

TECHNICAL INFORMATION

Hydraulic fluids

It is advisable to use hydraulic oils of mineral origin with anti-foaming, anti-oxidant and anti-corrosion characteristics and a high viscosity index;

- Recommended viscosity $15 \pm 92 \text{ mm}^2/\text{s}$ (cSt)
- Start-up viscosity limit $3000 \text{ mm}^2/\text{s}$ (cSt)

During normal operation, the temperature of the oil must be between 20°C and 65°C and limit values between -15°C and 80°C .

Suction pressure

The allowed working pressure supplied must be in the range 0.7 - 3 bar (absolute).

For higher values (up to 30 bar), versions with a K seal must be used.

Suction and delivery pipes

Particular attention must be given to the sizing of pipes (rigid or flexible), avoiding disproportionate lengths, sudden variations in cross section or small curvature radius, in any case selecting pipe cross-sections that guarantee an oil speed between 0.6 and 12 m/s.

Filtration

In order to eliminate any impurities present in the oil and to guarantee a longer duration of the pump, the system must be equipped with effective filtration which must be periodically checked to ensure that it is operating correctly.

The following are the recommended filtration levels:

- 26/23 ISO DIS 4406 up to 150 bar
- 23/20 ISO DIS 4406 for higher pressures.

Installation notes

- Make sure that the coupling used for pulling compensates for any axial misalignments that could compromise the integrity of the pump.
- If there are radial and/or axial/ loads on the pump shaft (as is the case, for example, when pulling is carried out using pulleys and belts) the versions available with a support must be chosen.
- The connection coupling between spline shafts must be appropriately lubricated, free to move axially and of an adequate length to cover the entire extension of the two shafts (motor and pump).
- If the pump is painted, protect the shaft seal and also make sure that the contact zone between the shaft seal and the shaft is free of dust or abrasive sediments.

Rotation direction

The rotation direction is defined as S (left/anticlockwise) or D (right/clockwise) by observing the shaft from the front.

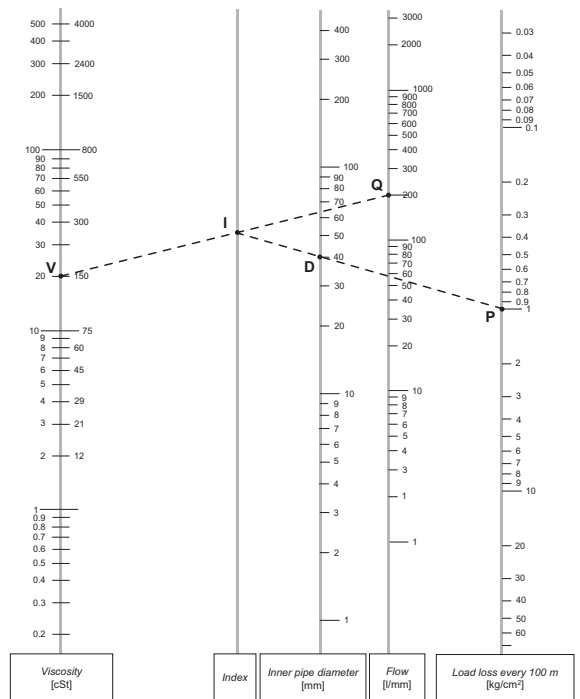
The pumps are monodirectional and therefore when ordering the required rotation direction must be specified; alternatively it is possible to modify the internal set-up as illustrated below (inversion of the rotation direction).

The pages regarding the pump characteristics highlight the directions of the delivery and suction flows for each version and rotation direction.

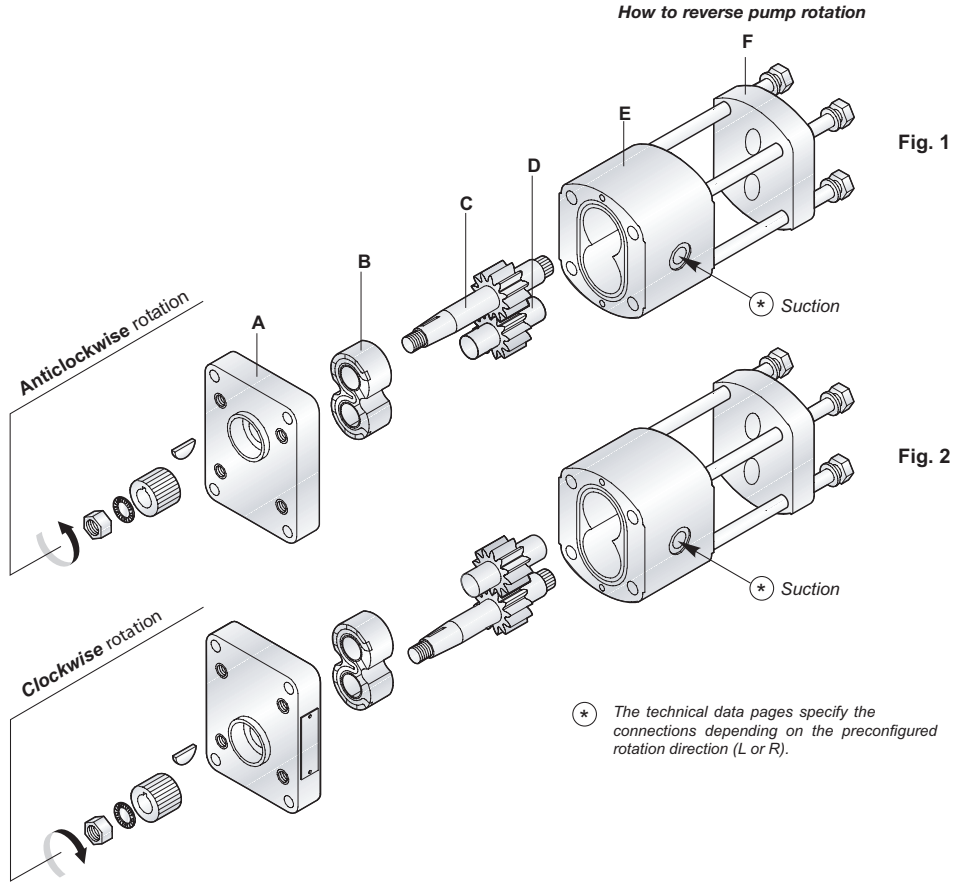
Pressure drops

The following nomogram allows you to calculate the pressure drops for each 100 m of piping when the viscosity of the oil, the delivery capacity of the pump and the diameter of the piping are known.

The viscosity (V), flow capacity (Q) and diameter (D) values are fixed on the respective scales; a line is drawn joining the points V and Q; the point where this intersects the index line is defined as point I. If the line joining point I to point D is extended, the load pressure drops value can then be read at the intersection with the last scale.



TECHNICAL INFORMATION



The gear pumps direction of rotation is indicated by an arrow on the label.

How to reverse the pumps rotation:

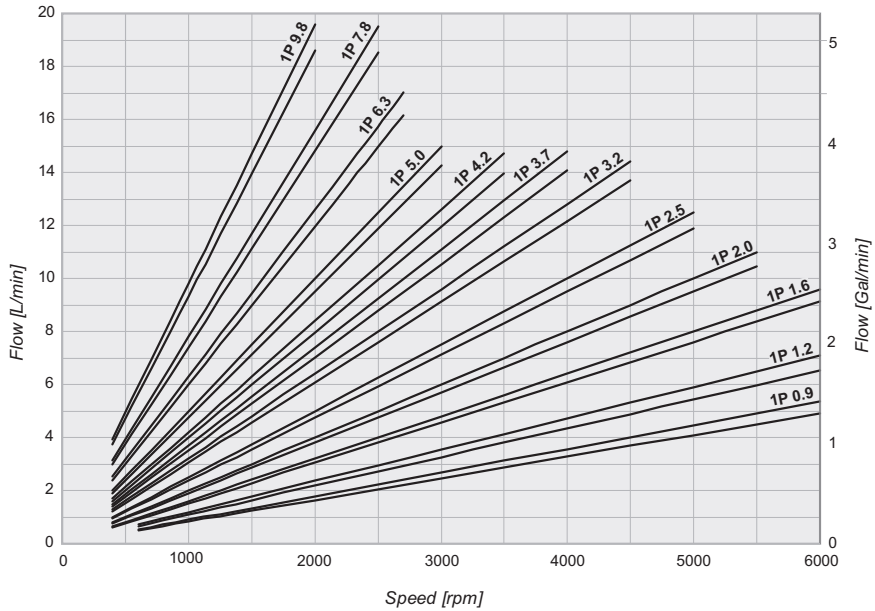
- Disassemble pump as shown in figure 1.
- Pull off gears C - D and reassemble according to figure 2.
- Reassemble bushing B as before.
- Reverse the flange A and reassemble the pump tightening the screws by using a torque wrench.
- For the pumps GR3 - GR4, disassemble only front flange.

Type of pump	GR1	GR2	GR3	GR4
Numbers of screws	4	4	16	16
Type of threads	M8	M10	M10	M14
Tightening torque of screws	30 Nm (266 in-lbs)	50 Nm (443 in-lbs)	60 Nm (531 in-lbs)	140 Nm (1239 in-lbs)
Type of coupling	1IS 12M	2IS 14M 2IS 15M	3IS 18M	4IS 23M
Tightening torque at nut coupling	9 ÷ 10 Nm (80 ÷ 89 in-lbs)	22 ÷ 25 Nm (195 ÷ 221 in-lbs) 32 ÷ 35 Nm (283 ÷ 310 in-lbs)	50 ÷ 55 Nm (443 ÷ 487 in-lbs)	100 ÷ 120 Nm (885 ÷ 1062 in-lbs)

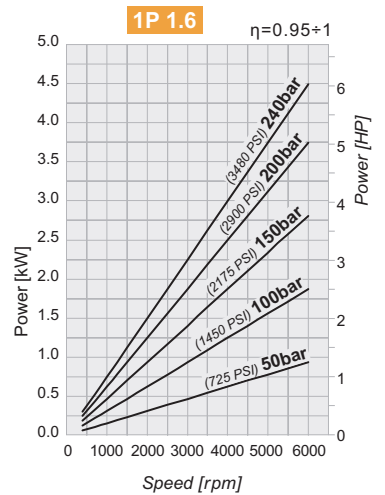
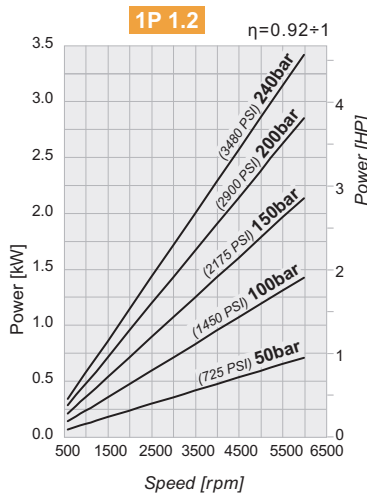
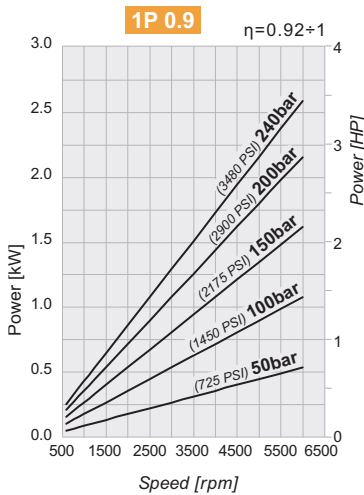
PUMPS GROUP 1 • PERFORMANCE



Flow - Speed chart

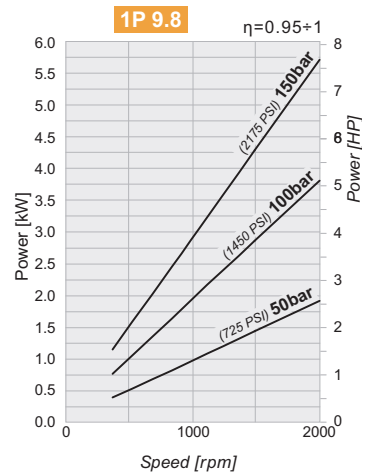
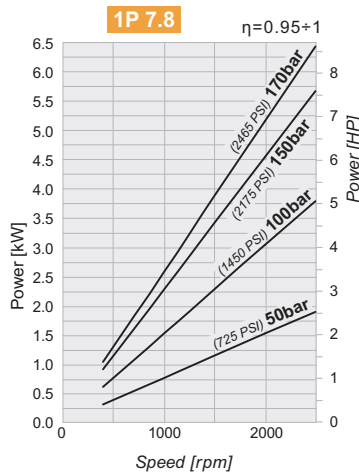
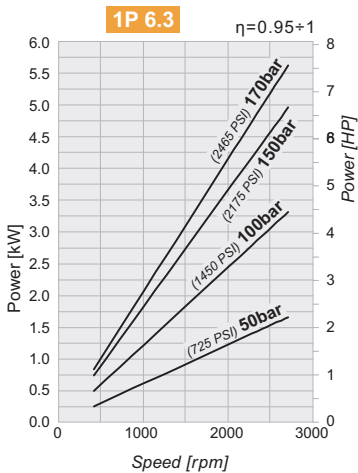
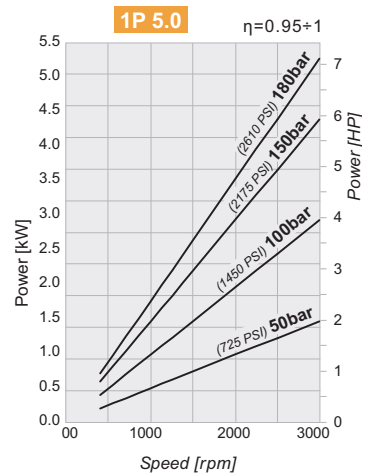
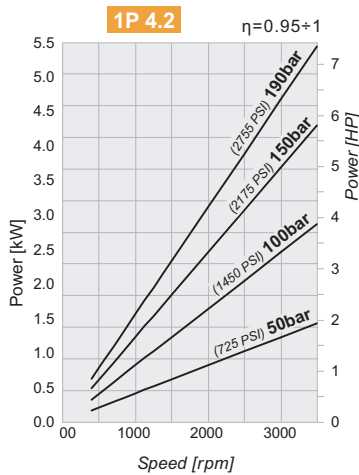
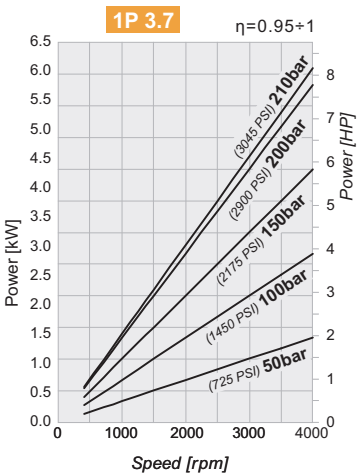
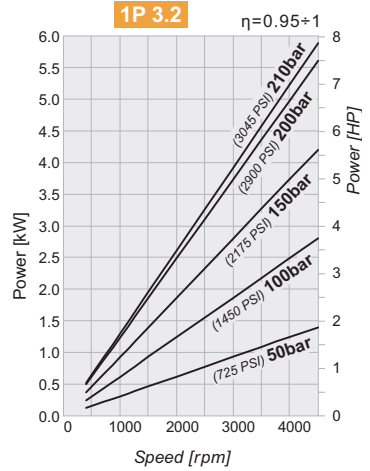
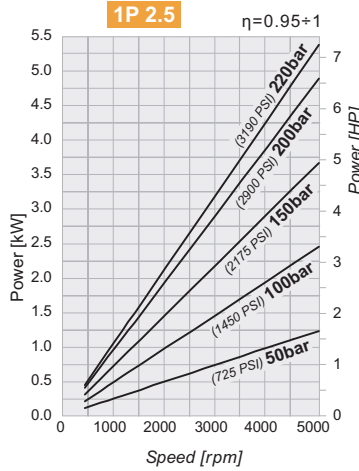
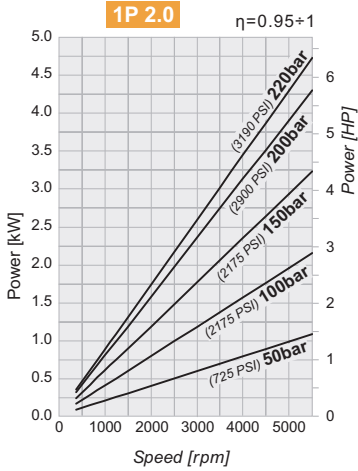


Pumps Group 1 Power and Speed Diagrams



PUMPS GROUP 1 • PERFORMANCE

Pumps Group 1 Power and Speed Diagrams



PUMPS GROUP 1 • STANDARD



Technical data

Size	Displacement [cm ³ /rev] (in ³ /rev)	Max. working pressure			Max. speed [g/min] (rpm)	Max. flow [l/min] (Gal/min)	Min. speed [g/min] (rpm)	Min. flow [l/min] (Gal/min)	Dimensions		Mass [Kg] (lbs)	Min. volumetric efficiency %
		P1 [bar] (PSI)	P2 [bar] (PSI)	P3 [bar] (PSI)					A [mm] (inch)	B [mm] (inch)		
1SP A0.9	0.89 (0.05)	240 (3480)	260 (3770)	290 (4205)	6000	5.3 (1.40)	600	0.49 (0.13)	34.80 (1.370)	73.6 (2.898)	0.91 (2.01)	92*
	1.18 (0.07)	240 (3480)	260 (3770)	290 (4205)		7.1 (1.88)		0.65 (0.17)	35.35 (1.392)	74.7 (2.941)		
1SP A1.2	1.6 (0.10)	240 (3480)	260 (3770)	290 (4205)	6000	9.6 (2.54)	400	0.61 (0.16)	36.20 (1.425)	76.4 (3.008)	0.95 (2.09)	92*
	2.0 (0.12)	220 (3190)	250 (3625)	270 (3915)		11 (2.91)		0.76 (0.20)	36.95 (1.455)	77.9 (3.067)		
1SP A2.0	2.5 (0.15)	220 (3190)	250 (3625)	270 (3915)	5500	12.5 (3.30)	400	0.95 (0.25)	37.95 (1.494)	79.9 (3.146)	1.00 (2.21)	95*
1SP A2.5	3.2 (0.20)	210 (3045)	240 (3480)	260 (3770)	4500	14.4 (3.80)	400	1.21 (0.32)	39.30 (1.547)	82.6 (3.252)	1.04 (2.29)	
1SP A3.2	3.7 (0.23)	210 (3045)	240 (3480)	260 (3770)	4000	14.8 (3.91)	400	1.40 (0.37)	40.30 (1.587)	84.6 (3.331)	1.07 (2.36)	95*
1SP A3.7	4.2 (0.26)	190 (2755)	210 (3045)	230 (3335)	3500	14.7 (3.88)	400	1.60 (0.42)	41.25 (1.624)	86.5 (3.406)	1.10 (2.43)	
1SP A4.2	5.0 (0.31)	180 (2610)	210 (3045)	230 (3335)	3000	15 (3.96)	400	1.90 (0.50)	42.80 (1.685)	89.6 (3.528)	1.14 (2.51)	95*
1SP A5.0	6.3 (0.38)	170 (2465)	190 (2755)	210 (3045)	2700	17 (4.49)	400	2.39 (0.63)	45.35 (1.785)	94.7 (3.728)	1.22 (2.69)	
1SP A6.3	7.76 (0.47)	170 (2465)	190 (2755)	210 (3045)	2500	19.4 (5.13)	400	2.95 (0.78)	48.20 (1.898)	100.4 (3.953)	1.30 (2.87)	95*
1SP A7.8	9.78 (0.60)	150 (2175)	170 (2465)	190 (2755)	2000	19.6 (5.18)	400	3.71 (0.98)	52.15 (2.053)	108.3 (4.264)	1.41 (3.11)	

* Value collected during the testing at 1500 rpm

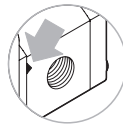
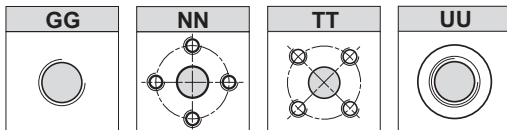
Example of ordering code

1SP A 2.0 D (H) - 10 GG 0 (VT)

1SP	Pump type	see table
A	Flange and cover material	A = Aluminium
2.0	Displacement	see table
D	Clockwise rotation	D = Clockwise rotation S = Anticlockwise rotation
(H)	Stiffening seal for low suction pressure	(optional)
— ⁽¹⁾	Standard flange	
10	Shaft type	10 - 11 - 13 - 14 - 15 - 27
GG	Port connection type	GG - NN - TT - UU - NG - TG - UG
0	Connections positions	0 - 1 - 3 - 4
(VT)	Optional	(VT) Viton seals (optional) VLP-I (N) Pressure relief valve (page A-27)

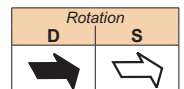
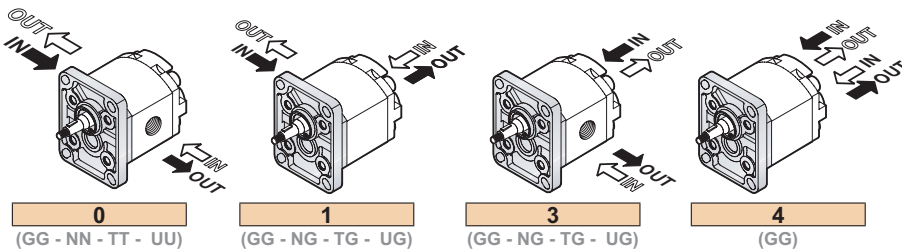
⁽¹⁾ It is not necessary to indicate STANDARD flange

Conn Port Connections



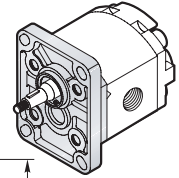
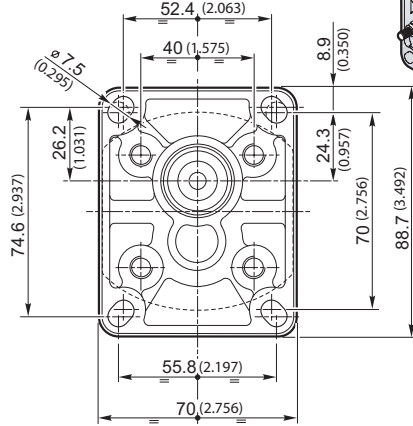
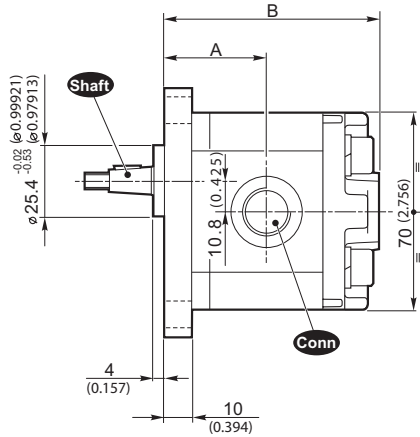
The sign on the body identifies the **suction side** for the pumps.

Connection positions

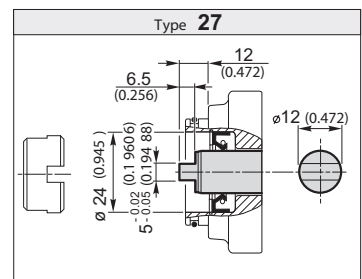
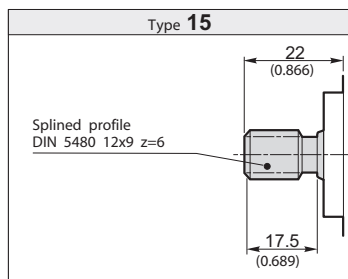
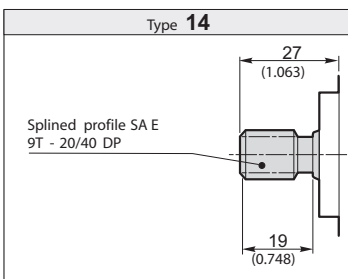
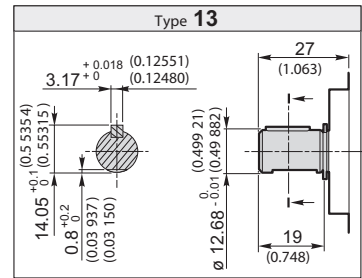
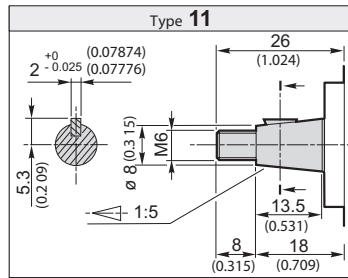
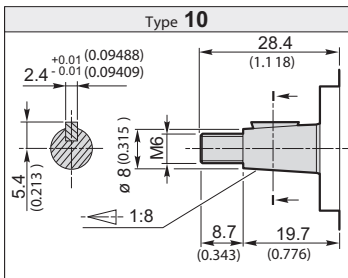


PUMPS GROUP 1 • STANDARD

Dimensions mm (inch)



Shaft Available shafts



PUMPS GROUP 1 • SAE AA



Technical data

Size	Displacement [cm ³ /rev] (in ³ /rev)	Max. working pressure			Max. speed [g/min] (rpm)	Max. flow [l/min] (Gal/min)	Min. speed [g/min] (rpm)	Min. flow [l/min] (Gal/min)	Dimensions		Mass [Kg] (lbs)	Min. volumetric efficiency %
		P1 [bar] (PSI)	P2 [bar] (PSI)	P3 [bar] (PSI)					A [mm] (inch)	B [mm] (inch)		
1SP A0.9	0.89 (0.05)	240 (3480)	260 (3770)	290 (4205)	6000	5.3 (1.40)	600	0.49 (0.13)	38.3 (1.508)	77.1 (3.035)	0.91 (2.01)	92*
1SP A1.2	1.18 (0.07)	240 (3480)	260 (3770)	290 (4205)	6000	7.1 (1.88)	600	0.65 (0.17)	38.85 (1.530)	78.2 (3.079)	0.93 (2.05)	
1SP A1.6	1.6 (0.10)	240 (3480)	260 (3770)	290 (4205)	6000	9.6 (2.54)	400	0.61 (0.16)	39.7 (1.563)	79.9 (3.146)	0.95 (2.09)	
1SP A2.0	2.0 (0.12)	220 (3190)	250 (3625)	270 (3915)	5500	11 (2.91)	400	0.76 (0.20)	40.45 (1.593)	81.4 (3.205)	0.97 (2.14)	
1SP A2.5	2.5 (0.15)	220 (3190)	250 (3625)	270 (3915)	5000	12.5 (3.30)	400	0.95 (0.25)	41.45 (1.632)	83.4 (3.283)	1.00 (2.21)	95*
1SP A3.2	3.2 (0.20)	210 (3045)	240 (3480)	260 (3770)	4500	14.4 (3.80)	400	1.21 (0.32)	42.8 (1.685)	86.1 (3.390)	1.04 (2.29)	
1SP A3.7	3.7 (0.23)	210 (3045)	240 (3480)	260 (3770)	4000	14.8 (3.91)	400	1.40 (0.37)	43.8 (1.724)	88.1 (3.469)	1.07 (2.369)	
1SP A4.2	4.2 (0.26)	190 (2755)	210 (3045)	230 (3335)	3500	14.7 (3.88)	400	1.60 (0.42)	44.75 (1.762)	90 (3.543)	1.10 (2.43)	
1SP A5.0	5.0 (0.31)	180 (2610)	210 (3045)	230 (3335)	3000	15 (3.96)	400	1.90 (0.50)	46.3 (1.823)	93.1 (3.665)	1.14 (2.51)	
1SP A6.3	6.3 (0.38)	170 (2465)	190 (2755)	210 (3045)	2700	17 (4.49)	400	2.39 (0.63)	48.85 (1.923)	98.2 (3.866)	1.22 (2.69)	
1SP A7.8	7.76 (0.47)	170 (2465)	190 (2755)	210 (3045)	2500	19.4 (5.13)	400	2.95 (0.78)	51.7 (2.035)	103.9 (4.091)	1.30 (2.87)	
1SP A9.8	9.78 (0.60)	150 (2175)	170 (2465)	190 (2755)	2000	19.6 (5.18)	400	3.71 (0.98)	55.65 (2.191)	111.8 (4.402)	1.41 (3.11)	

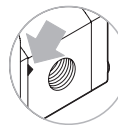
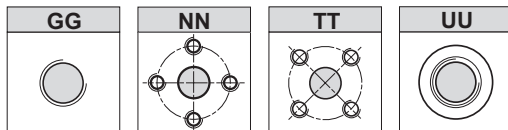
* Value collected during the testing at 1500 rpm

Example of ordering code

1SP A 2.0 D SAE AA (H) 10 GG 0 (VT)

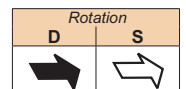
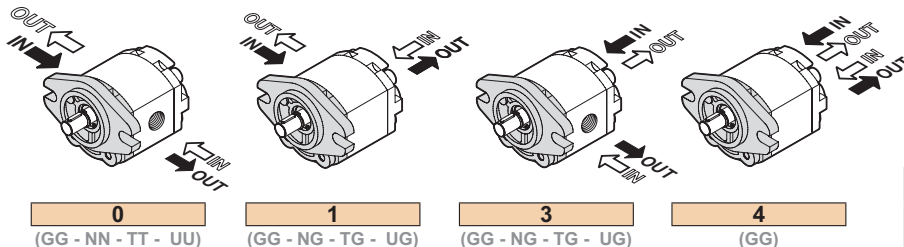
1SP	Pump type	see table
A	Flange and cover material	A = Aluminium
2.0	Displacement	see table
D	Clockwise rotation	D = Clockwise rotation S = Anticlockwise rotation
SAE AA	Flange type	SAE AA
(H)	Stiffening seal for low suction pressure	(optional)
—		
10	Shaft type	10 - 11 - 13 - 14 - 15 - 27
GG	Connections type	GG - NN - TT - UU - NG - TG - UG
0	Connections positions	0 - 1 - 3 - 4
(VT)	Optional	(VT) Viton seals (optional) VLP-I (N) Pressure relief valve (page A-27)

Conn Port Connections



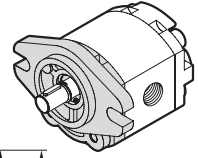
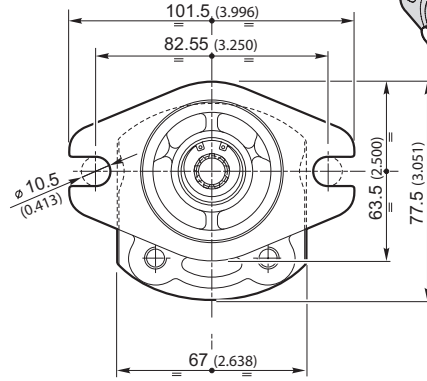
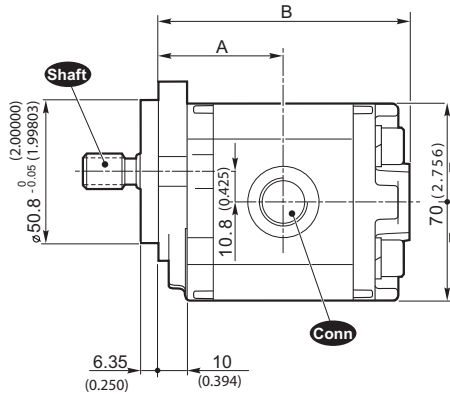
The sign on the body identifies the **suction side** for the pumps.

Port Connection positions

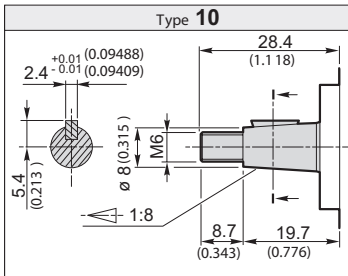


PUMPS GROUP 1 • SAE AA

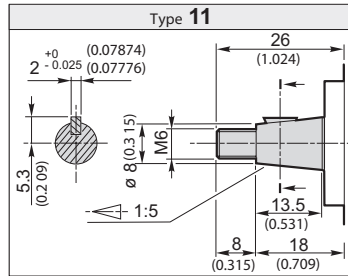
Dimensions



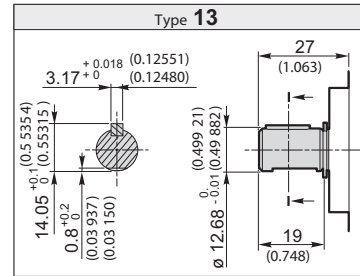
Shaft Available shafts



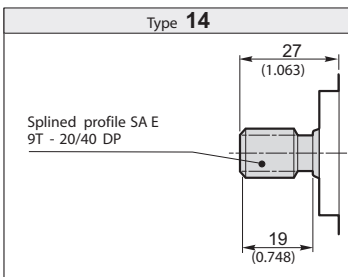
Torque 18 Nm / 13.3 ft lbs



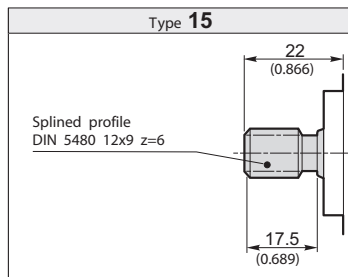
Torque 18 Nm / 13.3 ft lbs



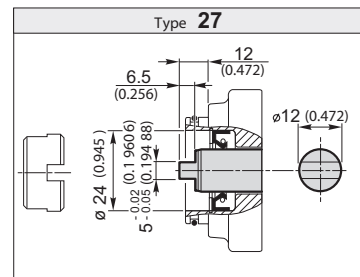
Torque 30 Nm / 22.1 ft lbs



Torque 30 Nm / 22.1 ft lbs



Torque 30 Nm / 22.1 ft lbs



Torque 12 Nm / 8.9 ft lbs

PUMPS GROUP 1 • MC32



Technical data

Power-pack

Size	Displacement [cm ³ /rev] [in ³ /rev]	Max. working pressure			Max. speed [g/min] (rpm)	Max. flow [l/min] (Gal/min)	Min. speed [g/min] (rpm)	Min. flow [l/min] (Gal/min)	Dimensions			Mass [Kg] (lbs)	Min. volumetric efficiency %
		P1 [bar] (PSI)	P2 [bar] (PSI)	P3 [bar] (PSI)					A [mm] (inch)	B [mm] (inch)	L ① [mm] (inch)		
1SP A0.9	0.89 (0.05)	210 (3045)	240 (3480)	260 (3770)	6000	5.3 (1.40)	600	0.49 (0.13)	73.1 (2.878)	61.6 (2.425)	80 (3.150)	0.91 (2.01)	92*
1SP A1.2	1.18 (0.07)	210 (3045)	240 (3480)	260 (3770)	6000	7.1 (1.88)	600	0.65 (0.17)	74.2 (2.921)	62.7 (2.469)	80 (3.150)	0.93 (2.05)	
1SP A1.6	1.6 (0.10)	210 (3045)	240 (3480)	260 (3770)	6000	9.6 (2.54)	400	0.61 (0.16)	75.9 (2.988)	64.4 (2.535)	80 (3.150)	0.95 (2.09)	
1SP A2.0	2.0 (0.12)	210 (3045)	240 (3480)	260 (3770)	5500	11 (2.91)	400	0.76 (0.20)	77.4 (3.047)	65.9 (2.594)	80 (3.150)	0.97 (2.14)	95*
1SP A2.5	2.5 (0.15)	210 (3045)	240 (3480)	260 (3770)	5000	12.5 (3.30)	400	0.95 (0.25)	79.4 (3.126)	67.9 (2.673)	85 (3.346)	1.00 (2.21)	
1SP A3.2	3.2 (0.20)	200 (2900)	230 (3335)	250 (3625)	4500	14.4 (3.80)	400	1.21 (0.32)	82.1 (3.232)	70.6 (2.780)	85 (3.346)	1.04 (2.29)	
1SP A3.7	3.7 (0.23)	200 (2900)	230 (3335)	250 (3625)	4000	14.8 (3.91)	400	1.40 (0.37)	84.1 (3.311)	72.6 (2.858)	90 (3.543)	1.07 (2.36)	
1SP A4.2	4.2 (0.26)	180 (2610)	210 (3045)	230 (3335)	3500	14.7 (3.88)	400	1.60 (0.42)	86 (3.386)	74.5 (2.933)	90 (3.543)	1.10 (2.43)	
1SP A5.0	5.0 (0.31)	180 (2610)	210 (3045)	230 (3335)	3000	15 (3.96)	400	1.90 (0.50)	89.1 (3.508)	77.6 (3.055)	95 (3.740)	1.14 (2.51)	
1SP A6.3	6.3 (0.38)	170 (2465)	190 (2755)	210 (3045)	2700	17 (4.49)	400	2.39 (0.63)	94.2 (3.709)	82.7 (3.256)	100 (3.937)	1.22 (2.69)	
1SP A7.8	7.76 (0.47)	170 (2465)	190 (2755)	210 (3045)	2500	19.4 (5.13)	400	2.95 (0.78)	99.9 (3.933)	88.4 (3.480)	105 (4.134)	1.30 (2.87)	
1SP A9.8	9.78 (0.60)	150 (2175)	170 (2465)	190 (2755)	2000	19.6 (5.18)	400	3.71 (0.98)	107.8 (4.244)	96.3 (3.791)	115 (4.528)	1.41 (3.11)	

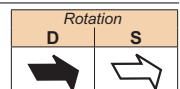
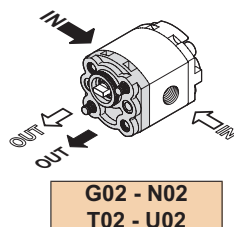
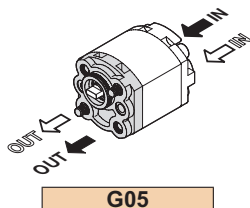
* Value collected during the testing at 1500 rpm

Example of ordering code

1SP	A	3.7	D	MC 32	-	27	G05	(VT)
------------	----------	------------	----------	--------------	----------	-----------	------------	-------------

1SP	Pump type	see table
A	Flange and cover material	A = Aluminium
3.7	Displacement	see table
D	Clockwise rotation	D = Clockwise rotation S = Anticlockwise rotation
MC 32	Flange type	MC 32
-		
27	Shaft type	27 - 10 - 11 - 15
G05	Connections type and position	G05 - G02 - N02 - T02 - U02
(VT)	Optional	(VT) Viton seals (optional)

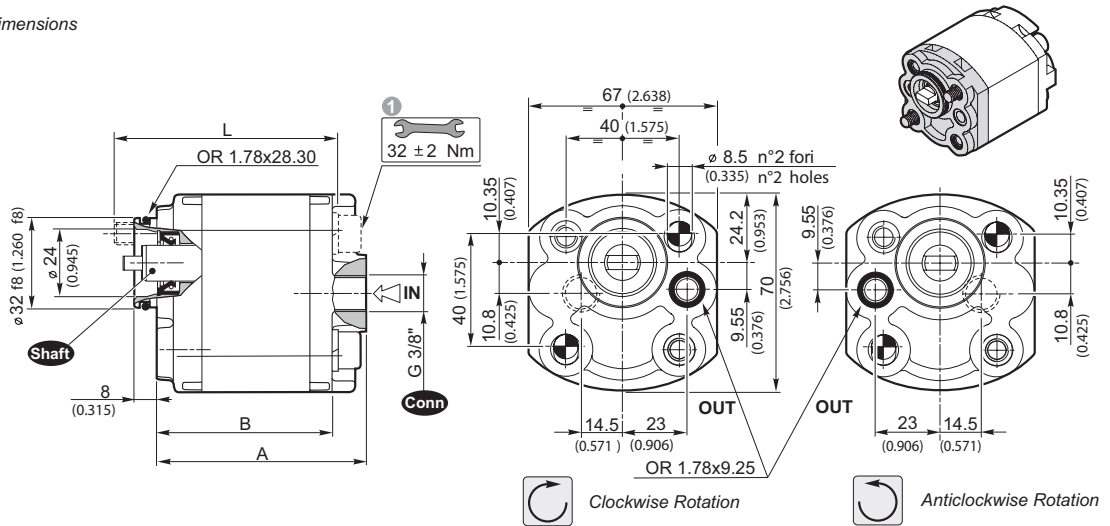
Port Connections type and position



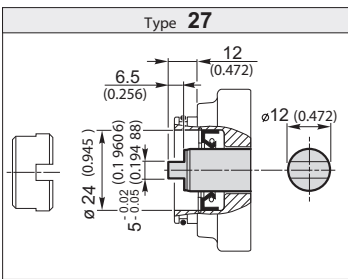
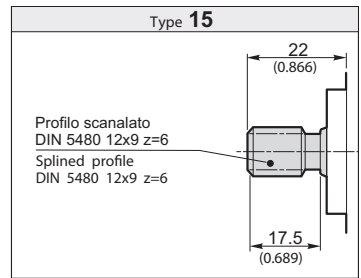
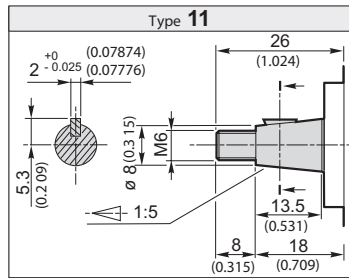
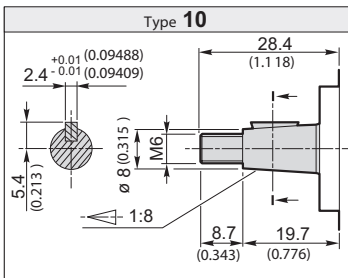
PUMPS GROUP 1 • MC32

Power-pack

Dimensions



Shaft Available shafts



1 Tightening torque of screws: 283 ± 18 lb-in. Use screws type 10.9 - 12.9 UNI EN 20898/1.
The screws kit for the pump assembling should be ordered separately.
Ordering code of assembling Kit:

L (see table)

The assembling of the pump should be effected by 2 screw studs type 10.9 - 12.9 pre-tighten at 221 ± 18 lb-in.
Fix the pump by self-locking nuts with tightening torque 283 ± 18 lb-in.

The rotation direction shall be specified while issuing the order because this kind of operation must necessarily be carried out at our premises.

PUMPS GROUP 1 • E 32 BX



Technical data

(Power-pack fixing)

Size	Displacement [cm³/rev] (in³/rev)	Max. working pressure			Max. speed [g/min] (rpm)	Max. flow [l/min] (Gal/min)	Min. speed [g/min] (rpm)	Min. flow [l/min] (Gal/min)	Dimensions				Mass [Kg] (lbs)	Min. volumetric efficiency %
		P1	P2	P3					A	B	C	L 1		
		[bar] (PSI)	[bar] (PSI)	[bar] (PSI)					[mm] (inch)	[mm] (inch)	[mm] (inch)	[mm] (inch)		
1SP A0.9	0.89 (0.05)	210 (3045)	240 (3480)	260 (3770)	6000	5.3 (1.40)	600	0.49 (0.13)	73.6 (2.898)	34.8 (1.370)	61.6 (2.425)	80 (3.150)	0.91 (2.01)	92*
1SP A1.2	1.18 (0.07)	210 (3045)	240 (3480)	260 (3770)	6000	7.1 (1.88)	600	0.65 (0.17)	74.7 (2.941)	35.35 (1.392)	62.7 (2.469)	80 (3.150)	0.93 (2.05)	
1SP A1.6	1.6 (0.10)	210 (3045)	240 (3480)	260 (3770)	6000	9.6 (2.54)	400	0.61 (0.16)	76.4 (3.008)	36.2 (1.425)	64.4 (2.535)	80 (3.150)	0.95 (2.09)	
1SP A2.0	2.0 (0.12)	210 (3045)	240 (3480)	260 (3770)	5500	11 (2.91)	400	0.76 (0.20)	77.9 (3.067)	36.95 (1.455)	65.9 (2.594)	80 (3.150)	0.97 (2.14)	95*
1SP A2.5	2.5 (0.15)	210 (3045)	240 (3480)	260 (3770)	5000	12.5 (3.30)	400	0.95 (0.25)	79.9 (3.146)	37.95 (1.494)	67.9 (2.673)	85 (3.346)	1.00 (2.21)	
1SP A3.2	3.2 (0.20)	200 (2900)	230 (3335)	250 (3625)	4500	14.4 (3.80)	400	1.21 (0.32)	82.6 (3.252)	39.3 (1.547)	70.6 (2.780)	85 (3.346)	1.04 (2.29)	
1SP A3.7	3.7 (0.23)	200 (2900)	230 (3335)	250 (3625)	4000	14.8 (3.91)	400	1.40 (0.37)	84.6 (3.331)	40.3 (1.587)	72.6 (2.858)	90 (3.543)	1.07 (2.36)	
1SP A4.2	4.2 (0.26)	180 (2610)	210 (3045)	230 (3335)	3500	14.7 (3.88)	400	1.60 (0.42)	86.5 (3.406)	41.25 (1.624)	74.5 (2.933)	90 (3.543)	1.10 (2.43)	
1SP A5.0	5.0 (0.31)	180 (2610)	210 (3045)	230 (3335)	3000	15 (3.96)	400	1.90 (0.50)	89.6 (3.528)	42.8 (1.685)	77.6 (3.055)	95 (3.740)	1.14 (2.51)	
1SP A6.3	6.3 (0.38)	170 (2465)	190 (2755)	210 (3045)	2700	17 (4.49)	400	2.39 (0.63)	94.7 (3.728)	45.35 (1.785)	82.7 (3.256)	100 (3.937)	1.22 (2.69)	
1SP A7.8	7.76 (0.47)	170 (2465)	190 (2755)	210 (3045)	2500	19.4 (5.13)	400	2.95 (0.78)	100.4 (3.953)	48.2 (1.898)	88.4 (3.480)	105 (4.134)	1.30 (2.87)	
1SP A9.8	9.78 (0.60)	150 (2175)	170 (2465)	190 (2755)	2000	19.6 (5.18)	400	3.71 (0.98)	108.3 (4.264)	52.15 (2.053)	96.3 (3.791)	115 (4.528)	1.41 (3.11)	

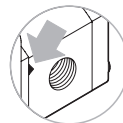
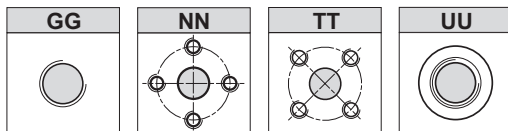
* Value collected during the testing at 1500 rpm

Example of ordering code

1SP A 3.7 D E32 BX - 17 GG 0 (VT)

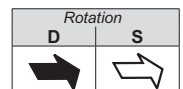
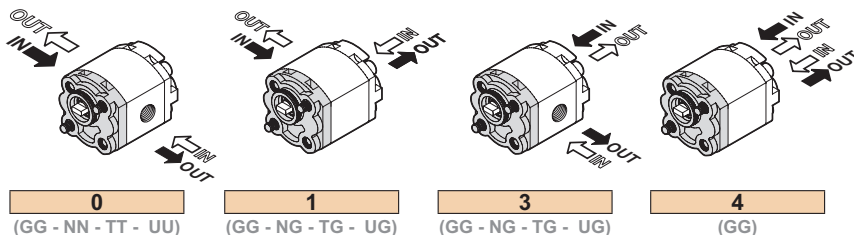
1SP	Pump type	see table
A	Flange and cover material	A = Aluminium
3.7	Displacement	see table
D	Clockwise rotation	D = Clockwise rotation S = Anticlockwise rotation
E 32 BX	Flange type	E 32 BX
-		
17	Shaft type	17 - M32
GG	Connections type	GG - NN - TT - UU - NG - TG - UG
0	Connections positions	0 - 1 - 3 - 4
(VT)	Optional	(VT) Viton seals (optional) VLP-I (N) Pressure relief valve (page A-27)

Conn Port Connections



The sign on the body identifies the **suction side** for the pumps.

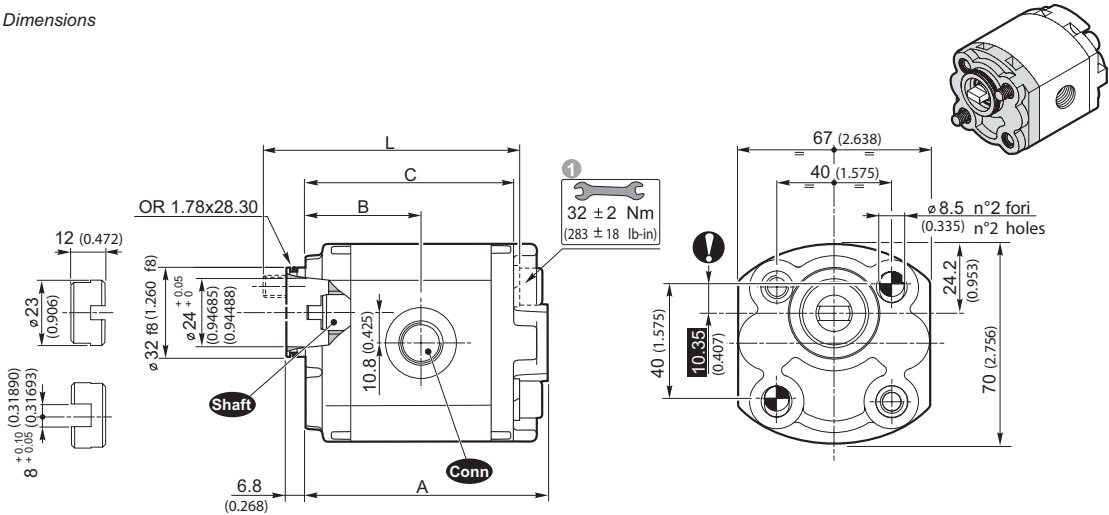
Port Connection positions



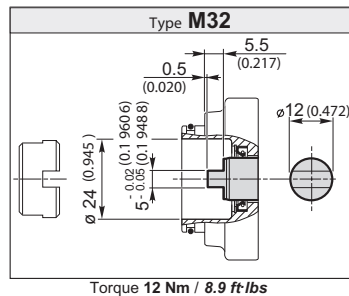
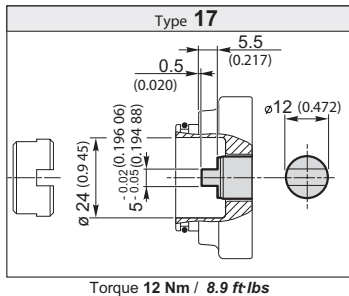
PUMPS GROUP 1 • E 32 BX

(Power-pack fixing)

Dimensions



Shaft Available shafts



1 Tightening torque of screws: 283 ± 18 lb-in. Use screws type 10.9 - 12.9 UNI EN 20898/1. The screws kit for the pump assembling should be ordered separately. Ordering code of assembling Kit:

0019W + Length L (see table)

The assembling of the pump should be effected with 2 screw studs type 10.9 - 12.9 pre-tighten at 221 ± 18 lb-in. Fix the pump by self-locking nuts with tightening torque 283 ± 18 lb-in.

PUMPS GROUP 1 • E 32 CX



Technical data

Size	Displacement			Max. working pressure			Max. speed [g/min] (rpm)	Max. flow [l/min] (Gal/min)	Min. speed [g/min] (rpm)	Min. flow [l/min] (Gal/min)	Dimensions				Mass [Kg] (lbs)	Min. volumetric efficiency %
	[cm ³ /rev] (in ³ /rev)	P1	P2	P3	A	B					C	L 1				
		[bar] (PSI)	[bar] (PSI)	[bar] (PSI)									[mm] (inch)	[mm] (inch)		
1SP A0.9	0.89 (0.05)	210 (3045)	240 (3480)	260 (3770)	6000	5.3 (1.40)	600	0.49 (0.13)	73.6 (2.898)	34.8 (1.370)	61.6 (2.425)	80 (3.150)	0.91 (2.01)	92*		
1SP A1.2	1.18 (0.07)	210 (3045)	240 (3480)	260 (3770)	6000	7.1 (1.88)	600	0.65 (0.17)	74.7 (2.941)	35.35 (1.392)	62.7 (2.469)	80 (3.150)	0.93 (2.05)			
1SP A1.6	1.6 (0.10)	210 (3045)	240 (3480)	260 (3770)	6000	9.6 (2.54)	400	0.61 (0.16)	76.4 (3.008)	36.2 (1.425)	64.4 (2.535)	80 (3.150)	0.95 (2.09)			
1SP A2.0	2.0 (0.12)	210 (3045)	240 (3480)	260 (3770)	5500	11 (2.91)	400	0.76 (0.20)	77.9 (3.067)	36.95 (1.455)	65.9 (2.594)	80 (3.150)	0.97 (2.14)	95*		
1SP A2.5	2.5 (0.15)	210 (3045)	240 (3480)	260 (3770)	5000	12.5 (3.30)	400	0.95 (0.25)	79.9 (3.146)	37.95 (1.494)	67.9 (2.673)	85 (3.346)	1.00 (2.21)			
1SP A3.2	3.2 (0.20)	200 (2900)	230 (3335)	250 (3625)	4500	14.4 (3.80)	400	1.21 (0.32)	82.6 (3.252)	39.3 (1.547)	70.6 (2.780)	85 (3.346)	1.04 (2.29)			
1SP A3.7	3.7 (0.23)	200 (2900)	230 (3335)	250 (3625)	4000	14.8 (3.91)	400	1.40 (0.37)	84.6 (3.331)	40.3 (1.587)	72.6 (2.858)	90 (3.543)	1.07 (2.36)			
1SP A4.2	4.2 (0.26)	180 (2610)	210 (3045)	230 (3335)	3500	14.7 (3.88)	400	1.60 (0.42)	86.5 (3.406)	41.25 (1.624)	74.5 (2.933)	90 (3.543)	1.10 (2.43)			
1SP A5.0	5.0 (0.31)	180 (2610)	210 (3045)	230 (3335)	3000	15 (3.96)	400	1.90 (0.50)	89.6 (3.528)	42.8 (1.685)	77.6 (3.055)	95 (3.740)	1.14 (2.51)			
1SP A6.3	6.3 (0.38)	170 (2465)	190 (2755)	210 (3045)	2700	17 (4.49)	400	2.39 (0.63)	94.7 (3.728)	45.35 (1.785)	82.7 (3.266)	100 (3.937)	1.22 (2.69)			
1SP A7.8	7.76 (0.47)	170 (2465)	190 (2755)	210 (3045)	2500	19.4 (5.13)	400	2.95 (0.78)	100.4 (3.953)	48.2 (1.898)	88.4 (3.480)	105 (4.134)	1.30 (2.87)			
1SP A9.8	9.78 (0.60)	150 (2175)	170 (2465)	190 (2755)	2000	19.6 (5.18)	400	3.71 (0.98)	108.3 (4.264)	52.15 (2.053)	96.3 (3.791)	115 (4.528)	1.41 (3.11)			

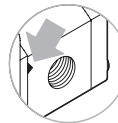
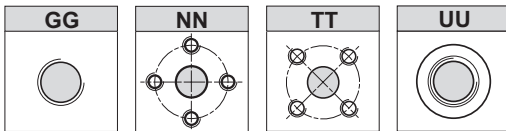
* Value collected during the testing at 1500 rpm)

Example of ordering code

1SP	A	3.7	D	E32 CX	-	17	GG	0	(VT)
-----	---	-----	---	--------	---	----	----	---	------

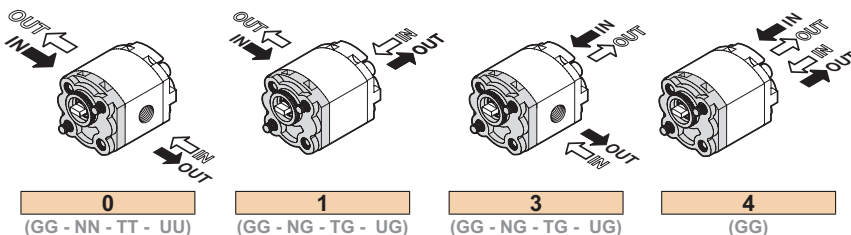
1SP	Pump type	see table
A	Flange and cover material	A = Aluminium
3.7	Displacement	see table
D	Clockwise rotation	D = Clockwise rotation S = Anticlockwise rotation
E 32 CX	Flange type	E 32 CX
-		
17	Shaft type	17 - M32
GG	Connections type	GG - NN - TT - UU - NG - TG - UG
0	Connections positions	0 - 1 - 3 - 4
(VT)	Optional	(VT) Viton seals (optional) VLP-I (N) Pressure relief valve (page A-27)

Conn Port Connections



The sign on the body identifies the **suction side** for the pumps.

Port Connection positions



Rotation	
D	S

PUMPS GROUP 1 • PORT CONNECTIONS

NN

Size		
C	D	d
10 (0.394)	26 (1.024)	M5

Size		
C	D	d
13 (0.512)	30 (1.181)	M6

GG

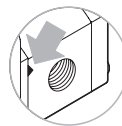
TT

UU

Size	
D	
9/16 - 18UNF	

Size	
D	
3/4 - 16UNF	

GG4



The sign on the body identifies the **suction side** for the pumps.

Port Connection positions

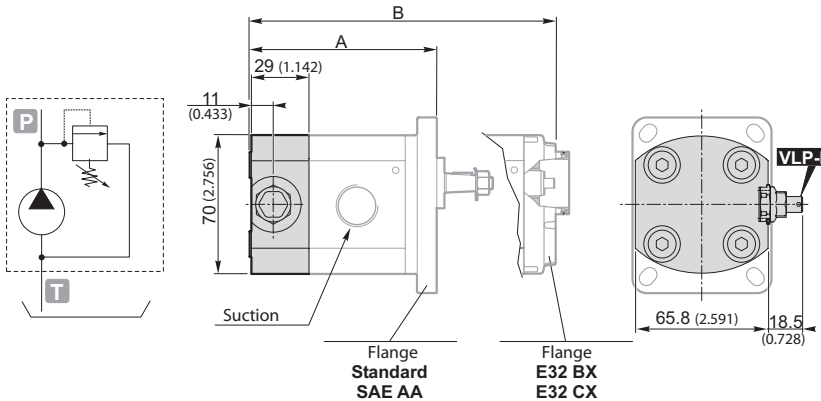
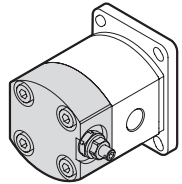
0	1	3	4	G05	G02 - N02 T02 - U02
For versions Standard - SAE AA - E32 BX - E32 CX					Only for MC 32

Rotation	
D	S

PUMPS GROUP 1 • OPTIONAL

VLP- I (N)

Pressure relief valve



	A		B
	Standard	SAE AA	E32 BX E32 CX
1SP A0.9	82.6 (3.252)	86.1 (3.390)	82.6 (3.252)
1SP A1.2	83.7 (3.295)	87.2 (3.433)	83.7 (3.295)
1SP A1.6	85.4 (3.362)	88.9 (3.500)	85.4 (3.362)
1SP A2.0	86.9 (3.421)	90.4 (3.559)	86.9 (3.421)
1SP A2.5	88.9 (3.500)	92.4 (3.638)	88.9 (3.500)
1SP A3.2	91.6 (3.606)	95.1 (3.744)	91.6 (3.606)
1SP A3.7	93.6 (3.685)	97.1 (3.823)	93.6 (3.685)
1SP A4.2	95.5 (3.760)	99.0 (3.898)	95.5 (3.760)
1SP A5.0	98.6 (3.882)	102.1 (4.020)	98.6 (3.882)
1SP A6.3	103.7 (4.083)	107.2 (4.220)	103.7 (4.083)
1SP A7.8	109.4 (4.307)	112.9 (4.445)	109.4 (4.307)
1SP A9.8	117.3 (4.618)	120.8 (4.756)	117.3 (4.618)

Warning.

The pressure relief valve can be applied by substituting the rear cover (only internal relief is set).

The opening of the pressure relief valve should be carry out for times not over 10" each minute to avoid the overheating of the pump.

Esempio di ordinazione in codice / Example of ordering code

1SP	A	2.5	D	SAE AA	-	10	GG0	VLP-I	(N)
-----	---	-----	---	--------	---	----	-----	-------	-----

VLP-I	Cover with VPL at internal exhaust	VPL-I
(N)	Spring type	B - N - G - R (See table)

		Spring type			
		B	N	G	R
		white spring	black spring	yellow spring	red spring
Calibration fields*	[bar] (psi)	30 ÷ 80 (435 ÷ 1160)	81 ÷ 200 (1175 ÷ 2900)	201 ÷ 300 (2915 ÷ 4350)	301 ÷ 400 (4365 ÷ 5800)

* Without setting request, it will be considered standard (black spring: 1740 psi).