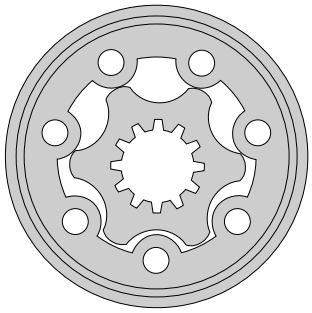
HYDRAULIC MOTORS HP

APPLICATION

» Conveyors
» Feeding mechanism of robots and manipulators
» Metal working machines
» Textile machines
» Machines for agriculture
» Food industries
» Grass cutting machinery etc.



CONTENTS

OPTIONS

» Model- Spool valve, gerotor
» Flange mount
» Side ports
» Shafts- straight, splined and tapered
» SAE and manifold ports
» Speed sensoring
» Other special features

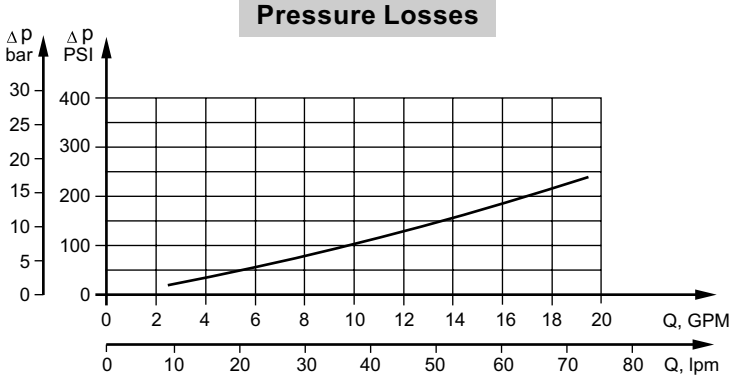
GENERAL

Displacement, in^3/rev [cm^3/rev.]	1.52÷24.16 [25÷396]
Max. Speed, [RPM]	150÷1600
Max. Torque, in-lb [daNm]	290÷3060 [3,3÷34,6]
Max. Output, HP [kW]	5÷11.5 [3,7÷8,5]
Max. Pressure Drop, PSI [bar]	945÷1815 [65÷125]
Max. Oil Flow, GPM [lpm]	10.5÷16 [40÷60,6]
Min. Speed, [RPM]	10
Pressure fluid	Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)
Temperature range, ^oF [^oC]	-22÷194 [-30÷90]
Optimal Viscosity range, SUS [mm^2/s]	98÷347 [20÷75]
Filtration	ISO code 20/16 (Min. recommended fluid filtration of 25 micron)

Oil flow in drain line

Pressure drop PSI [bar]	Viscosity SUS [mm^2/s]	Oil flow in drain line GPM [lpm]
1450 [100]	98 [20]	.660 [2,5]
	164 [35]	.476 [1,8]
2030 [140]	98 [20]	.925 [3,5]
	164 [35]	.740 [2,8]

Pressure Losses



SPECIFICATION DATA

Type		HP 25	HP 32	HP 40	HP 50	HP 80	HP 100
Displacement, in.³/rev. [cm.³/rev.]		1.52 [25]	1.95 [32]	2.44 [40]	3.02 [49,5]	4.83 [79,2]	6.04 [99,0]
Max. Speed,	Cont.	1600	1560	1515	1210	755	605
[RPM]	Int.*	1815	1720	1760	1515	945	755
Max. Torque	Cont.	290 [3,3]	380 [4,3]	550 [6,2]	725 [8,2]	1210 [13,7]	1500 [17,0]
in-lb [daNm]	Int.*	415 [4,7]	540 [6,1]	730 [8,2]	1050 [11,9]	1725 [19,5]	2100 [23,7]
Max. Output	Cont.	6.0 [4,5]	7.8 [5,8]	11.4 [8,5]	11.7 [8,7]	11.7 [8,7]	11.9 [8,9]
HP [kW]	Int.*	8.2 [6,1]	10.5 [7,8]	15.5 [11,6]	18.8 [14]	19.7 [14,7]	19.4 [14,5]
Max. Pressure Drop	Cont.	1450 [100]	1450 [100]	1750 [120]	1815 [125]	1815 [125]	1815 [125]
PSI [bar]	Int.*	2030 [140]	2030 [140]	2250 [155]	2540 [175]	2540 [175]	2540 [175]
Max. Oil Flow	Cont.	10.5 [40]	13.2 [50]	16 [60,6]	16 [60,6]	16 [60,6]	16 [60,6]
GPM [lpm]	Int.*	12 [45,4]	14.5 [55]	18.5 [70]	20 [75,7]	20 [75,7]	20 [75,7]
Max. Inlet Pressure	Cont.	2030 [140]	2030 [140]	2030 [140]	2030 [140]	2030 [140]	2030 [140]
PSI [bar]	Int.*	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]
	Peak**	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]
Max. Return Pres-	Cont.	2030 [140]	2030 [140]	2030 [140]	2030 [140]	2030 [140]	2030 [140]
sure with Drain Line	Int.*	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]
PSI [bar]	Peak**	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]
Max. Starting Pressure with Unloaded Shaft, PSI [bar]		145 [10]	145 [10]	145 [10]	145 [10]	145 [10]	145 [10]
Min. Starting Torque	At max.press. drop Cont.	265 [3,0]	355 [4,0]	480 [5,4]	610 [6,9]	1040 [11,7]	1310 [14,8]
in-lb [daNm]	At max.press. drop Int.*	370 [4,2]	500 [5,6]	600 [6,8]	885 [10]	1490 [16,8]	1860 [21]
Min. Speed*, [RPM]**		20	15	10	10	10	10
Weight, lb [kg]	HP	11.9 [5,4]	11.9 [5,4]	12.1 [5,5]	12.3 [5,6]	12.6 [5,7]	13.0 [5,9]
	HPQ	10.6 [4,8]	10.6 [4,8]	10.8 [4,9]	11.00 [5,0]	11.25 [5,1]	11.69 [5,3]

* Intermittent operation: the permissible values may occur for max. 10% of every minute.
** Peak load: the permissible values may occur for max. 1% of every minute.
*** For speeds of 10 RPM or lower, consult factory or your regional manager.
1. Intermittent speed and intermittent pressure drop must not occur simultaneously.
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4). If using synthetic fluids consult the factory for alternative seal materials.
4. Recommended minimum oil viscosity 70 SUS [13 mm²/s] at 122ºF [50ºC].
5. Recommended maximum system operating temperature is 180ºF [82ºC].
6. To assure optimum motor life fill with fluid prior to loading and run at moderate load and speed for 10-15 minutes.

SPECIFICATION DATA (continued)

Type		HP 125	HP 160	HP 200	HP 250	HP 315	HP 400
Displacement, in.³/rev. [cm.³/rev.]		7.55 [123,8]	9.66 [158,4]	12.1 [198]	15.1 [247,5]	19.3 [316,8]	24.16 [396]
Max. Speed,	Cont.	486	378	303	242	190	150
[RPM]	Int.*	605	472	378	303	236	189
Max. Torque	Cont.	1885 [21,3]	2335 [26,4]	2655 [30,0]	2920 [33,0]	3060 [34,6]	2965 [33,5]
in-lb [daNm]	Int.*	2640 [29,8]	2920 [33,0]	3090 [34,9]	3585 [40,5]	3560 [40,2]	3630 [41,0]
Max. Output	Cont.	11.8 [8,8]	11.4 [8,5]	10.6 [7,9]	9 [6,7]	7 [5,2]	5.5 [4,1]
HP [kW]	Int.*	17.4 [13]	16.1 [12]	16.1 [12]	13 [9,7]	9.5 [7,1]	8 [6]
Max. Pressure Drop	Cont.	1815 [125]	1740 [120]	1670 [115]	1450 [100]	1235 [85]	945 [65]
PSI [bar]	Int.*	2540 [175]	2250 [155]	2175 [150]	1815 [125]	1450 [100]	1160 [80]
Max. Oil Flow	Cont.	16 [60,6]	16 [60,6]	16 [60,6]	16 [60,6]	16 [60,6]	16 [60,6]
GPM [lpm]	Int.*	20 [75,7]	20 [75,7]	20 [75,7]	20 [75,7]	20 [75,7]	20 [75,7]
Max. Inlet Pressure	Cont.	2030 [140]	2030 [140]	2030 [140]	2030 [140]	2030 [140]	2030 [140]
PSI [bar]	Int.*	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]
	Peak**	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]
Max. Return Pres-	Cont.	2030 [140]	2030 [140]	2030 [140]	2030 [140]	2030 [140]	2030 [140]
sure with Drain Line	Int.*	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]
PSI [bar]	Peak**	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]
Max. Starting Pressure with Unloaded Shaft, PSI [bar]		145 [10]	145 [10]	100 [7]	100 [7]	100 [7]	100 [7]
Min. Starting Torque	At max.press. drop Cont.	1630 [18,4]	2130 [24,1]	2440 [27,5]	2700 [30,5]	2870 [32,4]	2840 [32]
in-lb [daNm]	At max.press. drop Int.*	2360 [26,6]	2780 [31,4]	3230 [36,5]	3430 [38,7]	3920 [44,2]	3740 [42,2]
Min. Speed*, [RPM]**		10	10	10	10	10	10
Weight, lb [kg]	HP	13.23 [6,0]	13.67 [6,2]	14.11 [6,4]	14.56 [6,6]	15.22 [6,9]	16.32 [7,4]
	HPQ	11.91 [5,4]	12.35 [5,6]	12.79 [5,8]	13.23 [6,0]	13.89 [6,3]	15.00 [6,8]

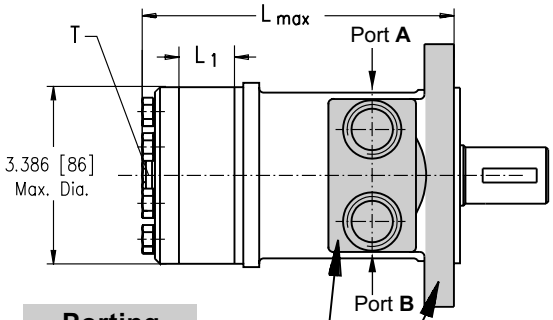
* Intermittent operation: the permissible values may occur for max. 10% of every minute.

** Peak load: the permissible values may occur for max. 1% of every minute.

*** For speeds of 10 RPM or lower, consult factory or your regional manager.

1. Intermittent speed and intermittent pressure drop must not occur simultaneously.
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4). If using synthetic fluids consult the factory for alternative seal materials.
4. Recommended minimum oil viscosity 70 SUS [13 mm²/s] at 122ºF [50ºC].
5. Recommended maximum system operating temperature is 180ºF [82ºC].
6. To assure optimum motor life fill with fluid prior to loading and run at moderate load and speed for 10-15 minutes.

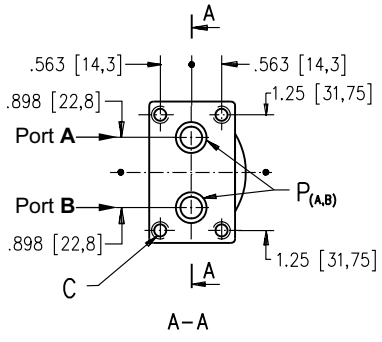
DIMENSIONS AND MOUNTING DATA FOR HP

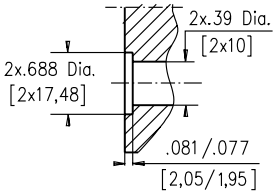


Porting

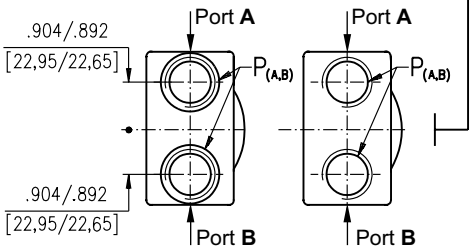
Side Ports

Version 1 3



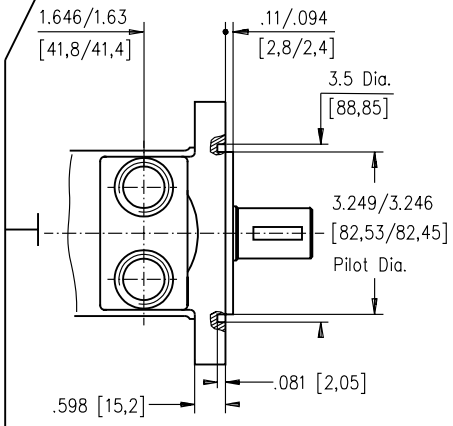


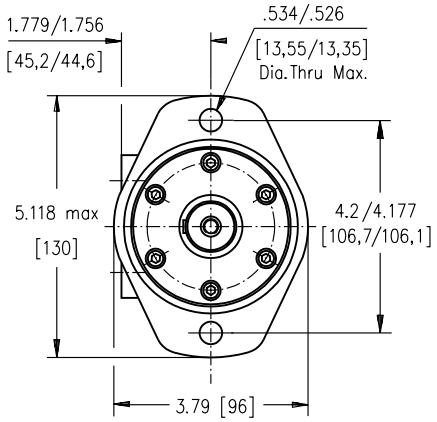
Version 4 Version 5



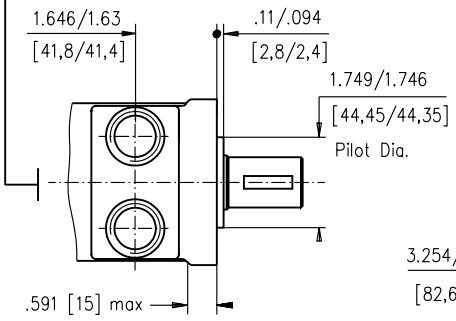
Mounting

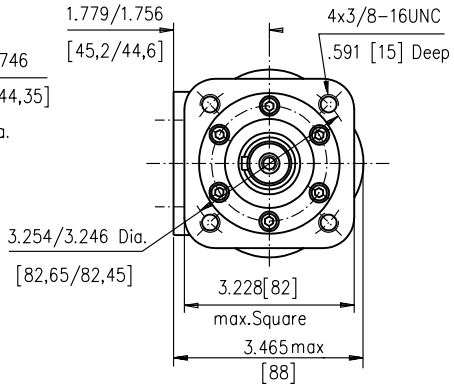
SAE A Flange

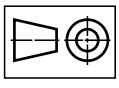




Q Square Flange







Type	Lmax,in. [mm]	L_1, in.[mm]
HP(Q) 25	5.32 [135,0]	.21 [5,20]
HP(Q) 32	5.37 [136,5]	.25 [6,30]
HP(Q) 40	5.43 [138,0]	.29 [7,40]
HP(Q) 50	5.39 [137,0]	.26 [6,67]
HP(Q) 80	5.55 [141,0]	.42 [10,67]
HP(Q) 100	5.70 [144,0]	.52 [13,33]
HP(Q) 125	5.79 [147,0]	.66 [16,67]
HP(Q) 160	5.98 [152,0]	.84 [21,33]
HP(Q) 200	6.18 [157,0]	1.05 [26,67]
HP(Q) 250	6.46 [164,0]	1.31 [33,33]
HP(Q) 315	6.81 [173,0]	1.68 [42,67]
HP(Q) 400	7.24 [184,0]	2.10 [53,33]

Standard Rotation
Viewed from Shaft End
Port **A** Pressurized - **CW**
Port **B** Pressurized - **CCW**

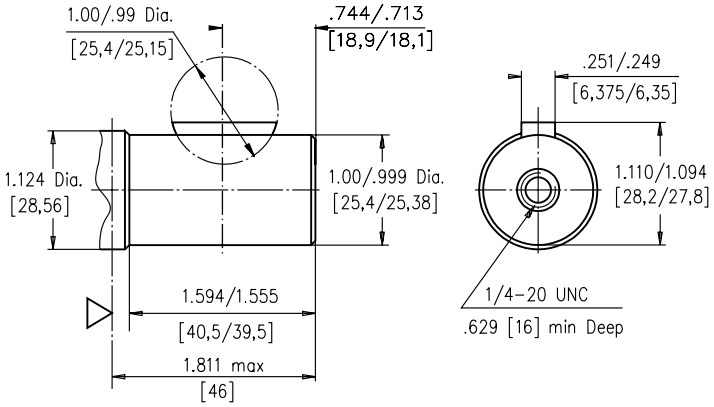
Reverse Rotation
Viewed from Shaft End
Port **A** Pressurized - **CCW**
Port **B** Pressurized - **CW**

Versions				
	1	3	4	5
C	4x 5/16-18UNC	4x M8	-	-
P(A,B)	2x.39 Dia. [2x10]	2x.39 Dia. [2x10]	2x 7/8-14UNF	2x½-14NPTF
T	7/16 -20UNF	7/16 -20UNF	7/16 -20UNF	7/16 -20UNF

SHAFT EXTENSIONS FOR HP AND HR MOTORS

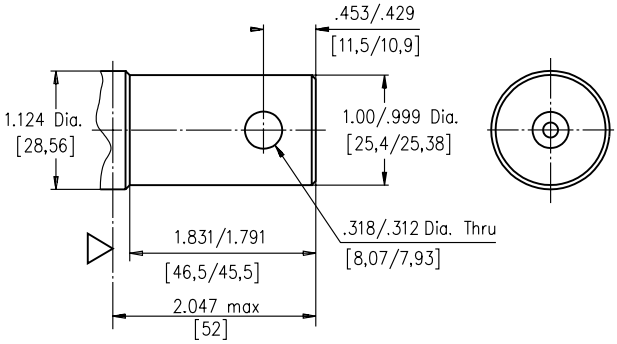
C

1" [25,4] straight, Woodruff key 1/4"x1" SAE J502
Max. Torque 3009 in-lb [34 daNm]



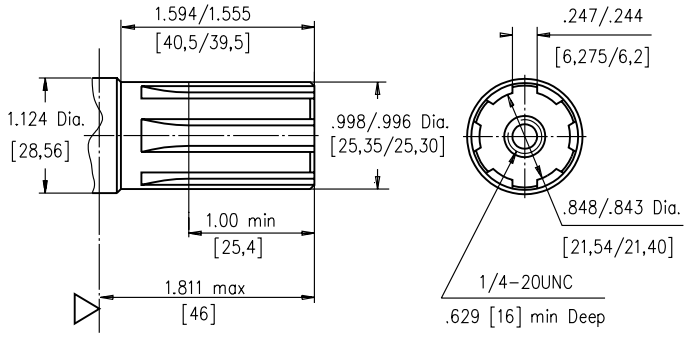
H

1" [25,4] straight, w/ .315 [8] Crosshole
Max. Torque 3009 in-lb [34 daNm]



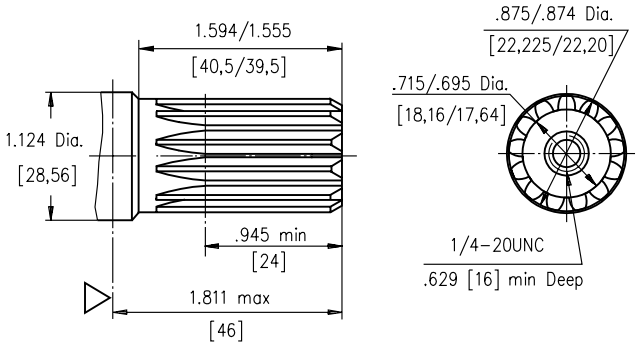
G

1" [25,4], SAE 6B Splined
Max. Torque 3540 in-lb [40 daNm]



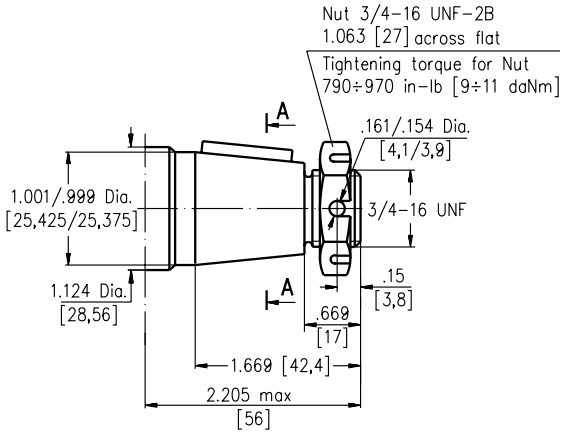
S

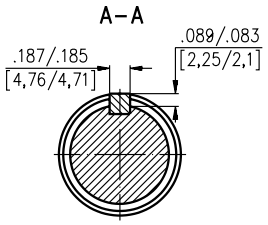
13T Splined, 7/8" [22,2], ANS B 92.1-1976
Max. Torque 3200 in-lb [36 daNm]



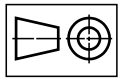
T

1" [25,4], SAE J501 Tapered
Parallel key 3/16"x3/16"x3/4"
Max. Torque 3540 in-lb [40 daNm]





1.5 Taper per Foot
[cone 1:8]



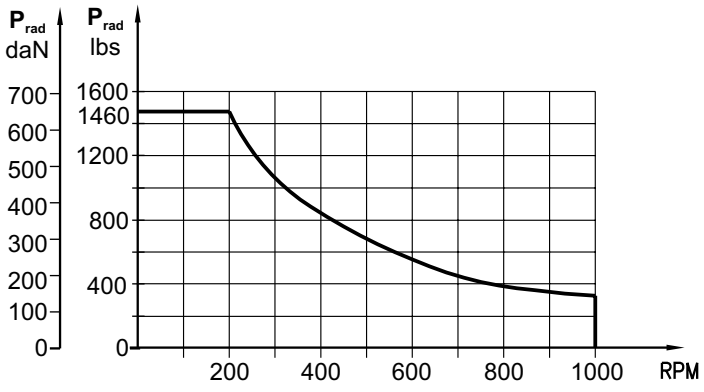
∇- Motor Mounting Surface
Requirement max. Torque must be not exceeded.

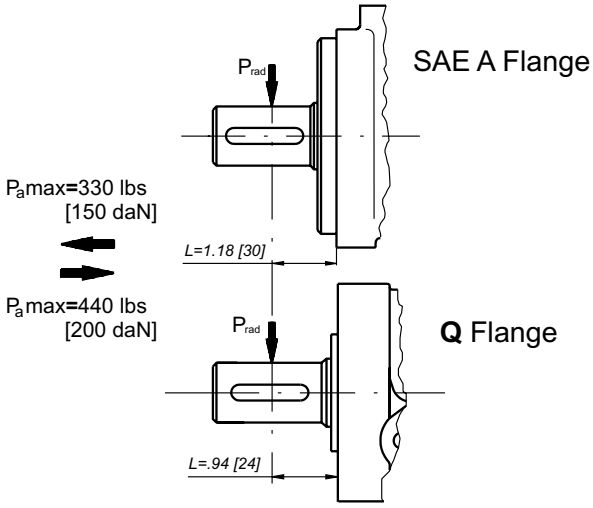
PERMISSIBLE SHAFT LOADS FOR HP AND HR MOTORS

The permissible radial shaft load **P_{rad}** depends on the speed RPM and distance *L* from the point of load to the mounting flange.

Radial Shaft Load: $P_{rad} = \frac{1460}{RPM} \times \frac{976}{3.82+L}$,lbs*

* 1. *L* - in inch
2. RPM < 200: max Prad=1460 lbs [650 daN]
3. RPM >200: *L* < 2.2 in.



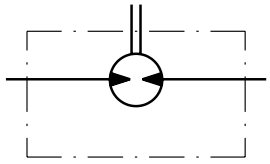


MAX. PERMISSIBLE SHAFT SEAL PRESSURE FOR HP AND HR MOTORS

HP...U1 and HR...U1 motors with high pressure seal and without drain connection:

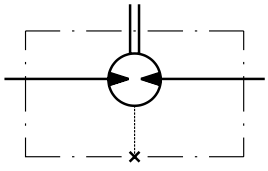
The shaft seal pressure equals the average of input pressure and return pressure.

$P_{seal} = \frac{P_{input}+P_{return}}{2}$

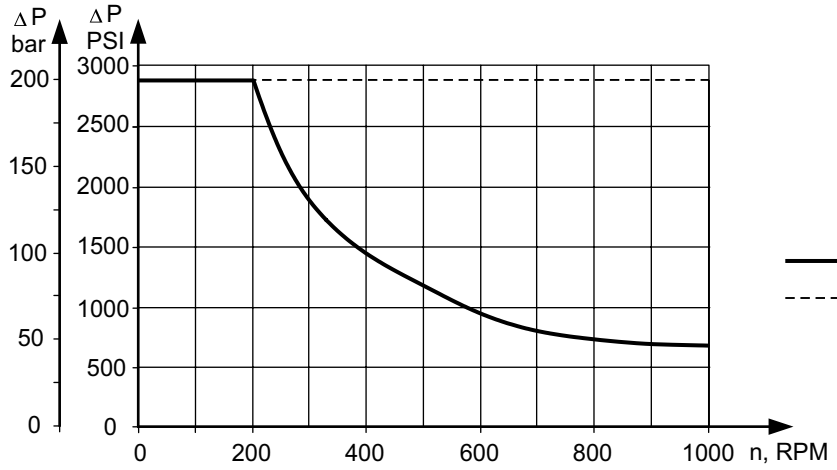


HP...U and HR...U motors with high pressure seal and drain connection:

The shaft seal pressure equals the pressure in the drain line.



Max. return pressure without drain line or max. pressure in the drain line



ORDER CODE

	1	2	3	4	5	6	7	8
H P					**U**			

Pos.1 - Mounting Flange

omit - SAE A, two holes

Q - Square, four bolts

Pos.2 - Displacement code*

25	- 1.52 [25,0] in.^{3}/rev. [cm.^{3}/rev.]
32	- 1.95 [32,0] in.^{3}/rev. [cm.^{3}/rev.]
40	- 2.44 [40,0] in.^{3}/rev. [cm.^{3}/rev.]
50	- 3.02 [49,5] in.^{3}/rev. [cm.^{3}/rev.]
80	- 4.83 [79,2] in.^{3}/rev. [cm.^{3}/rev.]
100	- 6.04 [99,0] in.^{3}/rev. [cm.^{3}/rev.]
125	- 9.66 [123,8] in.^{3}/rev. [cm.^{3}/rev.]
160	- 9.74 [158,4] in.^{3}/rev. [cm.^{3}/rev.]
200	- 12.10 [198,0] in.^{3}/rev. [cm.^{3}/rev.]
250	- 15.10 [247,5] in.^{3}/rev. [cm.^{3}/rev.]
315	- 19.30 [316,8] in.^{3}/rev. [cm.^{3}/rev.]
400	- 24.16 [396,0] in.^{3}/rev. [cm.^{3}/rev.]

Pos.3 - Shaft Extensions**

C	- 1" [25,4] straight, Woodruff key
G	- 1" [25,4] SAE 6B Splined
H	- 1" [25,4] straight, w/.315 [8] Cross-hole
S	- 7/8" [22,2] 13T Splined
T	- 1" [25,4] SAE J501 Tapered

Pos. 4 - Port Size/Type [standard manifold to each]

1	- side ports, Manifold [5/16-18 UNC Mounting Threads], 7/16-20 UNF
3	- side ports, Manifold [M8 Mounting Threads], 7/16-20 UNF
4	- side ports, 2x7/8-14 UNF, O-ring, 7/16-20 UNF
5	- side ports, 2x1/2-14 NPTF, 7/16-20 UNF

Pos. 5 - Shaft Seal Version [see page 9]

U - High pressure shaft seal (without check valves)

Pos. 6 - Drain Port

omit - with drain port

1 - without drain port

Pos. 7 - Special Features [see page 38]

Pos. 8 - Design Series

omit - Factory specified

*Notes : * For the Performance Data please look at "M+S Hydraulic" Catalogue for MLHP motors, pages 18÷24.*

*** The permissible output torque for shafts must not be exceeded!*

The hydraulic motors are mangano-phosphatized as standard.