

## **Langsamlaufende Hydraulikmotoren Serie MM**

## **Moteurs hydrauliques semi-rapides Série MM**

# Technische Informationen, Serie MM

## Informations techniques, série MM

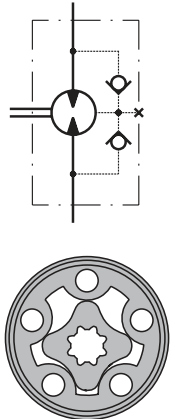


### APPLICATION

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

### OPTIONS

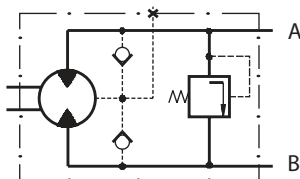
- » Model- Spool valve, gerotor
- » With or without flange
- » Side and rear ports
- » Series with pressure valve(s)
- » Shafts- straight and splined
- » Metric and BSPP ports
- » Speed sensing
- » Other special features



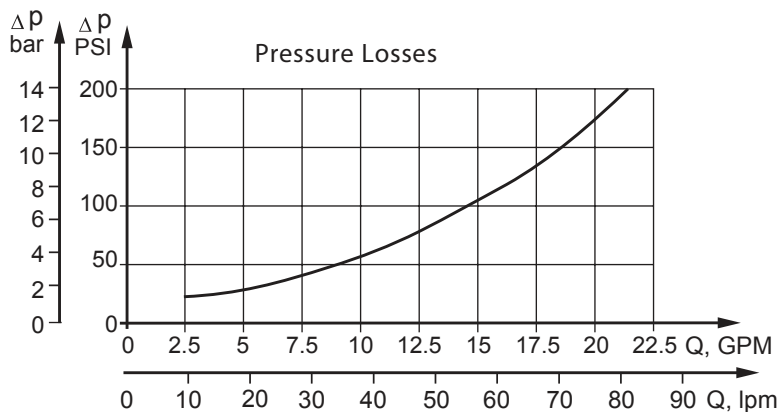
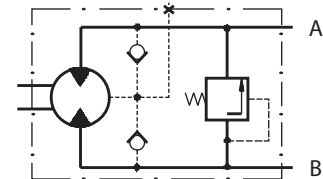
### GENERAL

Max. Displacement,	cm <sup>3</sup> /rev [in <sup>3</sup> /rev]	50 [3.05]	
Max. Speed,	[RPM]	2440	
Max. Torque,	daNm [in-lb]	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 <sup>2</sup> /s [SUS]	20÷75 [98÷347]	
Filtration		ISO code 20/16 (Min. recommended fluid filtration of 25 micron)	

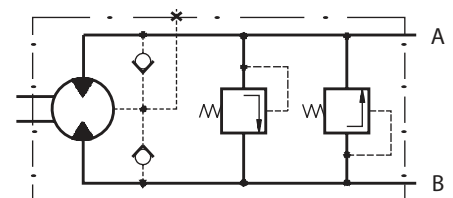
MMP Series with Integrated Internal Crossover Relief Valve  
A → B, Δp=100 or 50 bar [1450 or 725 PSI]



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]



# Technische Informationen, Serie MM

## Informations techniques, série MM

### SPECIFICATION DATA

Type	MM 8	MM 12.5	MM 20	MM 32	MM 40	MM 50	
Displacement, cm <sup>3</sup> /rev[. in <sup>3</sup> /rev]	8,2 [5]	12,9 [79]	20 [1.22]	31,8 [1.93]	40 [2.44]	50 [3.05]	
Max. Speed, [RPM]	Cont.	1950	1550	1000	630	500	400
	Int.*	2440	1940	1250	790	625	500
Max. Torque daNm [lb-in]	Cont.	1,2 [106]	1,7 [150]	2,6 [230]	4,2 [375]	4,2 [375]	4,5 [398]
	Int.*	1,5 [133]	2,3 [205]	3,5 [311]	5,7 [506]	5,7 [506]	5,8 [513]
	Peak**	2,1 [187]	3,3 [293]	5,1 [453]	6,4 [568]	6,6 [584]	8 [708]
Max. Output kW [HP ]	Cont.	1,8 [2.4]	2,4 [3.3]	2,4 [3.3]	2,4 [3.3]	1,8 [2.5]	1,7 [2.48]
	Int.*	2,6 [3.6]	3,2 [4.3]	3,2 [4.3]	3,2 [4.3]	3,0 [4.0]	2,1 [2.8]
Max. Pressure Drop bar [PSI ]	Cont.	105 [1500]	105 [1500]	105 [1500]	105 [1500]	82,5 [1200]	70 [1015]
	Int.*	140 [2030]	140 [2030]	140 [2030]	140 [2030]	110 [1600]	90 [1300]
	Peak**	200 [2900]	200 [2900]	200 [2900]	200 [2900]	140 [2000]	125 [1815]
Max. Oil Flow lpm [GPM ]	Cont.	16 [4.2]	20 [5.5]	20 [5.5]	20 [5.5]	20 [5.5]	20 [5.5]
	Int.*	20 [5.5]	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	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]
Max. Pressure in Drain Line,	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]	-	-	-
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. Return Pressure with Drain Line bar [PSI]	Cont.	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]
	Int.*	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]
	Peak**	175 [2540]	175 [2540]	175 [2540]	175 [2540]	175 [2540]	175 [2540]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		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 [65]	105 [1,2]	2,1 [190]	3,4 [300]	3,3 [295]	3,7 [330]
	At max. press. drop Int.*	1,0 [90]	150 [1,7]	2,9 [260]	4,8 [425]	4,6 [400]	4,8 [425]
Min. Speed***, [RPM]		50	40	30	30	25	20
Weight, kg [ lb]	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]
For "F" flange: + .441 [0,200]							

\* 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.

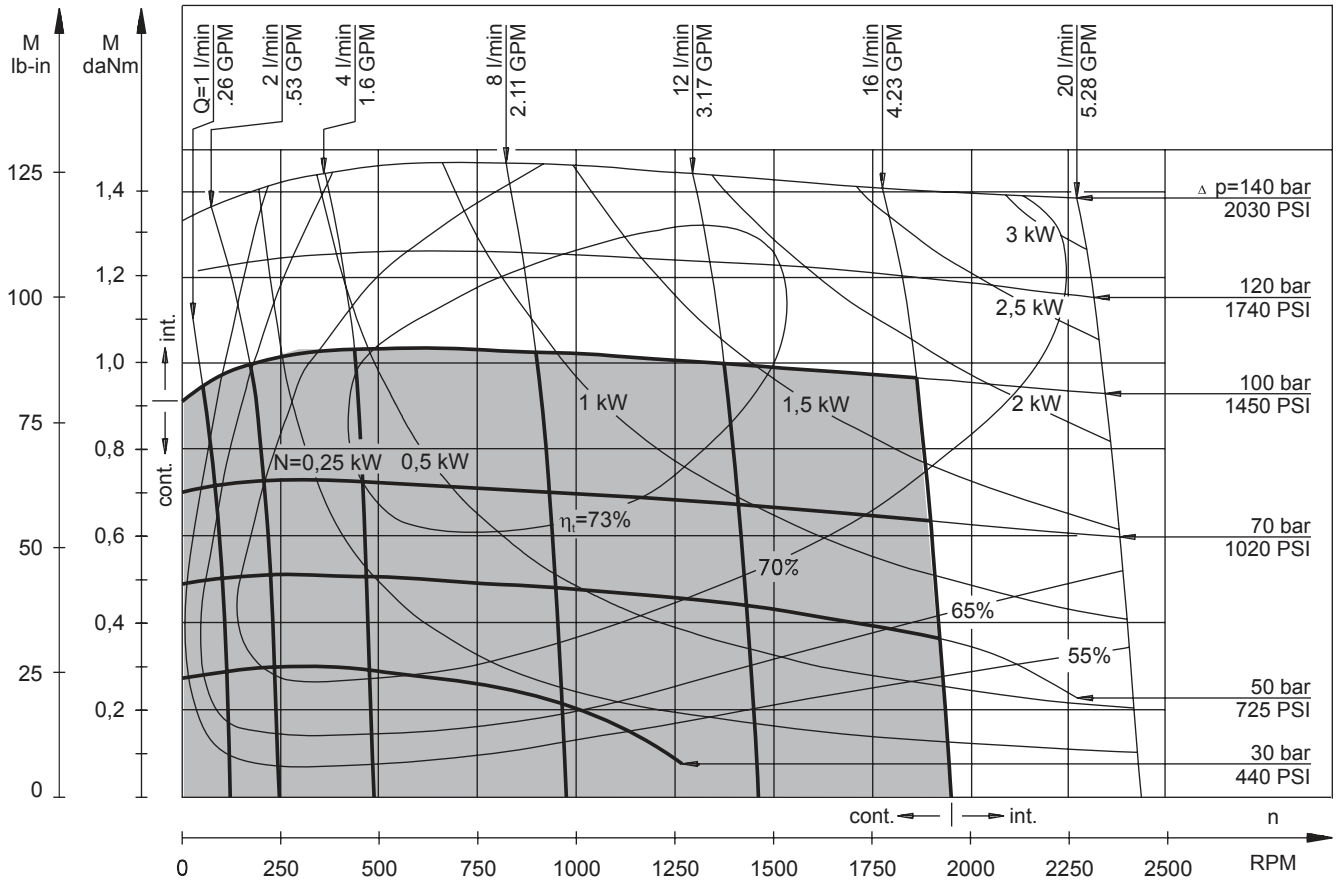
\*\*\* For speeds lower than given, consult factory or your regional manager.

- Intermittent speed and intermittent pressure must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- 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.
- Recommended minimum oil viscosity 13 mm<sup>2</sup>/s [70 SUS] at 50°C [122°F].
- Recommended maximum system operating temperature is 82°C [180°F].
- To assure optimum motor life fill with fluid prior to loading and run at moderate load and speed for 10-15 minutes.

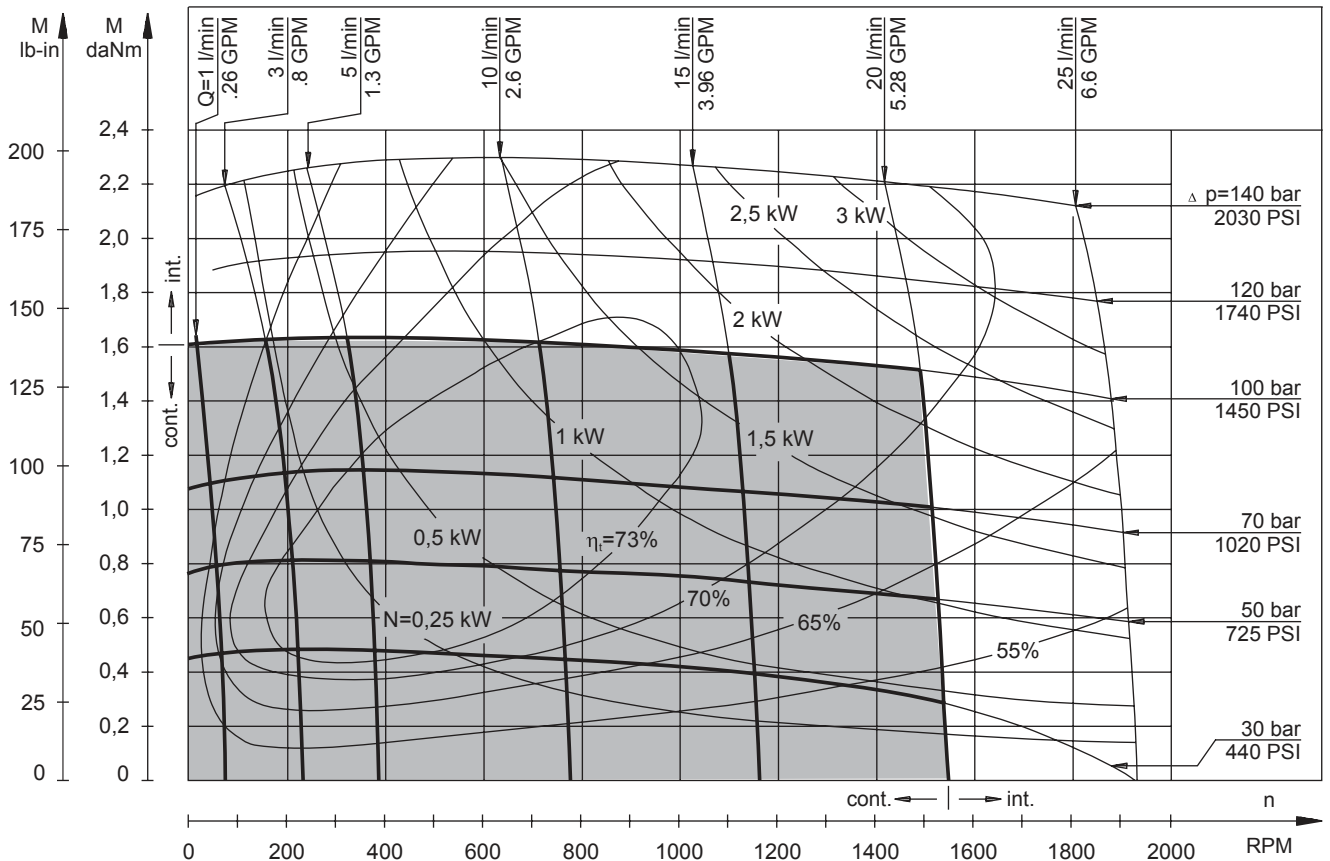
# Leistungs-Diagramme, Serie MM

## Diagrammes de puissance, série MM

MM 8



MM 12,5

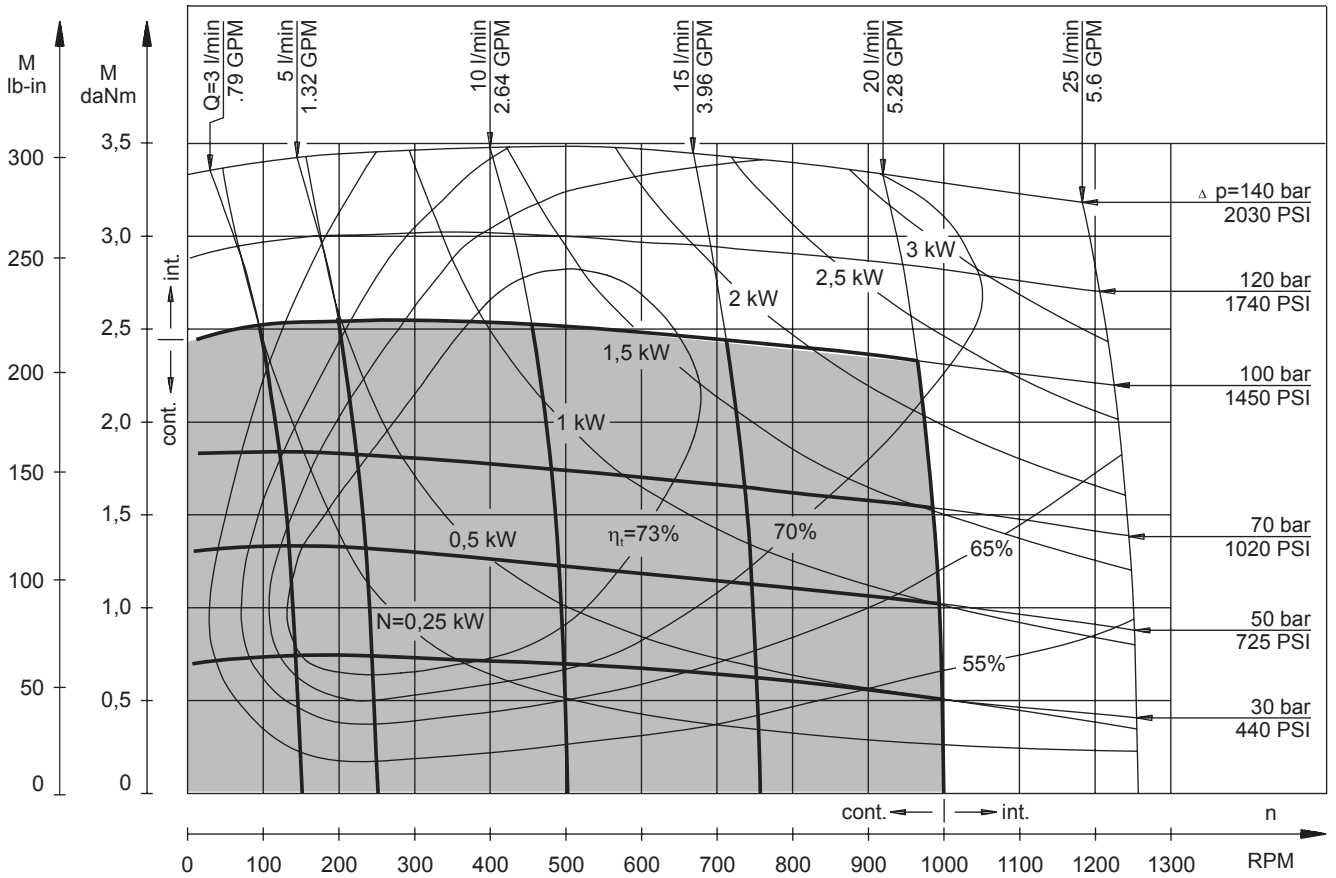


The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm<sup>2</sup>/s [150 SUS] at 50°C [122°F].

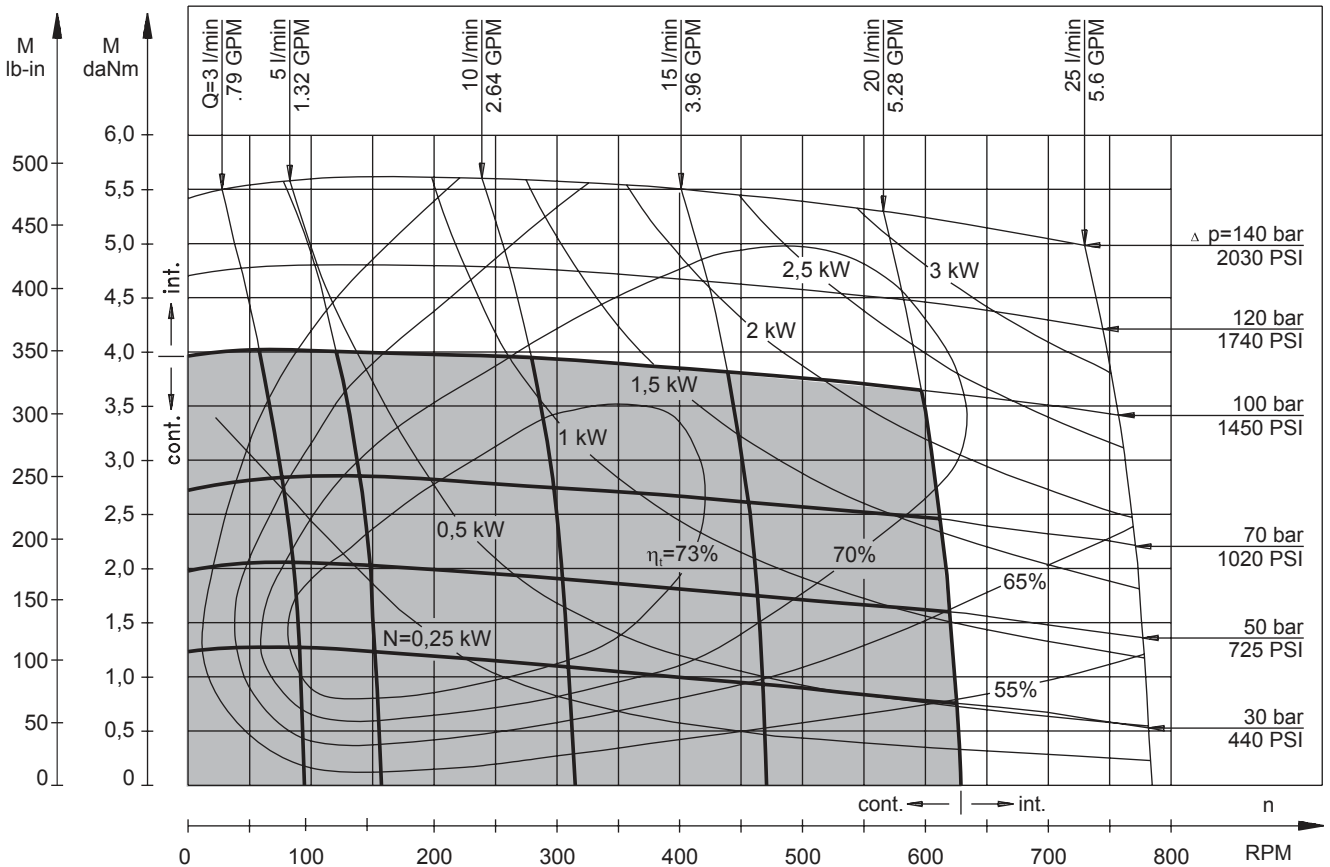
# Leistungs-Diagramme, Serie MM

## Diagrammes de puissance, série MM

MM 20



MM 32

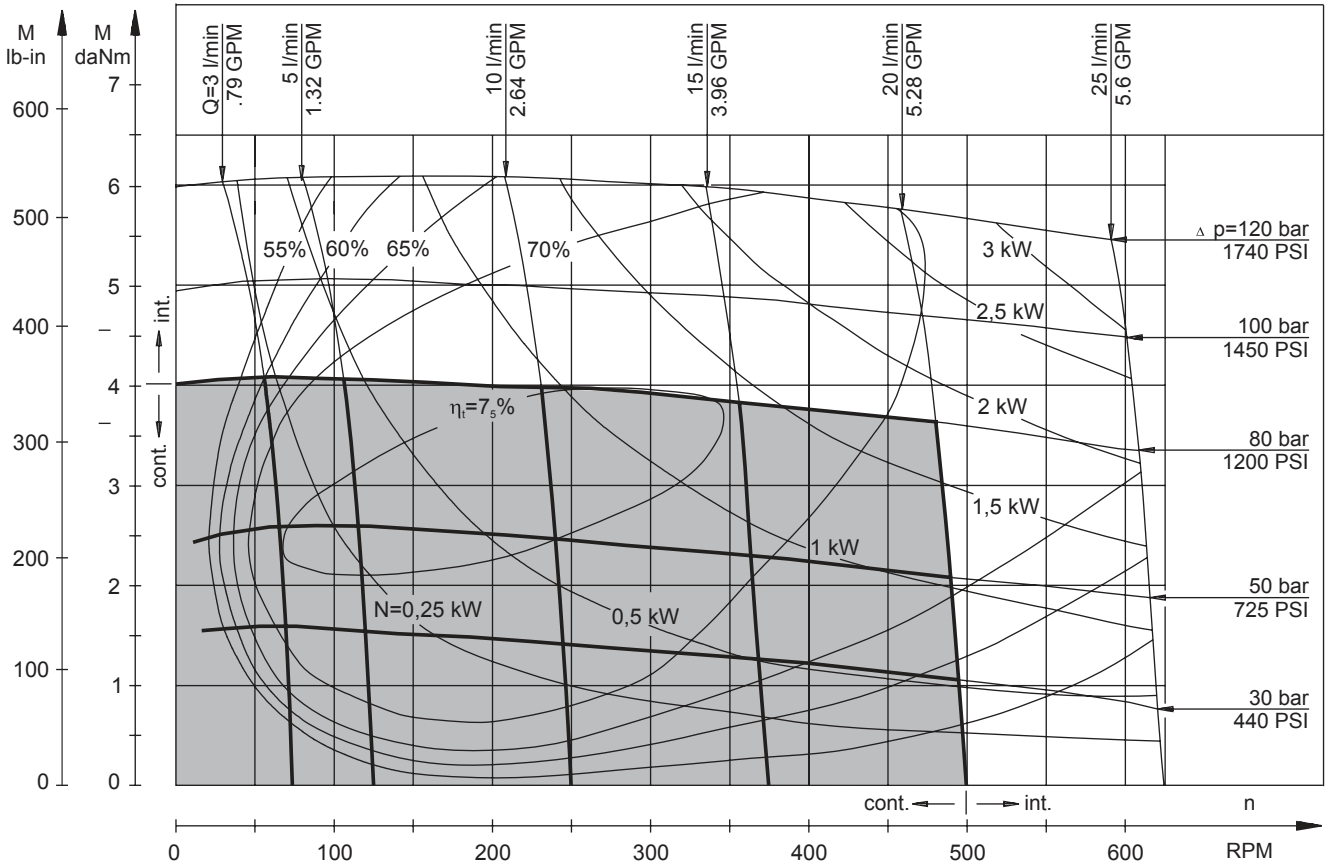


The function diagrams data is for average performance of randomly selected motors at back pressure  $5 \div 10$  bar [72.5 ÷ 145 PSI] and oil with viscosity of 32 mm<sup>2</sup>/s [150 SUS] at 50°C [122°F].

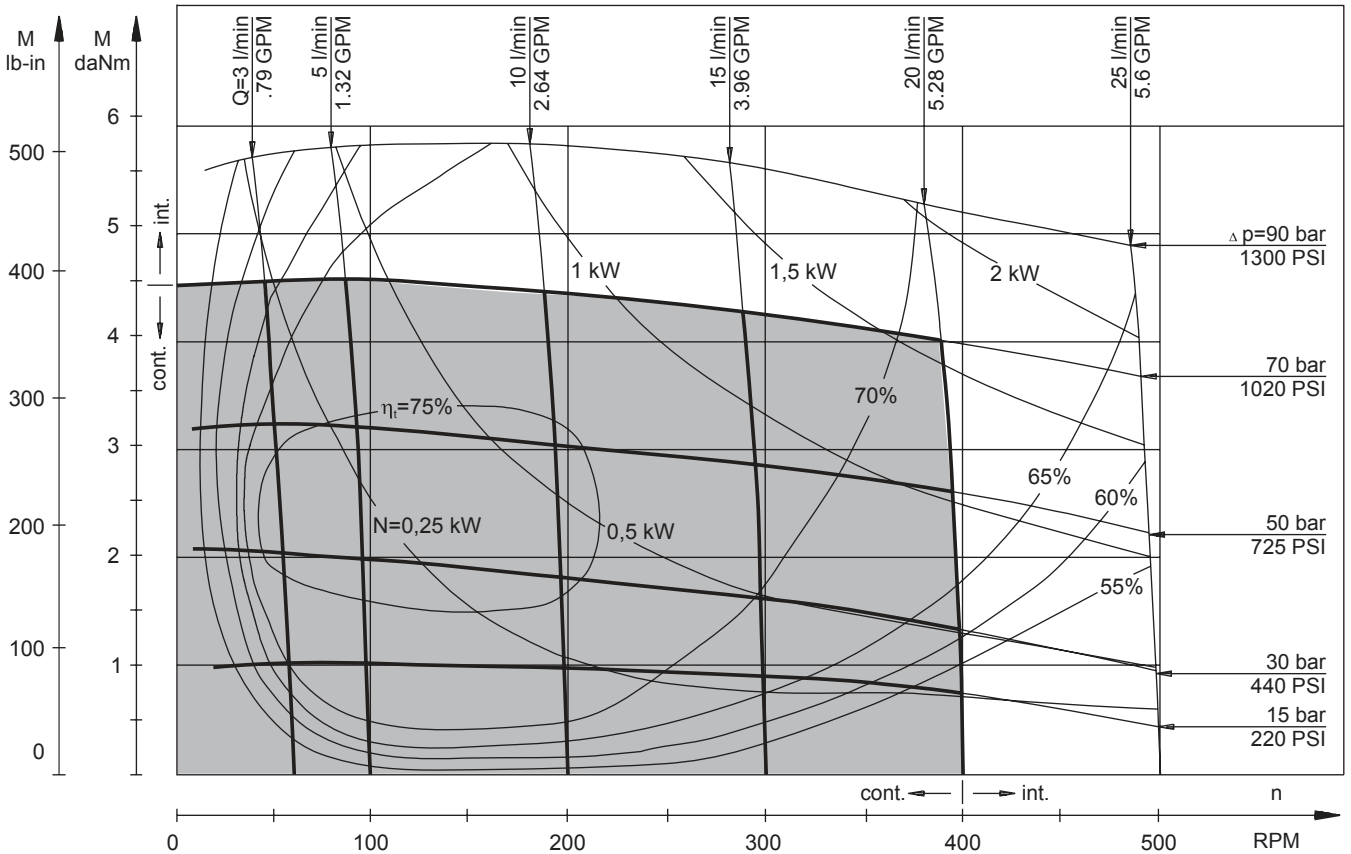
# Leistungs-Diagramme, Serie MM

## Diagrammes de puissance, série MM

MM 40



MM 50

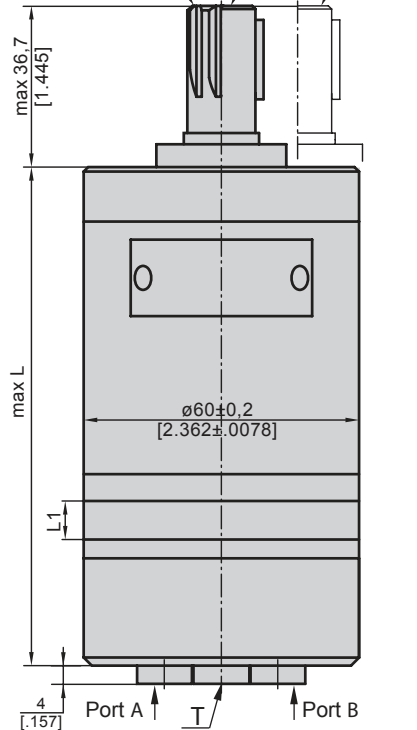


The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm<sup>2</sup>/s [150 SUS] at 50°C [122°F].

# Abmessungen- und Montage-Daten, Serie MM

## Dimensions et données d'installation, série MM

Three Bolts Mount  
SH Shaft C Shaft CK Shaft



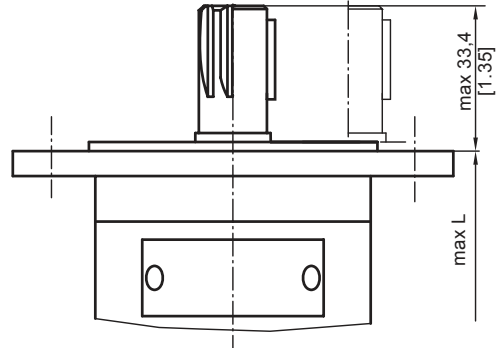
Rear Ports

Shaft Dim.  
See Page 11

Flange Dim.  
See Page 10

Port Dim.  
See Page 10

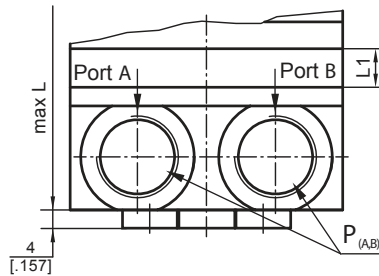
F Oval Mount (2 Holes)



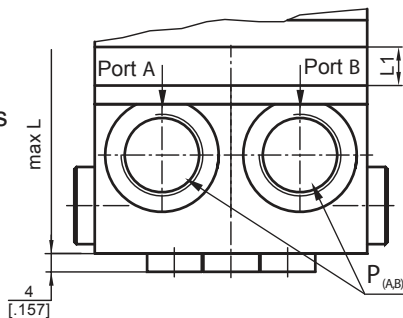
Standard Rotation  
Viewed from Shaft End  
Port A Pressurized - CW  
Port B Pressurized - CCW

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

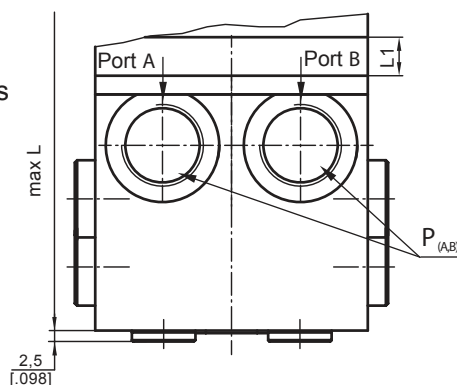
S Side Ports



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 <sub>1</sub> , 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]

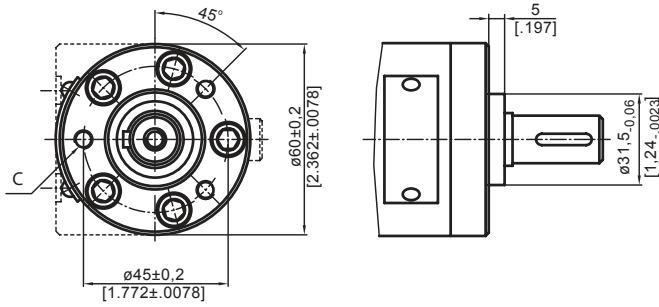
Type	L, mm [in.]	Type	L, mm [in.]	L <sub>1</sub> , mm [in.]
MMP 8	115 [4.528]	MMD 8	134 [5.276]	3,5 [.138]
MMP 12,5	117 [4.606]	MMD 12,5	136 [5.354]	5,5 [.217]
MMP 20	120 [4.724]	MMD 20	139 [5.472]	8,5 [.335]
MMP 32	125 [4.921]	MMD 32	144 [5.669]	13,5 [.531]
MMP 40	128,5 [5.039]	MMD 40	147,5 [5.807]	17 [.669]
MMP 50	132,5 [5.217]	MMD 50	151,5 [5.965]	21 [.827]



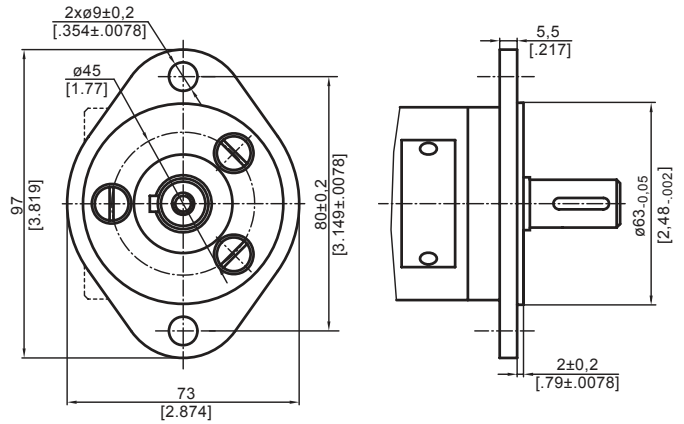
# Technische Informationen, Serie MM Informations techniques, série MM

## MOUNTING

### Three Bolts Mount

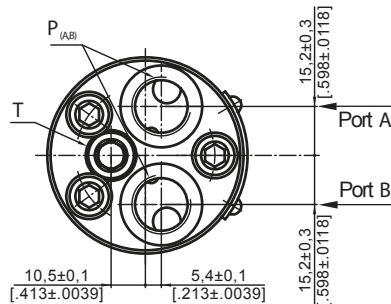


### F Oval Mount (2 Holes)

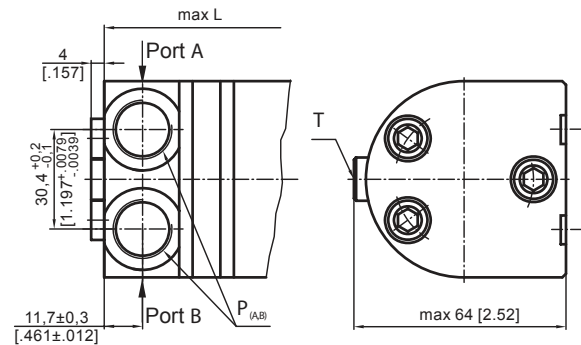


## PORTS

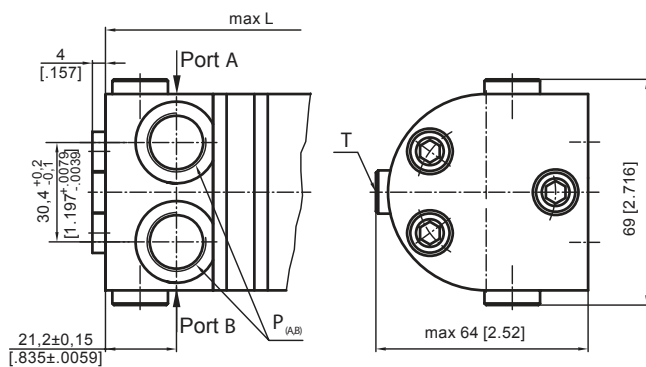
### Rear Ports



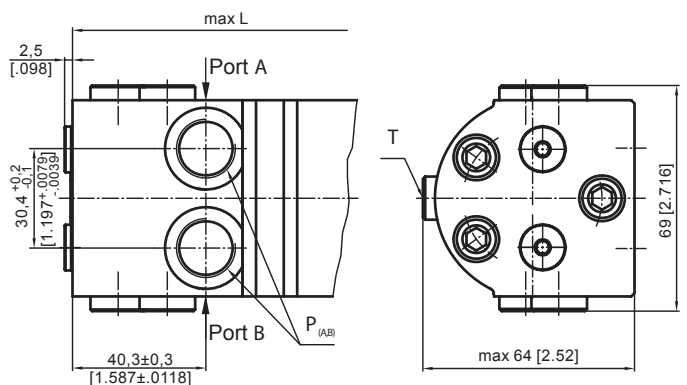
### S Side Ports



### 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<sub>(A,B)</sub> : 2xG3/8 or 2xM18x1,5 - 12 mm [.47 in] depth  
T : G1/8 or M10x1 - 10 mm [.39 in] depth

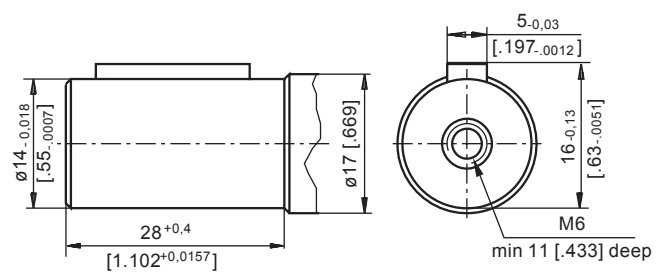
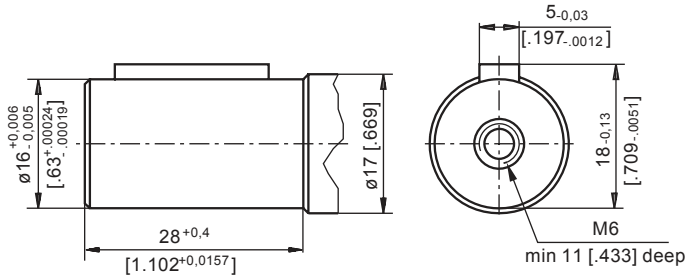


# Technische Informationen, Serie MM Informations techniques, série MM

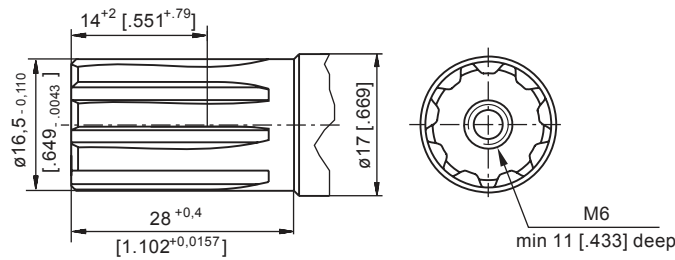
## SHAFT EXTENSIONS

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

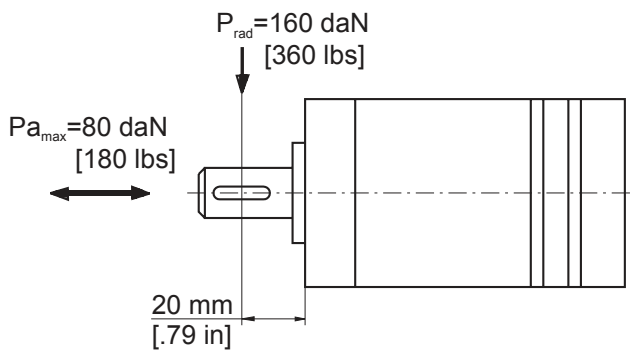
**CK** -  $\varnothing 14$  straight, Parallel key 5x5x16 DIN 6885  
Max. Torque 3 daNm [265 lb-in]



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



## PERMISSIBLE SHAFT LOAD



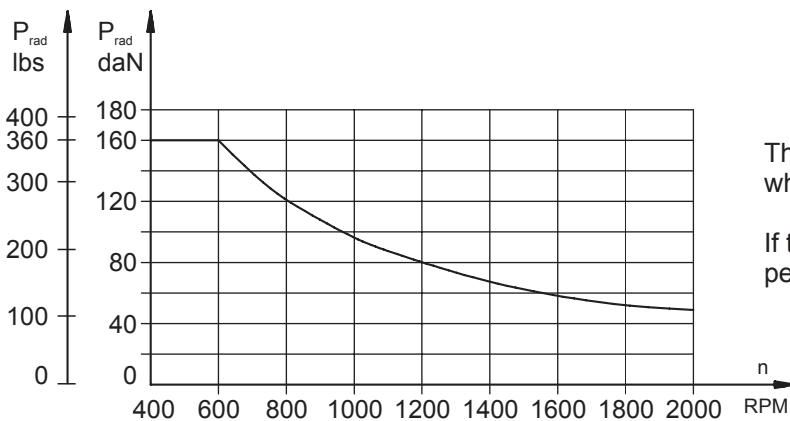
The permissible radial shaft load [P<sub>rad</sub>] is calculated from the distance [L] between the point of load application and the mounting surface:

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

[L in mm; L ≤ 80 mm]

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

[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.

# Bestell-Schlüssel, Serie MM

## Code de commande, série MM

	1	2	3	4	5	6	7	8	9
MM									

### 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 cm <sup>3</sup> /rev [0.5 in <sup>3</sup> /rev]
12.5	- 12,9 cm <sup>3</sup> /rev [0.79 in <sup>3</sup> /rev]
20	- 20,0 cm <sup>3</sup> /rev [1.22 in <sup>3</sup> /rev]
32	- 31,8 cm <sup>3</sup> /rev [1.93 in <sup>3</sup> /rev]
40	- 40,0 cm <sup>3</sup> /rev [2.44 in <sup>3</sup> /rev]
50	- 50,0 cm <sup>3</sup> /rev [3.05 in <sup>3</sup> /rev]

### Pos. 5 - Shaft Extensions \*

- C -  $\varnothing 16$  straight, Parallel key A5x5x16 DIN6885
- VC -  $\varnothing 16$  straight, Parallel key A5x5x16 DIN6885 with corrosion resistant bushing
- CK -  $\varnothing 14$  straight, Parallel key 5x5x16 DIN6885
- SH -  $\varnothing 16,5$  splined, B17x14 DIN 5482

### Pos. 6 - Ports

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

### Pos. 7 - Line to control \*\*

- /L - B  $\rightarrow$  A (left running)
- /R - A  $\rightarrow$  B (right running)

### Pos. 8 - Valve Rated Pressure \*\*\*

- /50 -  $\Delta p = 50$  bar
- /100 -  $\Delta p = 100$  bar

### Pos. 9 - Special Features

### Pos. 10 - Design Series

- omit - Factory specified

#### NOTES:

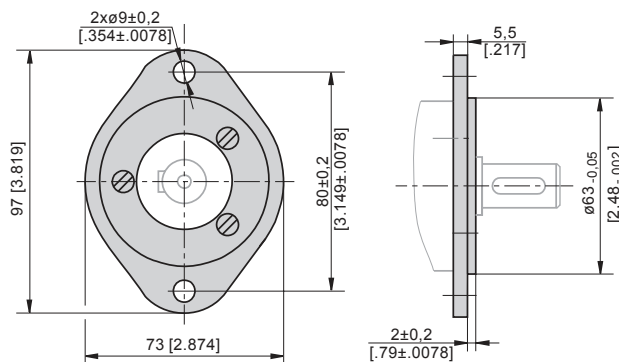
- \* The permissible output torque for shafts must not be exceeded!
- \*\* For P option useful only.
- \*\*\* For P and D option useful only.

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

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.