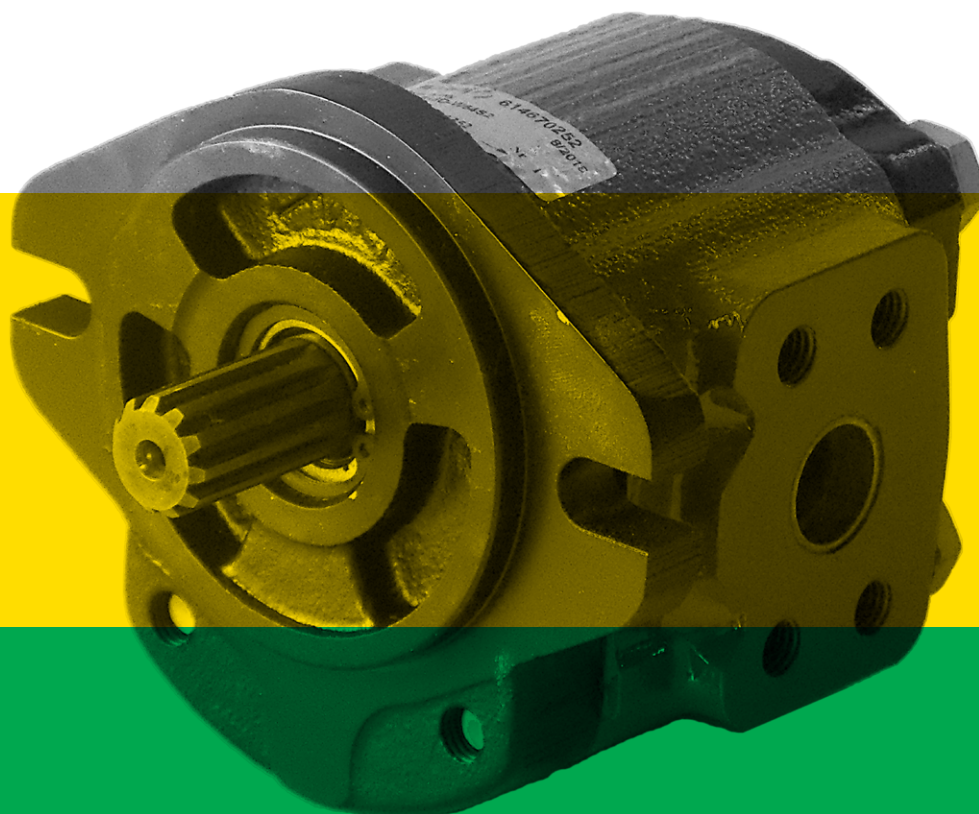


# 2PGE and 2MGE

Cast Iron Body  
Gear Pumps and Motors

Technical Catalogue

EO.146.0417.02.00IM01



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



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**Final revised edition-April 2017**

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.***





**GENERAL FEATURES**

SALAMI gear pumps are available with displacements from 16 cm<sup>3</sup>/rev to 26 cm<sup>3</sup>/rev (*from 1.01 cu.in./rev to 1.58 cu.in./rev*).

All pumps are available as multiple units either of the same or different series.

With all sizes of pumps there are options of shafts, flanges and ports as for European, German and American standards.

SALAMI gear pumps offer:

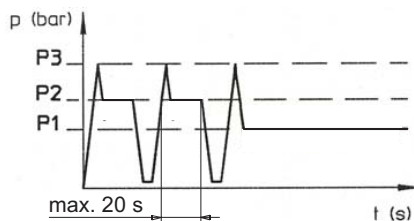
- High volumetric efficiency by innovative design and accurate control of machining tolerances.
  - Axial compensation achieved by the use of floating bushes that allow high volumetric efficiency throughout the working pressure range.
  - DU bearings ensure high pressure capability.
  - 12 teeth integral gear and shaft.
  - Cast iron body.
  - Cast iron flange and cover.
  - Double shaft seals.
  - Nitrile seals as standard and Viton seals in high temperature applications.
  - Typical 2PGE gear pumps are ideal for mobile equipment including: snow plows, light duty equipment, lift trucks, farm vehicles, town trucks, cherry pickers, lift gates, utility vehicles, aerial devices, hoists, spreaders, fan drive.
- All pumps are hydraulic tested after assembly to ensure the high standard performance required by SALAMI'S engineering.

**TECHNICAL DATA**

- Pump inlet pressure (absolute pressure)	0.8 to 1.5 bar <i>(11.6 to 21.7 psi)</i>
- Minimum operating fluid viscosity	12 mm <sup>2</sup> / sec
- Max starting viscosity	800 mm <sup>2</sup> / sec
- Suggested fluid viscosity range	17 - 65 mm <sup>2</sup> / sec
- Fluid operating temperature range	-25 to 85 °C
- Fluid operating temperature range with FPM seals (Viton)	-20 to 110°C
- Fluid operating temperature range with HNBR* seals	-30 to 110°C
- Hydraulic fluid	mineral oil

\*Available on request

**DEFINITION OF PRESSURES**



- P3 = Peak pressure
- P2 = Intermittent operating pressure (1/3 of working time)
- P1 = Continuous operating pressure

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## GENERAL FEATURES

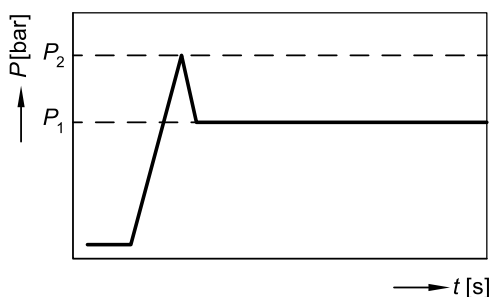
- Displacements from 16 cm<sup>3</sup>/rev to 26 cm<sup>3</sup>/rev (from 1.01 cu.in./rev to 1.58 cu.in./rev).
- Rated pressure up to 250 bar (3625psi).
- Back pressure capability up to 120 bar (1740 psi) only in bi-directional release.
- Speed up to 3200 rpm.
- Flanges, shafts and ports for ISO, DIN and SAE standards.
- Available in uni and bi-directional version for all the frame sizes, displacements and configurations.
- High volumetric efficiency by innovative design and 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 ensure high pressure capability.
- 12 teeth integral gear and shaft.
- Cast iron body.
- Cast iron flange and cover.
- Double shaft seals in all motor series. The one which faces the internal side is reinforced.
- Nitrile seals as standard and Viton seals in high temperature applications.
- Available with different valves and circuit configurations built-in rear cover.
- All motors are hydraulic tested after assembly to ensure the high standard performance required.
- Typical 2MGE gear motors 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.

## TECHNICAL DATA

- Max drain pressure	20 bar (290 psi)
- Minimum operating fluid viscosity	12 mm <sup>2</sup> /sec
- Permitted viscosity range	12 - 800 mm <sup>2</sup> / sec
- Recommended viscosity range	20 - 80 mm <sup>2</sup> / sec
- Permitted viscosity for starting	2000 mm <sup>2</sup> / sec
- Fluid operating temperature range	-25 to 85 °C
- Fluid operating temperature range with FPM seals	-20 to 110°C
- Fluid operating temperature range with HNBR* seals	-30 to 110°C
- Hydraulic fluid	mineral oil

\*Available on request

## DEFINITION OF PRESSURES



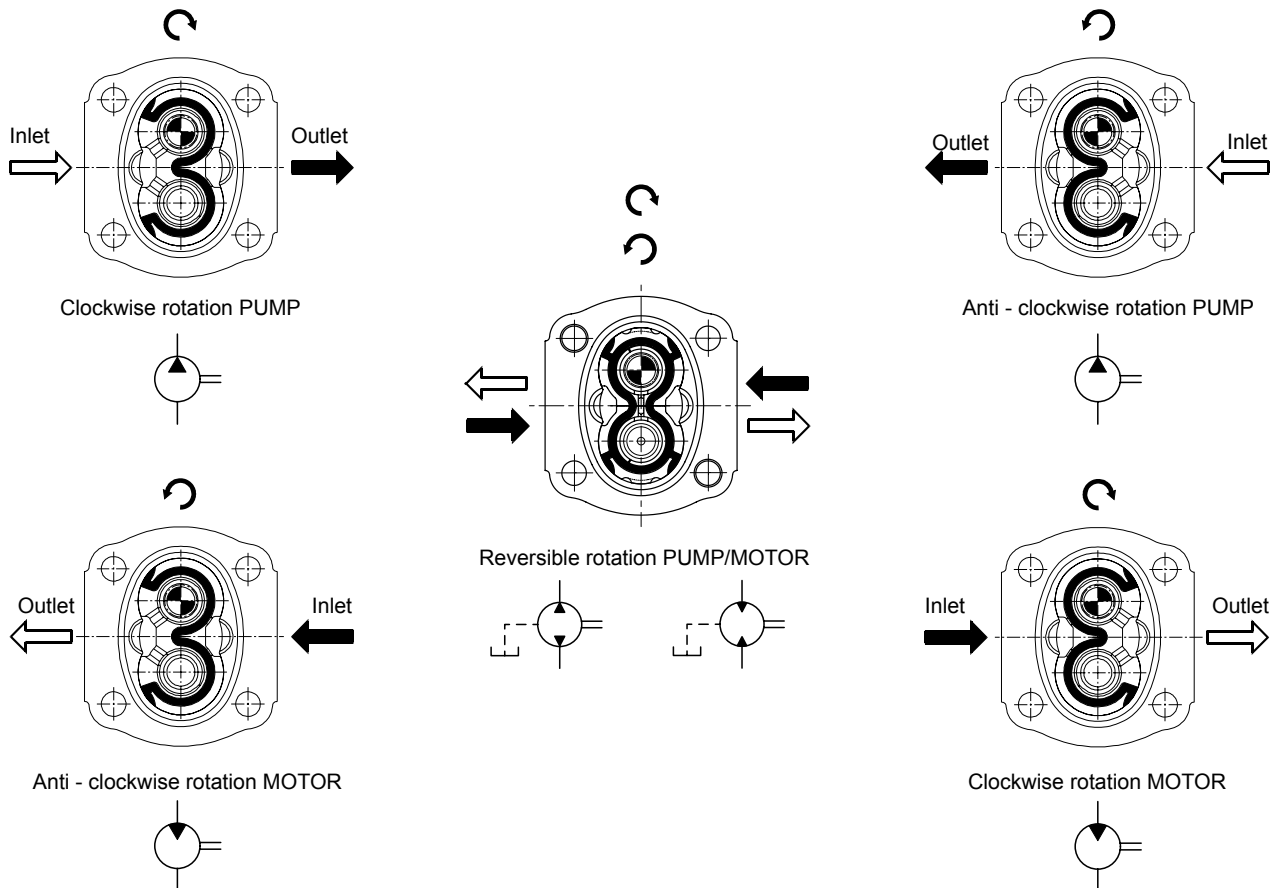
$P_1$  max. continuous pressure  
 $P_2$  starting pressure (depending on the application, this must be taken into consideration when setting the pressure of the hydraulic system's pressure-relief valve).

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**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.

**PUMP AND MOTOR ROTATION DIRECTION VIEWED AT THE DRIVE SHAFT**



**HYDRAULIC PIPE LINE**

To ensure favorable suction conditions it is important to keep pressure drop in suction pipe line to a minimum value (see 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 continuous 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 $\beta_x=75$	15 $\mu\text{m}$	25 $\mu\text{m}$

### FIRE RESISTENT FLUID

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

### COMMON FORMULAS

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

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

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

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

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

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


LEGENDA

$\Delta p$ = Working pressure (bar)  
 $q$ = Displacement (cm<sup>3</sup>/rev)  
 $n$ = Speed (min<sup>-1</sup>)  
 $\eta_m$ = Mechanical efficiency (0.92)  
 $\eta_v$ = Volumetric efficiency (0.95)

LEGENDA

$V$ = Displacement cm<sup>3</sup>/rev [in<sup>3</sup>/rev]  
 $P_{out}$ = Outlet pressure bar [psi]  
 $P_{in}$ = Inlet pressure bar [psi]  
 $\Delta p$ =  $P_{out} - P_{in}$  (system pressure) (rpm)  
 $n$ = Speed min<sup>-1</sup>  
 $\eta_m$ = Mechanical efficiency  
 $\eta_v$ = Volumetric efficiency  
 $\eta_t$ = Overall efficiency ( $\eta_v \cdot \eta_m$ )

### IDENTIFICATION LABEL




Made in Italy

Salami part number **613011042**

Product short description **3PE55D -R55S3-POMPA**

**WO0132803 013 2013/09**




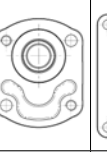
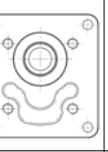

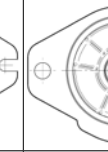




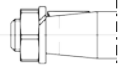

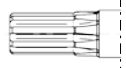
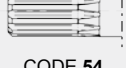
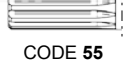
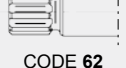

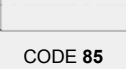


Rotation sense 

Product code (for Salami management) Month and year of made  
Number of assembling

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**SHAFTS AND FLANGES COMBINATION**








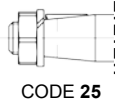

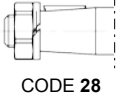
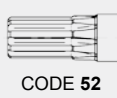
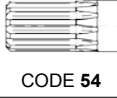
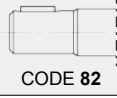

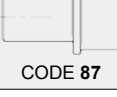
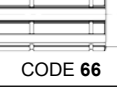
2PGE/ 2MGE									
	CODE P1	CODE B1	CODE B2-B3	CODE B4-B5	CODE C1	CODE S2	CODE S3	CODE T1	CODE Z2
 CODE 03			03B2 03B3						
 CODE 04				04B4 04B5					
 CODE 25		25B1		25B4 25B5					
 CODE 28	28P1								
 CODE 52						52S2			
 CODE 54						54S2			
 CODE 55							55S3		
 CODE 62	62P1	62B1		62B4 62B5	62C1				
 CODE 82	82P1					82S2			
 CODE 85	85P1					85S2			
 CODE 67									67Z2
 CODE 73								73T1	

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SHAFTS AND FLANGES WITH BEARING COMBINATION

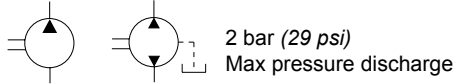
2PGE/ 2MGE							
	CODE CL	CODE CF	CODE CS	CODE CB	CODE CP	CODE CSB	CODE Z1
 CODE 25	25CL	25CF		25CB			
 CODE 26	26CL	26CF		26CB			
 CODE 28					28CP		
 CODE 52			52CS				
 CODE 54			54CS				
 CODE 82			82CS				
 CODE 85			85CS				
 CODE 87						87CSB	
 CODE 66							66Z1

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**WORKING CONDITIONS PUMPS**

▪ **GEAR PUMPS**



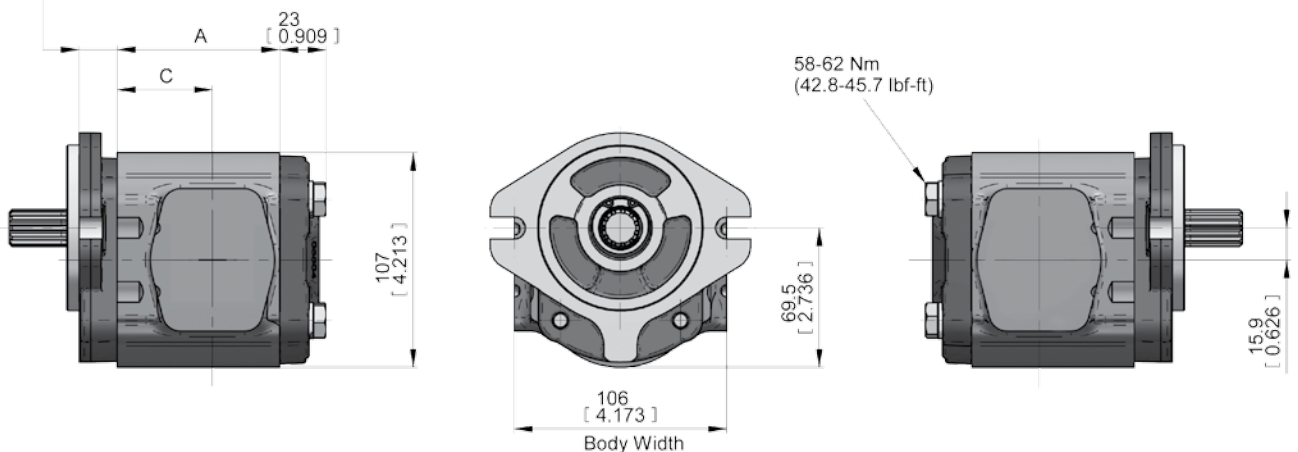
Displacements up to 25.8 cm<sup>3</sup>/rev - 1.58 cu.in./rev  
Pressure up to 320 bar - 4650 psi

TYPE		16	19	22.5	26
Displacement	cm <sup>3</sup> /rev cu.in./rev	16.6 1.01	19.4 1.18	22.9 1.37	25.8 1.58
Dimension A	mm in	67.5 2.65	75.6 2.97	81 3.19	86.8 3.42
Dimension C	mm in	39.5 1.56	39.5 1.56	47.5 1.87	47.5 1.87
Continuous pressure*	P <sup>1</sup> bar psi	270 (3915)		250 (3625)	230 (3335)
Intermittent pressure*	P <sup>2</sup> bar psi	300 (4350)		280 (4060)	260 (3750)
Peak pressure*	P <sup>3</sup> bar psi	320 (4650)		300 (4350)	280 (4060)
Max speed at	P <sup>2</sup> rpm	3000		2750	2500
Min speed at	P <sup>1</sup> rpm	500		500	500
Weight	kg lbs	6.6 14.5	7.1 15.6	7.5 16.5	7.8 17.2

\*Output shaft must be chosen in order to transmit the desired torque.

**ASSEMBLING DIMENSIONS**

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.)

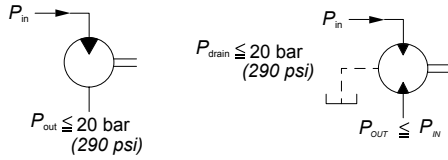


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### WORKING CONDITIONS MOTORS

#### GEAR MOTORS



Displacements up to 25.8 cm<sup>3</sup>/rev - 1.58 cu.in./rev  
Pressure up to 280 bar - 4000 psi

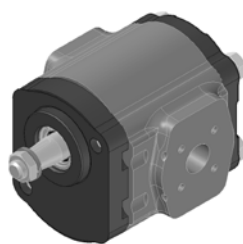
TYPE		16	19	22.5	26
max. continuous pressure P <sub>1</sub>	bar (psi)	250 (3625)	220 (3140)	200 (2900)	180 (2600)
max. starting pressure P <sub>2</sub>		280 (4000)	240 (3450)	220 (3140)	200 (2900)
min. rotational speed	min <sup>-1</sup>	450			
max. rotational speed P <sub>1</sub> *		3200		3000	2850
Motor outlet pressure P <sub>out</sub> Leakage-oil line pressure P <sub>drain</sub>	bar (psi)				
Weight	kg lbs	6.6 14.5	7.1 15.6	7.5 16.5	7.8 17.2

\*Permissible drain pressure decreases with increasing speed.

### ASSEMBLING EXAMPLES



2PGE - B25B1



2PGE - B25B4



2PGE - P28P1

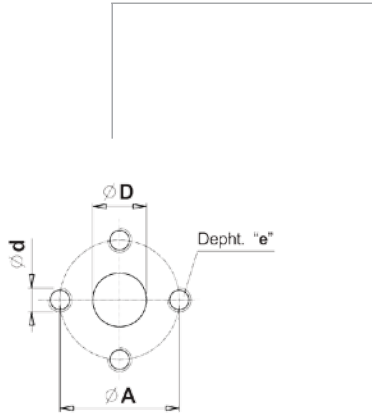


2PGE - R54S2

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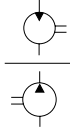


**FLANGED PORTS**



**code P**

Flanged ports  
european standard



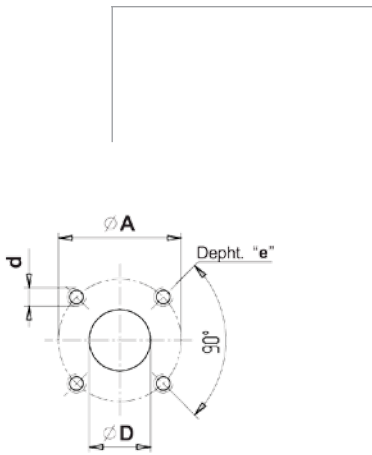
UNI-DIRECTIONAL								
MOTORS	OUTLET				INLET			
PUMPS	INLET				OUTLET			
	Ø D	Ø A	d	e	Ø D	Ø A	d	e
From 16 to 22.5	20 (0.79")	40 (1.57")	M8	13 (0.51")	13 (0.51")	30 (1.18")	M6	13 (0.51")
26	22 (0.87")				20 (0.79")	40 (1.57")		



BI-DIRECTIONAL								
MOTORS	INLET				OUTLET			
	Ø D	Ø A	d	e	Ø D	Ø A	d	e
16	13 (0.51")	30 (1.18")	M6	13 (0.51")	13 (0.51")	30 (1.18")	M6	13 (0.51")
From 19 to 26	20 (0.79")	40 (1.57")	M8	13 (0.51")	20 (0.79")	40 (1.57")	M8	13 (0.51")

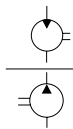


BI-DIRECTIONAL								
PUMPS	INLET				OUTLET			
	Ø D	Ø A	d	e	Ø D	Ø A	d	e
From 16 to 26	20 (0.79")	40 (1.57")	M8	13 (0.51")	20 (0.79")	40 (1.57")	M8	13 (0.51")



**code B**

Flanged ports  
german standard



UNI-DIRECTIONAL								
MOTORS	OUTLET				INLET			
PUMPS	INLET				OUTLET			
	Ø D	Ø A	d	e	Ø D	Ø A	d	e
From 16 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")				20 (0.79")	40 (1.57")		



BI-DIRECTIONAL								
MOTORS	INLET				OUTLET			
	Ø D	Ø A	d	e	Ø D	Ø A	d	e
16	15 (0.59")	35 (1.38")	M6	13 (0.51")	15 (0.59")	35 (1.38")	M6	13 (0.51")
From 19 to 26	20 (0.79")	40 (1.57")	M6	13 (0.51")	20 (0.79")	40 (1.57")	M6	13 (0.51")

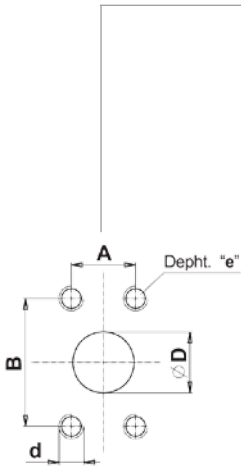


BI-DIRECTIONAL								
PUMPS	INLET				OUTLET			
	Ø D	Ø A	d	e	Ø D	Ø A	d	e
From 16 to 26	20 (0.79")	40 (1.57")	M6	13 (0.51")	20 (0.79")	40 (1.57")	M6	13 (0.51")

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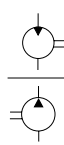


### FLANGED PORTS



**code W**

Flanged ports  
SAE J518  
METRIC THREAD



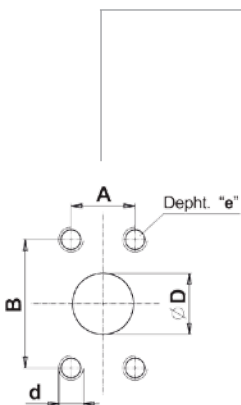
UNI-DIRECTIONAL										
MOTORS	OUTLET					INLET				
PUMPS	INLET					OUTLET				
	ØD	B	A	d	e	ØD	B	A	d	e
From 16 to 19	19 (0.75")	47.6 (1.87")	22.2 (0.87")	M10	15 (0.59")	12.7 (0.50")	38.1 (1.50")	17.5 (0.69")	M8	15 (0.59")
From 22.5 to 26	25.4 (1.00")	52.4 (2.06")	26.2 (1.03")	M10	15 (0.59")	19 (0.75")	47.6 (1.87")	22.2 (0.87")	M10	15 (0.59")



BI-DIRECTIONAL										
MOTORS	INLET					OUTLET				
	ØD	B	A	d	e	ØD	B	A	d	e
16	12.7 (0.50")	38.1 (1.50")	17.5 (0.69")	M8	15 (0.59")	12.7 (0.50")	38.1 (1.50")	17.5 (0.69")	M8	15 (0.59")
From 22.5 to 26	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")

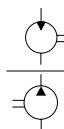


BI-DIRECTIONAL										
PUMPS	INLET					OUTLET				
	ØD	B	A	d	e	ØD	B	A	d	e
From 16 to 26	19 (0.75")	47.6 (1.87")	22.2 (0.87")	M10	15 (0.59")	19 (0.75")	47.6 (1.87")	22.2 (0.87")	M10	15 (0.59")



**code S**

Flanged ports  
SAE J518  
AMERICAN STANDARD  
THREAD



UNI-DIRECTIONAL										
MOTORS	OUTLET					INLET				
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 26	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										
MOTORS	INLET					OUTLET				
	ØD	B	A	d	e	ØD	B	A	d	e
16	12.7 (0.50")	38.1 (1.50")	17.5 (0.69")	5/16-18 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 26	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")

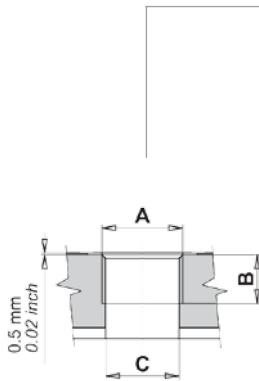


BI-DIRECTIONAL										
PUMPS	INLET					OUTLET				
	ØD	B	A	d	e	ØD	B	A	d	e
From 16 to 26	19 (0.75")	47.6 (1.87")	22.2 (0.87")	3/8-16 UNC	15 (0.59")	19 (0.75")	47.6 (1.87")	22.2 (0.87")	3/8-16 UNC	15 (0.59")

E0.146.0417.02.00IM01

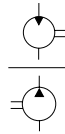


**THREADED PORTS**



**code G**

Threaded ports  
GAS (BSPP)



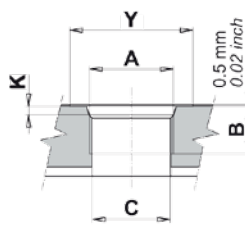
UNI-DIRECTIONAL						
MOTORS	OUTLET			INLET		
PUMPS	INLET			OUTLET		
	A	B	C	A	B	C
From 16 to 19	G 3/4	17 (0.67")	20 (0.79")	G 1/2	15 (0.59")	13 (0.79")
From 22.5 to 26	G1	22 (0.87")	25 (0.98")			



BI-DIRECTIONAL						
MOTORS	INLET			OUTLET		
	A	B	C	A	B	C
16	G 1/2	15 (0.59")	13 (0.79")	G 1/2	15 (0.59")	13 (0.79")
From 19 to 26	G 3/4	17 (0.67")	20 (0.79")	G 3/4	17 (0.67")	20 (0.79")

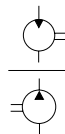


BI-DIRECTIONAL						
PUMPS	INLET			OUTLET		
	A	B	C	A	B	C
From 16 to 26	G 3/4	17 (0.67")	20 (0.79")	G 3/4	17 (0.67")	20 (0.79")



**code R**

Threaded ports  
SAE (ODT)



UNI-DIRECTIONAL										
MOTORS	OUTLET					INLET				
PUMPS	INLET					OUTLET				
	A	B	C	Y	K	A	B	C	Y	K
From 16 to 19	1-1/16-12 UN (SAE 12)	19 (0.75")	20 (0.79")	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 26										



BI-DIRECTIONAL										
MOTORS	INLET					OUTLET				
	A	B	C	Y	K	A	B	C	Y	K
16	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 19 to 26	1-1/16-12 UN (SAE 12)	19 (0.75")	20 (0.79")	41 (1.61")	3.3 (0.13")	1-1/16-12 UN (SAE 12)	19 (0.75")	20 (0.79")	41 (1.61")	3.3 (0.13")

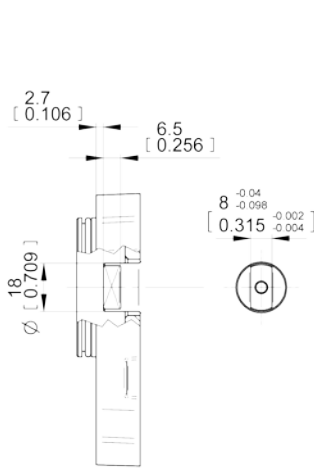


BI-DIRECTIONAL										
PUMPS	INLET					OUTLET				
	A	B	C	Y	K	A	B	C	Y	K
From 16 to 26	1-1/16-12 UN (SAE 12)	19 (0.75")	20 (0.79")	41 (1.61")	3.3 (0.13")	1-1/16-12 UN (SAE 12)	19 (0.75")	20 (0.79")	41 (1.61")	3.3 (0.13")

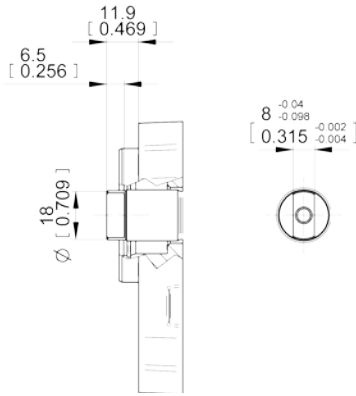
EO.146.0417.02.001M01



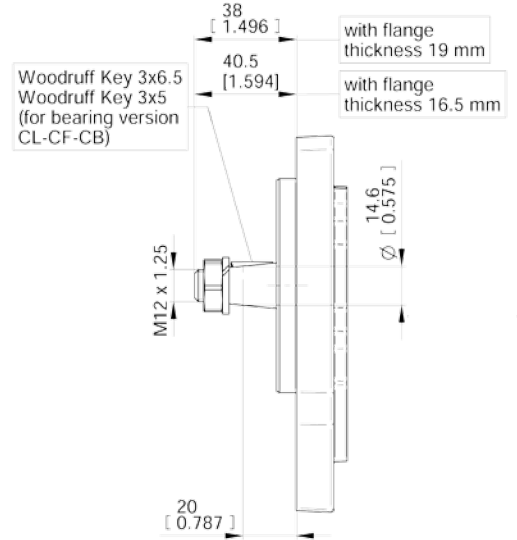
DRIVE SHAFTS



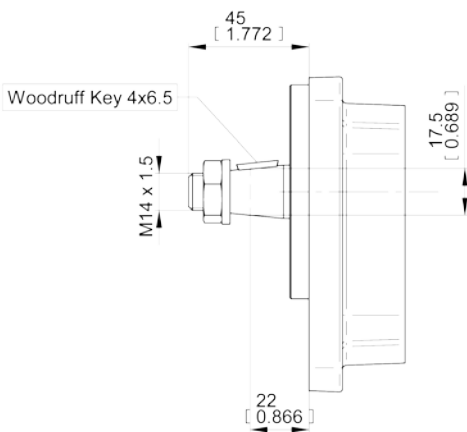
**code 03** Max torque 70 Nm (620 lbf in)  
**Tang drive for electric motors**  
Without shaft seal



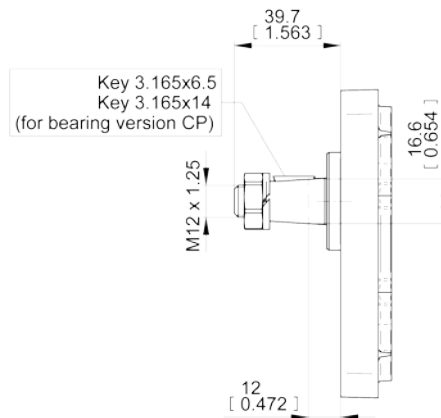
**code 04** Max torque 70 Nm (620 lbf in)  
**Tang drive**



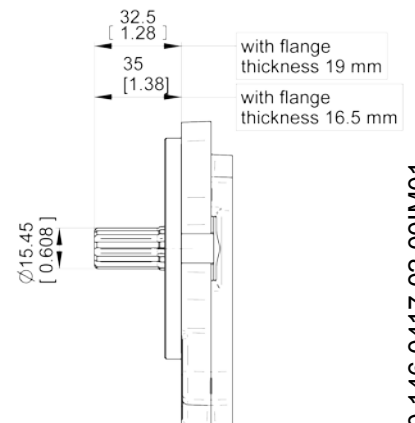
**code 25** Max torque 130 Nm (1151 lbf in)  
**Tapered 1:5**



**code 26** Max torque 120 Nm (1062 lbf in)  
**Tapered 1:5 (only for CB, CL, CF)**



**code 28** Max torque 130 Nm (1151 lbf in)  
**Tapered 1:8**

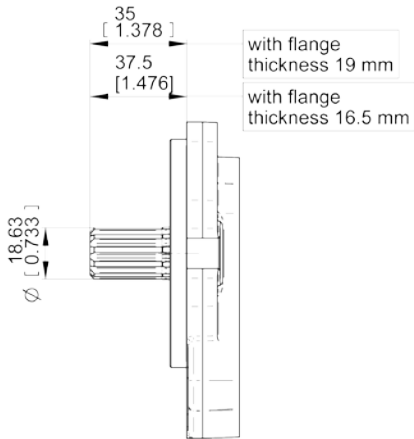


**code 52** Max torque 110 Nm (974 lbf in)  
**SAE A 9T-16/32DP**

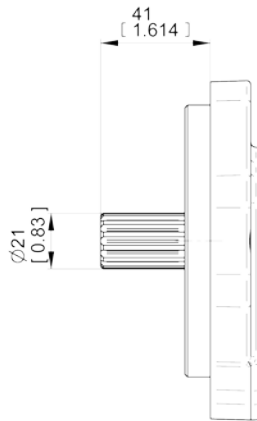
E0.146.0417.02.00IM01



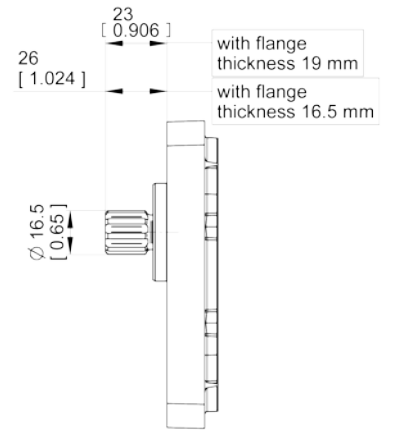
**DRIVE SHAFTS**



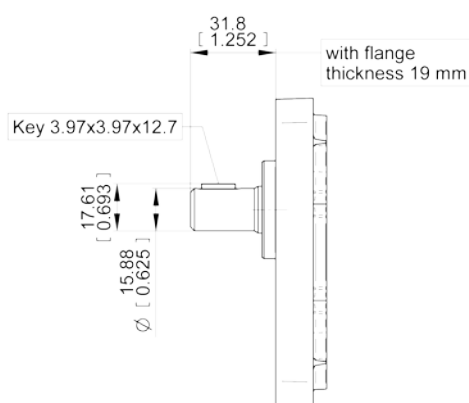
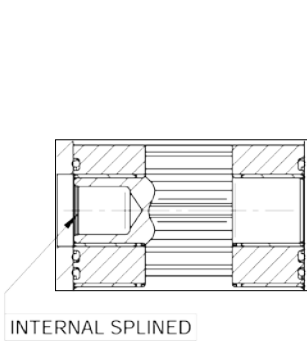
**code 54** Max torque 160 Nm (1416 lbt in)  
**SAE A 11T-16/32DP**



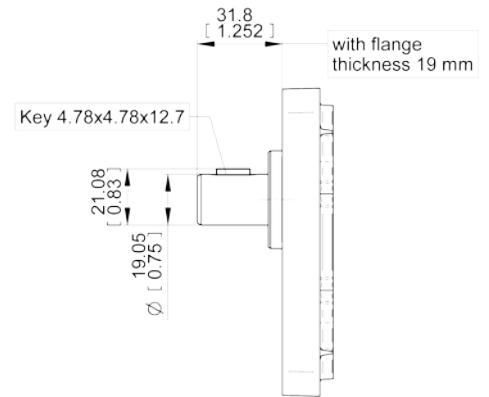
**code 55** Max torque 200 Nm (1770 lbt in)  
**SAE B 13T-16/32DP**



**code 62** Max torque 140 Nm (1239 lbt in)  
**9 teeth DIN 5482 splined**



**code 60** Max torque 110 Nm (974 lbt in)  
**DIN 5480 internal splined**  
 (only for rear pumps)



**code 82** Max torque 75 Nm (664 lbt in)  
**5/8" SAE A parallel**

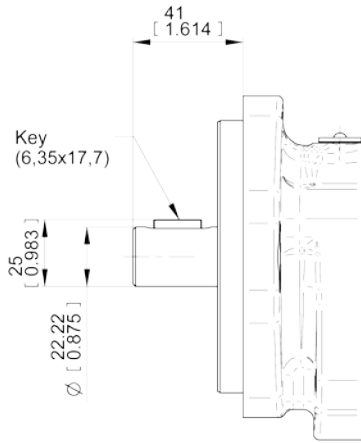
**code 85** Max torque 110 Nm (974 lbt in)  
**3/4" SAE A parallel**

EO.146.0417.02.001M01

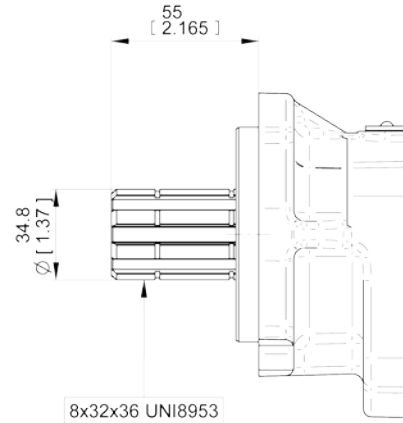




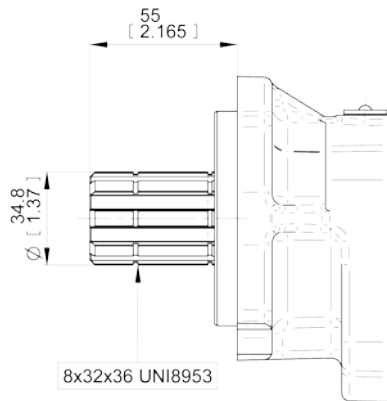
DRIVE SHAFTS



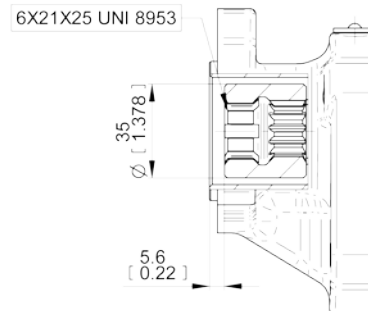
**code 87** Max torque 200 Nm (1770 lbt in)  
**SAE B parallel**



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



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

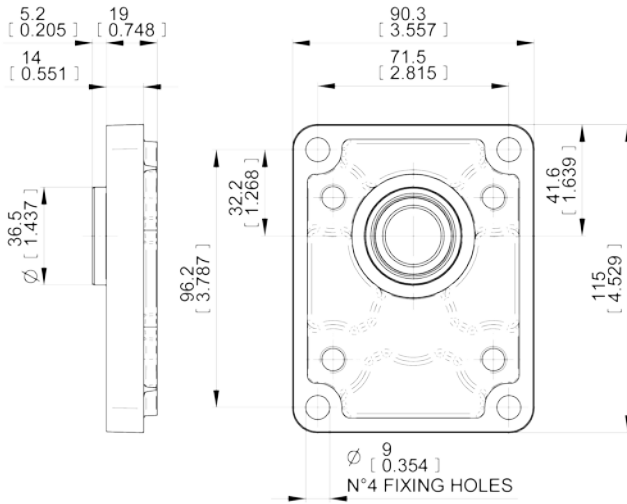


**code 73** Max torque 200 Nm (1770 lbt in)  
**6x21x25 UNI 8953**

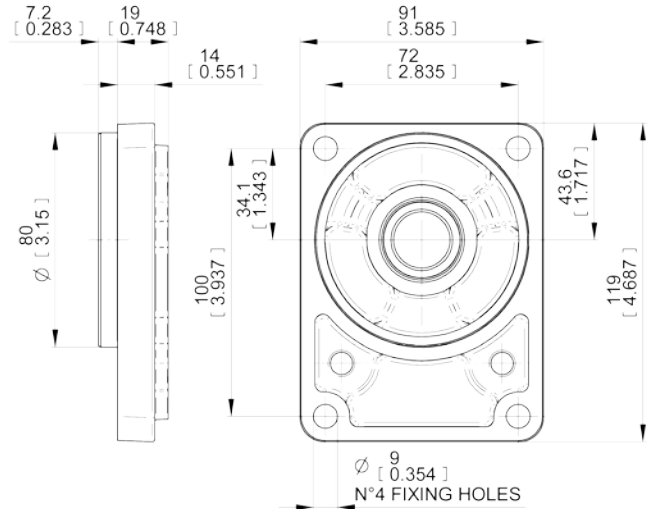
E0.146.0417.02.00IM01



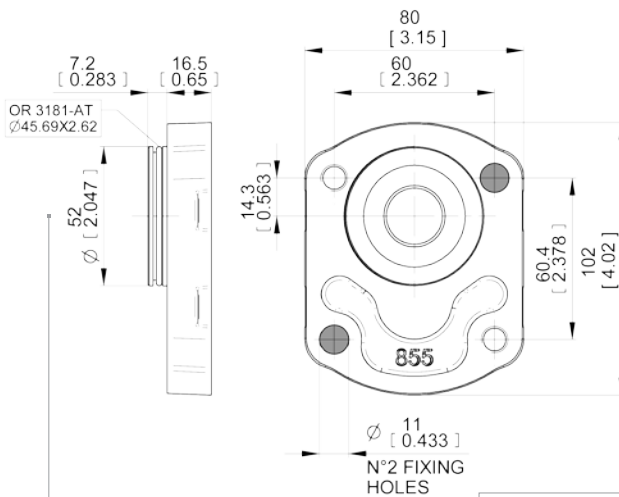
**MOUNTING FLANGES**



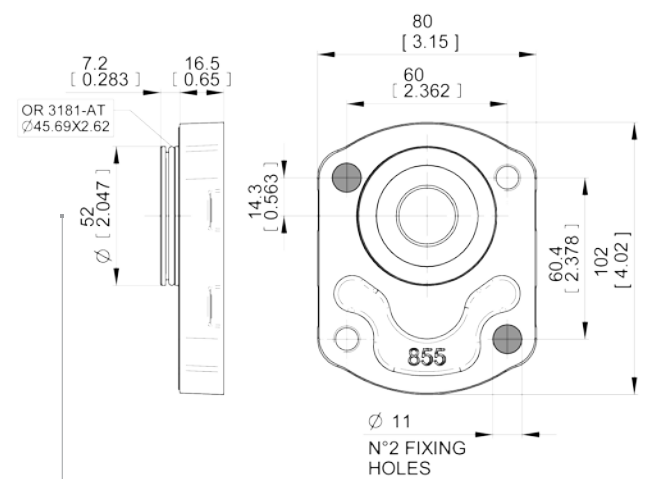
**P1** European standard  
 With shaft code 28-62-82-85



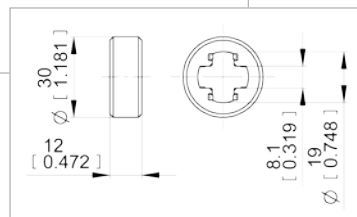
**B1** German standard  
 With shaft code 25-62



**B2** German standard  
 With shaft code 03



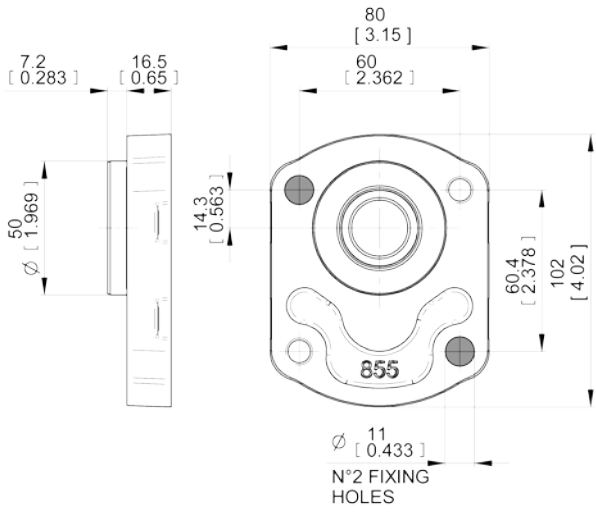
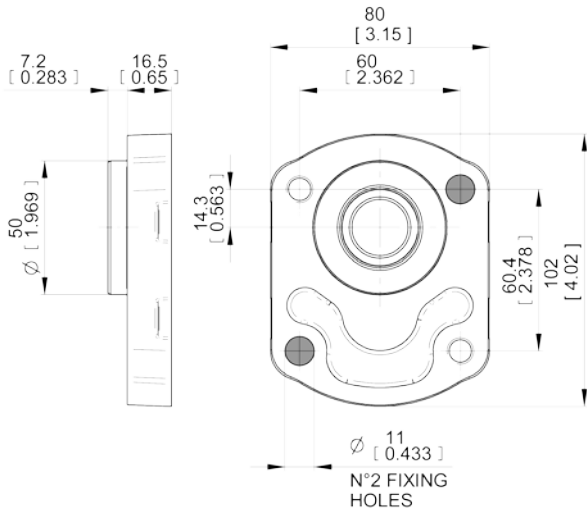
**B3** German standard  
 With shaft code 03



EO.146.0417.02.001M01



MOUNTING FLANGES



**B4**

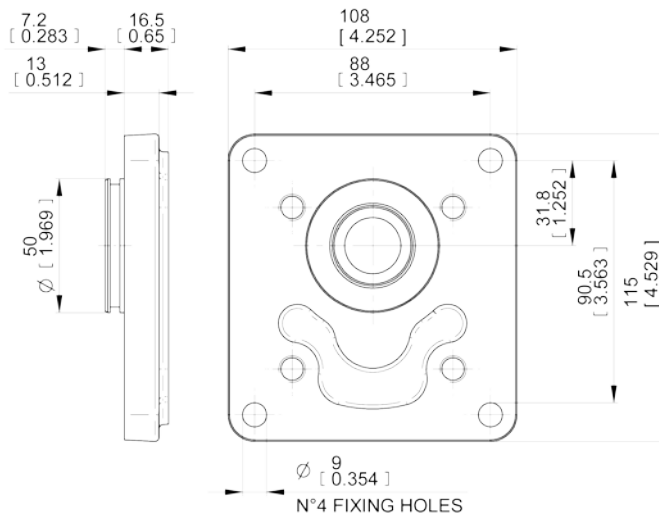
**German standard**

With shaft code 04-25-62

**B5**

**German standard**

With shaft code 04-25-62



**C1**

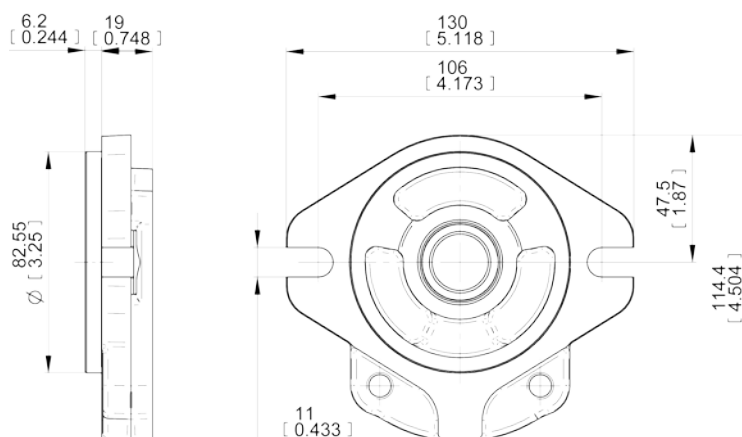
**4 bolts for Iveco engines**

With shaft code 62

E0.146.0417.02.00IM01



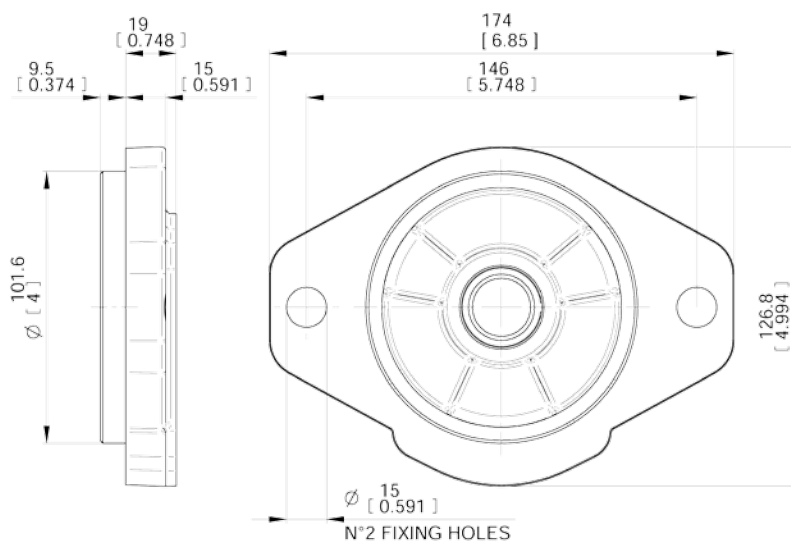
**MOUNTING FLANGES**



**S2**

**SAE A 2 Bolts**

With shaft code 52-54-82-85



**S3**

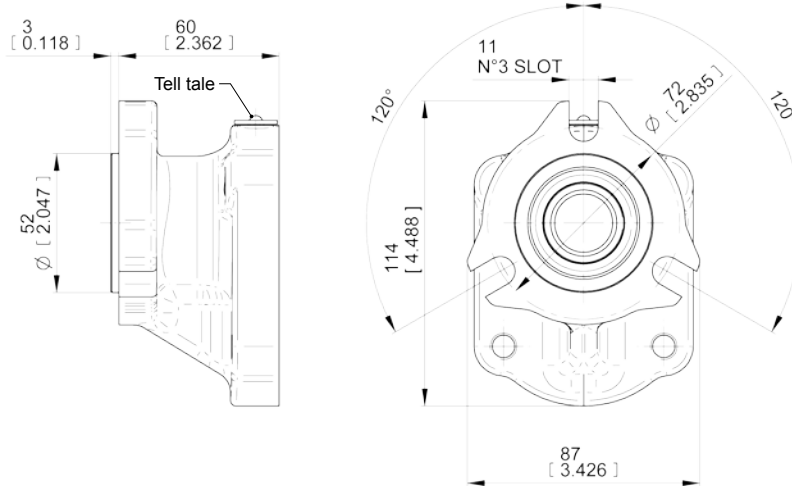
**SAE B 2 Bolts**

With shaft code 55

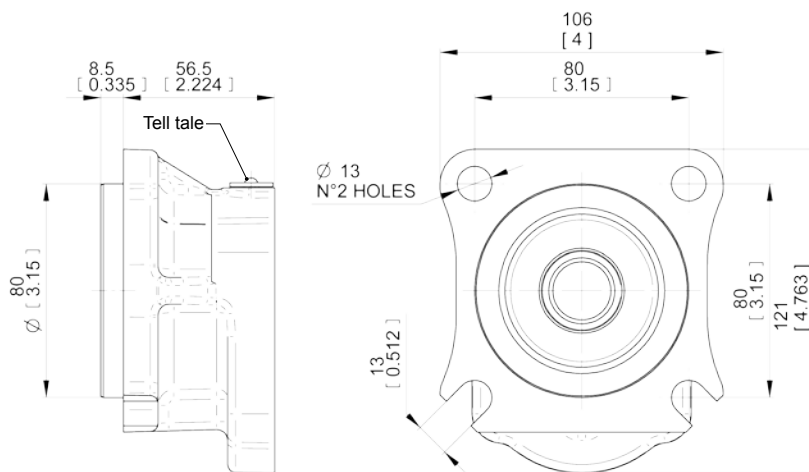
EO.146.0417.02.001M01



MOUNTING FLANGES



<b>T1</b>	<b>3 Bolts UNI 8953 for gear box</b>
With shaft code 73	



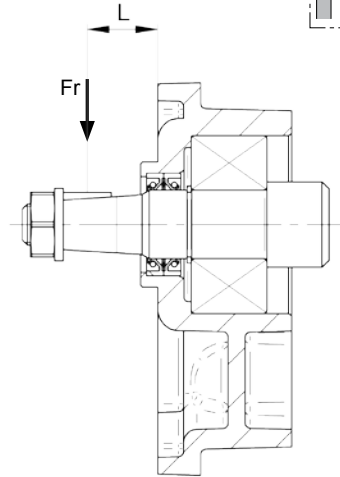
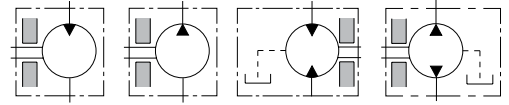
<b>Z2</b>	<b>4 Bolts for ZF gear box</b>
With shaft code 67	

E0.146.0417.02.00IM01



**OUTRIGGER BEARING**

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

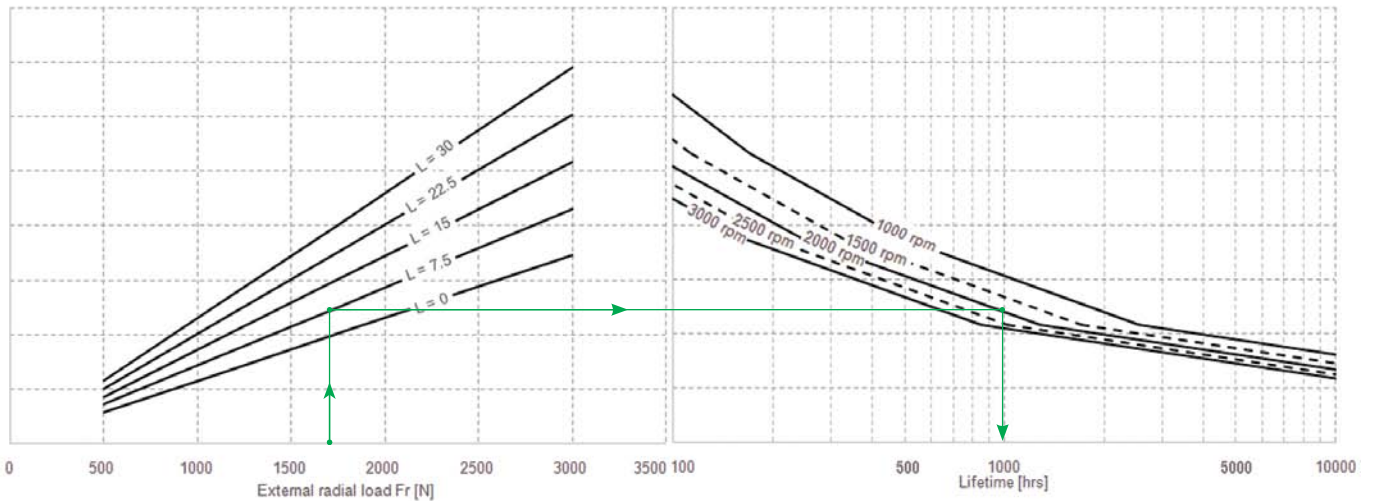


L=Distance between mounting flange and radial force point of application.

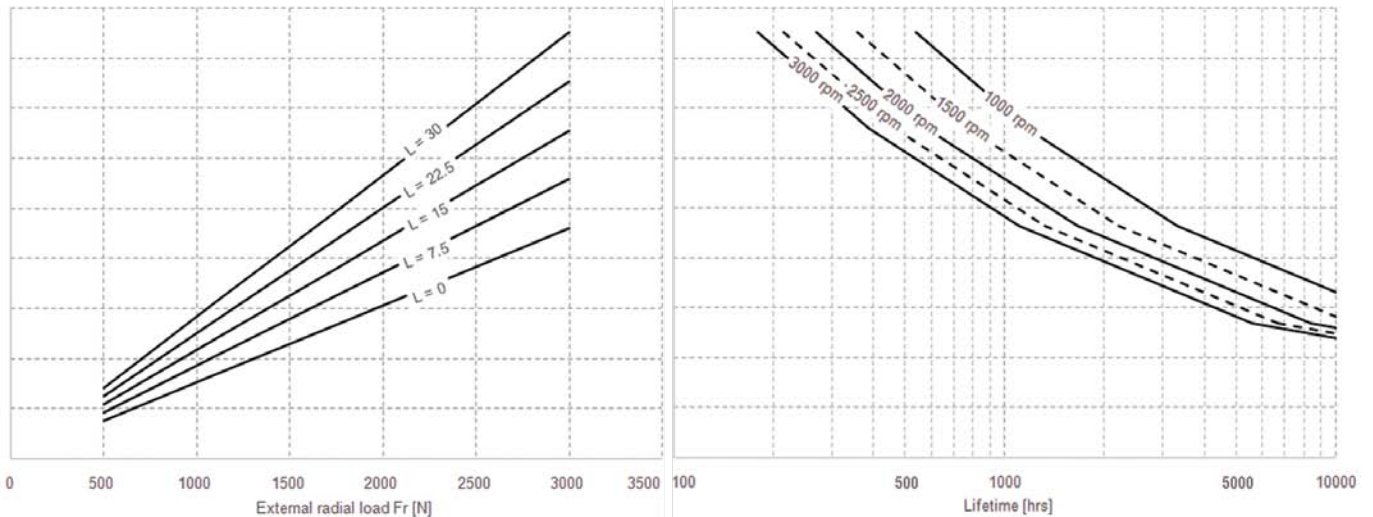
Example:  
 Fr = 1700 N  
 L = 7.5  
 Speed = 2000 rpm  
 → Expected life: 1000 hrs

TYPE	H
16	67.5 (2.66")
19	75.6 (2.97")
22.5	81 (3.19")
26	86.6 (3.42")

For Code CP-CB-CL-CS



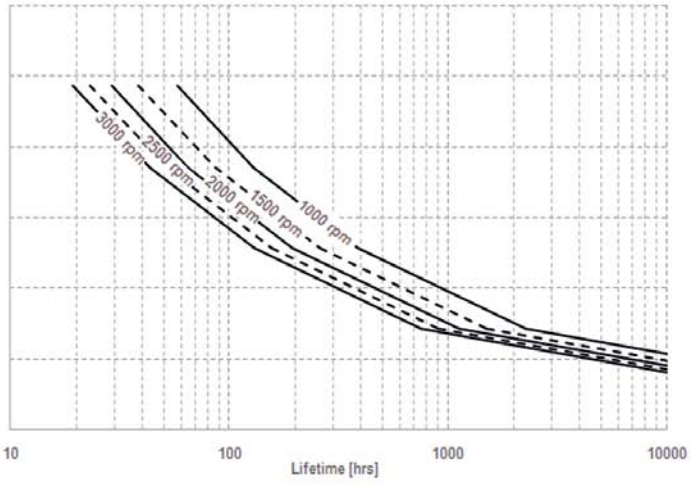
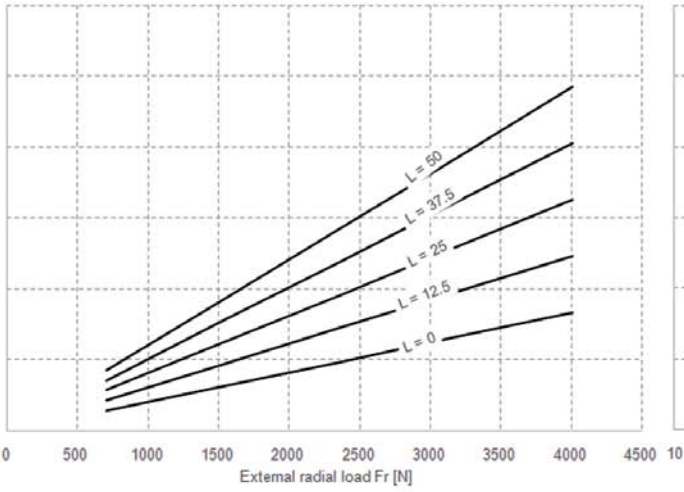
For Code CF



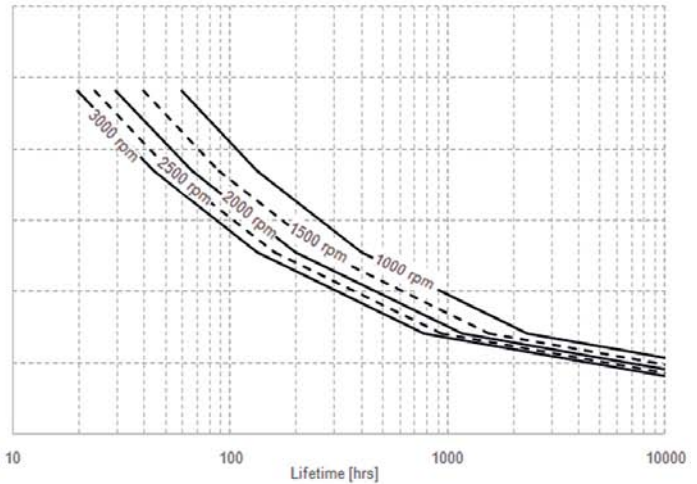
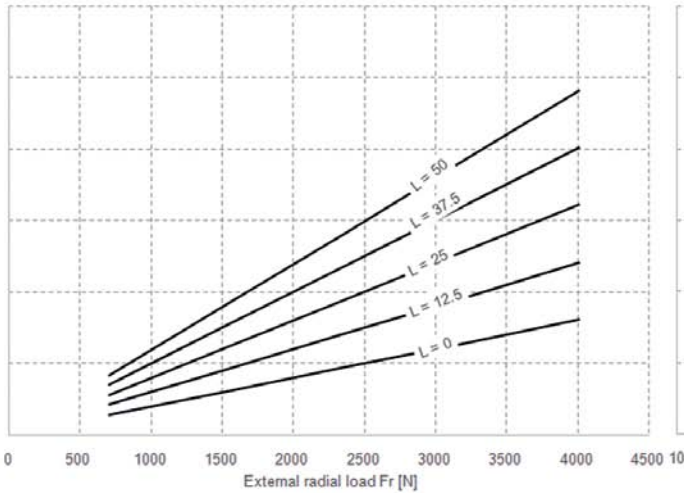
EO.146.0417.02.001M01



For Code Z1



For Code CSB

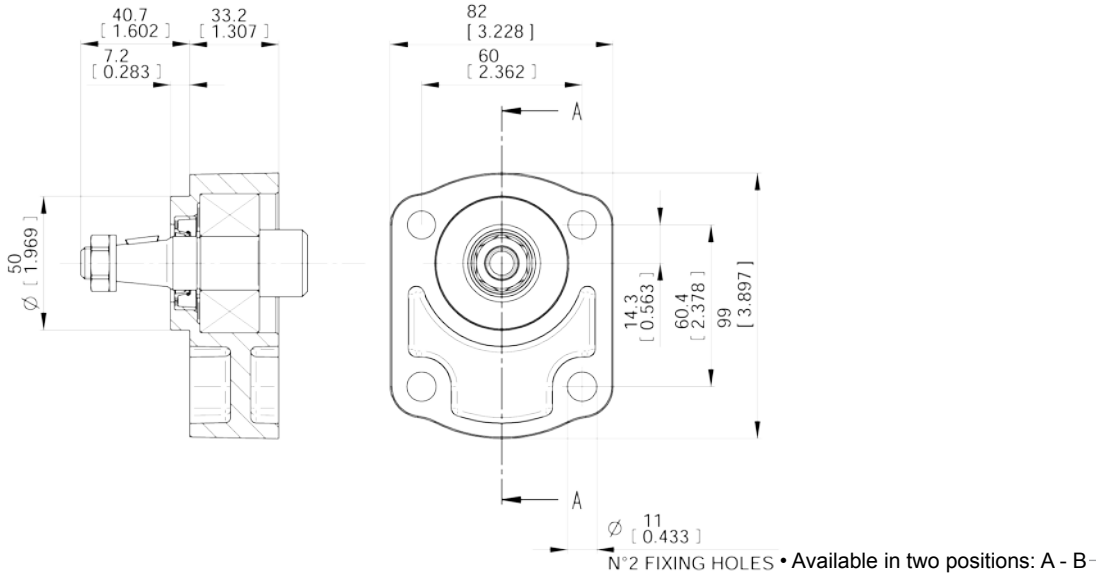


E0.146.0417.02.00IM01



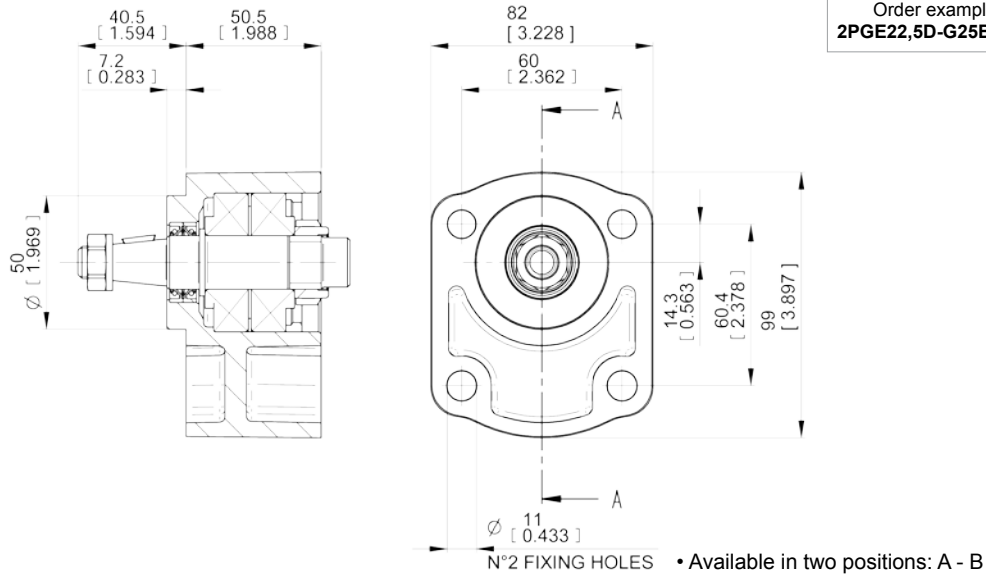
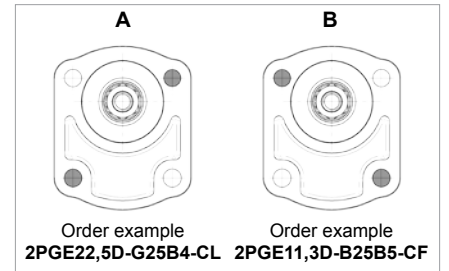


**ALUMINIUM MOUNTING FLANGES WITH BEARING**



Example with shaft code 25

<b>CL</b>	<b>For engine endothermic motors</b>
With shaft code 25-26	



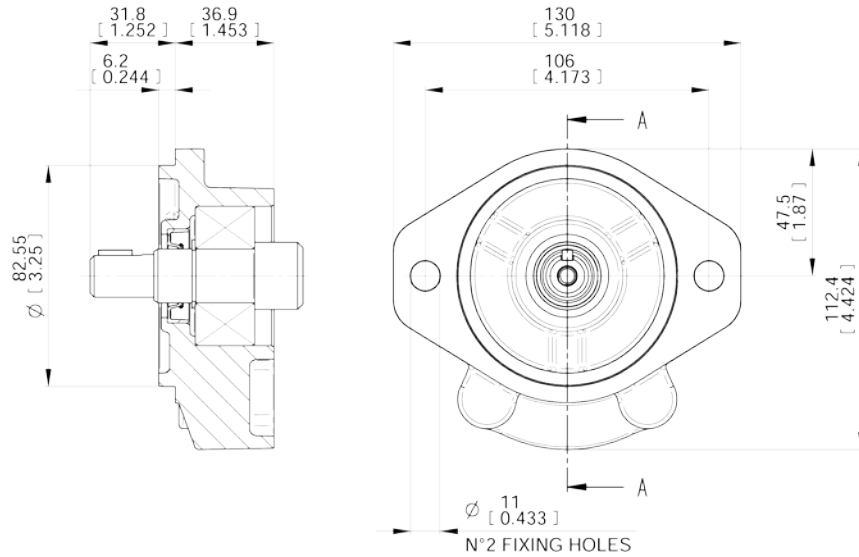
Example with shaft code 25

<b>CF</b>	<b>For endothermic motors</b>
With shaft code 25-26	

EO.146.0417.02.001M01

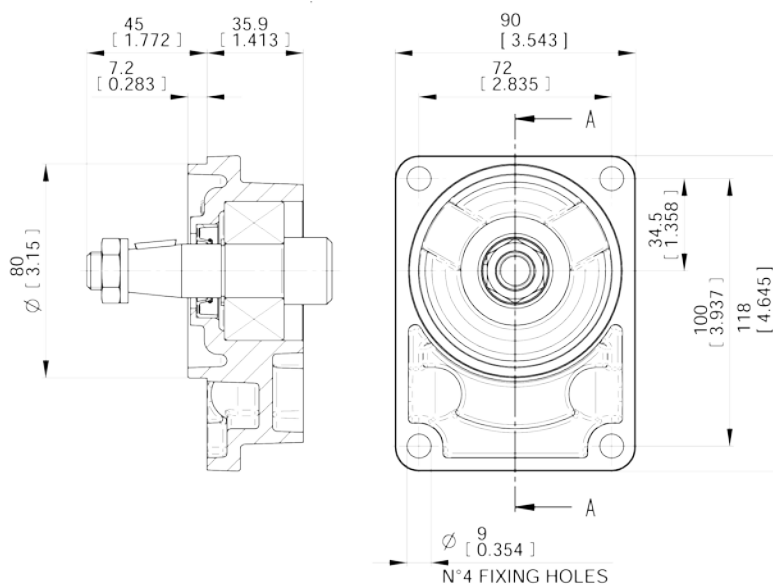


ALUMINIUM MOUNTING FLANGES  
WITH BEARING



Example with shaft code 82

<b>CS</b>	<b>SAE A</b>
With shaft code 52-54-82-85	



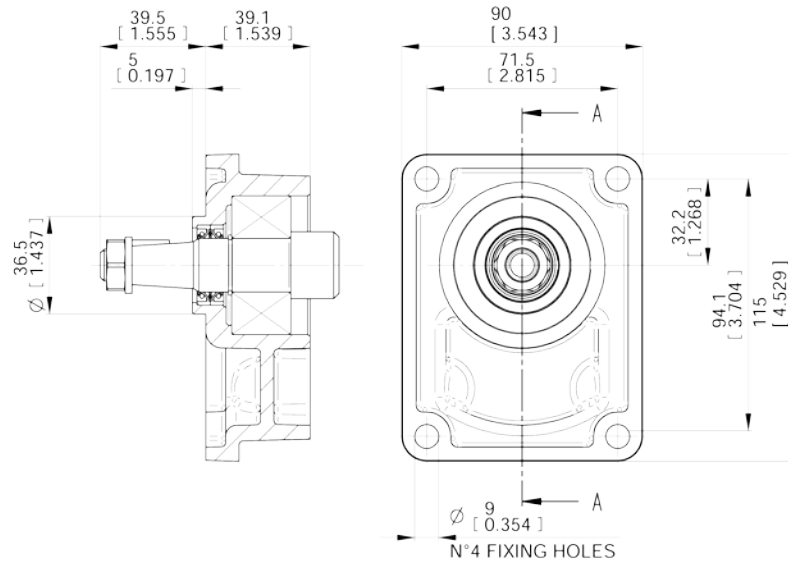
Example with shaft code 82

<b>CB</b>	<b>German standard</b>
With shaft code 25-26	

E0.146.0417.02.00IM01

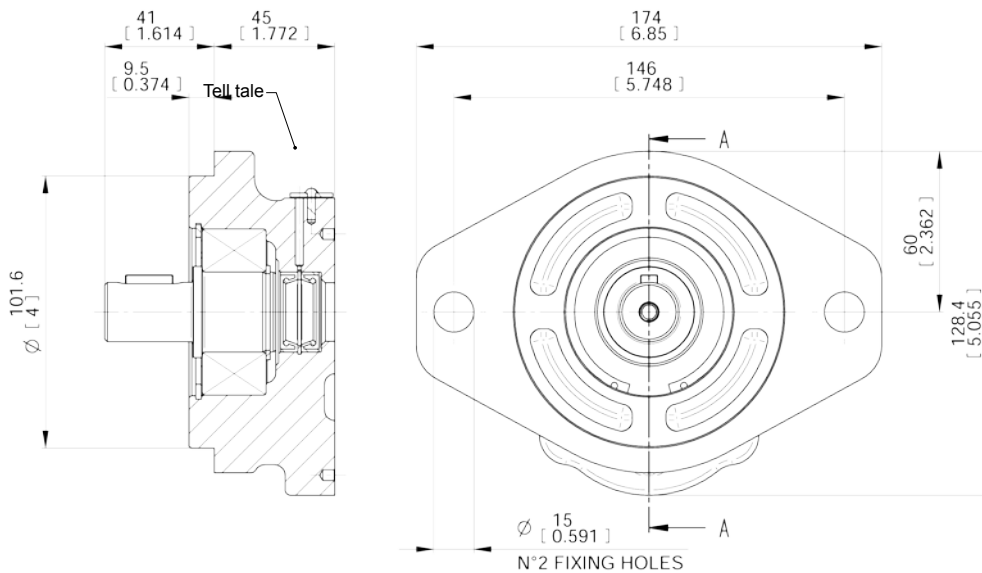


**ALUMINIUM MOUNTING FLANGES WITH BEARING**



<b>CP</b>	<b>European standard</b>
With shaft code 28	

**CAST IRON MOUNTING FLANGES WITH BEARING**

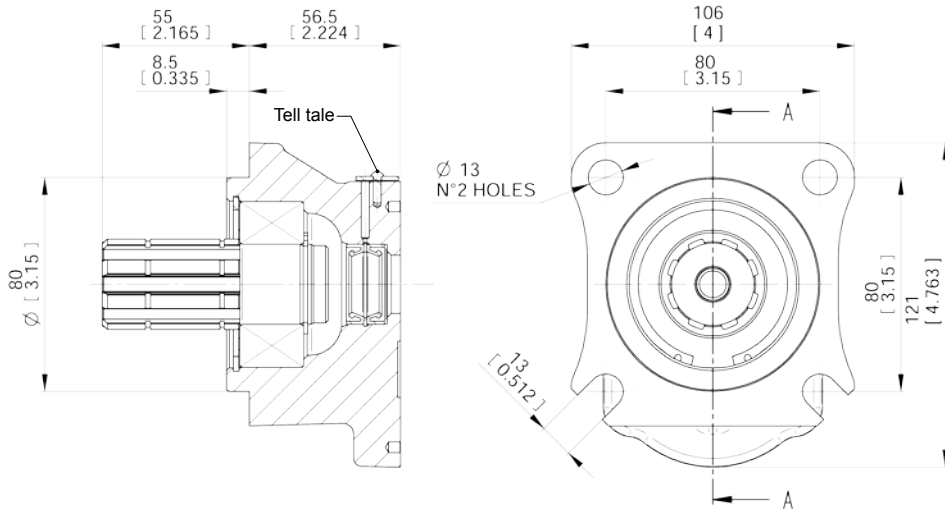


<b>CSB</b>	<b>SAE B</b>
With shaft code 87	

EO.146.0417.02.001M01

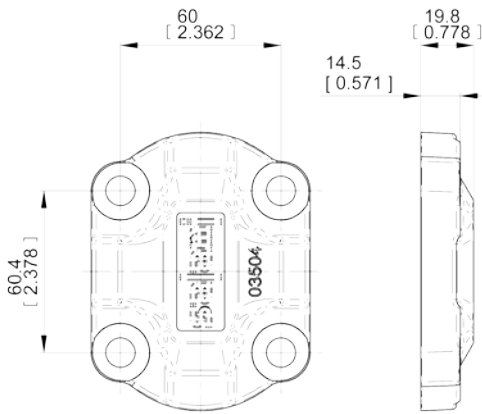


CAST IRON MOUNTING FLANGES  
WITH BEARING

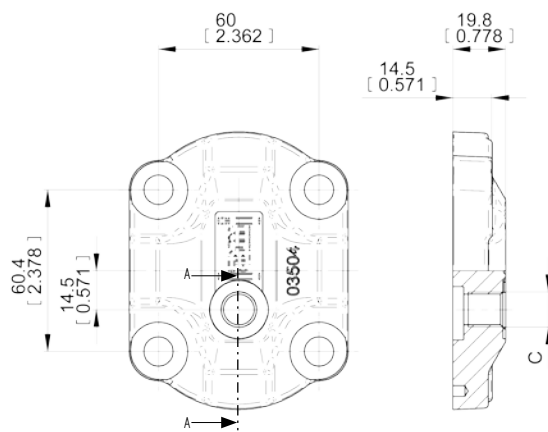


<b>Z1</b>	<b>4 Bolts for ZF gear box</b>
With shaft code 66	

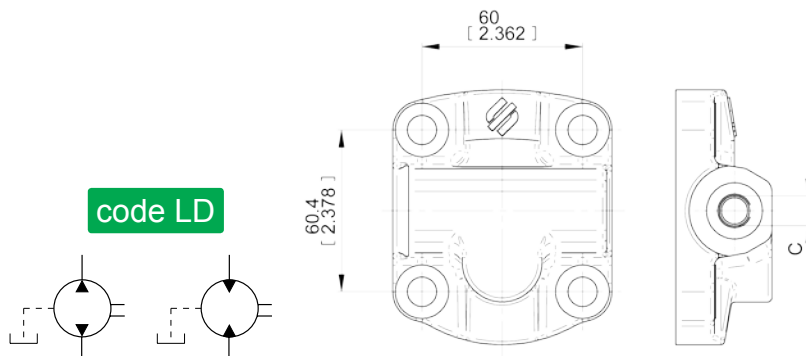
REAR COVERS



STANDARD REAR COVER



STANDARD REAR COVER WITH EXTERNAL DRAIN C



REAR COVER WITH LATERAL DRAIN

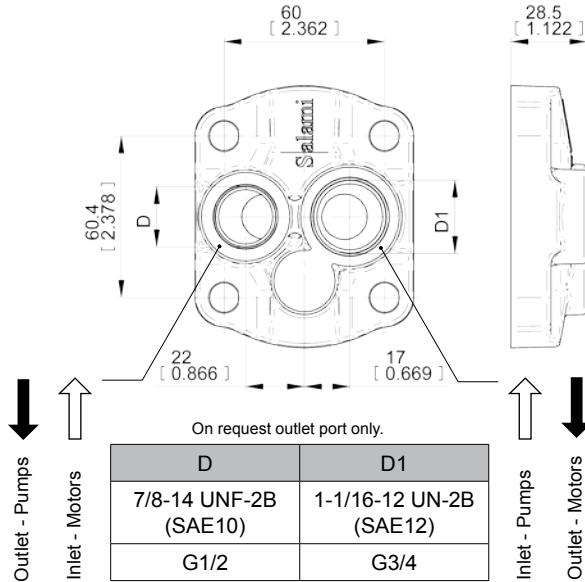
code LD

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

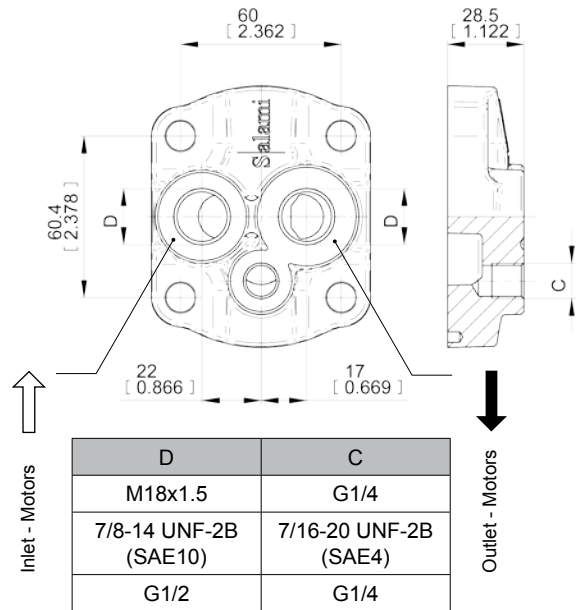
E0.146.0417.02.00IM01



**code 1** REAR COVER WITH REAR PORTS



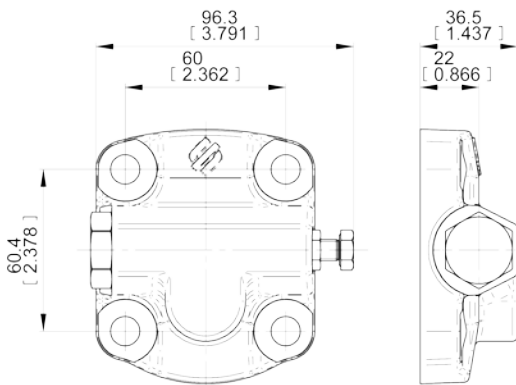
**code 1** REAR COVER WITH REAR PORTS AND EXTERNAL DRAIN ONLY FOR MOTORS



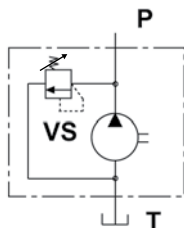
For rear ports if requested please advise type using.  
 For motors with threaded rear ports up to 22 l/min delivery note.

**REAR COVERS WITH VALVES**

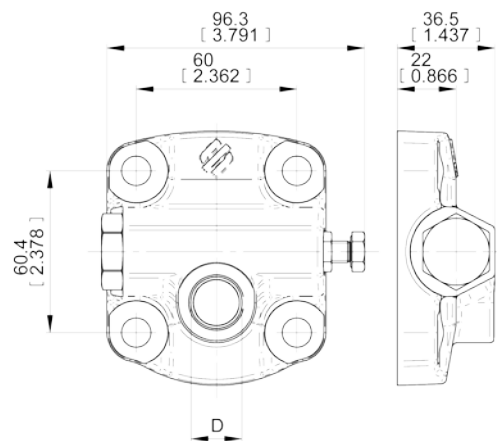
**code VS** INTERNAL DISCHARGE



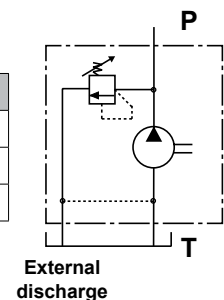
**MAIN RELIEF VALVE**  
 setting ranges  
 30-60 bar  
 61-120 bar  
 121-170 bar  
 171-250 bar



**code VSE** EXTERNAL DISCHARGE



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



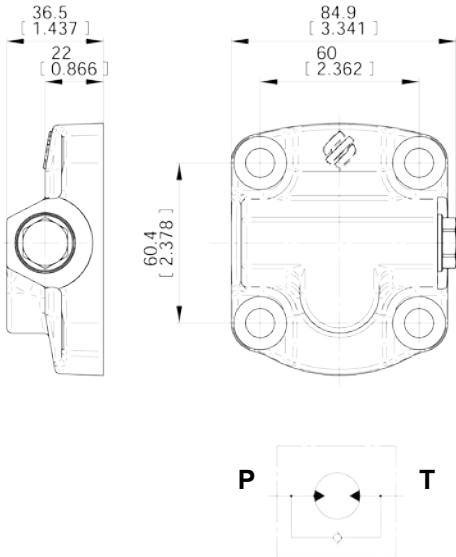
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REAR COVERS WITH VALVES

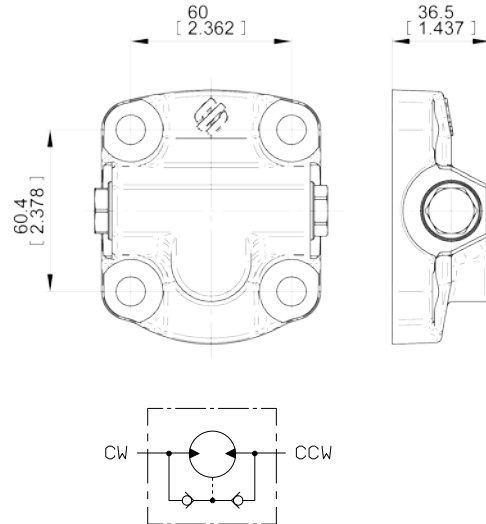
code VR

ANTI-CAVITATION VALVE  
- ONLY FOR MOTORS

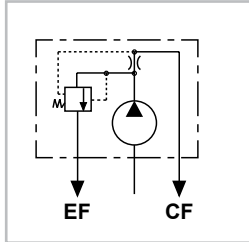


code IDV

REAR COVERS WITH  
INTERNAL DRAIN



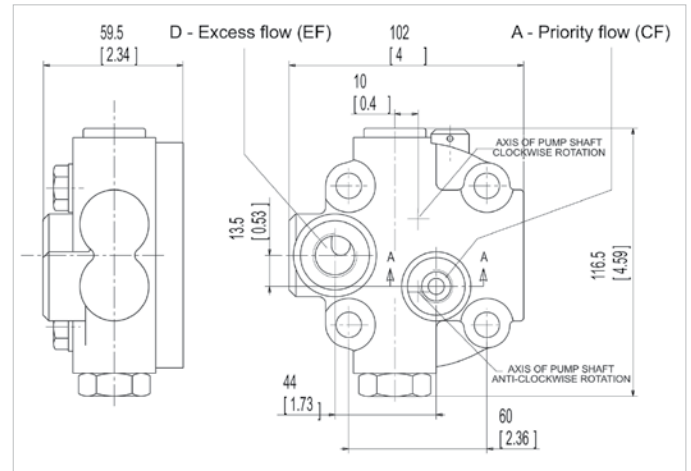
**PRESSURE COMPENSATED  
PRIORITY FLOW VALVE**



**code VP**

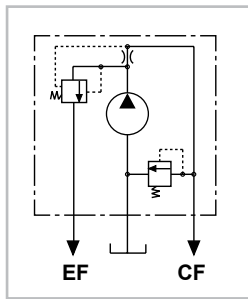
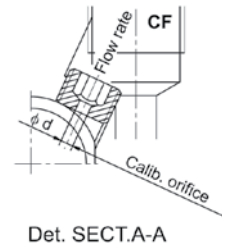
**code VP1**

Priority flow valve, excess flow to second actuator.



VP - VPS  
REAR PORTS

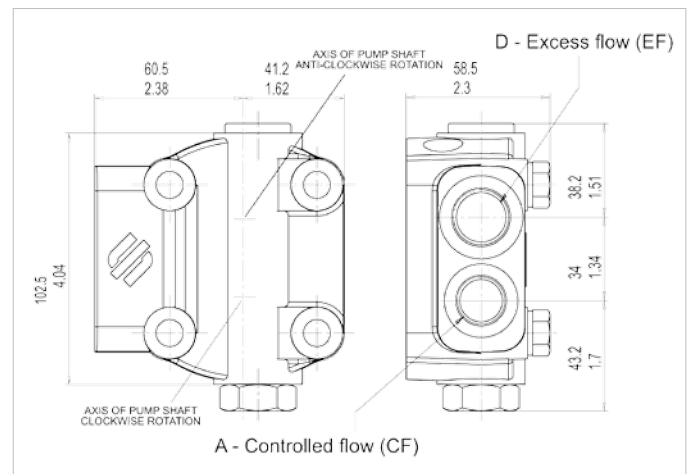
A	D
G 3/8	G 1/2
SAE6 9/16-18 UNF-2B	SAE8 3/4 - 16 UNF - 2B



**code VPS**

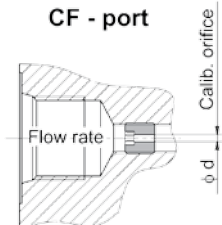
**code VPS1**

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



VP1 - VPS1  
SIDE PORTS

**CF - port**



CALIBRATED ORIFICE $\Phi d$ (mm/inch)	FLOW RATE (l/min - gpm) $\pm 10\%$
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 )**

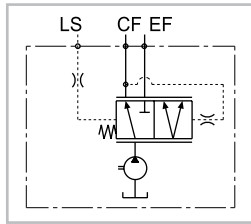
These are basically the same as VR valves differing only because the two flows can be loaded at the same time for supplying two separate circuits defined priority flow remains constant regardless of pump speed and system pressure variations. The second defined excess flow is directly proportional to pump speed. Priority flow is determined by diameter of hole on threaded dowel (see table). The max. pressure of the priority circuit can be limited by valve which relieves into pump suction.

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

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**LOADS SENSING PRIORITY VALVES**

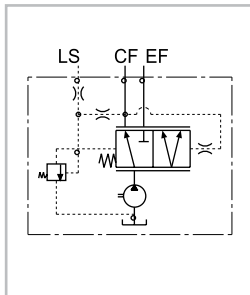


**code VPD**

**code VPD1**

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

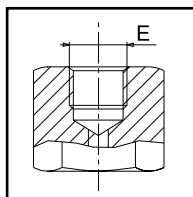
CF = Priority flow port  
EF = Excess flow port  
LS = Load sensing signal port



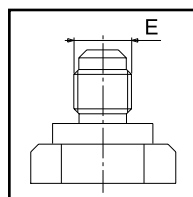
**code VPDS**

**code VPDS1**

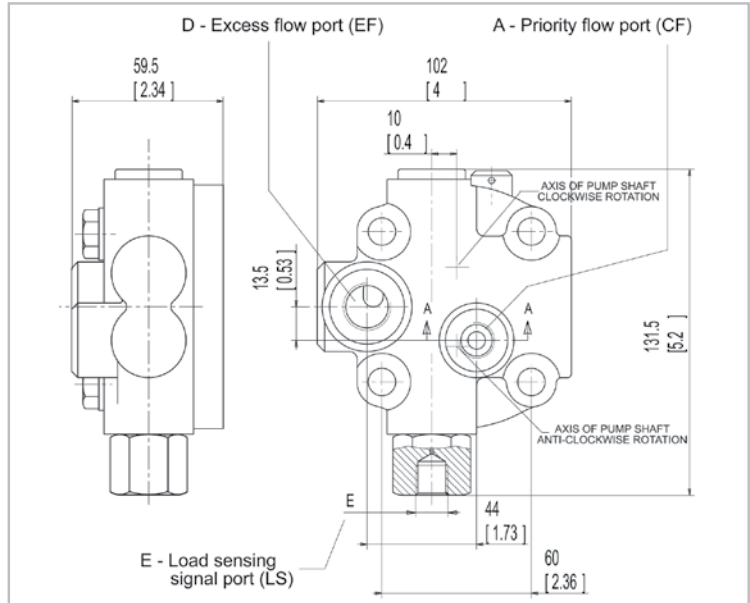
Load sensing priority valve with dynamic signal with main relief valve.



Female fitting

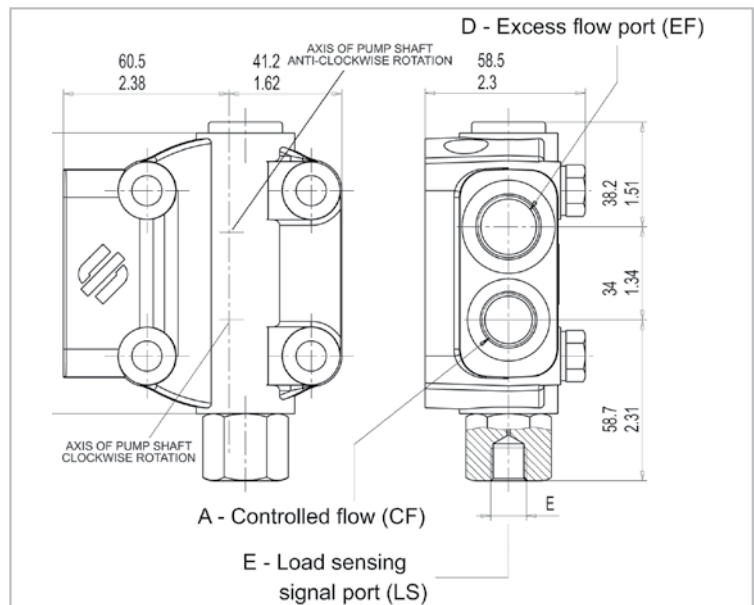


Male fitting



VPD - VPDS Minimum load sensing signal (LS) = 4 bar (28 psi)  
REAR PORTS

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



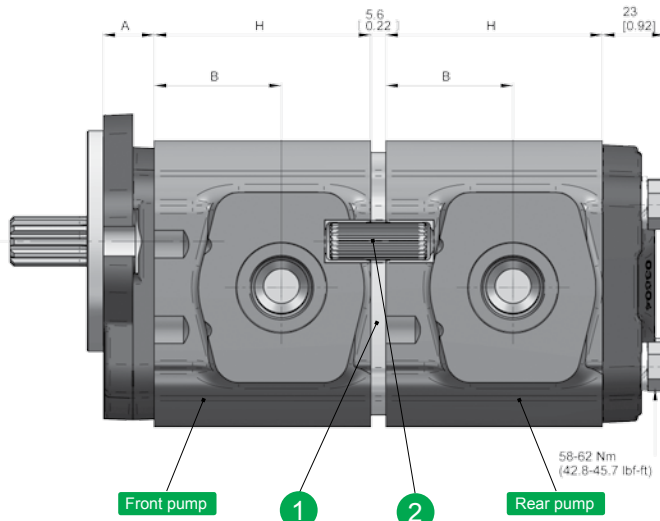
VPD1 - VPDS1 Minimum load sensing signal (LS) = 4 bar (28 psi)  
SIDE PORTS

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

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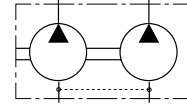
**MULTIPLE GEAR PUMPS  
ASSEMBLING DIMENSIONS**



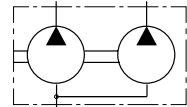
This is a Salami standard pump, all drive shafts have a splined end.

Kit multiple pumps

These units are pre-arranged for multiple pumps, they have the drive shaft code 60.



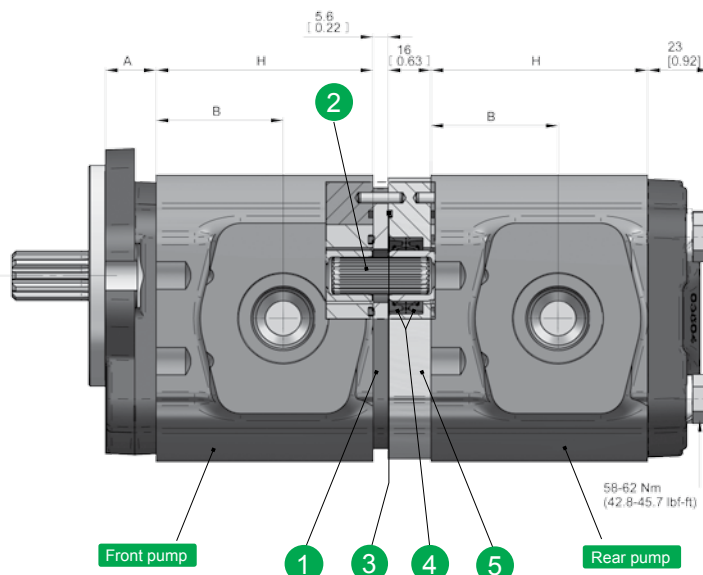
**MULTIPLE GEAR PUMPS with inlet port on each body**



**MULTIPLE GEAR PUMPS with common inlet port\***

The 2PGE pumps can be easily transformed into front pump in the multiple units. All drive shafts are pre-arranged and have a splined end according to 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.

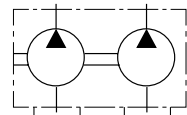
Type		16	19	22.5	26
Dimension A (flanges B4 - B5 - C1)	mm	16.5			
	in	0.65			
Dimension A (flanges P1 - S2 - B1 - S3)	mm	19			
	in	0.75			
Dimension B	mm	39.5	39.5	47.5	47.5
	in	1.56	1.56	1.87	1.87
Dimension H	mm	67.5	75.6	81	86.8
	in	2.65	2.97	3.19	3.42



This is a Salami standard pump, all drive shafts have a splined end.

Kit multiple pumps with separated stages for different fluid (2 tanks)

These units are pre-arranged for multiple pumps, they have the drive shaft code 60.



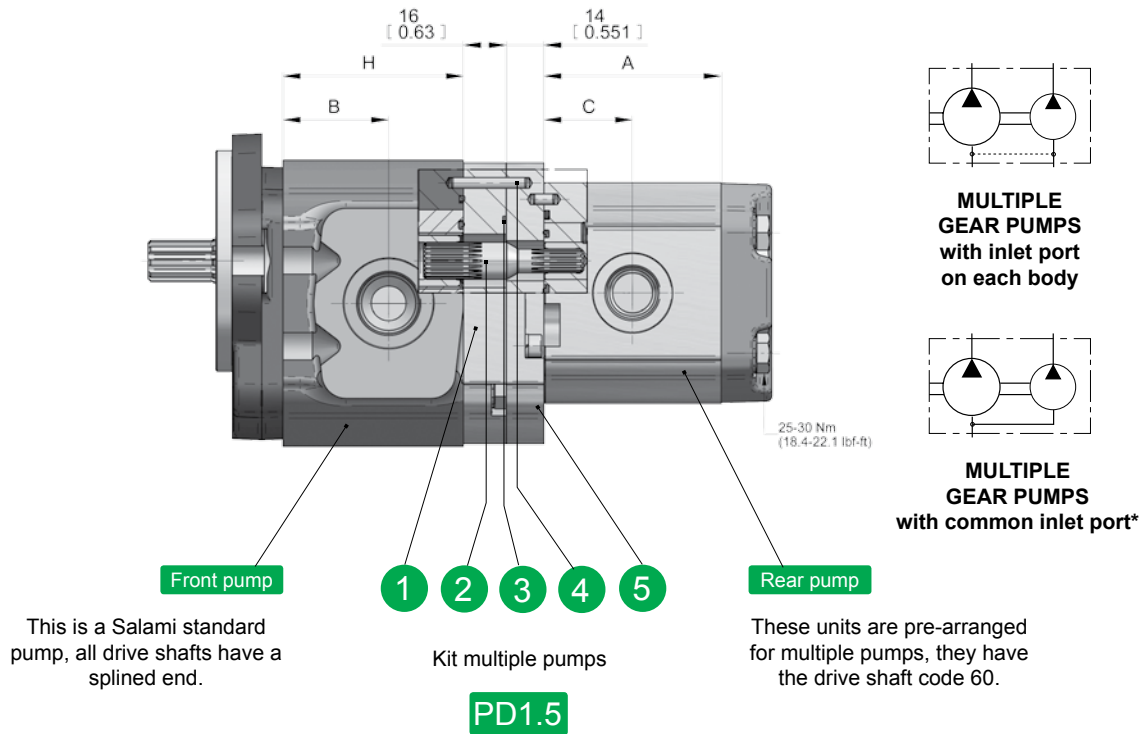
**code AS**

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2PGE COMBINATION WITH PUMP 1.5PE



1.5PE-Type		1.4	2.1	2.8	3.5	4.1	5.2	6.2	7.6	9.3	11
Dimension A	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	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

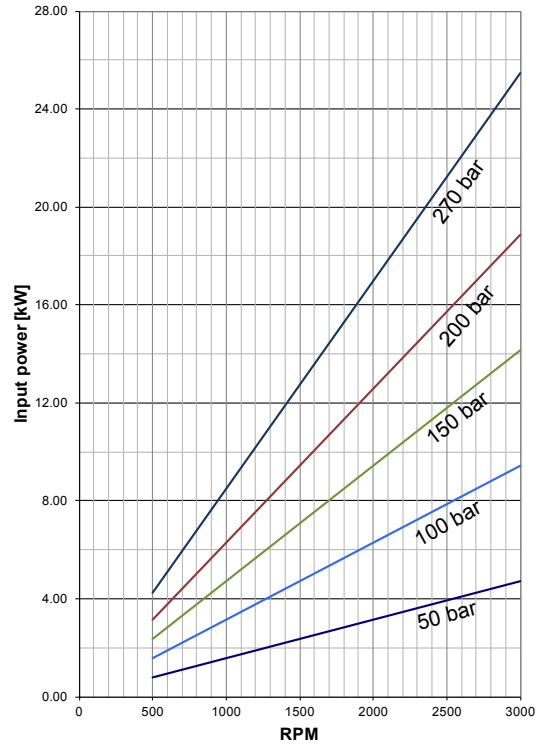
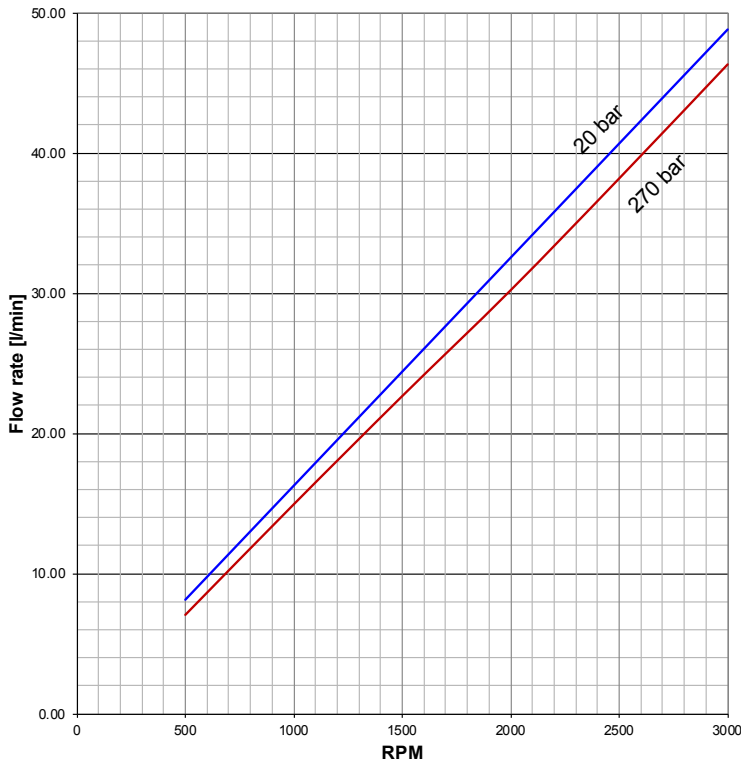
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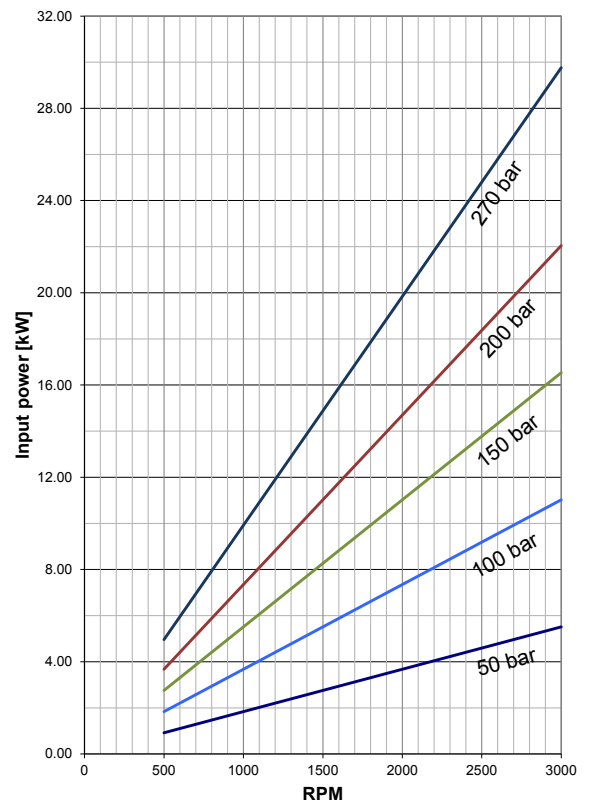
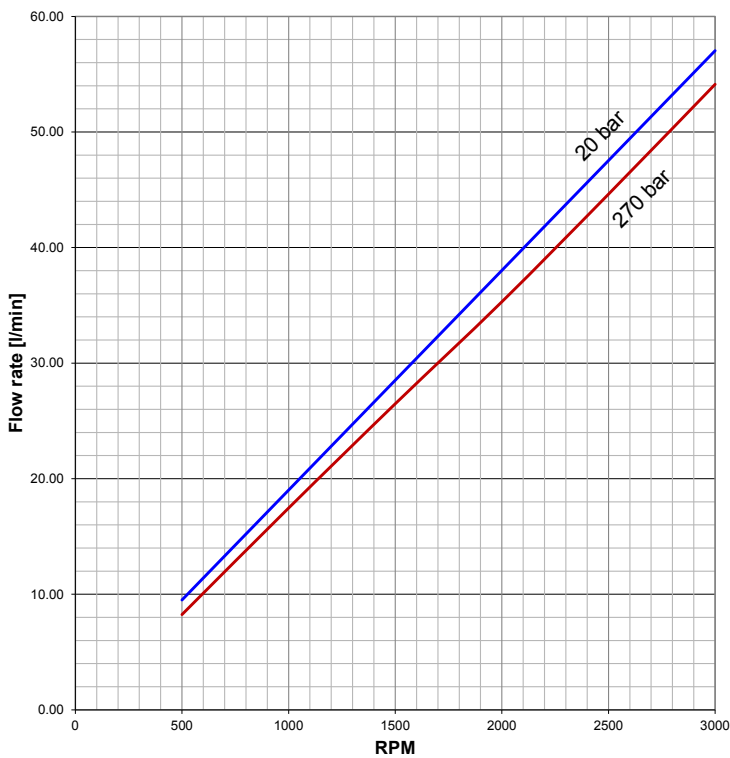
**PUMPS PERFORMANCE CURVES**

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

**2PGE - 16**



**2PGE - 19**



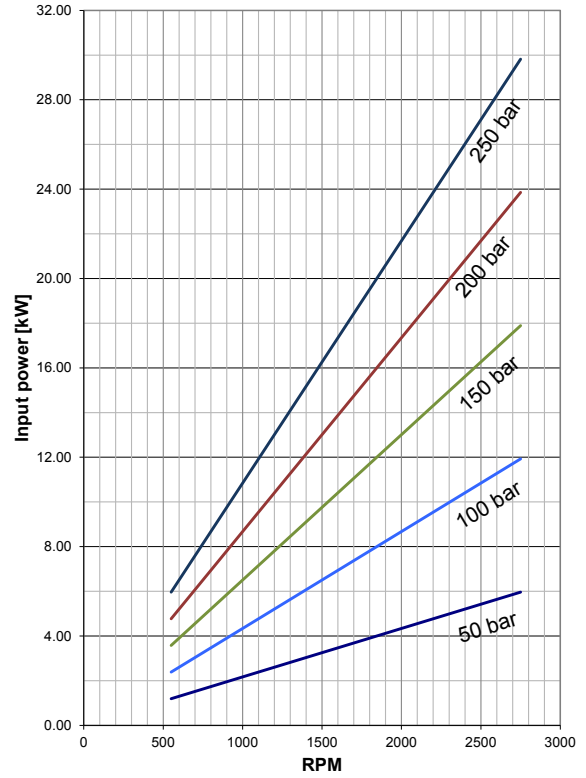
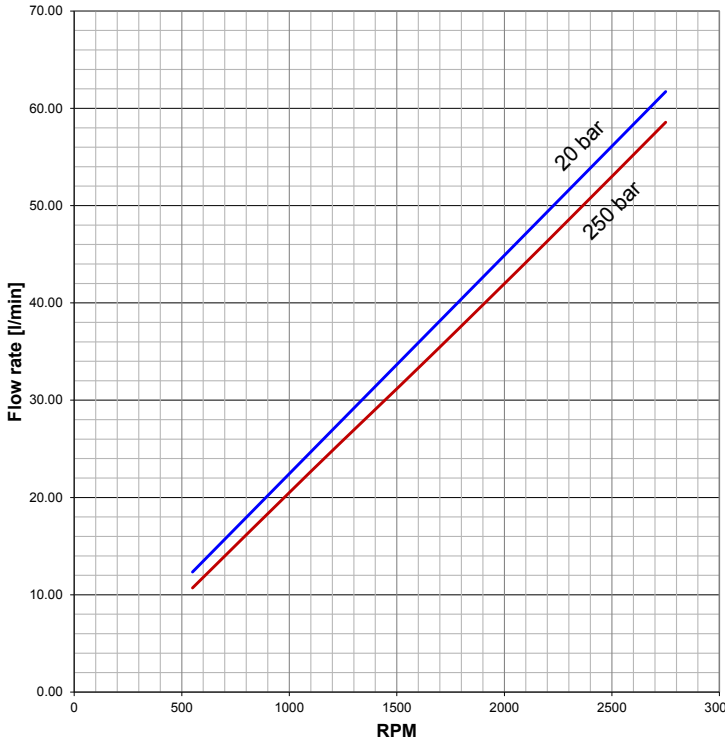
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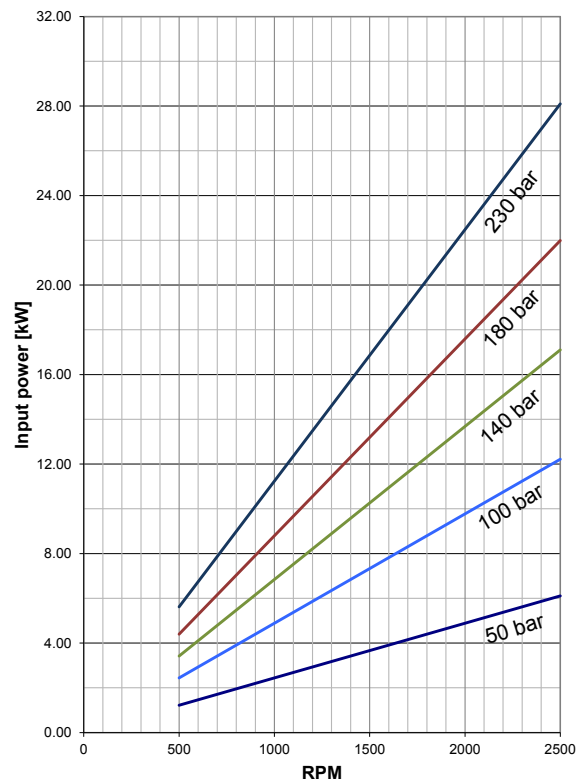
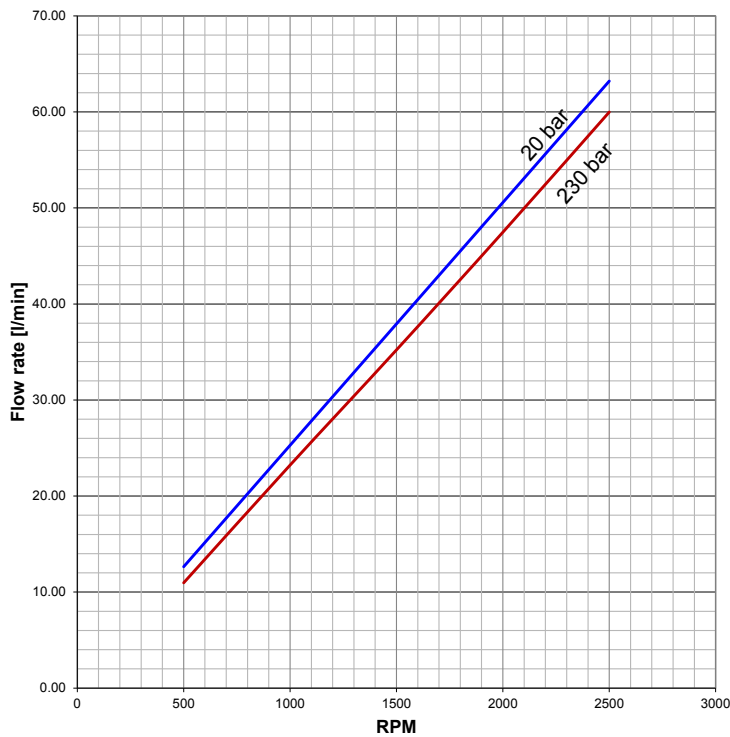
### PUMPS PERFORMANCE CURVES

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

#### 2PGE - 22.5



#### 2PGE - 26



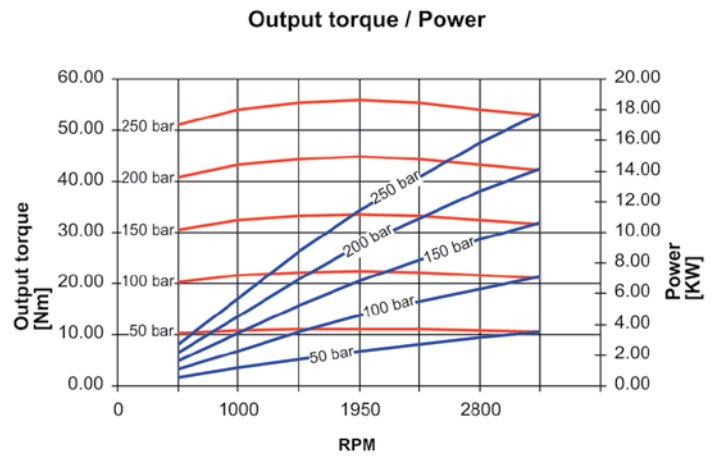
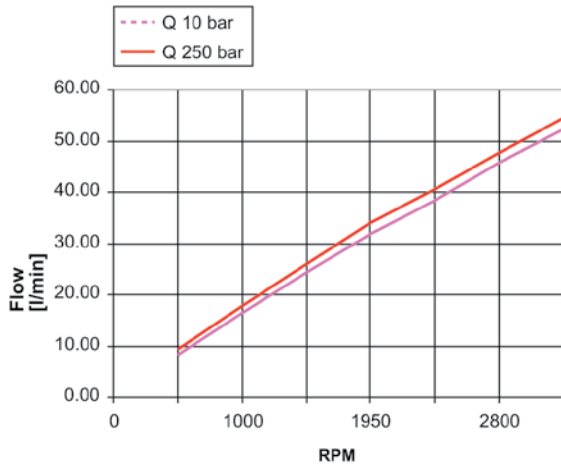
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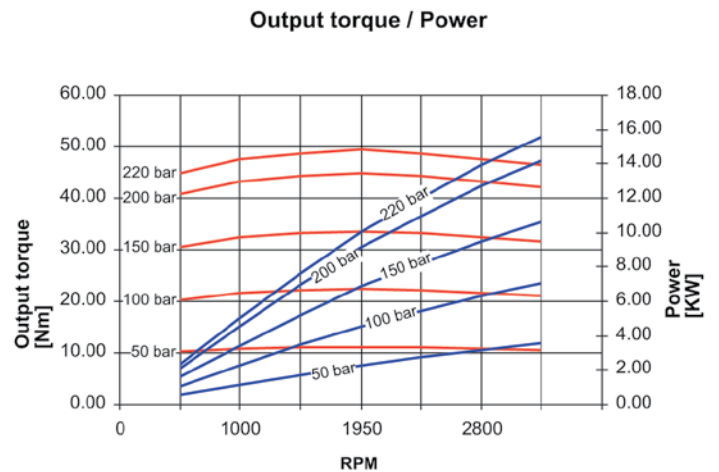
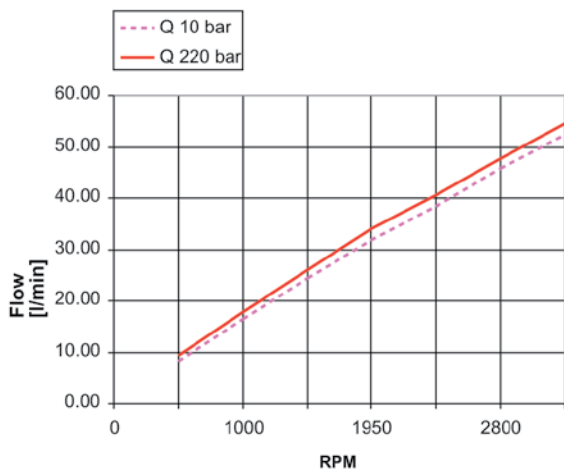
**MOTORS PERFORMANCE CURVES**

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

**2MGE - 16**



**2MGE - 19**



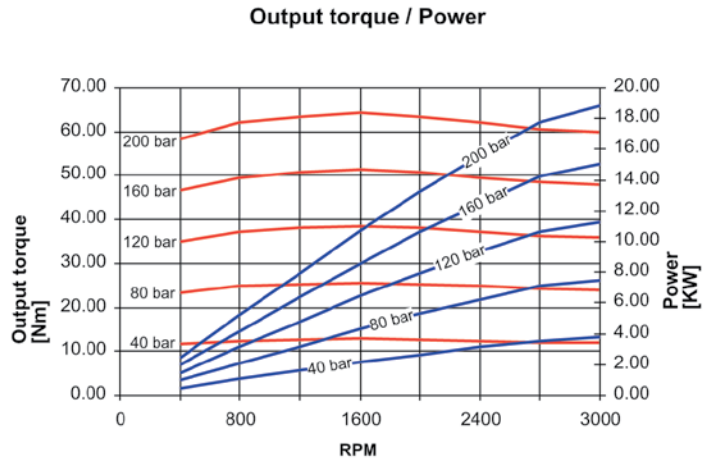
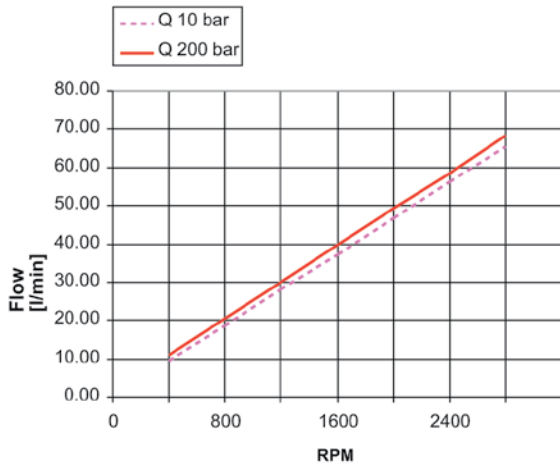
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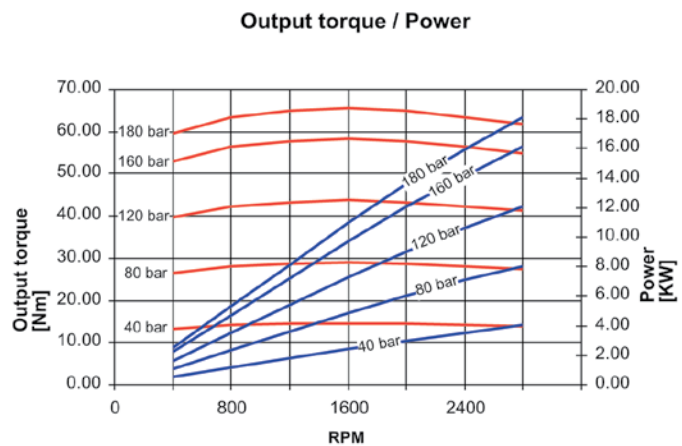
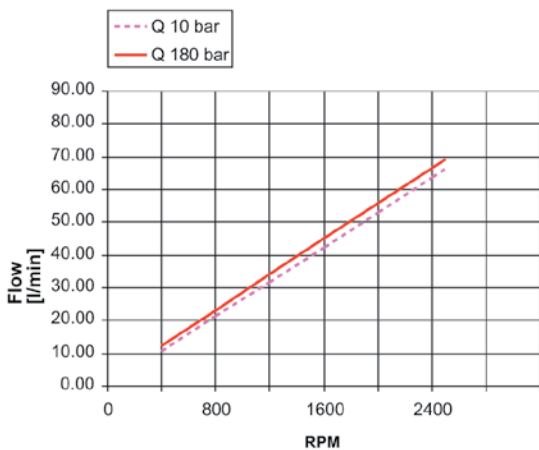
MOTORS PERFORMANCE CURVES

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

2MGE - 22.5



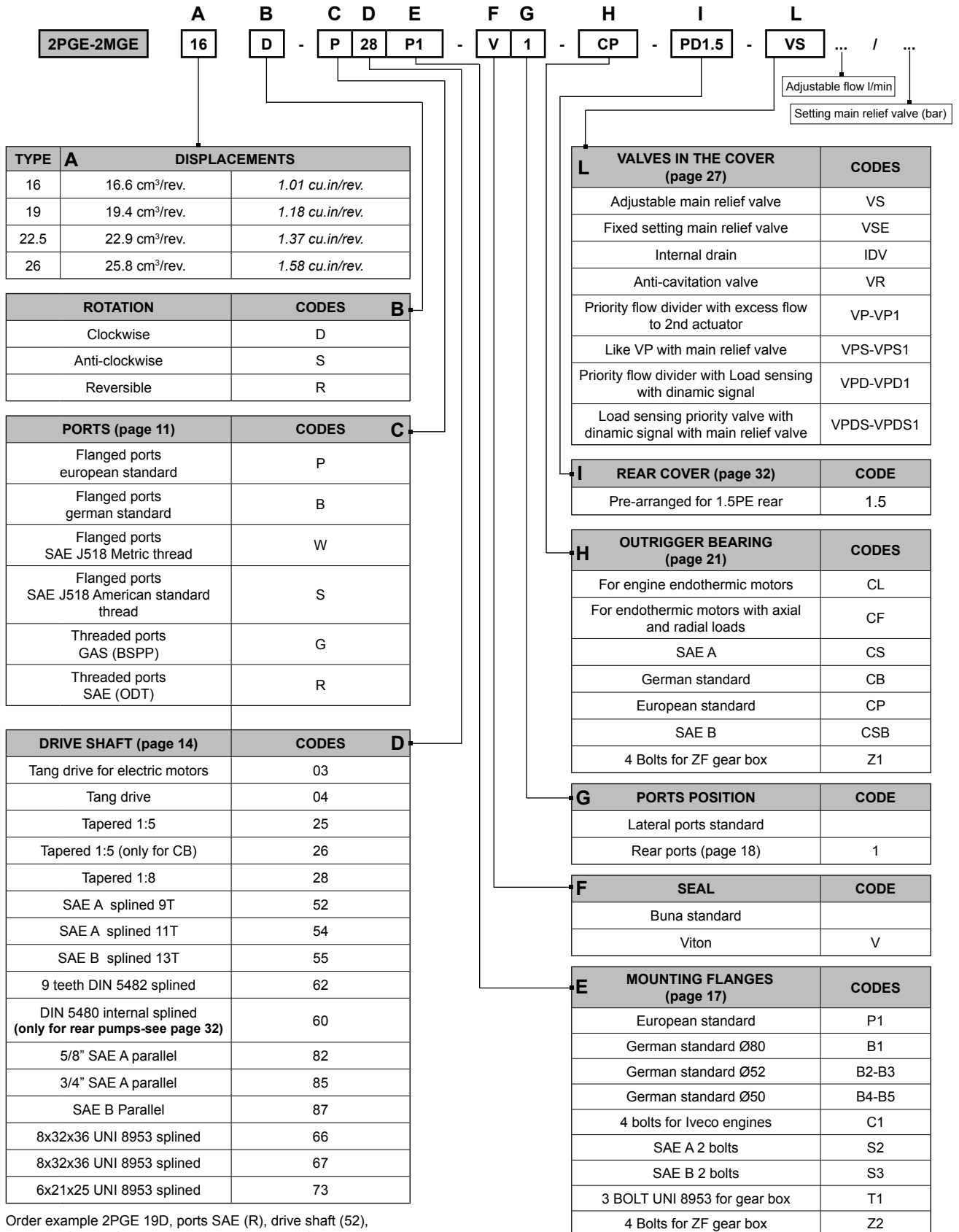
2MGE - 26



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**SINGLE PUMPS AND SINGLE MOTORS**



Order example 2PGE 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:  
**2PGE19D-R52S2-VPS12.5/180**

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### MULTIPLE PUMPS

Setting main relief valve (bar)

Adjustable flow l/min

**2PGE**    **A** 19 / 16    **B** D    **C** P    **D** 28    **E** P1    **F** V    **G** AS    **H** 1    **I** CP    **L** PD1.5    **M** VS

TYPE	DISPLACEMENTS	
16	16.6 cm <sup>3</sup> /rev.	1.01 cu.in/rev.
19	19.4 cm <sup>3</sup> /rev.	1.18 cu.in/rev.
22.5	22.9 cm <sup>3</sup> /rev.	1.37 cu.in/rev.
26	25.8 cm <sup>3</sup> /rev.	1.58 cu.in/rev.

ROTATION	CODES	<b>B</b>
Clockwise	D	
Anti-clockwise	S	

PORTS (page 11)	CODES	<b>C</b>
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	

DRIVE SHAFT (page 14)	CODES	<b>D</b>
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 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	
SAE B Parallel	87	
8x32x36 UNI 8953 splined	66	
8x32x36 UNI 8953 splined	67	
6x21x25 UNI 8953 splined	73	

<b>M VALVES IN THE COVER (page 27)</b>		CODES
Adjustable main relief valve	VS	
Fixed setting main relief valve	VSE	
Internal drain	IDV	
Anti-cavitation valve	VR	
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 dynamic signal	VPD-VPD1	
Load sensing priority valve with dynamic signal with main relief valve	VPDS-VPDS1	

<b>L REAR COVER (page 32)</b>	CODE
Pre-arranged for 1.5PE rear	1.5

<b>I OUTRIGGER BEARING (page 21)</b>		CODES
For engine endothermic motors	CL	
For endothermic motors with axial and radial loads	CF	
SAE A	CS	
German standard	CB	
European standard	CP	
SAE B	CSB	
4 Bolts for ZF gear box	Z1	

<b>H PORTS POSITION</b>		CODE
Lateral ports standard		
Rear ports	1	

<b>G SUCTION PORTS</b>		CODES
Common suction	UA*	
Separated stages	AS	

<b>F SEAL</b>		CODE
Buna standard		
Viton	V	

<b>E MOUNTING FLANGES (page 17)</b>		CODES
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	
3 BOLT UNI 8953 for gear box	T1	
4 Bolts for ZF gear box	Z2	

\*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.

Example to order a tandem pump with common suction:  
**2PGE19/16D-R54S2-UA1**

Example to order a triple pump with main relief in the rear pump:  
**2PGE22.5/19/16D-R54S2-VS175**

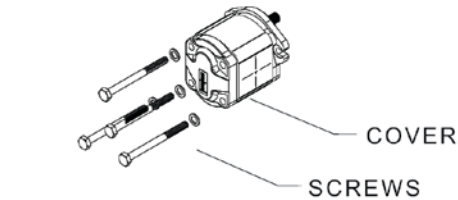
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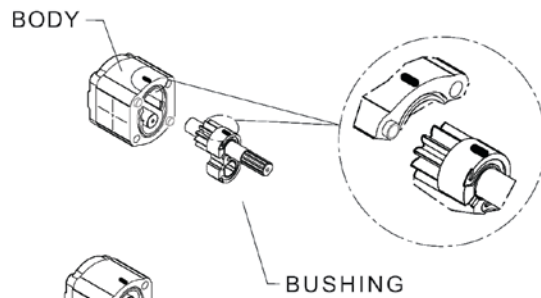
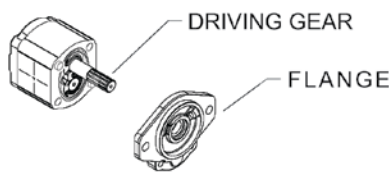
**ROTATION CHANGING INSTRUCTIONS FOR UNITS**

Before starting, be sure that the pump is cleaned externally as well as the working area to avoid that particles dangerous for pump working can find their way into the pump. Pump represented is a clockwise rotation pump.

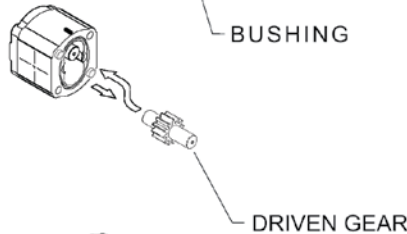
To obtain an anti\_clockwise rotation read carefully the following instructions.



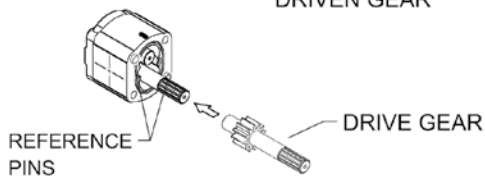
- 1 - Loosen and fully unscrew the screws.
- 2 - Lay the pump on the working area in order to have the mounting flange turned upside.
- 3 - Coat the shaft extension with grease to avoid damaging the shaft seal.
- 4 - Remove the flange and lay it on the working area; verify that the seal is correctly located in the body seat.



- 1 - Mark the position of the bushing and eventually the thrust plate, relative to the body.
- 2 - Remove the bushing, thrust plate and the driving gear taking care to avoid driven gear axial shifts.



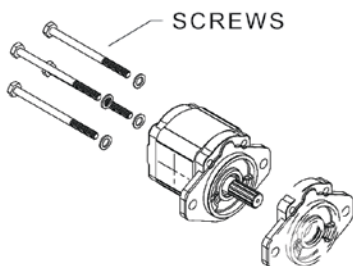
- 1 - Draw out the driven gear from its housing, taking care to avoid rear cover axial shifts.
- 2 - Re-locate the driven gear in the position previously occupied by the driving gear.



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



- 1 - 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



- 1 - Clean body and mounting flange refaced surfaces.
- 2 - Verify that the two plugs are located in the body.
- 3 - Refit the mounting flange, turned 180° from its original position.
- 4 - Replace the clamp bolts and tighten crosswise evenly to a torque you will find at page 8.
- Check that the shaft rotates freely.
- 6 - Mark on the flange the new direction of rotation.

EO.146.0417.02.001M01







**NOTES**

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