50°C





2PE - 8.3





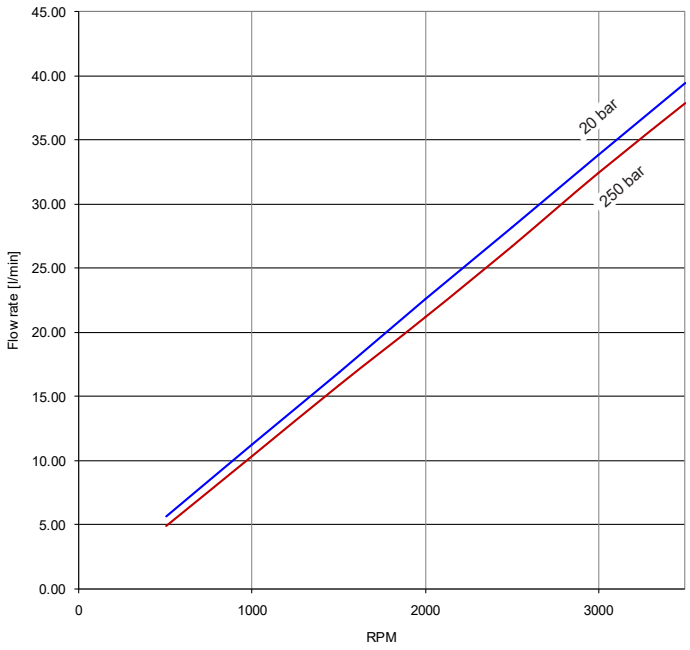
2PE - 10.5

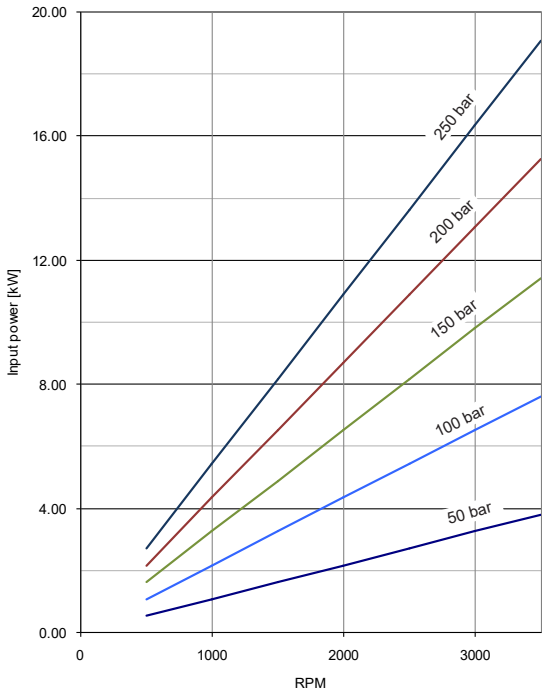
2PE

GEAR PUMPS "E" SERIES
Aluminium Body

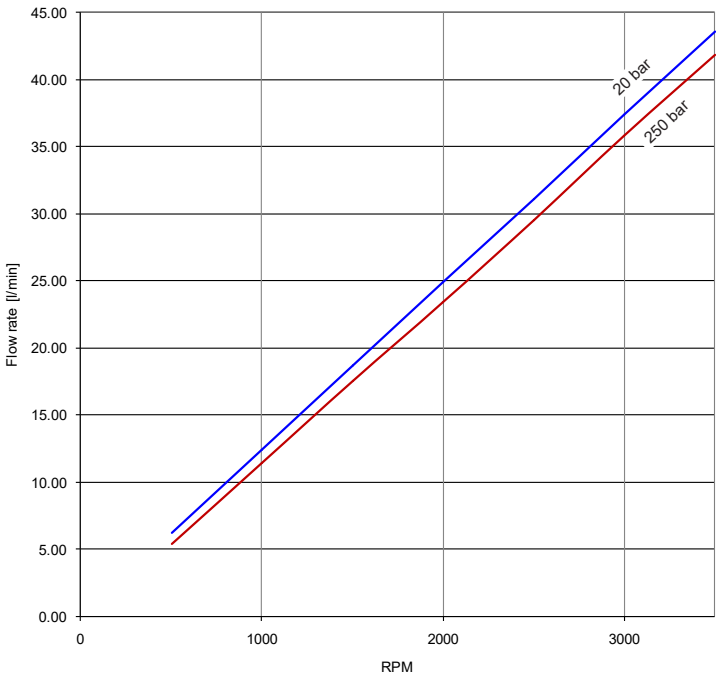
PERFORMANCE CURVES

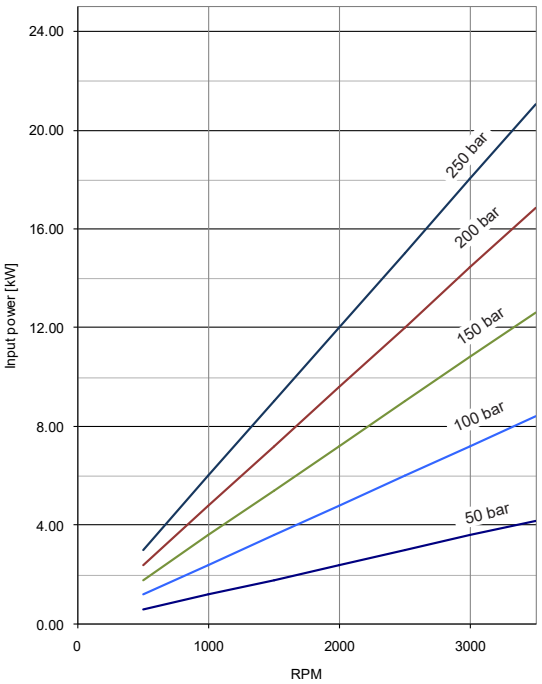
Performance curves carried out with oil viscosity at 21 cSt and oil temperature at 50°C





2PE - 11.3



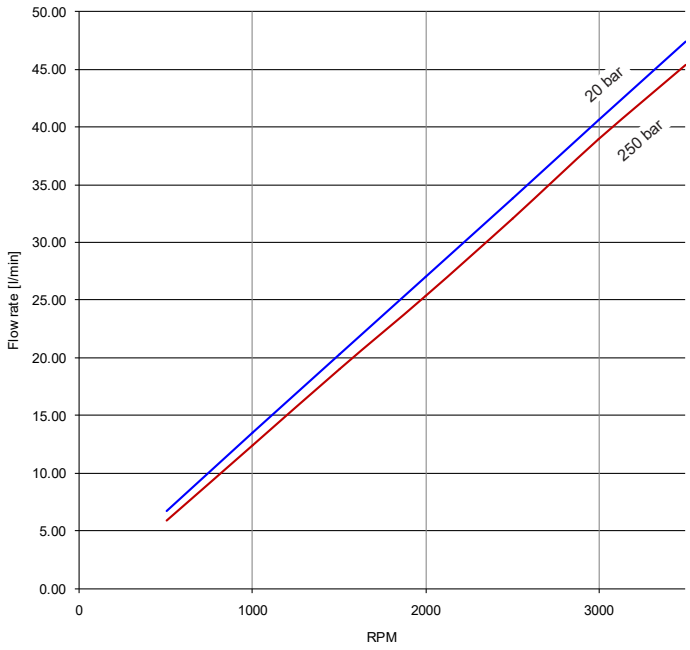


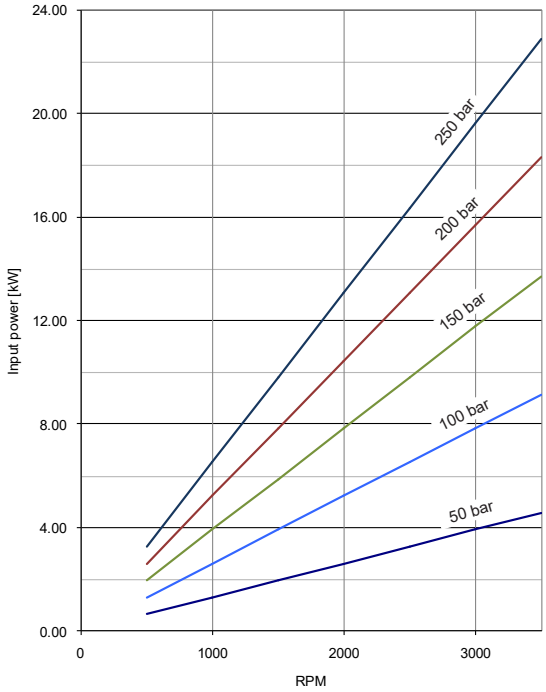
2PE - 12.5

E0.120.0219.02.00IM04

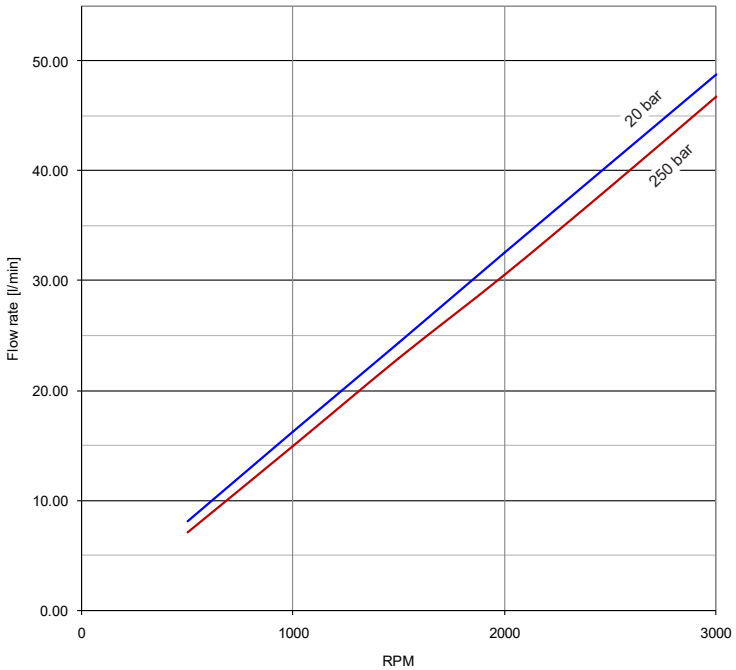
PERFORMANCE CURVES

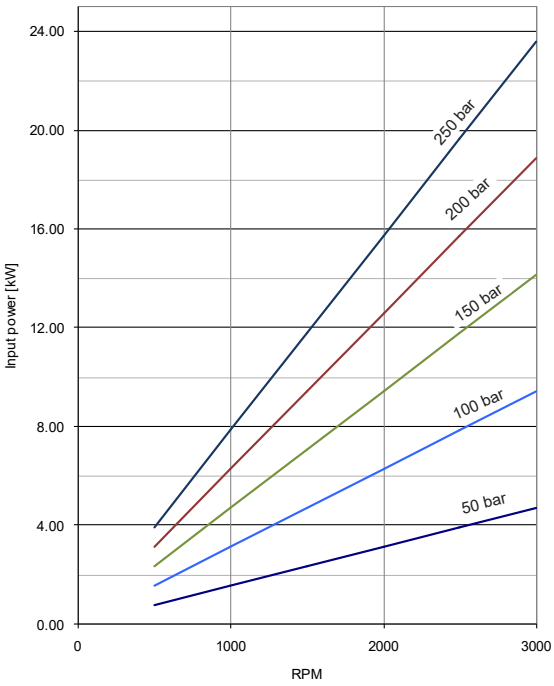
Performance curves carried out with oil viscosity at 21 cSt and oil temperature at 50°C





2PE - 13.8





2PE - 16

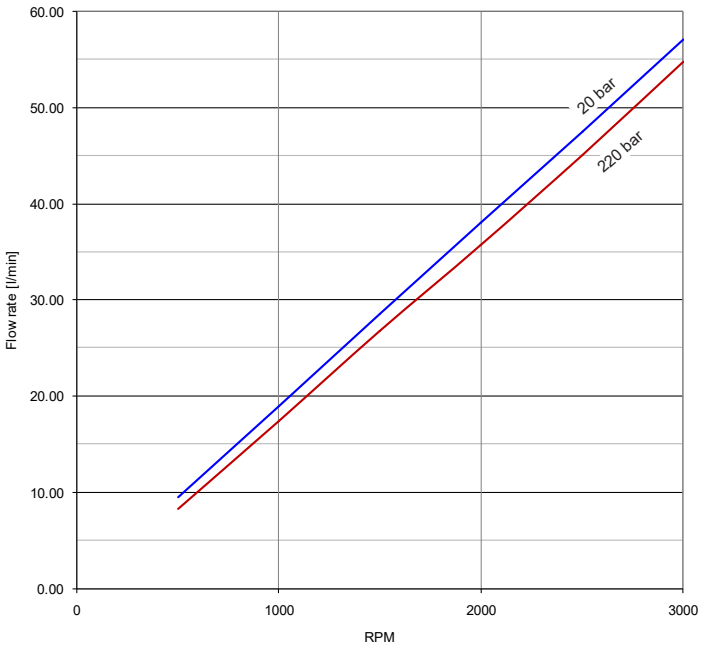
E0.120.0219.02.00IM04

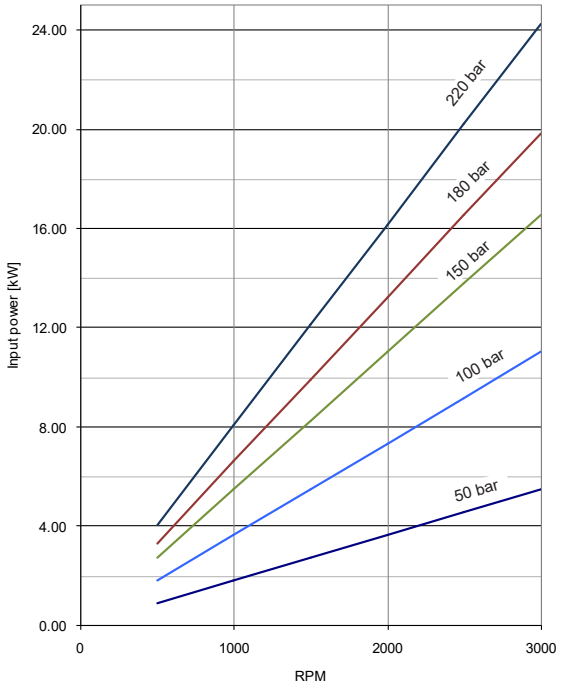
2PE

GEAR PUMPS "E" SERIES
Aluminium Body

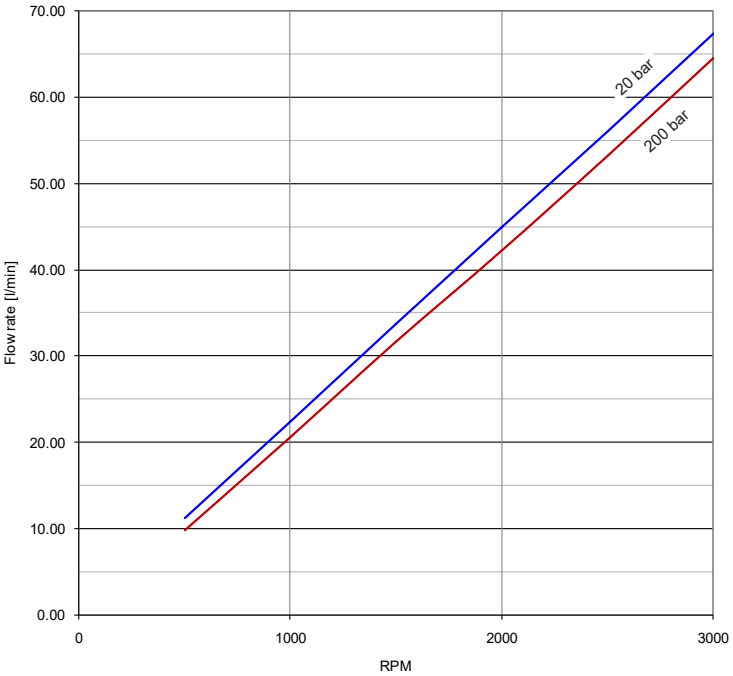
PERFORMANCE CURVES

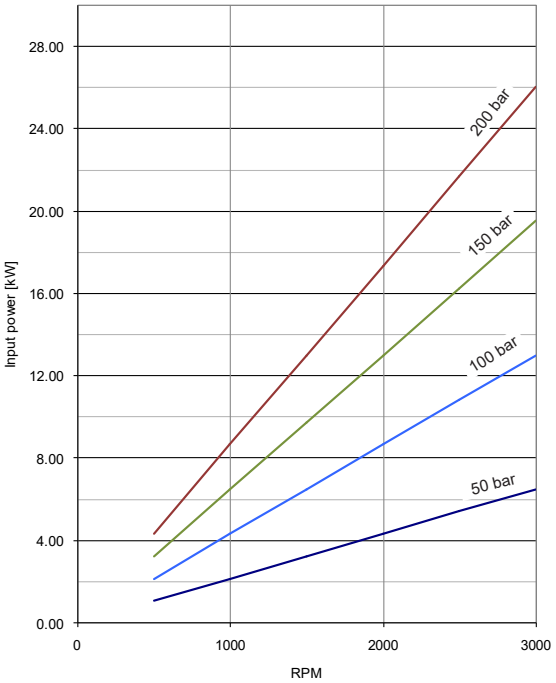
Performance curves carried out with oil viscosity at 21 cSt and oil temperature at 50°C





2PE - 19





2PE - 22.5

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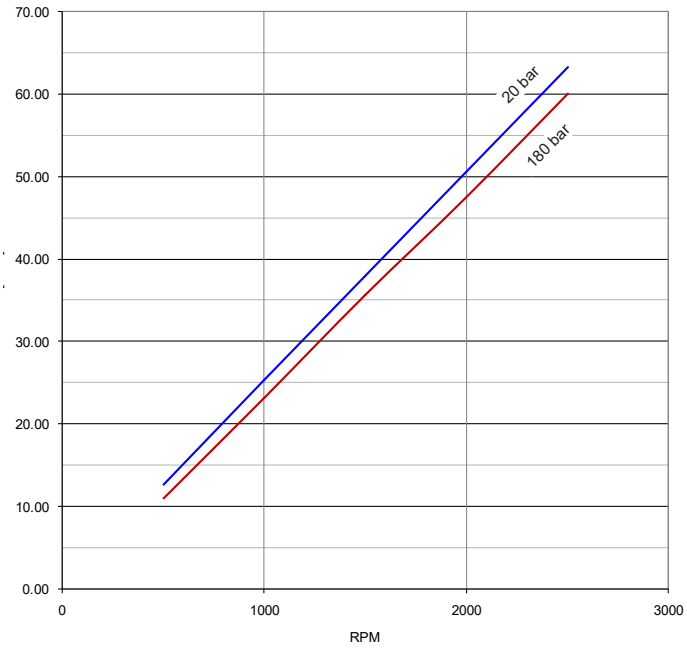
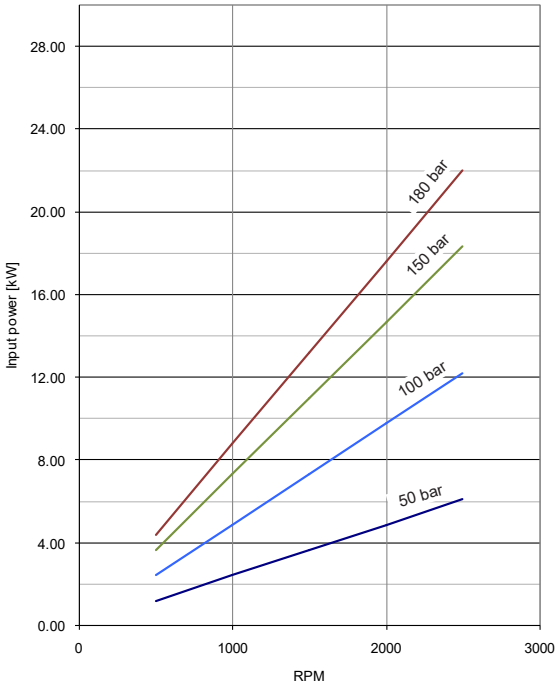
PERFORMANCE CURVES

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



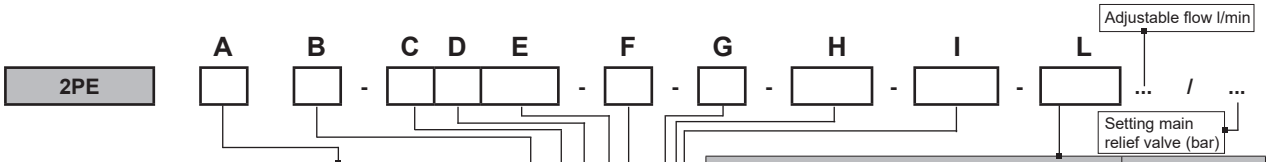


2PE - 26

How to order-2PE

GEAR PUMPS " E" SERIES
Aluminium Body

SINGLE PUMPS



DISPLACEMENTS		A CODES
4.6 cm³/rev.	*0.27 cu.in/rev.*	4.5
6.5 cm³/rev.	*0.40 cu.in/rev.*	6.5
8.2 cm³/rev.	*0.50 cu.in/rev.*	8.3
10.6 cm³/rev.	*0.65 cu.in/rev.*	10.5
11.5 cm³/rev.	*0.68 cu.in/rev.*	11.3
12.5 cm³/rev.	*0.77 cu.in/rev.*	12.5
13.8 cm³/rev.	*0.84 cu.in/rev.*	13.8
16.6 cm³/rev.	*1.01 cu.in/rev.*	16
19.4 cm³/rev.	*1.18 cu.in/rev.*	19
22.9 cm³/rev.	*1.37 cu.in/rev.*	22.5
25.8 cm³/rev.	*1.58 cu.in/rev.*	26

ROTATION (page 6)	B CODES
Clockwise	D
Anti-clockwise	S
Reversible	R

PORTS (page 35)	C CODES
Flanged ports european standard	P
Flanged ports german standard	B
Threaded ports GAS (BSPP)	G
Threaded ports SAE (ODT)	R

DRIVE SHAFT (page 36)	D CODES
Tang drive for engine driven	02
Tang drive for electric motors	03
Tang drive	04
Tapered 1:5	25
Tapered 1:5 (only for CB)	26
Tapered 1:8	28
SAE A splined 9T	52
SAE A splined 10T	53
SAE A splined 11T	54
SAE B splined 13T	55
DIN 5480 internal splined **(only for rear pumps- see page 51)**	60
9 teeth DIN 5482 splined	62
5/8" SAE A parallel	82
3/4" SAE A parallel	85

Order example: 2PE 19D, ports SAE (R), drive shaft (52), mounting flange (S2) with valve in the cover (VPS 12.5 l/min) and pressure relief valve setting 180 bar:
2PE19D-R52S2-VPS12.5/180

L VALVES IN THE COVER (page 45)	CODES
Lateral Drain	LD
Adjustable main relief valve	VS
Fixed setting main relief valve	VSE
Internal drain	IDV
Priority flow divider with excess flow to 2nd actuator	VP-VP1
Like VP with main relief valve	VPS-VPS1
Priority flow divider with Load sensing with dinamic signal	VPD-VPD1
Load sensing priority valve with dinamic signal with main relief valve	VPDS-VPDS1
Electric unloading valve (12V)	EV1/EV3
Electric unloading valve (24V)	EV2/EV4
Main relief and electric unloading valves (12V)	EVS1/EVS3
Main relief and electric unloading valves (24V)	EVS2/EVS4

I REAR COVER (page 52)	CODE
Pre-arranged for 1.5PE rear	PD1.5

H OUTRIGGER BEARING (page 41)	CODES
European standard	CP
German standard	CB
For engine endothermic motors	CL
For endothermic motors with axial and radial loads	CF
SAE A	CS

G PORTS POSITION	CODE
Lateral ports standard	
Rear ports (page)	1

F SEAL	CODE
Buna standard	
Viton	V

E MOUNTING FLANGES (page 38)	CODES
European standard	P1
German standard Ø80	B1
German standard Ø52	B2-B3
German standard Ø50	B4-B5
SAE A 2 bolts	S2
SAE B 2 bolts	S3
SAE A 2 bolts (with o-ring on the centering collar)	S6
4 bolts for Iveco motor	C1
4 bolts for Perkins motor	K1
German standard with shaft seal Ø52	K3
German standard with shaft seal Ø52	K4
2 threaded holes flange for Perkins motor	MF

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GEAR PUMPS " E" SERIES
Aluminium Body

2PE-How to order

MULTIPLE PUMPS

2PE [A] / [B][B] - [C][D][E] - [F][G] - [H] - [I] - [L] [M] ... / ...

Setting main relief valve (bar)

Adjustable flow l/min

DISPLACEMENTS		A CODES
3.2 cm³/rev.	***0.19 cu.in/rev.***	***3.2****
3.9 cm³/rev.	***0.24 cu.in/rev.***	***3.9****
4.6 cm³/rev.	*0.27 cu.in/rev.*	4.5
6.5 cm³/rev.	*0.40 cu.in/rev.*	6.5
8.2 cm³/rev.	*0.50 cu.in/rev.*	8.3
10.6 cm³/rev.	*0.65 cu.in/rev.*	10.5
11.5 cm³/rev.	*0.68 cu.in/rev.*	11.3
12.5 cm³/rev.	*0.77 cu.in/rev.*	12.5
13.8 cm³/rev.	*0.84 cu.in/rev.*	13.8
16.6 cm³/rev.	*1.01 cu.in/rev.*	16
19.4 cm³/rev.	*1.18 cu.in/rev.*	19
22.9 cm³/rev.	*1.37 cu.in/rev.*	22.5
25.8 cm³/rev.	*1.58 cu.in/rev.*	26

*Available only as rear pump

ROTATION (page 6)	CODES B
Clockwise	D
Anti-clockwise	S

PORTS (page 35)	CODES C
Flanged ports european standard	P
Flanged ports german standard	B
Threaded ports GAS (BSPP)	G
Threaded ports SAE (ODT)	R

DRIVE SHAFT (page 36)	CODES D
Tang drive for engine driven	02
Tang drive for electric motors	03
Tang drive	04
Tapered 1:5	25
Tapered 1:5 (only for CB)	26
Tapered 1:8	28
SAE A splined 9T	52
SAE A splined 10T	53
SAE A splined 11T	54
SAE B splined 13T	55
9 teeth DIN 5482 splined	62
5/8" SAE A parallel	82
3/4" SAE A parallel	85

*UA: this type of multiple pump is a Salami standard multiple pump which has only one inlet port opened, all the other inlet port are closed.
In case of common suction, the code 1 - 2 or 3, correspond to the body where inlet is located.

M VALVES IN THE COVER (page 45)	CODES
Lateral Drain	LD
Adjustable main relief valve	VS
Fixed setting main relief valve	VSE
Internal drain	IDV
Unloading valve	VSQ
Priority flow divider with excess flow to 2nd actuator	VP-VP1
Like VP with main relief valve	VPS-VPS1
Priority flow divider with Load sensing with dinamic signal	VPD-VPD1
Load sensing priority valve with dinamic signal with main relief valve	VPDS-VPDS1
Electric unloading valve (12V)	EV1/EV3
Electric unloading valve (24V)	EV2/EV4
Main relief and electric unloading valves (12V)	EVS1/EVS3
Main relief and electric unloading valves (24V)	EVS2/EVS4

L REAR COVER (page 52)	CODE
Pre-arranged for 1.5PE rear	PD1.5

I OUTRIGGER BEARING (page 41)	CODES
European standard	CP
German standard	CB
For engine endothermic motors	CL
For endothermic motors with axial and radial loads	CF
SAE A	CS

H PORTS POSITION	CODE
Lateral ports standard	
Rear ports (page)	1

G SUCTION PORTS	CODES
Common suction	UA*
Separeted stages	AS

F SEAL	CODE
Buna standard	
Viton	V

E MOUNTING FLANGES (page 38)	CODES	MOUNTING FLANGES	CODES
European standard	P1	SAE A 2 bolts (with o-ring on the centering collar)	S6
German standard Ø80	B1	4 bolts for Iveco engines	C1
German standard Ø52	B2-B3	4 bolts for Perkins motor	K1
German standard Ø50	B4-B5	German standard with shaft seal Ø52	K3
SAE A 2 bolts	S2	German standard with shaft seal Ø52	K4
SAE B 2 bolts	S3	2 threaded holes flange for Perkins motor	MF

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