

FEATURES

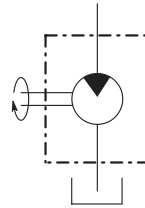
Motors with external gears from group 2 to group 3, divided into 17 displacements from 4 to 61,1cc, up to 270 bar of max working pressure and maximum speed up to 4000 rpm, with hydrostatic balance to reduce the axial slack.

Gear motors are available in unidirectional and reversible versions (reversible motors can be used same in serie circuit).

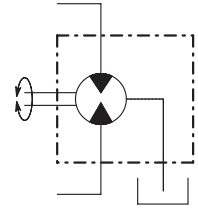
Each motor can be assembled with standard flanges (European, German or SAE) or with special ones (ZF, Perkins and Renault), with conic, cylindrical or splined shaft. Furthermore it is possible to assemble covers with two speed function and with pressure relief valve.

The motors are available in unidirectional D - S and reversible R version.

Unidirectional motor (D-S)



Reversible motor (R)

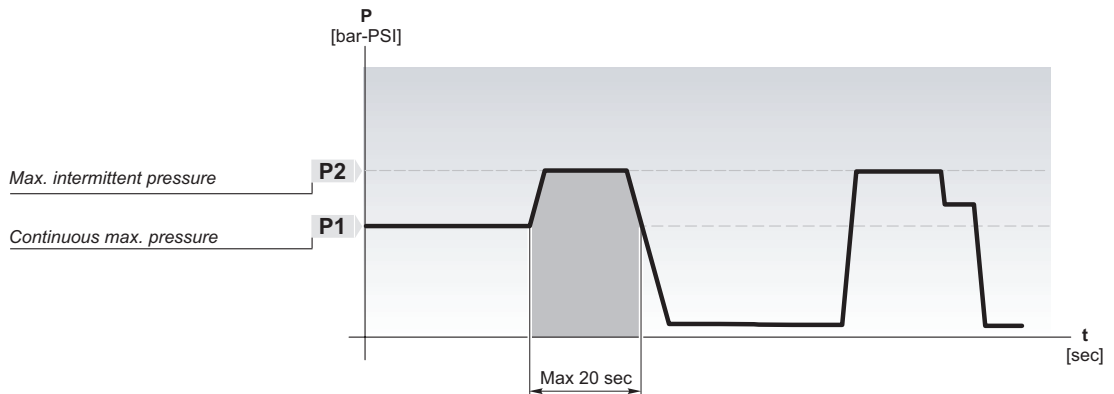


USE CONDITIONS

- Temperature 20°C ± 65°C
- Max. temperature - 15 °C + 80°C
- Suction allowed pressure min. 0.7 max. 3 bar (absolute)
- Recommended viscosity 15 ÷ 92 mm²/s
- Start max. viscosity 3000 mm²/s
- Filtering 26/23 150 ISO DIS 4406 until 2175 psi
23/20 ISO DIS 4406 for higher pressure

TECHNICAL INFORMATION

The motors can be subjected to the pressures P1, P2 indicated in the performance tables. The following diagram illustrates the definitions and applicability of these, compared to the rotation speed limits included.



Hydraulic measures

Q Flow	[l/min - Gal/min]
M Torque	[Nm - lbf.in]
P Power	[kW - HP]
V Displacement	[cm ³ /rev - in ³ /rev]
N Speed	[min ⁻¹ - rpm]
Δp Pressure	[bar - PSI]
η_v Volumetric efficiency	
η_m Mechanical efficiency	
η_t Overall efficiency	

Useful formulas

$$Q = \frac{V [\text{cm}^3/\text{rev}] \times n \times \eta_v \times 10^3}{\eta_v} \text{ l/min}$$

$$M = \frac{\Delta p [\text{bar}] \times V [\text{cm}^3/\text{rev}] \times \eta_m}{62.83} \text{ Nm}$$

$$P = \frac{\Delta p [\text{bar}] \times V [\text{cm}^3/\text{rev}] \times n \times \eta_t}{600 \times 1000} \text{ kW}$$

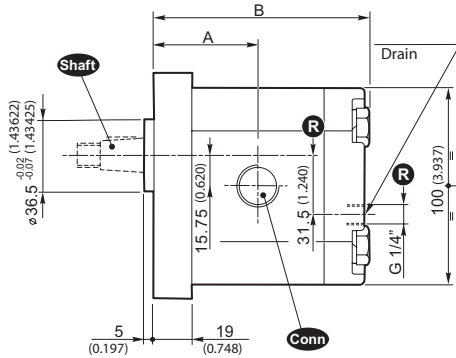
Conversion factors

1 l/min = 0.2641 US Gal/min
1 Nm = 8.851 in-lbs
1 Nm = 0.7375 ft-lbs
1 N = 0.2248 lbs
1kW = 1.34 HP
1cm ³ /giro = 0.061 in ³ /rev
1 bar = 14.5 PSI
1 mm = 0.0394 in
1 kg = 2.205 lbs

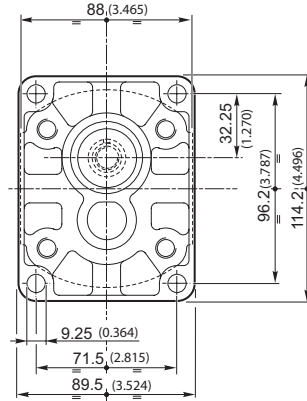
MOTORS GROUP 2 • STANDARD



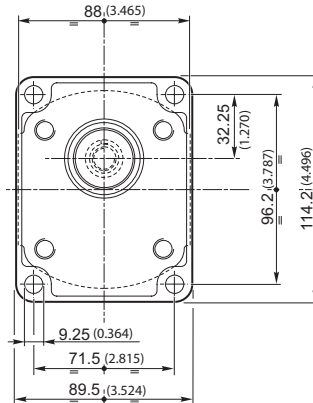
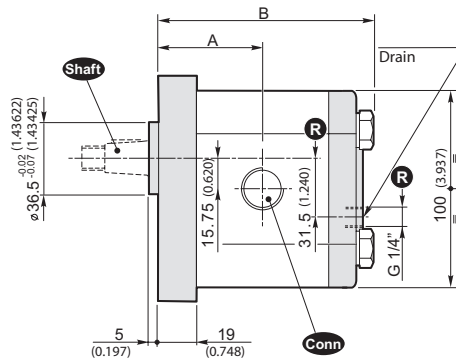
Flange and cover in Aluminium



R Only for reversible motors



Flange and cover in Cast iron



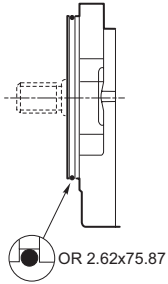
STND (Aluminium)

STND (Cast iron)

Size	Displacement [cm ³ /rev] (in ³ /rev)	Dimensions		Mass [Kg] (lbs)	Shaft	Conn	Dimensions		Mass [Kg] (lbs)	Shaft	Conn
		A [mm] (inch)	B [mm] (inch)				A [mm] (inch)	B [mm] (inch)			
2SM_4	4 (0.24)	44.4 (1.748)	93 (3.661)	2.30 (5.1)	10	G N T M U W F	44.4 (1.748)	93 (3.661)	3.40 (7.5)	10	G N T M U W F
2SM_6	6 (0.37)	46 (1.811)	96.3 (3.791)	2.45 (5.4)			46 (1.811)	96.3 (3.791)	3.60 (7.8)		
2SM_8	8.5 (0.52)	48.1 (1.894)	100.5 (3.957)	2.60 (5.7)			48.1 (1.894)	100.5 (3.957)	3.70 (8.2)		
2SM_11	11 (0.67)	50.2 (1.976)	104.6 (4.118)	2.70 (6.0)			50.2 (1.976)	104.6 (4.118)	3.80 (8.4)		
2SM_14	14 (0.85)	52.7 (2.075)	109.6 (4.315)	2.80 (6.2)			52.7 (2.075)	109.6 (4.315)	3.90 (8.6)		
2SM_16	16.5 (1.01)	54.8 (2.157)	113.8 (4.480)	2.95 (6.5)			54.8 (2.157)	113.8 (4.480)	4.05 (8.9)		
2SM_19	19.5 (1.19)	57.3 (2.256)	118.8 (4.677)	3.10 (6.8)			57.3 (2.256)	118.8 (4.677)	4.20 (9.3)		
2SM_22	22.5 (1.37)	59.8 (2.354)	123.8 (4.874)	3.25 (7.2)			59.8 (2.354)	123.8 (4.874)	4.35 (9.6)		
2SM_26	26 (1.59)	62.7 (2.469)	129.6 (5.102)	3.40 (7.5)			62.7 (2.469)	129.6 (5.102)	4.50 (9.9)		

MOTORS GROUP 2 • SAE A, SAE A-OR

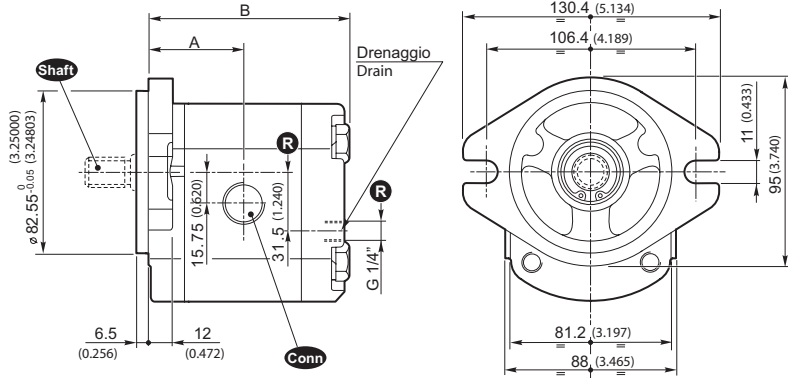
SAE A-OR



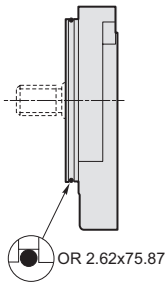
R Only for reversible motors

SAE A

Flange and cover in Aluminium

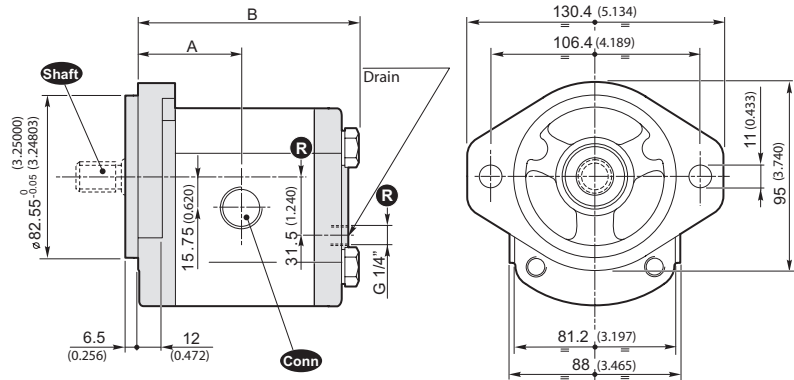


SAE A-OR



SAE A

Flange and cover in Cast iron



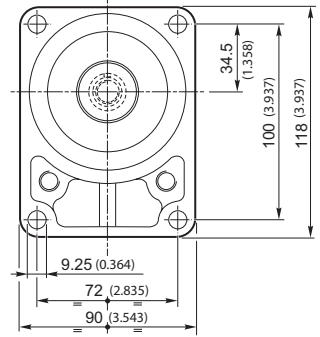
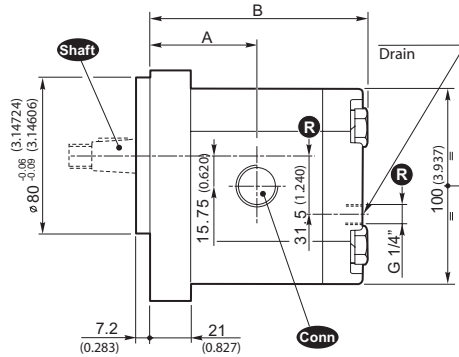
SAE A, SAE A-OR (Aluminium)

SAE A, SAE A-OR (Cast iron)

Size	Displacement [cm ³ /rev] [in ³ /rev]	Dimensions		Mass [Kg] [lbs]	Shaft	Conn	Dimensions		Mass [Kg] [lbs]	Shaft	Conn
		A [mm] [inch]	B [mm] [inch]				A [mm] [inch]	B [mm] [inch]			
2SM_4	4 (0.24)	44.4 (1.748)	93 (3.661)	2.30 (5.1)	10 11 12 13 14 15 16	G N T M U W F	44.4 (1.748)	93 (3.661)	3.40 (7.5)	10 11 12 13 14 15 16	G N T M U W F
2SM_6	6 (0.37)	46 (1.811)	96.3 (3.791)	2.45 (5.4)			46 (1.811)	96.3 (3.791)	3.55 (7.8)		
2SM_8	8.5 (0.52)	48.1 (1.894)	100.5 (3.957)	2.60 (5.7)			48.1 (1.894)	100.5 (3.957)	3.70 (8.2)		
2SM_11	11 (0.67)	50.2 (1.976)	104.6 (4.118)	2.70 (6.0)			50.2 (1.976)	104.6 (4.118)	3.80 (8.4)		
2SM_14	14 (0.85)	52.7 (2.075)	109.6 (4.315)	2.80 (6.2)			52.7 (2.075)	109.6 (4.315)	3.90 (8.6)		
2SM_16	16.5 (1.01)	54.8 (2.157)	113.8 (4.480)	2.95 (6.5)			54.8 (2.157)	113.8 (4.480)	4.05 (8.9)		
2SM_19	19.5 (1.19)	57.3 (2.256)	118.8 (4.677)	3.10 (6.8)			57.3 (2.256)	118.8 (4.677)	4.20 (9.3)		
2SM_22	22.5 (1.37)	59.8 (2.354)	123.8 (4.874)	3.25 (7.2)			59.8 (2.354)	123.8 (4.874)	4.35 (9.6)		
2SM_26	26 (1.59)	62.7 (2.469)	129.6 (5.102)	3.40 (7.5)			62.7 (2.469)	129.6 (5.102)	4.50 (9.9)		

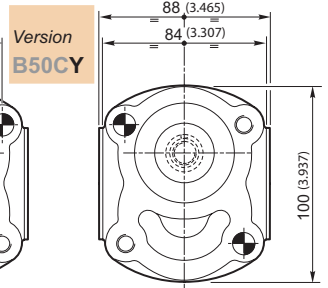
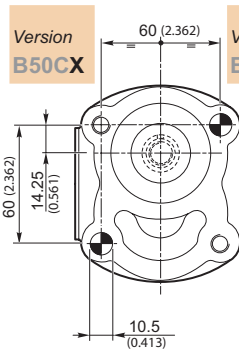
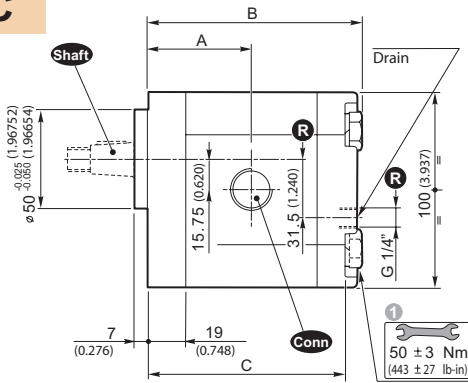
MOTORS GROUP 2 • B80C, B50C

B80C



R Only for reversible motors

B50C



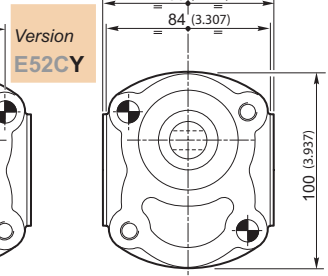
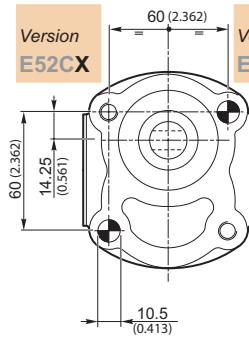
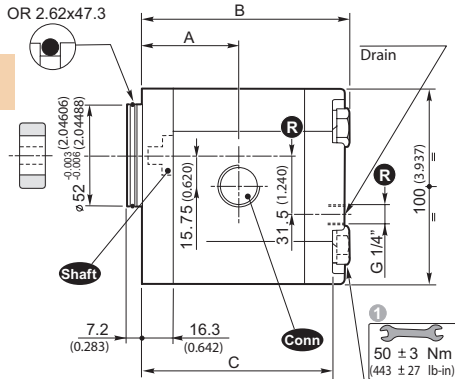
- 1** Tightening torque of screws: 443 ± 27 lb-in. Use screws type 10.9 - 12.9 UNI EN 20898/1.
The assembling of the pump should be effected with 2 screw studs type 10.9 - 12.9 pre-tighten at 354 ± 27 lb-in.
Fix the pump by self-locking nuts with tightening torque 443 ± 27 lb-in.
- The screws kit for the pump assembling should be ordered separately.
Ordering code of fixing Kit:

0029W + Length L (see table)

Size	Displacement [cm ³ /rev] [in ³ /rev]	B80C			Shaft	Conn	B50C				Shaft	Conn	
		Dimensions					Dimensions						Mass [Kg] [lbs]
		A [mm] [inch]	B [mm] [inch]	Mass [Kg] [lbs]			A [mm] [inch]	B [mm] [inch]	C [mm] [inch]	L ¹ [mm] [inch]			
2SM A4	4 (0.24)	46.4 (1.827)	95 (3.740)	2.30 (5.1)	10 11 12 13 14 15 16	G N T M U W F	44.4 (1.748)	93 (3.661)	84 (3.307)	105 (4.134)	2.30 (5.1)	10 11 12 13 14 15 16	G N T M U W F
2SM A6	6 (0.37)	48 (1.890)	98.3 (3.870)	2.45 (5.4)			46 (1.811)	96.3 (3.791)	87.3 (3.437)	105 (4.134)	2.45 (5.4)		
2SM A8	8.5 (0.52)	50.1 (1.972)	102.5 (4.035)	2.60 (5.7)			48.1 (1.894)	100.5 (3.957)	91.5 (3.602)	110 (4.331)	2.60 (5.7)		
2SM A11	11 (0.67)	52.2 (2.055)	106.6 (4.197)	2.70 (6.0)			50.2 (1.976)	104.6 (4.118)	95.6 (3.764)	115 (4.528)	2.70 (6.0)		
2SM A14	14 (0.85)	54.7 (2.154)	111.6 (4.394)	2.80 (6.2)			52.7 (2.075)	109.6 (4.315)	100.6 (3.961)	120 (4.724)	2.80 (6.2)		
2SM A16	16.5 (1.01)	56.8 (2.236)	115.8 (4.559)	2.95 (6.5)			54.8 (2.157)	113.8 (4.480)	104.8 (4.126)	125 (4.921)	2.95 (6.5)		
2SM A19	19.5 (1.19)	59.3 (2.335)	120.8 (4.756)	3.10 (6.8)			57.3 (2.256)	118.8 (4.677)	109.8 (4.323)	130 (5.118)	3.10 (6.8)		
2SM A22	22.5 (1.37)	61.8 (2.433)	125.8 (4.953)	3.25 (7.2)			59.8 (2.354)	123.8 (4.874)	114.8 (4.520)	135 (5.315)	3.25 (7.2)		
2SM A26	26 (1.59)	64.7 (2.547)	131.6 (5.181)	3.40 (7.5)			62.7 (2.469)	129.6 (5.102)	120.6 (4.748)	140 (5.512)	3.40 (7.5)		

MOTORS GROUP 2 • E52C

E52C



R Only for reversible motors

- 1 Tightening torque of screws: 443 ± 27 lb-in. Use screws type 10.9 - 12.9 UNI EN 20898/1.
The assembling of the pump should be effected with 2 screw studs type 10.9 - 12.9 pre-tighten at 354 ± 27 lb-in.
Fix the pump by self-locking nuts with tightening torque 443 ± 27 lb-in.

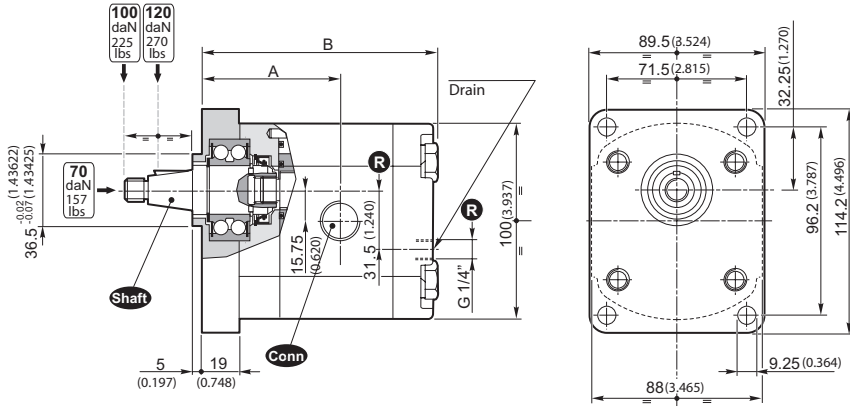
The screws kit for the fixing of the pump should be ordered separately.
Ordering code of fixing Kit:

0029W + Length L (see table)

E52C

Size	Displacement [cm ³ /rev] [in ³ /rev]	Dimensions				Mass [Kg] [lbs]	Shaft	Conn
		A [mm] [inch]	B [mm] [inch]	C [mm] [inch]	L 1 [mm] [inch]			
2SM A4	4 (0.24)	41.7 (1.642)	90.3 (3.555)	81.3 (3.201)	100 (3.937)	2.30 (5.1)	17	G N T M U W F
2SM A6	6 (0.37)	43.3 (1.705)	93.6 (3.685)	84.6 (3.331)	105 (4.134)	2.45 (5.4)		
2SM A8	8.5 (0.52)	45.4 (1.787)	97.8 (3.850)	88.8 (3.496)	110 (4.331)	2.60 (5.7)		
2SM A11	11 (0.67)	47.5 (1.870)	101.9 (4.012)	92.9 (3.657)	115 (4.528)	2.70 (6.0)		
2SM A14	14 (0.85)	50 (1.969)	106.9 (4.209)	97.9 (3.854)	120 (4.724)	2.80 (6.2)		
2SM A16	16.5 (1.01)	52.1 (2.051)	111.1 (4.374)	102.1 (4.020)	120 (4.724)	2.95 (6.5)		
2SM A19	19.5 (1.19)	54.6 (2.150)	116.1 (4.571)	107.1 (4.217)	125 (4.921)	3.10 (6.8)		
2SM A22	22.5 (1.37)	57.1 (2.248)	121.1 (4.768)	112.1 (4.413)	130 (5.118)	3.25 (7.2)		
2SM A26	26 (1.59)	60 (2.362)	126.9 (4.996)	117.9 (4.642)	140 (5.512)	3.40 (7.5)		

MOTORS GROUP 2 • SUPP.STND



R Only for reversible motors

Version to use with axial and/or radial loads

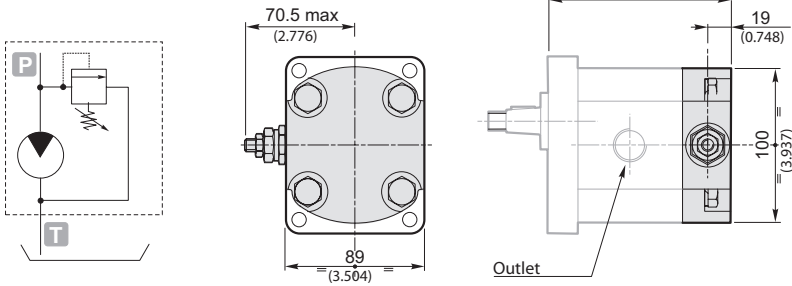
SUPP.STND

Size	Displacement [cm ³ /rev] [in ³ /rev]	Dimensions		Mass [Kg] [lbs]	Shaft	Conn
		A [mm] [inch]	B [mm] [inch]			
2SM A4	4 (0.24)	64.4 (2.535)	113 (4.449)	2.80 (6.2)	10	G N T M U W F
2SM A6	6 (0.37)	66 (2.598)	116.3 (4.579)	2.88 (6.4)		
2SM A8	8.5 (0.52)	68.1 (2.681)	120.5 (4.744)	3.00 (6.6)		
2SM A11	11 (0.67)	70.2 (2.764)	124.6 (4.906)	3.12 (6.9)		
2SM A14	14 (0.85)	72.7 (2.862)	129.6 (5.102)	3.27 (7.2)		
2SM A16	16.5 (1.01)	74.8 (2.945)	133.8 (5.268)	3.39 (7.5)		
2SM A19	19.5 (1.19)	77.3 (3.043)	138.8 (5.465)	3.53 (7.8)		
2SM A22	22.5 (1.37)	79.8 (3.142)	143.8 (5.661)	3.67 (8.1)		
2SM A26	26 (1.59)	82.7 (3.256)	149.6 (5.890)	3.84 (8.5)		

MOTORS GROUP 2 • OPTIONAL

VLP- I (N)

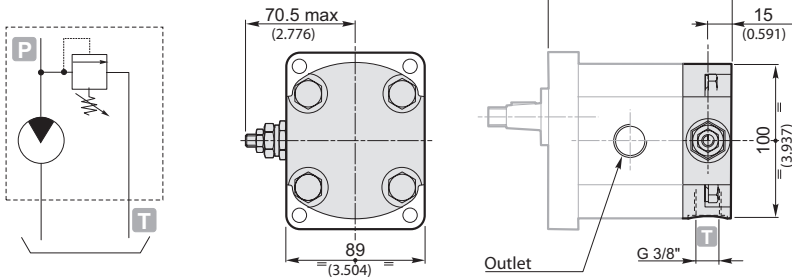
Pressure relief valve with internal exhaust



	A		
	Standard SAE A B50C	B80C	E52C
2SM A4	104.8 (4.126)	106.8 (4.205)	102.1 (4.020)
2SM A6	108.1 (4.256)	110.1 (4.335)	105.4 (4.150)
2SM A8	112.3 (4.421)	114.3 (4.500)	109.6 (4.315)
2SM A11	116.4 (4.583)	118.4 (4.661)	113.7 (4.476)
2SM A14	121.4 (4.780)	123.4 (4.858)	118.7 (4.673)
2SM A16	125.6 (4.945)	127.6 (5.024)	122.9 (4.839)
2SM A19	130.6 (5.142)	132.6 (5.220)	127.9 (5.035)
2SM A22	135.6 (5.339)	137.6 (5.417)	132.9 (5.232)
2SM A26	141.4 (5.567)	143.4 (5.646)	138.7 (5.461)

VLP- E (N)

Pressure relief valve with external exhaust



	A		
	Standard SAE A B50C	B80C	E52C
2SM A4	100.8 (3.969)	102.8 (4.047)	98.1 (3.862)
2SM A6	104.1 (4.098)	106.1 (4.177)	101.4 (3.992)
2SM A8	108.3 (4.264)	110.3 (4.343)	105.6 (4.157)
2SM A11	112.4 (4.425)	114.4 (4.504)	109.7 (4.319)
2SM A14	117.4 (4.622)	119.4 (4.701)	114.7 (4.516)
2SM A16	121.6 (4.787)	123.6 (4.866)	118.9 (4.681)
2SM A19	126.6 (4.984)	128.6 (5.063)	123.9 (4.878)
2SM A22	131.6 (5.181)	133.6 (5.260)	128.9 (5.075)
2SM A26	137.4 (5.409)	139.4 (5.488)	134.7 (5.303)

Warning.

The pressure relief valve can be applied by substituting the rear cover.

It is supplied only with aluminium flange and cover.

The showed motors are clockwise rotation.

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

Example of ordering code

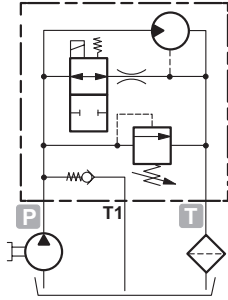
2SM	A	14	D	SAE A	-	10	G	(VT)	VLP-I	(N)
VLP-I	Cover with VLP								VLP-I (at internal exhaust) VLP-E (at external exhaust)	
(N)	Spring type								B - N - R (See table)	

		Spring type		
		B	N	R
		white spring	black spring	red spring
Calibration fields*	[bar] (psi)	10 ÷ 100 (145 ÷ 1450)	30 ÷ 280 (435 ÷ 4060)	80 ÷ 380 (1160 ÷ 5510)

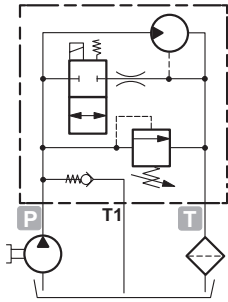
* Without setting request, it will be considered standard (black spring: 2175 psi).

MOTORS GROUP 2 • OPTIONAL

Two speed unidirectional motors with VLP pressure relief valve

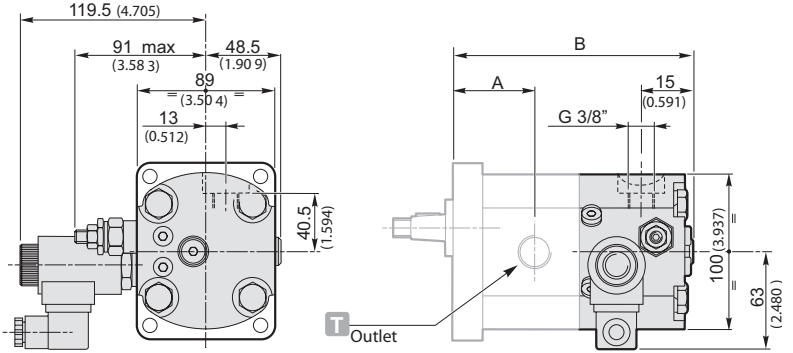


Electro Valve normally open (NA)

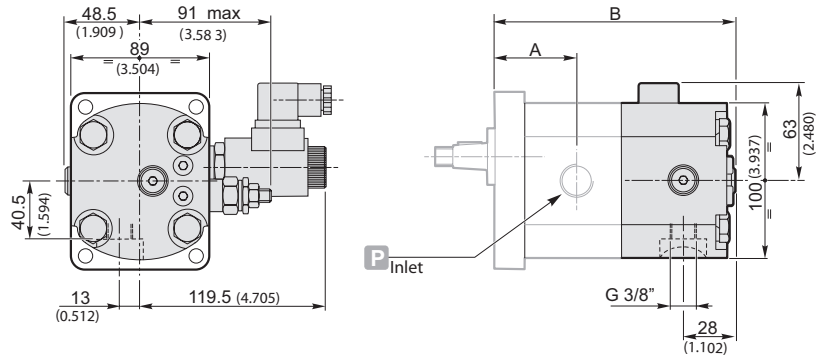


Electro Valve normally closed (NC)

Configuration for clockwise rotation



Configuration for anticlockwise rotation



	2SM A4	2SM A6	2SM A8	2SM A11	2SM A14	2SM A16	2SM A19	2SM A22	2SM A26
A	44.4 (1.748)	46 (1.811)	48.1 (1.894)	50.2 (1.976)	52.7 (2.075)	54.8 (2.157)	57.3 (2.256)	59.8 (2.354)	62.7 (2.469)
B	142.3 (5.602)	145.6 (5.732)	149.8 (5.898)	153.9 (6.059)	158.9 (6.256)	163.1 (6.421)	168.1 (6.618)	173.1 (6.815)	182 (7.165)

Example of ordering code

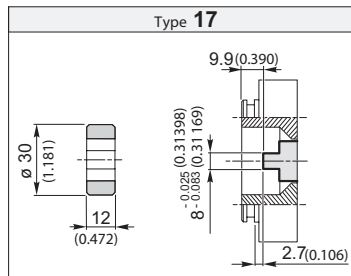
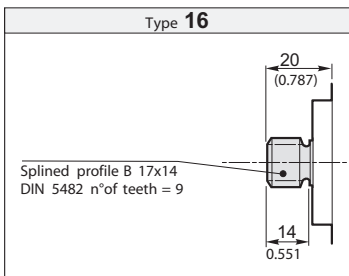
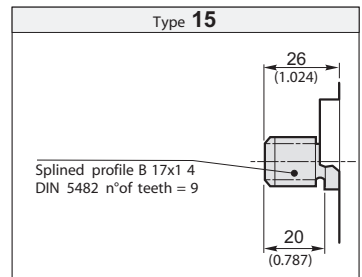
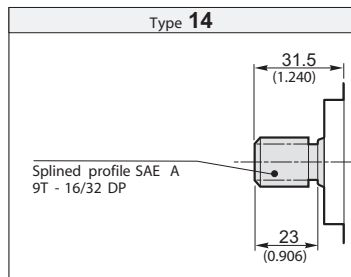
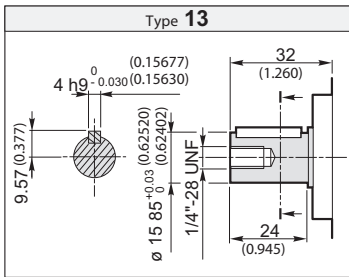
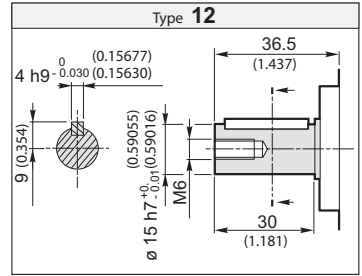
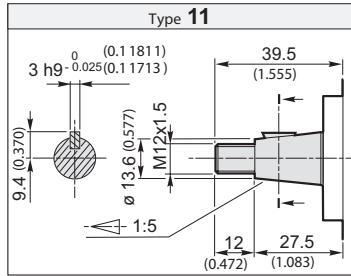
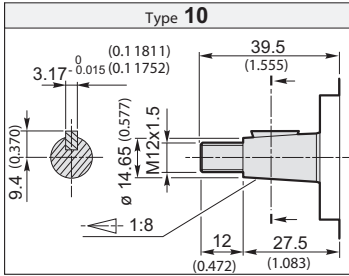
2SM	A14	D	NA	(24VDC)	VLP	(N)	SAE A	-	10	G
NA	NA = Normally open NC = Normally closed					NA = Normally open NC = Normally closed				
24VDC	Electromagnet voltage					12 - 24 - 48 V. DC 24 - 48 - 110 - 220 V. AC (50 Hz)				
VLP	Cover with VLP									
(N)	Spring type					B - N - R (See table)				

N.B.
Only motors with flange and cover in Aluminium

		Spring type		
		B	N	R
		white spring	black spring	red spring
Calibration fields*	[bar] (psi)	10 ÷ 100 (145 ÷ 1450)	30 ÷ 280 (435 ÷ 4060)	80 ÷ 380 (1160 ÷ 5510)

* Without setting request, it will be considered standard (black spring: 2175 psi).

MOTORS GROUP 2 • AVAILABLE SHAFTS



MOTORS GROUP 2 • CONNECTIONS FOR D-S MOTORS



G

Outlet

C

Delivery^a

G 1/2"

Size	
4 ÷ 8	
C	G 1/2"
Size	
11 ÷ 26	
C	G 3/4"

N

Outlet

D

C

d

Delivery^a

30 (1.181)

13 (0.709)

M6

Size		
4 ÷ 8		
C	D	d
13 (0.512)	30 (1.181)	M6
Size		
11 ÷ 26		
C	D	d
19 (0.748)	40 (1.575)	M8

T

Outlet

90°

M6

20 (0.787)

40 (1.575)

Delivery^a

90°

M6

15 (0.709)

35 (1.378)

M

Outlet

D

C

M8

Delivery^a

40 (1.575)

19 (0.748)

M8

Size	
11 ÷ 26	
C	D
19 (0.748)	40 (1.575)

U

Outlet

C

Delivery

7/8 14UNF

Size	
4 ÷ 8	
C	7/8 14UNF
Size	
11 ÷ 26	
C	1" 1/16 12UN

W

Outlet

1" 5/16 12UN

Delivery

1" 1/16 12UN

F

Outlet

E

D

C

M6

Delivery

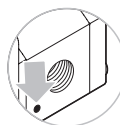
17.4 (0.685)

38 (1.496)

15 (0.591)

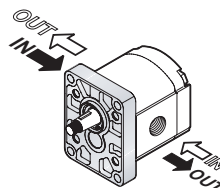
M6

Size		
4 ÷ 11		
C	D	E
20 (0.787)	38 (1.496)	17.4 (0.685)
Size		
14 ÷ 26		
C	D	E
26 (1.024)	22.4 (0.882)	47.6 (1.874)



The sign on the body identifies the **outlet side** for the motors.

Connections positions



Rotation	
D	S

MOTORS GROUP 2 • CONNECTIONS FOR R MOTORS

G

Delivery / Outlet

Size	
4 ÷ 8	
C	
G 1/2"	

Size	
11 ÷ 26	
C	
G 3/4"	

N

Delivery / Outlet

Size		
4 ÷ 8		
C	D	d
13 (0.512)	30 (1.181)	M6

Size		
11 ÷ 26		
C	D	d
19 (0.748)	40 (1.575)	M8

T

Delivery / Outlet

Size	
4 ÷ 8	
C	D
15 (0.591)	35 (1.378)

Size	
11 ÷ 26	
C	D
20 (0.787)	40 (1.575)

U

Delivery / Outlet

Size	
4 ÷ 8	
D	
7/8 14UNF	

Size	
11 ÷ 26	
D	
1" 1/16 12UN	

F

Delivery / Outlet

Size		
4 ÷ 11		
C	D	E
20 (0.787)	38 (1.496)	17.4 (0.685)

Size		
14 ÷ 26		
C	D	E
26 (1.024)	22.4 (0.882)	47.6 (1.874)



Any sign on the body in reversible motors is not considered.

Connections positions

