

**Langsamlaufende Hydraulikmotoren
Serie MR, MR....., MH**

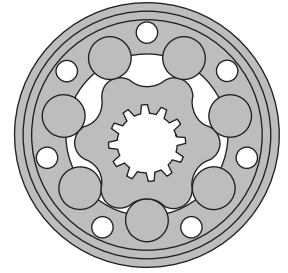
**Moteurs hydrauliques semi-rapides
Série MR, MR....., MH**

HYDRAULIC MOTORS MR



APPLICATION

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



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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

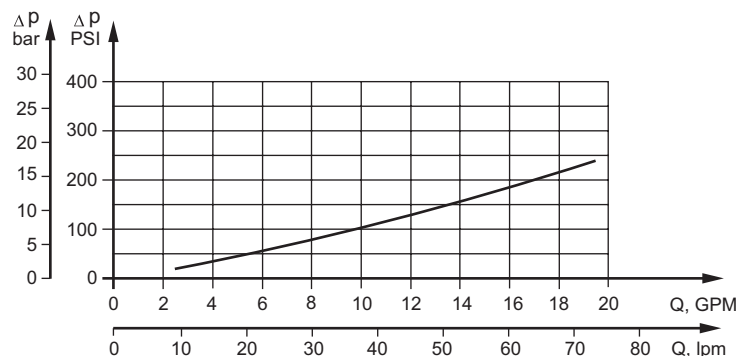
GENERAL

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 micron)

Oil flow in drain line

Pressure drop bar [PSI]	Viscosity mm ² /s [SUS]	Oil flow in drain line lpm [GPM]
140 [2030]	20 [98]	2,5 [.660]
	35 [164]	1,8 [.476]
210 [3045]	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, cm³/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	
	Int.*	970	940	750	600	470	375	300	240	
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 Pressure 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]	7,6 [15.4]	7,2 [14.7]	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, 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]	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.

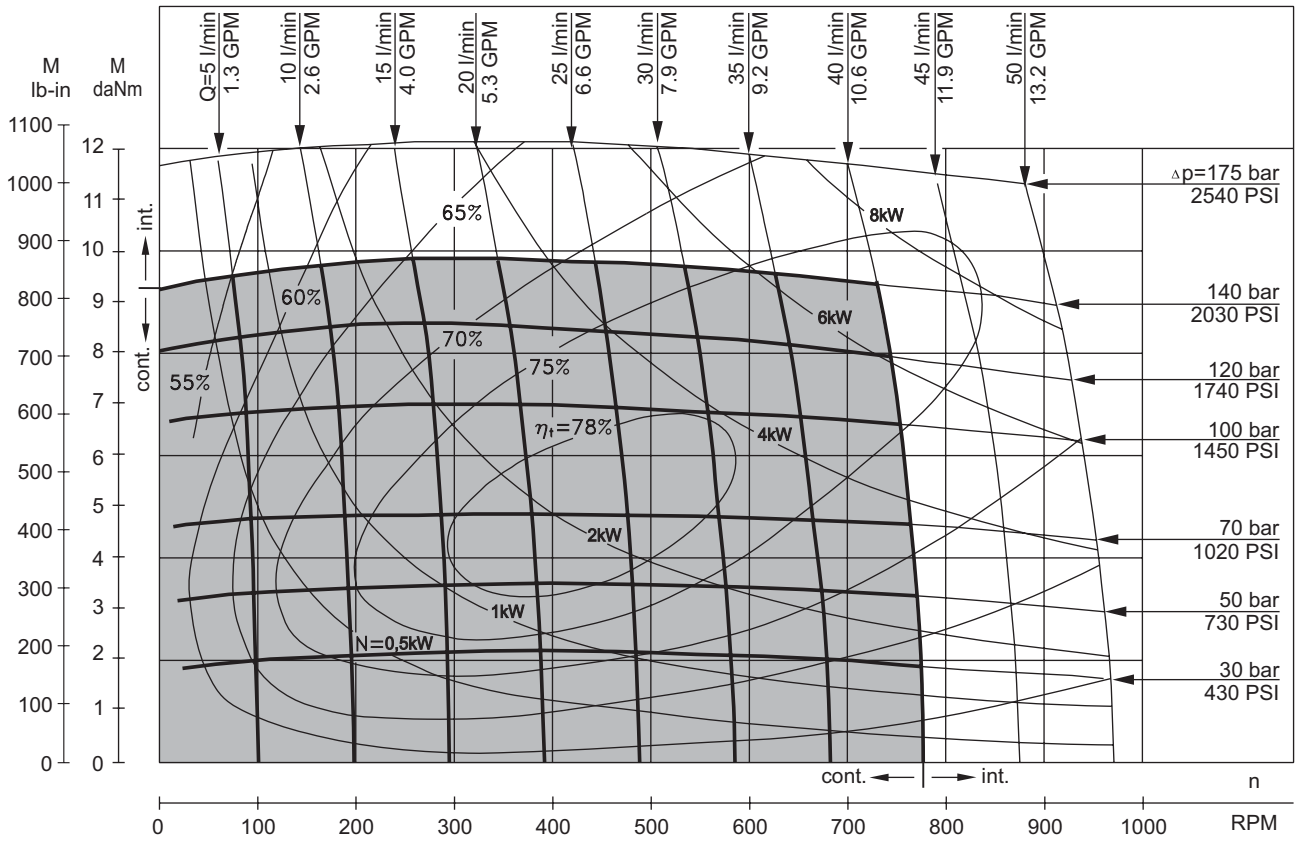
** Peak load: the permissible values may occur for max. 1% of every minute.

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

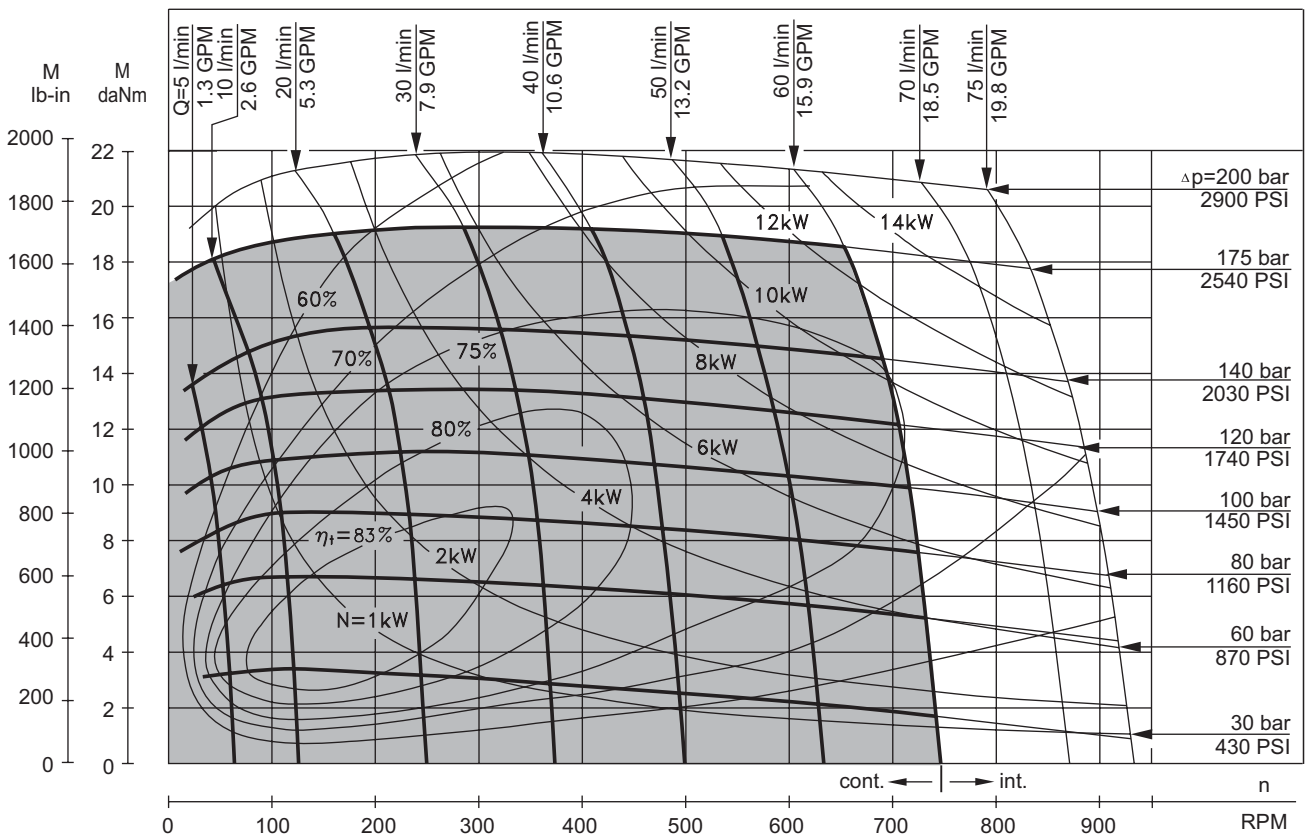
- Intermittent speed and intermittent pressure must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).
If using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

FUNCTION DIAGRAMS

MR 50



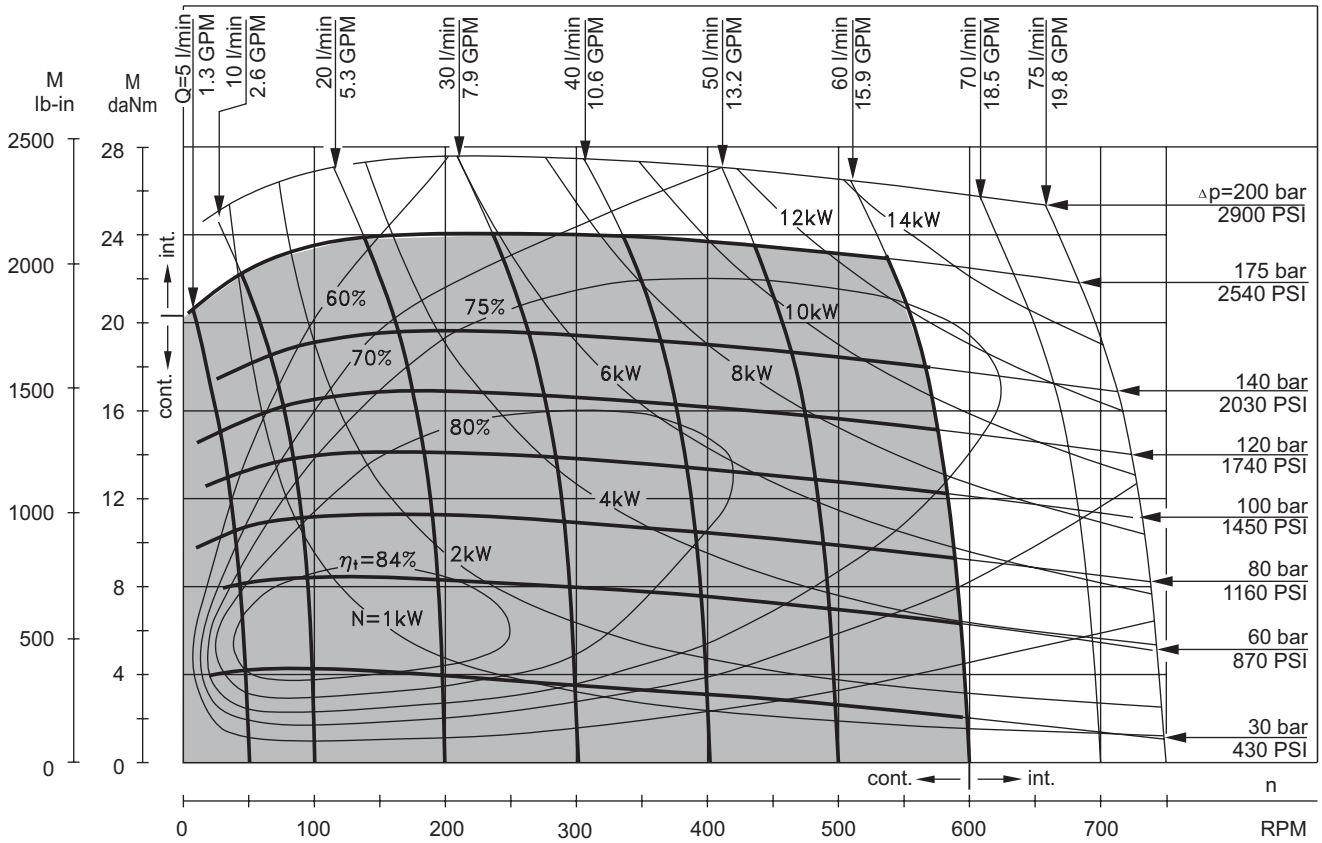
MR 80



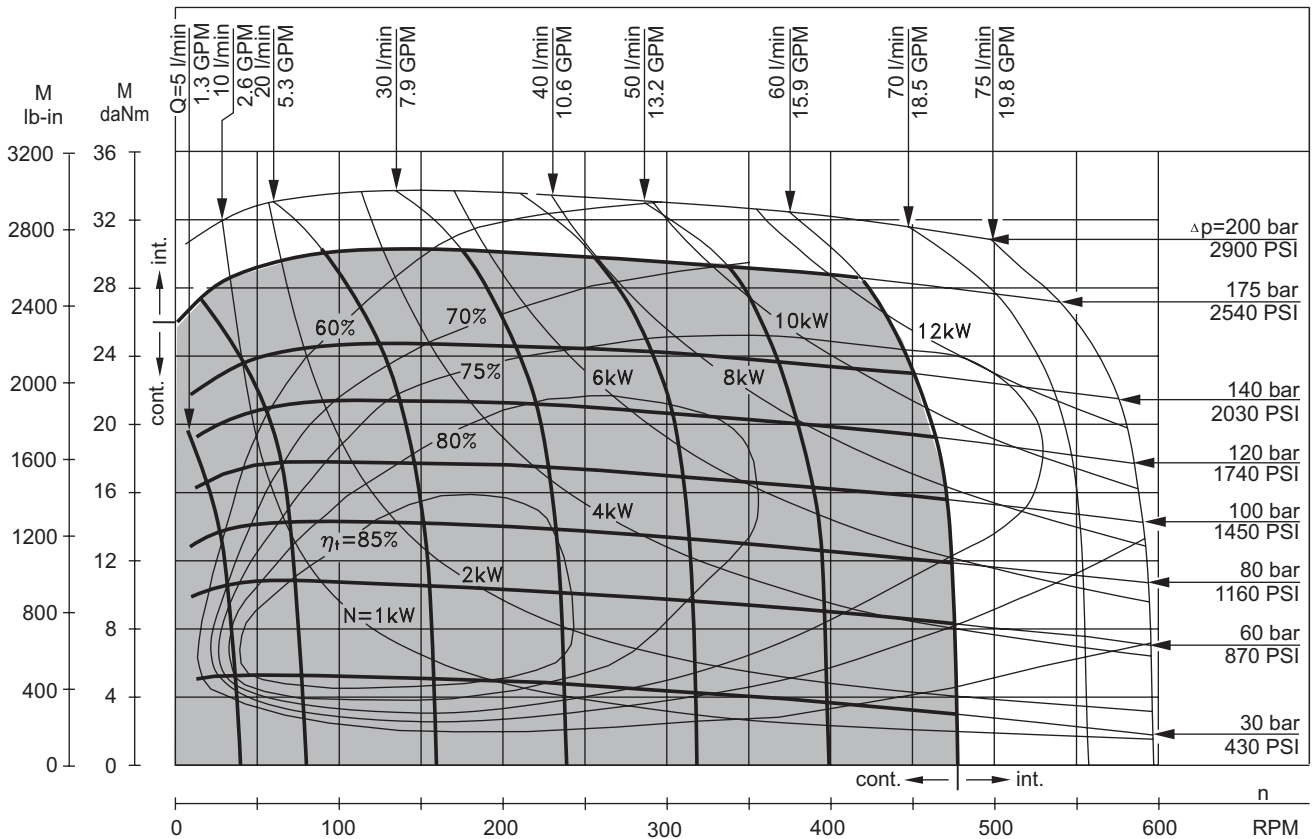
The function diagrams data is for average performance of randomly selected motors at back pressure 5 ± 10 bar [72.5 \pm 145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MR 100



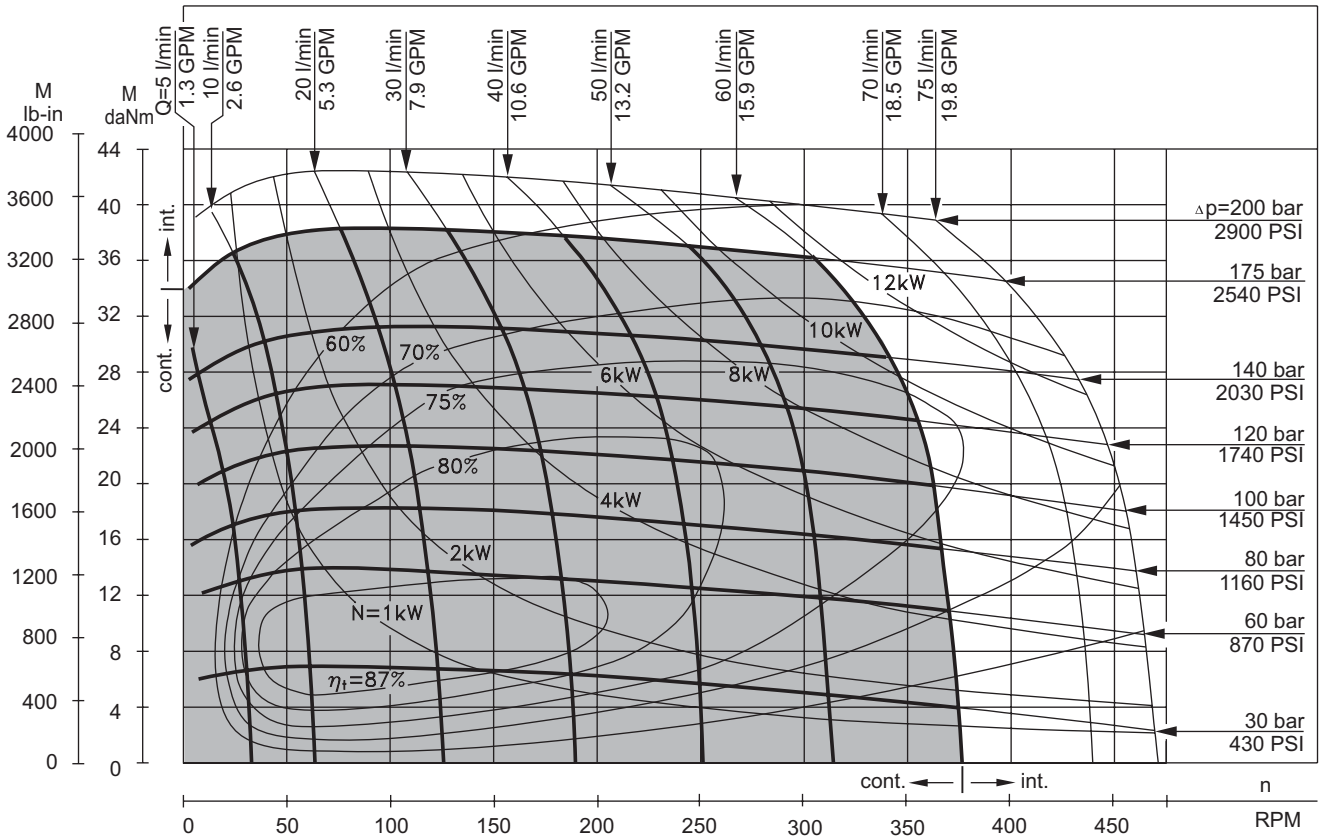
MR 125



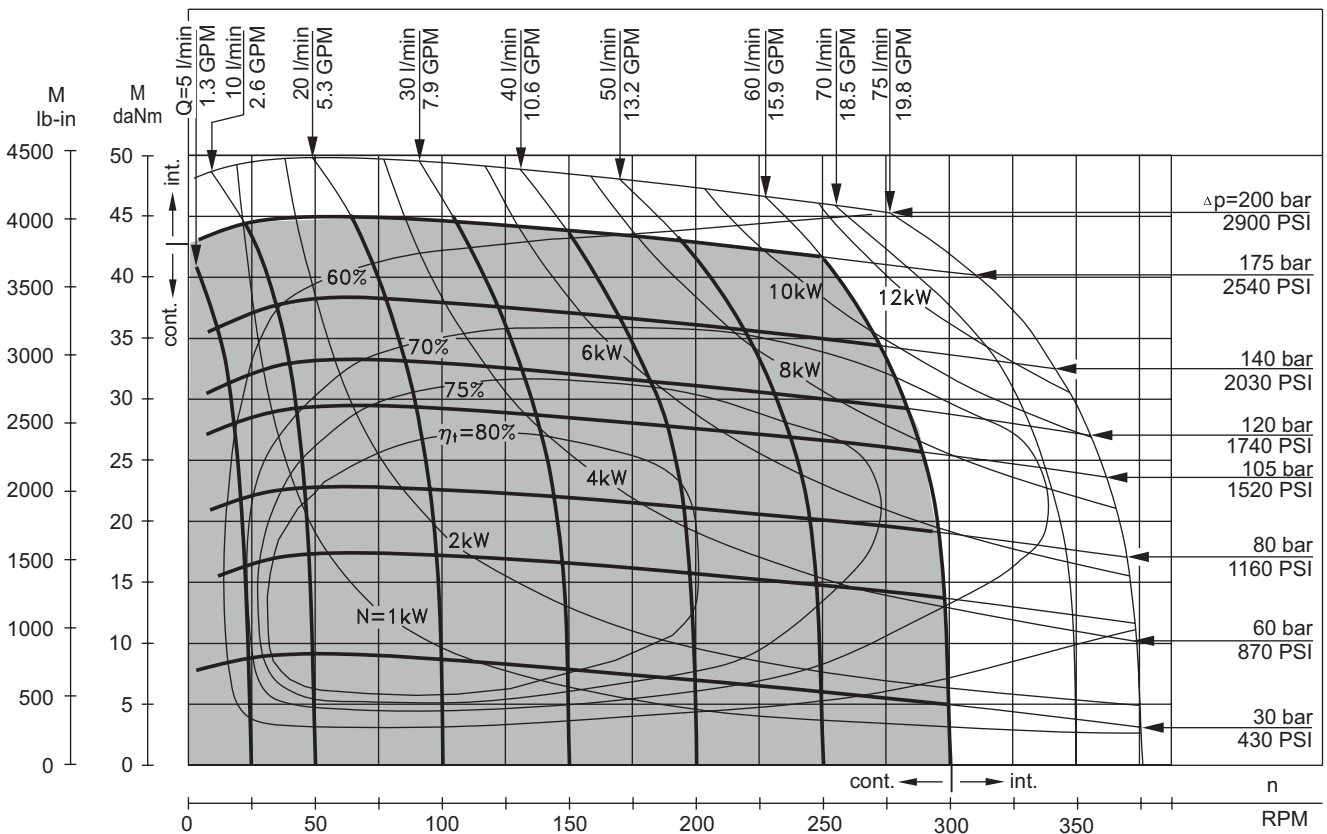
The function diagrams data is for average performance of randomly selected motors at back pressure 5 ± 10 bar [72.5 \pm 145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MR 160



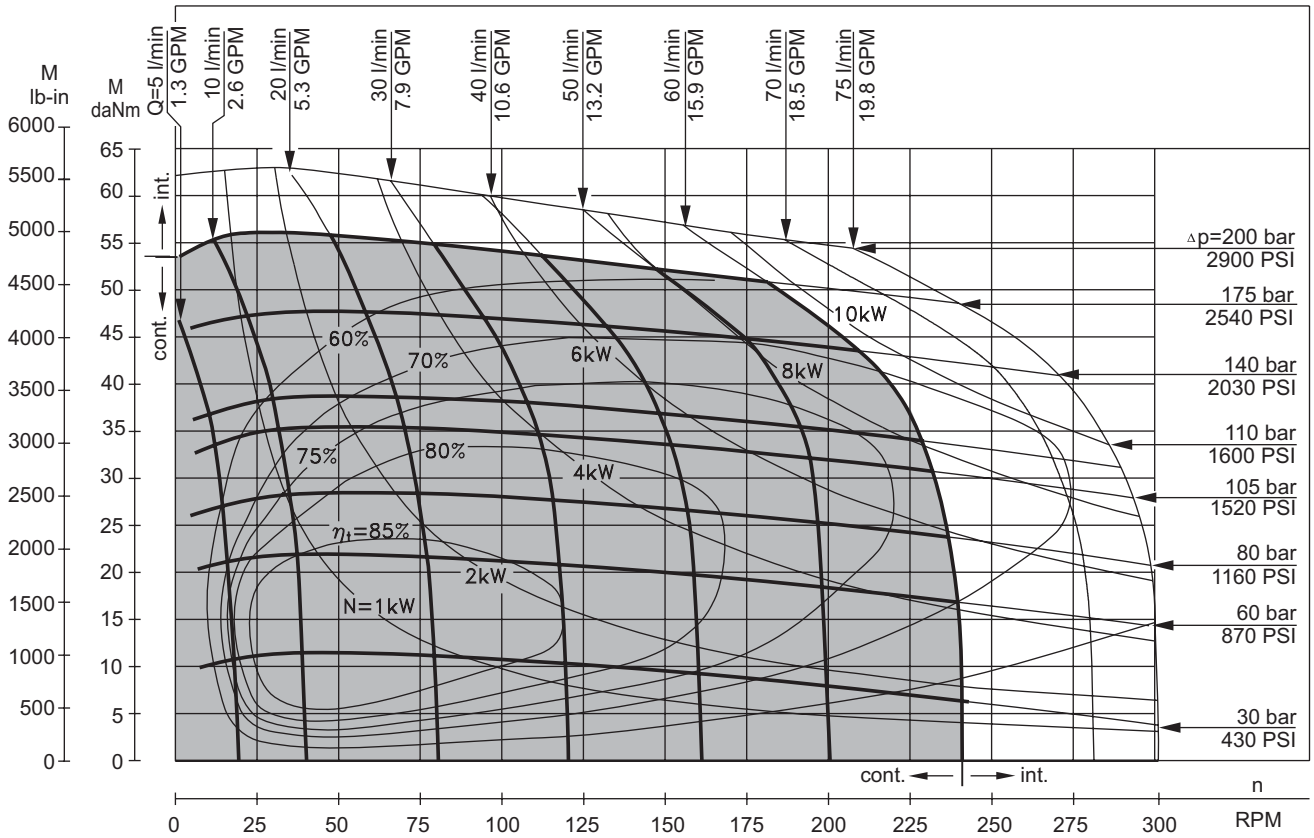
MR 200



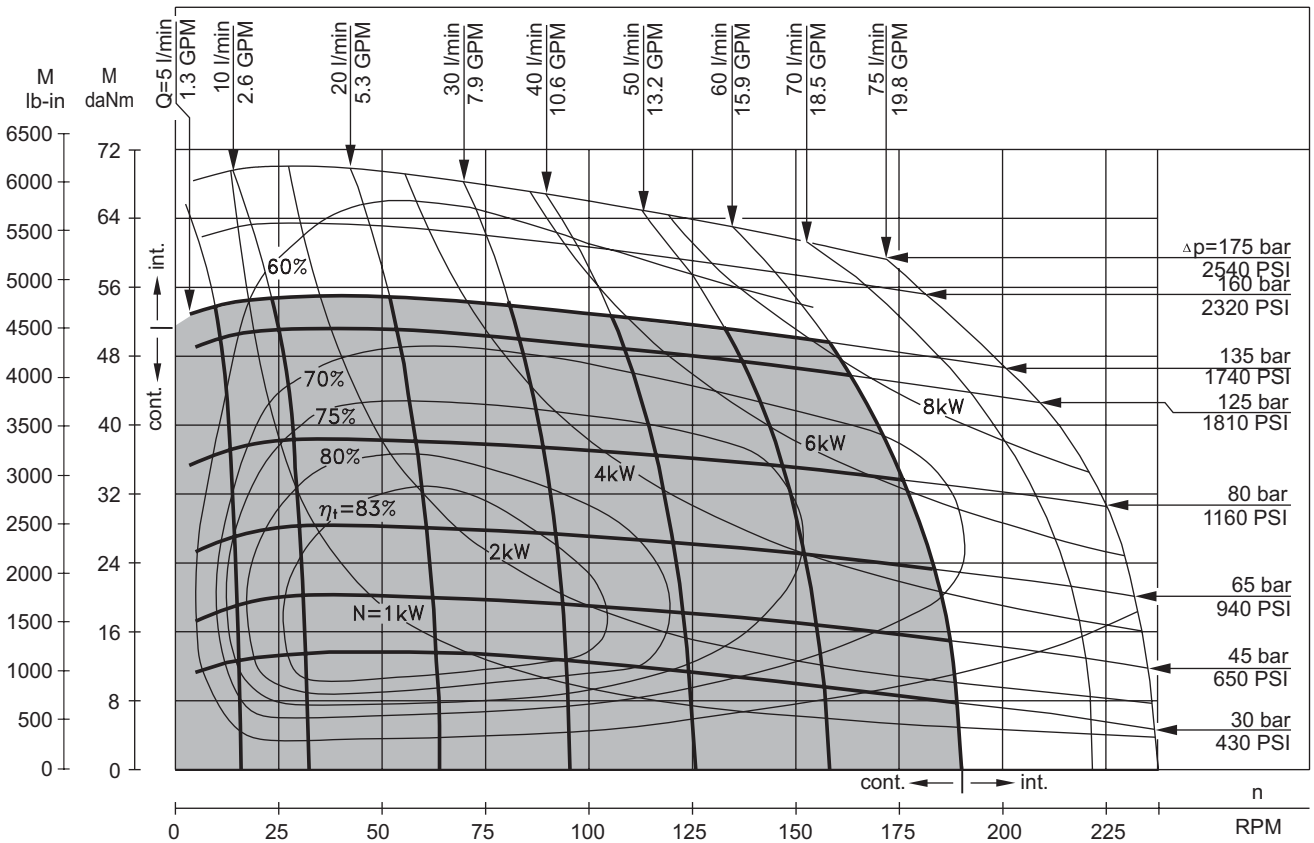
The function diagrams data is for average performance of randomly selected motors at back pressure 5±10 bar [72.5±145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MR 250



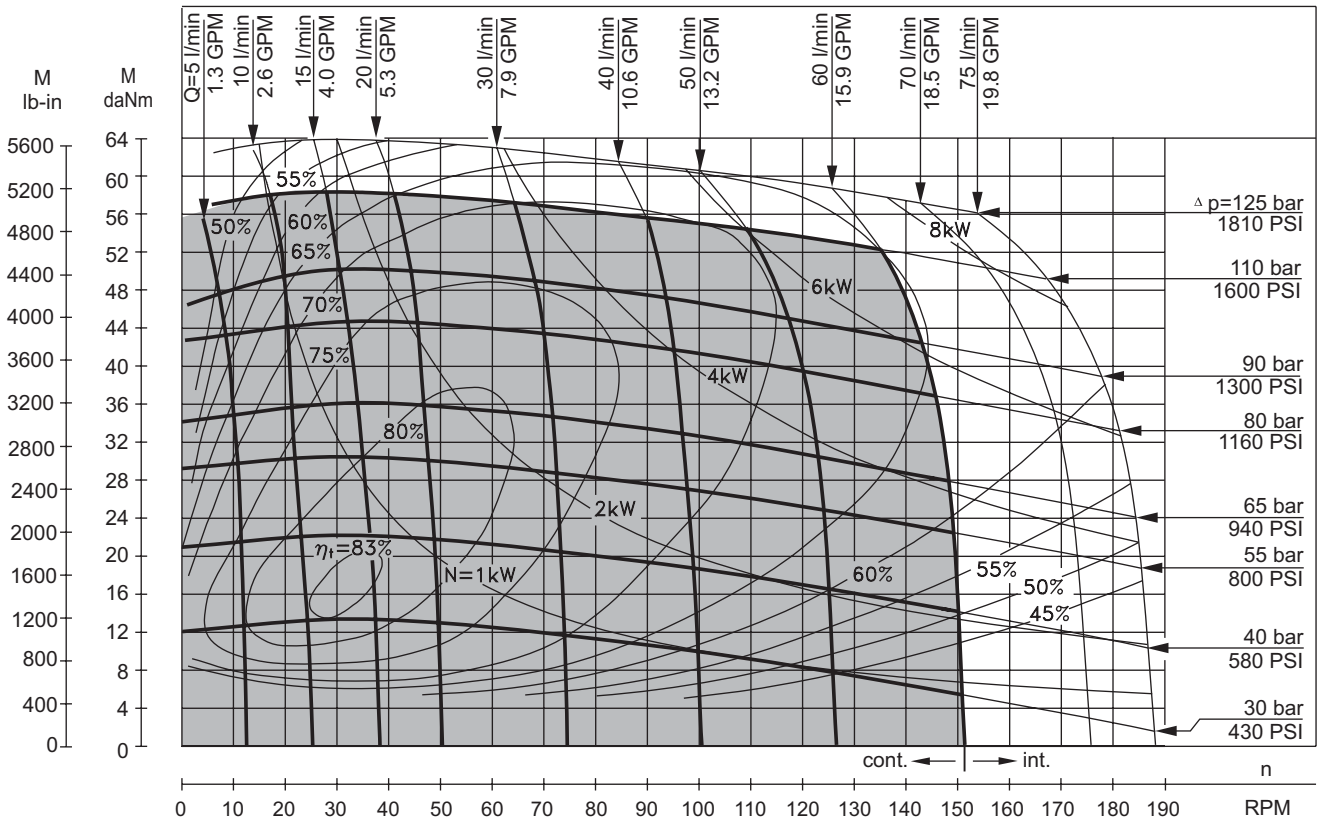
MR 315



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].

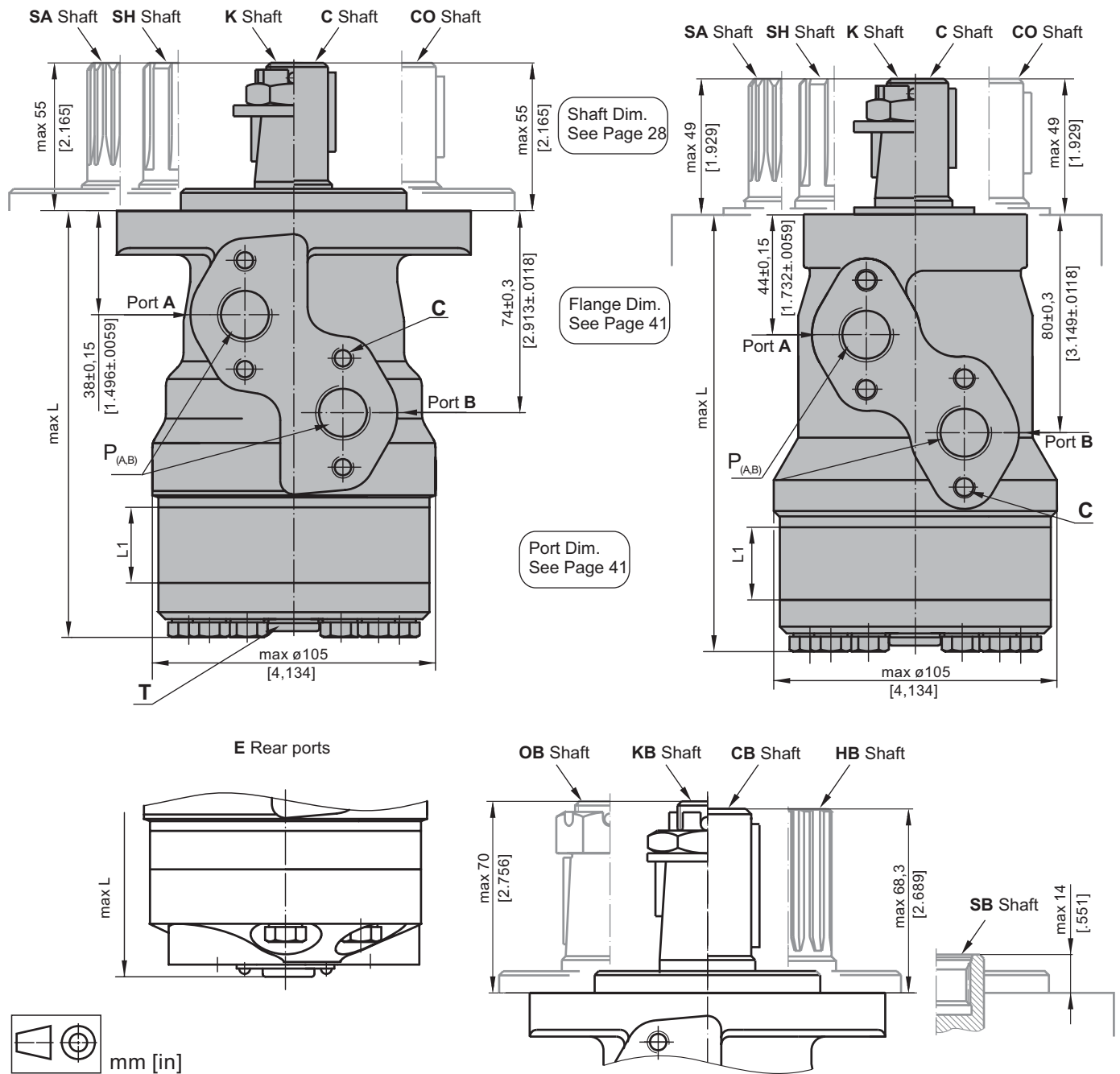
FUNCTION DIAGRAMS

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)

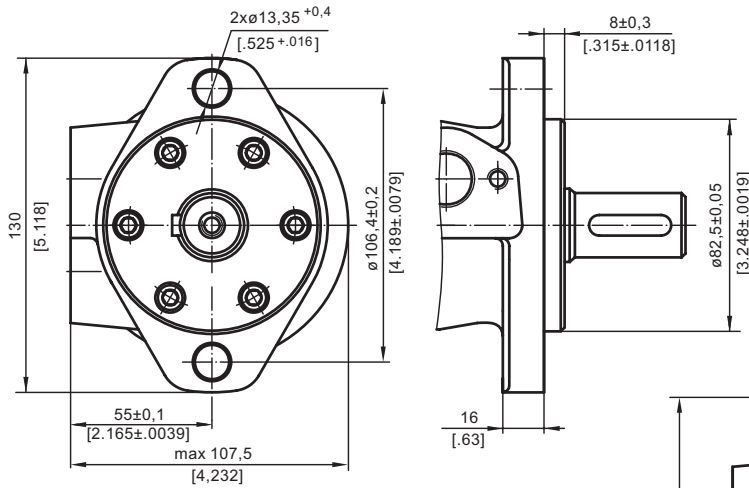
Standard Rotation
 Viewed from Shaft End
 Port A Pressurized - **CW**
 Port B Pressurized - **CW**

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

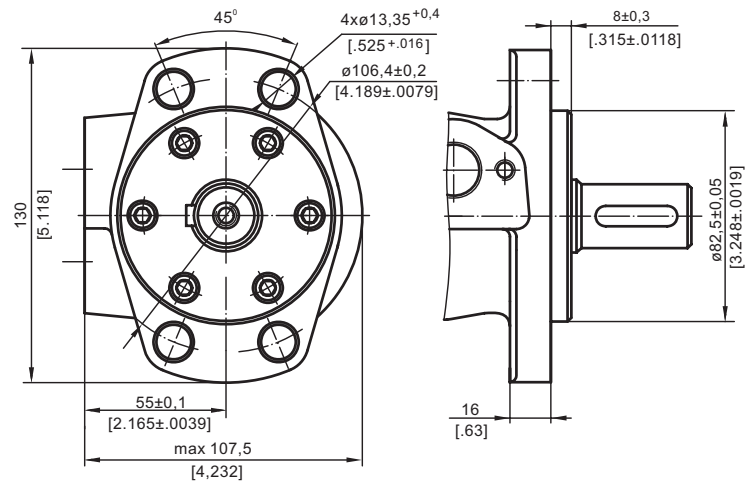
Type	L, mm [in]	Type	L, mm [in]	Type	L, mm [in]	Type	L, mm [in]	L ₁ , mm [in]
MR(F) 50	138,0 [5.43]	MRQ 50	143,5 [5.65]	MR(F)E 50	157,5 [6.20]	MRQE 50	163,5 [6.44]	9,0 [.35]
MR(F) 80	143,0 [5.63]	MRQ 80	148,5 [5.85]	MR(F)E 80	162,5 [6.40]	MRQE 80	168,5 [6.63]	14,0 [.55]
MR(F) 100	146,0 [5.75]	MRQ 100	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

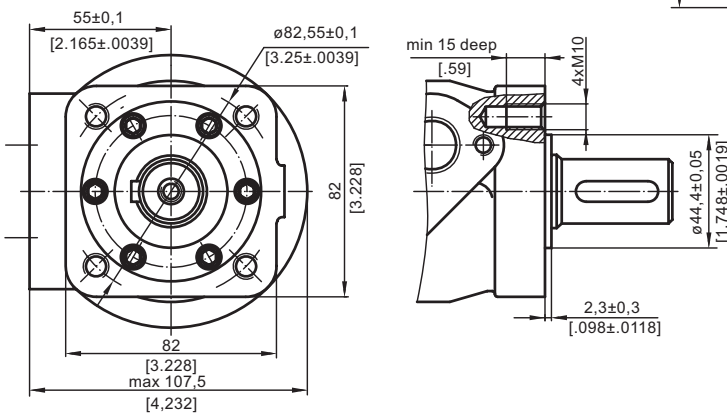
Oval Mount (2 Holes)



F - Oval Mount (4 Holes)

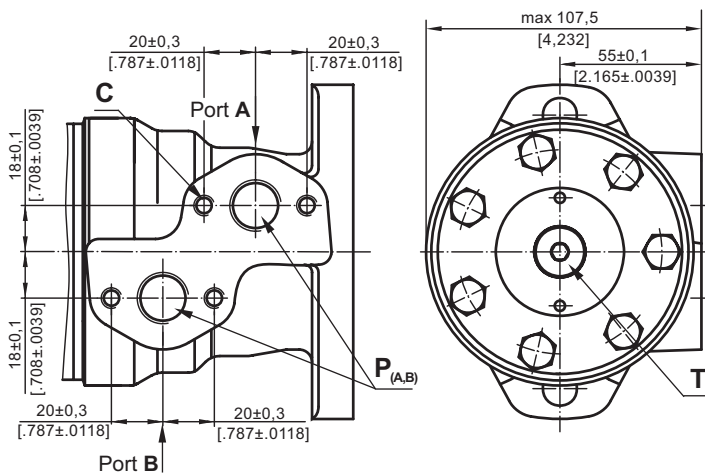


Q - Square Mount (4 Bolts)

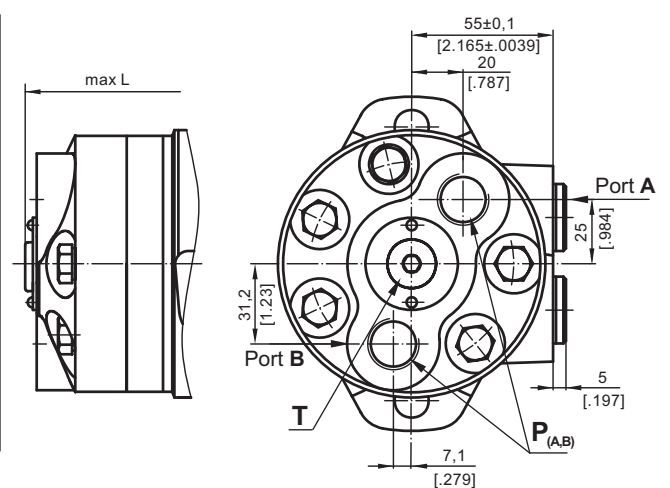


PORTS

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

W - Wheel mount

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 1/4"x1/4"x1 1/4" BS46

VCO - ø1" straight, Parallel key 1/4"x1/4"x1 1/4" 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 - ø1 1/4" tapered 1:8, Parallel key 5/16"x5/16"x1 1/4" BS46

HB - ø1 1/4" 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 98)

Pos.10 - Design Series

omit - Factory specified

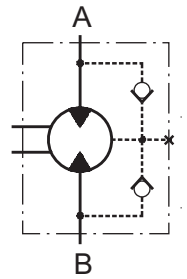
* The permissible output torque for shafts must not be exceeded!

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.

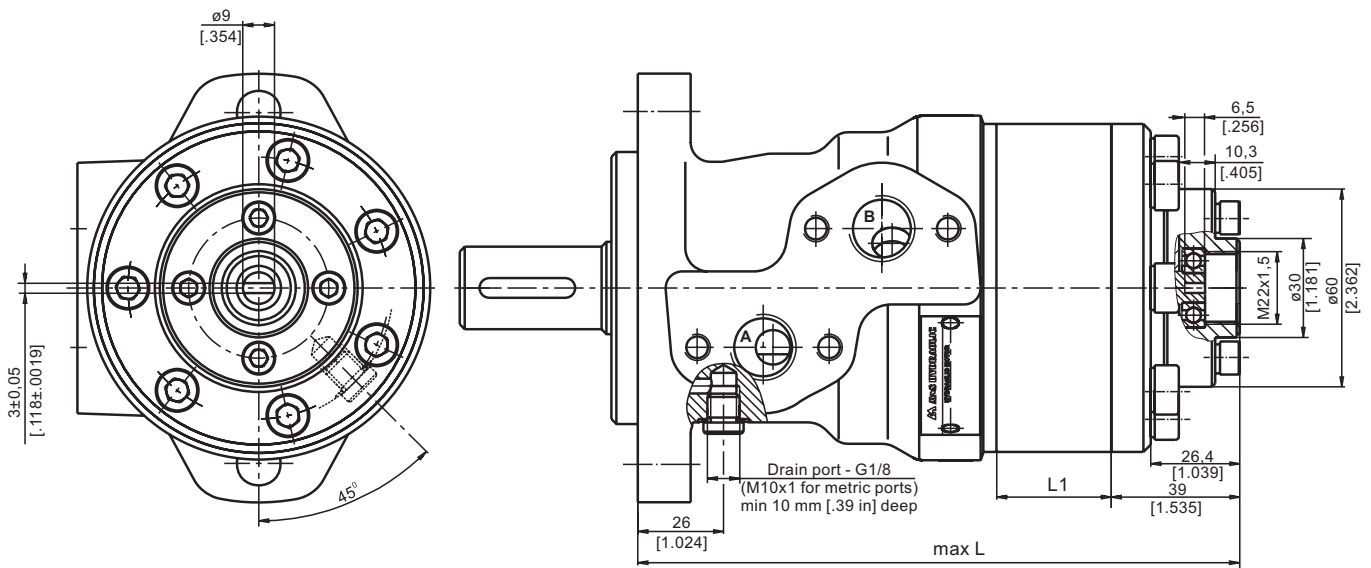
The hydraulic motors are mangano-phosphatized as standard.

Hydraulic motors type MR...T with tacho connection

MR motors are available in version with tacho drive shaft. With tacho connection the speed of the motor can be registered. Tacho shaft has a 6 times higher revolution speed than output shaft and opposite direction of rotation.



OUTLINE DIMENSIONS REFERENCE



Type	L, mm [in]	L ₁ , mm [in]
MR 50	157 [6.18]	9,0 [.35]
MR 80	162 [6.38]	14,0 [.55]
MR 100	165 [6.50]	17,4 [.69]
MR 125	170 [6.69]	21,8 [.86]
MR 160	176 [6.93]	27,8 [1.09]
MR 200	183 [7.20]	34,8 [1.37]
MR 250	192 [7.56]	43,5 [1.71]
MR 315	204 [8.03]	54,8 [2.16]
MR 400	218 [8.58]	69,4 [2.73]



Note: Radial or axial load on tacho shaft must be avoided. Max. torque on tacho shaft 0,1 daNm [.885 lb-in]. Max. cont. return pressure without drain line 20 bar [290 PSI].

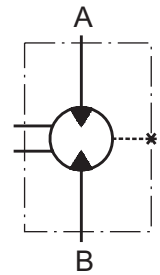
The main technical features correspond to the standard motors series MR. There are no changes in the overall and mounting dimensions. For detail technical and mounting data please refer to MR catalogue.

HYDRAULIC MOTORS MRNA



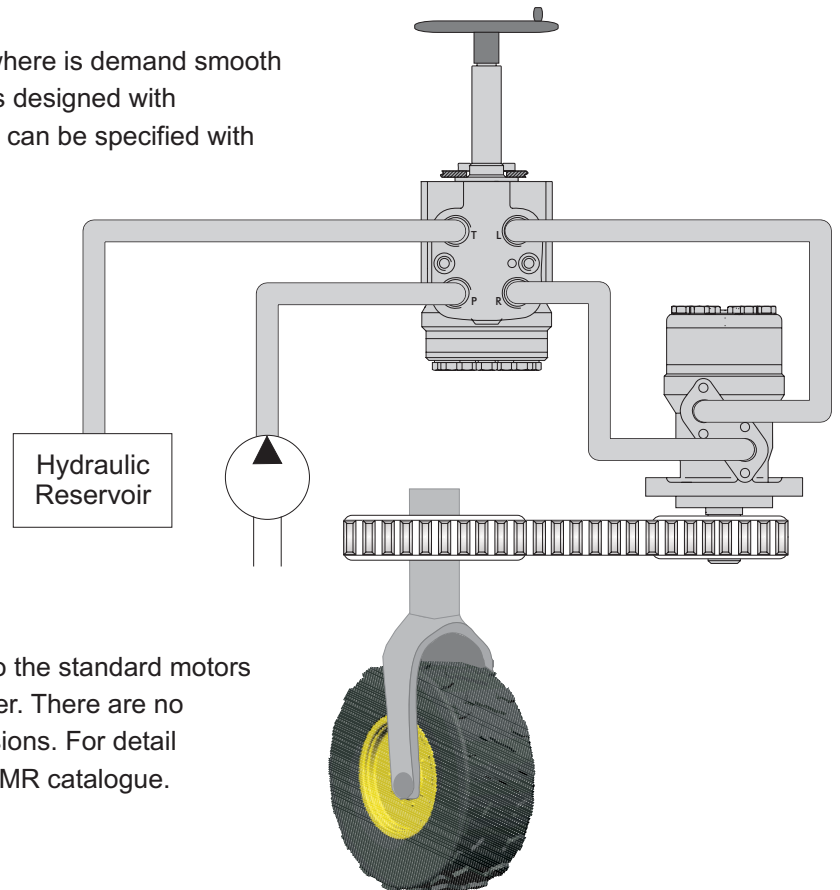
APPLICATION

- » Actuator motor as driving-motor for steering mechanism of the the three-wheel vehicles;
- » For conveyors (series connection);
- » Dosing motor etc.



MRNA is suitable for driven mechanism where is demand smooth operation low speed and high pressure. It is designed with separated output shaft and spool valve and can be specified with low internal leakage.

- » Good start-up characteristics;
- » Precise control of the Torque at low small flow.
- » Smooth operation at high pressure and small oil flow;
- » High volumetric efficiency.



The main technical features correspond to the standard motors series MR $\varnothing 28,56$ [1.124 in.] sealing diameter. There are no changes in the overall and mounting dimensions. For detail technical and mounting data please refer to MR catalogue.

SPECIFICATION DATA

Code	Displacement cm ³ /rev [in ³ /rev]	Max. Speed [RPM]	Max. Torque daNm [lb-in]				Max. Output kW [HP]				Max. Pressure Drop, bar [PSI]				Max. Oil Flow, lpm [GPM]
			C, CO shafts		SH, SA shafts		C, CO shafts		SH, SA shafts		C, CO shafts		SH, SA shafts		
			cont.	int*	cont.	int*	cont.	int*	cont.	int*	cont.	int*	cont.	int*	
MRNA 50	51,5 [3.14]	200	10 [885]	13 [1150]	10 [885]	13 [1150]	2,0 [2.68]	2,5 [3.35]	2,0 [2.68]	2,5 [3.35]	140 [2030]	175 [2540]	140 [2030]	175 [2540]	10,5 [2.8]
MRNA 80	80,3 [4.9]	200	20 [1770]	22 [1940]	20 [1770]	22 [1940]	3,0 [4.02]	3,5 [4.69]	3,0 [4.02]	3,5 [4.69]	175 [2540]	200 [2900]	175 [2540]	200 [2900]	16 [4.2]
MRNA 100	99,8 [6.09]	200	24 2120	28 [2480]	24 2120	28 [2480]	4,5 [6.03]	5,0 [6.71]	4,5 [6.03]	5,0 [6.71]	175 [2540]	200 [2900]	175 [2540]	200 [2900]	20 [5.3]
MRNA 125	125,7 [7.67]	200	30 [2650]	34 [3000]	30 [2650]	34 [3000]	5,5 [7.37]	6,0 [8.05]	5,5 [7.37]	6,0 [8.05]	175 [2540]	200 [2900]	175 [2540]	200 [2900]	25 [6.6]
MRNA 160	159,6 [9.74]	200	29 [2560]	39 [3450]	39 [3450]	43 [3800]	5,0 [6.71]	6,5 [8.05]	6,0 [8.05]	7,5 [10.05]	120 [1740]	175 [2540]	175 [2540]	200 [2900]	32 [8.5]
MRNA 200	199,8 [12.19]	200	29 [2560]	38,5 [3400]	38,5 [3400]	46 [4070]	5,0 [6.71]	7,0 [9.39]	6,5 [8.72]	9,0 [12.06]	105 [1520]	140 [2030]	140 [2030]	175 [2540]	40 [10.5]
MRNA 250	250,1 [15.26]	200	30 [2650]	39 [3450]	39 [3450]	47 [4160]	5,0 [6.71]	7,0 [9.39]	6,0 [8.05]	9,0 [12.06]	80 [1160]	110 [1600]	110 [1600]	140 [2030]	50 [13.2]
MRNA 315	315,7 [19.26]	190	30 [2650]	42 [3720]	36 [3450]	47 [4160]	5,0 [6.71]	7,5 [10.05]	6,0 [8.05]	8,5 [11.4]	70 [1020]	100 [1450]	85 [1230]	115 [1670]	65 [17.2]
MRNA 400	397,0 [24.4]	150	30 [2650]	40 [3540]	38 [3260]	47 [4160]	4,0 [5.36]	6,5 [8.72]	6,0 [8.05]	7,0 [9.39]	55 [800]	70 [1015]	65 [940]	90 [1300]	60 [15.8]

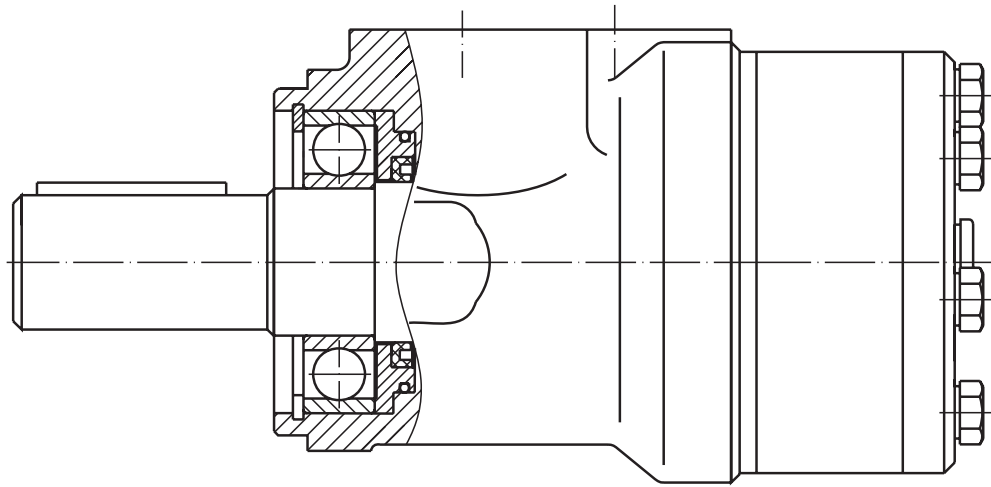
* Intermittent operation: the permissible values may occur for max. 10% of every minute.

HYDRAULIC MOTORS MRFL

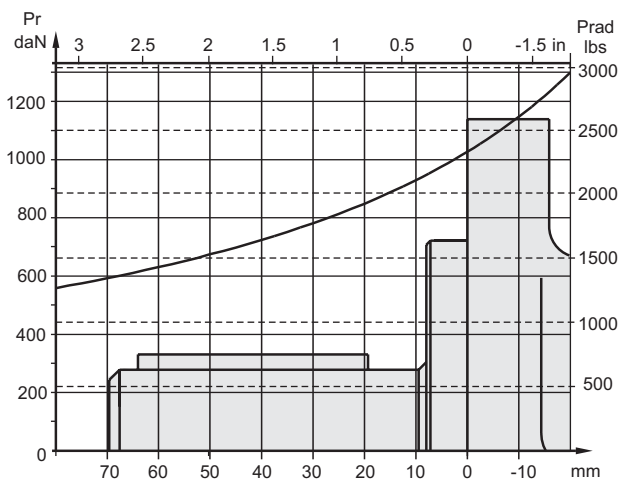
The hydraulic motors type MRFL... and MLHRFL... are designed for use in operating modes with peak radial loads of the output shaft (especially at starting and stopping) at direct drive of wheels or mechanisms (without clutch or gearbox).

The radial loads are borne by a radial ball bearing which is mounted on the shaft of the hydraulic motor.

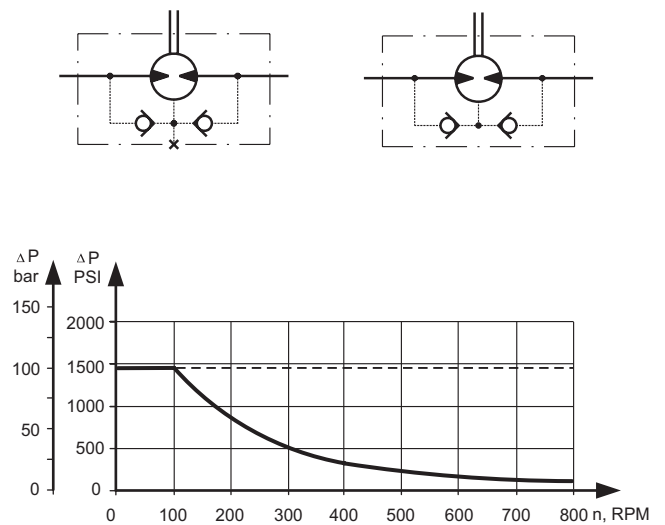
The main technical features correspond to the standard motors series MRF $\varnothing 35$ [1.378 in.] sealing diameter. There are no changes in the overall and mounting dimensions. For detail technical and mounting data please refer to MR catalogue.



PERMISSIBLE SHAFT LOADS

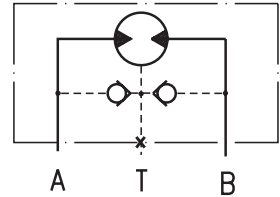
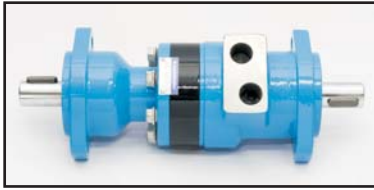


MAX. PERMISSIBLE SHAFT SEAL PRESSURE



— - continuous operations
 - - - - - intermittent operations

Hydraulic motors with Dual shaft type MRB...



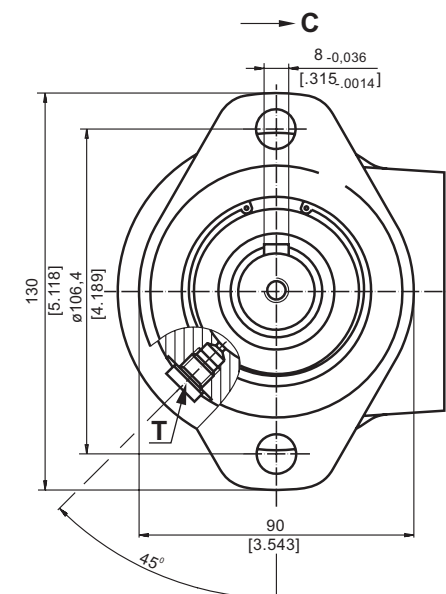
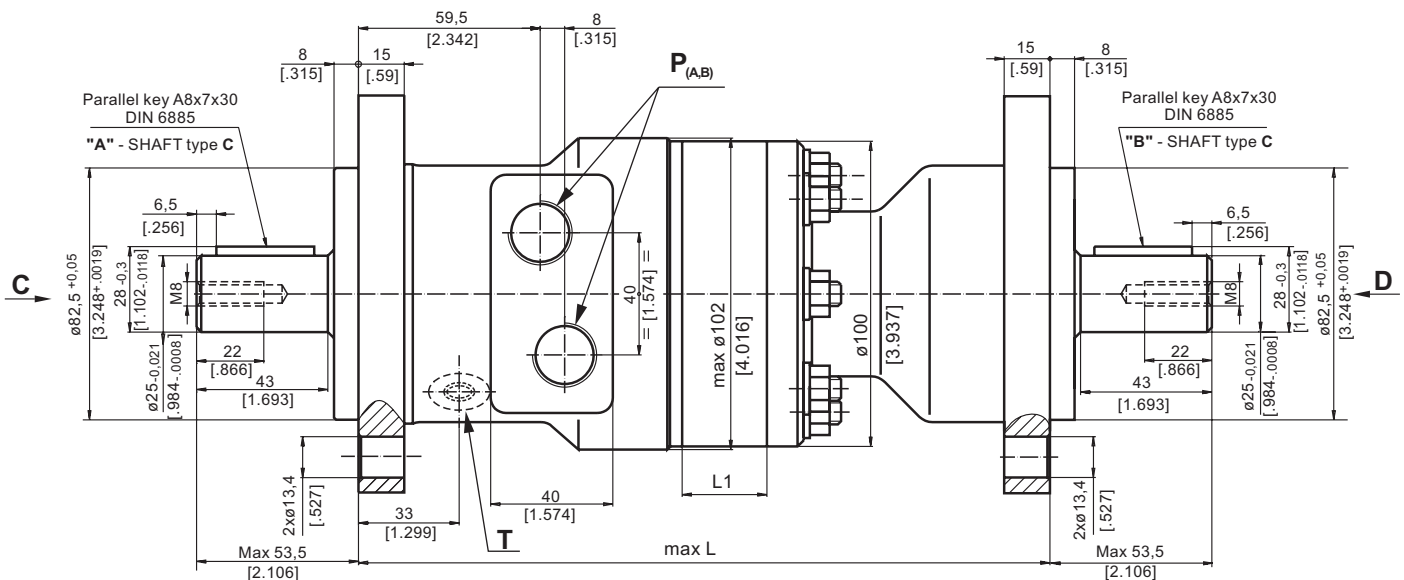
OPTIONS

- » Model- Spool valve, roll-gerotor;
- » Dual shaft;
- » Oval flange;
- » Side port;
- » Straight shafts;
- » BSPP ports;
- » Other special features.

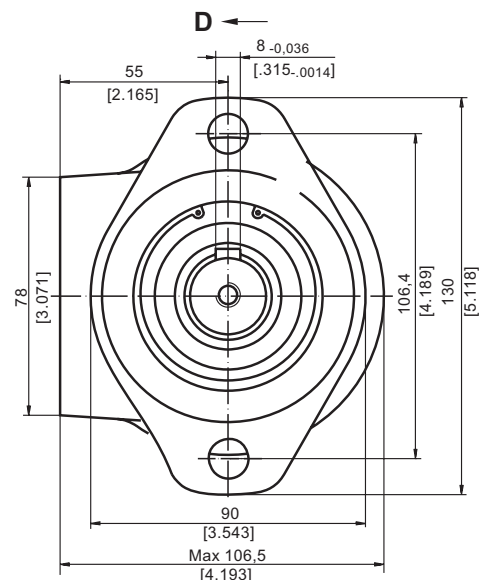
APPLICATION

- » Conveyors;
- » Feeding mechanism of robots and manipulators;
- » Metal working machines;
- » Textile machines;
- » Agriculture machines;
- » Food industries;
- » Mining machinery etc.

OUTLINE DIMENSINS REFERENCE



Type	L, mm [in]	L ₁ , mm[in]
MRB 50	208,0 [8.19]	9,0 [.35]
MRB 80	213,0 [8.39]	14,0 [.55]
MRB 100	216,0 [8.50]	17,4 [.69]
MRB 125	220,5 [8.68]	21,8 [.86]
MRB 160	226,5 [8.92]	27,8 [1.09]
MRB 200	233,5 [9.19]	34,8 [1.37]
MRB 250	242,5 [9.55]	43,5 [1.71]
MRB 300	253,5 [9.98]	54,8 [2.16]
MRB 400	268,0 [10.55]	69,4 [2.73]



P_(A,B) : 2xG1/2 - 18 mm [.71 in] depth
T : G1/8 - 9 mm [.35 in] depth (plugged)



SPECIFICATION DATA

Type	MRB 50 C/C	MRB 80 C/C	MRB 100 C/C	MRB 125 C/C	MRB 160 C/C	MRB 200 C/C	MRB 250 C/C	MRB 315 C/C	MRB 400 C/C
Displacement, cm³/rev [in³/rev]	51,5[3.14]	80,3[4.9]	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	775	750	600	475	375	300	240	190	150
	int.*	970	940	750	600	470	375	300	240
Max. Torque, daNm [lb-in]	10 [885]	19,5 [1725]	24 [2125]	30 [2655]	30 [2655]	30 [2655]	30 [2655]	30 [2655]	30 [2655]
	int.*	13 [1150]	22 [1947]	28 [2480]	34 [3010]	39 [3450]	39 [3450]	38 [3360]	42 [3720]
Max. Torque "A" Shaft, daNm [lb-in]	8 [710]	11,5 [1000]	12 [1060]	20 [1770]	20 [1770]	20 [1770]	20 [1770]	20 [1770]	20 [1770]
	int.*	9,5 [840]	13 [1150]	14 [1240]	23 [2035]	23 [2035]	23 [2035]	23 [2035]	23 [2035]
Max. Torque "B" Shaft, daNm [lb-in]	4 [355]	11,5 [1000]	12 [1060]	20 [1770]	20 [1770]	20 [1770]	20 [1770]	20 [1770]	20 [1770]
	int.*	5 [440]	13 [1150]	14 [1240]	23 [2035]	23 [2035]	23 [2035]	23 [2035]	23 [2035]
Max. Output, [kW] [HP]	7 [9.5]	12,5 [17]	13 [1150]	12,5 [17]	10 [13.4]	8 [10.7]	6 [8.0]	5 [6.7]	4 [5.4]
	int.*	8,5 [11.9]	15 [20.1]	15 [20.1]	14,5	12,5 [17]	10 [13.4]	8 [10.7]	6 [8.0]
Max. Pressure Drop, bar [PSI]	140 [2030]	175 [2540]	175 [2540]	175 [2540]	130 [1885]	110 [1600]	80 [1160]	70 [1020]	55 [800]
	int.*	175 [2540]	200 [2900]	200 [2900]	200 [2900]	175 [2540]	140 [2030]	110 [1600]	100 [1450]
Max. Oil Flow, lpm [GPM]	40 [10.5]	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]
	int.*	50 [13.2]	75 [18.5]	75 [18.5]	75 [18.5]	75 [18.5]	75 [18.5]	75 [18.5]	75 [18.5]
Max. Return Pressure without Drain Line, bar [PSI]	cont. 0 - 100 RPM	75 [1090]	75 [1090]	75 [1090]	75 [1090]	75 [1090]	75 [1090]	75 [1090]	75 [1090]
	cont. 100-200 RPM	50 [730]	50 [730]	50 [730]	50 [730]	50 [730]	50 [730]	50 [730]	50 [730]
	cont. 200-500 RPM	20 [290]	20 [290]	20 [290]	20 [290]	20 [290]	20 [290]	20 [290]	20 [290]
	int.* 0 - max RPM	75 [1090]	75 [1090]	75 [1090]	75 [1090]	75 [1090]	75 [1090]	75 [1090]	75 [1090]

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

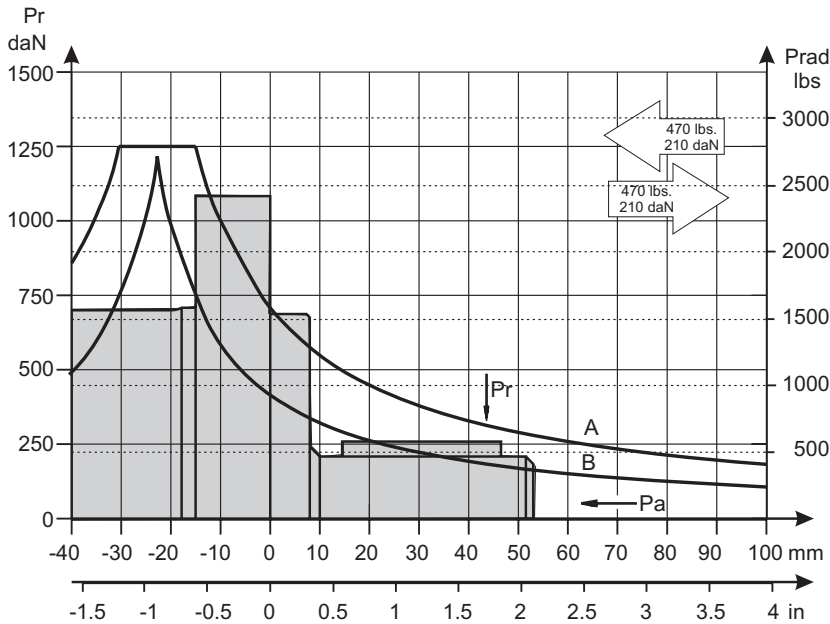
1. Intermittent speed and intermittent pressure must not occur simultaneously.
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).
If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

PERMISSIBLE SHAFT LOADS

The load diagrams are valid for an average bearings life of 1600 hrs at 200 r.p.m. with mineral base lubricating containing antiwear additives (ref.ISO 281 (3.3)standard).

The "A" curve gives the maximum static load affordable by the bearings.

The "B" curve gives the radial load top limit without axial load of 200 daN.



ORDER CODE

	1	2	3	4	5	6
MRB			/			

Pos.1 - Displacement code

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

Pos.2 - "A" Shaft Extensions*

C	- ø25 straight, Parallel key A8x7x30 DIN6885
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Pos.3 - "B" Shaft Extensions*

C	- ø25 straight, Parallel key A8x7x30 DIN6885
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Pos. 4 - Special Features

omit	- none
LSV	- Low Speed Valve

Pos. 5 - Option (Paint)**

omit	- no Paint
P	- Painted
PC	- Corrosion Protected Paint

Pos. 6 - Design Series

omit	- Factory specified
------	---------------------

NOTES:

* For other shaft extensions please contact with "M+S Hydraulic".

** Color at customer's request.

The hydraulic motors are manganophosphatized as standard.

SPECIFICATION DATA

Type	MH 200	MH 250	MH 315	MH 400	MH 500	
Displacement, cm³/rev [in³/rev]	201,3 [12.3]	252 [15.4]	314,9 [16.4]	396,8 [24.2]	502,4 [30.7]	
Max. Speed, [RPM]	Cont.	370	295	235	185	150
	Int.*	445	350	285	225	180
Max. Torque daNm [in-lb]	Cont.	51 [4510]	61 [5398]	74 [6548]	84 [7434]	82 [7257]
	Int.*	58 [5130]	70 [6195]	82 [7257]	98 [8673]	104 [9204]
	Peak**	64 [5064]	79 [6992]	98 [8673]	109 [9647]	117 [10350]
Max. Output kW [HP]	Cont.	16 [21]	16 [21]	14 [18.7]	12,5 [16.7]	11 [14.7]
	Int.*	18,5 [24.8]	18,5 [24.8]	15,5 [20.7]	15 [20.1]	14 [18.7]
Max. Pressure Drop bar [PSI]	Cont.	175 [2540]	175 [2540]	175 [2540]	155 [2240]	125 [1810]
	Int.*	200 [2900]	200 [2900]	200 [2900]	190 [2750]	160 [2320]
	Peak**	225 [3260]	225 [3260]	225 [3260]	210 [3045]	180 [2610]
Max. Oil Flow lpm [GPM]	Cont.	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]
	Int.*	90 [24]	90 [24]	90 [24]	90 [24]	90 [24]
Max. Inlet Pressure bar [PSI]	Cont.	200 [2900]	200 [2900]	200 [2900]	200 [2900]	200 [2900]
	Int.*	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]
	Peak**	250 [3626]	250 [3626]	250 [3626]	250 [3626]	250 [3626]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]	5 [72]	5 [72]	5 [72]	5 [72]	5 [72]	
Min. Starting Torque, daNm [in-lb]	At max.press.dropCont	39 [3450]	52 [4600]	66 [5840]	72 [6370]	72 [6370]
	At max.press.drop Int.*	45 [3980]	59 [5221]	73 [6460]	88 [7788]	88 [7788]
Min. Speed***, [RPM]	10	10	8	5	5	
Weight, kg [lb]	10,5 [23.2]	11 [24.3]	11,5 [25.4]	12,3 [27.1]	13 [28.7]	

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

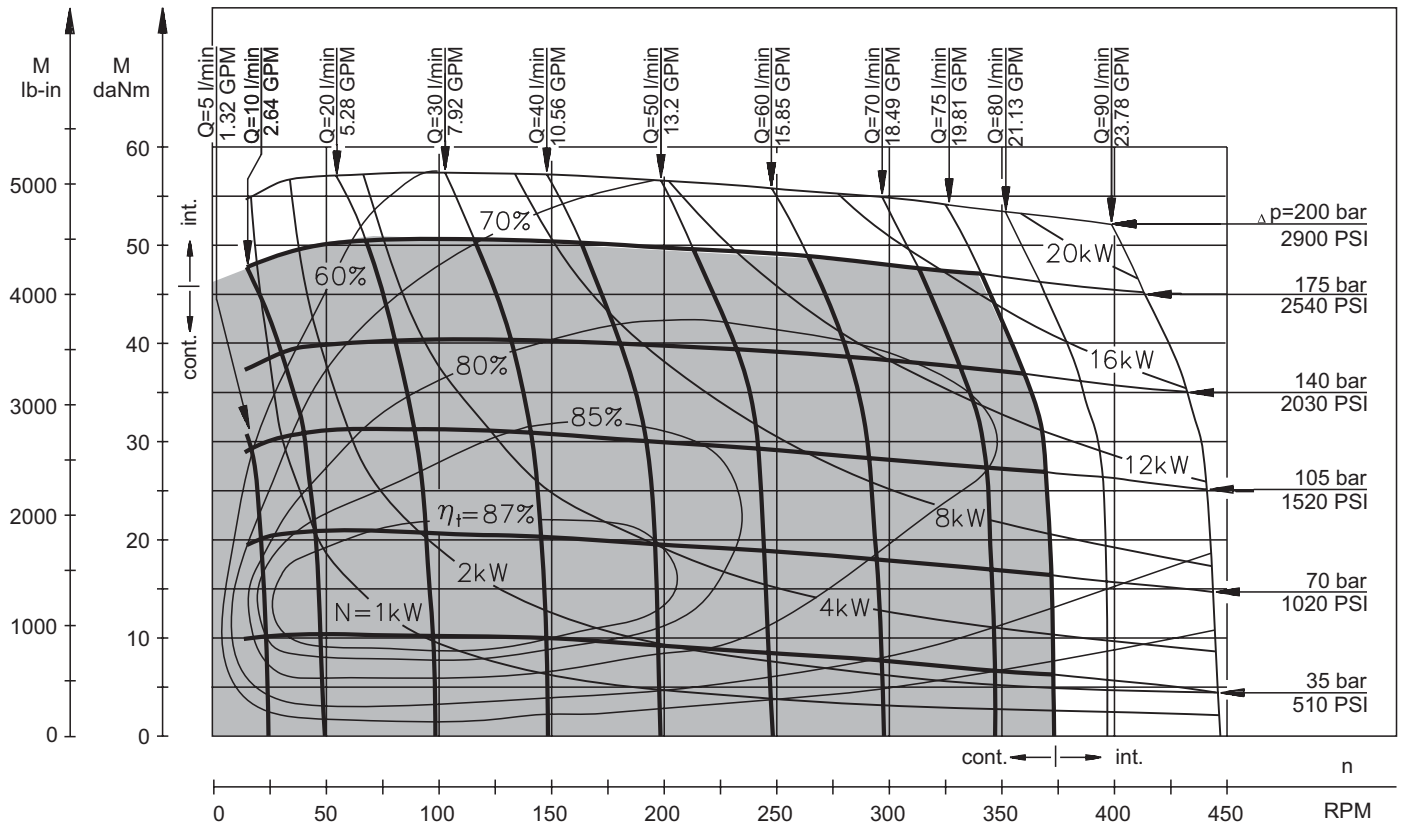
** Peak load: the permissible values may occur for max. 1% of every minute.

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

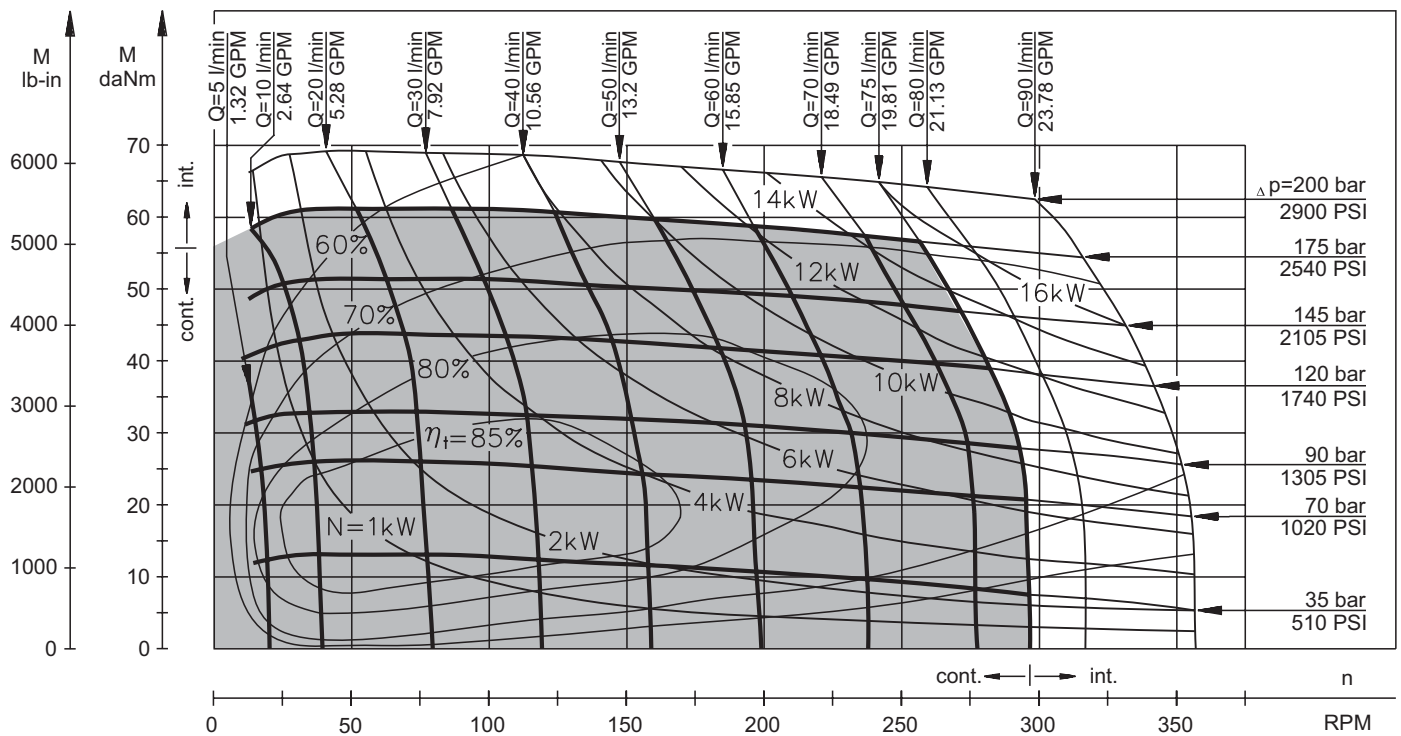
- Intermittent speed and intermittent pressure must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).
If using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

FUNCTION DIAGRAMS

MH 200



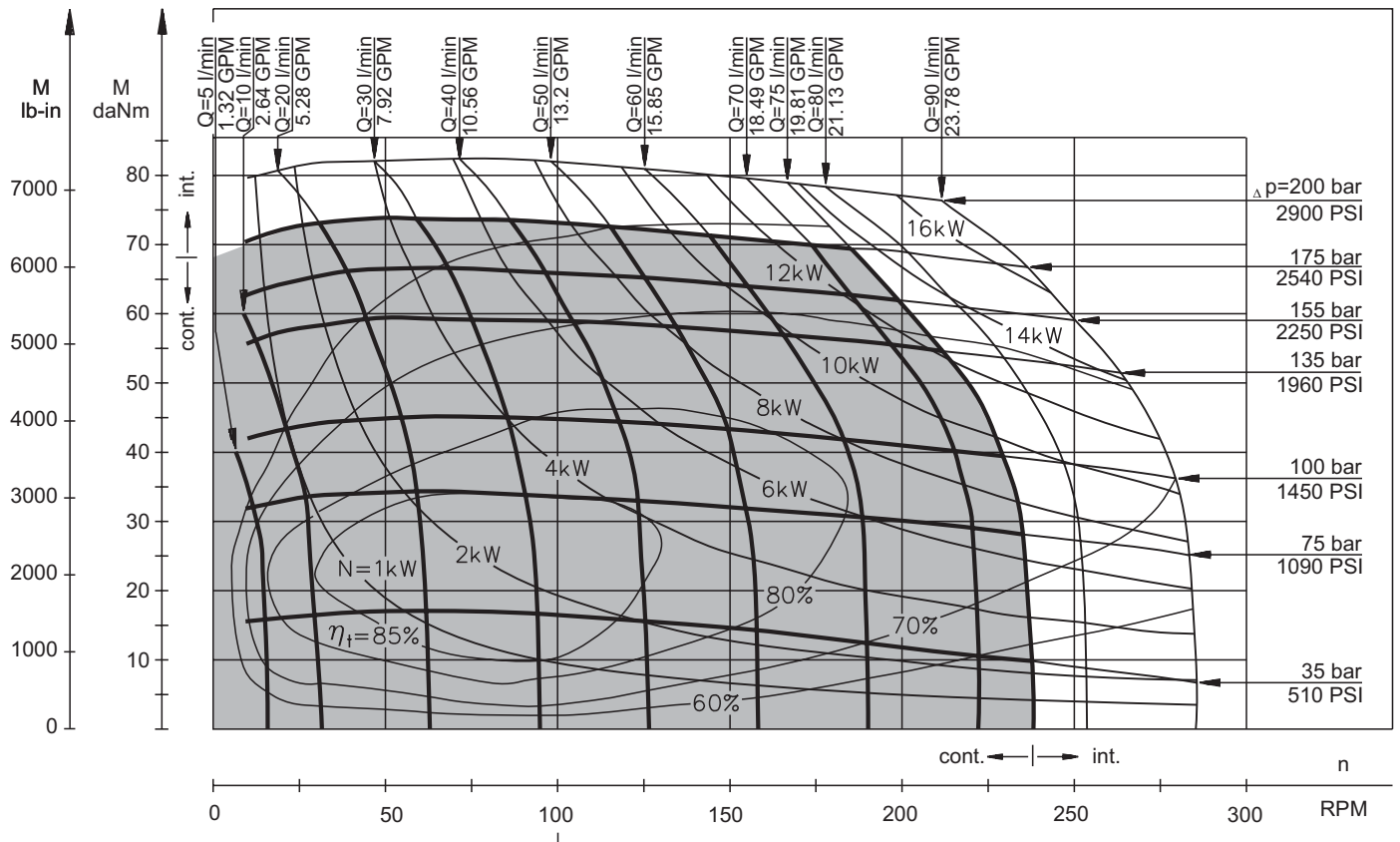
MH 250



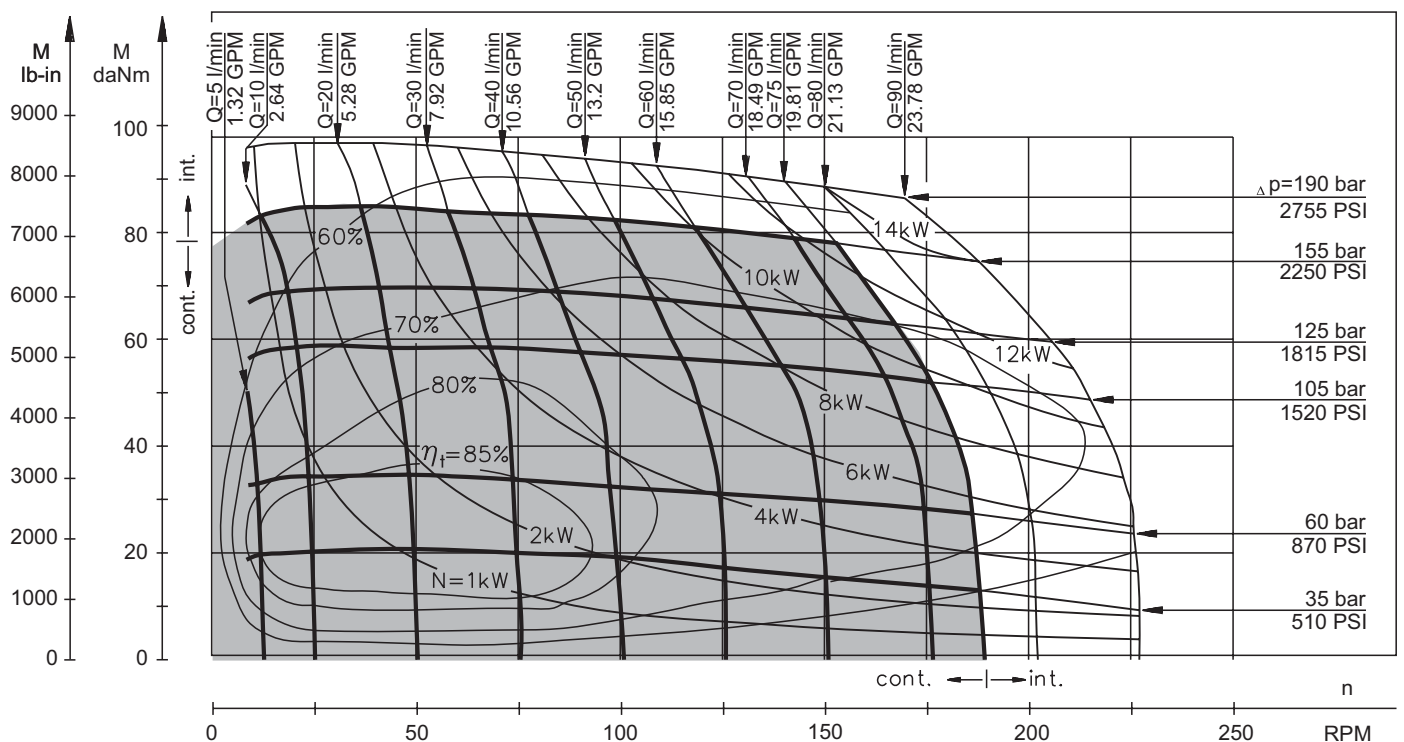
The function diagrams data is for average performance of randomly selected motors at back pressure 5 ÷ 10 bar [72.5 ÷ 145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MH 315



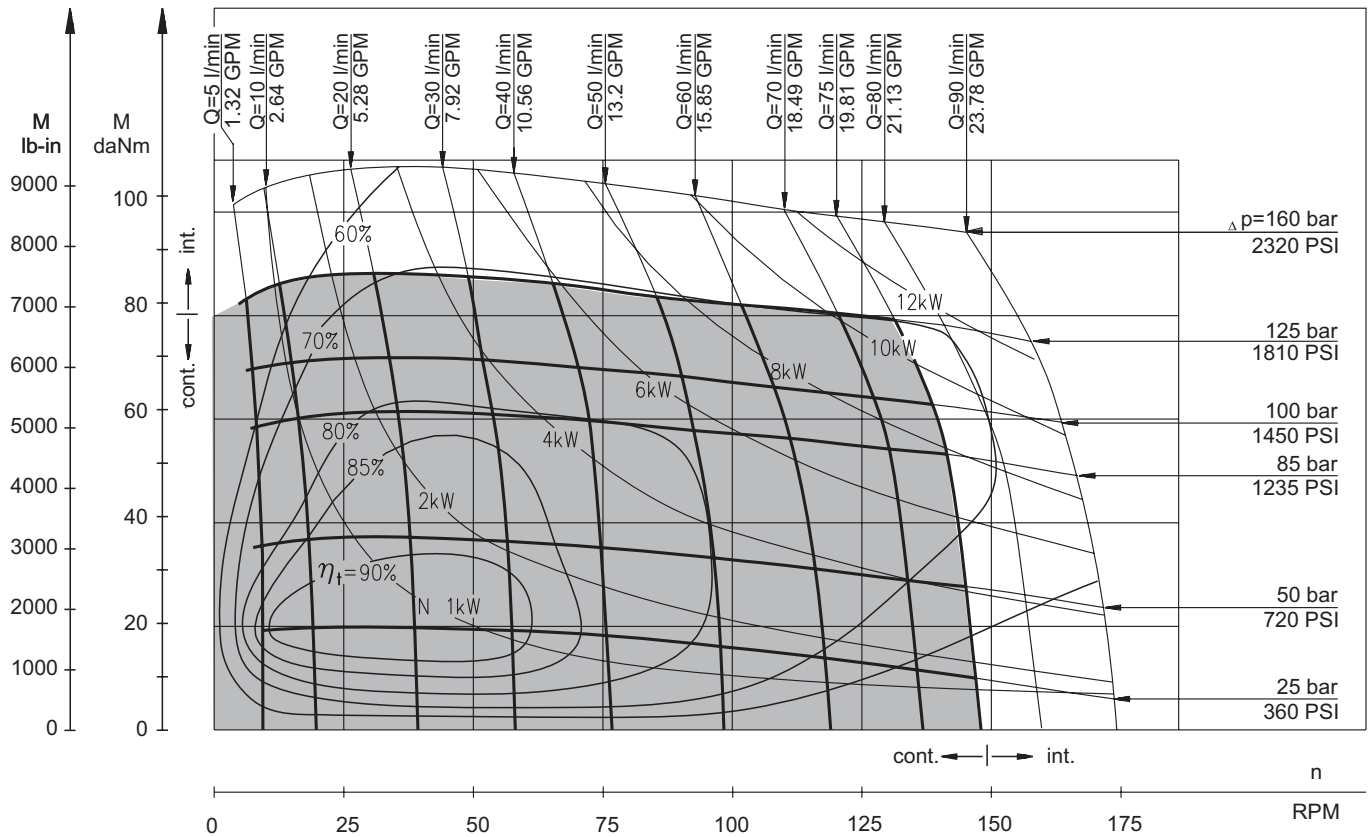
MH 400



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].

FUNCTION DIAGRAMS

MH 500



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].

PERMISSIBLE SHAFT LOADS FOR MH MOTORS

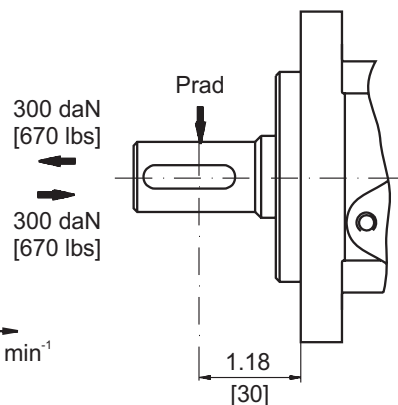
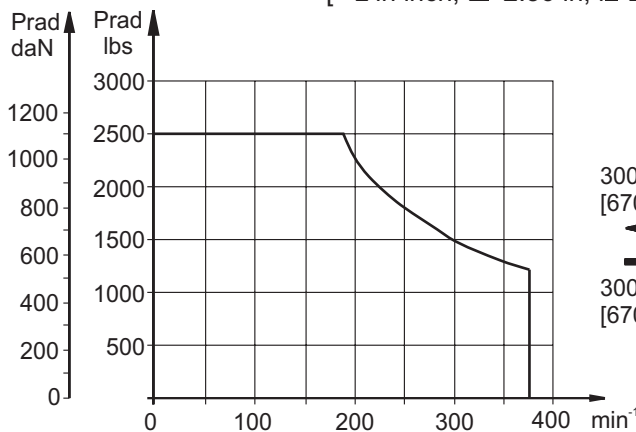
The permissible radial shaft load P_{rad} depends on the speed (RPM) and distance (L) from the point of load to the mounting flange.

$$Radial\ Shaft\ Load\ P_{rad} = \frac{1100}{n} \times \frac{25000}{103,5+L}, daN^*$$

[*L in mm; L ≤ 60 mm; n ≥ 200 RPM]

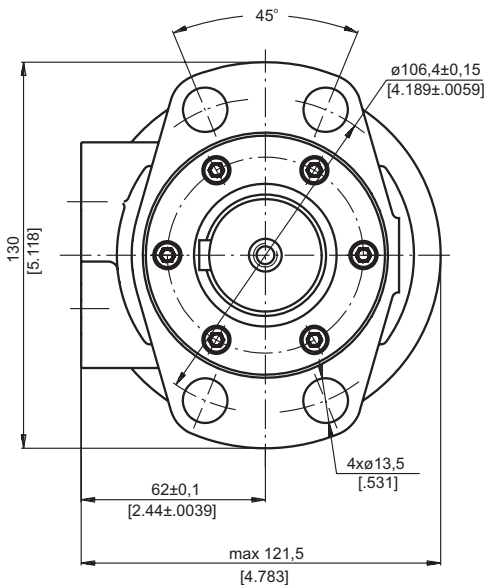
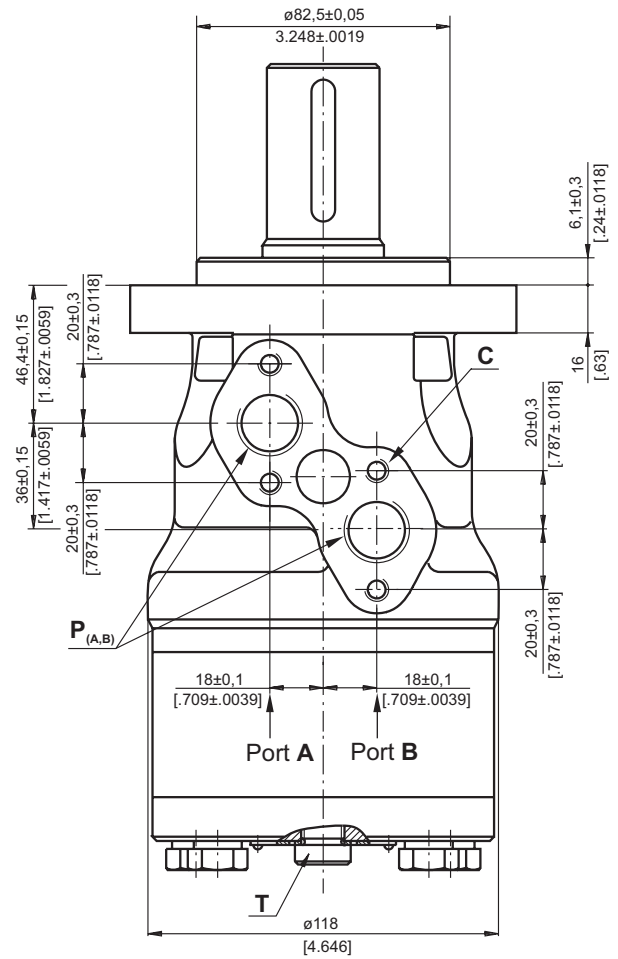
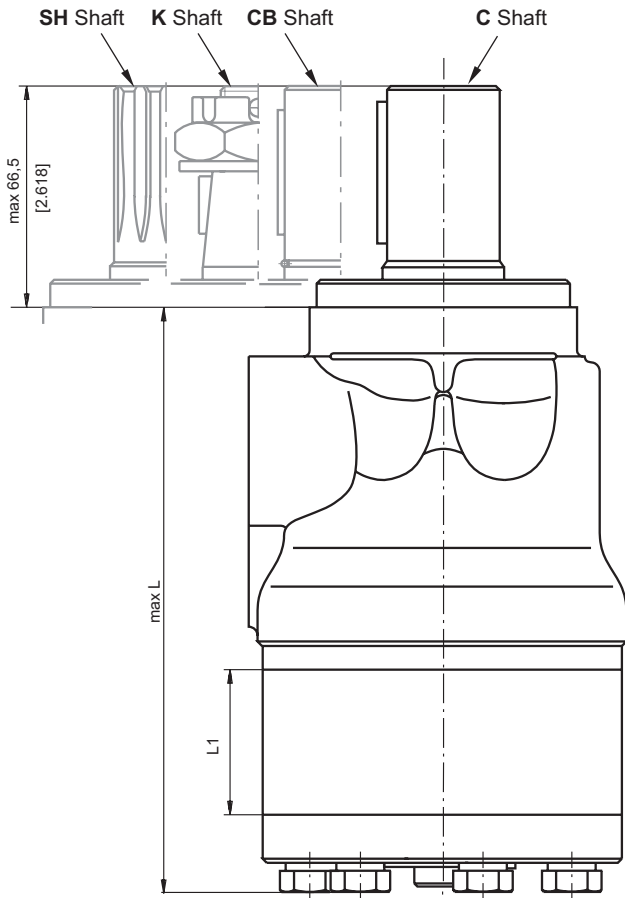
$$Radial\ Shaft\ Load\ P_{rad} = \frac{1100}{RPM} \times \frac{2215}{4.075+L}, lbs^{**}$$

[**L in inch; L ≤ 2.36 in; n ≥ 200 RPM]



DIMENSIONS AND MOUNTING DATA

Magneto Maunt (4 holes)



Type	L, mm [in.]	L ₁ , mm [in.]
MH 200	169 [6.65]	27,8 [1.09]
MH 250	176 [6.93]	34,8 [1.37]
MH 315	184 [7.24]	43,5 [1.71]
MH 400	196 [7.72]	54,8 [2.16]
MH 500	211 [8.31]	69,4 [2.73]

- 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

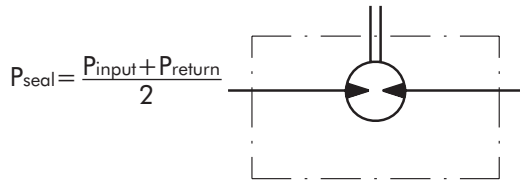
Reverse Rotation
 Viewed from Shaft End
 Port A Pressurized - CCW
 Port B Pressurized - CW



MAX. PERMISSIBLE SHAFT SEAL PRESSURE FOR MH MOTORS

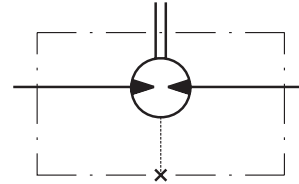
MH...U1 motors with high pressure seal and without drain connection:

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



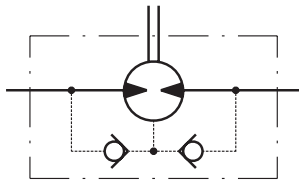
MH...U motors with high pressure seal and drain connection:

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



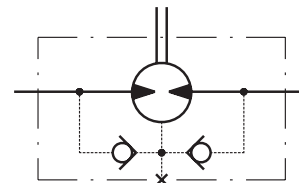
MH...1 motors with standard shaft seal and without drain connection:

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

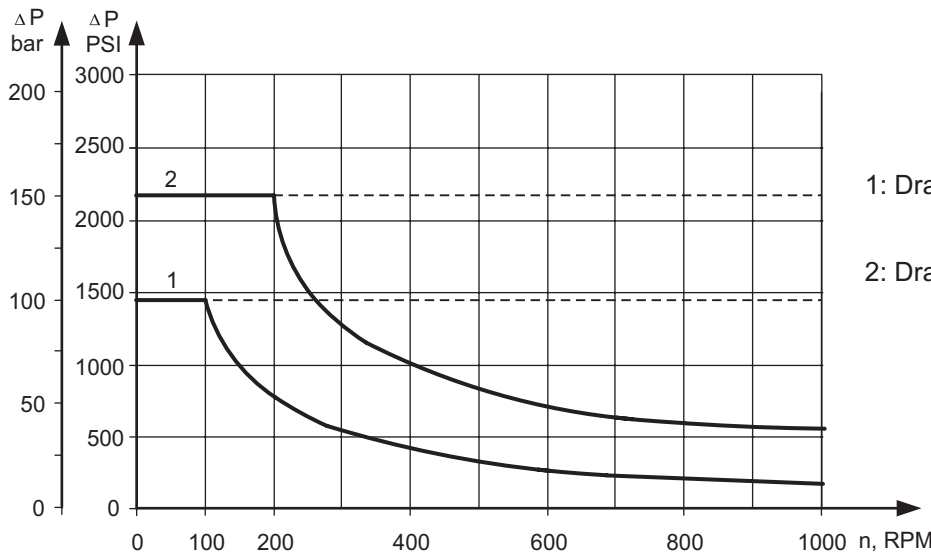


MH... motors with standard shaft seal and with drain connection:

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



Max. return pressure without drain line or max. pressure in the drain line



1: Drawing for Standard Shaft Seal

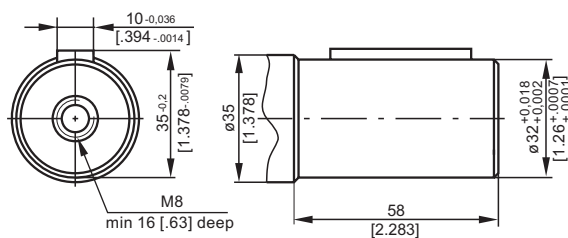
2: Drawing for High Pressure Seal ("U" Seal)

— - continuous operations

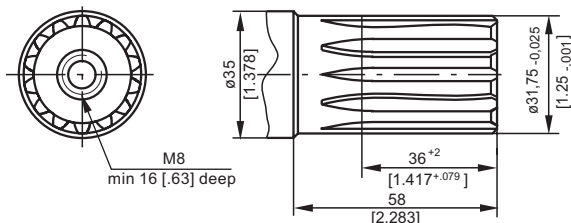
- - - - - intermittent operations

SHAFT EXTENSIONS

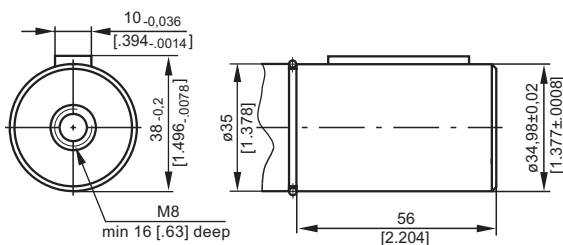
C - $\varnothing 32$ straight, Parallel key A10x8x45 DIN 6885
Max. Torque 77 daNm [6815 lb-in]



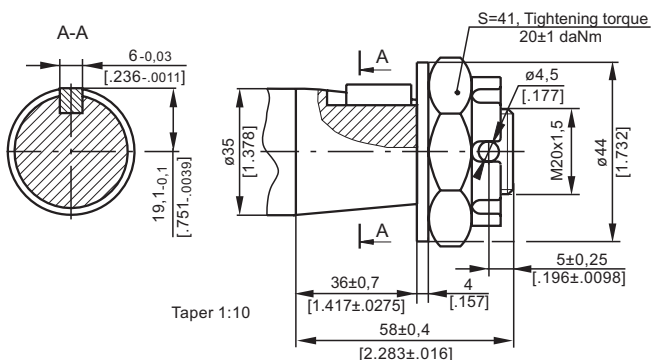
SH - $\varnothing 1\frac{1}{4}$ " splined 14T, DP 12/24 ANSI B92.1-1976
Max. Torque 95 daNm [8400 lb-in]



CB - $\varnothing 35$ straight, Parallel key A10x8x45 DIN 6885
Max. Torque 95 daNm [8400 lb-in]



K - tapered 1:10, Parallel key B6x6x20 DIN 6885
Max. Torque 95 daNm [8400 lb-in]



ORDER CODE



	1	2	3	4	5	6	7
MH							

Pos. 1 - Displacement code

- 200** - 201,3 cm³/rev [12.3 in³/rev]
- 250** - 252,0 cm³/rev [15.4 in³/rev]
- 315** - 314,9 cm³/rev [16.4 in³/rev]
- 400** - 396,8 cm³/rev [24.2 in³/rev]
- 500** - 502,4 cm³/rev [30.7 in³/rev]

Pos. 2 - Shaft Extensions *

- C** - $\varnothing 32$ straight, Parallel key A10x8x45 DIN 6885
- SH** - $\varnothing 1\frac{1}{4}$ " splined 14T ANSI B92.1-1970
- CB**** - $\varnothing 35$ straight, Parallel key A10x8x45 DIN 6885
- K** - $\varnothing 35$ tapered 1:10, Parallel key B6x6x20 DIN 6885

Pos. 3 - Shaft Seal Version

- omit - Standard shaft seal
- U** - High pressure shaft seal (without check valves)

Pos. 4 - Drain Port

- omit - with drain port
- 1** - without drain port

Pos. 5 - Ports

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

Pos. 6 - Special Features (see page 98)

Pos. 7 - Design Series

- omit - Factory specified

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

** The following combination is not allowed: "CB" shaft with U shaft seal.

The hydraulic motors are mangano-phosphatized as standard.