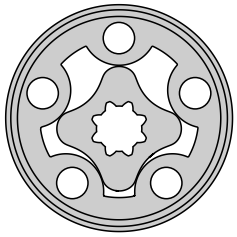
HYDRAULIC MOTORS MLHM

APPLICATION



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

CONTENTS

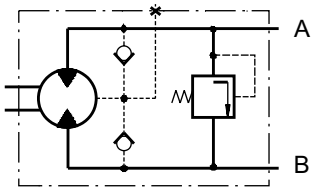
OPTIONS

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

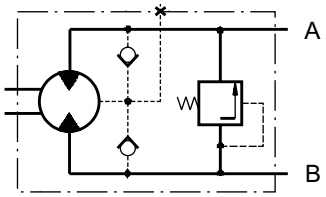
GENERAL

Displacement, in^3/rev [cm^3/rev.]	.5÷3.05 [8,2÷50]
Max. Speed, [RPM]	400÷1950
Max. Torque, in-lb [daNm]	106÷398 [1,2÷4,5]
Max. Output, HP [kW]	2.4÷3.3 [1,8÷2,4]
Max. Pressure Drop, PSI [bar]	1015÷1500 [70÷105]
Max. Oil Flow, GPM [lpm]	4.2÷5.5 [16÷20]
Min. Speed, [RPM]	20÷50
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)

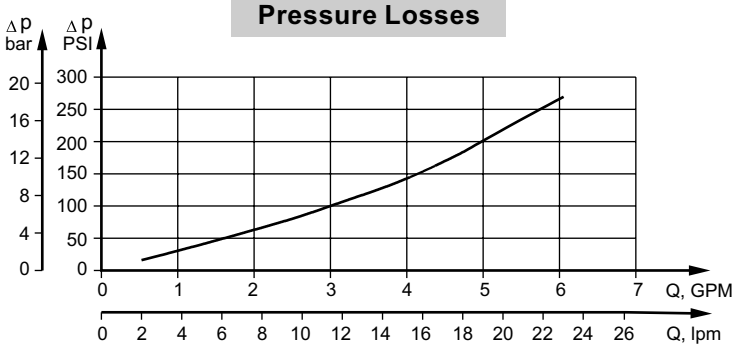
MLHM...P Series with Integrated Internal Crossover Relief Valve
A⟶B, Δp=1450 or 725 PSI [100 or 50 bar]



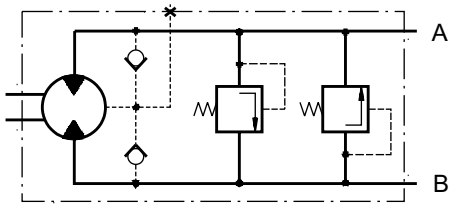
MLHM...P Series with Integrated Internal Crossover Relief Valve
B⟶A, Δp=1450 or 725 PSI [100 or 50 bar]



Pressure Losses



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



SPECIFICATION DATA

Type		MLHM 8	MLHM 12.5	MLHM 20	MLHM 32	MLHM 40	MLHM 50
Displacement, in.³/rev. [cm.³/rev.]		.5 [8,2]	.79 [12,9]	1.22 [20]	1.93 [31,8]	2.44 [40]	3.05 [50]
Max. Speed, [RPM]	Cont.	1950	1550	1000	630	500	400
	Int.*	2440	1940	1250	790	625	500
Max. Torque in-lb [daNm]	Cont.	106 [1,2]	150 [1,7]	230 [2,6]	375 [4,2]	375 [4,2]	398 [4,5]
	Int.*	133 [1,5]	205 [2,3]	311 [3,5]	506 [5,7]	506 [5,7]	513 [5,8]
	Peak**	187 [2,1]	293 [3,3]	453 [5,1]	568 [6,4]	584 [6,6]	708 [8]
Max. Output HP [kW]	Cont.	2.4 [1,8]	3.3 [2,4]	3.3 [2,4]	3.3 [2,4]	2.5 [1,8]	2.48 [1,7]
	Int.*	3.6 [2,6]	4.3 [3,2]	4.3 [3,2]	4.3 [3,2]	4 [3,0]	2.8 [2,1]
Max. Pressure Drop PSI [bar]	Cont.	1500 [105]	1500 [105]	1500 [105]	1500 [105]	1200 [82,5]	1015 [70]
	Int.*	2030 [140]	2030 [140]	2030 [140]	2030 [140]	1600 [110]	1300 [90]
	Peak**	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2000 [140]	1815 [125]
Max. Oil Flow GPM [lpm]	Cont.	4.2 [16]	5.5 [20]	5.5 [20]	5.5 [20]	5.5 [20]	5.5 [20]
	Int.*	5.5 [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 in-lb [daNm]	At max. press. drop Cont.	65 [0,7]	105 [1,2]	190 [2,1]	300 [3,4]	295 [3,3]	330 [3,7]
	At max. press. drop Int.*	90 [1,0]	150 [1,7]	260 [2,9]	425 [4,8]	400 [4,6]	425 [4,8]
Min. Speed*, [RPM]**		50	40	30	30	25	20
Weight, lb [kg]	MLHM(M) rear ports	4.2 [1,9]	4.41 [2]	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 of 30 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 15-30 minutes.

Performance Data MLHM 8

		Pressure (Δ PSI) 500	700	1000	Max. Cont. 1500	Max. Int. 1740	2000	Speed (theor.)
Flow [GPM]	0.5	30.5 **217**	45.7 **207**	65.5 **196**	94.8 **148**	109 **105**	122 **55**	**230**
	1	30 **450**	44.5 **447**	64.5 **440**	98.8 **405**	114 **371**	132 **314**	**461**
	2	27 **905**	43.1 **899**	62.6 **880**	97.1 **840**	113 **812**	133 **775**	**923**
	3	13.9 **1372**	40.1 **1355**	60.7 **1332**	95.4 **1292**	111 **1258**	130 **1224**	**1384**
Max. Cont.	4.25		31.3 **1924**	56.7 **1912**	91.1 **1873**	106 **1844**	126 **1791**	**1961**
Max. Int.	5.25		0 **2420**	52.7 **2383**	88.2 **2338**	101 **2316**	122 **2270**	**2423**
Torque (theor.) in-lb. [daNm]		40.7 [0,46]	57.5 [0,65]	80.5 [0,91]	119 [1,35]	138 [1,56]	157 [1,78]	

.50 in³./rev. [8,2 cm³./rev.]

Torque [in-lb] 122
Speed [RPM] 2270

Performance Data MLHM 20

		Pressure (Δ PSI) 250	500	700	1000	Max. Cont. 1500	Max. Int. 1740	2000	Speed (theor.)
Flow [GPM]	0.5	28.5 **96**	79 **91**	123 **85**	169 **70**	238 **40**	262 **20**		**94,5**
	1	33 **187**	79.5 **181**	120 **173**	167 **169**	242 **127**	273 **106**	312 **70**	**189**
	2	35 **378**	78.5 **375**	115 **371**	163 **358**	244 **323**	278 **303**	318 **274**	**379**
	3	31 **566**	74 **564**	108 **559**	155 **550**	240 **518**	275 **497**	319 **468**	**567**
	4	25 **750**	67 **746**	101 **743**	148 **733**	233 **700**	269 **689**	315 **664**	**757**
Max. Cont.	5.5	13 **1038**	53 **1035**	90 **1031**	163 **1024**	218 **1000**	255 **1993**	302 **1960**	**1040**
Max. Int.	6.6		38 **1247**	77 **1245**	125 **1242**	206 **1189**	245 **1180**	291 **1176**	**1250**
Torque (theor.) in-lb. [daNm]		47.8 [0,54]	98 [1,11]	140 [1,59]	197 [2,23]	291 [3,29]	338 [3,82]	385 [4,36]	

1.22 in³./rev. [20 cm³./rev.]

Performance Data MLHM 12.5

		Pressure (Δ PSI) 500	700	1000	Max. Cont. 1500	Max. Int. 1740	2000	Speed (theor.)
Flow [GPM]	0.5	48.3 **133**	70.8 **129**	100 **113**	147.4 **65**	164 **33**		**146**
	1	49.2 **281**	71.2 **275**	101.6 **260**	153 **218**	172 **190**	200 **138**	**293**
	2	46.8 **575**	69.1 **566**	100.4 **554**	154 **516**	175 **488**	206 **446**	**586**
	3	43.8 **866**	66.3 **860**	97.1 **850**	150 **816**	173 **792**	205 **745**	**880**
	4	39.8 **1160**	63.1 **1152**	94.1 **1144**	147 **1109**	170 **1085**	203 **1043**	**1170**
Max. Cont.	5.5	30 **1604**	55.6 **1593**	87 **1582**	139 **1560**	164 **1541**	195 **1494**	**1612**
Max. Int.	6.6	14.8 **1910**	50 **1891**	80 **1878**	132 **1848**	157 **1828**	191 **1788**	**1937**
Torque (theor.) in-lb. [daNm]		62.8 [0,71]	91.1 [1,03]	127.4 [1,44]	187.6 [2,12]	217.7 [2,46]	248.7 [2,81]	

.79 in³./rev. [12,9 cm³./rev.]

Performance Data MLHM 32

		Pressure (Δ PSI) 250	500	700	1000	Max. Cont. 1500	Max. Int. 1740	2000	Speed (theor.)
Flow [GPM]	0.5	65 **58**	130 **54**	181 **49**	246 **44**	366 **15**			**59**
	1	66 **119**	132 **114**	182 **108**	251 **100**	375 **77**	430 **63**	500 **46**	**119**
	2	62 **236**	128 **230**	177 **226**	252 **218**	377 **195**	433 **183**	506 **158**	**238**
	3	52 **357**	115 **353**	169 **348**	245 **342**	373 **319**	431 **304**	506 **280**	**357**
	4	40 **476**	108 **472**	159 **468**	234 **462**	363 **441**	422 **429**	500 **406**	**476**
Max. Cont.	5.5	24 **654**	88 **651**	144 **648**	220 **640**	345 **621**	406 **605**	480 **585**	**654**
Max. Int.	6.6	7 **786**	74 **784**	127 **782**	204 **778**	327 **761**	385 **748**	453 **727**	**786**
Torque (theor.) in-lb. [daNm]		248.7 [2,81]	248.7 [2,81]	248.7 [2,81]	248.7 [2,81]	248.7 [2,81]	248.7 [2,81]	248.7 [2,81]	

1.93 in³./rev. [31,8 cm³./rev.]

The Performance data was collected at back pressure 72.5÷145 PSI [5÷10 bar] and oil with viscosity of 150 SUS [32 mm²/s] at 122ºF [50° C].

Performance Data MLHM 40

Flow [GPM]	Pressure (Δ PSI) 400	700	1000	Max. Cont. 1200	Max. Int. 1500	1700	Speed (theor.)
0.5	130 **43**	230 **38**	318 **32**	380 **27**	468 **16**	- **-**	46
1	129 **91**	230 **88**	320 **81**	382 **75**	475 **62**	540 **49**	92
2	122 **187**	225 **185**	318 **173**	380 **167**	472 **158**	544 **146**	183
3	116 **278**	214 **273**	308 **268**	372 **263**	466 **255**	538 **244**	273
4	102 **373**	202 **367**	296 **362**	360 **357**	462 **349**	532 **340**	365
Max. Cont. 5.5	78 **517**	182 **512**	272 **506**	338 **499**	436 **491**	508 **482**	501
Max. Int. 6.6	57 **622**	165 **617**	254 **612**	320 **607**	400 **600**	484 **591**	603
Torque (theor.) in-lb. [daNm]	161 [1,82]	292 [3,3]	408 [4,62]	487 [5,5]	604 [6,82]	685 [7,74]	

Torque [in-lb] 540
Speed [RPM] 49

2.53 in^3./rev. [41,5 cm^3./rev.]

Performance Data MLHM 50

Flow [GPM]	Pressure (Δ PSI) 200	400	700	Max. Cont. 1000	Max. Int. 1285	Speed (theor.)
0.5	90 **35**	185 **31**	308 **26**	434 **21**	- **-**	37
1	92 **72**	182 **69**	308 **65**	438 **60**	550 **52**	74
2	90 **149**	172 **146**	298 **142**	432 **138**	558 **130**	148
3	88 **225**	160 **222**	285 **219**	428 **215**	555 **207**	221
4	80 **301**	145 **299**	274 **296**	410 **290**	540 **284**	294
Max. Cont. 5.5	62 **415**	114 **414**	250 **411**	385 **406**	505 **396**	404
Max. Int. 6.6	36 **499**	85 **498**	212 **494**	352 **490**	466 **484**	486
Torque (theor.) in-lb. [daNm]	101 [1,14]	200 [2,26]	363 [4,1]	508 [5,74]	644 [7,27]	

Torque [in-lb] 550
Speed [RPM] 52

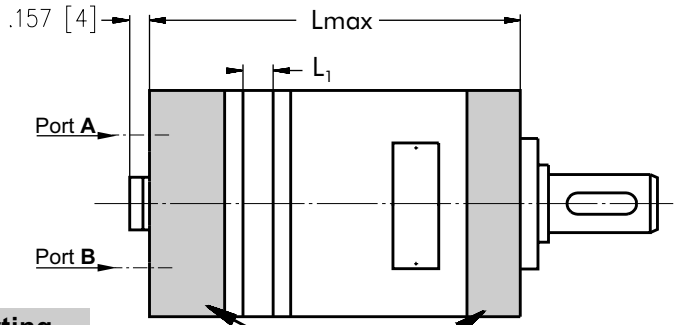
3.14 in^3./rev. [51,5 cm^3./rev.]

Metric Conversions

Flow 1 lpm = .2642 GPM
Pressure 1 bar = 14.51 PSI
Torque 1 Nm = 8.85 in-lb

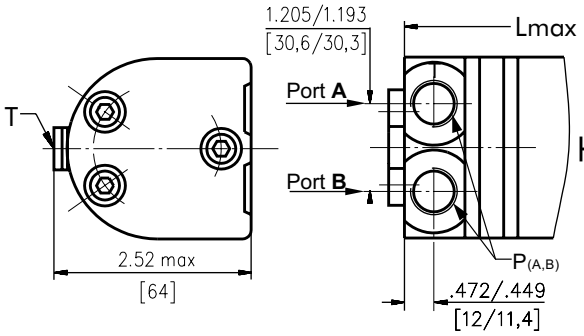
The Performance data was collected at back pressure 72.5÷145 PSI [5÷10 bar] and oil with viscosity of 150 SUS [32 mm²/s] at 122°F [50° C].

DIMENSIONS AND MOUNTING DATA

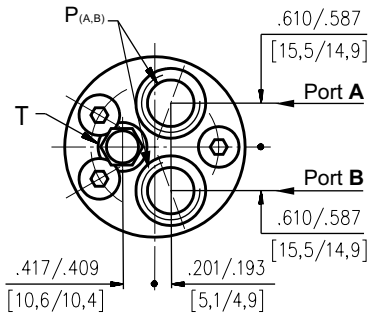


Porting

Side Ports, without valves
Version 2 3 4

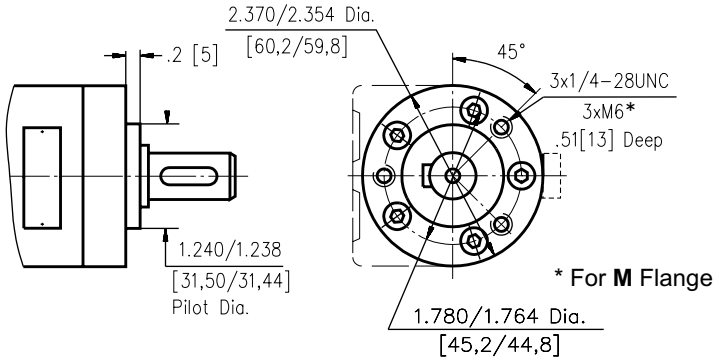


Rear Ports
Version 6 7 9

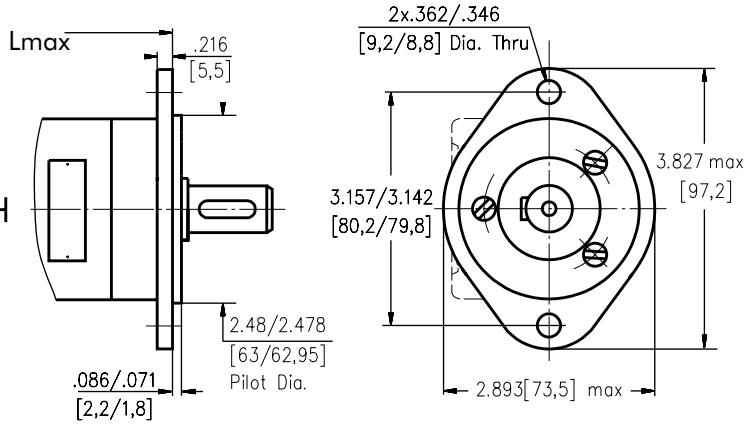


Mounting

Round Flange



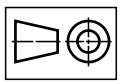
F Flange



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

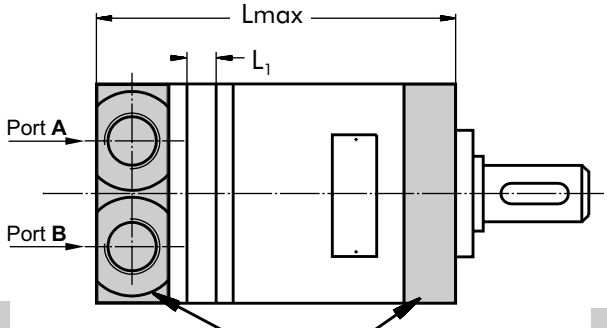
Standard Rotation
Viewed from Shaft End
Port **A** Pressurized - **CW**
Port **B** Pressurized - **CCW**

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



Type	Side Ports L_{max}, in.[mm]	Rear Ports L_{max}, in.[mm]	Type	Side Ports L_{max}, in.[mm]	Rear Ports L_{max}, in.[mm]	L_1 in.[mm]
MLHM(M) 8	4.134[105,0]	4.094 [104,0]	MLHMF 8	4.272 [108.5]	4.232 [107,5]	.138 [3,5]
MLHM(M)12.5	4.213[107,0]	4.173 [106,0]	MLHMF 12.5	4.350 [110,5]	4.311 [109,5]	.217 [5,5]
MLHM(M) 20	4.331[110,0]	4.291 [109,0]	MLHMF 20	4.587 [116,5]	4.547 [115,5]	.335 [8,5]
MLHM(M) 32	4.528[115,0]	4.488 [114,0]	MLHMF 32	4.665 [118,5]	4.626 [117,5]	.531 [13,5]
MLHM(M) 40	4.665[118,5]	4.626 [117,5]	MLHMF 40	4.803 [122,0]	4.764 [121,0]	.669 [17]
MLHM(M) 50	4.823[122,5]	4.783 [121,5]	MLHMF 50	4.961 [126,0]	4.921 [125,0]	.827 [21]

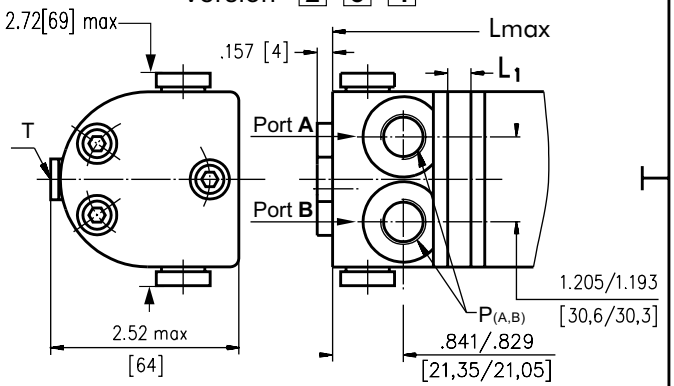
DIMENSIONS AND MOUNTING DATA



Porting

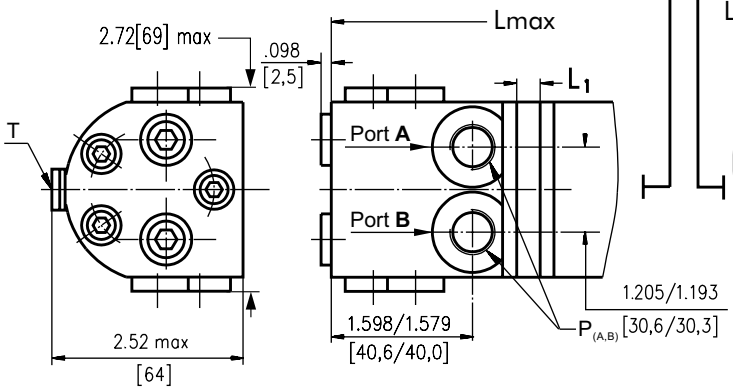
P - Side Ports with Single Crossover Relief Valve

Version **2** **3** **4**



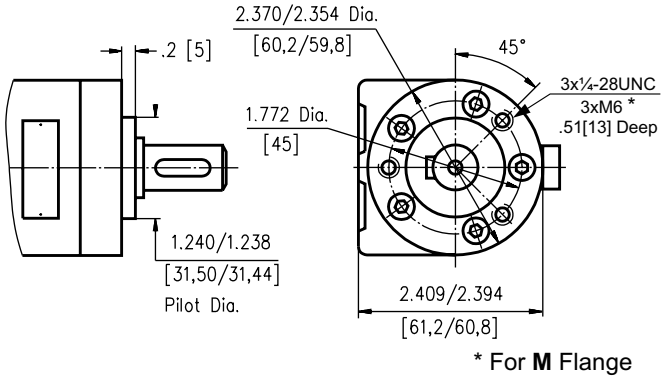
D - Side Ports with Dual Crossover Relief Valve

Version **2** **3** **4**



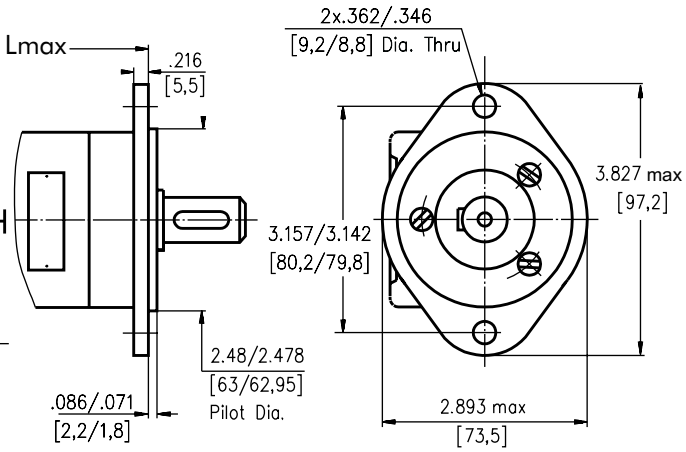
Mounting

Round Flange



* For **M** Flange

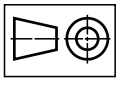
F Flange



	Versions		
	2	**3**	**4**
P(A,B)	2xG⅜	2xM18x1,5	2x⁹⁄₁₆-18UNF
T	G⅛	M10x1	⅜-24UNF

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**

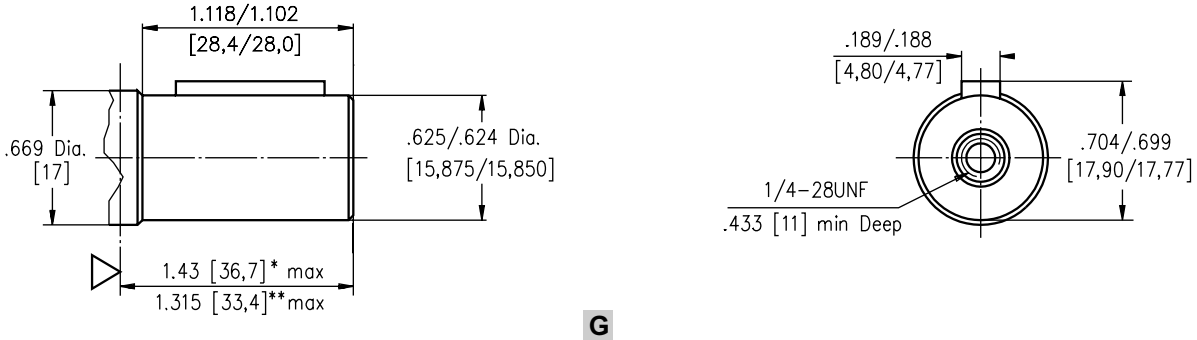


Type	L_{max}, in.[mm]	Type	L_{max}, in.[mm]	Type	L_{max}, in.[mm]	Type	L_{max}, in.[mm]	L_1, in.[mm]
MLHM(M) 8...P	4.528 [115]	MLHMF 8...P	4.665 [118,5]	MLHM(M) 8...D	5.276 [134,0]	MLHMF 8...D	5.433 [138]	.138 [3,5]
MLHM(M)12,5..P	4.606 [117]	MLHMF12,5..P	4.744 [120,5]	MLHM(M)12,5..D	5.354 [136,0]	MLHMF12,5..D	5.512 [140]	.217 [5,5]
MLHM(M) 20...P	4.724 [120]	MLHMF 20...P	4.862 [123,5]	MLHM(M) 20...D	5.472 [139,0]	MLHMF 20...D	5.748 [146]	.335 [8,5]
MLHM(M) 32...P	4.921 [125]	MLHMF 32...P	5.059 [128,5]	MLHM(M) 32...D	5.669 [144,0]	MLHMF 32...D	5.827 [148]	.531 [13,5]
MLHM(M) 40...P	5.039 [128]	MLHMF 40...P	5.197 [132,0]	MLHM(M) 40...D	5.807 [147,5]	MLHMF 40...D	5.945 [151]	.669 [17]
MLHM(M) 50...P	5.217 [132,5]	MLHMF 50...P	5.354 [136,0]	MLHM(M) 50...D	5.965 [151,5]	MLHMF 50...D	6.102 [155]	.828 [21]

SHAFT EXTENSIONS

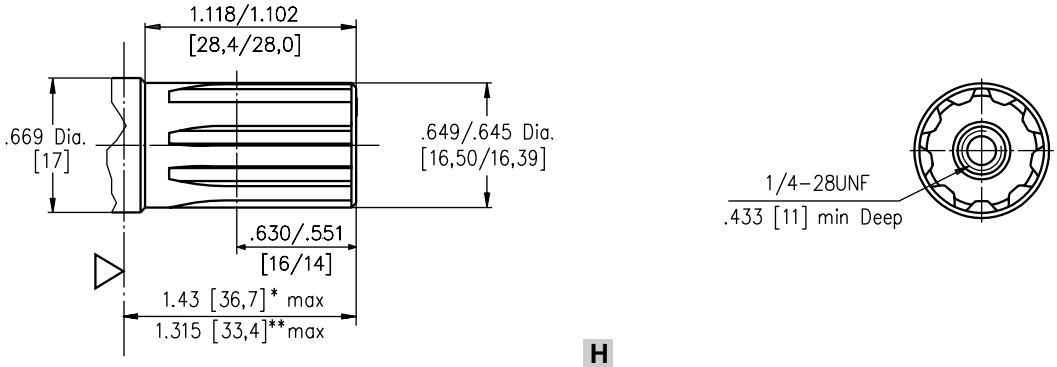
C

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



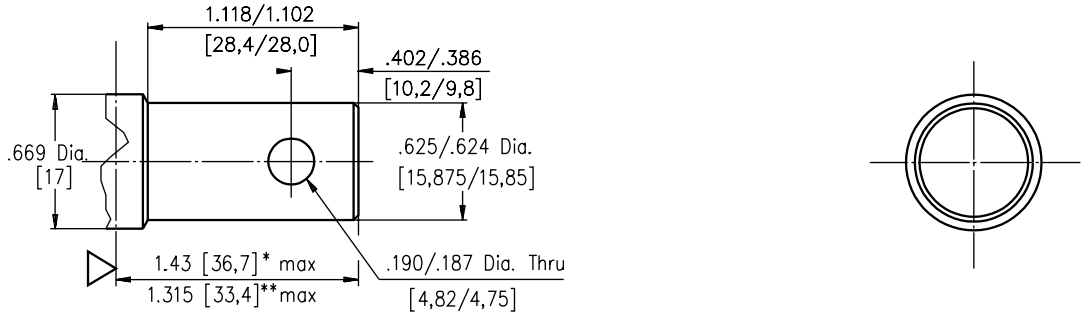
G

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



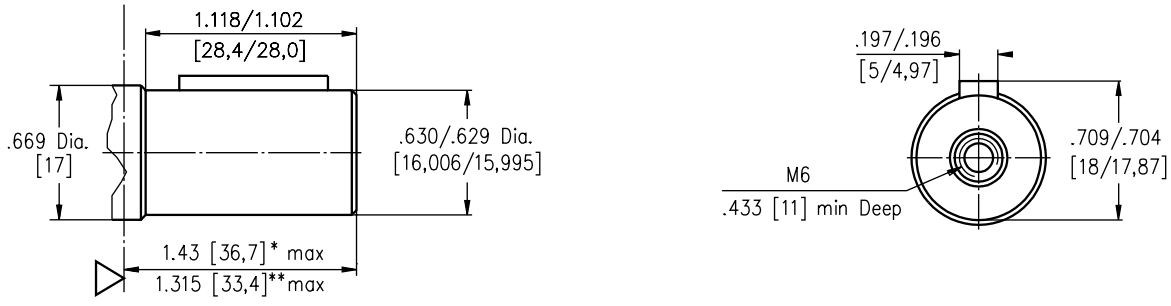
H

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



M

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



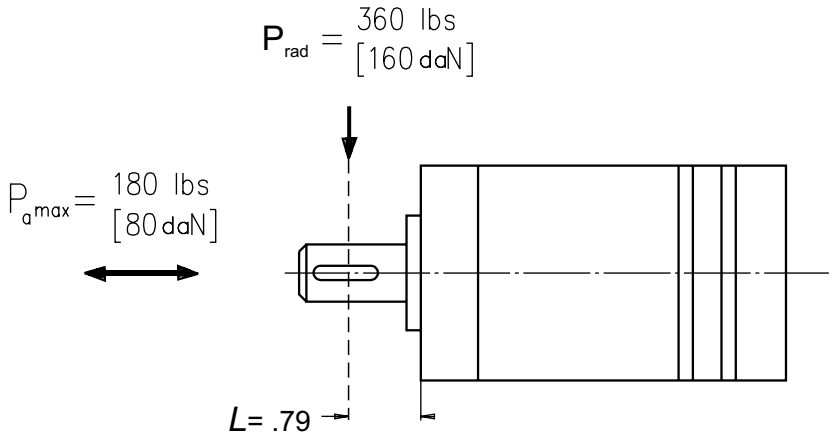
* For Round Flange

** For Flange **F**

▽- Motor Mounting Surface

Requirement max. Torque must be not exceeded.

PERMISSIBLE SHAFT LOAD



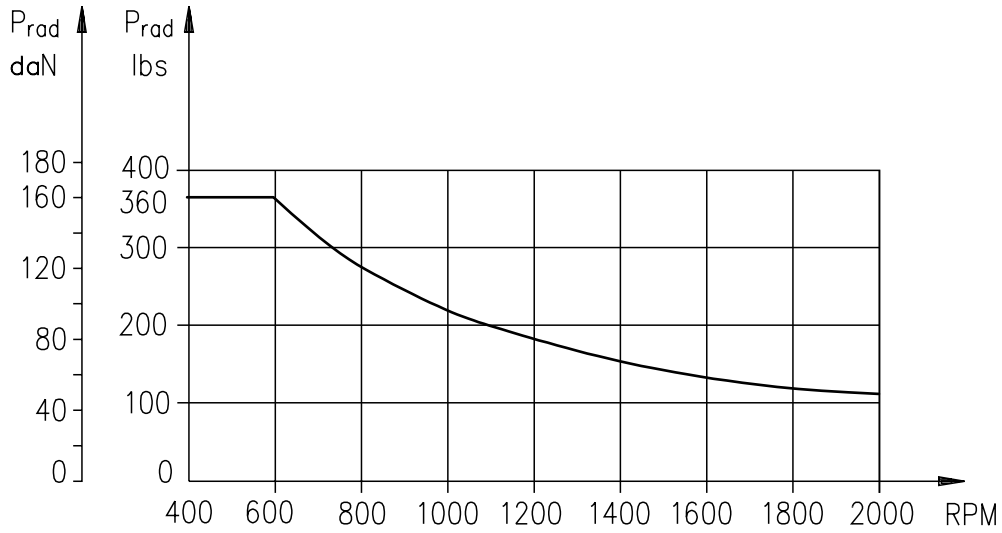
The permissible radial shaft load $\mathbf{P_{rad}}$ is calculated from the distance L between the point of load application and the mounting surface:

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

* 1. L - in inch
2. $L \leq 3.12$

The drawing shows the permissible radial load when L= .79 .

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

F - flange, two holes

M - round metric, three bolts M6

Pos.2 - Displacement code

8 - .5 [8,2] in.^{3}/rev. [cm.^{3}/rev.]

12.5 - .79 [12,9] in.^{3}/rev. [cm.^{3}/rev.]

20 - 1.22 [20,0] in.^{3}/rev. [cm.^{3}/rev.]

32 - 1.93 [31,8] in.^{3}/rev. [cm.^{3}/rev.]

40 - 2.44 [40,0] in.^{3}/rev. [cm.^{3}/rev.]

50 - 3.05 [50,0] in.^{3}/rev. [cm.^{3}/rev.]

Pos.3 - Shaft Extensions* [for dimensions data see page 10]

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 thread, 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 thread, 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 - △p= 725 PSI [50 bar]

/100 - △p=1450 PSI [100 bar]

Pos. 8 - Special Features [see page 52]

Pos. 9 - Design Series

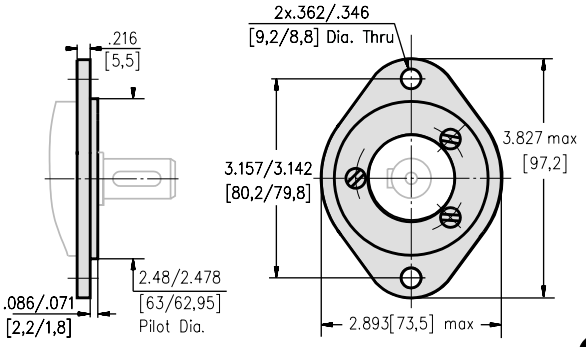
omit - Factory specified

*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.

F - Flange Kit (2 Holes)

Order No:48443 029 00



Flange Kit includes 3 screws - 1/4-28 UNF for attaching flange to the motor.