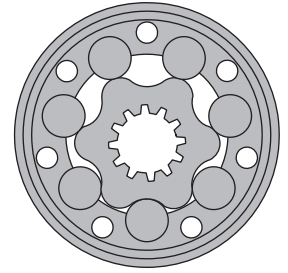


HYDRAULIC MOTORS MR



APPLICATION

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



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 Permissible shaft Seal Pressure ... 30
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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

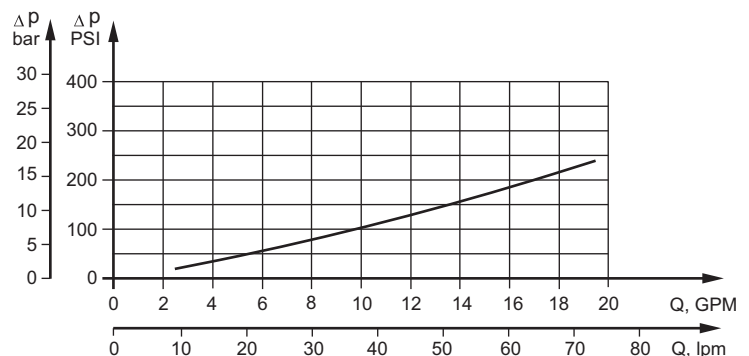
GENERAL

| | |
|---|--|
| Max. Displacement, cm ³ /rev [in ³ /rev] | 397 [24.4] |
| Max. Speed, [RPM] | 970 |
| Max. Torque, daNm [lb-in] | cont.: 61 [5400] int.: 69 [6100] |
| Max. Output, kW [HP] | 15 [20.1] |
| Max. Pressure Drop, bar [PSI] | cont.: 175 [2540] int.: 200 [2900] |
| Max. Oil Flow, lpm [GPM] | 75 [20] |
| Min. Speed, [RPM] | 10 |
| 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) |

Oil flow in drain line

| Pressure drop bar [PSI] | Viscosity mm ² /s [SUS] | Oil flow in drain line lpm [GPM] |
|----------------------------|---------------------------------------|--|
| 100 [1450] | 20 [98] | 2,5 [.660] |
| | 35 [164] | 1,8 [.476] |
| 140 [2030] | 20 [98] | 3,5 [.925] |
| | 35 [164] | 2,8 [.740] |

Pressure Losses



SPECIFICATION DATA

Specification Data for MR... motors with **C, CO, SH, K** and **SA** shafts.
($\varnothing 28,56$ sealing diameter)

| Type | | MR 50 | MR 80 | MR 100 | MR 125 | MR 160 | MR 200 | MR 250 | MR 315 | MR 400 |
|---|-----------------------------|----------------|----------------|----------------|-----------------|-----------------|------------------|------------------|------------------|---------------|
| Displacement, cm ³ /rev [in ³ /rev] | | 51,5 [3.14] | 80,3 [4.90] | 99,8 [6.09] | 125,7 [7.67] | 159,6 [9.74] | 199,8 [12.19] | 250,1 [15.26] | 315,7 [19.26] | 397 [24.4] |
| | Max. Speed, [RPM] | | | | | | | | | |
| | Cont. | 775 | 750 | 600 | 475 | 375 | 300 | 240 | 190 | 150 |
| | Int.* | 970 | 940 | 750 | 600 | 470 | 375 | 300 | 240 | 190 |
| Max. Torque daNm [in-lb] | Cont. | 10 [900] | 20 [1770] | 24 [2125] | 30 [2655] | 39 [3450] | 38,5[3410] | 39 [3450] | 36 [3185] | 38 [3360] |
| | Int.* | 13 [1150] | 22 [1947] | 28 [2480] | 34 [3010] | 43 [3805] | 46 [4070] | 47 [4160] | 47 [4160] | 47 [4160] |
| | Peak** | 17 [1505] | 27 [2390] | 32 [2832] | 37 [3275] | 46 [4070] | 56 [4960] | 60 [5310] | 61 [5400] | 61 [5400] |
| Max. Output kW [HP] | Cont. | 7 [9.5] | 12,5 [17] | 13 [17.4] | 12,5[16.8] | 11,5[15.4] | 9 [12] | 8 [10.7] | 5 [6.7] | 4,8 [6.4] |
| | Int.* | 8,5 [11.9] | 15 [20.1] | 15 [20.1] | 14,5[19.5] | 14 [18.8] | 12 [16.1] | 9,5 [12.7] | 8 [10.7] | 6,8 [9.1] |
| Max. Pressure Drop bar [PSI] | Cont. | 140[2030] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 140[2030] | 110[1600] | 85 [1230] | 65 [940] |
| | Int.* | 175[2540] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 175[2540] | 140[2030] | 115[1670] | 90 [1300] |
| | Peak** | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 200[2900] | 150[2175] | 115[1670] |
| Max. Oil Flow lpm [GPM] | Cont. | 40 [10.5] | 60 [15.8] | 60 [15.8] | 60 [15.8] | 60 [15.8] | 60 [15.8] | 60 [15.8] | 60 [15.8] | 60 [15.8] |
| | Int.* | 50 [13.2] | 75 [19.8] | 75 [19.8] | 75 [19.8] | 75 [19.8] | 75 [19.8] | 75 [19.8] | 75 [19.8] | 75 [19.8] |
| Max. Inlet Pressure bar [PSI] | Cont. | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] |
| | Int.* | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] |
| | Peak** | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] |
| Max. Return Pres- sure with Drain Line bar [PSI] | Cont. | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] |
| | Int.* | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] |
| | Peak** | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] |
| Max. Starting Pressure with Unloaded Shaft, bar [PSI] | | 10 [145] | 10 [145] | 10 [145] | 9 [130] | 7 [102] | 5 [73] | 4 [58] | 3 [44] | 3 [44] |
| Min. Starting Torque daNm [in-lb] | At max.press. drop Cont. | 8 [710] | 15 [1330] | 20 [1770] | 25 [2215] | 32 [2832] | 33 [2920] | 31 [2740] | 31,5[2875] | 31,5[2875] |
| | At max.press. drop Int.* | 10 [85] | 17 [1505] | 23 [2035] | 28 [2480] | 37 [3275] | 40 [3540] | 48 [4250] | 58 [5220] | 50 [4425] |
| | | | | | | | | | | |
| Min. Speed***, [RPM] | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Weight, kg [lb] | MR(F) | 6,8 [15] | 6,9 [15.2] | 7,2 [15.9] | 7,3 [16.1] | 7,5 [15.2] | 8 [17.6] | 8,4 [18.5] | 9,1 [20] | 9,8 [21.6] |
| For rear ports: +0,650 [1.433] | MRQ(N) | 6,2 [13.7] | 6,3 [13.9] | 6,6 [14.6] | 6,8 [15] | 7,2 [14.7] | 7,6 [15.4] | 7,8 [17.2] | 8,6 [19] | 9,3 [20.5] |

* 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 mm²/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.

SPECIFICATION DATA (continued)

Specification Data for MR... motors with CB, KB, OB and HB shafts.
(ø35 sealing diameter)

| Type | | MR 50 | MR 80 | MR 100 | MR 125 | MR 160 | MR 200 | MR 250 | MR 315 | MR 400 |
|---|-----------------------------|------------|-----------|------------|------------|------------|------------|------------|------------|------------|
| Displacement, cm³/rev [in ³ /rev] | | 51,5 | 80,3 | 99,8 | 125,7 | 159,6 | 199,8 | 250,1 | 315,7 | 397 |
| | | [3.14] | [4.90] | [6.09] | [7.67] | [9.74] | [12.19] | [15.26] | [19.26] | [24.4] |
| Max. Speed, [RPM] | Cont. | 775 | 750 | 600 | 475 | 375 | 300 | 240 | 190 | 150 |
| | Int.* | 970 | 940 | 750 | 600 | 470 | 375 | 300 | 240 | 190 |
| Max. Torque daNm [in-lb] | Cont. | 10 [900] | 20 [1770] | 24 [2125] | 30 [2655] | 39 [3450] | 45 [4000] | 54 [4780] | 55 [4870] | 61 [5400] |
| | Int.* | 13 [1150] | 22 [1947] | 28 [2480] | 34 [3010] | 43 [3805] | 50 [4425] | 61 [5400] | 69 [6110] | 69 [6110] |
| | Peak** | 17 [1505] | 27 [2390] | 32 [2832] | 37 [3275] | 46 [4070] | 56 [4960] | 71 [6280] | 84 [7435] | 87 [7700] |
| Max. Output kW [HP] | Cont. | 7 [9.5] | 12,5 [17] | 13 [17.4] | 12,5[16.8] | 11,5[15.4] | 11 [14.8] | 10 [13.4] | 9 [12] | 7,8 [10.5] |
| | Int.* | 8,5 [11.9] | 15 [20.1] | 15 [20.1] | 14,5[19.5] | 14 [18.8] | 13 [17.4] | 12 [16.1] | 10 [13.4] | 10,6[14.2] |
| Max. Pressure Drop bar [PSI] | Cont. | 140[2030] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 135[1960] | 110[1600] |
| | Int.* | 175[2540] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 175[2540] | 140[2030] |
| | Peak** | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 210[3045] | 175[2540] |
| Max. Oil Flow lpm [GPM] | Cont. | 40 [10.5] | 60 [15.8] | 60 [15.8] | 60 [15.8] | 60 [15.8] | 60 [15.8] | 60 [15.8] | 60 [15.8] | 60 [15.8] |
| | Int.* | 50 [13.2] | 75 [19.8] | 75 [19.8] | 75 [19.8] | 75 [19.8] | 75 [19.8] | 75 [19.8] | 75 [19.8] | 75 [19.8] |
| Max. Inlet Pressure bar [PSI] | Cont. | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] |
| | Int.* | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] |
| | Peak** | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] |
| Max. Return Pres- sure with Drain Line bar [PSI] | Cont. | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] | 175[2540] |
| | Int.* | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] | 200[2900] |
| | Peak** | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] | 225[3260] |
| Max. Starting Pressure with Unloaded Shaft, bar [PSI] | | 10 [145] | 10 [145] | 10 [145] | 9 [130] | 7 [102] | 5 [73] | 4 [58] | 3 [44] | 3 [44] |
| Min. Starting Torque daNm [in-lb] | At max.press. | | | | | | | | | |
| | drop Cont. | 8 [710] | 15 [1330] | 20 [1770] | 25 [2215] | 32 [2832] | 41 [3630] | 50 [4425] | 50 [4425] | 50 [4425] |
| | At max.press. drop Int.* | 10 [885] | 17 [1505] | 23 [2035] | 28 [2480] | 37 [3275] | 46 [4070] | 55 [4870] | 66 [5840] | 61 [5400] |
| Min. Speed***, [RPM] | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Weight, kg [lb] | | | | | | | | | | |
| For rear ports: +0,650 [1.433] | | 6,9 [15,2] | 7 [15,4] | 7,3 [16.1] | 7,4 [16.3] | 7,6 [15.4] | 8,1 [18.9] | 8,5 [18.7] | 9,2 [20.3] | 9,9 [21.8] |

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

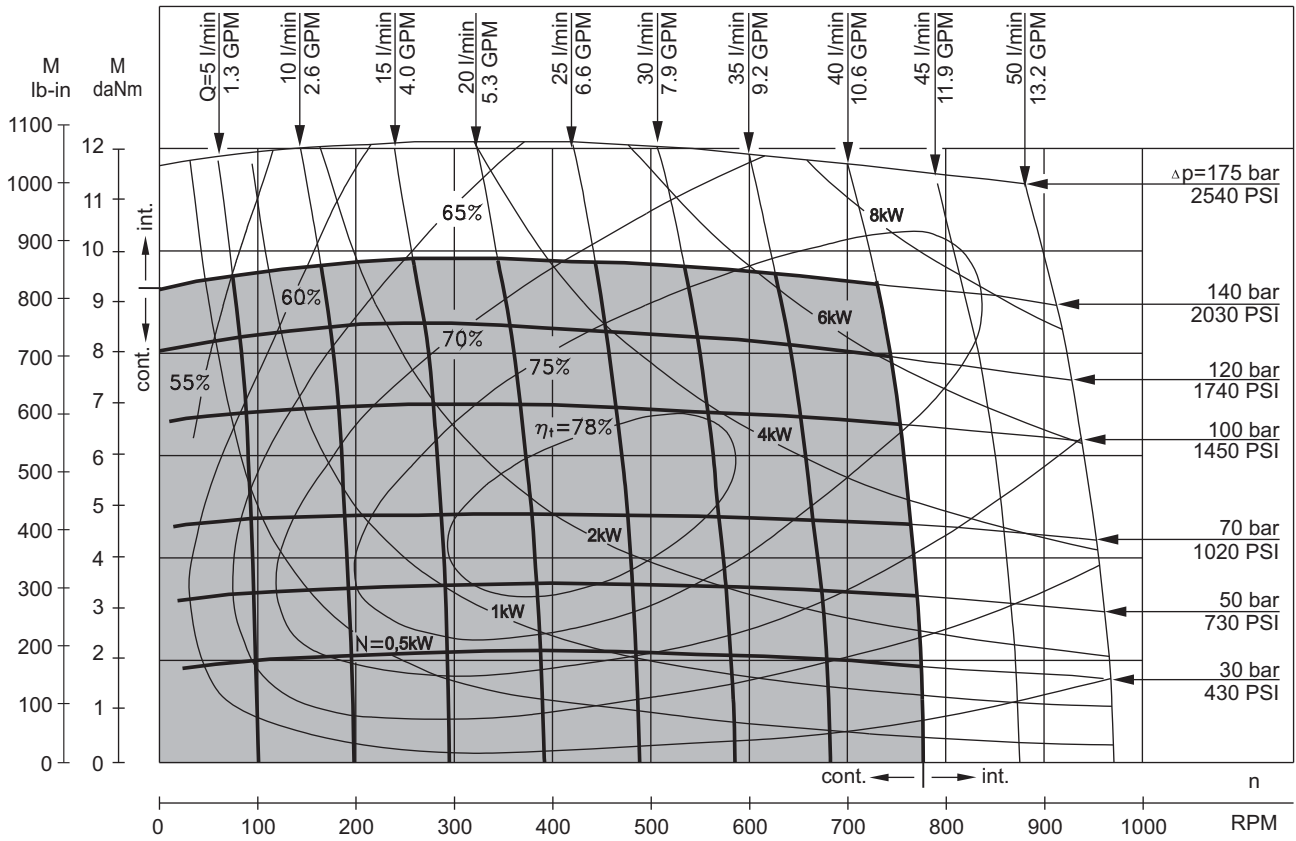
** Peak load: the permissible values may occur for max. 1% of every minute.

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

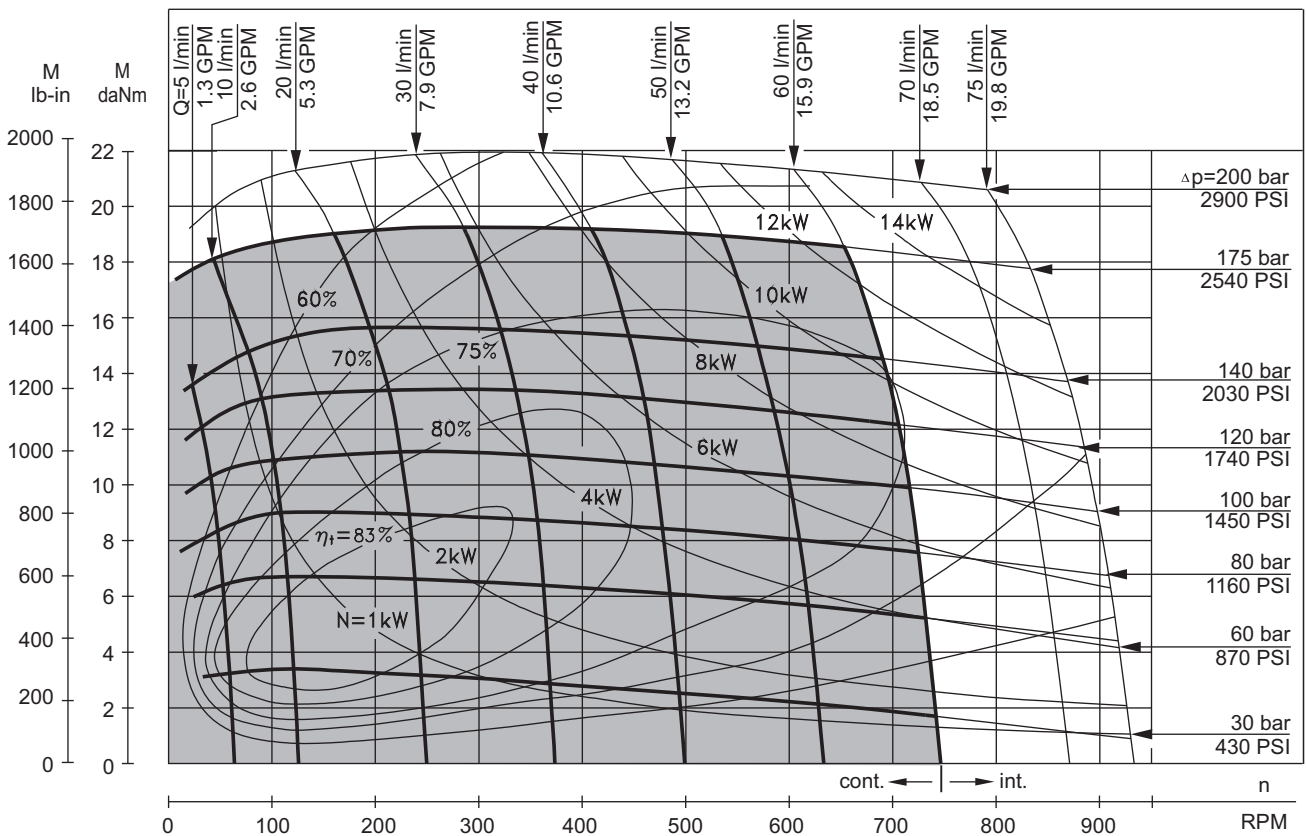
1. Intermittent speed and intermittent pressure must not occur simultaneously.
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).
If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

MR 50



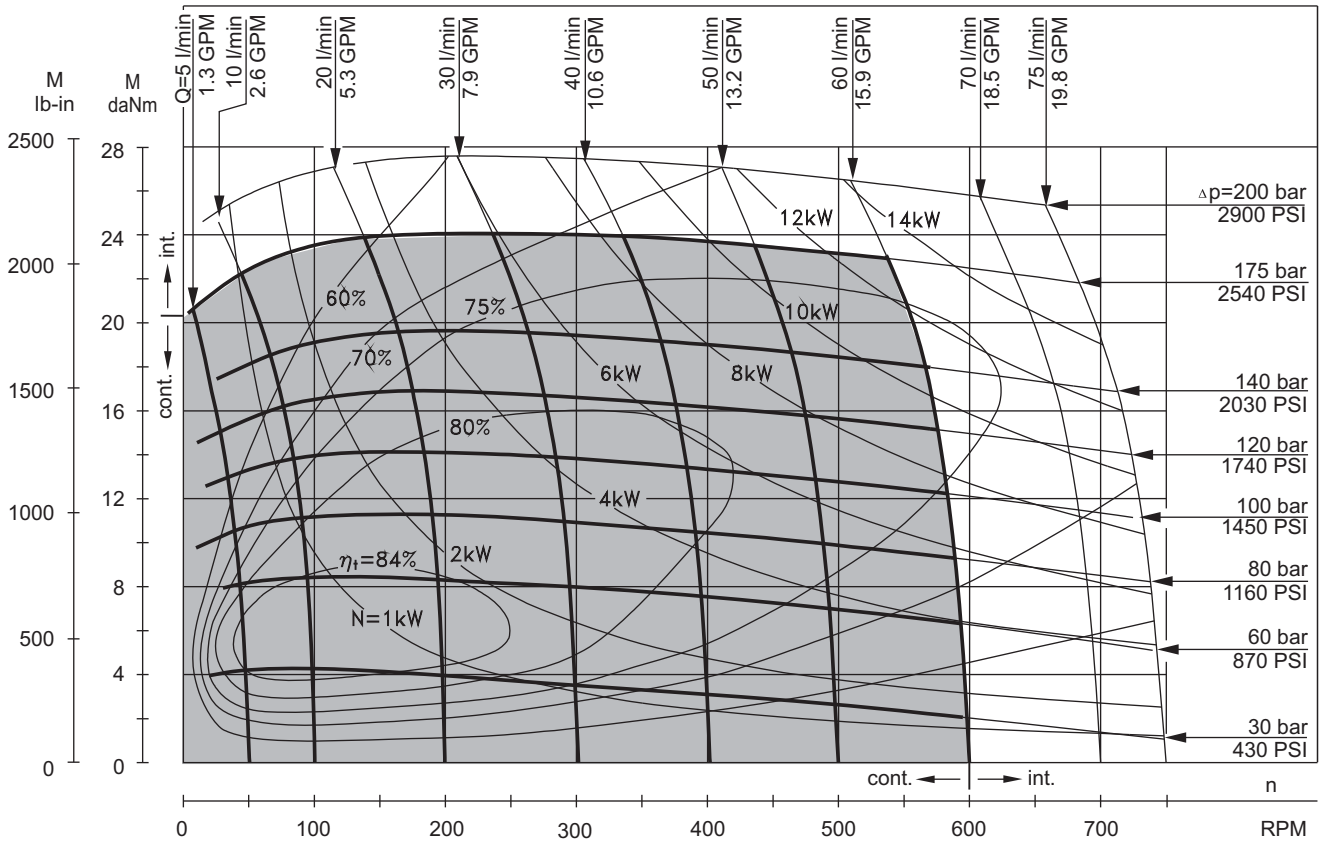
MR 80



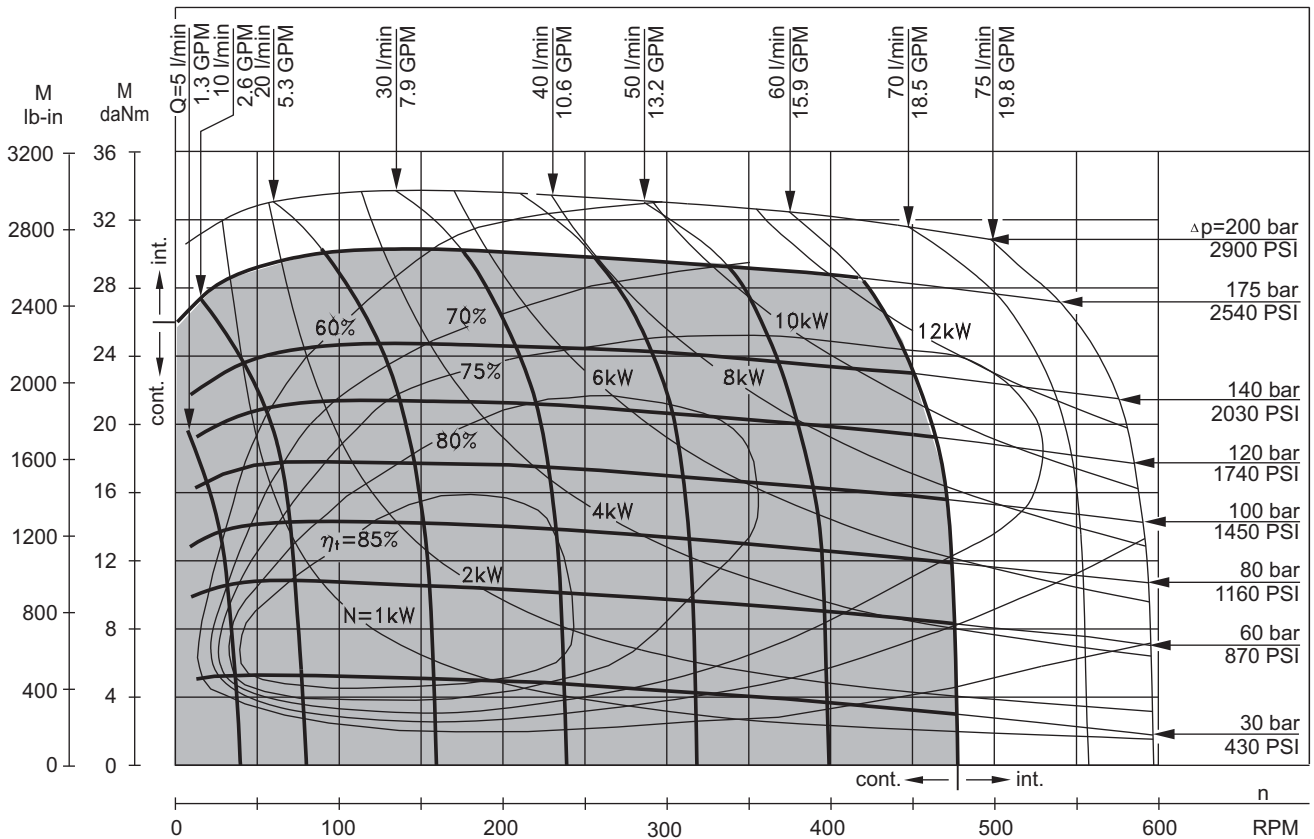
The function diagrams data is for average performance of randomly selected motors at back pressure 5 ± 10 bar [72.5 \pm 145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MR 100



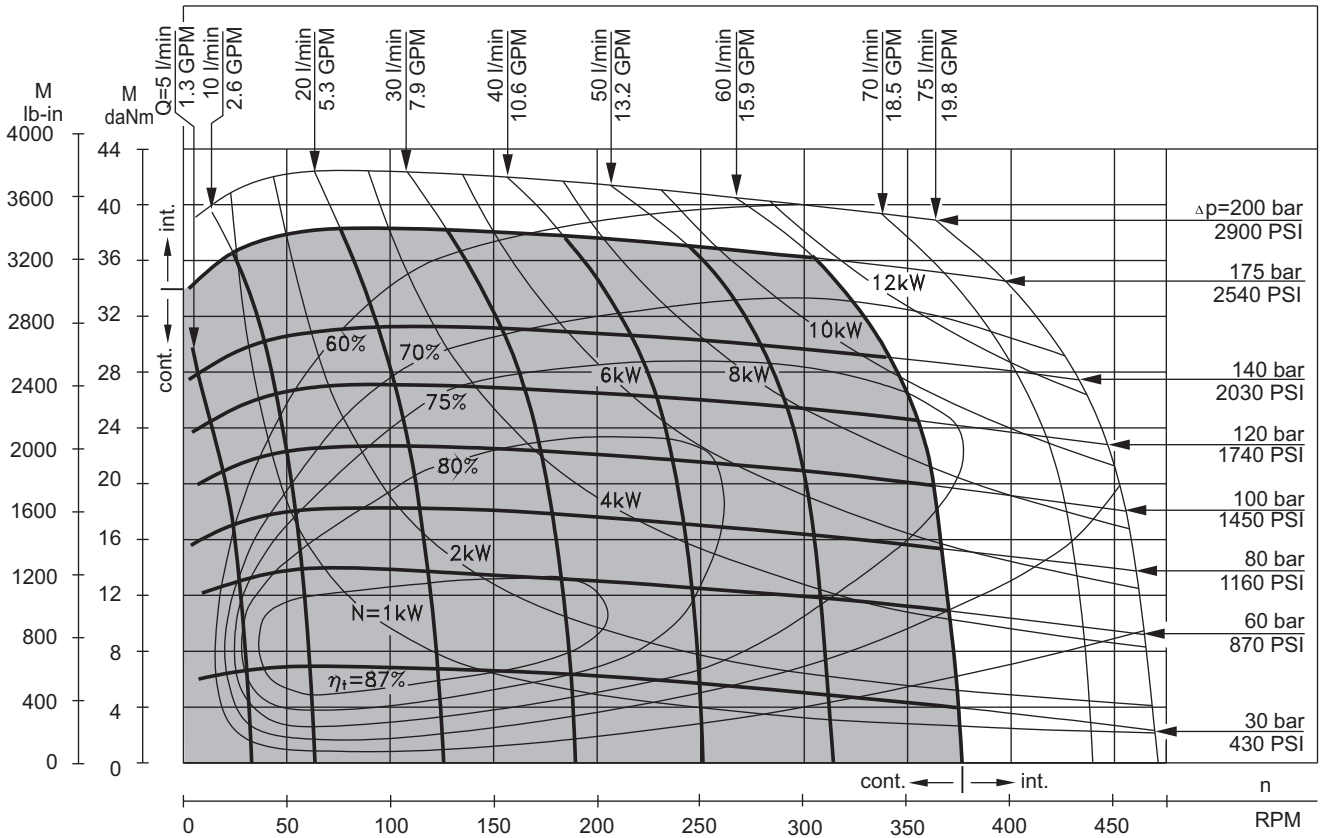
MR 125



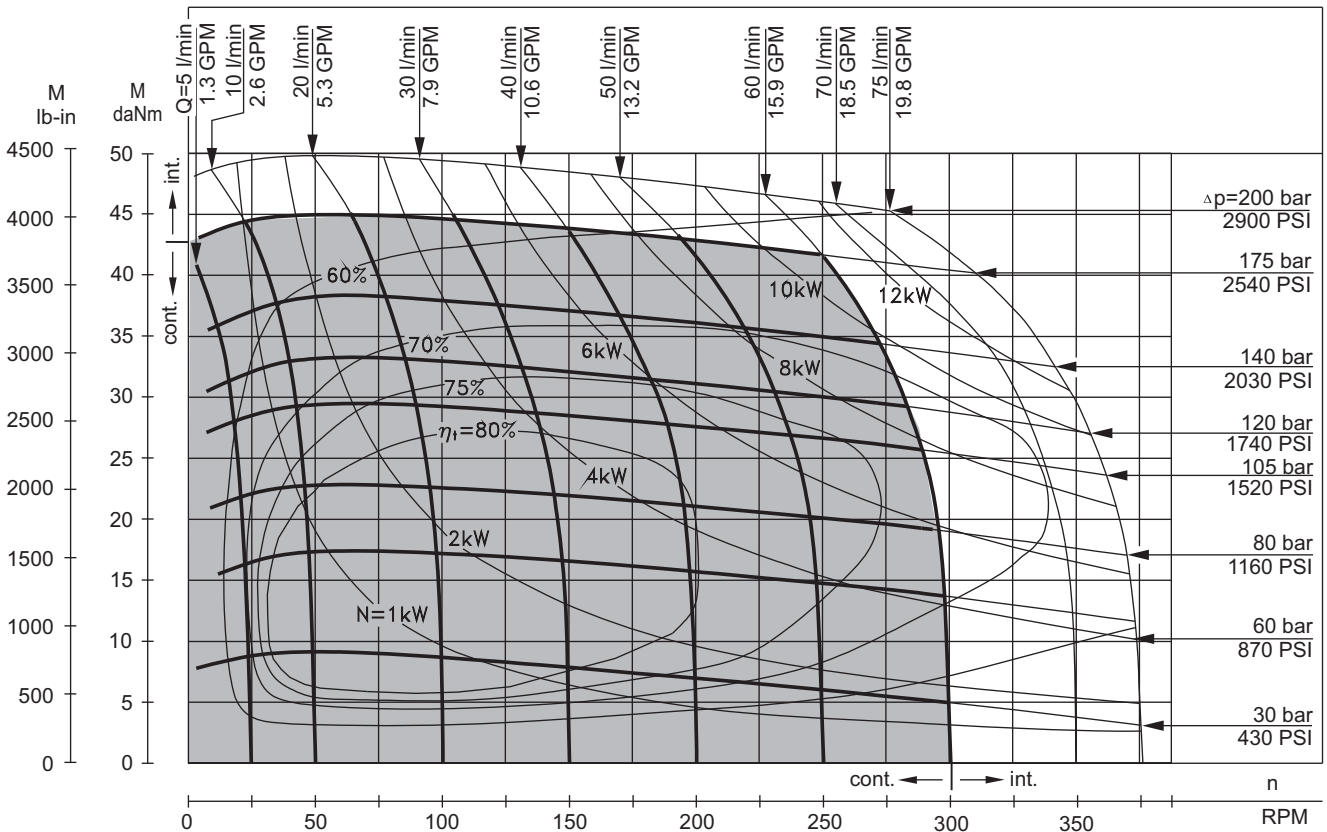
The function diagrams data is for average performance of randomly selected motors at back pressure $5 \pm 10 \text{ bar}$ [72.5±145 PSI] and oil with viscosity of $32 \text{ mm}^2/\text{s}$ [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MR 160



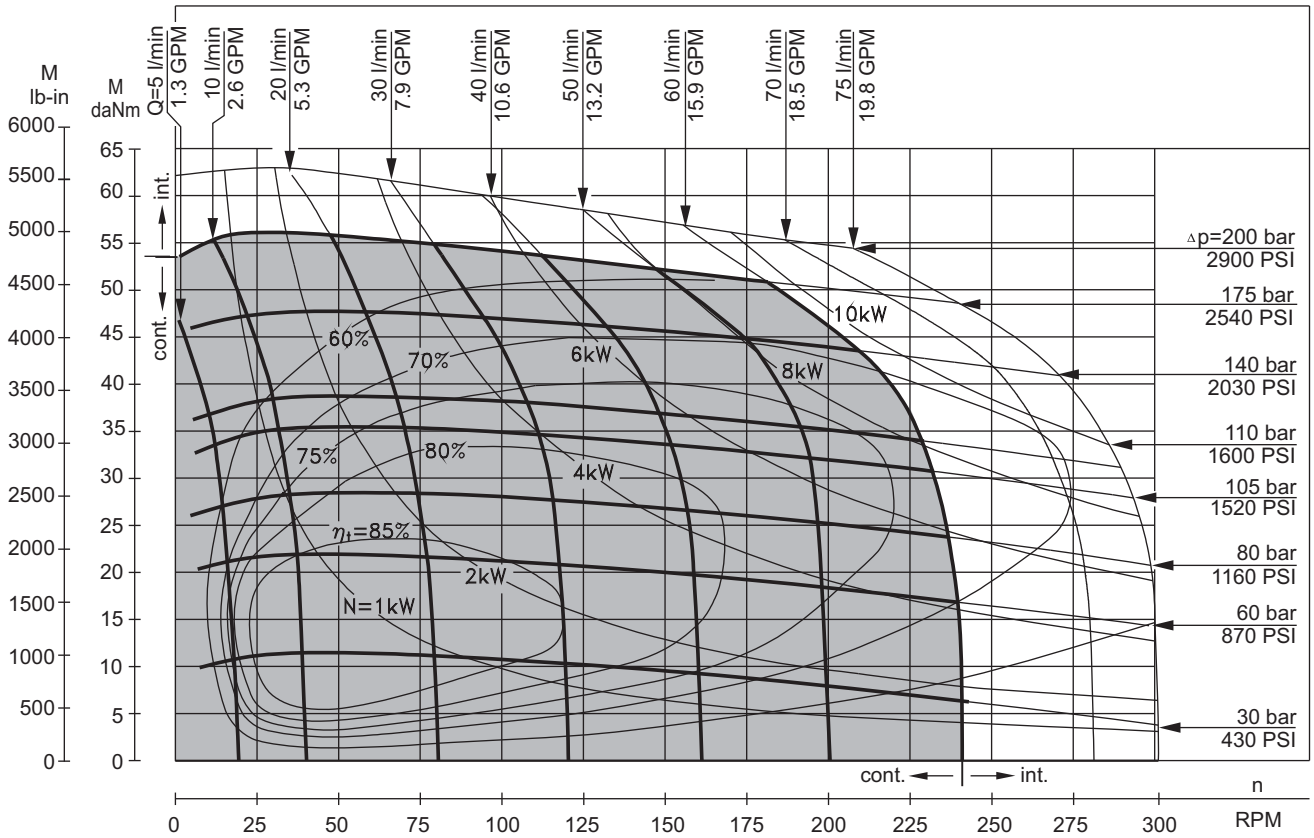
MR 200



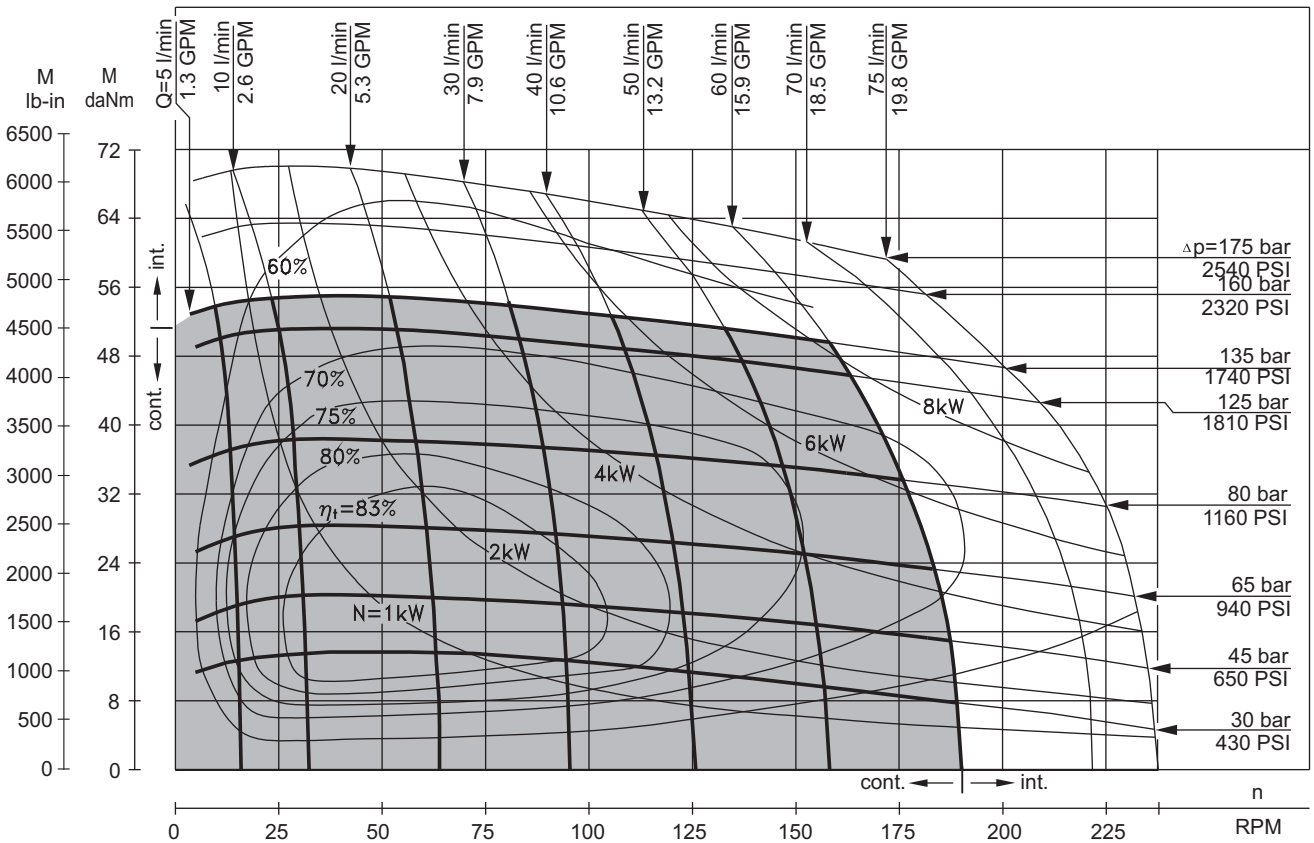
The function diagrams data is for average performance of randomly selected motors at back pressure 5 ± 10 bar [72.5 \pm 145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MR 250



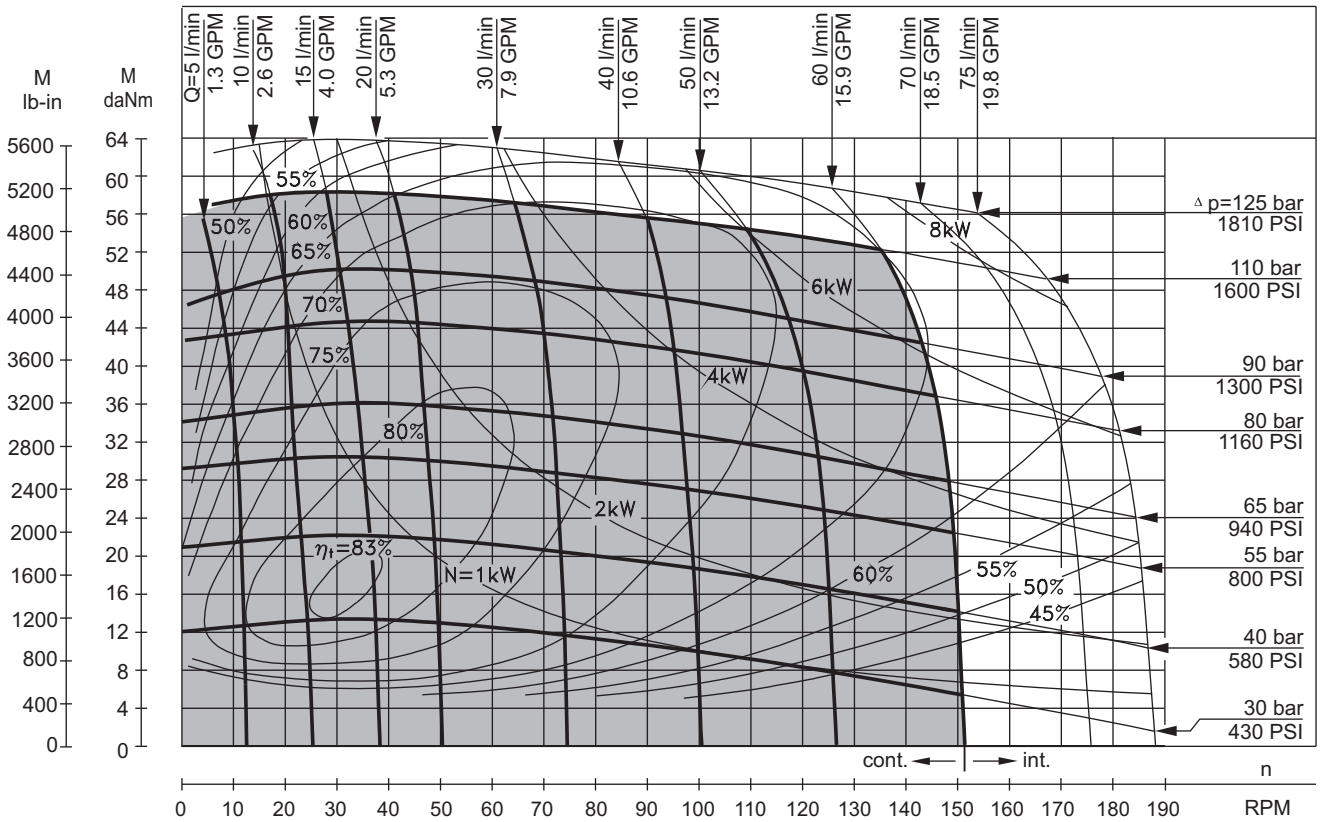
MR 315



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].

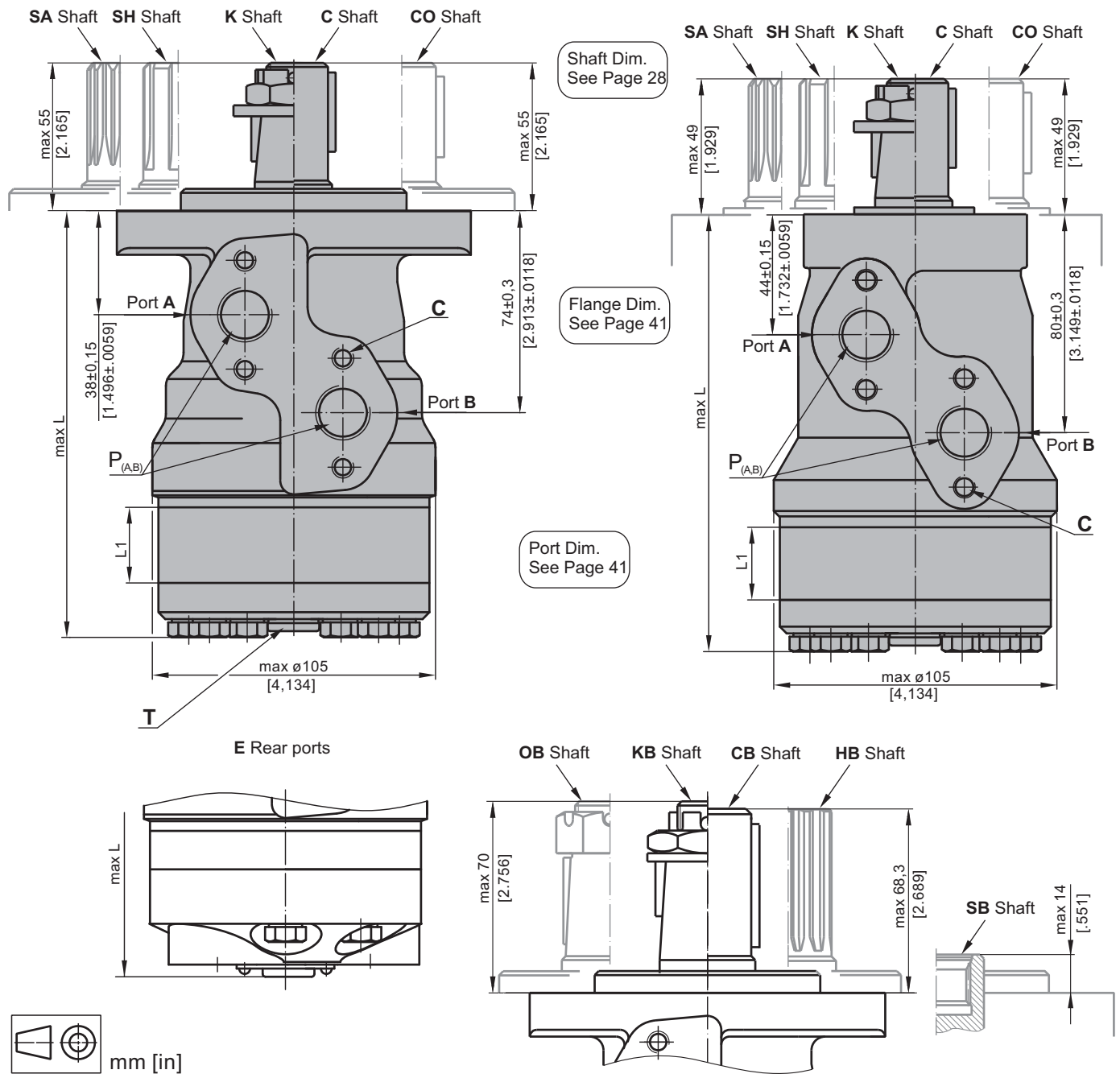
FUNCTION DIAGRAMS

MR 400



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



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

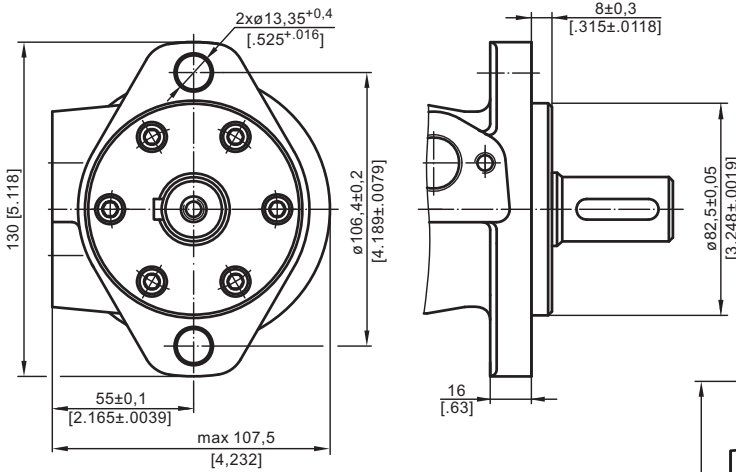
Standard Rotation
 Viewed from Shaft End
 Port A Pressurized - **CW**
 Port B Pressurized - **CW**

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

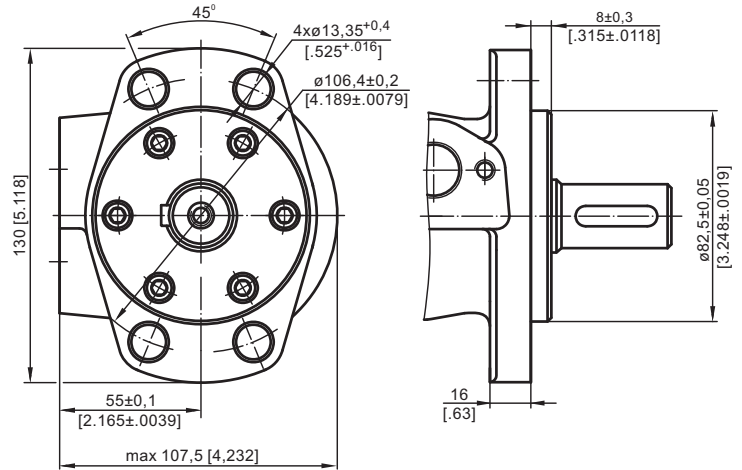
| Type | L, mm [in] | Type | L, mm [in] | Type | L, mm [in] | Type | L, mm [in] | L ₁ , mm [in] |
|-----------|--------------|---------|--------------|------------|--------------|----------|--------------|--------------------------|
| MR(F) 50 | 138,0 [5.43] | MRQ 50 | 143,5 [5.65] | MR(F)E 50 | 157,5 [6.20] | MRQE 50 | 163,5 [6.44] | 9,0 [.35] |
| MR(F) 80 | 143,0 [5.63] | MRQ 80 | 148,5 [5.85] | MR(F)E 80 | 162,5 [6.40] | MRQE 80 | 168,5 [6.63] | 14,0 [.55] |
| MR(F) 100 | 146,0 [5.75] | MRQ 100 | 152,0 [5.98] | MR(F)E 100 | 165,5 [6.52] | MRQE 100 | 171,5 [6.75] | 17,4 [.69] |
| MR(F) 125 | 150,5 [5.93] | MRQ 125 | 156,5 [6.16] | MR(F)E 125 | 170,0 [6.69] | MRQE 125 | 176,0 [6.93] | 21,8 [.86] |
| MR(F) 160 | 156,5 [6.16] | MRQ 160 | 162,5 [6.40] | MR(F)E 160 | 176,0 [6.93] | MRQE 160 | 182,0 [7.17] | 27,8 [1.09] |
| MR(F) 200 | 163,5 [6.44] | MRQ 200 | 169,5 [6.67] | MR(F)E 200 | 183,0 [7.20] | MRQE 200 | 189,0 [7.44] | 34,8 [1.37] |
| MR(F) 250 | 172,0 [6.77] | MRQ 250 | 179,0 [7.05] | MR(F)E 250 | 192,0 [7.56] | MRQE 250 | 198,0 [7.80] | 43,5 [1.71] |
| MR(F) 315 | 183,0 [7.20] | MRQ 315 | 189,0 [7.44] | MR(F)E 315 | 204,0 [8.03] | MRQE 315 | 210,0 [8.27] | 54,8 [2.16] |
| MR(F) 400 | 198,0 [7.80] | MRQ 400 | 204,0 [8.03] | MR(F)E 400 | 218,0 [8.58] | MRQE 400 | 224,0 [8.82] | 69,4 [2.73] |

MOUNTING

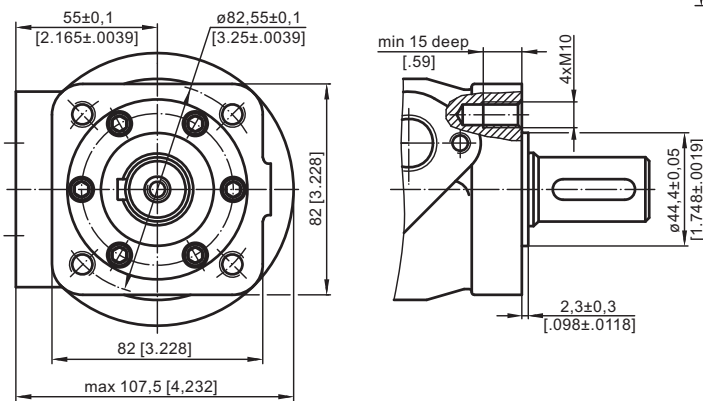
Oval Mount (2 Holes)



F - Oval Mount (4 Holes)

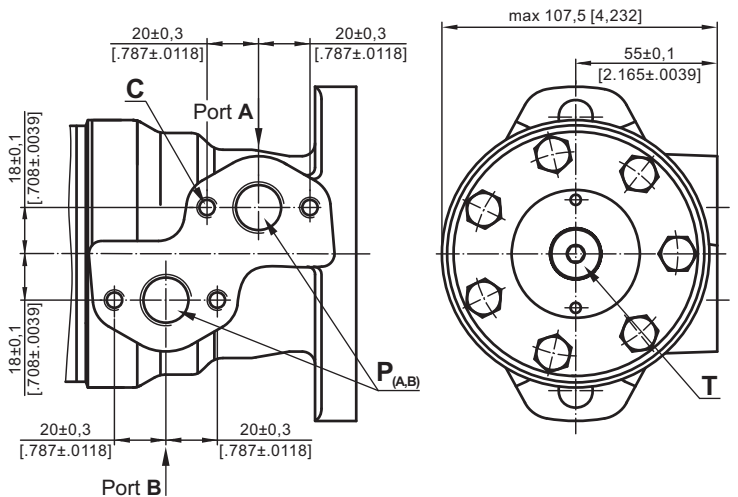


Q - Square Mount (4 Bolts)

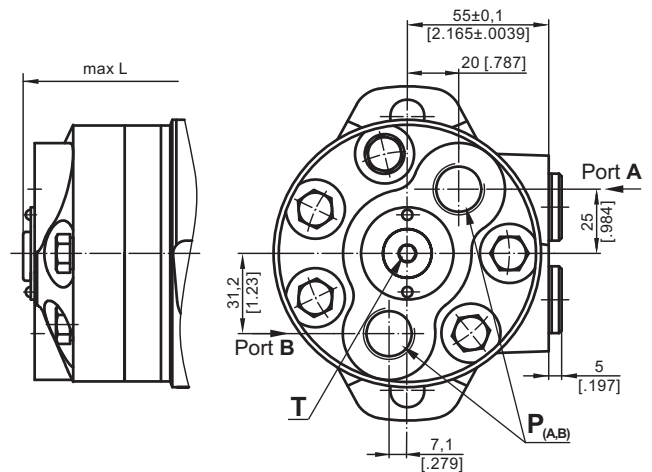


PORTS

Side Ports



E Rear Ports



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

- 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

ORDER CODE

| | | | | | | | | | | |
|------------|---|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| M R | | | | | | | | | | |

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

- 50** - 51,5 cm³/rev [3.14 in³/rev]
- 80** - 80,3 cm³/rev [4.90 in³/rev]
- 100** - 99,8 cm³/rev [6.09 in³/rev]
- 125** - 125,7 cm³/rev [7.67 in³/rev]
- 160** - 159,6 cm³/rev [9.74 in³/rev]
- 200** - 199,8 cm³/rev [12.19 in³/rev]
- 250** - 250,1 cm³/rev [15.26 in³/rev]
- 315** - 315,7 cm³/rev [19.26 in³/rev]
- 400** - 397,0 cm³/rev [24.40 in³/rev]

Pos.5 - Shaft Extensions* (see page 28)

- C** - ø25 straight, Parallel key A8x7x32 DIN6885
- VC** - ø25 straight, Parallel key A8x7x32 DIN6885
with corrosion resistant bushing
- CO** - ø1" straight, Parallel key ¼"x¼"x1¼" BS46
- VCO** - ø1" straight, Parallel key ¼"x¼"x1¼" BS46
with corrosion resistant bushing
- SH** - ø25,32 splined BS 2059 (SAE 6B)
- VSH** - ø25,32 splined BS 2059 (SAE 6B)
with corrosion resistant bushing
- K** - ø28,56 tapered 1:10, Parallel key B5x5x14 DIN6885
- SA** - ø24,5 splined B 25x22 DIN 5482
- VSA** - ø24,5 splined B 25x22 DIN 5482
with corrosion resistant bushing
- CB** - ø32 straight, Parallel key A10x8x45 DIN6885
- KB** - ø35 tapered 1:10, Parallel key B6x6x20 DIN6885
- SB** - splined A 25x22 DIN 5482
- OB** - ø1¼" tapered 1:8, Parallel key ⅝"x⅝"x1¼" BS46
- HB** - ø1¼" splined 14T ANSI B92.1 - 1976

Pos. 6 - Shaft Seal Version (see page 30)

- omit - Low pressure shaft seal or Standard shaft seal for "...B" shaft
- 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 (see page 120)
Pos.10 - Design Series

- omit - Factory specified

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 permissible output torque for shafts must not be exceeded!

The hydraulic motors are mangano-phosphatized as standard.