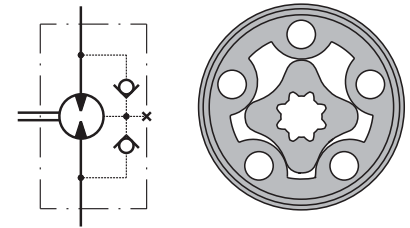


HYDRAULIC MOTORS MM



APPLICATION

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



CONTENTS

| | |
|-------------------------------|------|
| Specification data | 5 |
| Function diagrams | 6÷8 |
| Dimensions and mounting ... | 9÷10 |
| Shaft extensions | 11 |
| Permissible shaft loads | 11 |
| Order code | 12 |

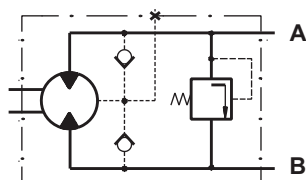
OPTIONS

- » 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 sensing;
- » Other special features

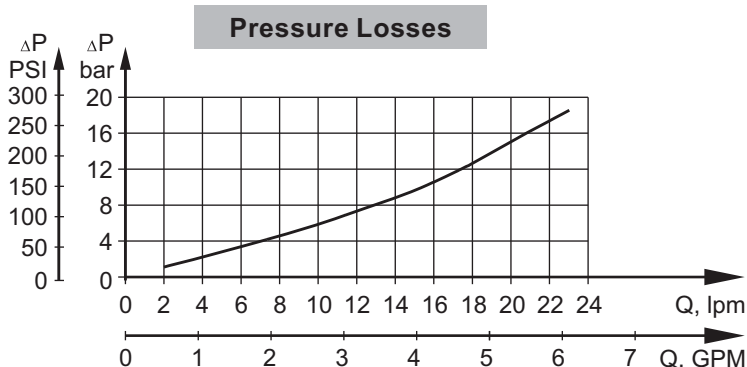
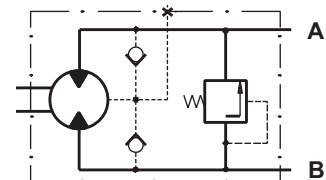
GENERAL

| | | |
|-----------------------------------------------------------------------|------------------------------------------------------------------|------------------|
| Max. Displacement, cm ³ /rev [in ³ /rev] | 50 [3.05] | |
| Max. Speed, [RPM] | 2440 | |
| Max. Torque, daNm [lb-in] | cont.: 4,5 [398] | int.: 5,8 [513] |
| Max. Output, kW [HP] | 3,2 [4.3] | |
| Max. Pressure Drop, bar [PSI] | cont.: 105 [1500] | int.: 140 [2030] |
| Max. Oil Flow, lpm [GPM] | 25 [6.6] | |
| Min. Speed, [RPM] | 20 | |
| Pressure fluid | Mineral based- HLP(DIN 51524) or HM(ISO 6743/4) | |
| Temperature range, °C [°F] | -40÷140 [-40÷284] | |
| Optimal Viscosity range, mm ² /s [SUS] | 20÷75 [98÷347] | |
| Filtration | ISO code 20/16 (Min. recommended fluid filtration of 25 microns) | |

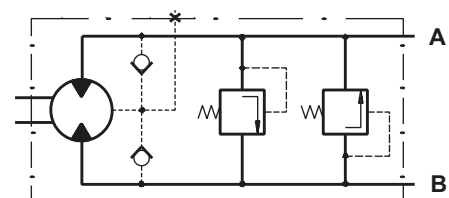
MMP Series with Integrated Internal Crossover Relief Valve
A → B, Δp=100 or 50 bar [1450 or 725 PSI]



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



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



SPECIFICATION DATA

| Type | MM 8 | MM 12.5 | MM 20 | MM 32 | MM 40 | MM 50 | |
|------------------------------------------------------------------------------------------|---------------------------|------------|-------------|-------------|-------------|------------|------------|
| Displacement, cm³/rev [in³/rev] | 8,2 [50] | 12,5 [77] | 19,9 [1.22] | 31,6 [1.93] | 39,8 [2.43] | 50 [3.08] | |
| Max. Speed, [RPM] | Cont. | 1950 | 1550 | 1000 | 630 | 500 | 400 |
| | Int.* | 2450 | 1940 | 1250 | 800 | 630 | 500 |
| Max. Torque daNm [lb-in] | Cont. | 1,1 [95] | 1,6 [140] | 2,5 [220] | 4,0 [350] | 4,5 [400] | 4,6 [410] |
| | Int.* | 1,5 [135] | 2,3 [200] | 3,5 [310] | 5,7 [500] | 7,0 [620] | 8,8 [780] |
| | Peak** | 2,1 [187] | 3,3 [293] | 5,1 [453] | 6,4 [568] | 8,2 [725] | 10,0 [885] |
| Max. Output kW [HP] | Cont. | 1,8 [2.4] | 2,4 [3.2] | 2,4 [3.2] | 2,4 [3.2] | 2,2 [3.0] | 1,8 [2.4] |
| | Int.* | 2,6 [3.5] | 3,2 [4.3] | 3,2 [4.3] | 3,2 [4.3] | 3,2 [4.3] | 3,2 [4.3] |
| Max. Pressure Drop bar [PSI] | Cont. | 100 [1450] | 100 [1450] | 100 [1450] | 100 [1450] | 90 [1310] | 70 [1020] |
| | Int.* | 140 [2030] | 140 [2030] | 140 [2030] | 140 [2030] | 140 [2030] | 140 [2030] |
| | Peak** | 200 [2900] | 200 [2900] | 200 [2900] | 160 [2320] | 160 [2320] | 160 [2320] |
| Max. Oil Flow lpm [GPM] | Cont. | 16 [4.2] | 20 [5.3] | 20 [5.3] | 20 [5.3] | 20 [5.3] | 20 [5.3] |
| | Int.* | 20 [5.3] | 25 [6.6] | 25 [6.6] | 25 [6.6] | 25 [6.6] | 25 [6.6] |
| Max. Inlet Pressure bar [PSI] | Cont. | 140 [2030] | 140 [2030] | 140 [2030] | 140 [2030] | 140 [2030] | 140 [2030] |
| | Int.* | 175 [2540] | 175 [2540] | 175 [2540] | 175 [2540] | 175 [2540] | 175 [2540] |
| | Peak** | 225 [3260] | 225 [3260] | 225 [3260] | 225 [3260] | 225 [3260] | 225 [3260] |
| Max. Return Pressure without Drain Line or Max. Pressure in Drain Line, bar [PSI] | Cont. 0-100 RPM | 140 [2030] | 140 [2030] | 140 [2030] | 140 [2030] | 140 [2030] | 140 [2030] |
| | Cont. 100-400 RPM | 105 [1500] | 105 [1500] | 105 [1500] | 105 [1500] | 105 [1500] | 105 [1500] |
| | Cont. 400-800 RPM | 50 [725] | 50 [725] | 50 [725] | 50 [725] | 50 [725] | 50 [725] |
| | Cont. >800 RPM | 20 [290] | 20 [290] | 20 [290] | - | - | - |
| Max. Return Pressure with Drain Line bar [PSI] | Int.* 0-max. RPM | 140 [2030] | 140 [2030] | 140 [2030] | 140 [2030] | 140 [2030] | 140 [2030] |
| | Cont. | 140 [2030] | 140 [2030] | 140 [2030] | 140 [2030] | 140 [2030] | 140 [2030] |
| | Int.* | 175 [2540] | 175 [2540] | 175 [2540] | 175 [2540] | 175 [2540] | 175 [2540] |
| Max. Starting Pressure with Unloaded Shaft, bar [PSI] | Peak** | 225 [3260] | 225 [3260] | 225 [3260] | 225 [3260] | 225 [3260] | 225 [3260] |
| | Cont. | 4 [60] | 4 [60] | 4 [60] | 4 [60] | 4 [60] | 4 [60] |
| Min. Starting Torque daNm [lb-in] | At max. press. drop Cont. | 0,7 [60] | 1,2 [105] | 2,1 [185] | 3,4 [300] | 3,8 [335] | 4,1 [365] |
| | At max. press. drop Int.* | 1,0 [90] | 1,7 [150] | 2,9 [255] | 4,8 [425] | 6,2 [550] | 7,9 [700] |
| Min. Speed***, [RPM] | | 50 | 40 | 30 | 30 | 25 | 20 |
| Weight, kg [lb] For "F" flange: + 0,200 [.441] | MM | 1,9 [4.2] | 2,0 [4.41] | 2,1 [4.63] | 2,2 [4.85] | 2,3 [5.07] | 2,5 [5.51] |
| | MMF(S) | 2,0 [4.41] | 2,1 [4.63] | 2,2 [4.85] | 2,3 [5.07] | 2,4 [5.29] | 2,6 [5.73] |
| | MMP | 2,2 [4.85] | 2,3 [5.07] | 2,4 [5.29] | 2,5 [5.51] | 2,6 [5.73] | 2,8 [6.17] |
| | MMD | 2,6 [5.73] | 2,7 [5.95] | 2,8 [6.17] | 2,9 [6.39] | 3,0 [6.61] | 3,2 [7.05] |

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

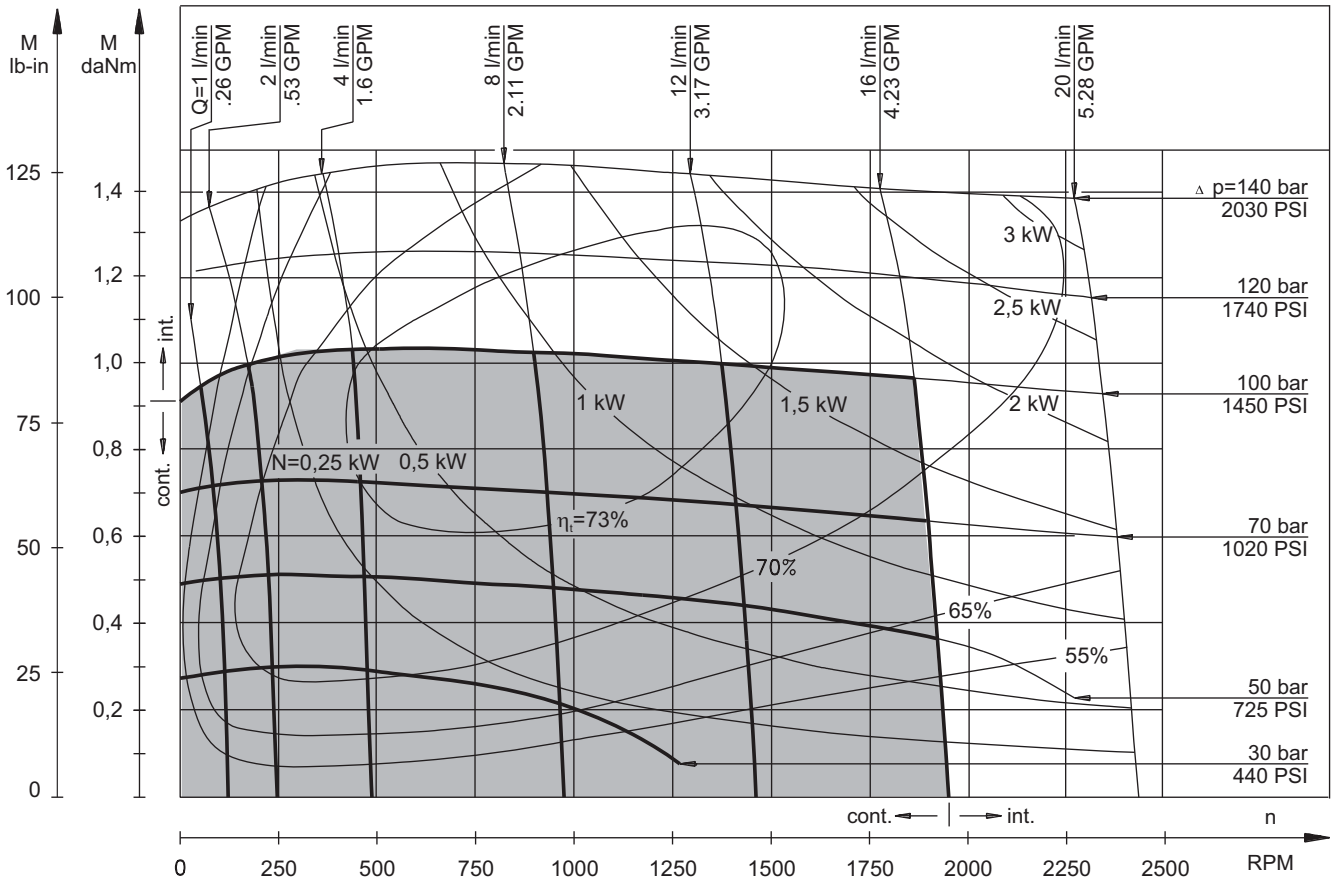
** Peak load: the permissible values may occur for max. 1% of every minute.

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

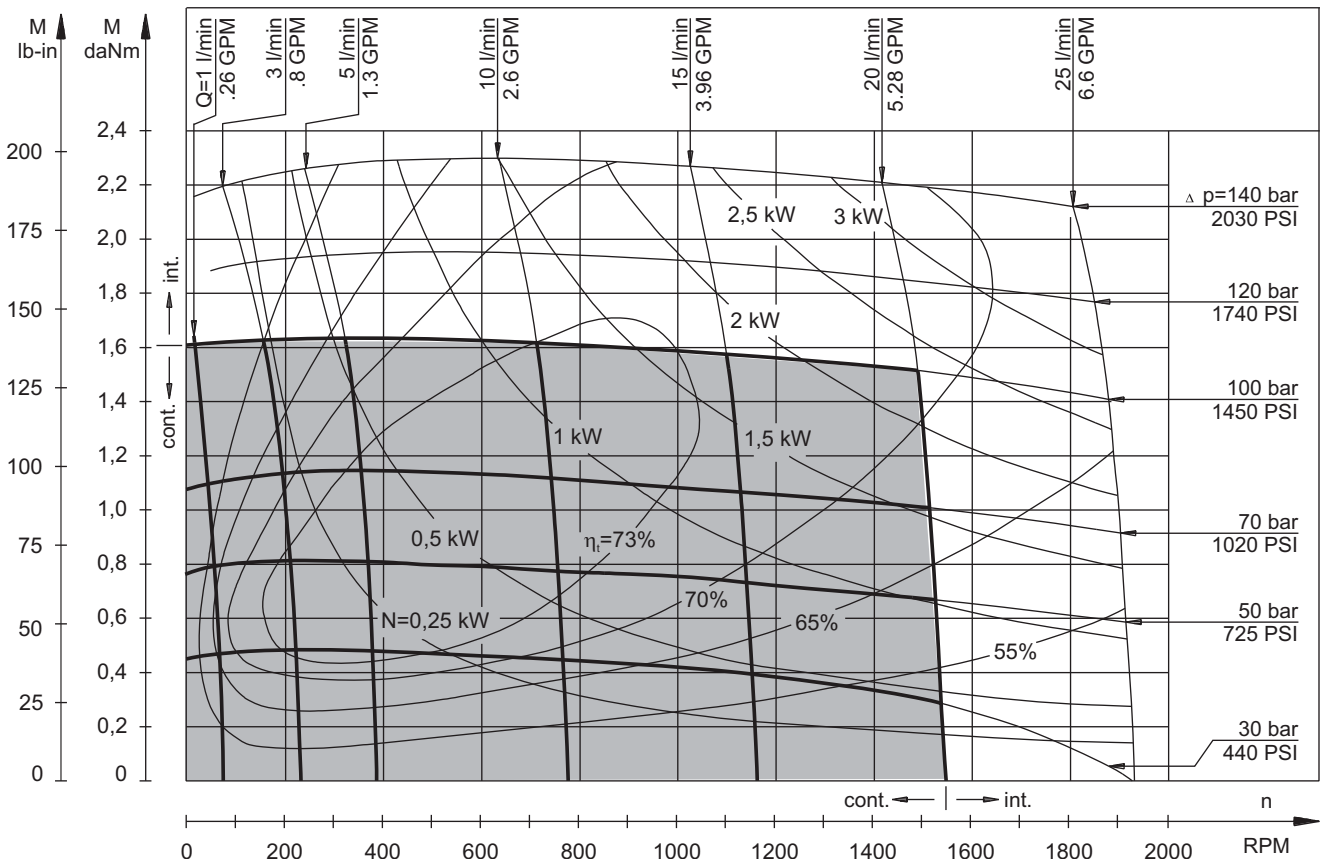
1. Intermittent speed and intermittent pressure must not occur simultaneously.
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).
If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

FUNCTION DIAGRAMS

MM 8



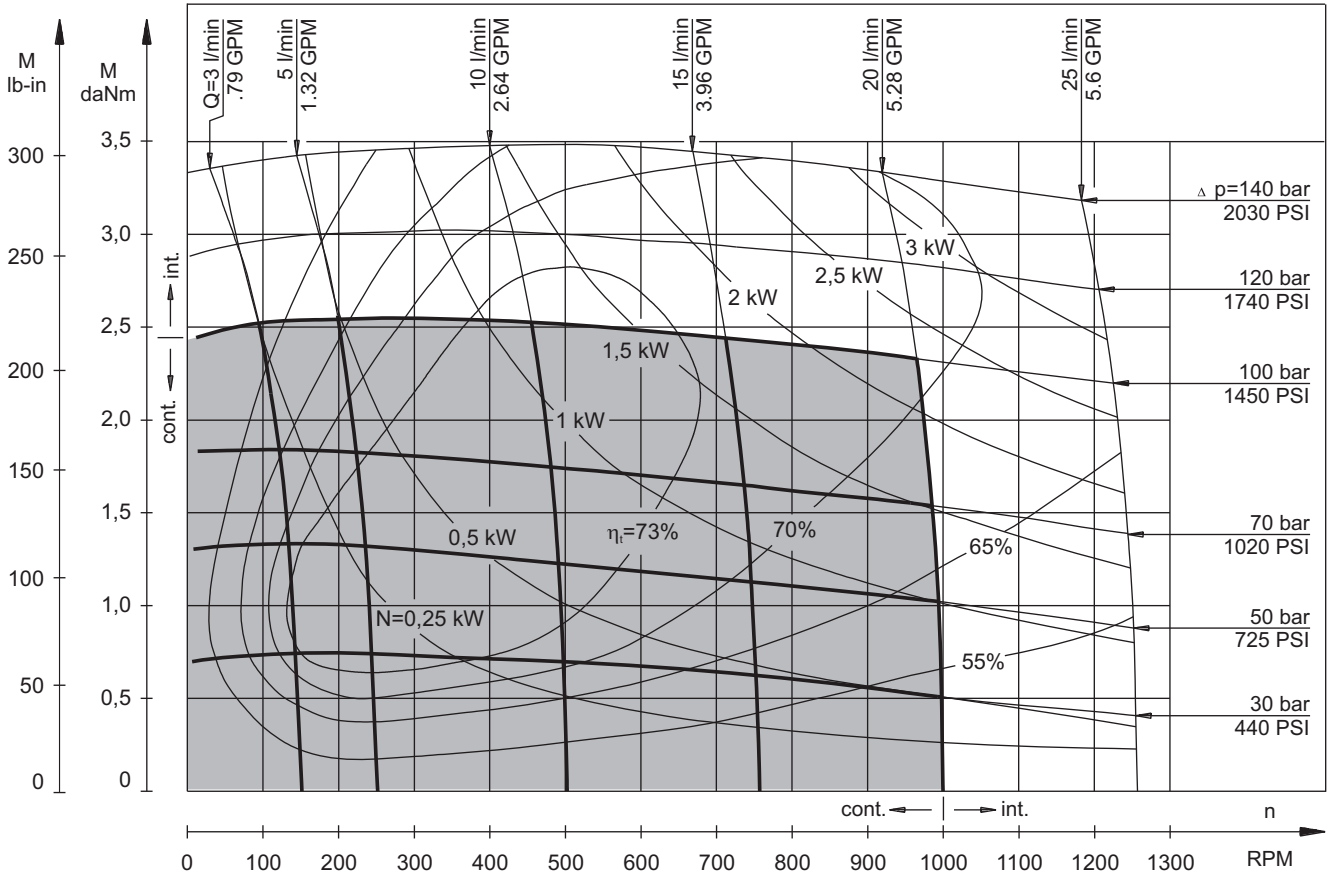
MM 12,5



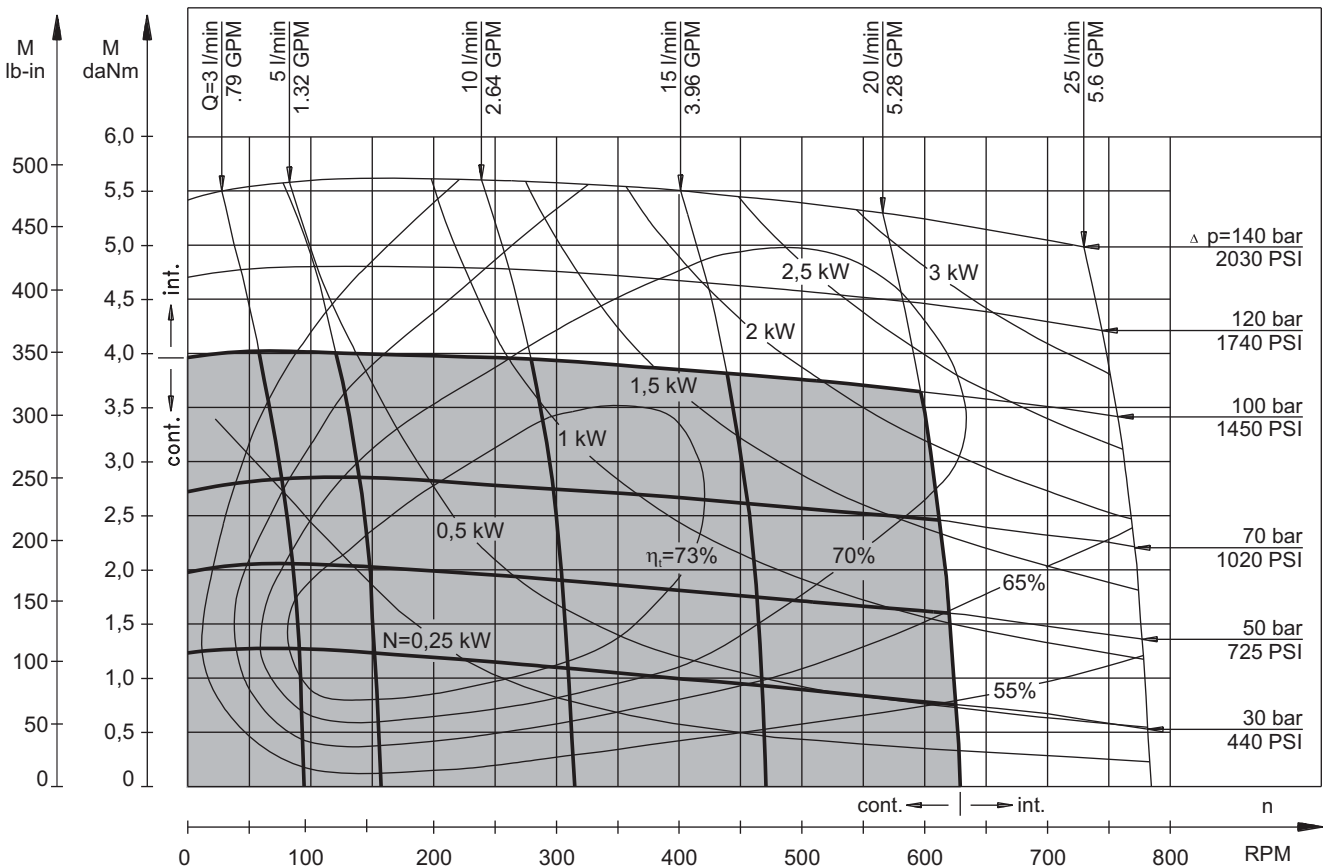
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MM 20



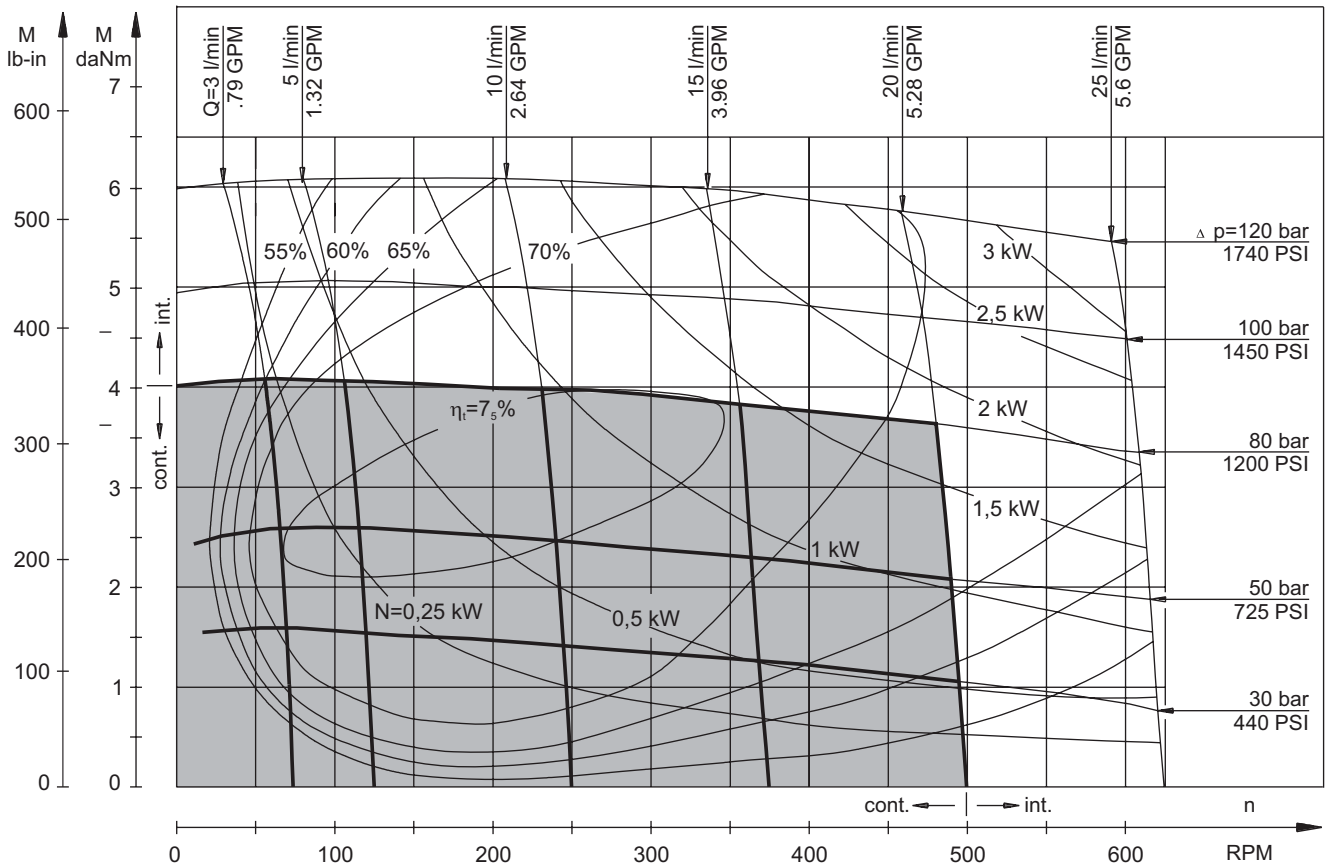
MM 32



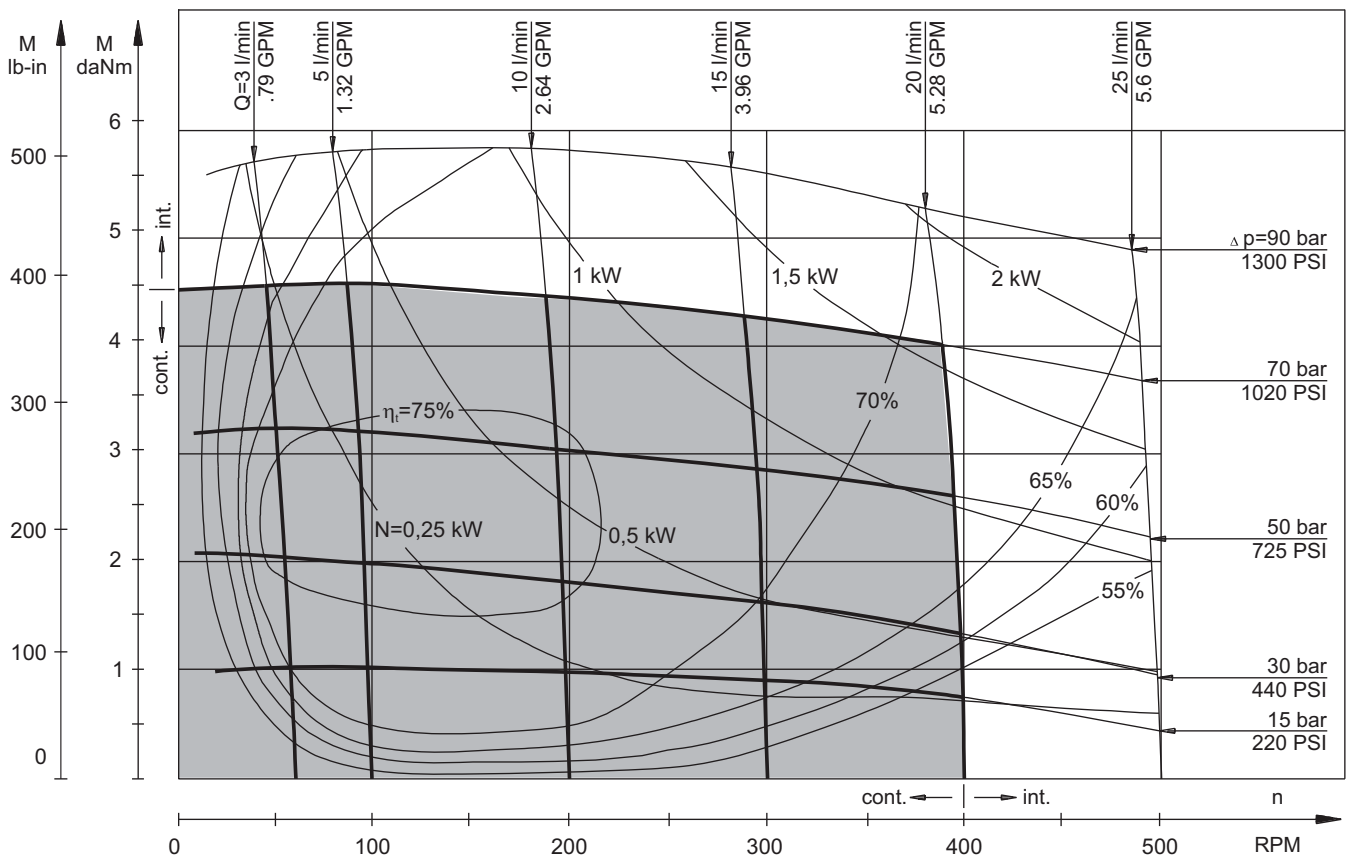
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MM 40



MM 50

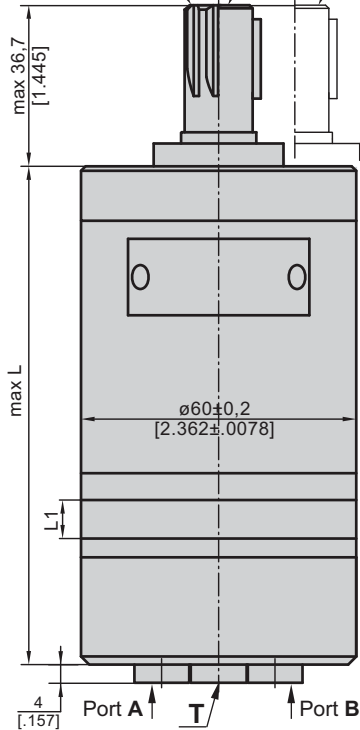


The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

DIMENSIONS AND MOUNTING DATA
MM, MMS, MMP, MMD

Three Bolts Mount

SH Shaft C Shaft CK Shaft



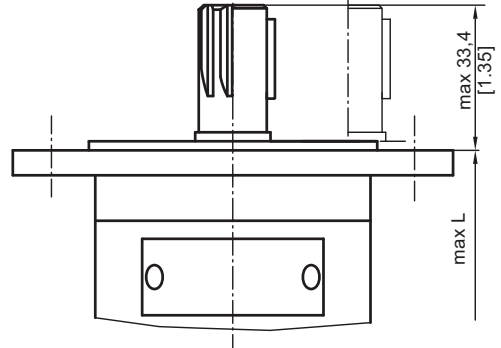
Rear Ports

Shaft Dim.
See Page 11

Flange Dim.
See Page 10

Port Dim.
See Page 10

F Oval Mount (2 Holes)



Standard Rotation

Viewed from Shaft End

Port A Pressurized - **CW**

Port B Pressurized - **CCW**

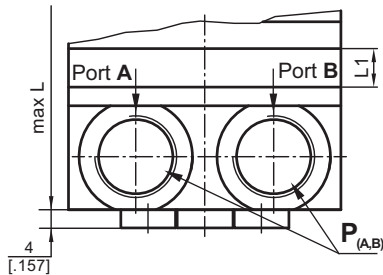
Reverse Rotation

Viewed from Shaft End

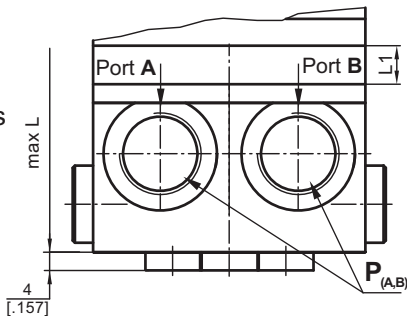
Port A Pressurized - **CCW**

Port B Pressurized - **CW**

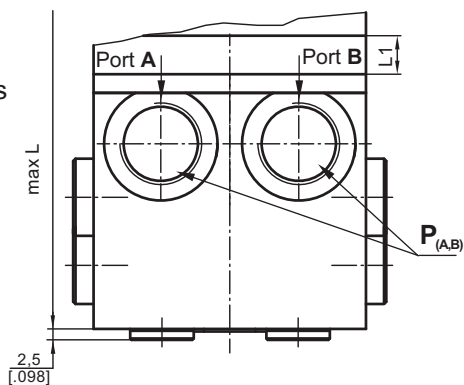
S Side Ports



P Side Ports



D Side Ports



$P_{(A,B)}$: 2xG3/8 or 2xM18x1,5 - 12 mm [.47 in] depth

T : G1/8 or M10x1 - 10 mm [.39 in] depth

| Type | L, mm [in.] | Type | L, mm [in.] | L_1 , mm [in.] |
|---------|---------------|----------|---------------|------------------|
| MM 8 | 104 [4.094] | MMS 8 | 105 [4.134] | 3,5 [.138] |
| MM 12,5 | 106 [4.173] | MMS 12,5 | 107 [4.213] | 5,5 [.217] |
| MM 20 | 109 [4.291] | MMS 20 | 110 [4.331] | 8,5 [.335] |
| MM 32 | 114 [4.488] | MMS 32 | 115 [4.528] | 13,5 [.531] |
| MM 40 | 117,5 [4.626] | MMS 40 | 118,5 [4.665] | 17 [.669] |
| MM 50 | 121,5 [4.783] | MMS 50 | 122,5 [4.823] | 21 [.827] |

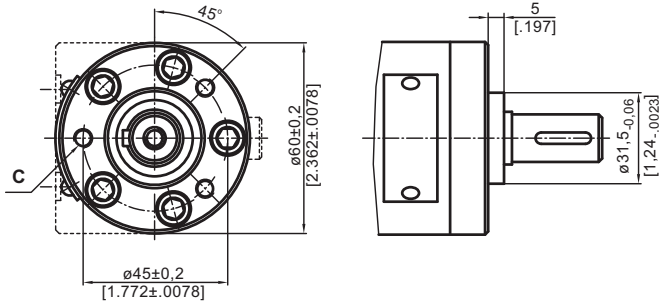
| Type | L, mm [in.] | Type | L, mm [in.] | L_1 , mm [in.] |
|----------|---------------|----------|---------------|------------------|
| MMP 8 | 115 [4.528] | MMD 8 | 134 [5.276] | 3,5 [.138] |
| MMP 12,5 | 117 [4.606] | MMD 12,5 | 136 [5.354] | 5,5 [.217] |
| MMP 20 | 120 [4.724] | MMD 20 | 139 [5.472] | 8,5 [.335] |
| MMP 32 | 125 [4.921] | MMD 32 | 144 [5.669] | 13,5 [.531] |
| MMP 40 | 128,5 [5.039] | MMD 40 | 147,5 [5.807] | 17 [.669] |
| MMP 50 | 132,5 [5.217] | MMD 50 | 151,5 [5.965] | 21 [.827] |

For "F" Flange +3,5 mm

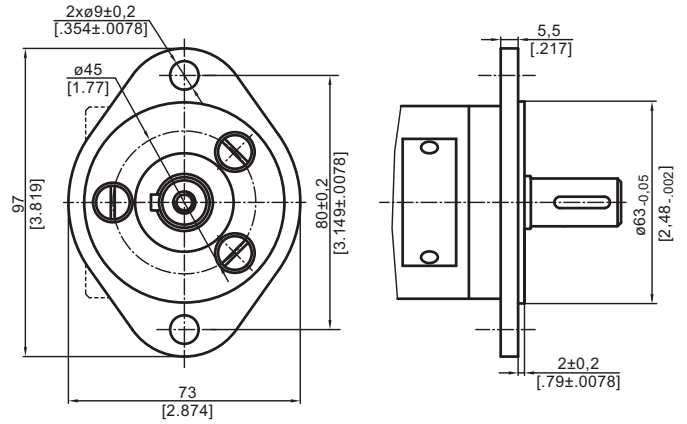


MOUNTING

Three Bolts Mount

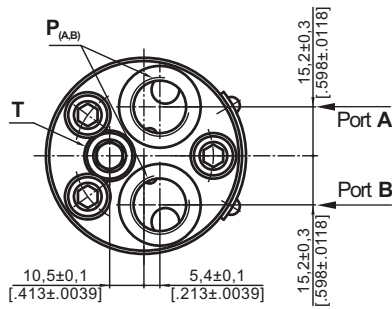


F Oval Mount (2 Holes)

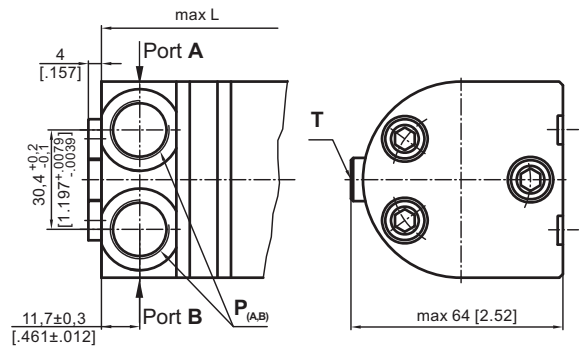


PORTS

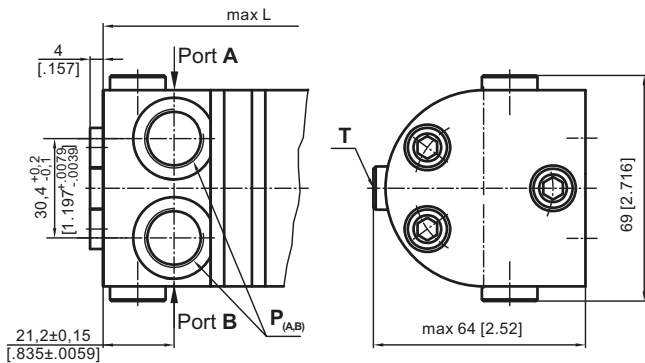
Rear Ports



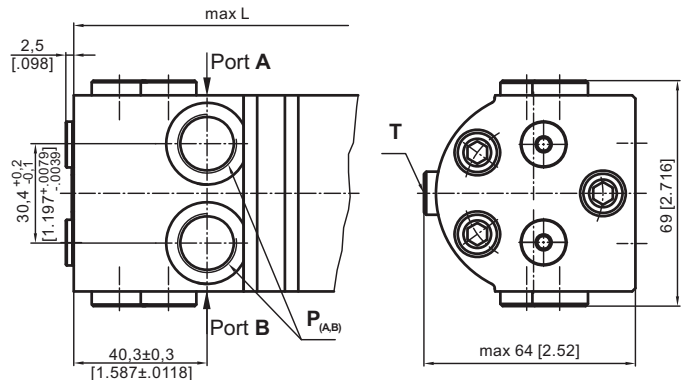
S Side Ports



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**

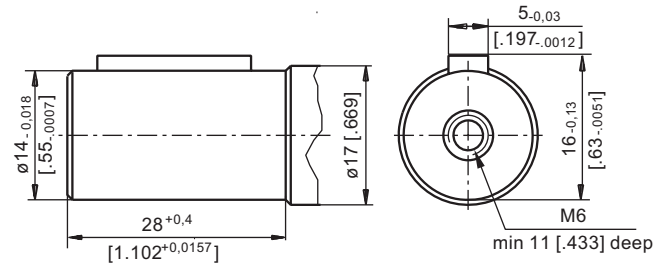
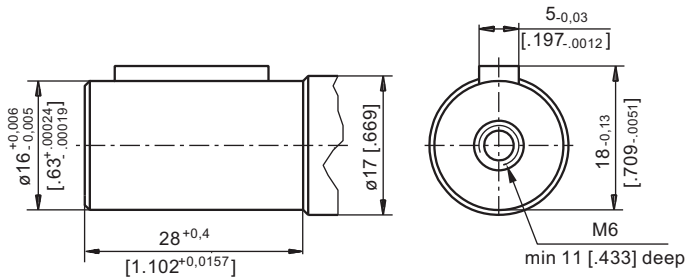
Reverse Rotation
Viewed from Shaft End
Port A Pressurized - **CCW**
Port B Pressurized - **CW**

C : 3xM6 - 12 mm [.47 in] depth
P_(A,B) : 2xG3/8 or 2xM18x1,5 - 12 mm [.47 in] depth
T : G1/8 or M10x1 - 10 mm [.39 in] depth

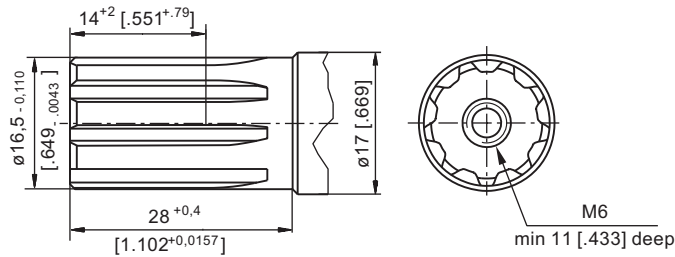
SHAFT EXTENSIONS

C - $\varnothing 16$ straight, Parallel key 5x5x16 DIN 6885
Max. Torque 3,9 daNm [345 lb-in]

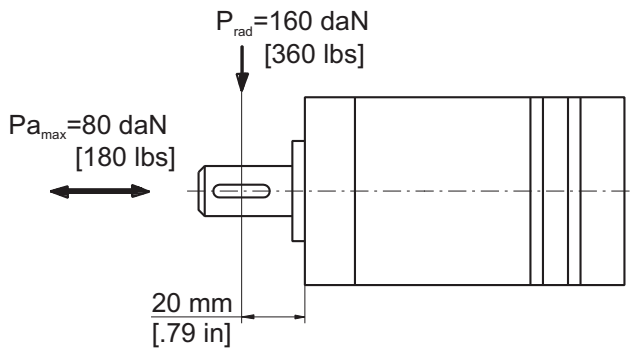
CK - $\varnothing 14$ straight, Parallel key 5x5x16 DIN 6885
Max. Torque 3 daNm [265 lb-in]



SH - $\varnothing 16,5$ Splined, B17x14 DIN 5482
Max. Torque 4,4 daNm [390 lb-in]



PERMISSIBLE SHAFT LOAD



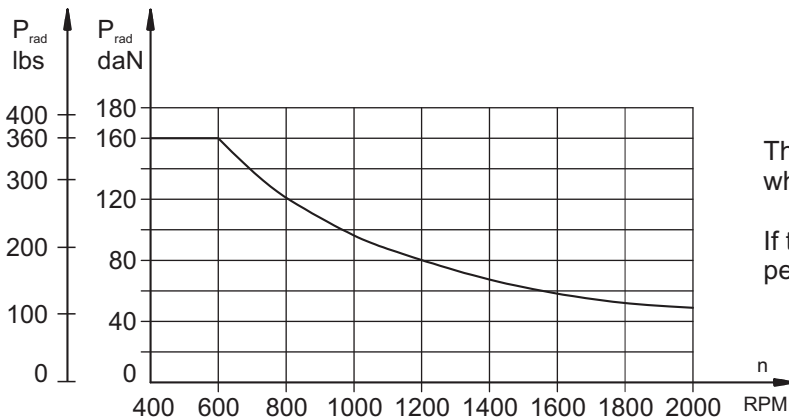
The permissible radial shaft load [Prad] is calculated from the distance [L] between the point of load application and the mounting surface:

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

[L in mm; L ≤ 80 mm]

$$P_{rad} = \frac{600}{n} \times \frac{1155}{2,42 + L}, \text{ [lbs]}$$

[L in inch; L ≤ 3.15 in]



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

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 | 10 |
| M M | | | | | | | | | | |

Pos.1 - Adjustment Option

- omit - without valve
- P*** - Side ports with single crossover relief valve
- D*** - Side ports with dual crossover relief valve

Pos.2 - Mounting Flange

- omit - Three bolts mount
- F** - Oval mount, two holes

Pos.3 - Port type (not valid for P and D version)

- omit - Rear ports
- S** - Side ports

Pos.4 - Displacement code

- 8** - 8,2 cm³/rev [.5 in³/rev]
- 12.5** - 12,9 cm³/rev [.79 in³/rev]
- 20** - 20,0 cm³/rev [1.22 in³/rev]
- 32** - 31,8 cm³/rev [1.93 in³/rev]
- 40** - 40,0 cm³/rev [2.44 in³/rev]
- 50** - 50,0 cm³/rev [3.05 in³/rev]

Pos. 5 - Shaft Extensions*

- C** - ø16 straight, Parallel key A5x5x16 DIN6885
- VC** - ø16 straight, Parallel key A5x5x16 DIN6885 with corrosion resistant bushing
- CK** - ø14 straight, Parallel key 5x5x16 DIN6885
- SH** - ø16,5 splined, B17x14 DIN 5482

Pos. 6 - Ports

- omit - BSPP (ISO 228)
- M** - Metric (ISO 262)

Pos. 7 - Line to control (see page 4)**

- /L** - B → A (left running)
- /R** - A → B (right running)

Pos. 8 - Valve Rated Pressure***

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

Pos. 9 - Special Features (see page 119)

Pos.10 - Design Series

- omit - Factory specified

NOTES:

- * The permissible output torque for shafts must not be exceeded!
- ** For **P** option useful only.
- *** For **P** and **D** option useful only.

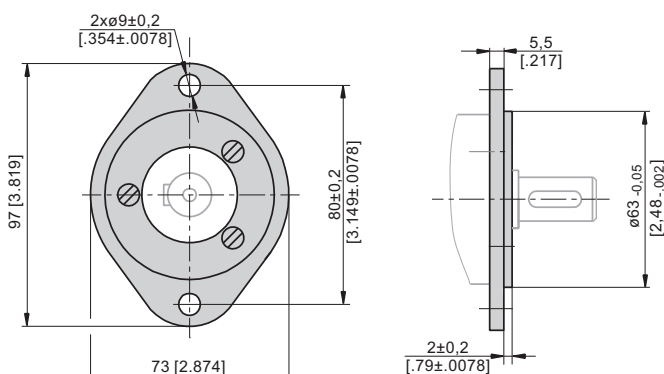
⚠ **MMP** and **MMD** are available with new crossover relief valves with improved characteristics. The new valves allow easier pressure setting in a wider range: from 50 bar [725 PSI] to 140 bar [2030 PSI]. For more information about MMP and MMD - series 2 please contact with "M+S Hydraulic".

The Valve pressure setting must be at flow rate of 2 lpm [.53 GPM].

The hydraulic motors are mangano - phosphatized as standard.

F - FLANGE (2 Holes)

Order No for Flange:48443 014 00



F Flange is mounted to the motor with 3 screws - M6x14. Tightening Torque: 5-6 Nm [44-53 lb-in].