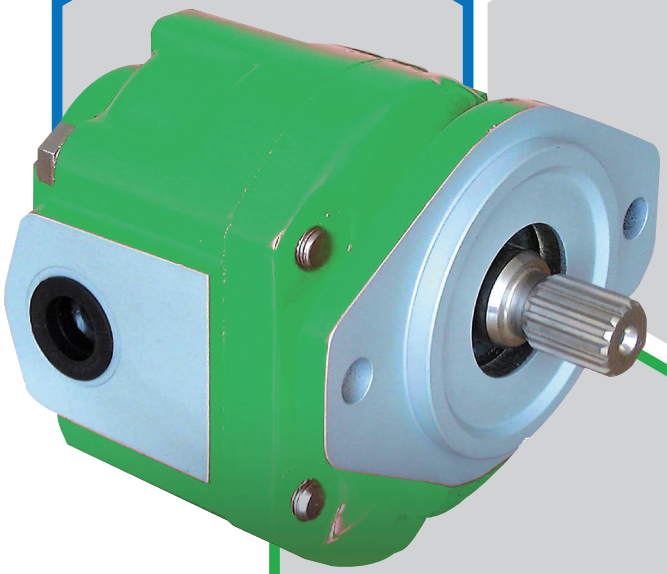
HYDRECO

ADVANCED HYDRAULIC TECHNOLOGIES



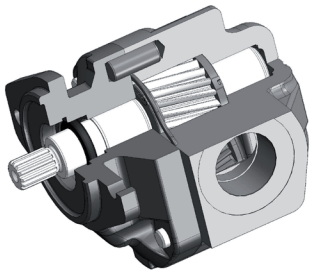
QX5 series

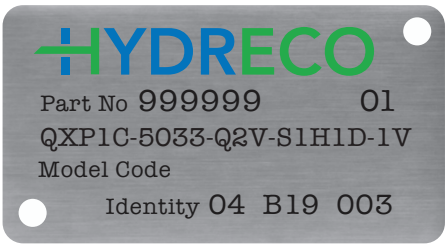
EXTERNAL GEAR PUMPS

23 to 68 cc/rev 250 bar

TECHNICAL CATALOGUE

QX_2020_01





OPERATING PARAMETERS

QX pumps use helical gears and are designed to reduce the amount of fluid borne noise generated by the pump and hence transmitted into the hydraulic system. This results in a reduction in the amount of airborne noise emitted from the machine.

QX pumps are highly efficient and are designed to provide high performance levels and long life when operated within the parameters shown below. For operation outside these parameters please consult your Hydreco Hydraulics representative.

Max outlet port pressures	250 rated 280 peak	
Inlet port pressures	0.7 - 3 bar abs	
Speed Range	All models	400 - 3000 rev/min
Temperature	Minimum at start-up	-40°C (-40°F)
	Maximum continuous	+80°C (+176°F)
	Maximum intermittent	+100°C (+212°F)
Viscosity	Maximum at start-up	2000 mm²/sec (9,000 SSU)
	Maximum continuous	250 mm²/sec (1150 SSU)
	Minimum continuous	10 mm²/sec (60 SSU)
	Optimum	15-25 mm²/sec (78-124 SSU)
Fluid Cleanliness	To ISO4406 solid contaminant	
	Start-up period	21/17
	Maximum in service	19/15
	Optimum	16/11
	Maximum water	0.1%
Fluid Velocity	Maximum in INLET line	2.5 m/sec (8 ft/sec)
	Recommended in INLET line	1.5 m/sec (5 ft/sec)
Shaft Loads	Maximum axial load	250 N (56 lb)
	Maximum radial load	500 N (112 lb)
Fluids	All data is quoted for mineral oils HM and HV. For fire resistant and environmentally aware fluids please contact your Hydreco Hydraulics representative.	
Rotation	Clockwise or Anti-clockwise viewed from shaft end (not reversible).	

SUPER QUIET, HIGH PERFORMANCE HYDRAULIC PUMPS

QX5 pumps incorporate Hydreco Hydraulics' unique patented helical gear technology to give the highest performance with lowest noise levels.

The helical gears reduce flow and pressure ripple effects to significantly reduce generated noise while large diameter shafts and bearings combined with rigidly aligned cast iron housings ensure long life in arduous applications.

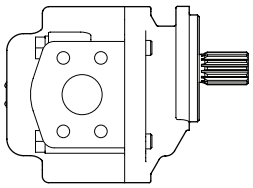
Accuracy of components and pressure compensated side plates ensure that high performance levels are maintained.

A RANGE OF SINGLE AND MULTIPLE PUMPS

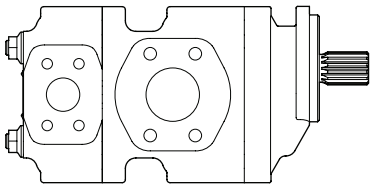
Pump elements are available with displacements from 23 to 68 cm^3/rev (1.4 to 4.15 in^3/rev) for maximum continuous operating pressures of 250 bar and maximum intermittent operating pressures of 280 bar.

Pumps can be supplied as single, double, triple or quadruple units. There is a limit on the combinations that are available in doubles, triples and quadruples. Please refer to Hydreco for details on multiple pumps.

SINGLE PUMPS



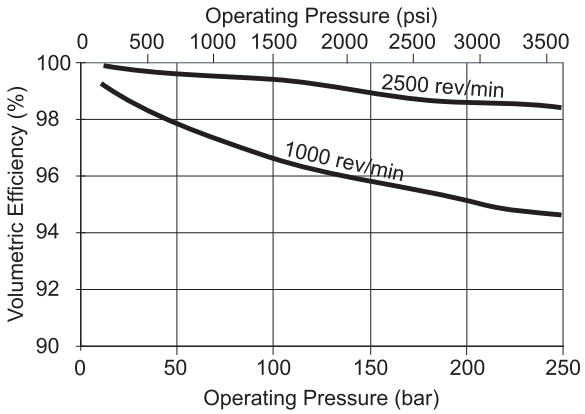
DOUBLE PUMPS



REAR PUMP FRONT PUMP

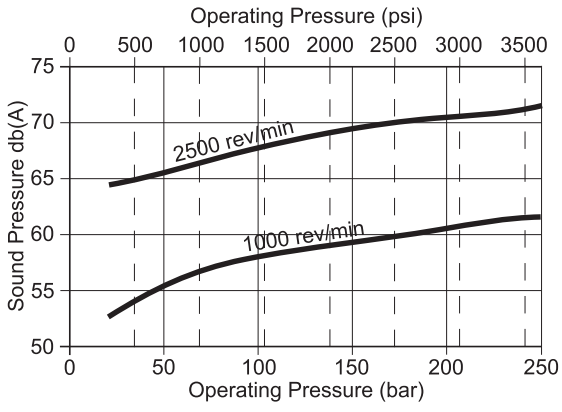
Code Pump Size & Displacement	Displacement cc/rev	Displacement cu in./rev	Outlet Pressure				Speed		
			Rated	Peak	Rated	Peak	Rated	Max	Min
			bar	bar	psi	psi	rpm	rpm	rpm
5023	23	1.40	250	280	3625	4060	2500	3000	400
5026	26	1.59	250	280	3625	4060	2500	3000	400
5029	29	1.77	250	280	3625	4060	2500	3000	400
5033	33	2.01	250	280	3625	4060	2500	3000	400
5036	36	2.20	250	280	3625	4060	2500	3000	400
5041	41	2.50	250	280	3625	4060	2500	3000	400
5046	46	2.81	250	280	3625	4060	2500	3000	400
5051	51	3.11	250	280	3625	4060	2500	3000	400
5056	56	3.42	230	255	3335	3698	2500	3000	400
5063	63	3.84	210	235	3045	3408	2500	3000	400
5068	68	4.15	190	215	2755	3118	2500	3000	400
Note: speed may be limited due to port velocity									

PUMP EFFICIENCES



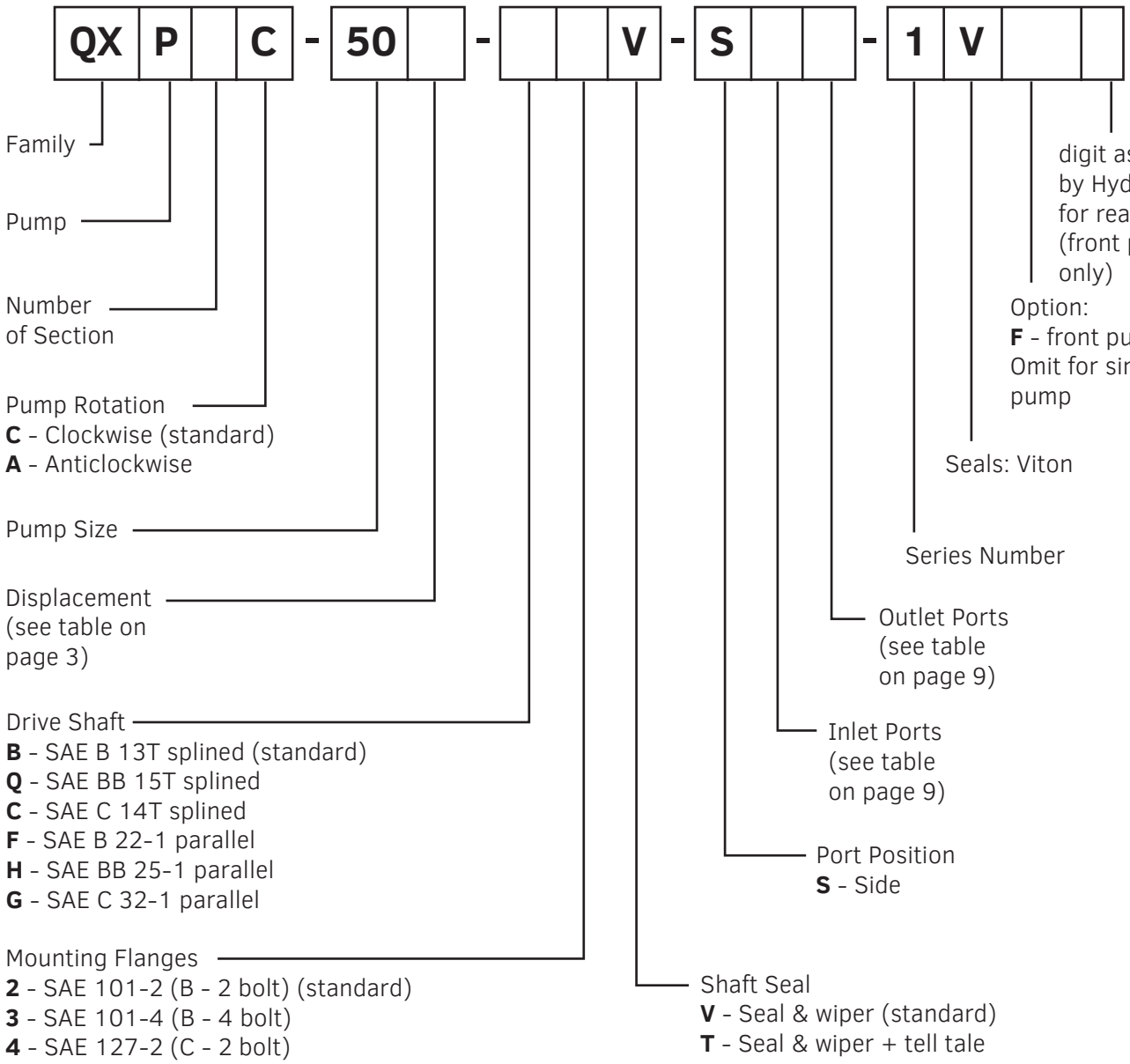
Volumetric efficiency level measured with pump QX 5041

NOISE LEVELS



Sound pressure levels when measured at 1 metre from the pump obtained in accordance with ISO 9614-4 on a pump model QX 5041.

Identification code for single and front pump



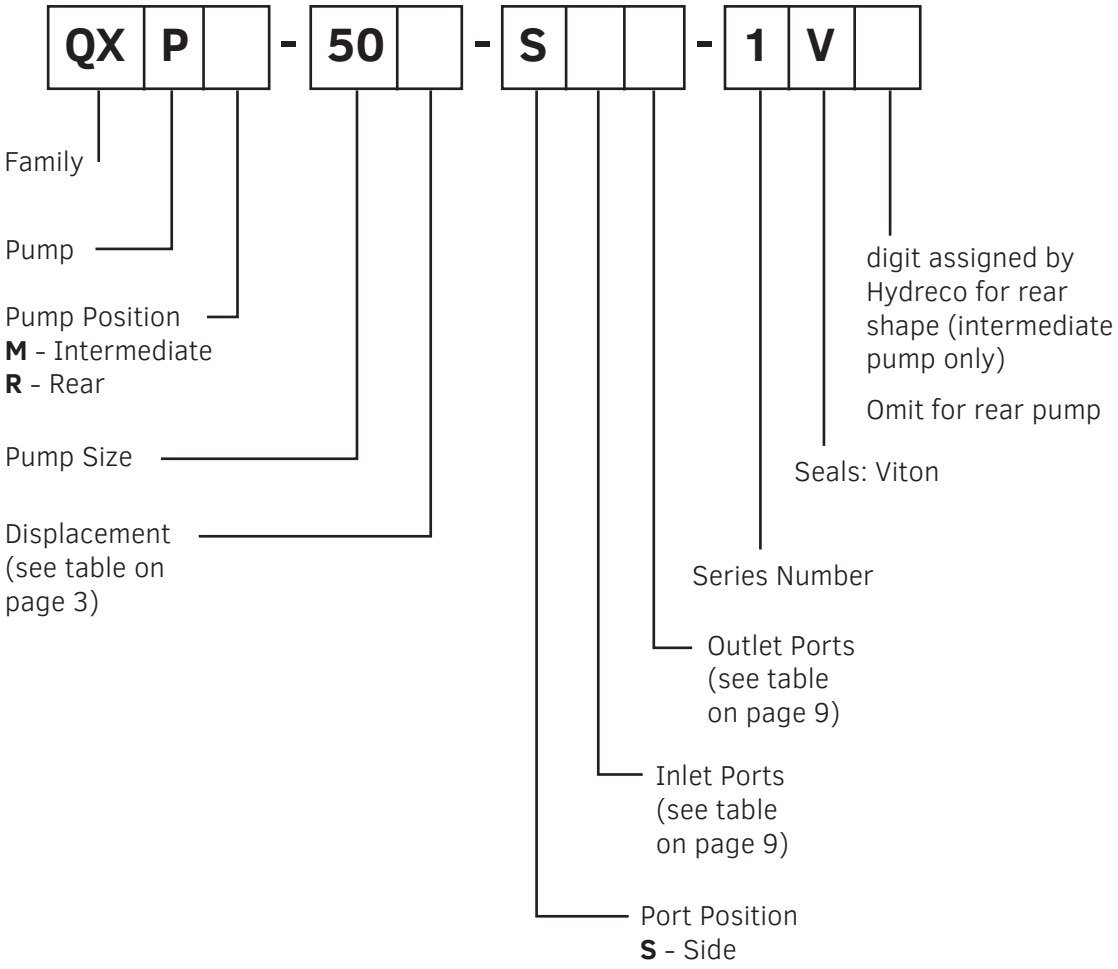
Single Pump Example:

QXP1C-5033-Q2V-S1H1D-1V

Front Pump Example:

QXP3C-5033-Q2V-S1H1D-1VF**

Identification code for multiple pumps



Identification code for double pumps

Identification Code Front Pump + Identification Code Rear Pump

Example: QXP2A-5033-Q2V-S1H1D-1V** + QXPR-5033-S1H1D-1V

Identification code for triple pumps

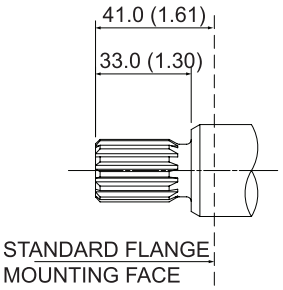
Identification Code Front Pump + Identification Code Intermediate Pump + Identification Code Rear Pump

Example: QXP3A-5033-Q2V-S1H1D-1VF** + QXPM-5033-S1H1D-1V** + QXPR-5033-S1H1D-1V

SHAFT OPTIONS

Code B — SAE 22-4 (B) 7/8" spline

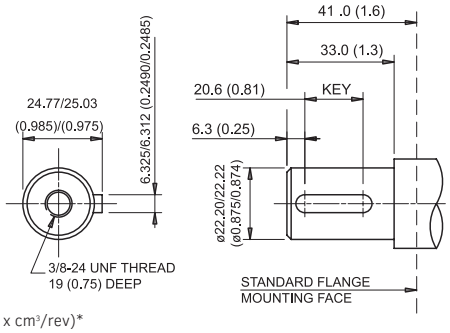
Involute Spline
13 teeth
16/32 DP
Flat root, side fit
30 deg pressure angle
Major dia 21.79/21.69
(0.858/0.854)



p x D = 14226 (bar x cm³/rev)*
p x D = 12590 (psi x cu.in/rev)*

T = 252 Nm T = 186 lb.ft

Code F — SAE 22-1 (B) 7/8" parallel

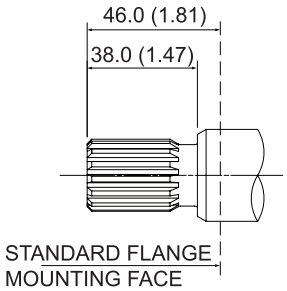


p x D = 14226 (bar x cm³/rev)*
p x D = 12590 (psi x cu.in/rev)*

T = 252 Nm T = 186 lb.ft

Code Q — SAE 25-4 (BB) 1" spline

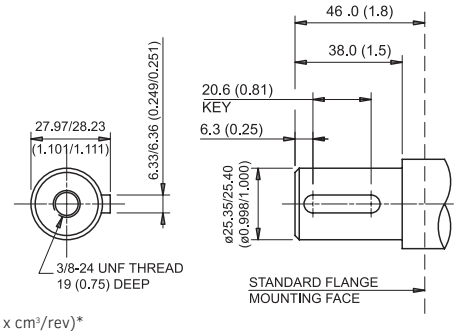
Involute Spline
15 teeth
16/32 DP
Flat root, side fit
30 deg pressure angle
Major dia 24.87/24.97
(0.983/0.979)



p x D = 22450 (bar x cm³/rev)*
p x D = 19869 (psi x cu.in/rev)*

T = 397 Nm T = 293 lb.ft

Code H — SAE 25-1 (BB) 1" parallel

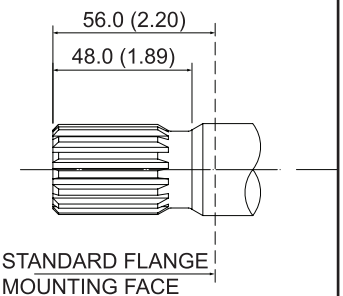


p x D = 22450 (bar x cm³/rev)*
p x D = 19869 (psi x cu.in/rev)*

T = 397 Nm T = 293 lb.ft

Code C — SAE 32-4 (C) 1.1/4" spline

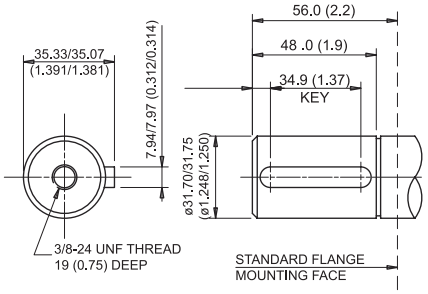
Involute Spline
14 teeth
12/24 DP
Flat root, side fit
30 deg pressure angle
Major dia 31.22/31.12
(1.229/1.225)



p x D = 45565 (bar x cm³/rev)*
p x D = 40325 (psi x cu.in/rev)*

T = 806 Nm T = 594 lb.ft

Code G — SAE 32-1 (C) 1.1/4" parallel



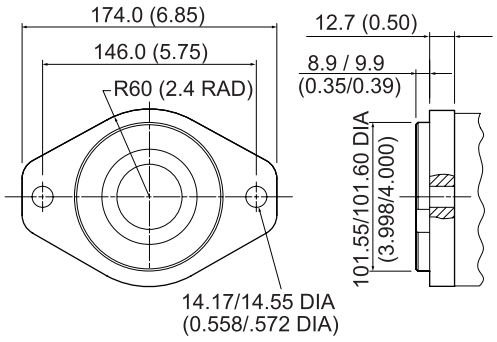
p x D = 45565 (bar x cm³/rev)*
p x D = 40325 (psi x cu.in/rev)*

T = 806 Nm T = 594 lb.ft

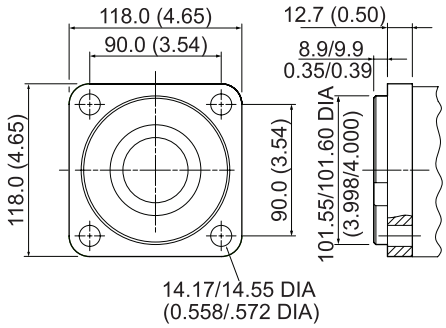
* p = pressure, D = displacement. The stated values must not be exceeded.
Note: For multiple pumps the sum of the p x D or torque values must not exceed the stated value.

MOUNTING FLANGES OPTIONS

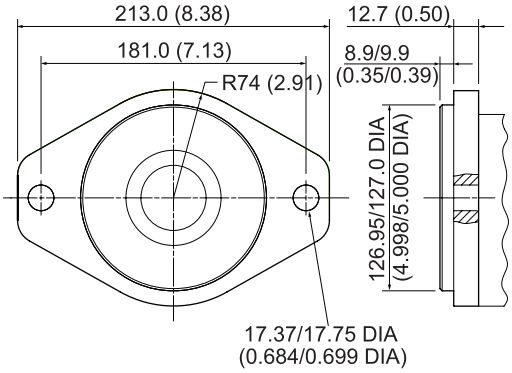
Code 2 SAE 101-2 (B - 2 bolt)



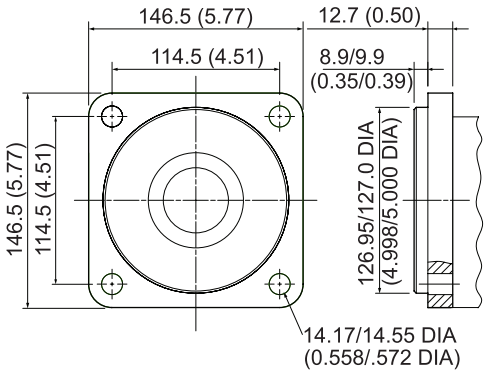
Code 3 SAE 101-4 (B - 4 bolt)



Code 4 SAE 127-2 (C - 2 bolt)

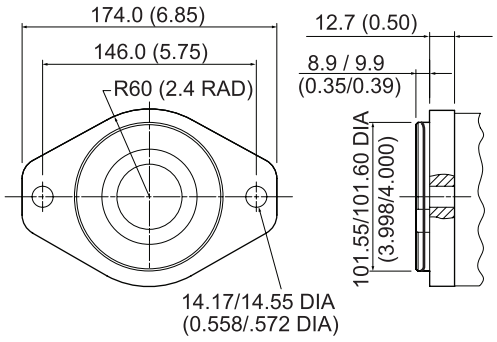


Code 5 SAE 127-4 (C - 4 bolt)



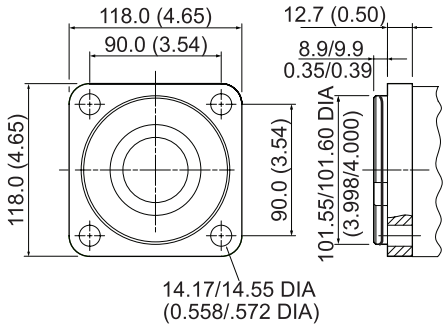
Code 48 SAE 101-2 (B - 2 bolt)

With “O” Ring Seal on Spigot Diameter



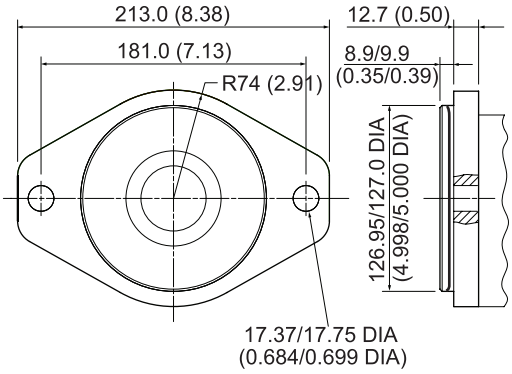
Code 49 SAE 101-4 (B - 4 bolt)

With “O” Ring Seal on Spigot Diameter



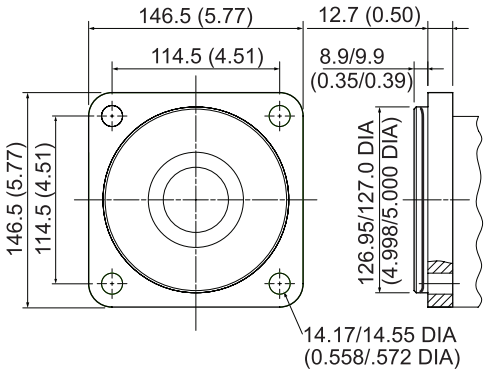
Code 52 SAE 127-2 (C - 2 bolt)

With “O” Ring Seal on Spigot Diameter



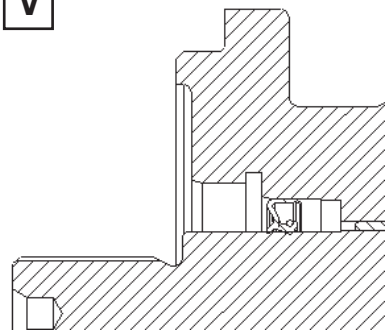
Code 53 SAE 127-4 (C - 4 bolt)

With “O” Ring Seal on Spigot Diameter



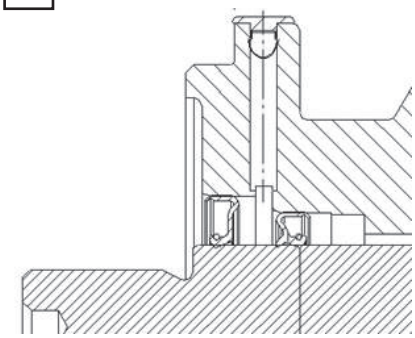
SHAFT SEAL OPTIONS

V



Shaft seal and wiper for external drives

T



Shaft seal, wiper and seal with tell-tale hole for torque converter and gearbox.

The tell-tale hole indicates leakage before mixing of fluids can occur.

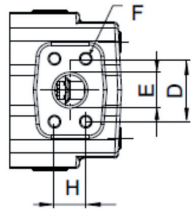
SHAFTS & FLANGES AVAILABILITY

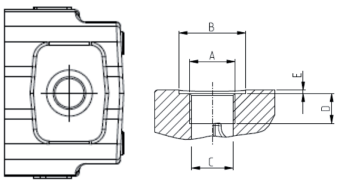
PUMP SIZE	FLANGES availability		Drive Shafts availability					
			Splined			Parallel		
			B	Q	C	F	H	G
	Code	Description	SAE B 13T	SAE BB 15T	SAE C 14T	SAE B 22-1	SAE BB 25-1	SAE C 1 38-1
50	2	SAE 101-2 (B - 2 bolt)	●	O	-	O	O	-
	3	SAE 101-4 (B - 4 bolt)	O	O	-	O	O	-
	4	SAE 127-2 (C - 2 bolt)	-	O	O	-	O	O
	5	SAE 127-4 (C - 4 bolt)	-	O	O	-	O	O
	48	SAE 101-2 (B - 2 bolt)	O	O	-	O	O	O
	49	SAE 101-4 (B - 4 bolt)	O	O	-	O	O	O
	52	SAE 127-2 (C - 2 bolt)	-	O	O	-	O	O
	53	SAE 127-4 (C - 4 bolt)	-	O	O	-	O	O

●	Standard
O	Available on request
-	Not Available

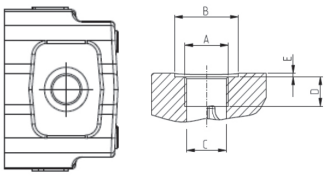
If your flange & shafts requirement is not stated above please refer to Hydreco

PORT DETAILS

SAE FLANGED PORTS (3000 PSI series) Compliant with SAE J518	Ordering Code	Port Size	Dimension				Preferred Ports		
			E	D	H	F	Displacement	IN	OUT
	**1A**	1/2”	12.7	38.1	17.48	M8x1.25	23	1F	1B
	1B	3/4”	19.05	47.63	22.23	M10x1.5	26	1F	1B
	1D	1”	25.4	52.37	26.19	M10x1.5	27	1F	1B
	1F	1 1/4”	31.75	58.72	30.18	M10x1.5	29	1F	1B
	1H	1 1/2”	38.1	69.85	35.71	M12x1.75	33	1H	1D
	1K	2”	50.8	77.77	42.88	M12x1.75	36	1H	1D
							37	1H	1D
							41	1H	1D
							46	1H	1D
							51	1H	1D
							56	1K	1D
							63	1K	1D
							68	1K	1D

BSP THREADED PORTS Compliant with ISO 228	Ordering Code	Port Size	Dimension				Preferred Ports		
			B	C	D	E	Displacement	IN	OUT
	**3A**	1/2”	38.1	19.05	19.05	0.5	23	3D	3B
	3B	3/4”	47.63	24.59	22.23	0.5	26	3D	3B
	3D	1”	50.8	30.94	25.4	0.5	29	3D	3B
	3F	1 1/4”	66.68	39.29	28.58	0.5	33	3F	3D
	3H	1 1/2”	76.2	45.24	28.58	0.5	36	3F	3D
	3K	2”	76.2	57.15	31.75	0.5	41	3F	3D
							46	3H	3D
							51	3H	3D
							56	3H	3D
							63	3H	3D
							68	3H	3D

Imperial threaded options also available. Please refer to Hydreco for details.

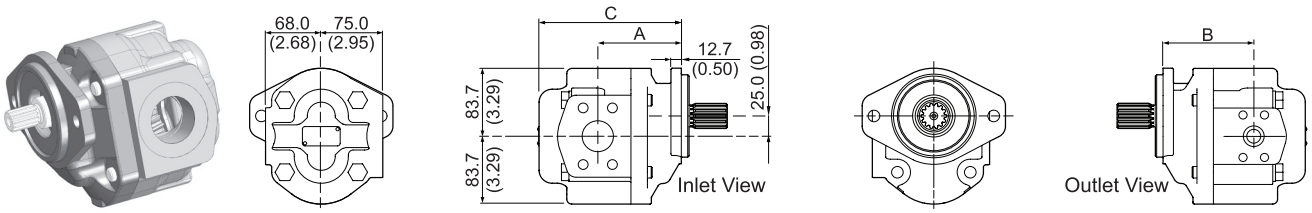
UNF THREADED PORTS with O-Ring Compliant with SAEJ1926	Ordering Code	Port Size	Dimension				Preferred Ports		
			B	C	D	E	Displacement	IN	OUT
	**4D**	1” UNF “O” Ring	38.48	23.34	19.05	1.5	23	4G	4E
	4E	1 1/16” UNF “O” Ring (=#12)	41.28	24.92	19.05	1.5	26	4G	4E
	4F	1 1/4” UNF “O” Ring	46.49	29.69	19.05	1.5	29	4G	4E
	4G	1 5/16” UNF “O” Ring (=#16)	48.51	31.27	19.05	1.5	33	4J	4G
	4J	1 5/8” UNF “O” Ring (=#20)	57.67	39.22	19.05	1.5	36	4J	4G
							41	4J	4G
							46	4J	4G
							51	N/A	N/A
							56	N/A	N/A
							63	N/A	N/A
							68	N/A	N/A

Imperial threaded options also available. Please refer to Hydreco for details.

NOTE: Please refer to Hydreco in case of different dimensions/machining port requirements and common suction option.

SINGLE PUMPS

All dimensions are in mm (inches)

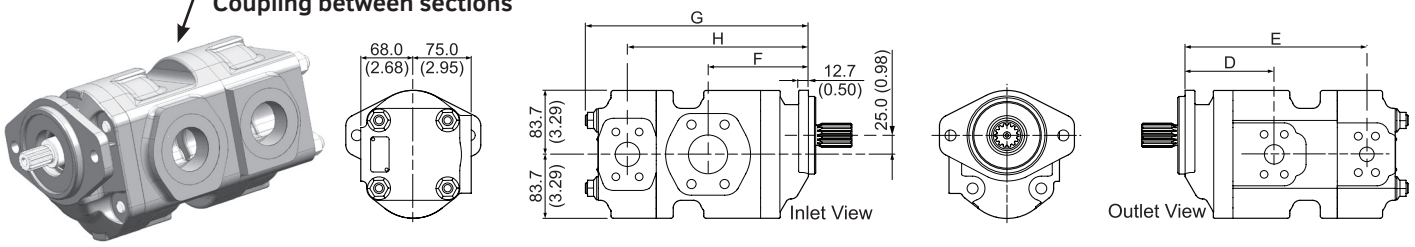


DIM^N	PUMP DISPLACEMENT cm³/rev (in³/rev)												
	23 (1.404)	26 (1.587)	27 (1.648)	29 (1.770)	33 (2.014)	36 (2.197)	37 (2.258)	41 (2.502)	46 (2.807)	51 (3.112)	56 (3.417)	63 (3.844)	68 (4.150)
A	98.93 (3.89)	98.93 (3.89)	98.93 (3.89)	98.93 (3.89)	100.23 (3.95)	100.23 (3.95)	100.23 (3.95)	100.23 (3.95)	102.38 (4.03)	102.38 (4.03)	103.93 (4.09)	103.93 (4.09)	103.93 (4.09)
B	100.38 (3.95)	100.38 (3.95)	100.38 (3.95)	100.38 (3.95)	111.13 (4.37)	111.13 (4.37)	111.13 (4.37)	111.13 (4.37)	111.13 (4.37)	111.13 (4.37)	111.13 (4.37)	111.13 (4.37)	111.13 (4.37)
C	150.11 (5.91)	150.11 (5.91)	150.11 (5.91)	150.11 (5.91)	164.73 (6.49)	164.73 (6.49)	164.73 (6.49)	164.73 (6.49)	173.33 (6.82)	173.33 (6.82)	187.68 (7.39)	187.68 (7.39)	187.68 (7.39)

DUAL PUMPS

T = 338 Nm / 249 lb. ft

Coupling between sections



Dimension to Front Outlet - D

Rear Pump		5068	5063	5056	5051	5046	5041	5036	5033	5029	5026	5023
Front Pump	5068	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)
	5063		129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)
	5056			129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)
	5051				129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)	129.9 (5.114)
	5046					115.4 (4.542)	115.4 (4.542)	115.4 (4.542)	115.4 (4.542)	115.4 (4.542)	115.4 (4.542)	115.4 (4.542)
	5041						115.4 (4.542)	115.4 (4.542)	115.4 (4.542)	115.4 (4.542)	115.4 (4.542)	115.4 (4.542)
	5037							107.7 (4.239)	107.7 (4.239)	107.7 (4.239)	107.7 (4.239)	107.7 (4.239)
	5036							107.7 (4.239)	107.7 (4.239)	107.7 (4.239)	107.7 (4.239)	107.7 (4.239)
	5033								107.7 (4.239)	107.7 (4.239)	107.7 (4.239)	107.7 (4.239)
	5029									100.4 (3.952)	100.4 (3.952)	100.4 (3.952)
	5027										100.4 (3.952)	100.4 (3.952)
	5026										100.4 (3.952)	100.4 (3.952)
	5023											100.4 (3.952)

Dimension to Rear Outlet - E

Rear Pump		5068	5063	5056	5051	5046	5041	5036	5033	5029	5026	5023
Front Pump	5068	265.0 (10.435)	265.0 (10.435)	265.0 (10.435)	265.0 (10.435)	265.0 (10.435)	265.0 (10.435)	265.0 (10.435)	265.0 (10.435)	254.3 (10.012)	254.3 (10.012)	254.3 (10.012)
	5063		265.0 (10.435)	265.0 (10.435)	265.0 (10.435)	265.0 (10.435)	265.0 (10.435)	265.0 (10.435)	265.0 (10.435)	254.3 (10.012)	254.3 (10.012)	254.3 (10.012)
	5056			265.0 (10.435)	265.0 (10.435)	265.0 (10.435)	265.0 (10.435)	265.0 (10.435)	265.0 (10.435)	254.3 (10.012)	254.3 (10.012)	254.3 (10.012)
	5051				265.0 (10.435)	265.0 (10.435)	265.0 (10.435)	265.0 (10.435)	265.0 (10.435)	254.3 (10.012)	254.3 (10.012)	254.3 (10.012)
	5046					246.2 (9.694)	246.2 (9.694)	246.2 (9.694)	246.2 (9.694)	220.5 (8.680)	220.5 (8.680)	220.5 (8.680)
	5041						246.2 (9.694)	246.2 (9.694)	246.2 (9.694)	220.5 (8.680)	220.5 (8.680)	220.5 (8.680)
	5037							238.5 (9.390)	238.5 (9.390)	212.8 (8.377)	212.8 (8.377)	212.8 (8.377)
	5036							238.5 (9.390)	238.5 (9.390)	212.8 (8.377)	212.8 (8.377)	212.8 (8.377)
	5033								238.5 (9.390)	212.8 (8.377)	212.8 (8.377)	212.8 (8.377)
	5029									190.5 (7.499)	190.5 (7.499)	190.5 (7.499)
	5027										190.5 (7.499)	190.5 (7.499)
	5026										190.5 (7.499)	190.5 (7.499)
	5023											190.5 (7.499)

SINGLE AND DUAL PUMPS

Dimension to Front Inlet - F

Rear Pump		5068	5063	5056	5051	5046	5041	5036	5033	5029	5026	5023
Front Pump	5068	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)
	5063		144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)
	5056			144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)
	5051				144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)	144.3 (5.683)
	5046					130.0 (5.117)	130.0 (5.117)	130.0 (5.117)	130.0 (5.117)	130.0 (5.117)	130.0 (5.117)	130.0 (5.117)
	5041						130.0 (5.117)	130.0 (5.117)	130.0 (5.117)	130.0 (5.117)	130.0 (5.117)	130.0 (5.117)
	5036							22.3 (4.814)	122.3 (4.814)	122.3 (4.814)	122.3 (4.814)	122.3 (4.814)
	5033								122.3 (4.814)	122.3 (4.814)	122.3 (4.814)	122.3 (4.814)
	5029									107.0 (4.212)	107.0 (4.212)	107.0 (4.212)
	5026										107.0 (4.212)	107.0 (4.212)
	5023											107.0 (4.212)

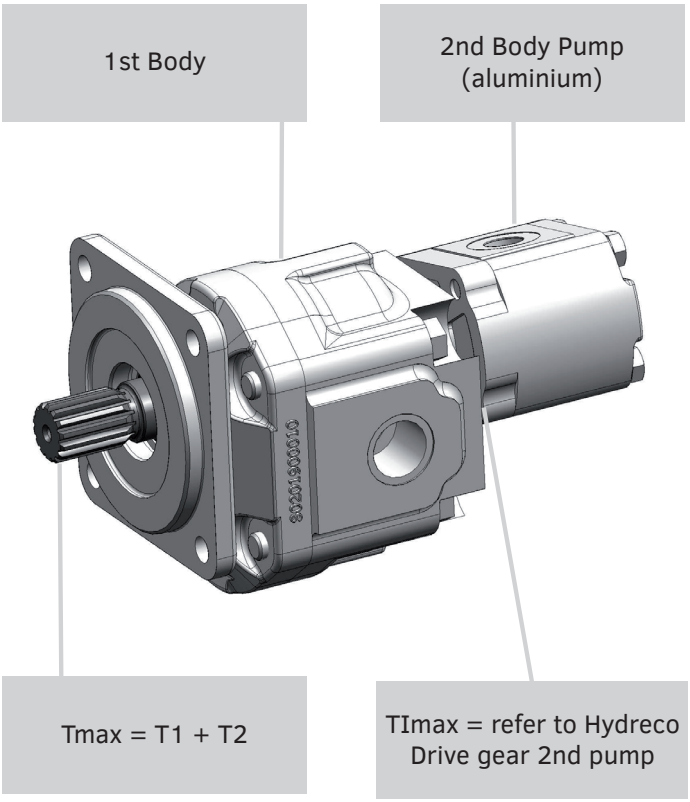
Dimension to Rear Inlet - H

Rear Pump		5068	5063	5056	5051	5046	5041	5036	5033	5029	5026	5023
Front Pump	5068	257.8 (10.151)	257.8 (10.151)	257.8 (10.151)	256.3 (10.090)	256.3 (10.090)	254.1 (10.005)	254.1 (10.005)	254.1 (10.005)	252.8 (9.953)	252.8 (9.953)	252.8 (9.953)
	5063		257.8 (10.151)	257.8 (10.151)	256.3 (10.090)	256.3 (10.090)	254.1 (10.005)	254.1 (10.005)	254.1 (10.005)	252.8 (9.953)	252.8 (9.953)	252.8 (9.953)
	5056			257.8 (10.151)	256.3 (10.090)	256.3 (10.090)	254.1 (10.005)	254.1 (10.005)	254.1 (10.005)	252.8 (9.953)	252.8 (9.953)	252.8 (9.953)
	5051				256.3 (10.090)	256.3 (10.090)	254.1 (10.005)	254.1 (10.005)	254.1 (10.005)	252.8 (9.953)	252.8 (9.953)	252.8 (9.953)
	5046					237.5 (9.349)	235.3 (9.264)	235.3 (9.264)	235.3 (9.264)	219.0 (8.623)	219.0 (8.623)	219.0 (8.623)
	5041						235.3 (9.264)	235.3 (9.264)	235.3 (9.264)	219.0 (8.623)	219.0 (8.623)	219.0 (8.623)
	5036							227.6 (8.961)	227.6 (8.961)	211.3 (8.319)	211.3 (8.319)	211.3 (8.319)
	5033								227.6 (8.961)	226.3 (8.910)	226.3 (8.910)	226.3 (8.910)
	5029									189.0 (7.442)	189.0 (7.442)	189.0 (7.442)
	5026										189.0 (7.442)	189.0 (7.442)
	5023											189.0 (7.442)

Dimension Overall - G

Rear Pump		5068	5063	5056	5051	5046	5041	5036	5033	5029	5026	5023
Front Pump	5068	341.6 (12.448)	341.6 (12.448)	341.6 (12.448)	327.2 (12.883)	327.2 (12.883)	333.9 (13.147)	333.9 (13.147)	333.9 (13.147)	308.9 (12.161)	308.9 (12.161)	308.9 (12.161)
	5063		341.6 (12.448)	341.6 (12.448)	327.2 (12.883)	327.2 (12.883)	333.9 (13.147)	333.9 (13.147)	333.9 (13.147)	308.9 (12.161)	308.9 (12.161)	308.9 (12.161)
	5056			341.6 (12.448)	327.2 (12.883)	327.2 (12.883)	333.9 (13.147)	333.9 (13.147)	333.9 (13.147)	308.9 (12.161)	308.9 (12.161)	308.9 (12.161)
	5051				327.2 (12.883)	327.2 (12.883)	333.9 (13.147)	333.9 (13.147)	333.9 (13.147)	308.9 (12.161)	308.9 (12.161)	308.9 (12.161)
	5046					308.4 (12.142)	315.9 (12.438)	315.9 (12.438)	315.9 (12.438)	273.9 (10.784)	273.9 (10.784)	273.9 (10.784)
	5041						315.9 (12.438)	315.9 (12.438)	315.9 (12.438)	273.9 (10.784)	273.9 (10.784)	273.9 (10.784)
	5036							308.9 (12.162)	308.9 (12.162)	267.9 (10.548)	267.9 (10.548)	267.9 (10.548)
	5033								308.9 (12.162)	267.9 (10.548)	267.9 (10.548)	267.9 (10.548)
	5029									243.9 (9.603)	243.9 (9.603)	243.9 (9.603)
	5026										243.9 (9.603)	243.9 (9.603)
	5023											243.9 (9.603)

For installation details on Triple and Quadruple pumps, please contact your Hydreco Hydraulics representative.



MULTIPLE PUMPS

Multiple pumps with aluminium pumps as rear pump are available with different ranges of displacements and maximum operating pressures.

Please refer to Hydreco for details on available configurations.

FLOW RATE

Metric Units
Flow (l/min) = Speed (rpm) x Displacement (cc/rev) / 1000

Imperial Units
Flow (USGPM) = Speed (rpm) x Displacement (in^3/rev) x 0.004329

FLUID VELOCITY

Metric Units
Velocity (m/s) = 21.22 x Q / D2
Q = flow rate (L/min)
D = Pipe bore (mm)

Imperial Units
Velocity (ft/s) = 0.408 x Q / D2
Q = flow rate (USGPM)
D = Pipe bore (in)

TORQUE

Metric Units
Theoretical Torque (Nm) = Pressure (bar) x Displacement (cc/rev) / (20 x Pi)

Actual Torque Nm = Pressure (bar) x Displacement (cc/rev) / (20 x Pi x 0.9)
(90% Mech Efficiency)

Imperial Units
Theoretical Torque (lbf.ft) = Pressure (psi) x Displacement (in^3/rev) / 75.36
Actual Torque Nm = Pressure (bar) x Displacement (cc/rev) / (75.36 x 0.9)

POWER

Metric Units
Power (KW) = Torque (Nm) x angular speed (rad/sec)
= Torque x speed (rpm) x 0.1047

Imperial Units
Power (hp) = torque (ft lbs) x speed (rpm) / 5,252

FLUIDS

Designation	Fluid Type	Rated Pressure	Max Speed	Fluid Temperature limits	
		bar	rpm	ºC min	ºC max
HM / HV	Mineral based hydraulic Fluid	250	3300	-20	+80
HFA	Oil in water emulsion	75	1500	10*	60*
HFB	Water in oil emulsion	130	1500	10*	65*
HFC	Water glycol	175	1500	0*	65*
HFD	Phosphate ester	Refer to Hydreco	Refer to Hydreco	Refer to Hydreco	Refer to Hydreco
HETG	Triglyceride based fluid	Refer to Hydreco	Refer to Hydreco	Refer to Hydreco	Refer to Hydreco
HEES	Synthetic ester fluid	Refer to Hydreco	Refer to Hydreco	Refer to Hydreco	Refer to Hydreco
*Note - may be further limited by fluid supplier					

INLET CONDITIONS

It is essential that pumps are installed so that they can always fill with fluid.
'QX5' Series pump inlet porting is designed to facilitate full volume fill but the following machine design recommendations should be followed.

- Never run pumps dry - particular care should be taken to open any shut-off valves.
- Use large diameter pipes and fittings and avoid sharp bends and long lengths.

Inlet fluid velocity should not exceed 2.5 m/sec (8.0 ft/sec) calculated by:

$V = \frac{21.22Q}{D^2}$ m/sec where V = velocity (m/sec), Q = flow rate (l/min), D = bore diameter (mm)

$V = \frac{0.408Q}{D^2}$ ft/sec where V = velocity (ft/sec), Q = flow rate (US gal/min), D = bore diameter (inches)

- If possible mount the pump below the lowest level of fluid in the tank. If necessary prime the pump on start-up.
- Ensure that inlet lines are airtight.
- Particular care should be taken where high speeds and/or high fluid viscosities are involved.

As a general rule pressure at the pump inlet should not be less than 0.8 bar absolute (6" Hg depression) at normal viscosity of 23 mm^2/sec (110 SSU) at maximum operating speed.

Hydreco Hydraulics' engineers will be pleased to advise on any installation

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