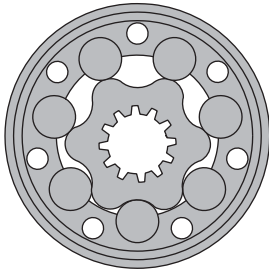


## Hydraulic orbital motors with reduced displacement MR40



### APPLICATION

- » Conveyors
- » Feeding mechanism of robots and manipulators
- » Metal working machines
- » Textile machines
- » Agricultural machines
- » Food industries
- » Grass cutting machinery etc.

### OPTIONS

- » Model - Spool valve, roll-gerotor
- » Flange mount
- » Motor with needle bearing
- » Side and rear ports
- » Shafts - straight, splined and tapered
- » Shaft seal for high and low pressure
- » Metric and BSPP ports
- » Speed sensing
- » Other special features

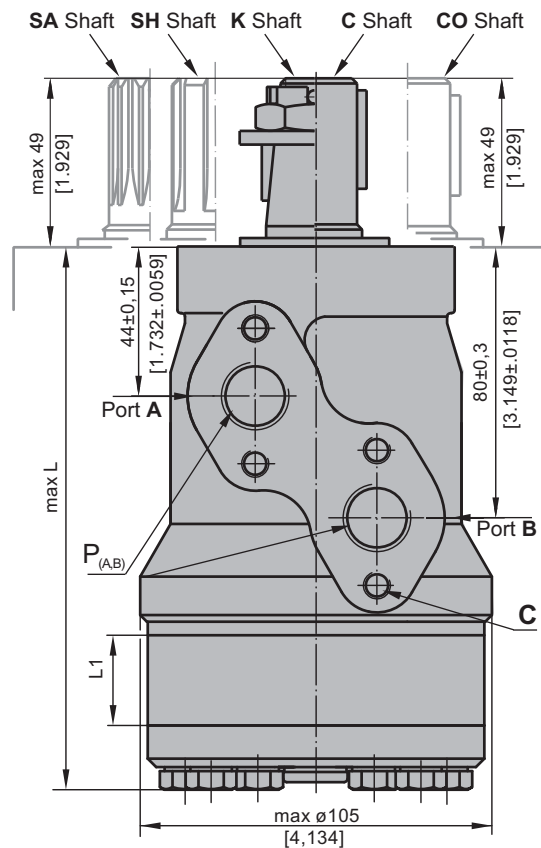
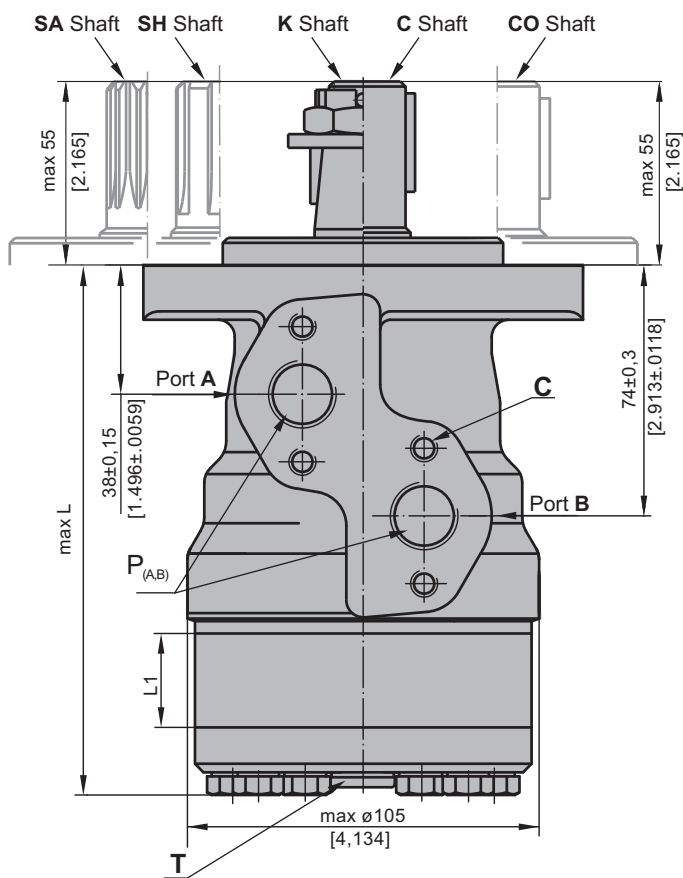
### SPECIFICATION DATA

| Type   | MR 40                              |
|--|------------------------------------|
| Displacement, cm <sup>3</sup> /rev [in <sup>3</sup> /rev ] | 40,1 [2.45]                        |
| Max. Speed,<br>[RPM]                                       | Cont. 1000                         |
|  | Int.* 1250                         |
| Max. Torque<br>daNm [lb-in]                                | Cont. 9 [797]                      |
|  | Int.* 10 [885]                     |
| Max. Output<br>kW [HP]                                     | Cont. 8,5 [11.4]                   |
|  | Int.* 11 [14.6]                    |
| Max. Pressure Drop<br>bar [PSI]                            | Cont. 175 [2540]                   |
|  | Int.* 200 [2900]                   |
| Max. Oil Flow<br>lpm [GPM]                                 | Cont. 40 [10.5]                    |
|  | Int.* 50 [13.2]                    |
| Max. Inlet Pressure<br>bar [PSI]                           | Cont. 175 [2540]                   |
|  | Int.* 200 [2900]                   |
| Max. Return Pres-<br>sure with Drain Line, bar [PSI]       | Cont. 175 [2540]                   |
|  | Int.* 200 [2900]                   |
| Max. Starting Pressure with Unloaded Shaft, bar [PSI]      | 20 [290]                           |
| Min. Starting Torque<br>daNm [lb-in]                       | At max.press. drop Cont. 6.8 [602] |
|  | At max.press. drop Int.* 7.8 [690] |
| Min. Speed***, [RPM]                                       | 20                                 |
| Weight, kg [lb]  | MR(F) 6,9 [15.2]                   |
|  | MRQ(N) 6,3 [13.9]                  |
| For rear ports: +0,650 [1.433]                             |                                    |

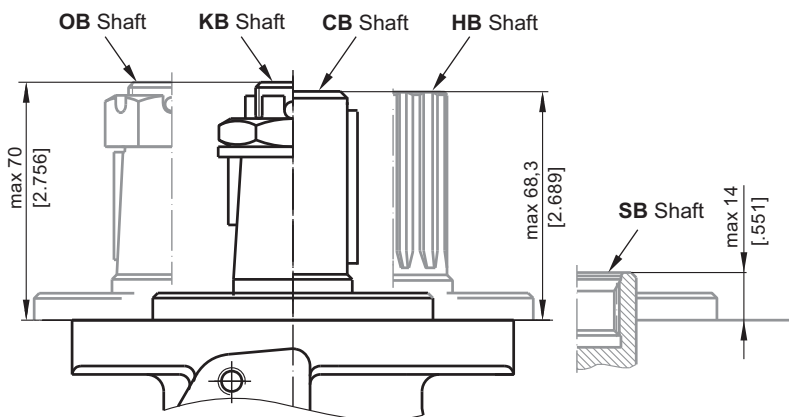
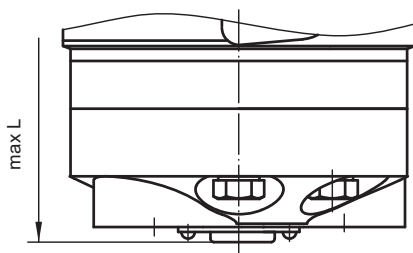
- \* Intermittent operation: the permissible values may occur for max. 10% of every minute.  
 \*\* For speeds lower than given, consult factory or your regional manager.

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 mm<sup>2</sup>/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.

**DIMENSIONS AND MOUNTING DATA**



**E** Rear ports



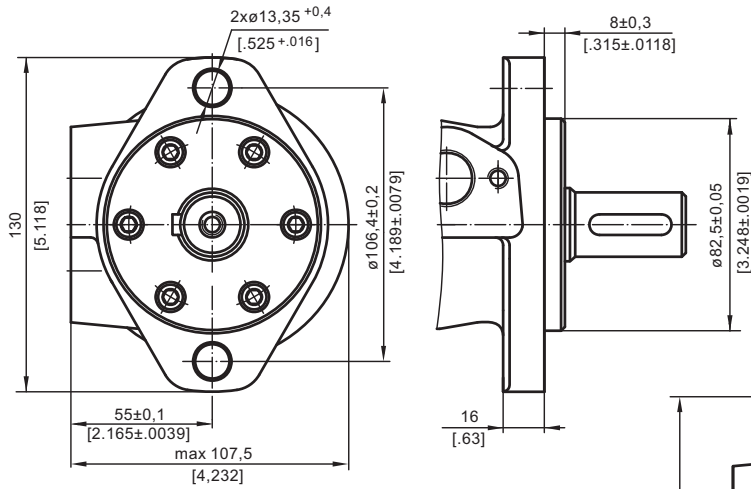
- C** : 4xM8 - 13 mm [.51 in] depth
- P<sub>(A,B)</sub>**: 2xG1/2 or 2xM22x1,5 - 15 mm [.59 in] depth
- T** : G1/4 or M14x1,5 - 12 mm [.47 in] depth (plugged)

- |                                 |                                 |
|---------------------------------|---------------------------------|
| <b>Standard Rotation</b>        | <b>Reverse Rotation</b>         |
| Viewed from Shaft End           | Viewed from Shaft End           |
| Port A Pressurized - <b>CW</b>  | Port A Pressurized - <b>CCW</b> |
| Port B Pressurized - <b>CCW</b> | Port B Pressurized - <b>CW</b>  |

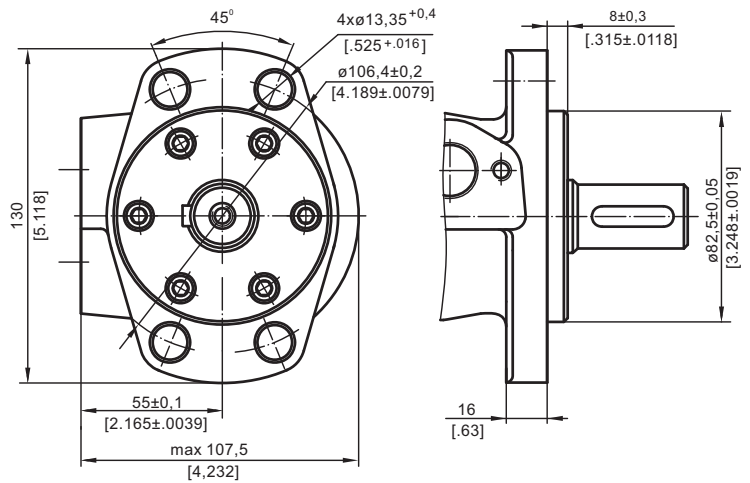
| Type     | L, mm [in]   | Type   | L, mm [in]   | Type      | L, mm [in]   | Type    | L, mm [in]   | L <sub>1</sub> , mm [in] |
|----------|--------------|--------|--------------|-----------|--------------|---------|--------------|--------------------------|
| MR(F) 40 | 143,0 [5.63] | MRQ 40 | 148,5 [5.85] | MR(F)E 40 | 162,5 [6.40] | MRQE 40 | 168,5 [6.63] | 14,0 [.55]               |

**MOUNTING**

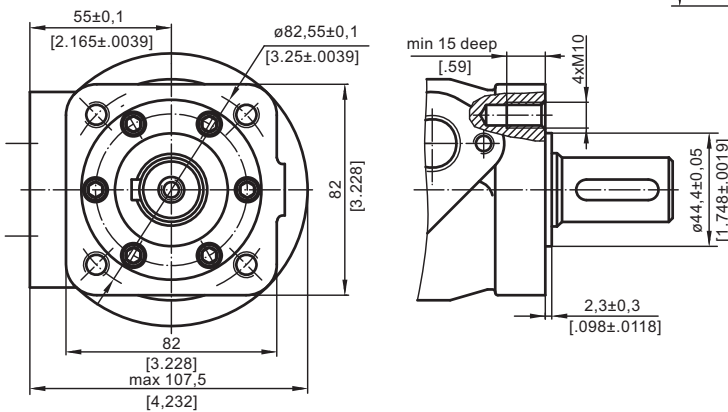
Oval Mount (2 Holes)



**F** - Oval Mount (4 Holes)



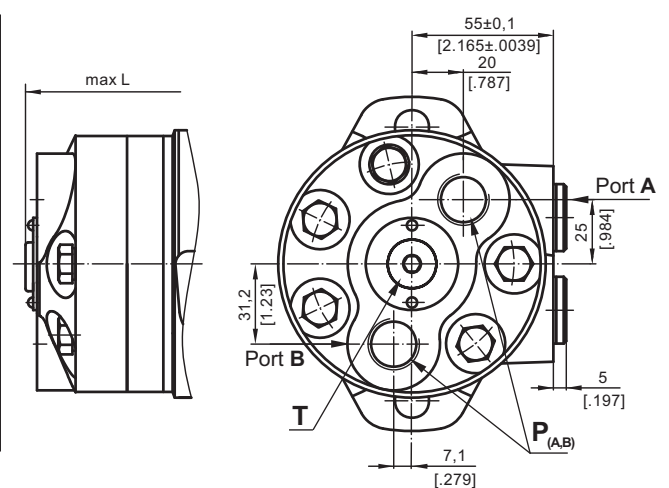
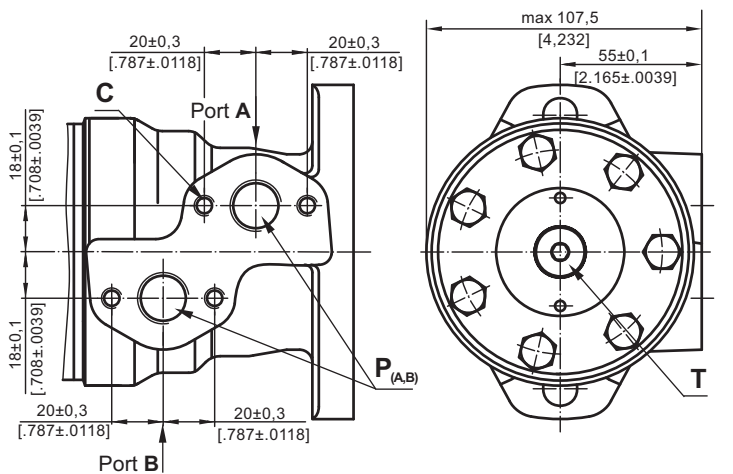
**Q** - Square Mount (4 Bolts)



**PORTS**

Side Ports

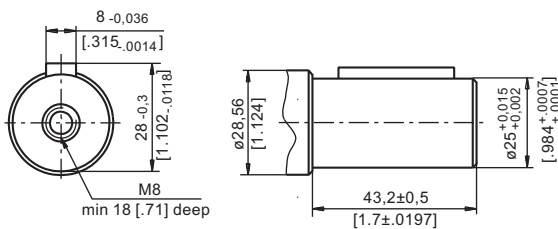
**E** Rear Ports



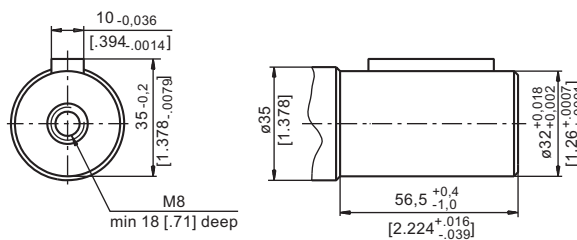
- C** : 4xM8 - 13 mm [0.51 in] depth
- P<sub>(A,B)</sub>** : 2xG1/2 or 2xM22x1,5 - 15 mm [0.59 in] depth
- T** : G1/4 or M14x1,5 - 12 mm [0.47 in] depth (plugged)

## SHAFT EXTENSIONS

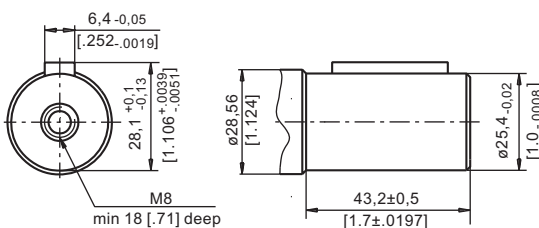
**C** -  $\varnothing 25$  straight, Parallel key A8x7x32 DIN 6885  
Max. Torque 34 daNm [3010 lb-in]



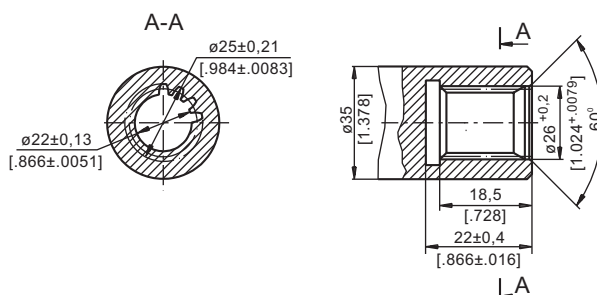
**CB** -  $\varnothing 32$  straight, Parallel key A10x8x45 DIN 6885  
Max. Torque 77 daNm [6815 lb-in]



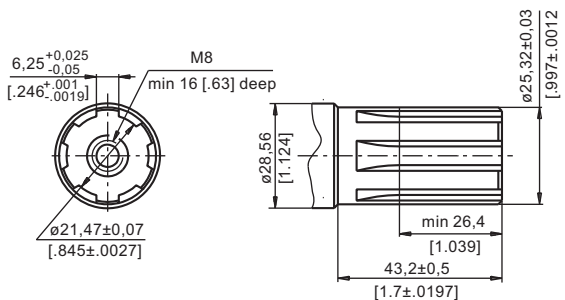
**CO** -  $\varnothing 1"$  straight, Parallel key  $\frac{1}{4} \times \frac{1}{4} \times 1 \frac{1}{4}$ " BS46  
Max. Torque 34 daNm [3010 lb-in]



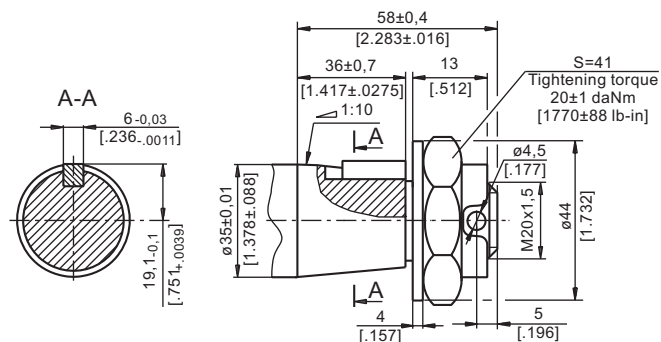
**SB** - splined A25x22xH10 DIN 5482  
Max. Torque 34 daNm [3010 lb-in]



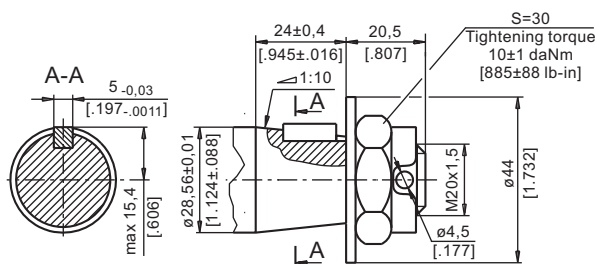
**SH** - splined, BS 2059 (SAE 6B)  
Max. Torque 40 daNm [3540 lb-in]



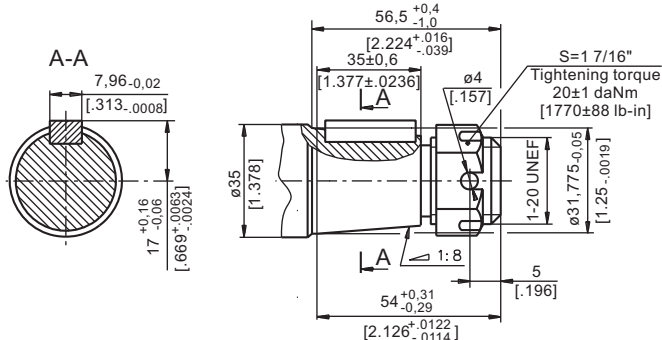
**KB** - tapered 1:10, Parallel key B6x6x20 DIN 6885  
Max. Torque 77 daNm [6815 lb-in]



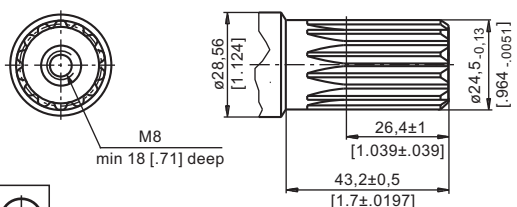
**K** - tapered 1:10, Parallel key B5x5x14 DIN 6885  
Max. Torque 40 daNm [3540 lb-in]



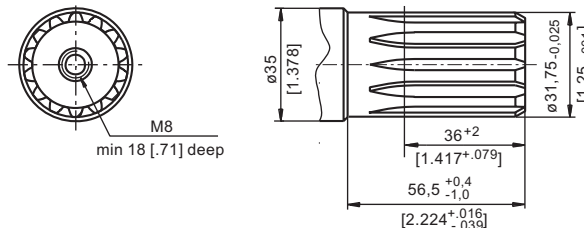
**OB** - tapered 1:8 SAEJ 501, Parallel key  $\frac{5}{16} \times \frac{5}{16} \times 1 \frac{1}{4}$ " BS46  
Max. Torque 77 daNm [6815 lb-in]



**SA** - splined, B25x22h9 DIN 5482  
Max. Torque 40 daNm [3540 lb-in]

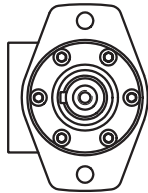
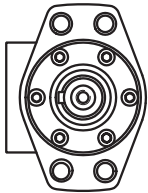
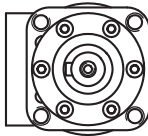


**HB** -  $\varnothing 1 \frac{1}{4}$ " splined 14T, ANSI B92.1-1976 Norm  
Max. Torque 77 daNm [6815 lb-in]



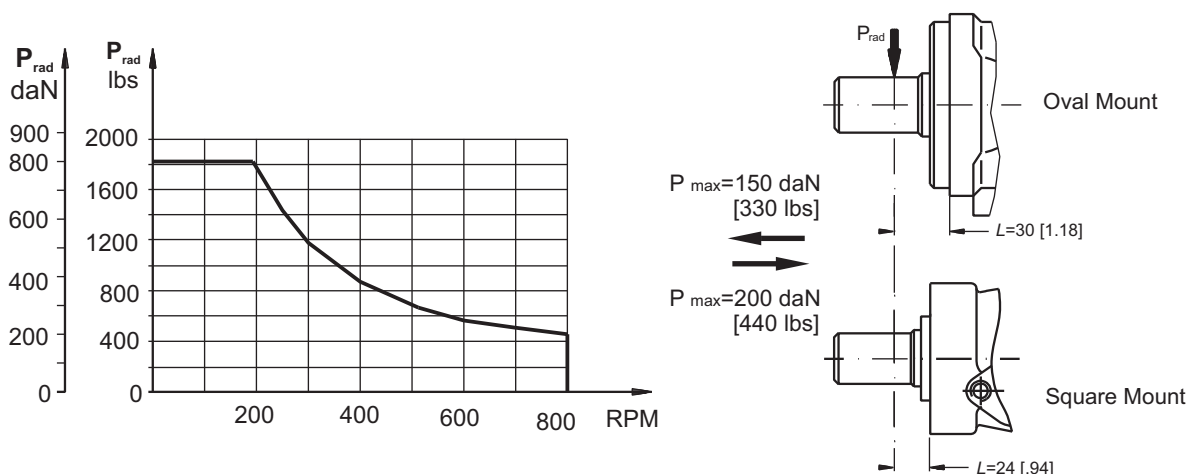
### PERMISSIBLE SHAFT LOADS

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

| Mounting Flange                       |  |  |  |
|---------------------------------------|---|--|---|
| Shaft Version                         | cylindrical - C, CO<br>tapered - K, splined - SH                                  | splined - HB<br>cylindrical - CB   | cylindrical - C, CO   |
| Radial Shaft Load $P_{rad}$ , in mm   | $\frac{800}{n} \times \frac{25000}{95+L}$ , daN*                                  | $\frac{800}{n} \times \frac{18750}{95+L}$ , daN*                                   | $\frac{800}{n} \times \frac{25000}{101+L}$ , daN*                                   |
| Radial Shaft Load $P_{rad}$ , in inch | $\frac{800}{RPM} \times \frac{2215}{3.74+L}$ , lbs*                               | $\frac{800}{RPM} \times \frac{1660}{3.74+L}$ , lbs*                                | $\frac{800}{RPM} \times \frac{2215}{3.98+L}$ , lbs*                                 |

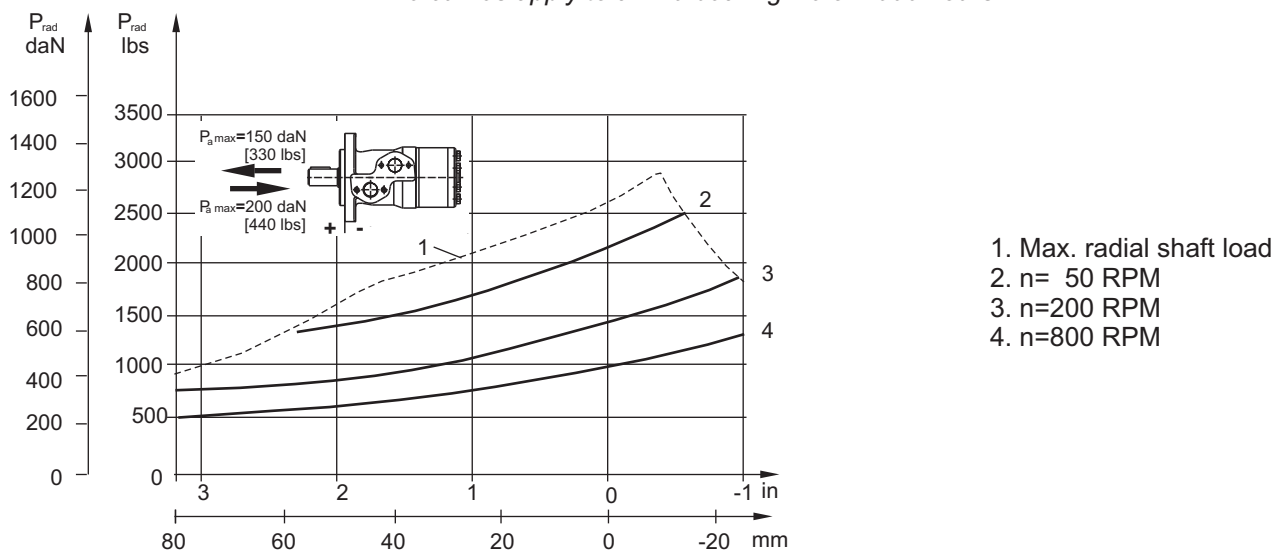
\*  $n \leq 200$  RPM; max  $P_{rad}$ =800 daN [1800 lbs]  
 $n \geq 200$  RPM;  $L < 55$  mm [2.2 in]

Radial Shaft Load  $P_{rad}$  for C, CO Shaft Extensions by  $L=30$  mm [1.18 in] (24 mm [.94 in])



### MRN 40

The curves apply to a B10 bearing life of 2000 hours.



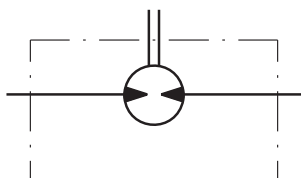
1. Max. radial shaft load
2.  $n=50$  RPM
3.  $n=200$  RPM
4.  $n=800$  RPM

**MAX. PERMISSIBLE SHAFT SEAL PRESSURE**

**MR40...U1 motors with high pressure seal and without drain connection:**

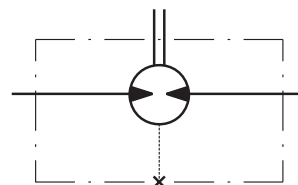
The shaft seal pressure equals the average of input pressure and return pressure.

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



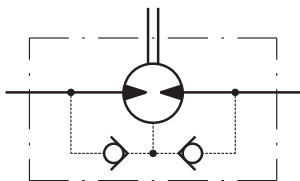
**MR40...U motors with high pressure seal and drain connection:**

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



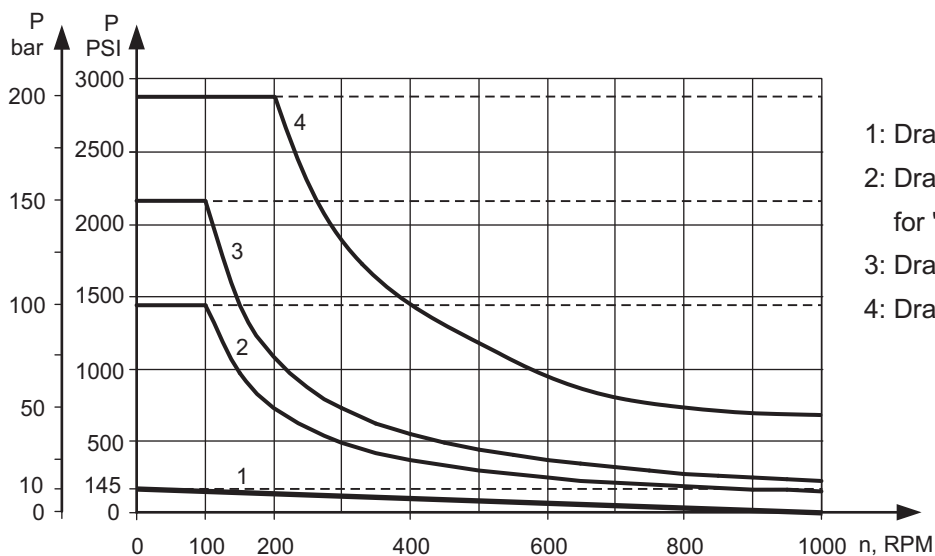
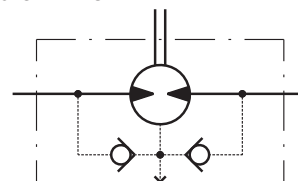
**MR40...1 motors with low pressure seal or standard shaft seal and without drain connection:**

The shaft seal pressure never exceeds the pressure in the return line.



**MR40... motors with low pressure seal or standard shaft seal and with drain connection:**

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



- 1: Drawing for Low Pressure Seal
- 2: Drawing for Standard Shaft Seal for "...B" shafts
- 3: Drawing for Standard Shaft Seal ("D" Seal)
- 4: Drawing for High Pressure Seal ("U" Seal)

— - continuous operations  
 - - - - - intermittent operations

## ORDER CODE

|            | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|------------|---|---|---|---|---|---|---|---|---|----|----|----|
| <b>M R</b> |   |   |   |   |   |   |   |   |   |    |    |    |

**Pos.1 - Mounting Flange**

omit - Oval mount, two holes

**F** - Oval mount, four holes**Q** - Square mount, four bolts**Pos.2 - Option (needle bearings)**

omit - none

**N** - with needle bearings**Pos.3 - Port type**

omit - Side ports

**E** - Rear ports**Pos.4 - Displacement code****25** - 25,65 cm<sup>3</sup>/rev [1.01 in<sup>3</sup>/rev]**35** - 34,7 cm<sup>3</sup>/rev [1.37 in<sup>3</sup>/rev]**40** - 40,1 cm<sup>3</sup>/rev [2.45 in<sup>3</sup>/rev]**Pos.5 - Shaft Extensions\*****C** -  $\varnothing$ 25 straight, Parallel key A8x7x32 DIN6885**VC** -  $\varnothing$ 25 straight, Parallel key A8x7x32 DIN6885  
with corrosion resistant bushing**CO** -  $\varnothing$ 1" straight, Parallel key  $\frac{1}{4}$ "x $\frac{1}{4}$ "x $\frac{1}{4}$ " BS46**VCO** -  $\varnothing$ 1" straight, Parallel key  $\frac{1}{4}$ "x $\frac{1}{4}$ "x $\frac{1}{4}$ " BS46  
with corrosion resistant bushing**SH** -  $\varnothing$ 25,32 splined BS 2059 (SAE 6B)**VSH** -  $\varnothing$ 25,32 splined BS 2059 (SAE 6B)  
with corrosion resistant bushing**K** -  $\varnothing$ 28,56 tapered 1:10, Parallel key B5x5x14 DIN6885**SA** -  $\varnothing$ 24,5 splined B 25x22 DIN 5482**VSA** -  $\varnothing$ 24,5 splined B 25x22 DIN 5482  
with corrosion resistant bushing**CB** -  $\varnothing$ 32 straight, Parallel key A10x8x45 DIN6885**KB** -  $\varnothing$ 35 tapered 1:10, Parallel key B6x6x20 DIN6885**SB** - splined A 25x22 DIN 5482**OB** -  $\varnothing$ 1 $\frac{1}{4}$ " tapered 1:8, Parallel key  $\frac{5}{16}$ "x $\frac{5}{16}$ "x $\frac{1}{4}$ " BS46**HB** -  $\varnothing$ 1 $\frac{1}{4}$ " splined 14T ANSI B92.1 - 1976**Pos. 6 - Shaft Seal Version**

omit - Low pressure shaft seal

**D** - Standard shaft seal**U** - High pressure shaft seal (without check valves)**Pos. 7 - Drain Port**

omit - with drain port

**1** - without drain port**Pos. 8 - Ports**

omit - BSPP (ISO 228)

**M** - Metric (ISO 262)**Pos. 9 - Special Features**

omit - none

**LL** - Low Leakage**LSV** - Low Speed Valve**FR** - Free Running**Pos.10 - Rotation**

omit - Standard Rotation

**R** - Reverse Rotation**Pos.11 - Option (Paint)\*\***

omit - no Paint

**P** - Painted**PC** - Corrosion Protected Paint**Pos.12 - Design Series**

omit - Factory specified

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

\*\* Color at customer's request.

**NOTES:** The following combinations are not allowed: - **Q** flange with "...**B**" shafts;  
- **N** option with "...**B**" shafts, Low Pressure Seal or **U** option;  
- "...**B**" shafts with **D** and **U** shaft seals.

The hydraulic motors are manganophosphatized as standard.