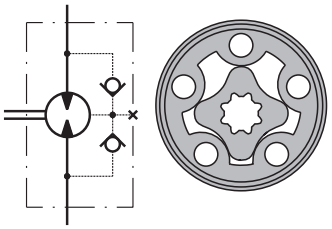
HYDRAULIC MOTORS MLHM

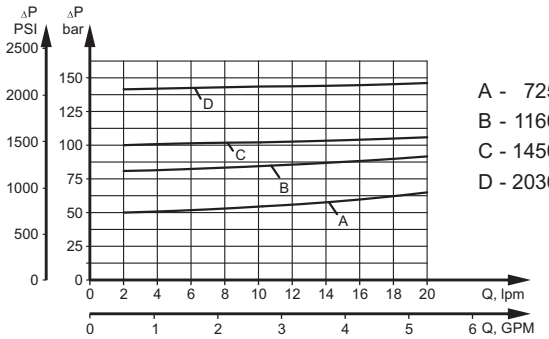
CONTENTS

APPLICATION

» Conveyors
» Textile machines
» Mining machinery
» Machine tools
» Ventilators
» Construction plant equipment and access platforms etc.



Pressure Settings at Flow
Q=.53 GPM [2 lpm], 150 SUS [32 mm²/s], 122°F [50°C]

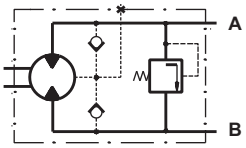


A - 725 PSI [50 bar]
B - 1160 PSI [80 bar]
C - 1450 PSI [100 bar]
D - 2030 PSI [140 bar]

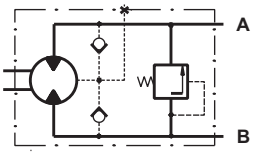
OPTIONS

» Model - Spool valve, gerotor
» With or without flange
» Side and rear ports
» Series with pressure valve(s)
» Shafts - straight and splined
» Metric and BSPP ports
» Speed sensoring;
» Other special features

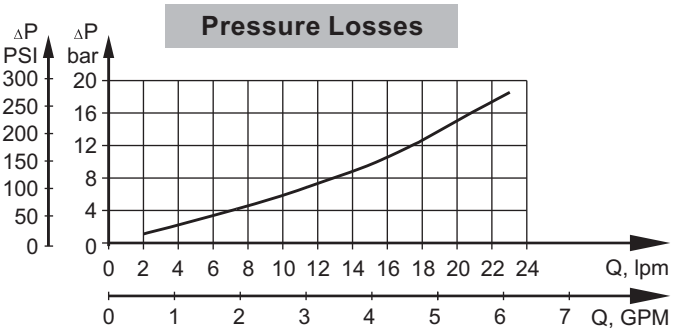
MLHMP Series with Integrated Internal Crossover Relief Valve
A⟶B,Δp=1450 or 725 PSI [100 or 50 bar]



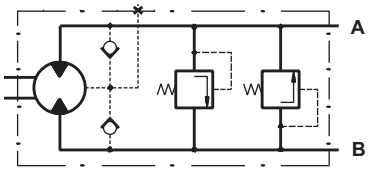
MLHMP Series with Integrated Internal Crossover Relief Valve
B⟶A,Δp=1450 or 725 PSI [100 or 50 bar]



Pressure Losses



MLHMD Series with Integrated Internal Crossover Relief Valves
A⟷B,Δp=100 or 50 bar [1450 or 725 PSI]



GENERAL

Max. Displacement,	in³/rev [cm³/rev]	3.05 [50]
Max. Speed,	[RPM]	2440
Max. Torque,	lb-in [daNm]	cont.: 398 [4,5] int.: 513 [5,8]
Max. Output,	HP [kW]	4,3 [3,2]
Max. Pressure Drop,	PSI [bar]	cont.: 1500 [105] int.: 2030 [140]
Max. Oil Flow,	GPM [lpm]	6.6 [25]
Min. Speed,	[RPM]	20
Pressure fluid		Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)
Temperature range,	°F [°C]	-40÷284 [-40÷140]
Optimal Viscosity range,	SUS [mm²/s]	98÷347 [20÷75]
Filtration		ISO code 20/16 (Min. recommended fluid filtration of 25 microns)

SPECIFICATION DATA

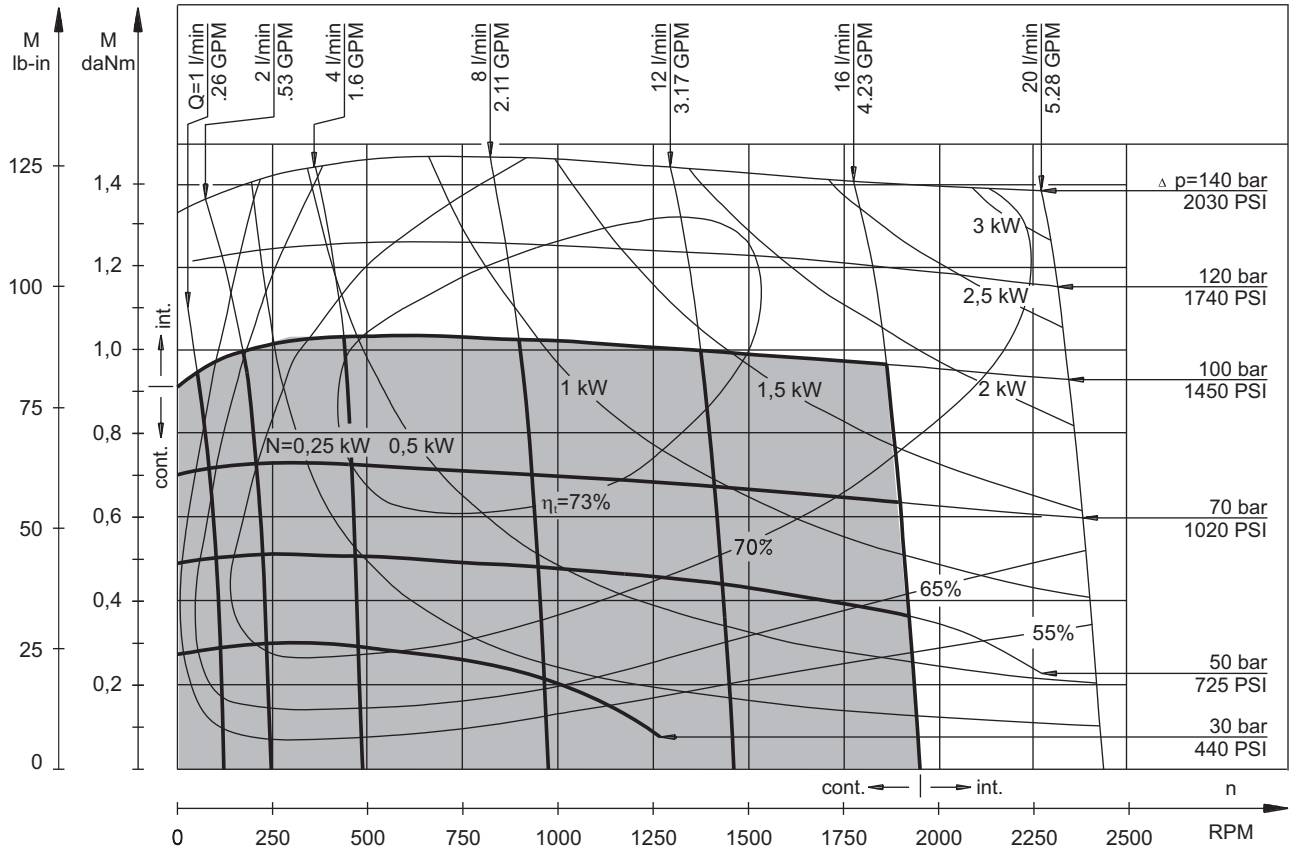
Type		MLHM 8	MLHM 12.5	MLHM 20	MLHM 32	MLHM 40	MLHM 50
Displacement, in^3/rev [cm^3/rev]		.50 [8,2]	.77 [12,5]	1.22 [19,9]	1.93 [31,6]	39,8 [39,8]	3.08 [50]
Max. Speed, [RPM]	Cont.	1950	1550	1000	630	500	400
	Int.*	2450	1940	1250	800	630	500
Max. Torque lb-in [daNm]	Cont.	95 [1,1]	140 [1,6]	220 [2,5]	350 [4,0]	400 [4,5]	410 [4,6]
	Int.*	135 [1,5]	200 [2,3]	310 [3,5]	500 [5,7]	620 [7,0]	780 [8,8]
	Peak**	187 [2,1]	293 [3,3]	453 [5,1]	568 [6,4]	725 [8,2]	885 [10,0]
Max. Output HP [kW]	Cont.	2.4 [1,8]	3.2 [2,4]	3.2 [2,4]	3.2 [2,4]	3.0 [2,2]	2.4 [1,8]
	Int.*	3.5 [2,6]	4.3 [3,2]	4.3 [3,2]	4.3 [3,2]	4.3 [3,2]	4.3 [3,2]
Max. Pressure Drop PSI [bar]	Cont.	1450 [100]	1450 [100]	1450 [100]	1450 [100]	1310 [90]	1020 [70]
	Int.*	2030 [140]	2030 [140]	2030 [140]	2030 [140]	2030 [140]	2030 [140]
	Peak**	2900 [200]	2900 [200]	2900 [200]	2320 [160]	2320 [160]	2320 [160]
Max. Oil Flow GPM [lpm]	Cont.	4.2 [16]	5.3 [20]	5.3 [20]	5.3 [20]	5.3 [20]	5.3 [20]
	Int.*	20 [20]	6.6 [25]	6.6 [25]	6.6 [25]	6.6 [25]	6.6 [25]
Max. Inlet Pressure PSI [bar]	Cont.	2030 [140]	2030 [140]	2030 [140]	2030 [140]	2030 [140]	2030 [140]
	Int.*	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]
	Peak**	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]
Max. Return Pressure without Drain Line or Max. Pressure in Drain Line, PSI [bar]	Cont. 0-100 RPM	2030 [140]	2030 [140]	2030 [140]	2030 [140]	2030 [140]	2030 [140]
	Cont. 100-400 RPM	1500 [105]	1500 [105]	1500 [105]	1500 [105]	1500 [105]	1500 [105]
	Cont. 400-800 RPM	725 [50]	725 [50]	725 [50]	725 [50]	725 [50]	725 [50]
	Cont. >800 RPM	290 [20]	290 [20]	290 [20]	-	-	-
	Int.* 0-max. RPM	2030 [140]	2030 [140]	2030 [140]	2030 [140]	2030 [140]	2030 [140]
Max. Return Pressure with Drain Line PSI [bar]	Cont.	2030 [140]	2030 [140]	2030 [140]	2030 [140]	2030 [140]	2030 [140]
	Int.*	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]
	Peak**	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]
Max. Starting Pressure with Unloaded Shaft, PSI [bar]		60 [4]	60 [4]	60 [4]	60 [4]	60 [4]	60 [4]
Min. Starting Torque lb-in [daNm]	At max. press. drop Cont.	60 [0,7]	105 [1,2]	2,1 [185]	300 [3,4]	335 [3,8]	365 [4,1]
	At max. press. drop Int.*	90 [1,0]	150 [1,7]	2,9 [255]	425 [4,8]	550 [6,2]	700 [7,9]
Min. Speed*, [RPM]**		50	40	30	30	25	20
Weight, lb [kg]	MLHM(M) rear ports	4.2 [1,9]	4.41 [2,0]	4.63 [2,1]	4.85 [2,2]	5.07 [2,3]	5.51 [2,5]
For "F" flange: + .441 [0,200]	MLHM(M)	4.41 [2,0]	4.63 [2,1]	4.85 [2,2]	5.07 [2,3]	5.29 [2,4]	5.73 [2,6]
	MLHM(M)...P	4.85 [2,2]	5.07 [2,3]	5.29 [2,4]	5.51 [2,5]	5.73 [2,6]	6.17 [2,8]
	MLHM(M)...D	5.73 [2,6]	5.95 [2,7]	6.17 [2,8]	6.39 [2,9]	6.61 [3,0]	7.05 [3,2]

* 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 lower than given, consult factory or your regional manager.

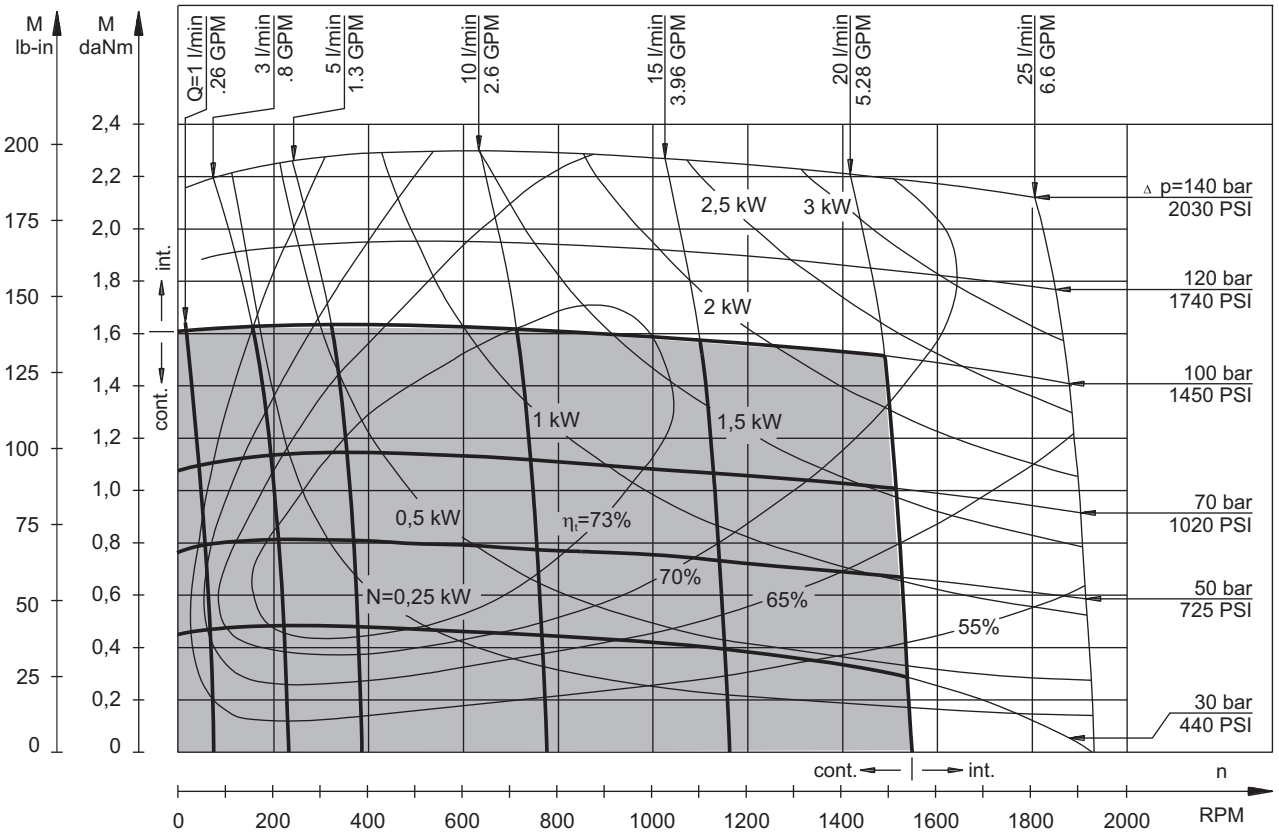
1. Intermittent speed and intermittent pressure drop must not occur simultaneously.
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4). 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 15-30 minutes.

FUNCTION DIAGRAMS

MLHM 8



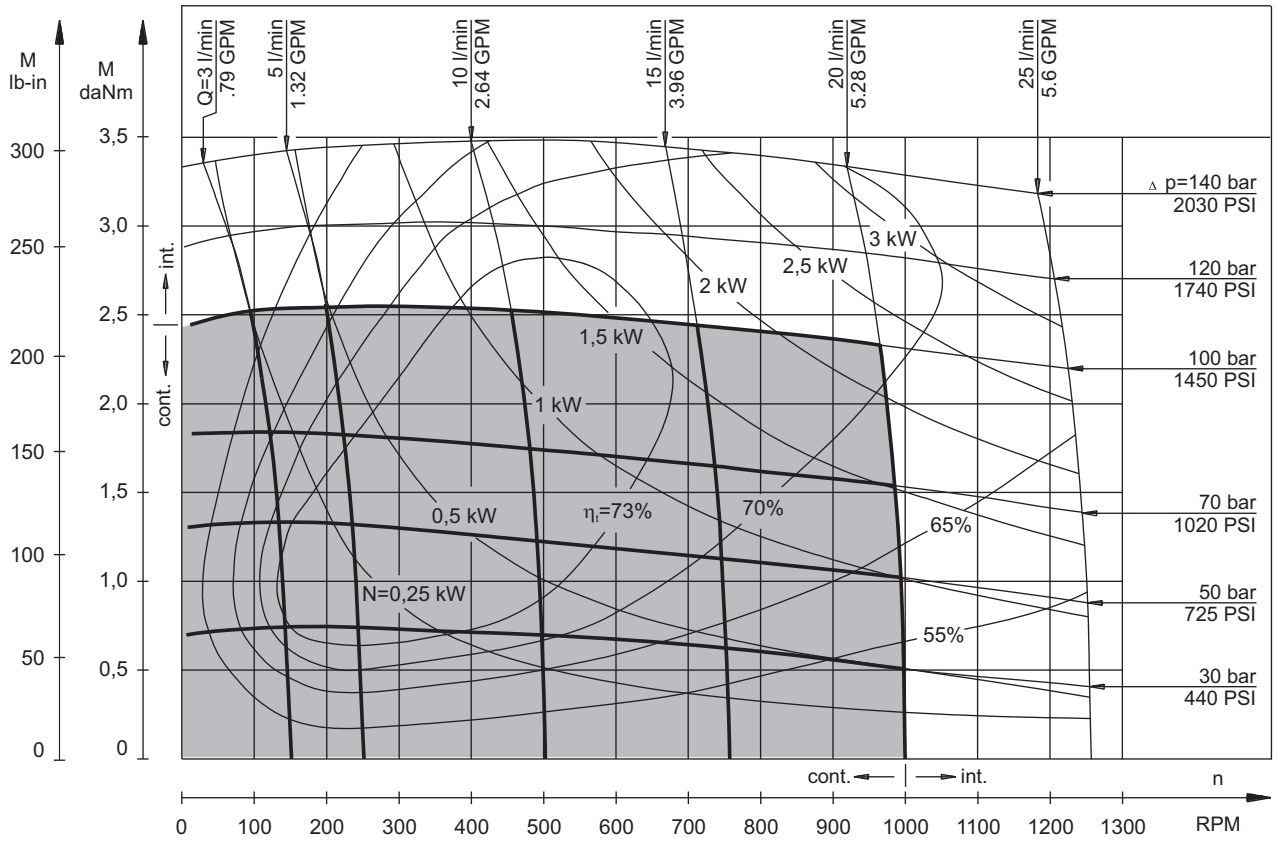
MLHM 12,5



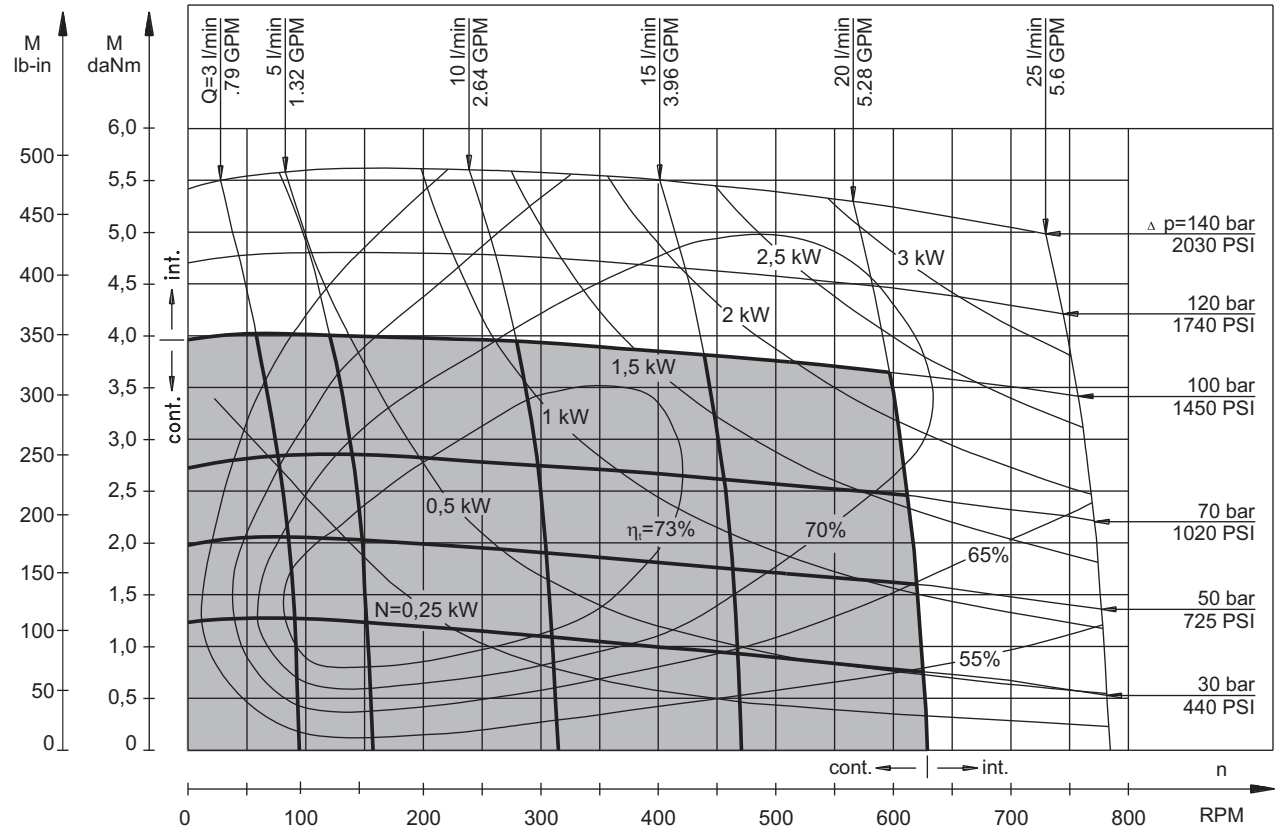
The function diagrams data is for average performance of randomly selected motors at back pressure 72.5÷145 PSI [5÷10 bar] and oil with viscosity of 150 SUS [32 mm²/s] at 122°F [50°C].

FUNCTION DIAGRAMS

MLHM 20



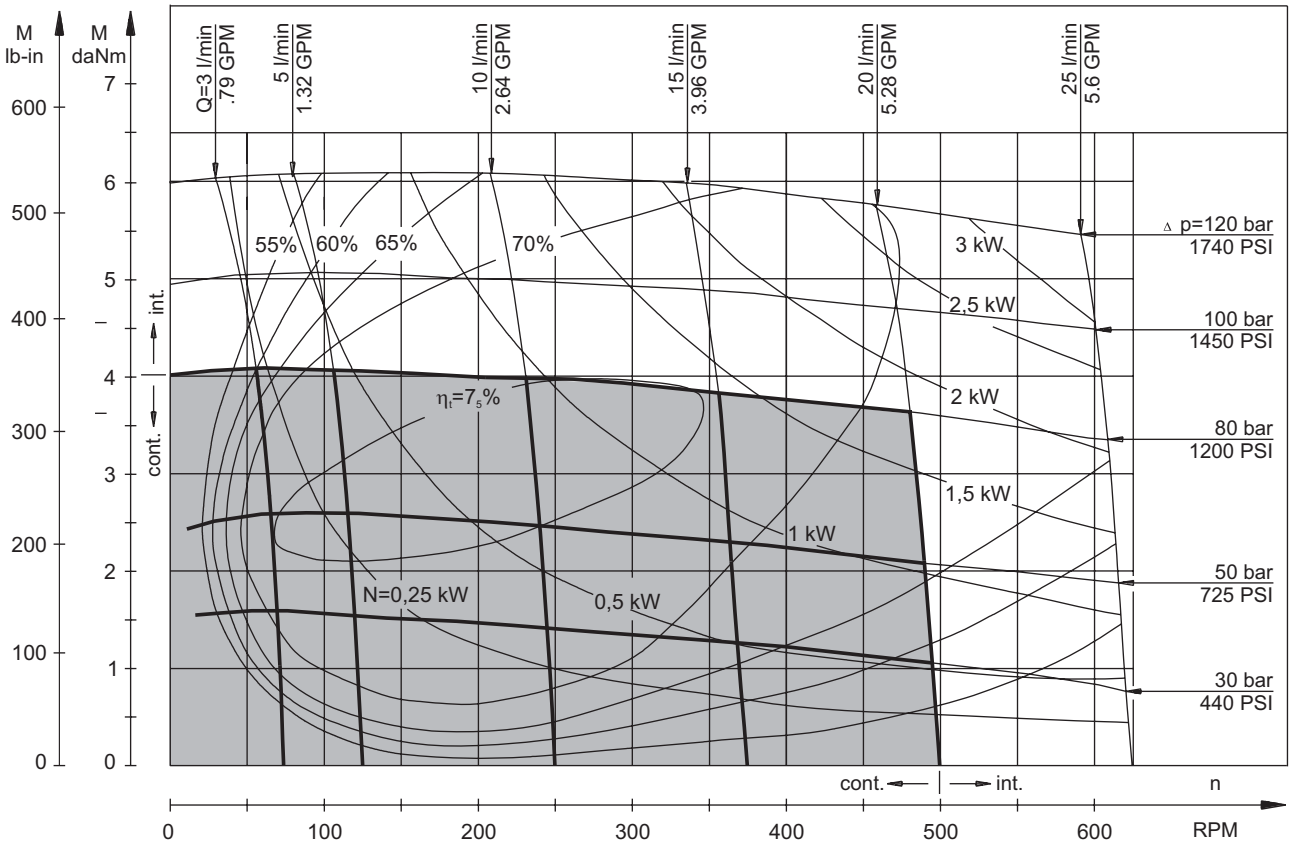
MLHM 32



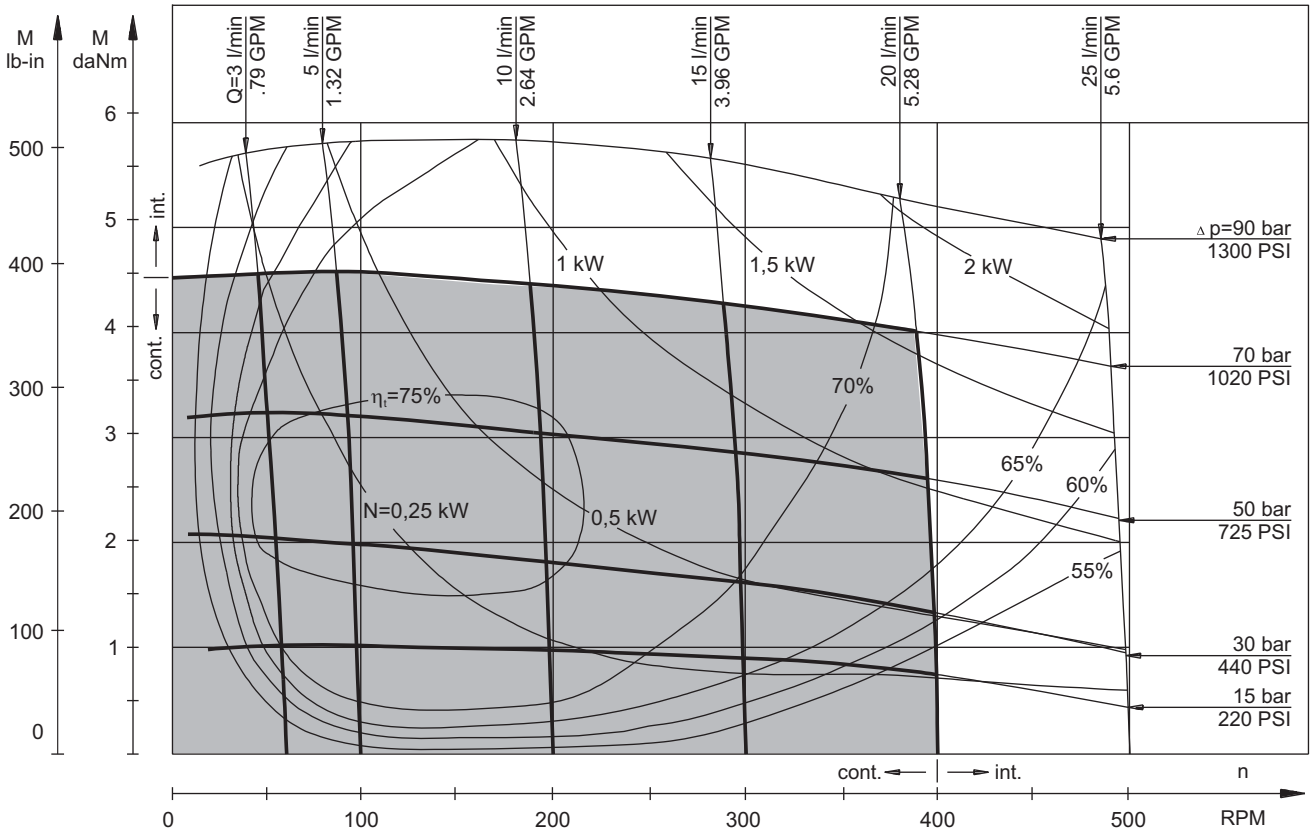
The function diagrams data is for average performance of randomly selected motors at back pressure 72.5÷145 PSI [5÷10 bar] and oil with viscosity of 150 SUS [32 mm²/s] at 122°F [50°C].

FUNCTION DIAGRAMS

MLHM 40



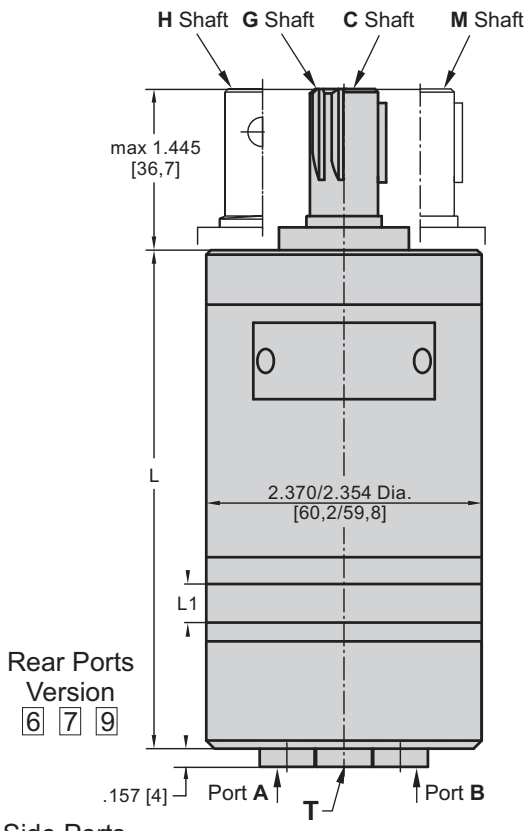
MLHM 50



The function diagrams data is for average performance of randomly selected motors at back pressure 72.5÷145 PSI [5÷10 bar] and oil with viscosity of 150 SUS [32 mm²/s] at 122°F [50°C].

DIMENSIONS AND MOUNTING DATA
MLHM, MLHMP, MLHMD

Three Bolts Mount



Shaft Dim.
See Page 11

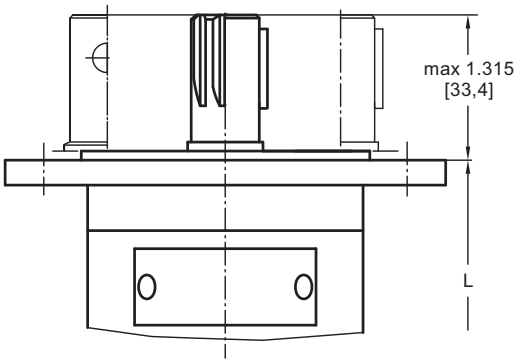
Flange Dim.
See Page 10

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**

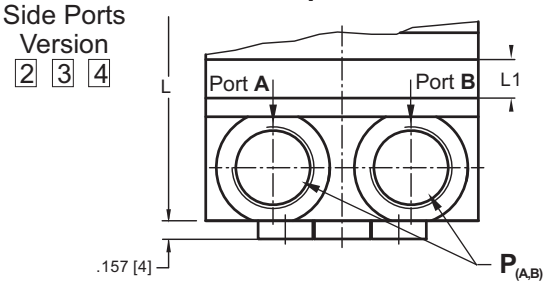
Port Dim.
See Page 10

F Oval Mount (2 Holes)



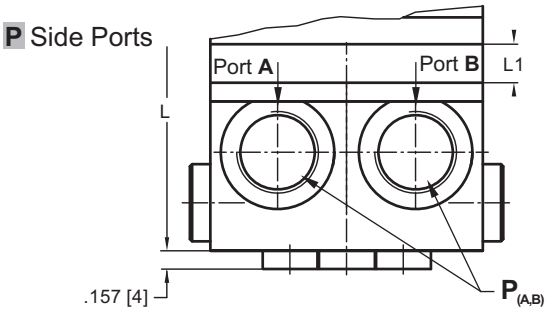
	Versions		
	2 , 6	3 , 9	4 , 7
$P_{(A,B)}$	2xG⅜	2xM18x1,5	2x⁹⁄₁₆-18UNF
T	G⅛	M10x1	⅜-24UNF

Side Ports Version 2 3 4



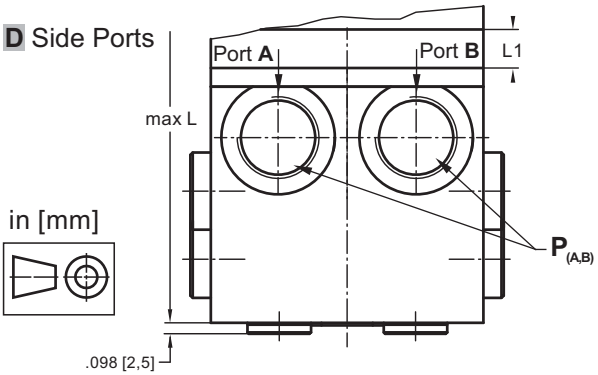
Type	Side Ports L, in [mm]	Rear Ports L, in [mm]	L_1 in [mm]
MLHM(M) 8	4.134 [105,0]	4.094 [104,0]	.138 [3,5]
MLHM(M)12.5	4.213 [107,0]	4.173 [106,0]	.217 [5,5]
MLHM(M) 20	4.331 [110,0]	4.291 [109,0]	.335 [8,5]
MLHM(M) 32	4.528 [115,0]	4.488 [114,0]	.531 [13,5]
MLHM(M) 40	4.665 [118,5]	4.626 [117,5]	.669 [17,0]
MLHM(M) 50	4.823 [122,5]	4.783 [121,5]	.827 [21,0]

P Side Ports



Type	Side Ports L, in [mm]	Rear Ports L, in [mm]	L_1 in [mm]
MLHMF 8	4.272 [108,5]	4.232 [107,5]	.138 [3,5]
MLHMF 12.5	4.350 [110,5]	4.311 [109,5]	.217 [5,5]
MLHMF 20	4.469 [113,5]	4.429 [112,5]	.335 [8,5]
MLHMF 32	4.665 [118,5]	4.626 [117,5]	.531 [13,5]
MLHMF 40	4.803 [122,0]	4.764 [121,0]	.669 [17,0]
MLHMF 50	4.961 [126,0]	4.921 [125,0]	.827 [21,0]

D Side Ports



in [mm]

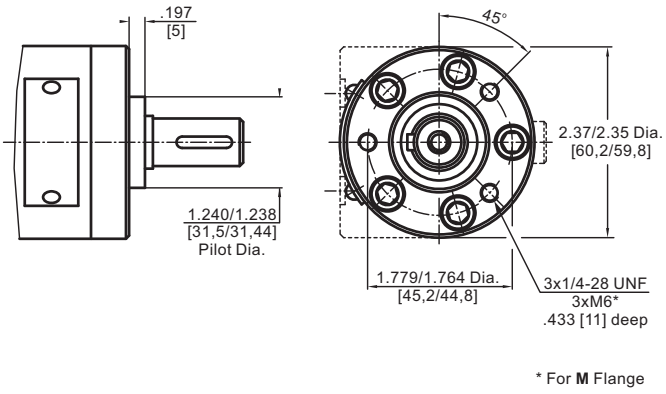
Type	L, in [mm]	Type	L, in [mm]
MLHM(M) 8...P	4.528 [115,0]	MLHMF 8...P	4.665 [118,5]
MLHM(M)12,5..P	4.606 [117,0]	MLHMF12,5...P	4.744 [120,5]
MLHM(M) 20...P	4.724 [120,0]	MLHMF 20...P	4.862 [123,5]
MLHM(M) 32...P	4.921 [125,0]	MLHMF 32...P	5.059 [128,5]
MLHM(M) 40...P	5.039 [128,0]	MLHMF 40...P	5.197 [132,0]
MLHM(M) 50...P	5.217 [132,5]	MLHMF 50...P	5.354 [136,0]

Type	L, in [mm]	Type	L, in [mm]	L_1, in [mm]
MLHM(M) 8...D	5.276 [134,0]	MLHMF 8...D	5.433 [138]	.13 [3,5]
MLHM(M)12,5...D	5.354 [136,0]	MLHMF12,5...D	5.512 [140]	.21 [5,5]
MLHM(M) 20...D	5.472 [139,0]	MLHMF 20...D	5.748 [146]	.335 [8,5]
MLHM(M) 32...D	5.669 [144,0]	MLHMF 32...D	5.827 [148]	.531 [13,5]
MLHM(M) 40...D	5.807 [147,5]	MLHMF 40...D	5.945 [151]	.669 [17,0]
MLHM(M) 50...D	5.965 [151,5]	MLHMF 50...D	6.102 [155]	.828 [21,0]

MLHM MOTORS

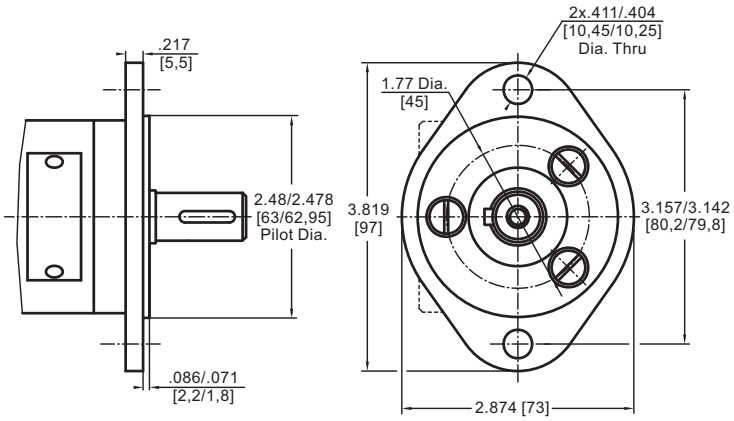
MOUNTING

Three Bolts Mount



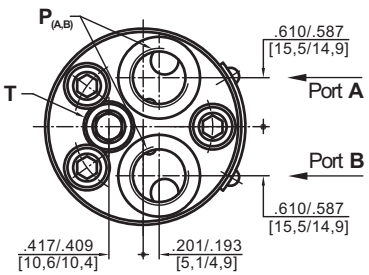
* For **M** Flange

F Oval Mount (2 Holes)

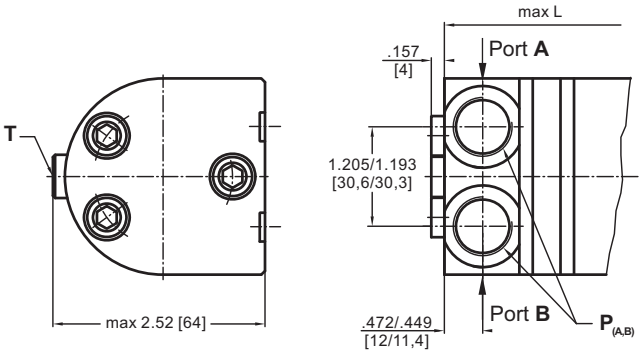


PORTS

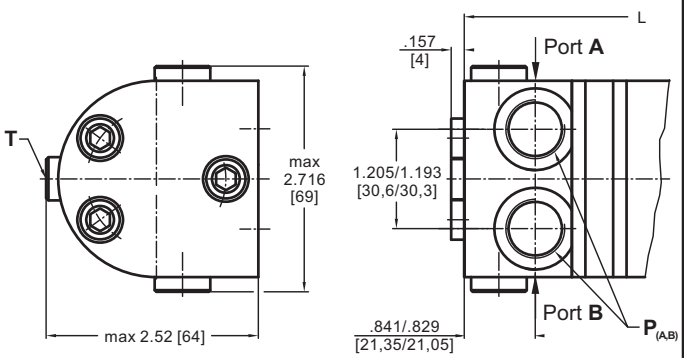
Rear Ports
Version 6 7 9



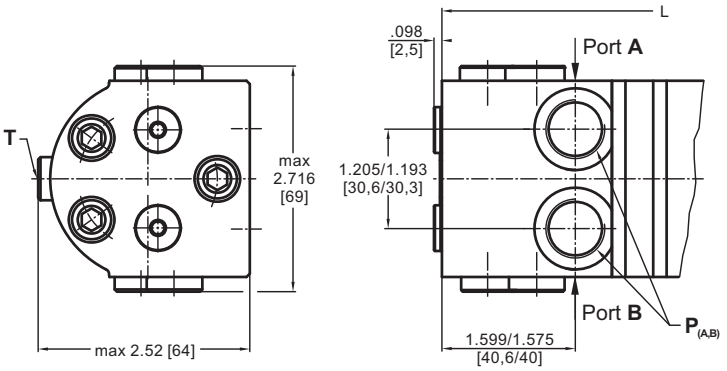
Side Ports, without valves
Version 2 3 4



P Side Ports with Single Crossover Relief Valve



D Side Ports with Dual Crossover Relief Valve



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**

in [mm]

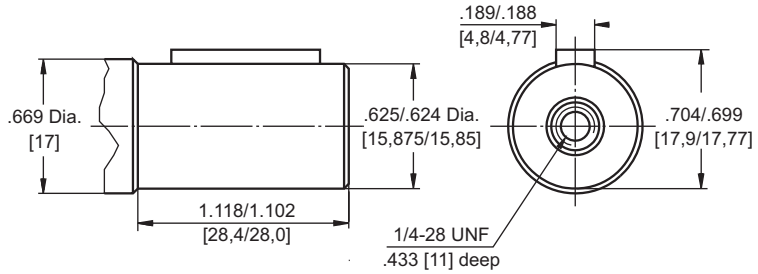
	Versions		
	2 , 6	3 , 9	4 , 7
$P_{(A,B)}$	2xG⅜	2xM18x1,5	2x⁹⁄₁₆-18UNF
T	G⅛	M10x1	⅜-24UNF

M+S HYDRAULIC

SHAFT EXTENSIONS

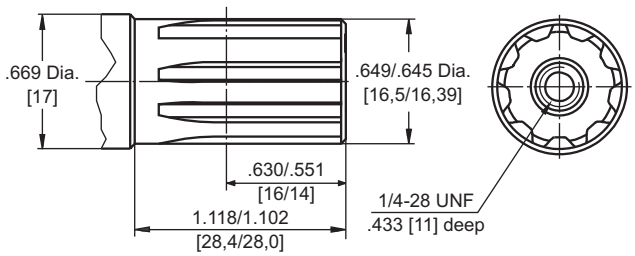
C

5/8“ [15,8] straight, Parallel key 3/16"x3/16"x3/4" BS 46
Max.Torque 345 lb-in [3,9 daNm]



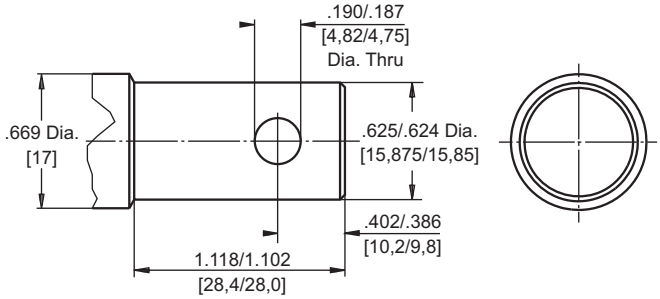
G

Splined - Metric B 17x14 DIN 5482
Max. Torque 390 lb-in [4,4 daNm]



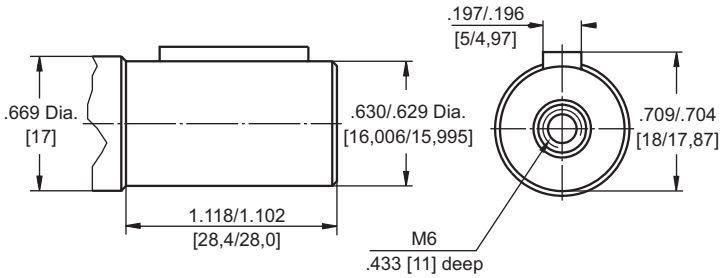
H

5/8" [15,8] straight, w/ .19 [4,82] Crosshole
Max. Torque 345 lb-in [3,9 daNm]



M

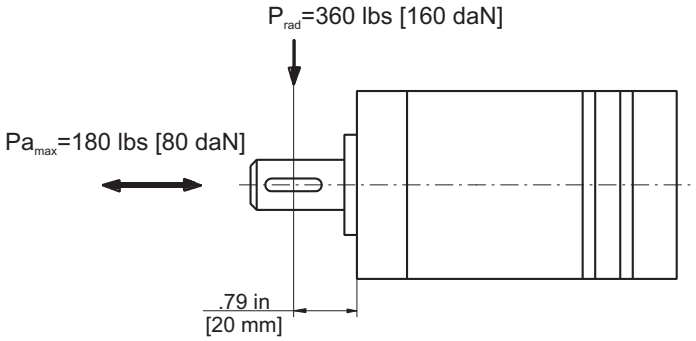
ø16 straight, Parallel key A5x5x16 DIN 6885
Max. Torque 345 lb-in [3,9 daNm]



Requirement max. Torque must be not exceeded.

in [mm]

PERMISSIBLE SHAFT LOAD



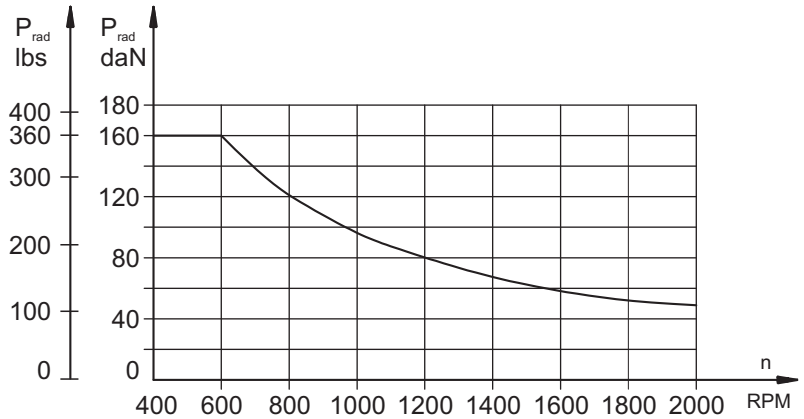
The permissible radial shaft load [Prad] is calculated from the distance [L] between the point of load application and the mounting surface:

$$P_{rad} = \frac{600}{n} X \frac{13040}{61{,}5+L}\ , \text{[daN]}$$

[L in mm; L≤ 80 mm]

$$P_{rad} = \frac{600}{n} X \frac{1155}{2.42 + L}\ , \text{[lbs]}$$

[L in inch; L≤ 3.15 in]



The drawing shows the permissible radial load when L=.79 in [20 mm].

If the calculated shaft load exceeds the permissible, a flexible coupling must be used.

ORDER CODE

	1	2	3	4	5	6	7	8	9
M L H M									

Pos.1 - Mounting Flange

omit - round, three bolts 1/4-28 UNF
F - flange, two holes
M - round metric, three bolts M6

Pos.2 - Displacement code

8 - .5 in^3/rev [8,2 cm^3/rev]
12.5 - .79 in^3/rev [12,9 cm^3/rev]
20 - 1.22 in^3/rev [20,0 cm^3/rev]
32 - 1.93 in^3/rev [31,8 cm^3/rev]
40 - 2.44 in^3/rev [40,0 cm^3/rev]
50 - 3.05 in^3/rev [50,0 cm^3/rev]

Pos.3 - Shaft Extensions* [for dimensions data see page 11]

C - $^5/_8$" [15,8] straight, Parallel key
VC - $^5/_8$" [15,8] straight, Parallel key w/ corrosion resistant bushing
G - Involute Splined- Metric B17x14 DIN5482
H - $^5/_8$" [15,8] straight, Parallel key w/ .19 [4,82] Crosshole
M - 16 mm straight, Parallel key
VM - 16 mm straight, Parallel key w/ corrosion resistant bushing

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

2 - side ports, 2xG3/8, G1/8, BSP thread, ISO 228
3 - side ports, 2xM18x1,5; M10x1; metric, ISO 262
4 - side ports, 2x9/16-18 UNF, O-ring, 3/8-24 UNF
6 - rear ports, 2xG3/8, G1/8, BSP thread, ISO 228
7 - rear ports, 2x9/16-18 UNF, O-ring, 3/8-24 UNF
9 - rear ports, 2xM18x1,5; M10x1; metric, ISO 262

Pos.5 - Option**

omit - without valves
D - side ports with dual crossover relief valve
P - side ports with single crossover relief valve

Pos.6 - Directions for Control [for "P" option only]

/L - B → A (left control)
/R - A → B (right control)

Pos.7 - Valve Rated Pressure [for "P" and "D" option only]

/50 - Δp= 725 PSI [50 bar]
/80 - Δp=1160 PSI [80 bar]
/100 - Δp=1450 PSI [100 bar]
/140 - Δp=2030 PSI [140 bar]

Pos.8 - Special Features [see page 103]

Pos.9 - Design Series

omit - Factory specified

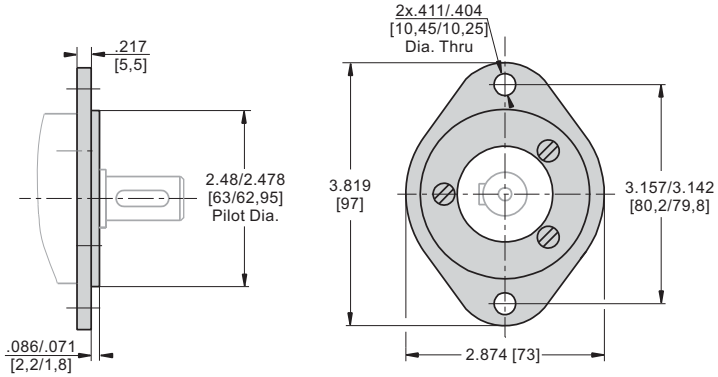
NOTES: * The permissible output torque for shafts must not be exceeded!
** Options **P**, **D** - for side ports (2, 3, 4) only.

The hydraulic motors are mangano-phosphatized as standard.

⚠ **MLHMP** and **MLHMD** are available with new crossover relief valves with improved characteristics. The new valves allow easier pressure setting in a wider range: from 725 PSI to 2030 PSI [50÷140 bar]. For more information about MLHMP and MLHMD - series 2 please contact with "M+S Hydraulic".

F - Flange (2 Holes)

Order No for Flange:48443 029 00



F Flange is mounted to the motor with 3 screws - 1/4-28 UNF.
Tightening Torque: 45÷53 lb-in [5÷6 Nm].