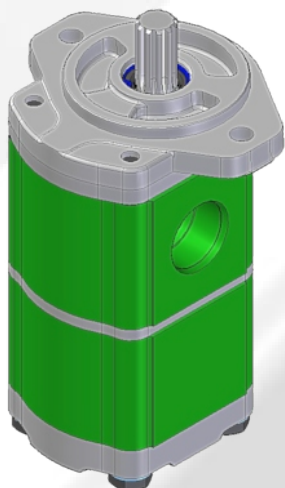
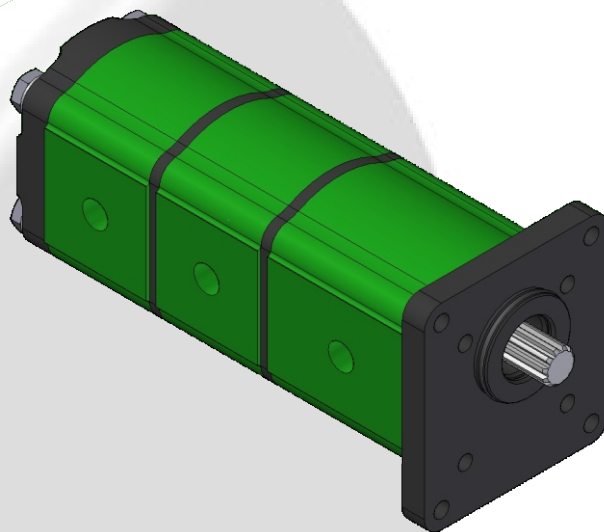
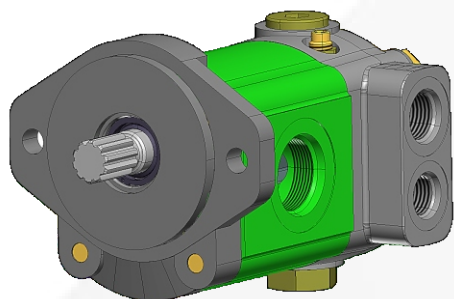
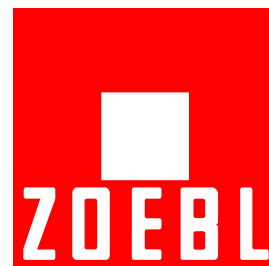


GEAR PUMPS "E" SERIES - GROUP 2

Technical catalogue



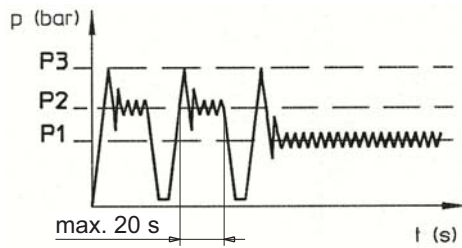
Vertrieb in Österreich: www.zoehl.co.at

E0.23.0609.02.00

COMPANY
WITH QUALITY SYSTEM
CERTIFIED BY DNV
=ISO 9001/2000=



DEFINITION OF PRESSURES



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

GENERAL

SALAMI gear pumps are available with displacements from 3.2 cm³/rev to 26 cm³/rev (from 0.19 cu.in./rev to 1.59 cu.in./rev).

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

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

SALAMI gear pumps and motors 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.
- Extruded alluminum body.
- Die cast alluminum cover and flange - cast iron rear.
- Double shaft seals.
- Nitrile seals as standard and viton seals in high temperature applications.

All pumps and motors are hydraulic tested after assembly to ensure the high standard performance required by SALAMI'S engineering.

WORKING CONDITIONS

- Pump inlet pressure (absolute pressure)	0,7 to 2,5 bar 10 to 36 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	-15 to 85 °C
- Fluid operating temperature range with FPM seals(Viton) ...	-20 to 110°C
- Hydraulic fluid	mineral oil

Important:

in case of assembling of pumps without shaft seals (eg. B2 - B3....), you have to keep the value of min. suction pressure (0.7 bar (abs)) in the vane between pump and coupling too.

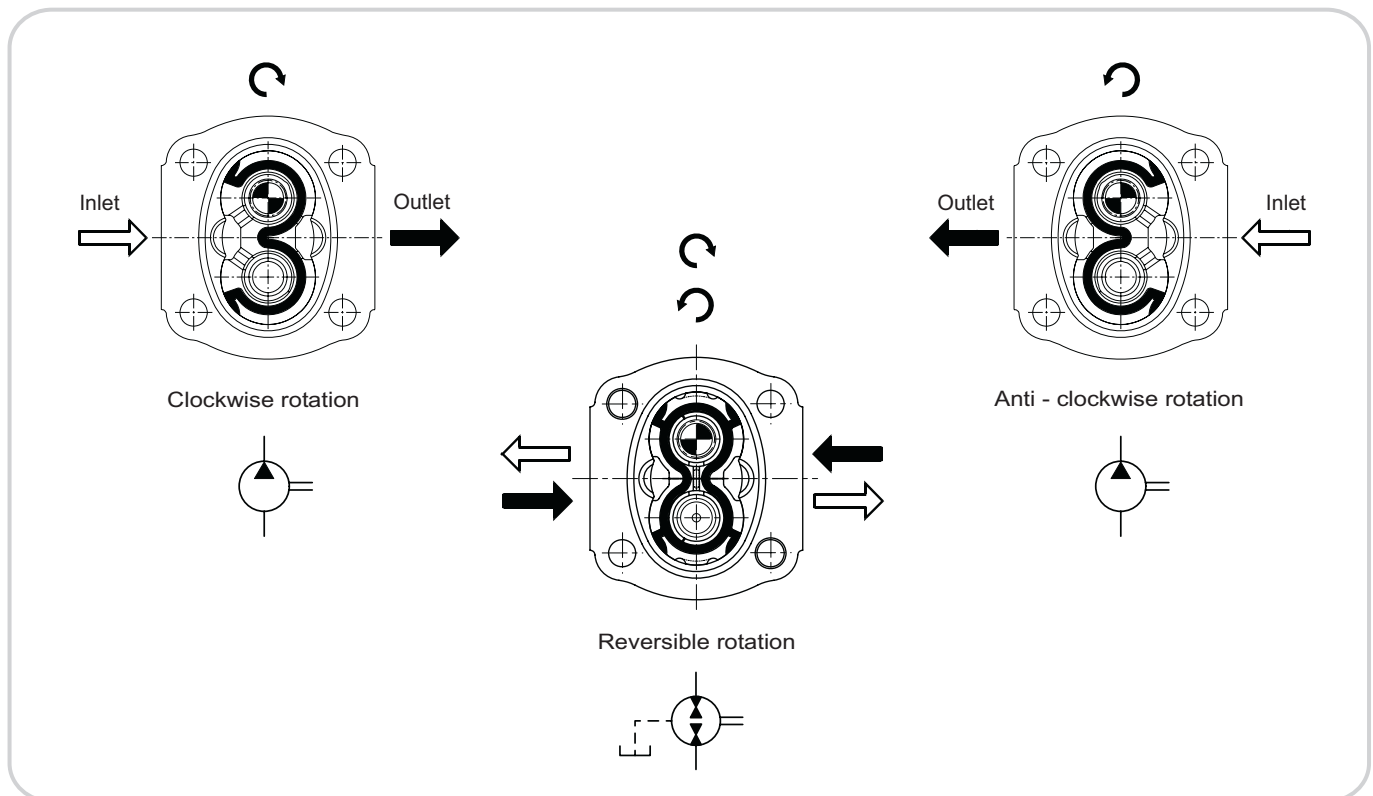
Lower pressure can lead to suction of oil through the front flange (seat of the shaft without seal); this can damage seriously the pump.

DRIVE SHAFT

Radial and axial loads on the shafts must be avoided since they reduce the life of the unit. Pumps driven by power take - off on engines must always be connected by placing an "Oldham" coupling or coupling having convex toothed hub.

This is to ensure that inevitable misalignment during assembly is reduced to minimum.

PUMP 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 WORKING CONDITIONS).

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

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

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

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

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

When tandem pumps are supplied by 2 different reservoirs with 2 different fluids it is necessary to specify "AS" version.

In case of reversible motor allowance must be made to ensure the motor is not drained, through the case drain, when stationary.

FILTRATION INDEX RECOMMENDED

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

FIRE RESISTENT FLUID

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

COMMON FORMULAS

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

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

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

LEGENDA

Δp = Working pressure (bar)

q = Displacement (cm^3/rev)

n = Speed (min^{-1})

η_m = Mechanical eff. (0.92)

η_v = Volumetric eff. (0.95)

DESCRIPTION OF THE NEW PRODUCT IDENTIFICATION LABEL

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

A			
B			
C		D	
E	salami	F	G

A = Product short description (eg. VD8A/FDD/U4G).

B = Customer part number.

C = Salami part number (eg. 6235 0025 0).

D = Production code (for Salami management)

E = Rotation sense (only for pumps).

F = Production date (see data sheet here below)

G = Progressive number of assembling.

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



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

Product short description. _____
Salami part number and progressive number of assembling. _____
Production code (for Salami management). _____
Month and year of made: maybe in the future you can find this type of production date in the label beside too. _____
Rotation sense. _____

ASSEMBLED	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
JANUARY	7A	8M	9M	0M	1M	2M	3M	4M	5M	6M	7M	08M	09M	10M	11M	12M
FEBRUARY	7B	8N	9N	0N	1N	2N	3N	4N	5N	6N	7N	08N	09N	10N	11N	12N
MARCH	7C	8P	9P	0P	1P	2P	3P	4P	5P	6P	7P	08P	09P	10P	11P	12P
APRIL	7D	8Q	9Q	0Q	1Q	2Q	3Q	4Q	5Q	6Q	7Q	08Q	09Q	10Q	11Q	12Q
MAY	7E	8R	9R	0R	1R	2R	3R	4R	5R	6R	7R	08R	09R	10R	11R	12R
JUNE	7F	8S	9S	0S	1S	2S	3S	4S	5S	6S	7S	08S	09S	10S	11S	12S
JULY	7G	8T	9T	0T	1T	2T	3T	4T	5T	6T	7T	08T	09T	10T	11T	12T
AUGUST	7H	8U	9U	0U	1U	2U	3U	4U	5U	6U	7U	08U	09U	10U	11U	12U
SEPTEMBER	7I	8V	9V	0V	1V	2V	3V	4V	5V	6V	7V	08V	09V	10V	11V	12V
OCTOBER	7J	8Z	9Z	0Z	1Z	2Z	3Z	4Z	5Z	6Z	7Z	08Z	09Z	10Z	11Z	12Z
NOVEMBER	7K	8X	9X	0X	1X	2X	3X	4X	5X	6X	7X	08X	09X	10X	11X	12X
DECEMBER	7L	8Y	9Y	0Y	1Y	2Y	3Y	4Y	5Y	6Y	7Y	08Y	09Y	10Y	11Y	12Y

ROTATION CHANGING INSTRUCTIONS FOR PUMPS GROUP 2

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 aclockwise rotation pump.

To obtain an anti_clockwise rotation read carefully the following instructions.

Picture "A"

- 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.

Picture "B"

- 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.

Picture "C"

- 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.

Picture "D"

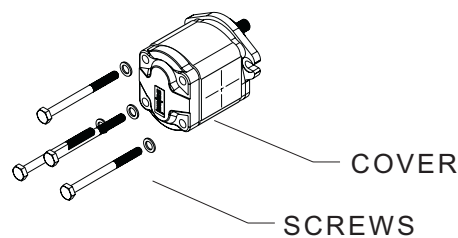
- 1 - Re-locate the driving gear in the position previously occupied by the driven gear.

Picture "E"

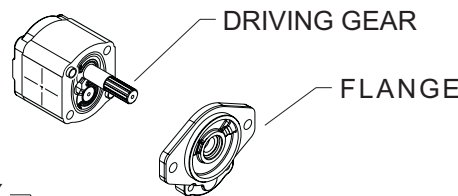
- 1 - Replace the bushing and thrust plate taking care that:
 - marks are located as on the picture
 - surface containing the seal is visible
 - seal and its protection are correctly located

Picture "F"

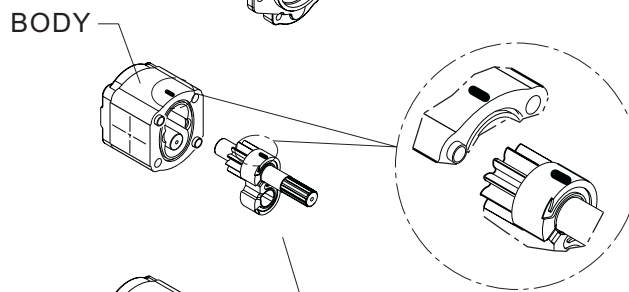
- 1 - Clean body and mounting flange refaced surfaces.
- 2 - Verify that the two plugs are located in the body.
- 3 - Refit the mounting flange, turned 180° from its original position.
- 4 - Replace the clamp bolts and tighten crosswise evenly to a torque you will find at page 2.
Check that the shaft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



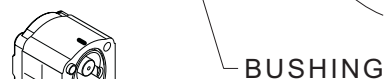
Picture "A"



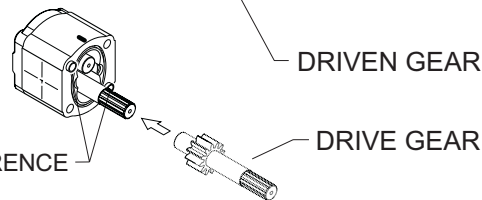
Picture "A"



Picture "B"



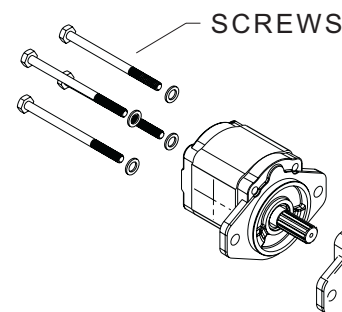
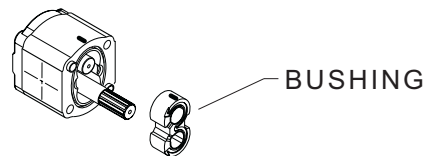
Picture "C"



Picture "D"

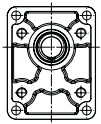
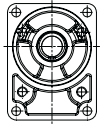





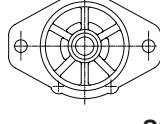













Pict. "E"



Pict. "F"

COMBINATION WITH TYPES OF FLANGES AND DRIVES SHAFTS AVAILABLE

2PE	 P1	 B1	 B4 B5	 B2 B3	 S2 S6	 K1	 C1	 S3
 25		25 B1	25 B4 25 B5					
 28	28 P1							
 02						02 K1		
 03				03B2 03B3				
 04			04B4 04B5					
 62	62 P1	62 B1	62 B4 62 B5				62 C1	
 52					52 S2 52 S6			
 54					54 S2 54 S6			
 55								55 S3
 85					85 S2 85 S6			
 82	82 P1				82 S2 82 S6			

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

Displacements up to 1.58 cu.in./rev
Pressure up to 4300 psi



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

ASSEMBLING DIMENSIONS AND VALUES OF PRESSURE AND SPEED

Type		3.2*	3.9*	4.5	6.5	8.3	10.5	11.3	12.5	13.8	16	19	22.5	26
Displacement	cm ³ /rev 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	56.35 2.22	59.6 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		24.98 0.98	26.4 1.04	28.17 1.11	29.8 1.17		31.75 1.25	33.75 1.33	37.80 1.49	40.5 1.59	43.4 1.71	
Working pressure	p1 bar psi	250 3600						220 3140			200 2900	180 2600		
Intermittent pressure	p2 bar psi	280 4000						240 3450			220 3140	200 2900		
Peak pressure	p3 bar psi	300 4300						260 3750			240 3450	220 3140		
Max speed at	p2 rpm	4000				3500				3000		2750	2500	
Min speed at	p1 rpm	600				500				400		400	300	
Weight	kg lbs	2.01 4.4	2.05 4.5	2.1 4.6		2.25 5.0	2.3 5.1	2.37 5.2	2.4 5.3	2.5 5.5	2.8 6.2	2.95 6.5	3.1 6.8	

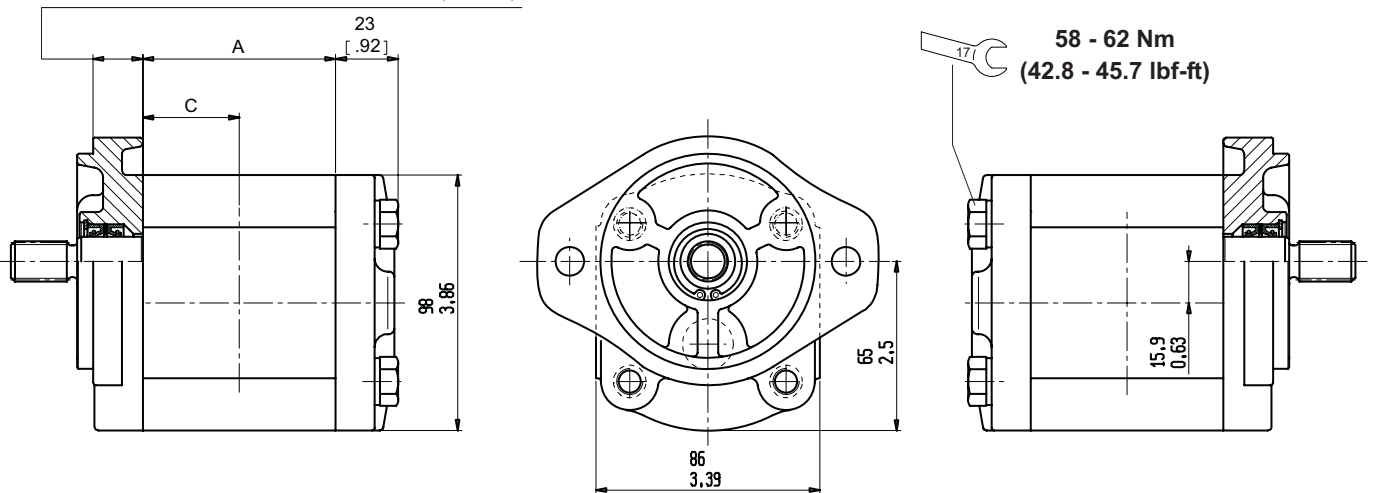
* Available only as rear pump

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

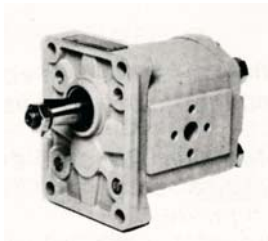
For flanges code:

P1 - B1 - S2 - S6, this dimension is 19 mm (0.75 in.)

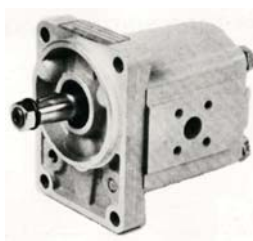
B2 - B3 - B4 - B5, this dimension is 16.5 mm (0.65 in.)



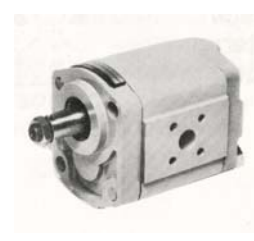
ASSEMBLING EXAMPLES



2PE - P28P1



2PE - B25B1

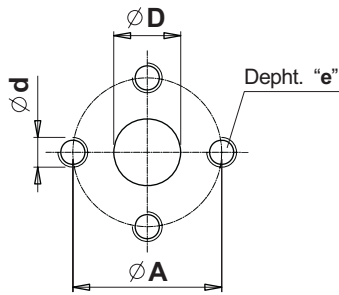


2PE - B25B4



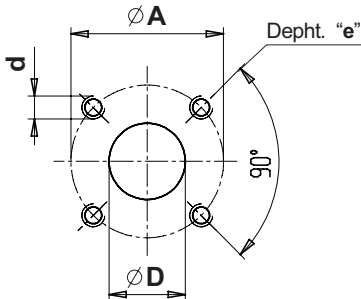
2PE - B62B1

FLANGED PORTS



Type	INLET				OUTLET			
	ØD	ØA	d	e	ØD	ØA	d	e
From 3.2 to 8.3	13 (0.51")	30 (1.19")	M6	13 (0.51")	13 (0.51")	30 (1.19")	M6	13 (0.51")
From 11.3 to 22.5	20 (0.78")	40 (1.56")	M8					
26	22 (0.87")							

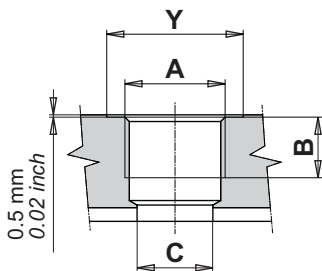
code P



Type	INLET				OUTLET			
	ØD	ØA	d	e	ØD	ØA	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")							

code B

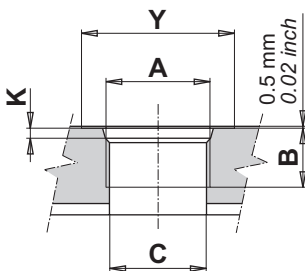
THREADED PORTS



Type	INLET			OUTLET		
	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")

code G

British standard pipe parallel (BSPP)

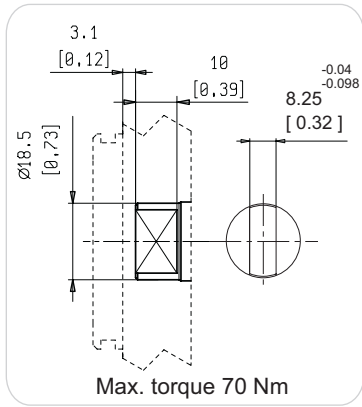


Type	INLET					OUTLET				
	A	B	ØC	Y	K	A	B	ØC	Y	K
From 3.2 to 26	1-1/16 UNF (SAE 12)	16 (0.62")	20 (0.78")	41 (1.61")	3.3 (0.12")	7/8 - 14 UNF (SAE 10)	14 (0.54")	13 (0.51")	34 (1.32")	2.5 (0.10")

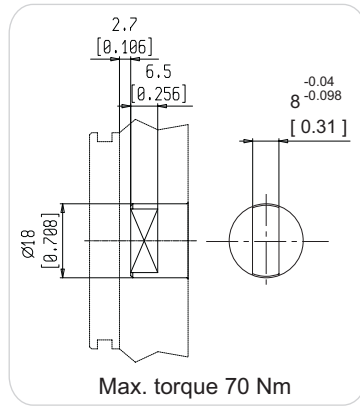
code R

SAE threaded (ODT)

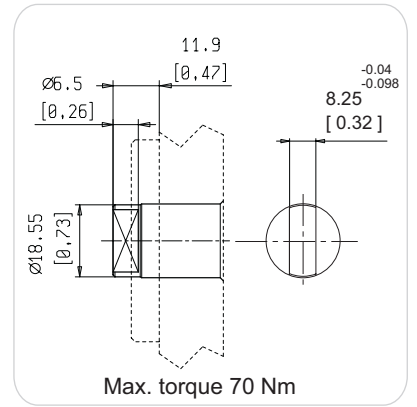
DRIVE SHAFTS



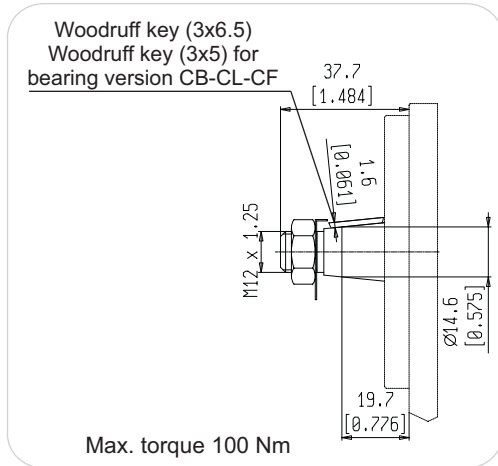
code 02 Tang drive for diesel engines. For flange K1 without shaft seal.



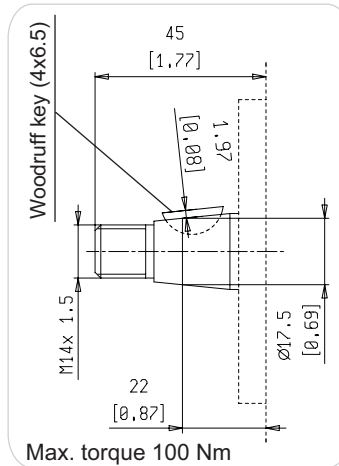
code 03 Tang drive for electric motors. Without shaft seal.



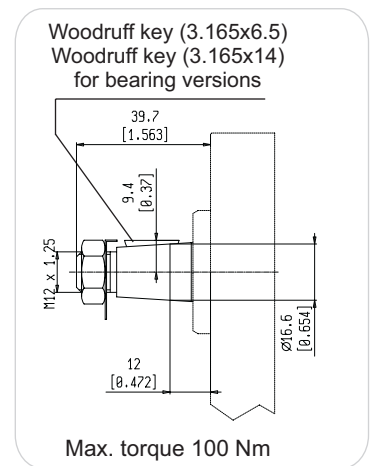
code 04 Tang drive.



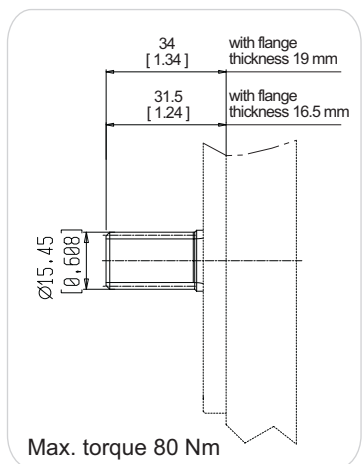
code 25 Tapered 1:5



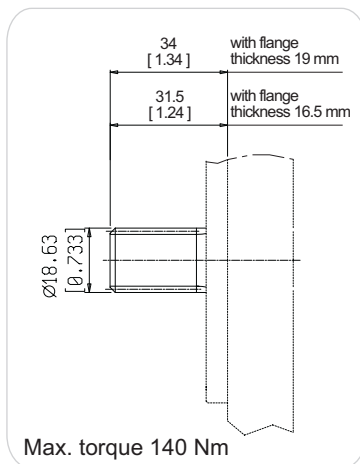
code 26 Tapered 1:5 (only for CB)



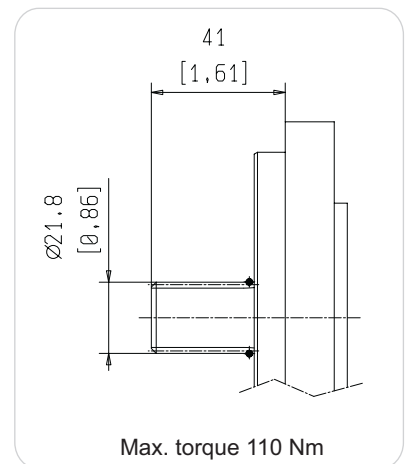
code 28 Tapered 1:8



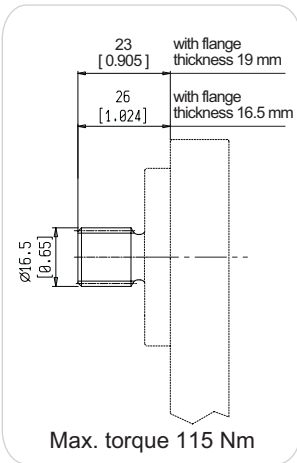
code 52 SAE A 9T-16/32DP
Ansi B92 1a 1976



code 54 SAE 11T-16/32DP
Ansi B92 1a 1976

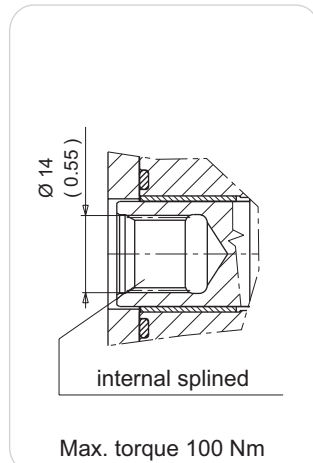


code 55 SAE B 13T-16/32DP
Ansi B92 1a 1976



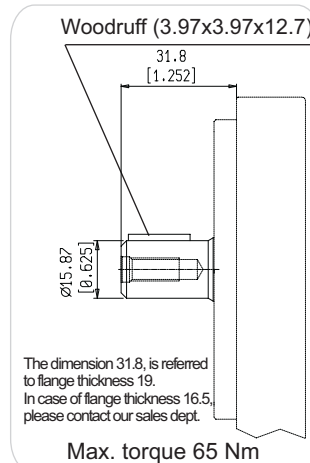
code 62

9 teeth DIN 5482 splined



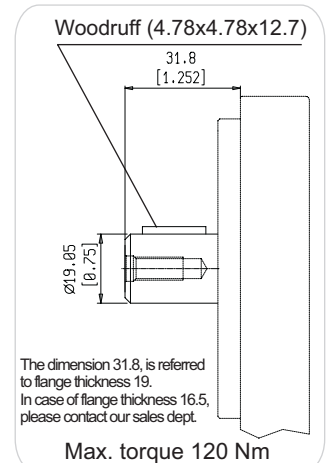
code 60

DIN 5480 internal splined
Only for rear pumps



code 82

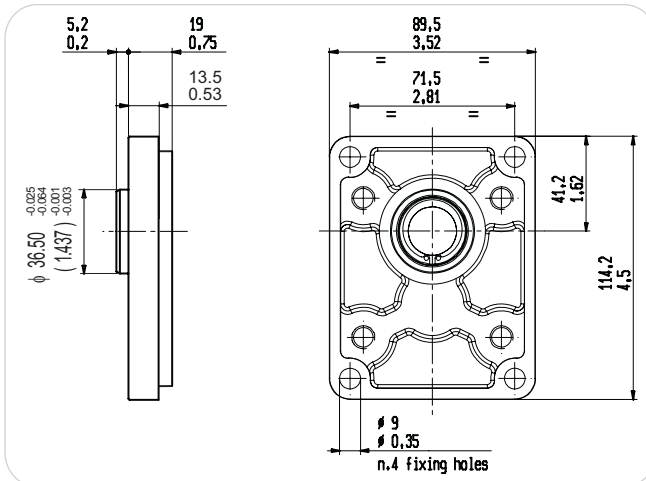
5/8" SAE A parallel



code 85

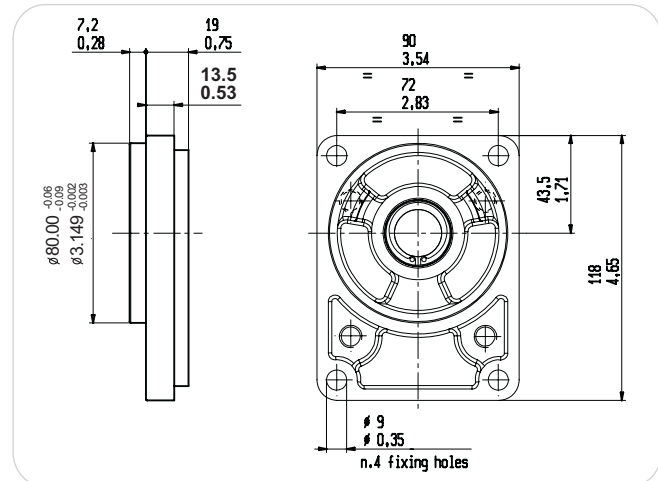
3/4" SAE A parallel

MOUNTING FLANGES



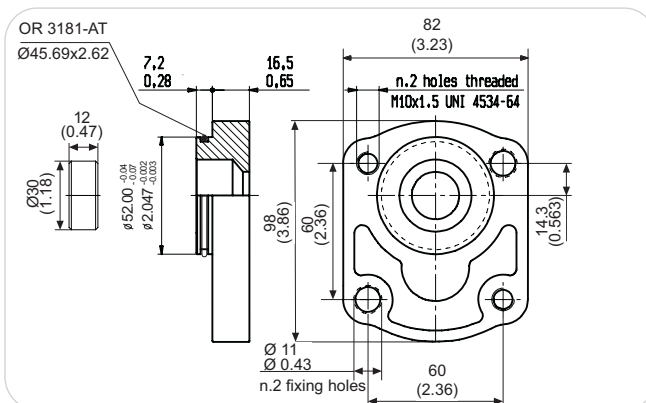
code P1

With shaft code 28 - 62 - 81 - 82 - 85



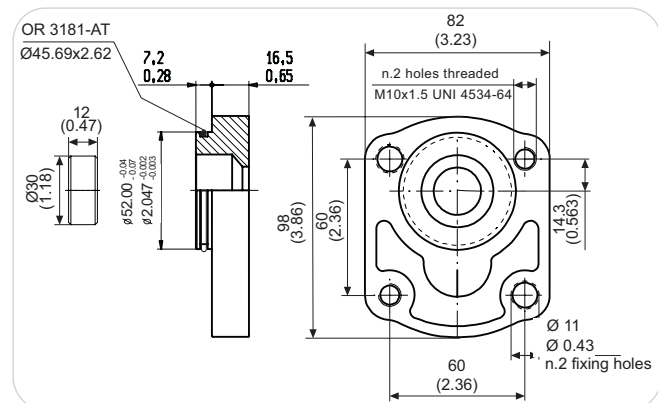
code B1

With shaft code 25-62



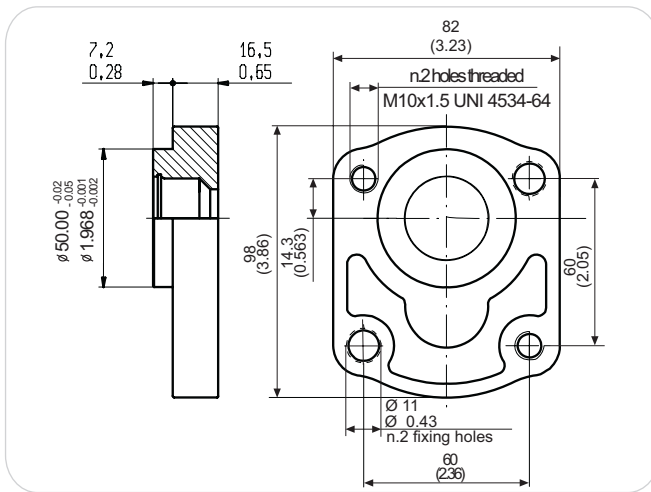
code B2

With shaft code 03-61

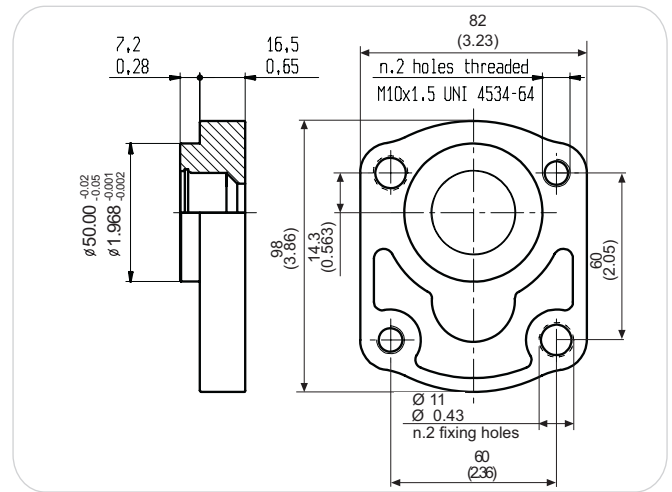


code B3

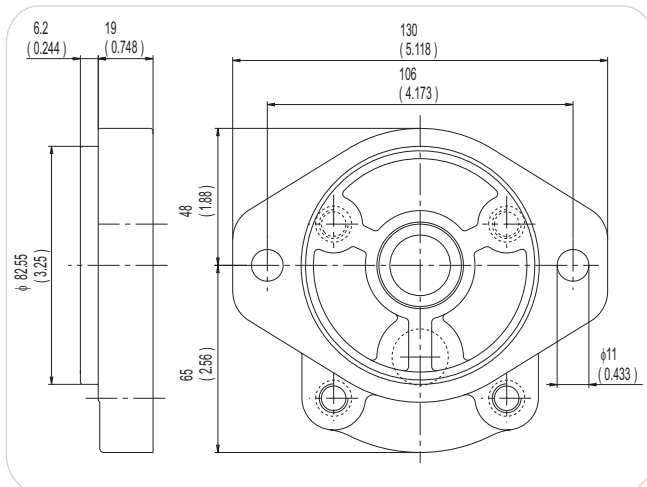
With shaft code 03-61



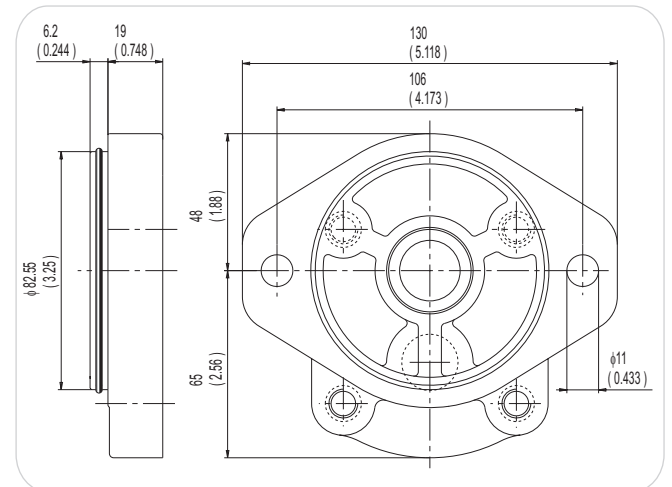
code B4 With shaft code 25-62



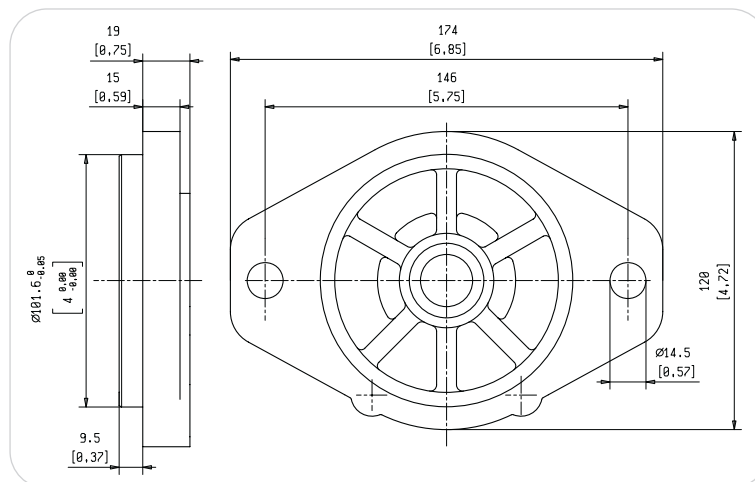
code B5 With shaft code 25-62



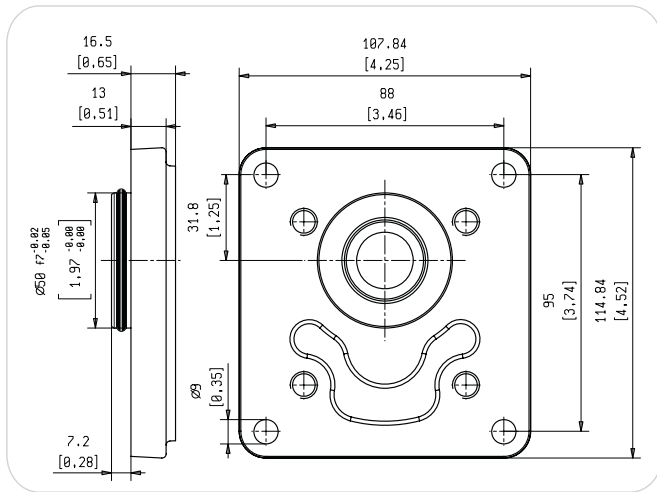
code S2 With shaft code 52-54-82-85.



code S6 With shaft code 52-54-82-85

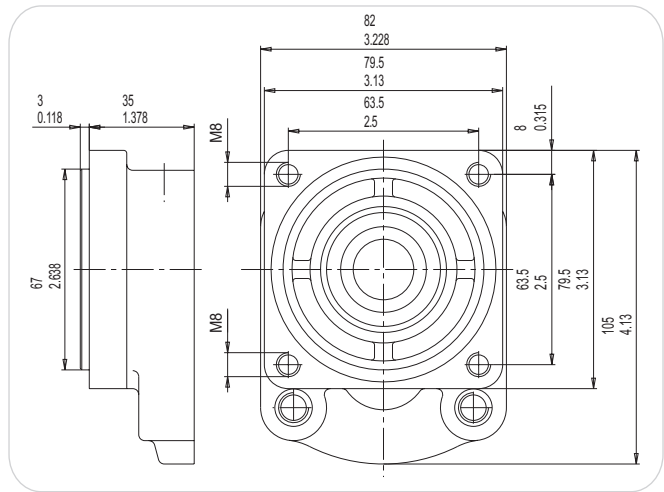


code S3 With shaft code 52-54-55-82-85



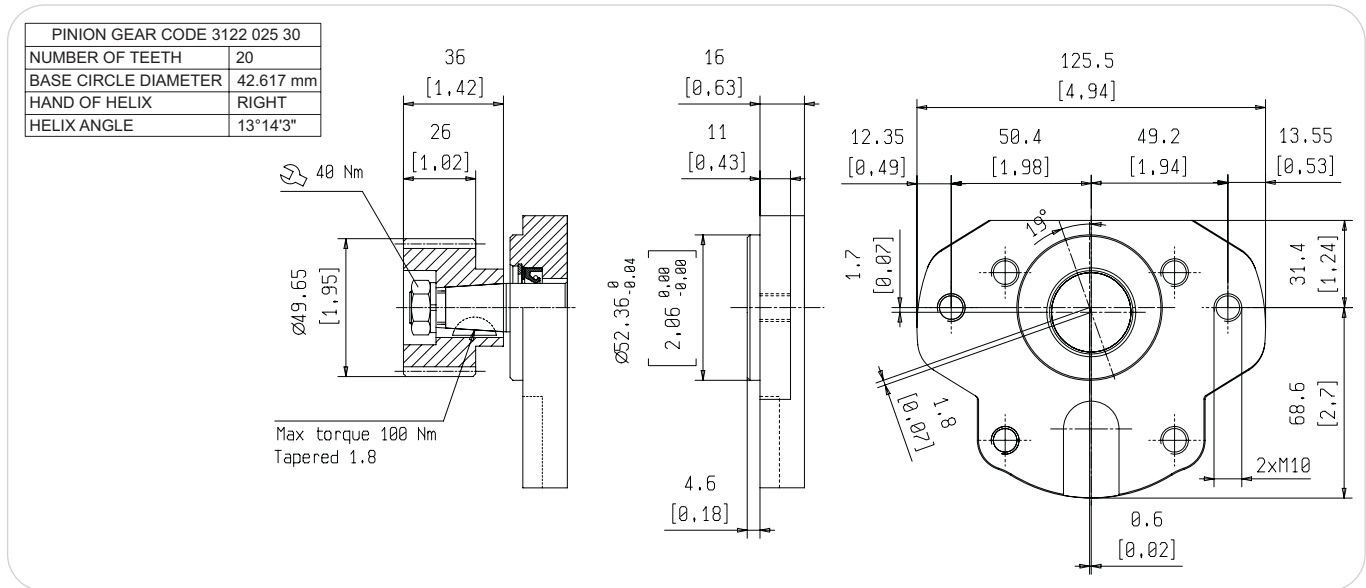
code C1

With shaft code 52-54-82-85
For Iveco engines



code K1

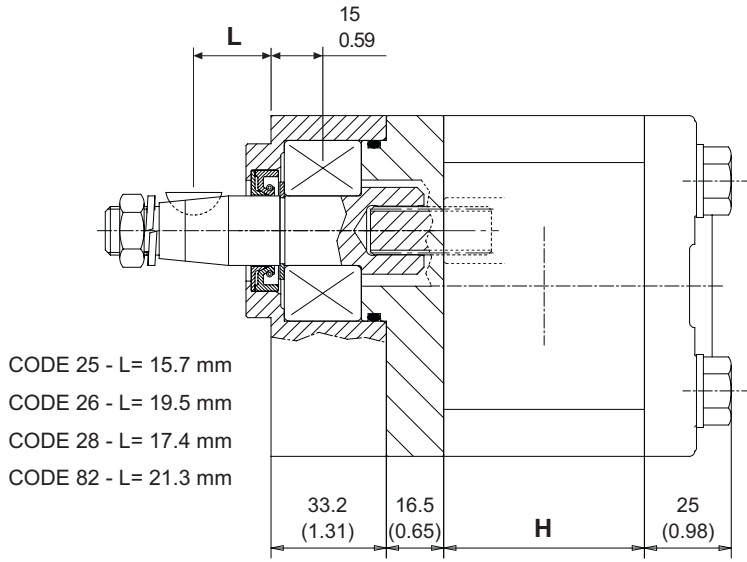
With shaft code 02.
For Perkins engines (series 100)



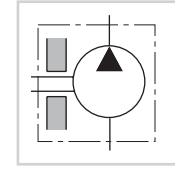
code MF

With shaft code 28
The combination 28MF is not comprehensive of pinon gear.
The pinion gear must be specified in phase of order.

OUTRIGGER BEARING



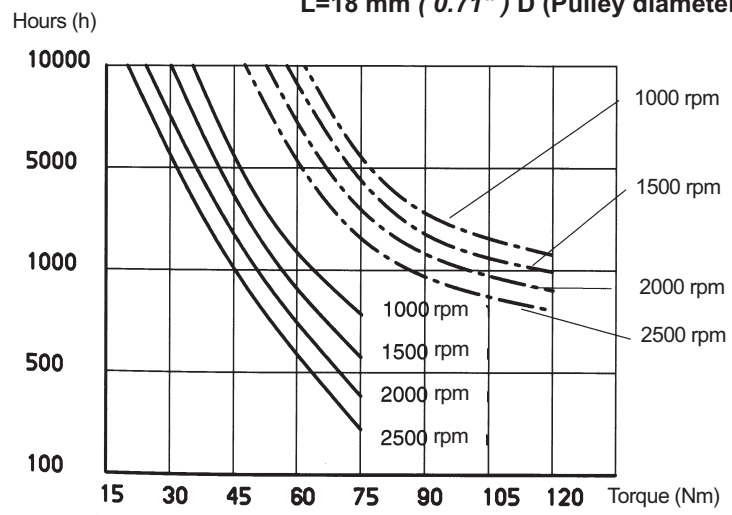
CODE 25 - L= 15.7 mm
 CODE 26 - L= 19.5 mm
 CODE 28 - L= 17.4 mm
 CODE 82 - L= 21.3 mm



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	59.6 (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")

Order example pump 2PE with bearing: **2PE16D - B25 B4 - CL**

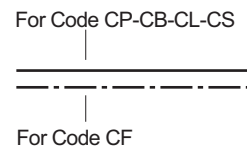
**Life of bearing under following condition:
 L=18 mm (0.71") D (Pulley diameter)=90 mm (3.54")**



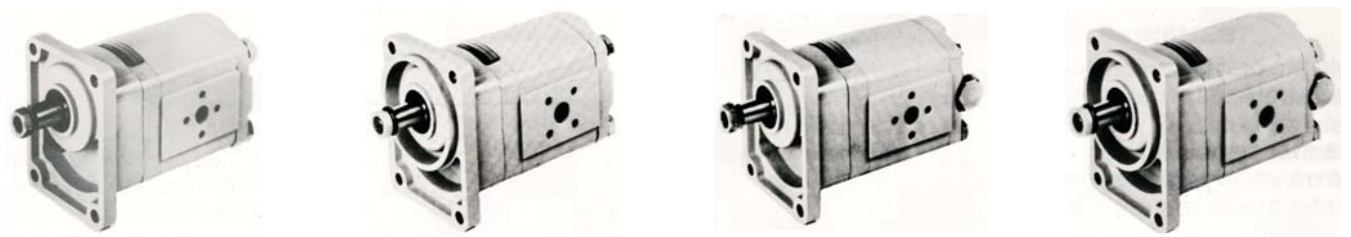
To calculate the absorbed pump or motor torque, please use the following formula:

$$C \text{ (Nm)} = \frac{C_y \Delta p}{62.8 \eta_m}$$

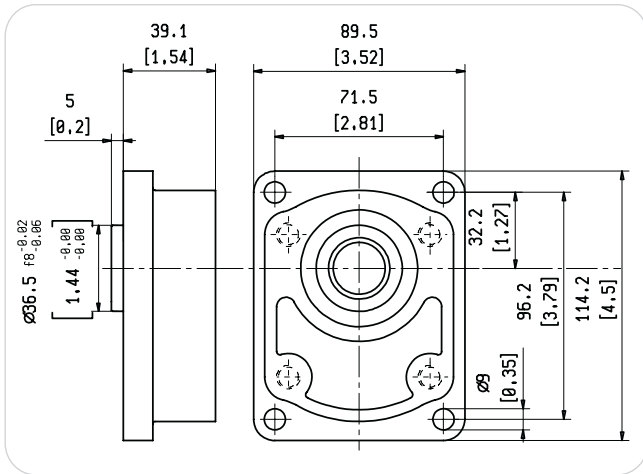
C_y = Displacement (cm^3/rev)
 Δp = Pressure (bar)



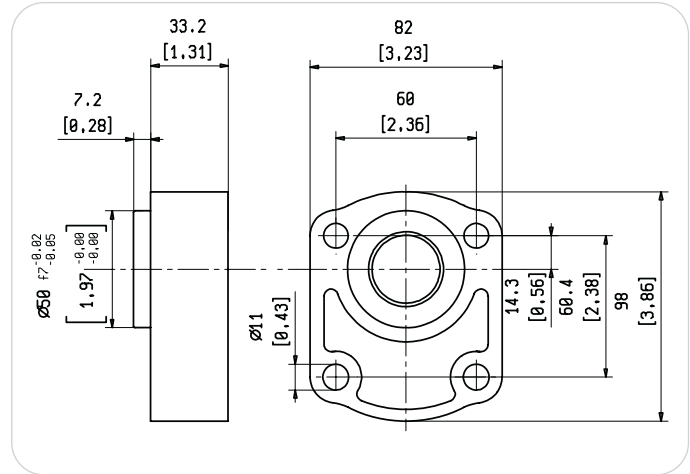
*Available for quantity, please contact our sales department.



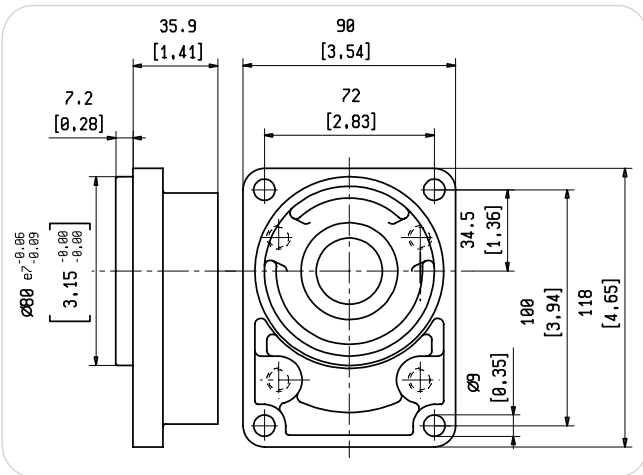
MOUNTING FLANGES WITH BEARING SUPPORT



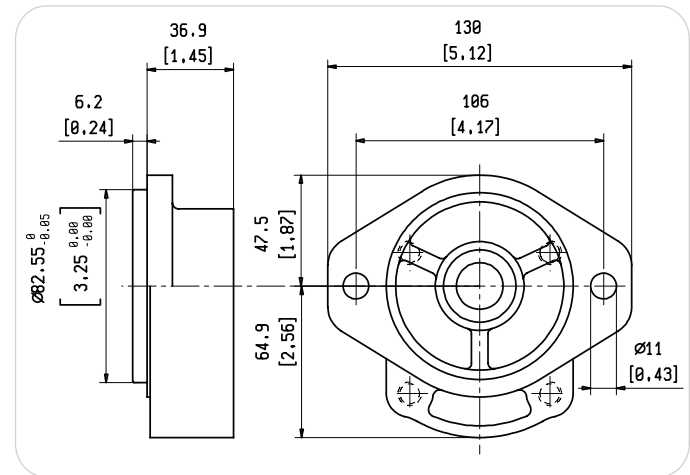
code CP With shaft code 28



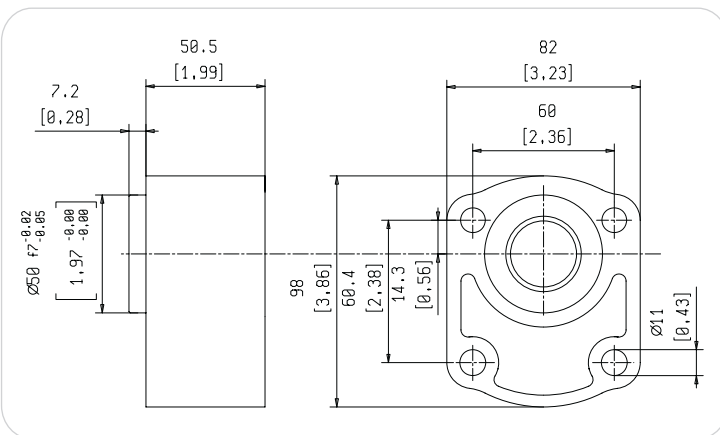
code CL With shaft code 25, 26



code CB With shaft codes 25-26

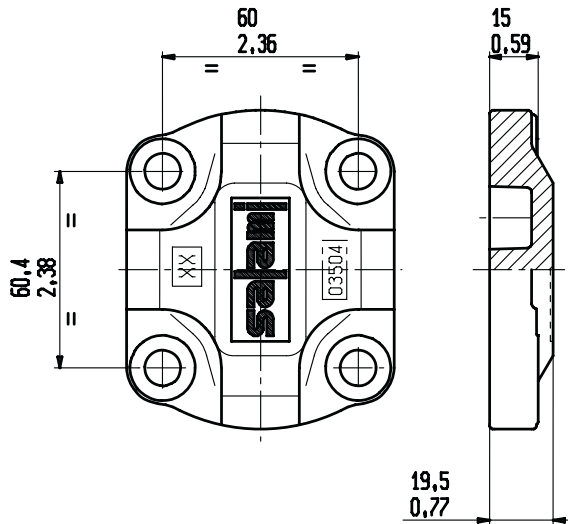


code CS SAE A with shaft codes 52-54-82

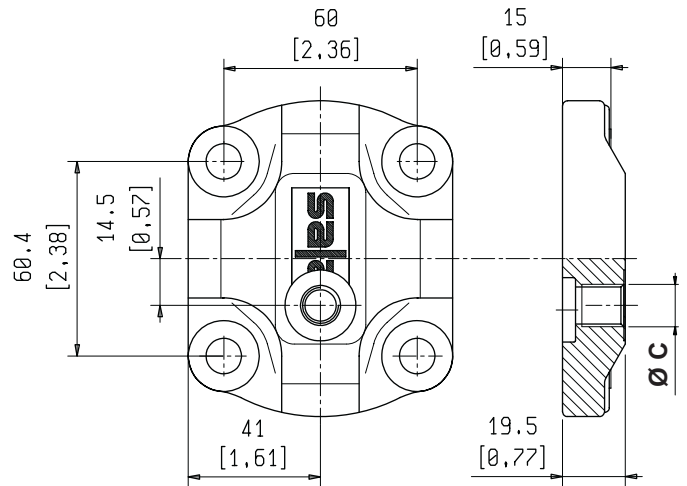


code CF SAE A with shaft codes 25-26

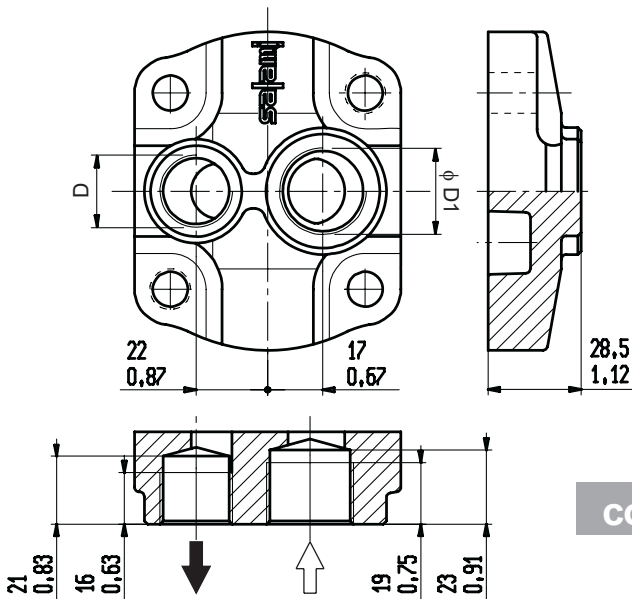
REAR COVERS



Standard rear cover for unidirectional pumps



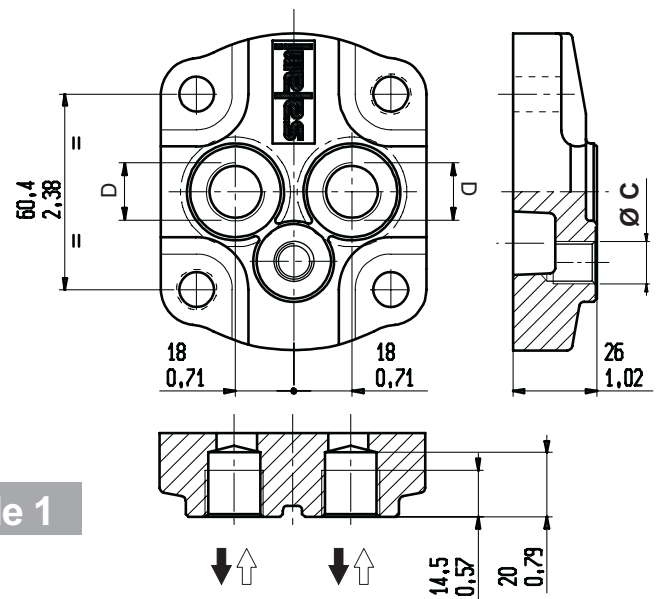
Standard cover for reversible pumps and motors, with external drain ΦC .
For the dimension ΦC please see the table here below.



UNIDIRECTIONAL PUMPS
On request outlet port only.

D	D1
M 18x1.5	M 26x1.5
7/8-14 UNF-2B (SAE 10)	1-1/16-12 UN-2B (SAE 12)
G 1/2	G 3/4

code 1



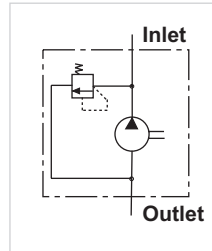
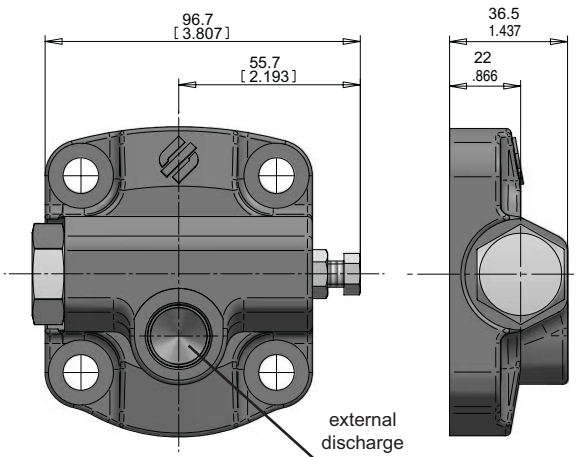
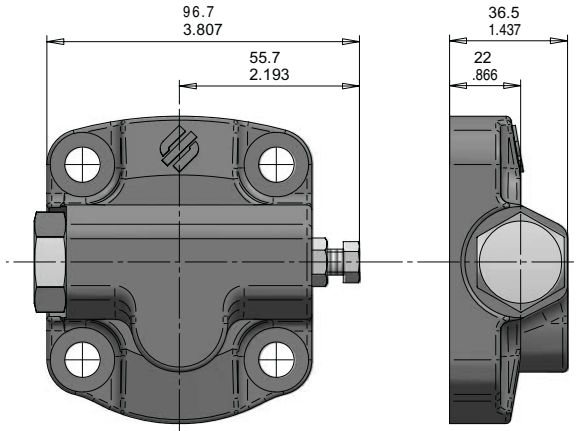
BIDIRECTIONAL PUMPS

For pumps with threaded rear ports until 25 l/min delivery.

D	C
M 18x1.5	G 1/4
7/8-14 UNF-2B (SAE 10)	7/16-20 UNF-2B (SAE 4)
G 1/2	G 1/4

For rear ports if requested please advise type using note.

REAR COVERS WITH MAIN RELIEF VALVES

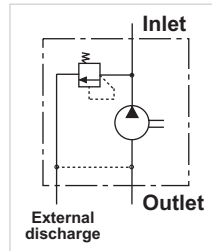


code VS

With main relief valve
with internal exhaust
gallery

For this main relief valve you
can choice four setting
ranges:

- (20 - 50 bar)
- (51 - 75 bar)
- (76 - 150 bar)
- (151 - 220 bar)



code VSE

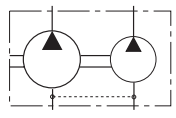
D (external discharge)

M 18 x 1.5 (METRIC)

3/4-16 UNF-2B (SAE 8)

G 3/8 (BSPP)

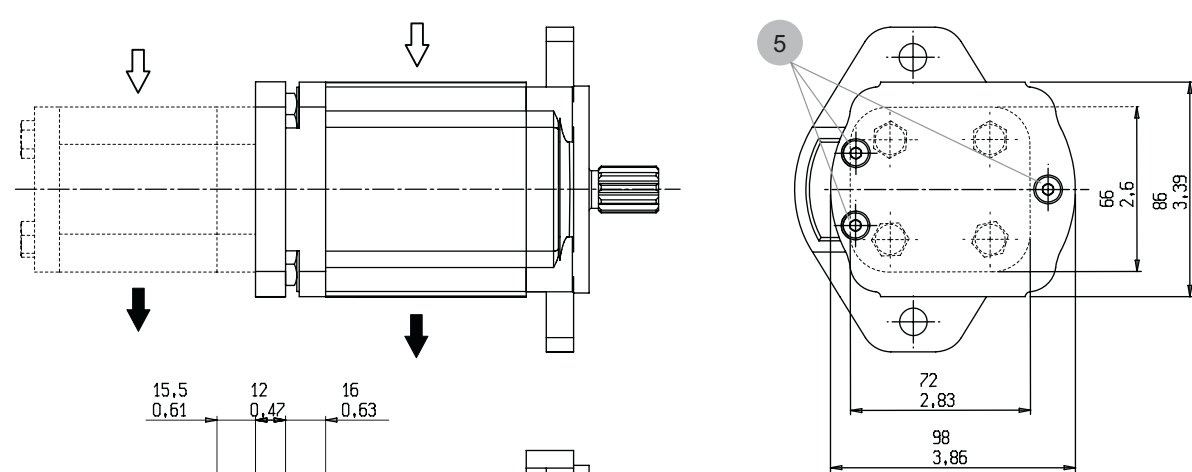
**REAR COVER FOR MULTIPLE PUMP 2PE/1PE
(SEPARATED SUCTIONS)**



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

Assembling kit for multiple pump 2PE/1PE

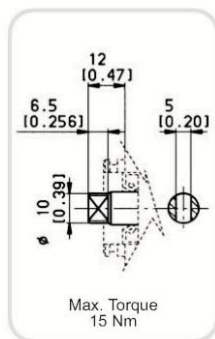
code PD1



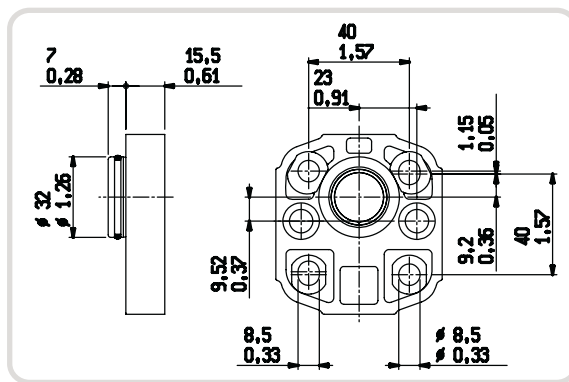
Assembling components:

- 1 - n.1 special cover 2PE
- 2 - n.1 middle flange
- 3 - n.1 coupling sleeve
- 4 - n.1 centering collar
- 5 - n.3 screws TCEI M6X14 ISO 262
- 6 - n.1 O-ring 2-033-AT

THE 1PE PUMP HAS THE SHAFT CODE "06" AND THE FLANGE CODE "B0"
(as per our gear pumps and motors catalogue group 1)



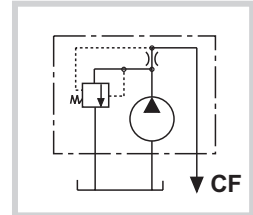
code 06



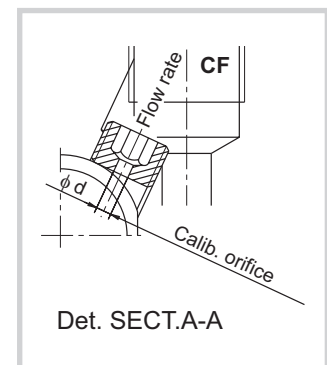
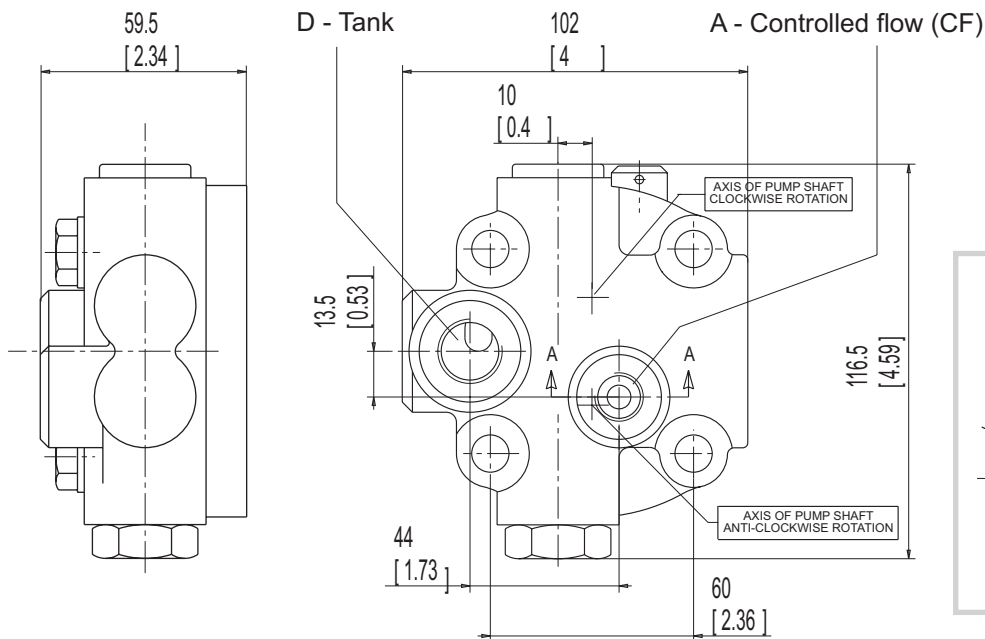
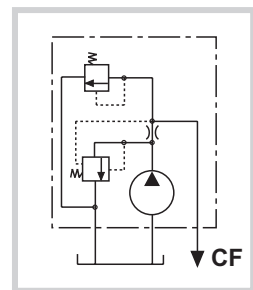
code B0

REAR COVER WITH PRESSURE COMPENSATED FLOW CONTROL VALVE REAR PORTS

code VR Pressure compensated flow control valve with excess flow to tank



code VRS Pressure compensated flow control valve with excess flow to tank, with main relief valve on controlled flow line.



A	D
G 3/8	G 1/2
9/16-18 UNF-2B (SAE 6)	3/4-16 UNF-2B (SAE 8)

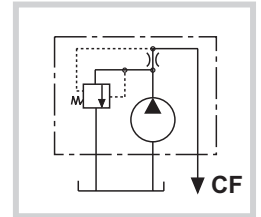
FLOW CONTROL VALVE (VR - VRS)

3 - way flow control valve housed in a special cast iron cover which ensures constant flow regardless pump speed and system pressure variations. It can also be supplied with adjustable pressure relief valve whose relieved flow goes into excess pump flow line. In this way the max fluid temperature is lower than obtained if the excess flow returned directly to pump inlet. The flow regulated is determined by the diameter of hole on the threaded dowel (see table).

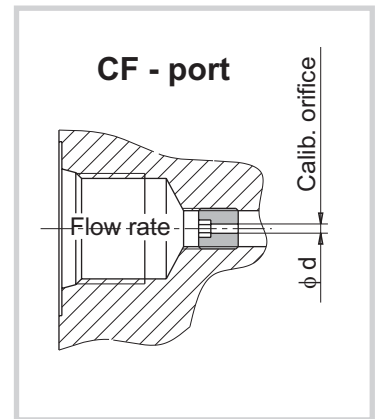
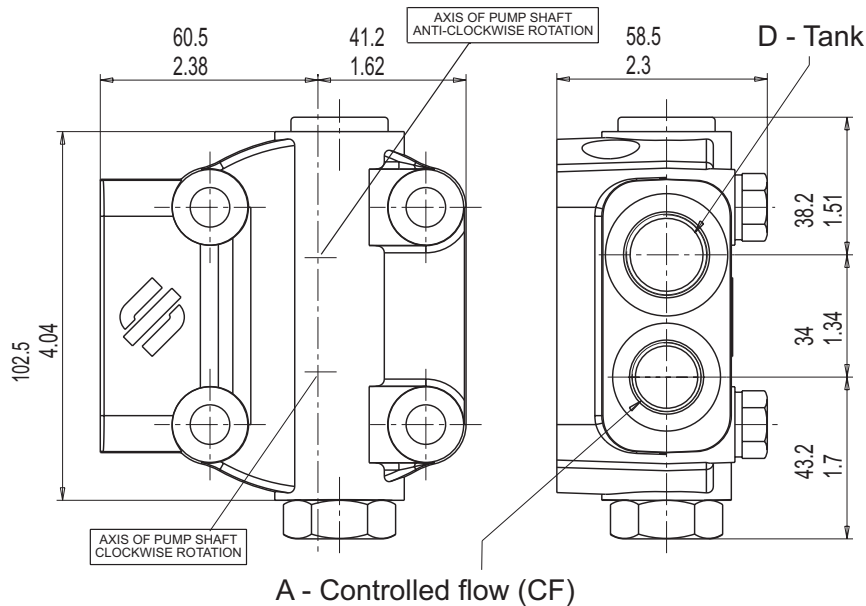
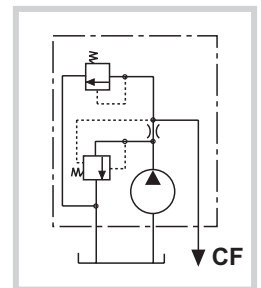
CALIBRATED ORIFICE ϕd (mm/inch)	FLOW RATE (l/min - gpm) $\pm 10\%$
1.5 (0.06")	2.5 (0.66)
2 (0.08")	4 (1.06)
2.4 (0.09")	6 (1.59)
2.8 (0.11")	8 (2.11)
3.1 (0.12")	10 (2.64)
3.5 (0.14")	12.5 (3.30)
4 (0.16")	16 (4.23)
4.4 (0.17")	20 (5.28)
4.9 (0.19")	25 (6.61)

**REAR COVER WITH PRESSURE COMPENSATED FLOW CONTROL VALVE
SIDE PORTS**

code VR1 Pressure compensated flow control valve with excess flow to tank



code VRS1 Pressure compensated flow control valve with excess flow to tank, with main relief valve on controlled flow line.



A	D
G 3/8	G 1/2
3/4-16 UNF-2B (SAE 8)	7/8-14 UNF-2B (SAE 10)

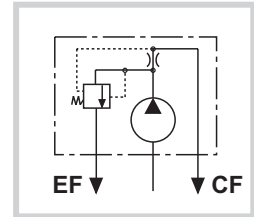
FLOW CONTROL VALVE (VR - VRS)

3 - way flow control valve housed in a special cast iron cover which ensures constant flow regardless pump speed and system pressure variations. It can also be supplied with adjustable pressure relief valve whose relieved flow goes into excess pump flow line. In this way the max fluid temperature is lower than obtained if the excess flow returned directly to pump inlet. The flow regulated is determined by the diameter of hole on the threaded dowel (see table).

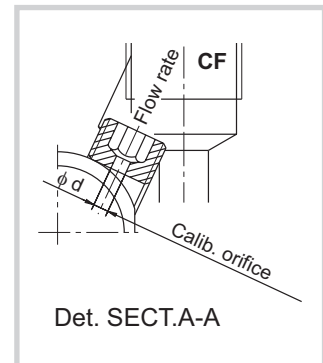
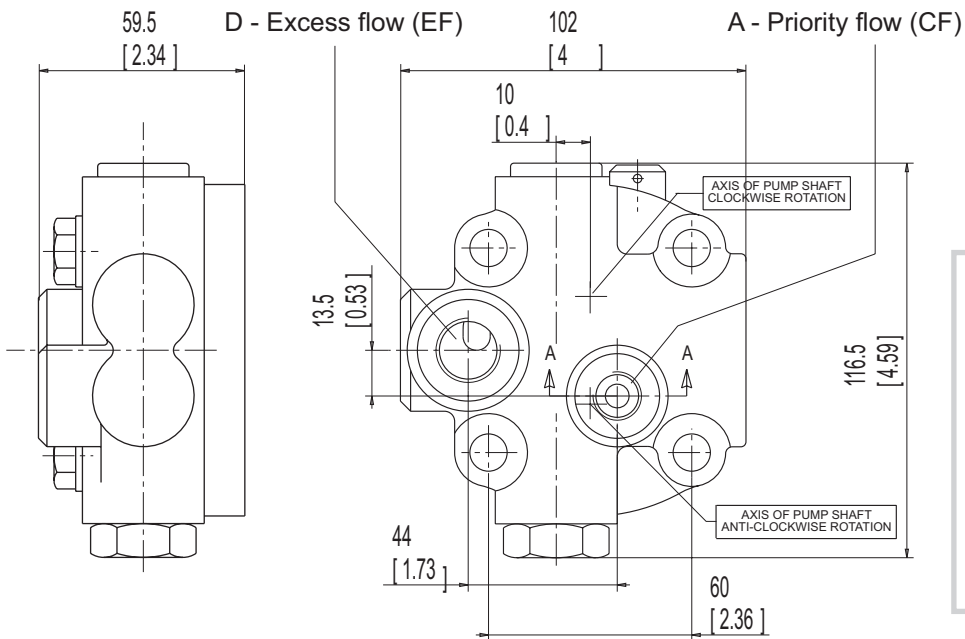
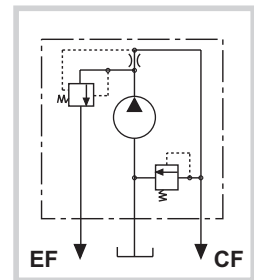
CALIBRATED ORIFICE ϕd (mm/inch)	FLOW RATE (l/min - gpm) $\pm 10\%$
1.5 (0.06")	2.5 (0.66)
2 (0.08")	4 (1.06)
2.4 (0.09")	6 (1.59)
2.8 (0.11")	8 (2.11)
3.1 (0.12")	10 (2.64)
3.5 (0.14")	12.5 (3.30)
4 (0.16")	16 (4.23)
4.4 (0.17")	20 (5.28)
4.9 (0.19")	25 (6.61)

REAR COVER WITH PRESSURE COMPENSATED PRIORITY FLOW VALVE REAR PORTS

code VP Priority flow valve, excess flow to second actuator.



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



A	D
G 3/8	G 1/2
9/16-18 UNF-2B (SAE 6)	3/4-16 UNF-2B (SAE 8)

CALIBRATED ORIFICE Ø 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)

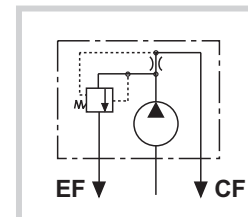
PRIORITY FLOW DIVIDERS (VP - VPS)

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.

REAR COVER WITH PRESSURE COMPENSATED PRIORITY FLOW VALVE
SIDE PORTS

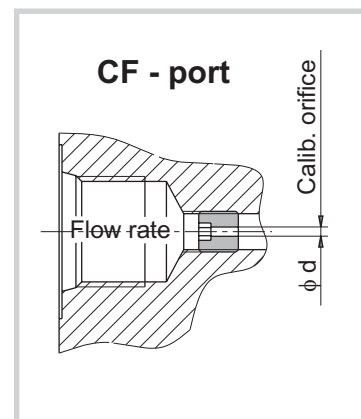
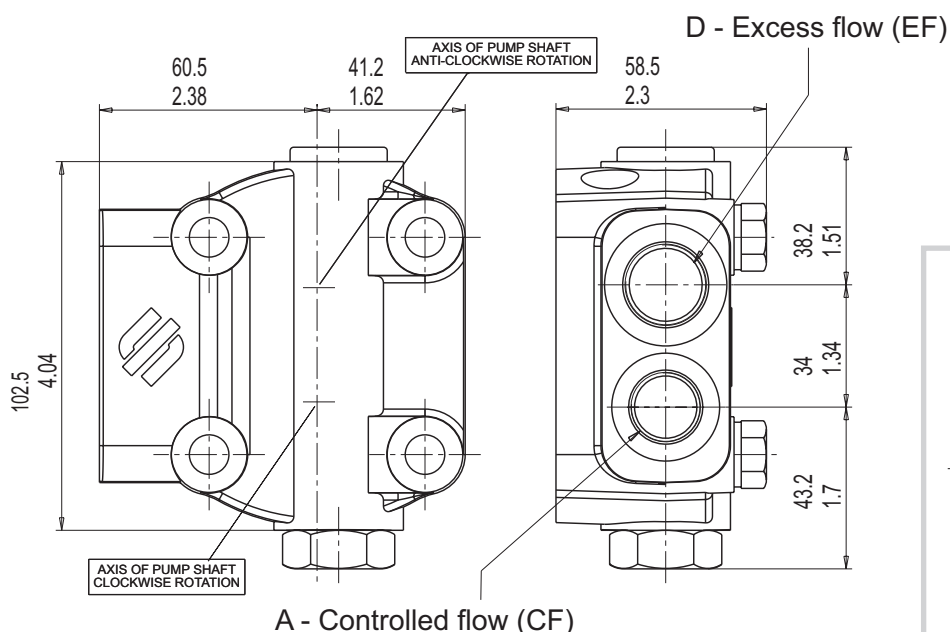
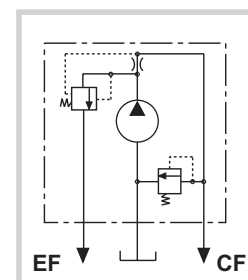
code VP1

Priority flow valve, excess flow to second actuator.



code VPS1

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



A	D
G 3/8	G 1/2
3/4-16 UNF-2B (SAE 8)	7/8-14 UNF-2B (SAE 10)

PRIORITY FLOW DIVIDERS (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.

CALIBRATED ORIFICE Ø 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)

REAR COVER WITH LOAD-SENSING PRIORITY VALVES REAR PORTS

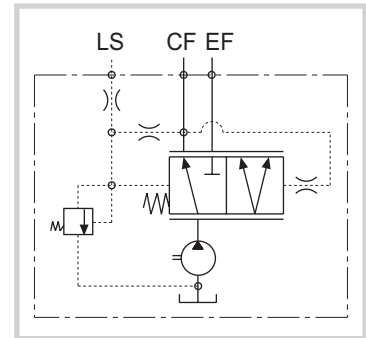
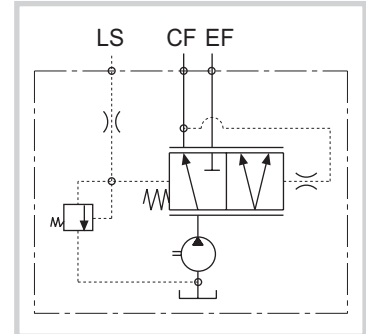
code VPL

Load sensing priority valve with main relief valve

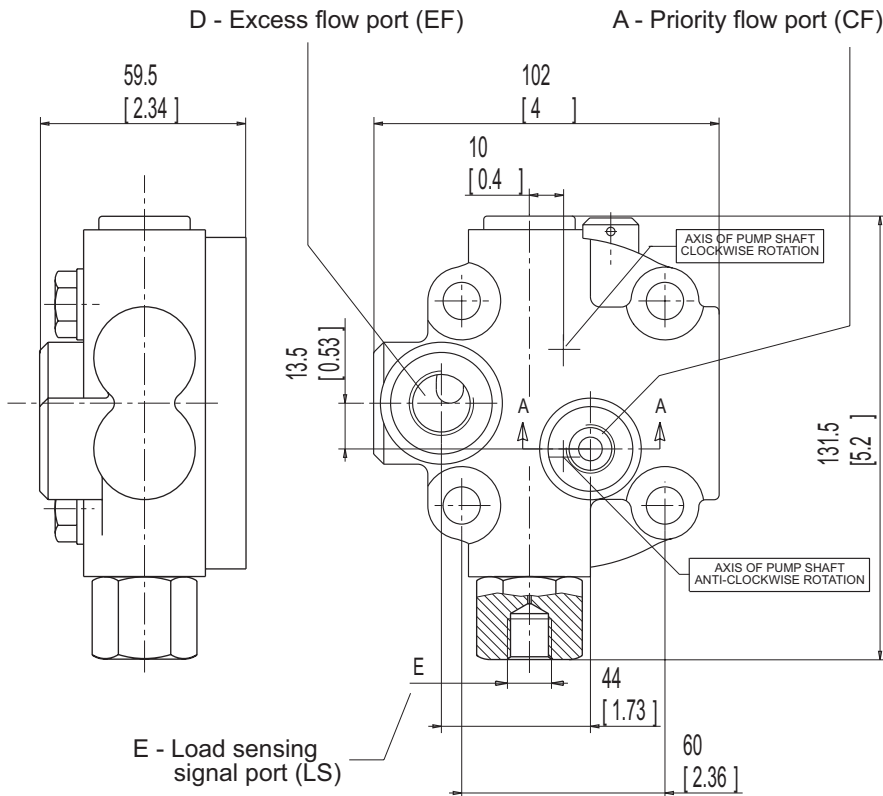


code VPD

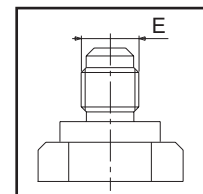
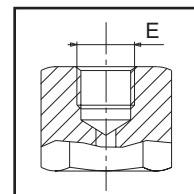
Load sensing priority valve with dynamic signal and main relief valve



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



PRIORITY FLOW RATE	
l / min ± 10%	gpm ± 10%
8	2.10
10.5	2.61
12.5	3.78
16	4.17
20	5.22



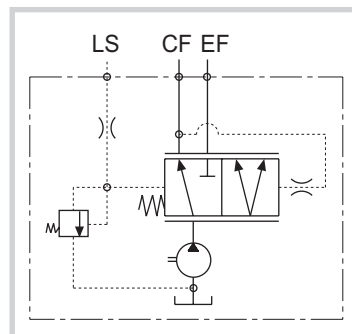
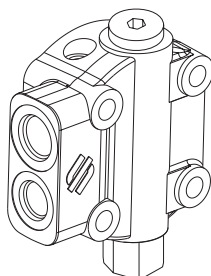
Minimum load sensing signal (LS) = 4 bar (28 psi)

A	D	E
G 3/8	G 1/2	G 1/4
9/16-18 UNF-2B (SAE 6)	3/4-16 UNF-2B (SAE 8)	7/16-20 UNF-2B (SAE 4)

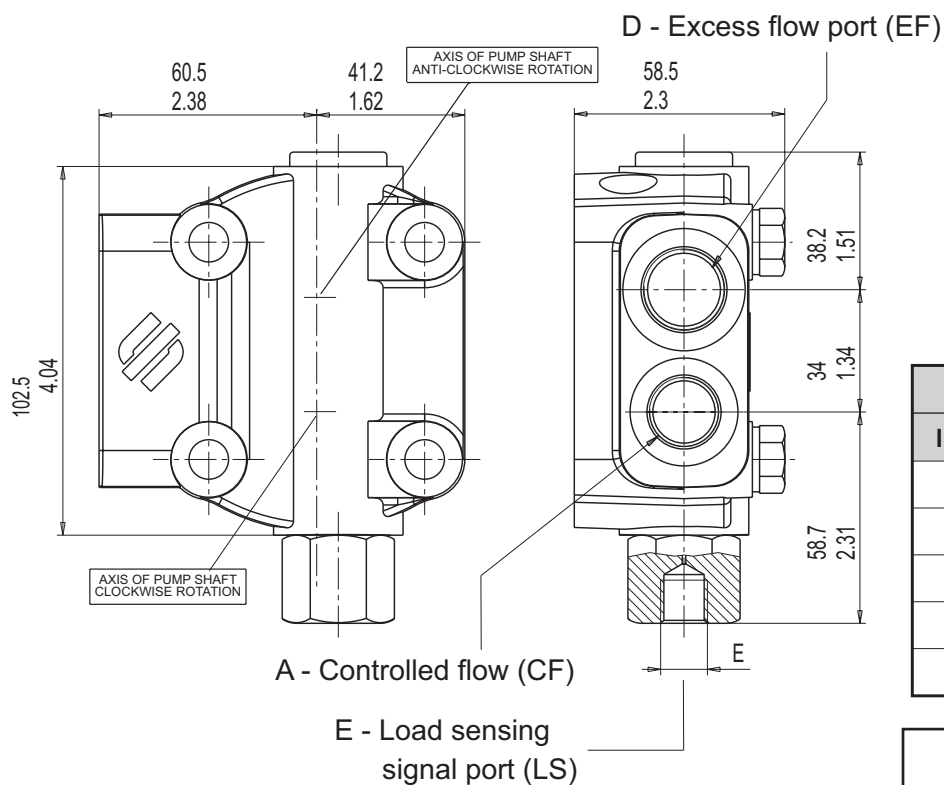
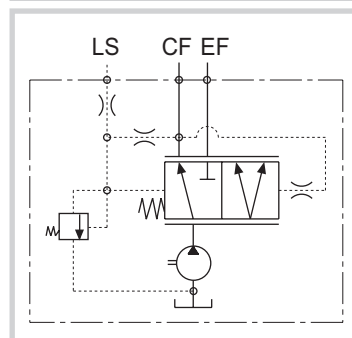
Side ports also available. Please specify with note.

REAR COVER WITH LOAD-SENSING PRIORITY VALVES
SIDE PORTS

code VPL1 Load sensing priority valve with main relief valve



code VPD1 Load sensing priority valve with dynamic signal and main relief valve



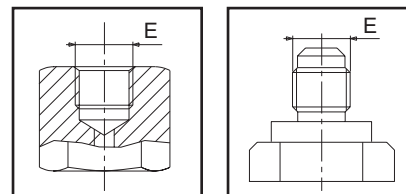
LS = Load sensing signal port
 CF = Priority flow port
 EF = Excess flow port

PRIORITY FLOW RATE	
l / min ± 10%	gpm ± 10%
8	2.10
10.5	2.61
12.5	3.78
16	4.17
20	5.22

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

A	D	E
G 3/8	G 1/2	G 1/4
3/4-16 UNF-2B (SAE 8)	7/8-14 UNF-2B (SAE 10)	7/16-20 UNF-2B (SAE 4)

Side ports also available. Please specify with note.

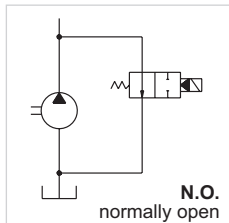


REAR COVER WITH ELECTRIC UNLOADING VALVE

code EV

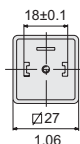
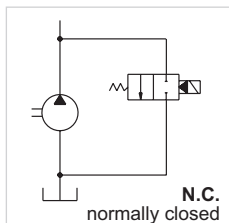
EV1 - 12 Vcc

EV2 - 24 Vcc

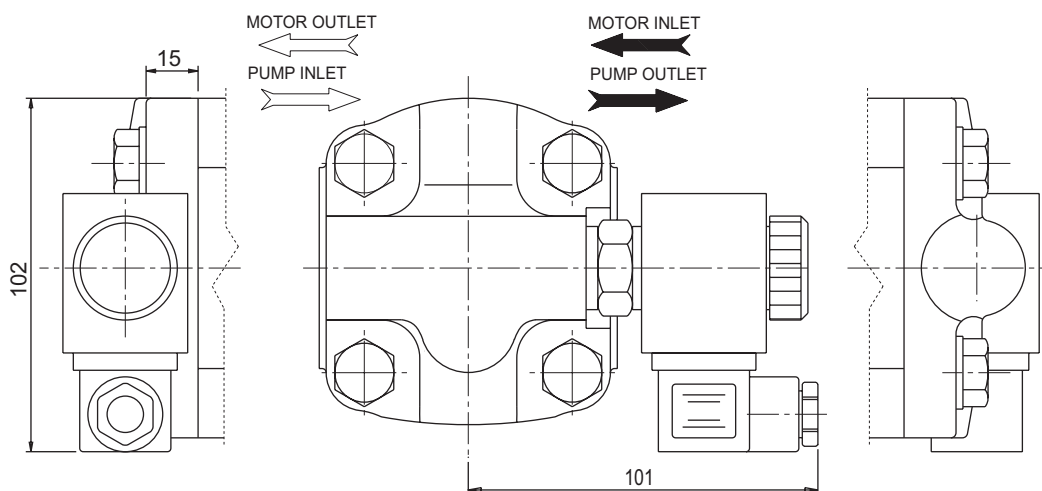
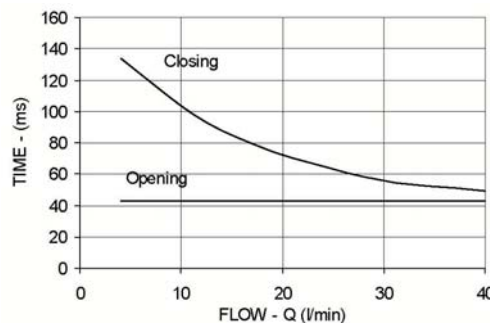
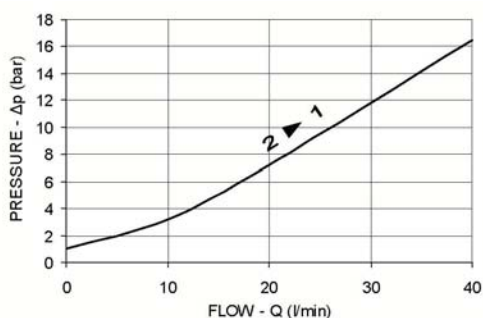


EV3 - 12 Vcc

EV4 - 24 Vcc



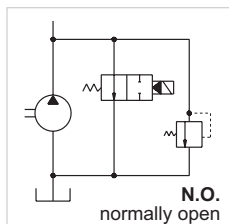
CONNECTOR
DIN 43650
A/ISO 4400



code EVS

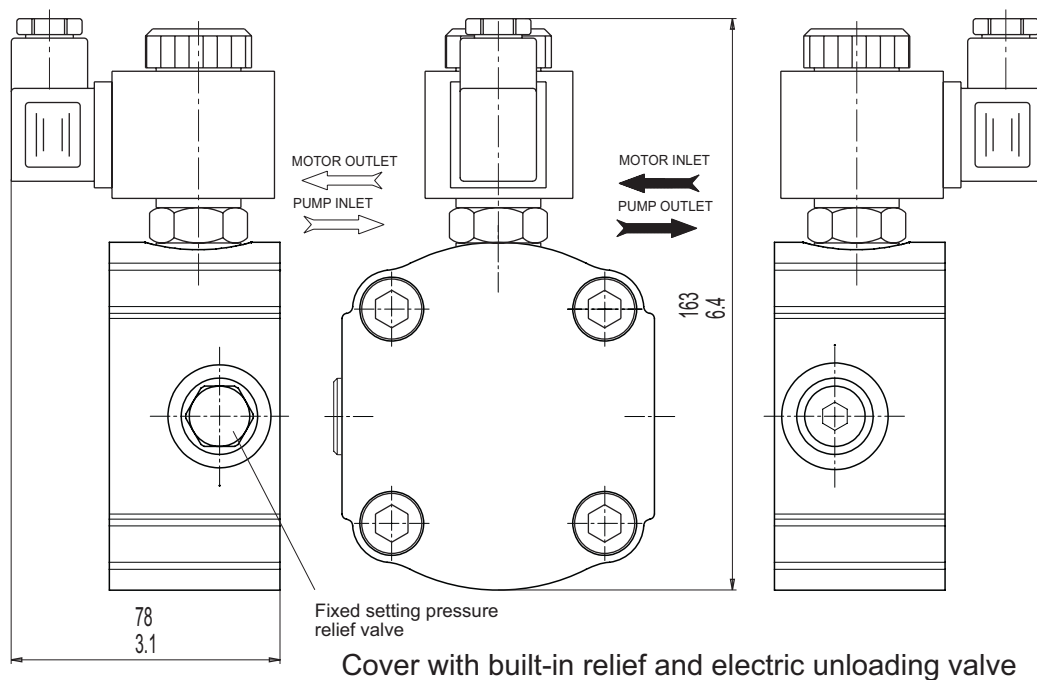
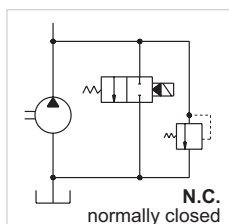
EVS1 - 12 Vcc

EVS2 - 24 Vcc



EVS3 - 12 Vcc

EVS4 - 24 Vcc



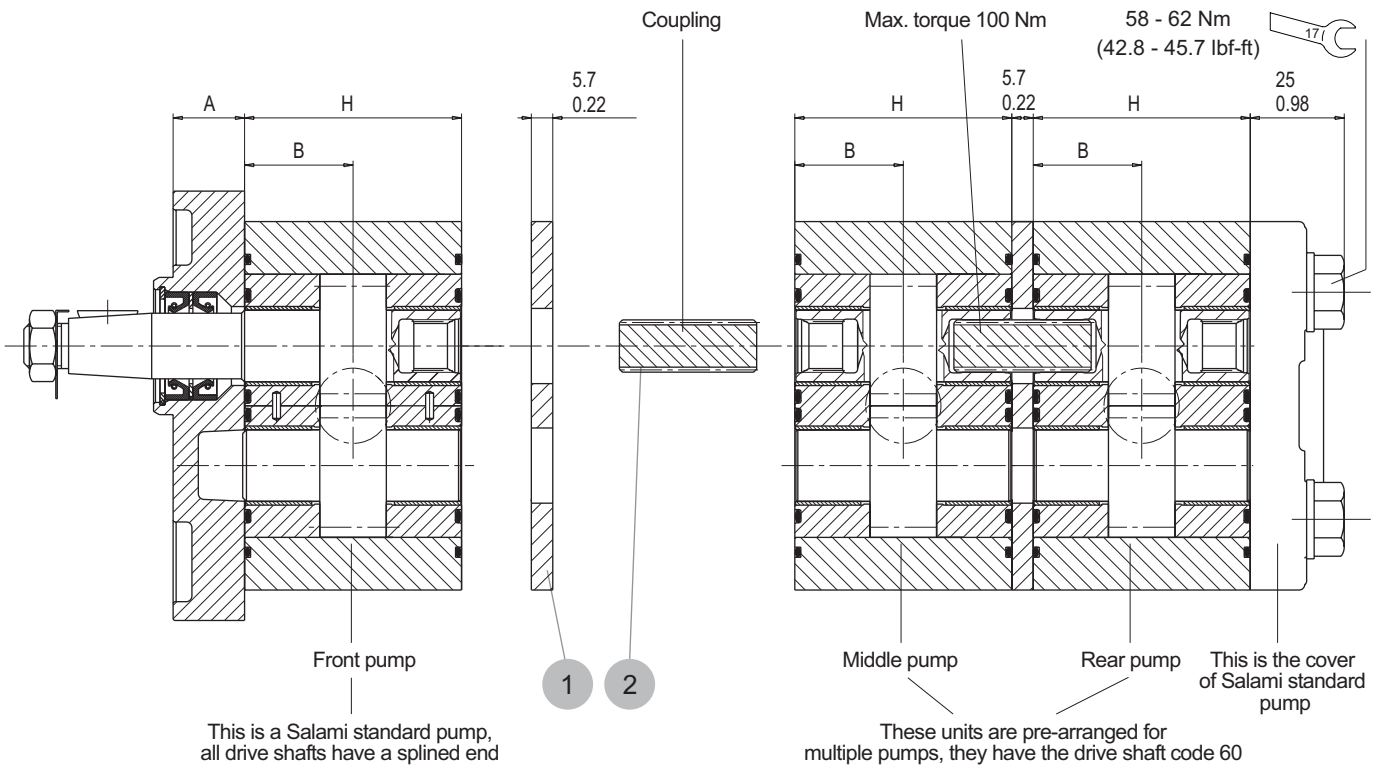
ASSEMBLING DIMENSIONS



In case of common inlet port, special bodies are required.

Commercial code "UA", in case of common inlet port .See page 34.

Type		3.2	3.9	4.5	6.5	8.3	10.5	11.3	12.5	13.8	16	19	22.5	26
Dimension A (flanges B2 - B3)	mm in	16,5 0.65												
Dimension A (flanges P1 - S2 - B1)	mm in	19 0.75												
Dimension B	mm in	23.55 0.91		24.98 0.98	26.4 1.04	28.17 1.11	29.8 1.17	31.75 1.25	33.75 1.33	37.8 1.49	40.5 1.59	43.4 1.71		
Dimension H	mm in	47,1 1.83		49.95 1.97	52.8 2.07	56.35 2.22	59.6 2.35	63.5 2.5	67.5 2.66	75.6 2.97	81 3.19	86.8 3.42		



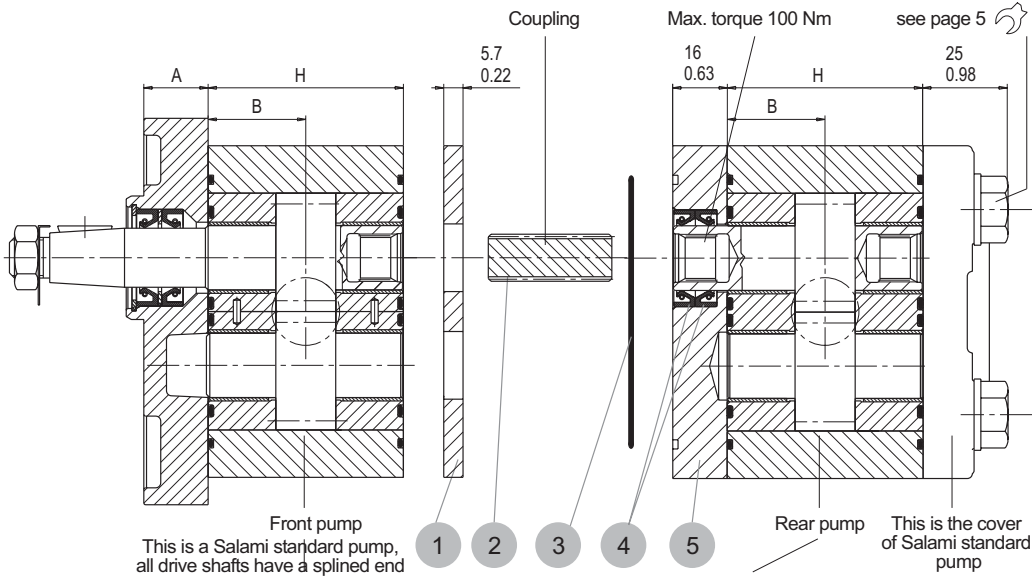
1 2 = kit multiple pumps

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.

MULTIPLE PUMP WITH SEPARATED STAGES

Finally to assembly the multiple pump you need to order bolts of the right length

For dimension (A - B - H) see page 26



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

Rear pump
This is the cover
of Salami standard
pump

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

Multiple pump with
separated stages
components kit:

1 2 3 4 5 the drive shaft 60* is longer than standard code 60

code AS

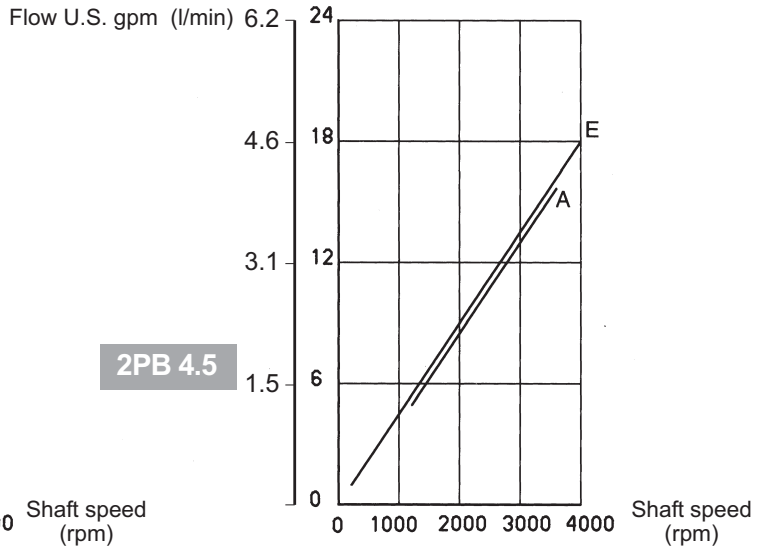
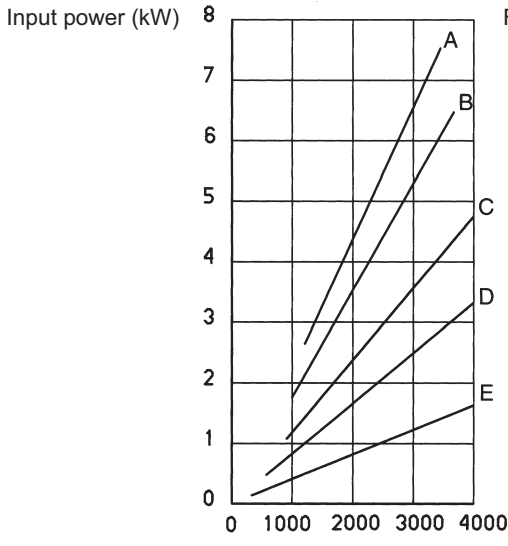
Order example:

2PB 11.3/2PB 8.3D - P28 P1 - AS

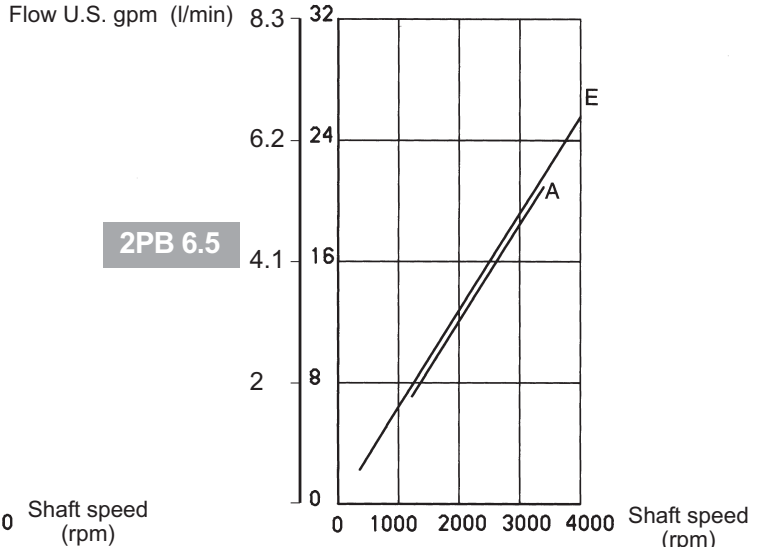
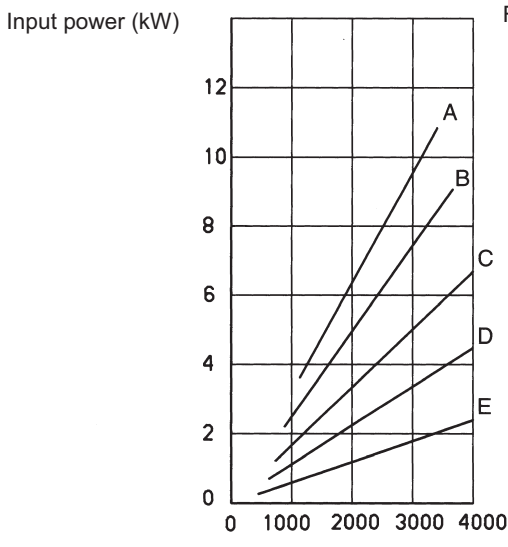
A=250 bar - (3600 psi)
 B=225 bar - (3250 psi)
 C=200 bar - (2900 psi)
 D=150 bar - (2175 psi)
 E=100 bar - (1450 psi)
 F= 50 bar - (725 psi)

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

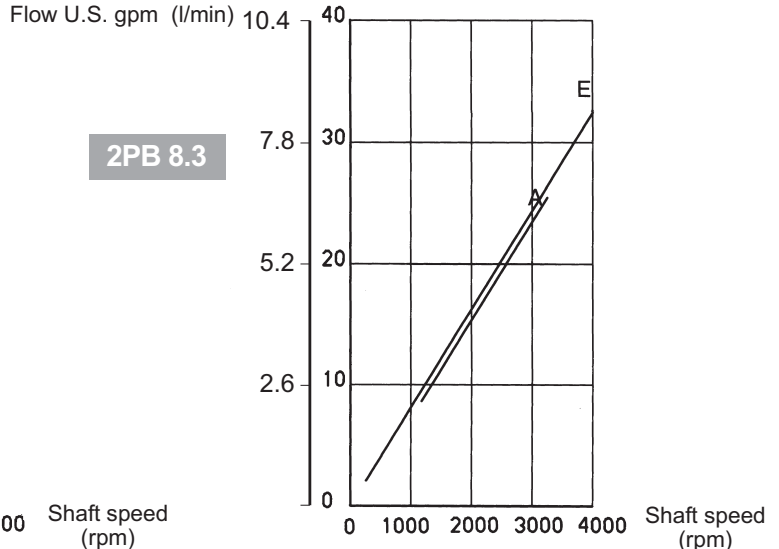
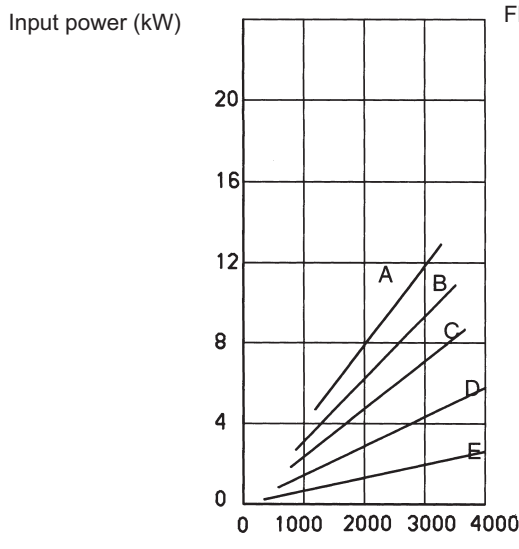
PUMP PERFORMANCE CURVES



2PB 4.5

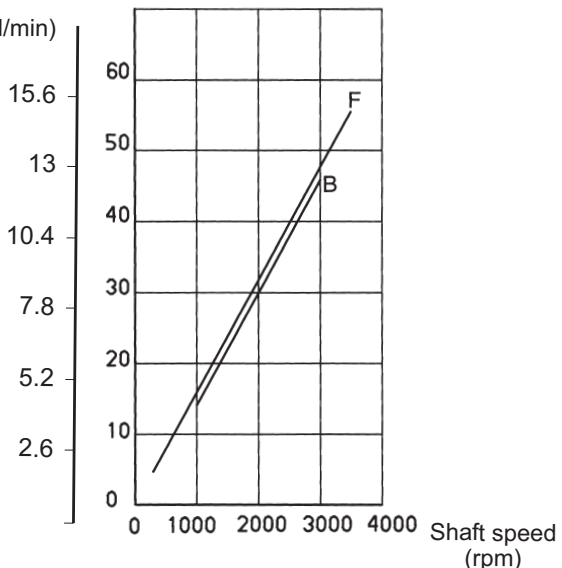
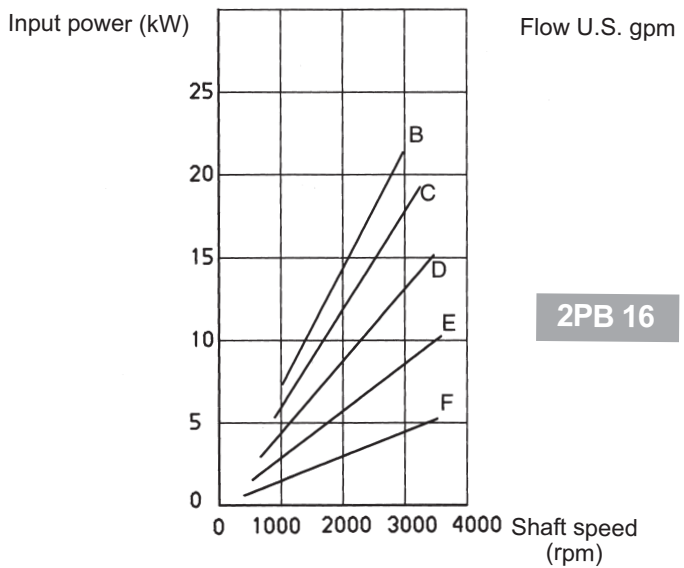
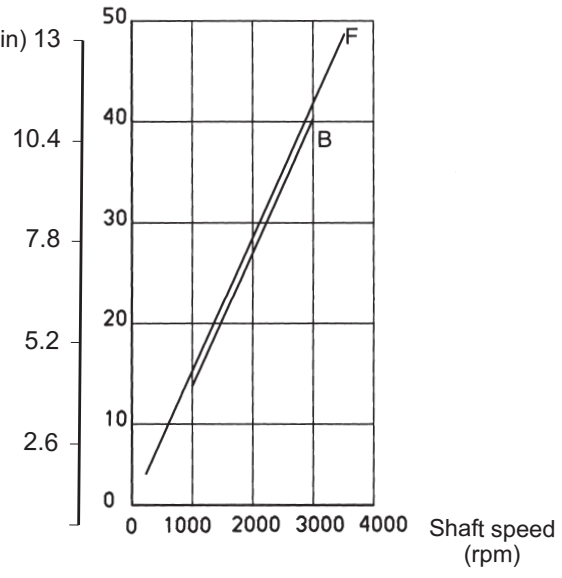
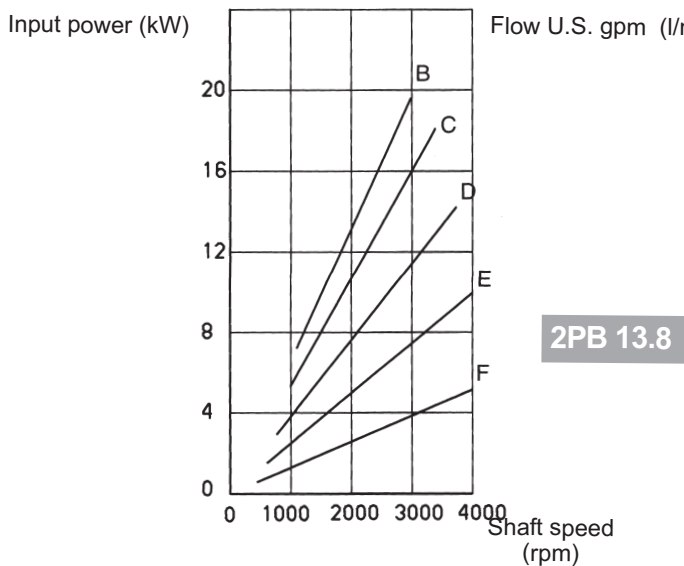
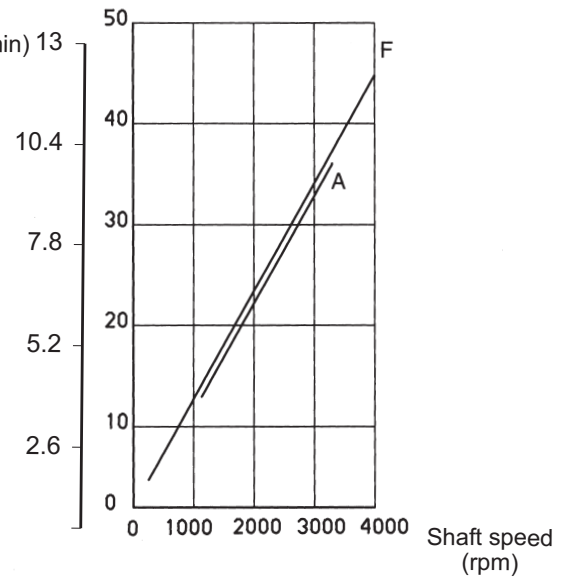
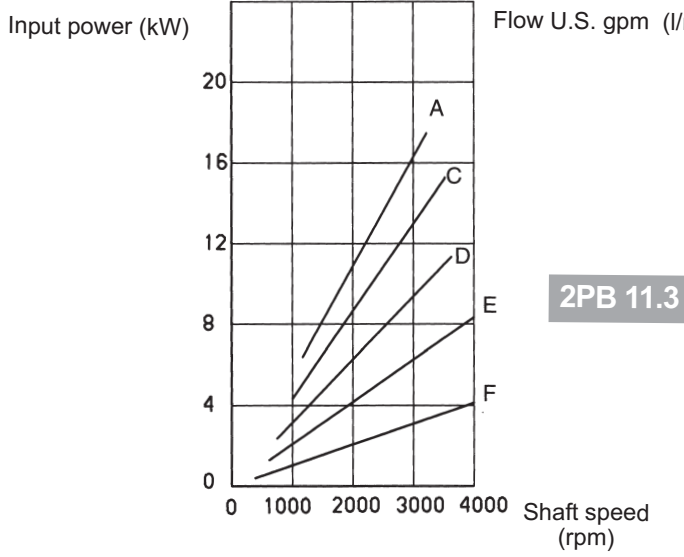


2PB 6.5



2PB 8.3

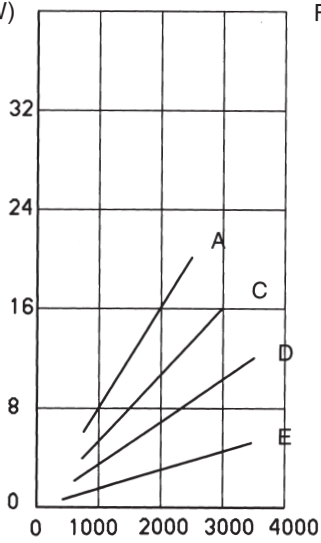
Performance curves carried out with oil viscosity at 16 cSt and oil temperature at 60°C



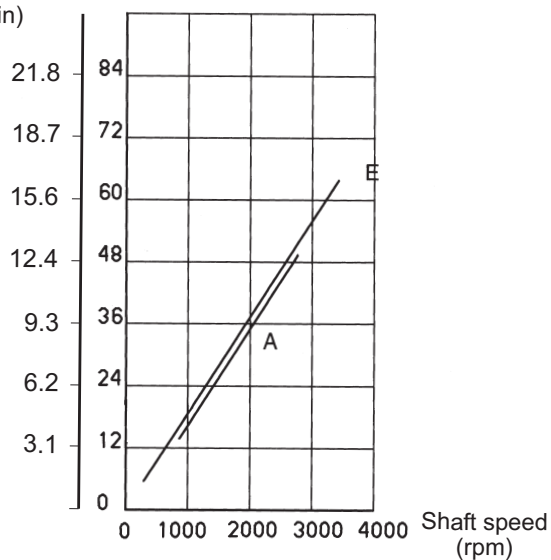
A=250 bar - (3600 psi)
 B=225 bar - (3250 psi)
 C=200 bar - (2900 psi)
 D=150 bar - (2175 psi)
 E=100 bar - (1450 psi)
 F= 50 bar - (725 psi)

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

Input power (kW)

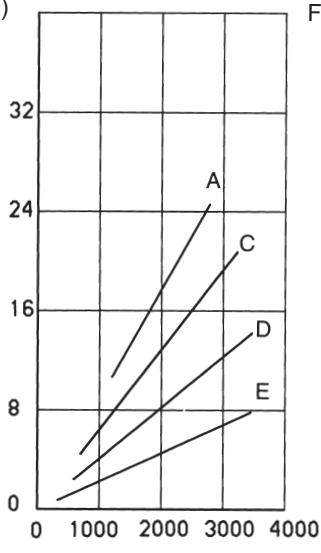


Flow U.S. gpm (l/min)

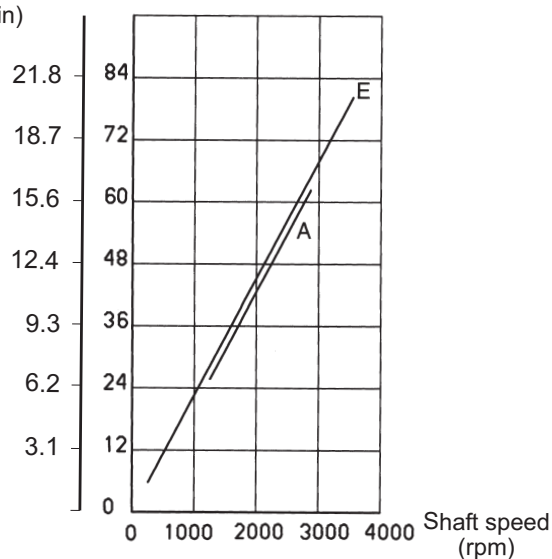


2PB 19

Input power (kW)

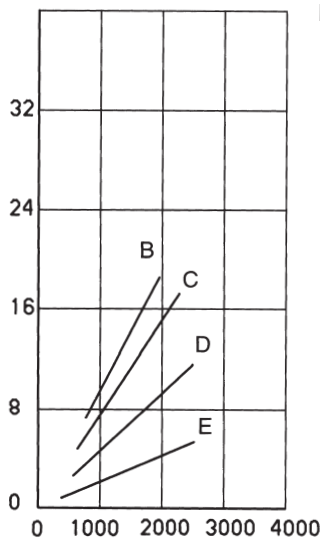


Flow U.S. gpm (l/min)

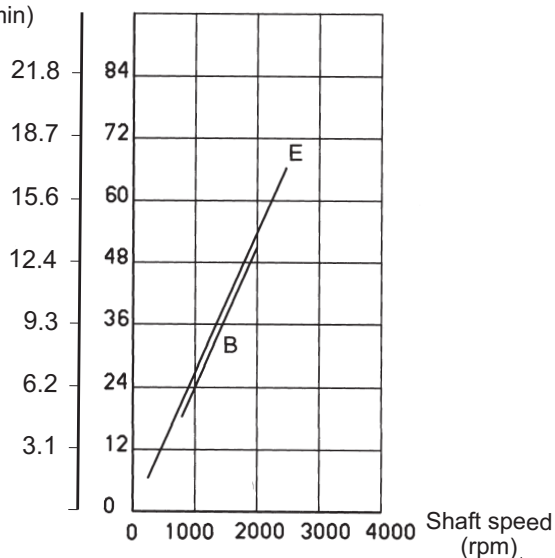


2PB 22.5

Input power (kW)

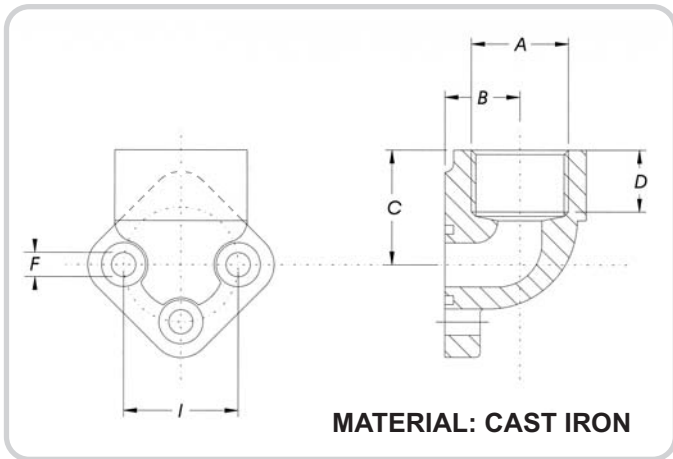


Flow U.S. gpm (l/min)

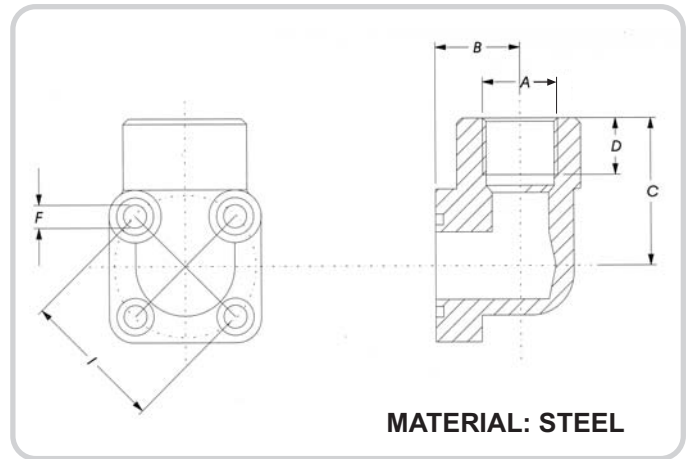


2PB 26

PORT CONNECTORS



Type G



Type GB

AVAILABLE CONNECTORS - DIMENSIONS AND CODE

Type	C	B	I	D	Ø F	Ø A	ORDERING CODE COMPLETE OF SCREW - SPRING WASHER - O RING
1 G/1	26	17.5	30	14	6.5	M18x1.5	4352 7004 0
1 G/2	26	17.5	30	14	6.5	G 3/8	4352 7005 0
1 G/3	26	17.5	30	14	6.5	G 1/2	4352 7006 0
2 G	36	21	40	16	8.5	G 3/4	4352 7011 0
1 GB/1	40	18	35	16	6.5	M18x1.5	4352 7008 1
1 GB/2	40	18	35	16	6.5	G 3/8	4352 7009 1
1 GB/3	40	18	35	16	6.5	G 1/2	4352 7010 1
2 GB	41.5	24	40	16	6.5	G 3/4	4352 7012 1

SINGLE PUMPS/MOTORS

2 P E 16 D - P 28 P1 - V 1 - CP - PD1 - VS / - - - -

DIMENSION

FUNCTION	CODE
Pump	P

SERIES

TYPE	DISPLACEMENTS	
4.5	4.6 cm ³ /rev.	0,27 cu.in/rev.
6.5	6.5 cm ³ /rev.	0,40 cu.in/rev.
8.3	8.2 cm ³ /rev.	0,50 cu.in/rev.
10.5	10.6 cm ³ /rev.	0.65 cu.in/rev.
11.3	11.5 cm ³ /rev.	0,68 cu.in/rev.
12.5	12.5 cm ³ /rev.	0.77 cu.in/rev.
13.8	13.8 cm ³ /rev.	0,84 cu.in/rev.
16	16.6 cm ³ /rev.	1.01 cu.in/rev.
19	19.4 cm ³ /rev.	1.15 cu.in/rev.
22.5	22.9 cm ³ /rev.	1.37 cu.in/rev.
26	25.8 cm ³ /rev.	1.58 cu.in/rev.

ROTATION	CODES
Clockwise	D
Anti-clockwise	S
Reversible	R

PORTS (pag. 8)	CODES
Flanged ports european standard	P
Flanged ports german standard	B
GAS threaded ports (BSPP)	G
SAE Threaded ports (ODT)	R

DRIVE SHAFTS (pag. 9 - 10)	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 9 T	52
SAE A splined 11 T	54
SAE A splined 13 T	55
DIN 5482 splined shaft 9 T	62
SAE A parallel shaft Ø 15,87	82
SAE A parallel shaft Ø 19,05	85

*The assembling is the same of that of page 16.

Setting main relief valve (bar)

Adjusted flow l/min

PD1 = pre-arranged for 1PE (pag. 17)

VALVES IN THE COVER	CODES
Adjustable main relief valve (pag.16)	VS
Fixed setting main relief valve*	VSF
Like VS with external discharge (pag.16)	VSE
Like VSF with external discharge*	VSEF
Flow regulator with excess flow to tank(pag.17 - 18)	VR - VR1
Like VR with main relief valve (pag. 17 - 18)	VRS - VRS1
Priority flow divider with excess flow to 2 nd actuator(pag.19 - 20)	VP - VP1
Like VP with main relief valve(pag.19 - 20)	VPS - VPS1
Priority flow divider with Load-sensing(pag.21 - 22)	VPL - VPL1
Like VPL with dinamic signal(pag.21 - 22)	VPD - VPD1
Electric unloading valve (12 V) (pag.23)	EV1
Electric unloading valve (24 V) (pag.23)	EV2
Main relief and electric unloading valves (12V) (pag.23)	EVS1
Main relief and electric unloading valves (24 V) (pag.23)	EVS2

OUTRIGGER BEARINGS (pag. 13 - 14)	CODES
European standard	CP
German standard	CB
For engine endothermic motors	CL
For endothermic motors with axial and radial loads	CF
SAE A	CS

PORTS POSITION	CODE
Lateral ports standard	
Rear ports (pag. 15)	1

SEAL	CODE
Buna Standard	
Viton	V

MOUNTING FLANGES (pag. 10 - 11 - 12)	CODES
European standard	P1
German standard Ø 80	B1
German standard Ø 52	B2-B3
German standard Ø 50	B4-B5
SAE A 2 bolts	S2
SAE A 2 bolts (with O-ring on the centering collar)	S6
SAE B 2 bolts	S3
4 bolts for Iveco motor	C1
4 bolts for Perkins Motor	K1
2 threaded holes flange for Perkins motor	MF

Order example: Pump 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: 2PE 19D-R52 S2-VPS12,5/180

MULTIPLE PUMPS

2PE 16 / 16 13.8 D - P 28 P1 - V AS 1 - CP - PD1 - 1PE.....

TYPE	DISPLACEMENTS	
3.2	3.2 cm ³ /rev.	0.19 cu.in/rev.
3.9	3.9 cm ³ /rev.	0.24 cu.in/rev.
4.5	4.6 cm ³ /rev.	0.27 cu.in/rev.
6.5	6.5 cm ³ /rev.	0.40 cu.in/rev.
8.3	8.2 cm ³ /rev.	0.50 cu.in/rev.
10.5	10.6 cm ³ /rev.	0.65 cu.in/rev.
11.3	11.5 cm ³ /rev.	0.68 cu.in/rev.
12.5	12.7 cm ³ /rev.	0.77 cu.in/rev.
13.8	13.8 cm ³ /rev.	0.84 cu.in/rev.
16	16.6 cm ³ /rev.	1.01 cu.in/rev.
19	19.4 cm ³ /rev.	1.15 cu.in/rev.
22.5	22.9 cm ³ /rev.	1.37 cu.in/rev.
26	25.8 cm ³ /rev.	1.58 cu.in/rev.

ROTATION	CODES
Clockwise	D
Anti-clockwise	S

PORTS (pag. 9)	CODES
Flanged ports european standard	P
Flanged ports german standard	B
GAS threaded ports (BSPP)	G
SAE Threaded ports (ODT)	R

DRIVE SHAFTS (pag. 10 - 11)	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 9 T	52
SAE A splined 11 T	54
SAE A splined 13 T	55
DIN 5482 splined shaft 9 T	62
SAE A parallel shaft Ø 15,87	82
SAE A parallel shaft Ø 19,05	85

See corresponding single pump (1PE).
Our catalogue code
10.38.1209.02.00

PD1 = pre-arranged for 1PE (pag. 17)

OUTRIGGER BEARINGS (pag. 15 - 16)	CODES
European standard	CP
German standard	CB
For engine endothermic motors	CL
For endothermic motors with axial and radial loads	CF
SAE A	CS

PORTS POSITION	CODES
Lateral ports standard	
Rear ports (pag.16)	1

SUCTION TYPES	CODES
Common suction (pag. 25)	UA*
Separated stages (pag. 26)	AS

SEAL	CODE
Buna Standard	
Viton	V

MOUNTING FLANGES (pag. 11 - 12 - 13)	CODES
European standard	P1
German standard Ø 80	B1
German standard Ø 52	B2-B3
German standard Ø 50	B4-B5
SAE A 2 bolts	S2
SAE A 2 bolts (with O-ring on the centering collar)	S6
SAE B 2 bolts	S3
4 bolts for Iveco motor	C1
4 bolts for Perkins Motor	K1
2 threaded holes flange for Perkins motor	MF

Available only as rear pump

*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: 2PE 16/6.2D - B25 B2 - UA1

Example to order a triple pump with main relief in the rear pump: 2PE 13.8/8.3/4.5D - P28 P0 - VS175

WARRANTY

- We warrant products sold by us to be free from defects in material and workmanship.
- Our sole obligation to buyer under this warranty is the repair or replacement, at our option, of any products or parts thereof which, under normal use and proper maintenance, have proven defective in material or workmanship, this warranty does not cover ordinary wear and tear, abuse, misuse, averloading, alteration.
- No claims under this warranty will be valid unless buyer notifies SALAMI in writing within a reasonable time of the buyer's discovery of such defects, but in no event later than twelve (12) months from date of shipment to buyer.
- Our obligation under this warranty shall not include any transportation charges or cost of installation, replacement, field repair, or other charges related to returning products to us; or any liability for direct, indirect or consequential damage or delay. If requested by us, products or parts for which a warranty claim is made are to be returned transportation prepaid to our factory. The risk of loss of any products or parts thereof returned to SALAMI will be on buyer.
- No employee or representative is authorized to change any warranty in any way or grant any other warranty unless such change is made in writing and signed by an officer of SALAMI.



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