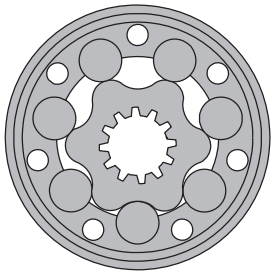
HYDRAULIC MOTORS MLHR

APPLICATION

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



CONTENTS

OPTIONS

- » Model - Spool valve, roll-gerotor
- » Flange mount
- » Motor with needle bearing
- » Side and rear ports
- » Shafts - straight, splined and tapered
- » SAE, Metric and BSPP ports
- » Speed sensoring
- » Other special features

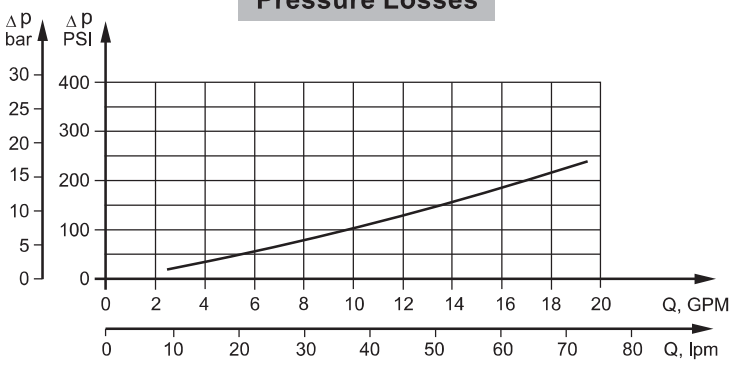
GENERAL

Max. Displacement, in^3/rev [cm^3/rev]	24.4 [397]
Max. Speed, [RPM]	970
Max. Torque, lb-in [daNm]	cont.: 5400 [61] int.: 6100 [69]
Max. Output, HP [kW]	20.1 [15]
Max. Pressure Drop, PSI [bar]	cont.: 2540 [175] int.: 2900 [200]
Max. Oil Flow, GPM [lpm]	19.8 [75]
Min. Speed, [RPM]	10
Pressure fluid	Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)
Temperature range, ^{o}F [^{o}C]	-40÷284 [-40÷140]
Optimal Viscosity range, SUS [mm^2/s]	98÷347 [20÷75]
Filtration	ISO code 20/16 (Min. recommended fluid filtration of 25 microns)

Oil flow in drain line

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

Pressure Losses



SPECIFICATION DATA

Specification Data for MLHR... motors with **C, D, G, H, M, S** and **T** shafts.
(1.124 [28,56] sealing diameter)

Type		MLHR 50	MLHR 80	MLHR 100	MLHR 125	MLHR 160	MLHR 200	MLHR 250	MLHR 315	MLHR 400
Displacement, in³/rev		3.14	4.90	6.09	7.67	9.74	12.19	15.26	19.26	24.4
[cm³/rev]		[51,5]	[80,3]	[99,8]	[125,7]	[159,6]	[199,8]	[250,1]	[315,7]	[397]
Max. Speed,	Cont.	775	750	600	475	375	300	240	190	150
[RPM]	Int.*	970	940	750	600	470	375	300	240	190
Max. Torque	Cont.	900 [10,1]	1725 [19,5]	2125 [24]	2655 [30]	3450 [39]	3410 [38,5]	3450 [39]	3450 [39]	3360 [38]
lb-in [daNm]	Int.*	1150 [13]	1947 [22]	2480 [28]	3010 [34]	3805 [43]	4070 [46]	5150 [58]	5045 [57]	5310 [60]
	Peak**	1505 [17]	2390 [27]	2832 [32]	3275 [37]	4070 [46]	4960 [56]	6280 [71]	7400 [83]	7700 [87]
Max. Output	Cont.	9.5 [7]	17 [12,5]	17.4 [13]	16.8 [12,5]	15.4 [11,5]	12 [9]	8.7 [6,5]	8 [6]	6.4 [4,8]
HP [kW]	Int.*	11.9 [8,5]	20.1 [15]	20.1 [15]	19.5 [14,5]	18.8 [14]	15.4 [11,5]	14.1 [10,5]	12.9 [9,6]	11.8 [8,8]
Max. Pressure Drop	Cont.	2030 [140]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2030 [140]	1600 [110]	1300 [90]	1020 [70]
PSI [bar]	Int.*	2540 [175]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2540 [175]	2540 [175]	2030 [140]	1670 [115]
	Peak**	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3045 [210]	2540 [175]
Max. Oil Flow	Cont.	10.5 [40]	15.8 [60]	15.8 [60]	15.8 [60]	15.8 [60]	15.8 [60]	15.8 [60]	15.8 [60]	15.8 [60]
GPM [lpm]	Int.*	13.2 [50]	19.8 [75]	19.8 [75]	19.8 [75]	19.8 [75]	19.8 [75]	19.8 [75]	19.8 [75]	19.8 [75]
Max. Inlet Pressure	Cont.	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]
PSI [bar]	Int.*	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]
	Peak**	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]
Max. Return Pres-	Cont.	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]
sure with Drain Line	Int.*	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]
PSI [bar]	Peak**	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]
Max. Starting Pressure with Unloaded Shaft, PSI [bar]		145 [10]	145 [10]	145 [10]	130 [9]	102 [7]	73 [5]	58 [4]	44 [3]	44 [3]
Min. Starting Torque	At max.press.									
lb-in [daNm]	drop Cont.	710 [8]	1330 [15]	1770 [20]	2215 [25]	2832 [32]	2920 [33]	2740 [31]	2920 [33]	2650 [30]
	At max.press.									
	drop Int.*	85 [10]	1505 [17]	2035 [23]	2480 [28]	3275 [37]	3540 [40]	4250 [48]	5220 [58]	4425 [50]
Min. Speed*, [RPM]**		10	10	10	10	10	10	10	10	10
Weight, lb [kg]	MLHR(F)(N)	15 [6,8]	15,2 [6,9]	15.9 [7,2]	16.1 [7,3]	15.2 [7,5]	17.6 [8]	18.5 [8,4]	20 [9,1]	21.6 [9,8]
For rear ports +1.433 [0,650]	MLHRQ(M)(N)	13.7 [6,2]	13.9 [6,3]	14.6 [6,6]	15 [6,8]	15.4 [7,6]	14.7 [7,2]	17.2 [7,8]	19 [8,6]	20.5 [9,3]

* 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 70 SUS [13 mm²/s] at 122°F [50°C].
5. Recommended maximum system operating temperature is 180°F [82°C].
6. 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 MLHR... motors with **B, K, R** and **L** shafts.
(1.378 [35] sealing diameter)

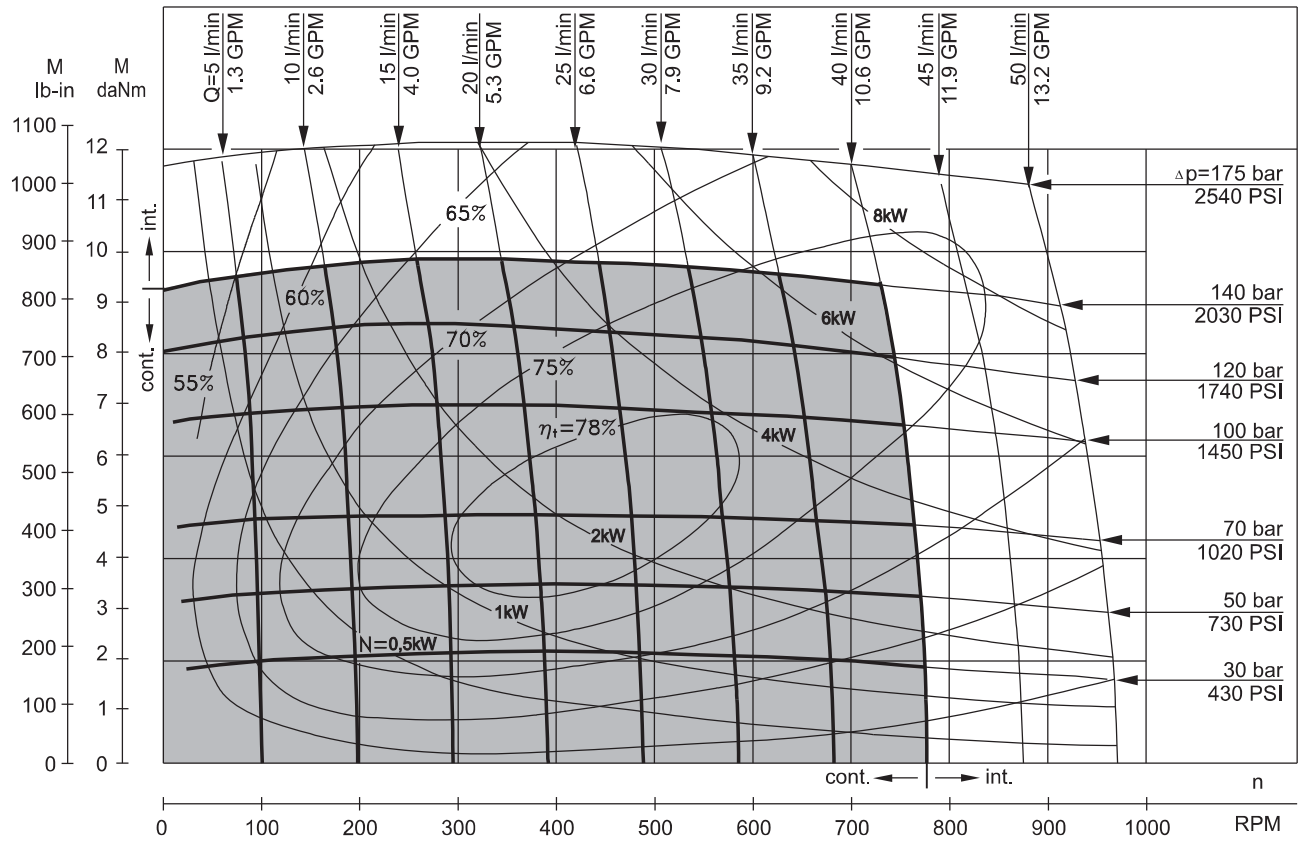
Type		MLHR 50	MLHR 80	MLHR 100	MLHR 125	MLHR 160	MLHR 200	MLHR 250	MLHR 315	MLHR 400
Displacement, in³/rev		3.14	4.90	6.09	7.67	9.74	12.19	15.26	19.26	24.4
[cm³/rev]		[51,5]	[80,3]	[99,8]	[125,7]	[159,6]	[199,8]	[250,1]	[315,7]	[397]
Max. Speed,	Cont.	775	750	600	475	375	300	240	190	150
[RPM]	Int.*	970	940	750	600	470	375	300	240	190
Max. Torque	Cont.	900 [10,1]	1725 [19,5]	2125 [24]	2655 [30]	3450 [39]	4000 [45]	4780 [54]	4870 [55]	5400 [61]
lb-in [daNm]	Int.*	1150 [13]	1947 [22]	2480 [28]	3010 [34]	3805 [43]	4425 [50]	5400 [61]	5580 [63]	6100 [69]
	Peak**	1505 [17]	2390 [27]	2832 [32]	3275 [37]	4070 [46]	4960 [56]	6280 [71]	7350 [83]	7700 [87]
Max. Output	Cont.	9.5 [7]	17 [12,5]	17.4 [13]	16.8 [12,5]	15.4 [11,5]	14.8 [11]	13.4 [10]	12 [9]	10.5 [7,8]
HP [kW]	Int.*	11.9 [8,5]	20.1 [15]	20.1 [15]	19.5 [14,5]	18.8 [14]	17.4 [13]	16.1 [12]	14.8 [11]	14.2 [10,6]
Max. Pressure Drop	Cont.	2030 [140]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	1960 [135]	1670 [115]
PSI [bar]	Int.*	2540 [175]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2320 [160]	2030 [140]
	Peak**	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3045 [210]	2540 [175]
Max. Oil Flow	Cont.	10.5 [40]	15.8 [60]	15.8 [60]	15.8 [60]	15.8 [60]	15.8 [60]	15.8 [60]	15.8 [60]	15.8 [60]
GPM [lpm]	Int.*	13.2 [50]	19.8 [75]	19.8 [75]	19.8 [75]	19.8 [75]	19.8 [75]	19.8 [75]	19.8 [75]	19.8 [75]
Max. Inlet Pressure	Cont.	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]
PSI [bar]	Int.*	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]
	Peak**	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]
Max. Return Pres-	Cont.	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]
sure with Drain Line	Int.*	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]	2900 [200]
PSI [bar]	Peak**	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]	3260 [225]
Max. Starting Pressure with Unloaded Shaft, PSI [bar]		145 [10]	145 [10]	145 [10]	130 [9]	102 [7]	73 [5]	58 [4]	44 [3]	44 [3]
Min. Starting Torque	At max.press. drop Cont.	710 [8]	1330 [15]	1770 [20]	2215 [25]	2832 [32]	3630 [41]	4000 [45]	4000 [45]	4340 [49]
lb-in [daNm]	At max.press. drop Int.*	885 [10]	1505 [17]	2035 [23]	2480 [28]	3275 [37]	4070 [46]	4870 [55]	5840 [66]	5400 [61]
Min. Speed*, [RPM]**		10	10	10	10	10	10	10	10	10
Weight, lb [kg] **For rear ports +1.433 [0,650]**		15,2 [6,9]	15,4 [7]	16.1 [7,3]	16.3 [7,4]	15.4 [7,6]	18.9 [8,1]	18.7 [8,5]	20.3 [9,2]	21.8 [9,9]

* 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.

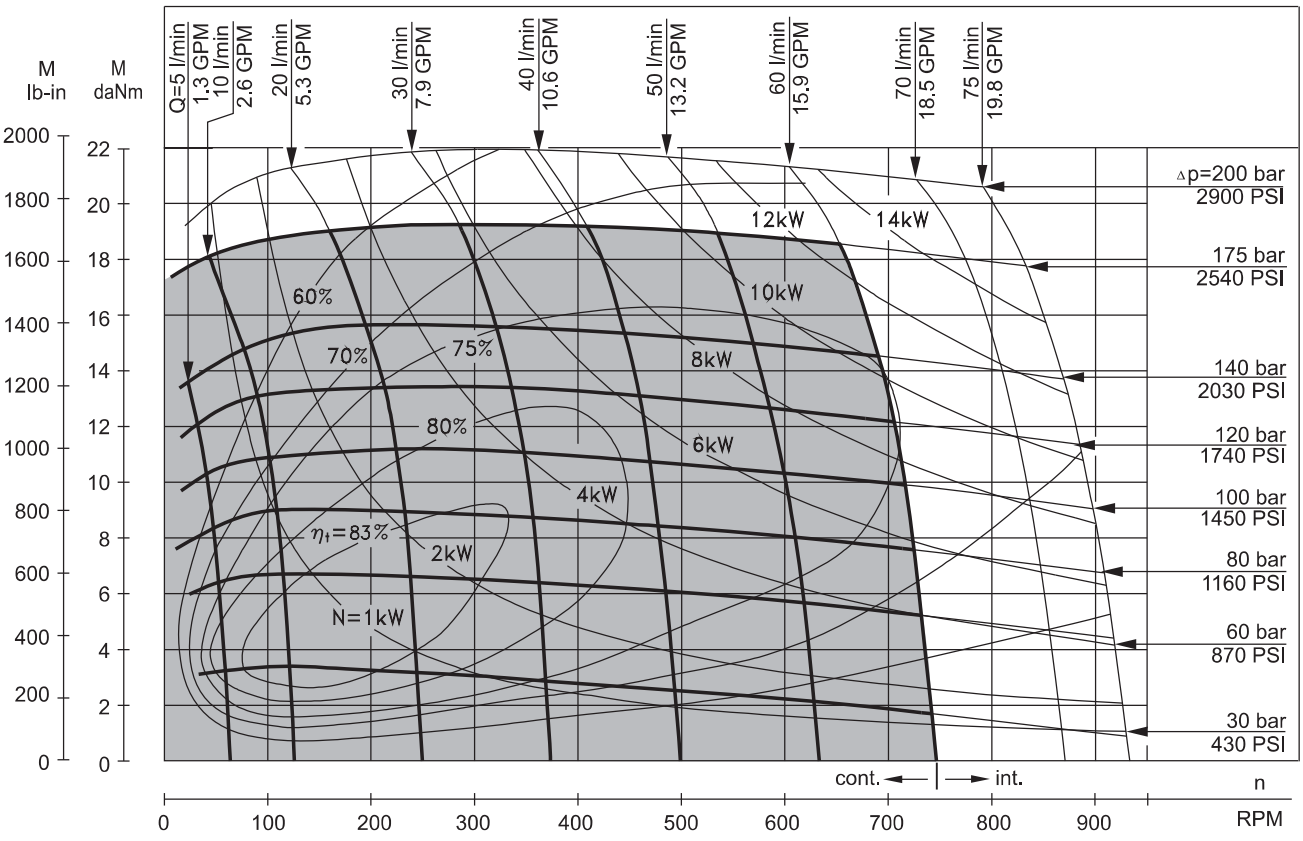
1. Intermittent speed and intermittent pressure must not occur simultaneously.
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4). If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

MLHR 50



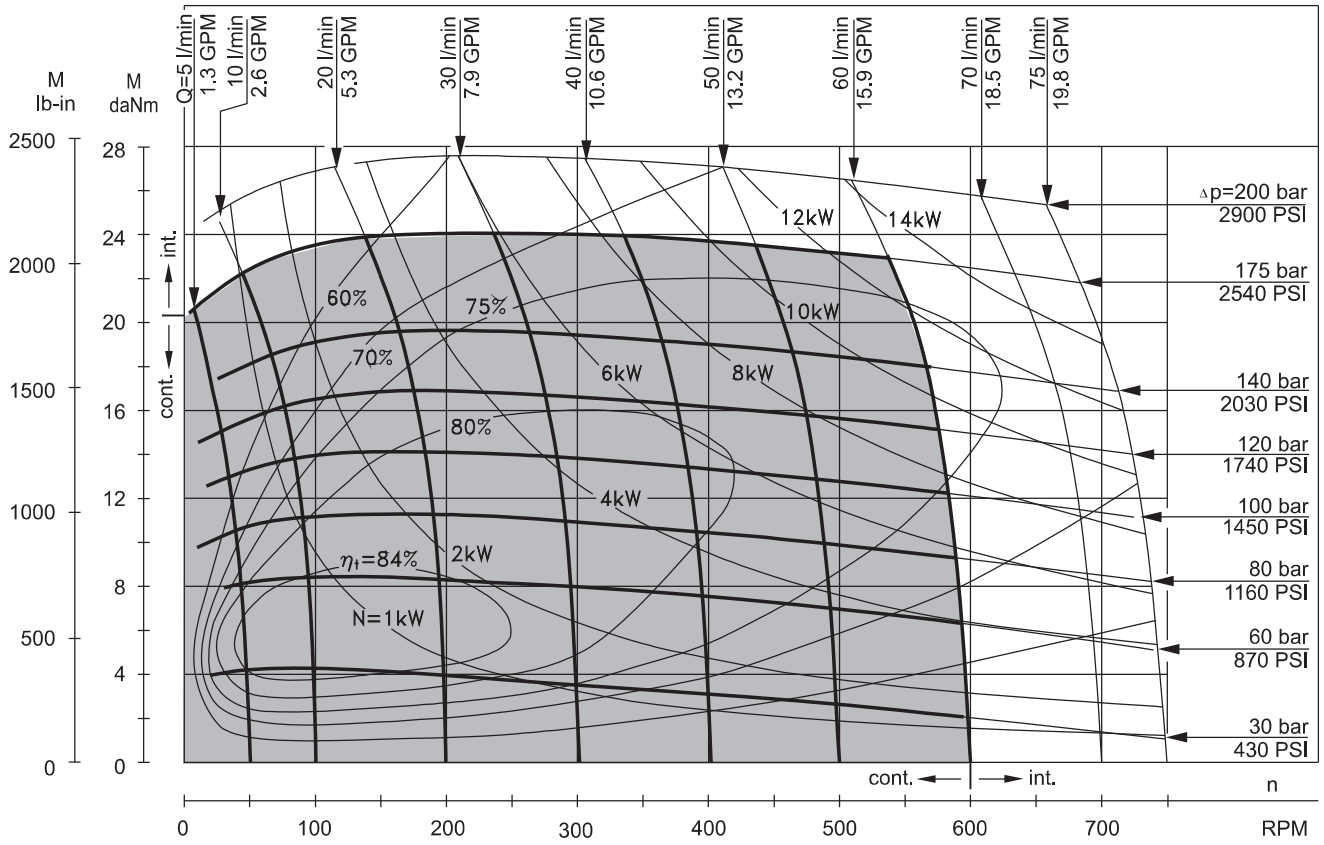
MLHR 80



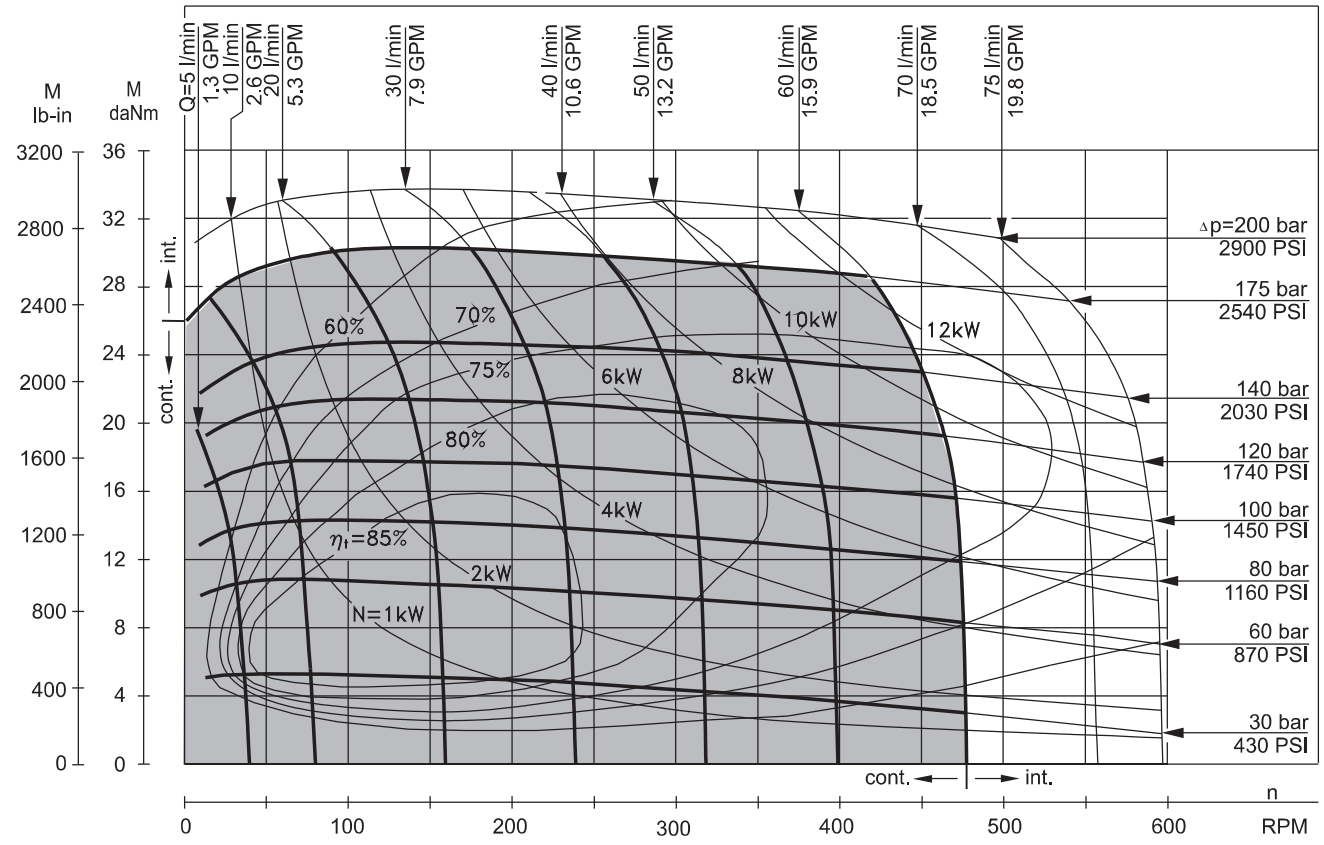
The function diagrams data is for average performance of randomly selected motors at back pressure 72.5÷145 PSI [5÷10 bar] and oil with viscosity of 150 SUS [32 mm²/s] at 122°F [50°C].

FUNCTION DIAGRAMS

MLHR 100



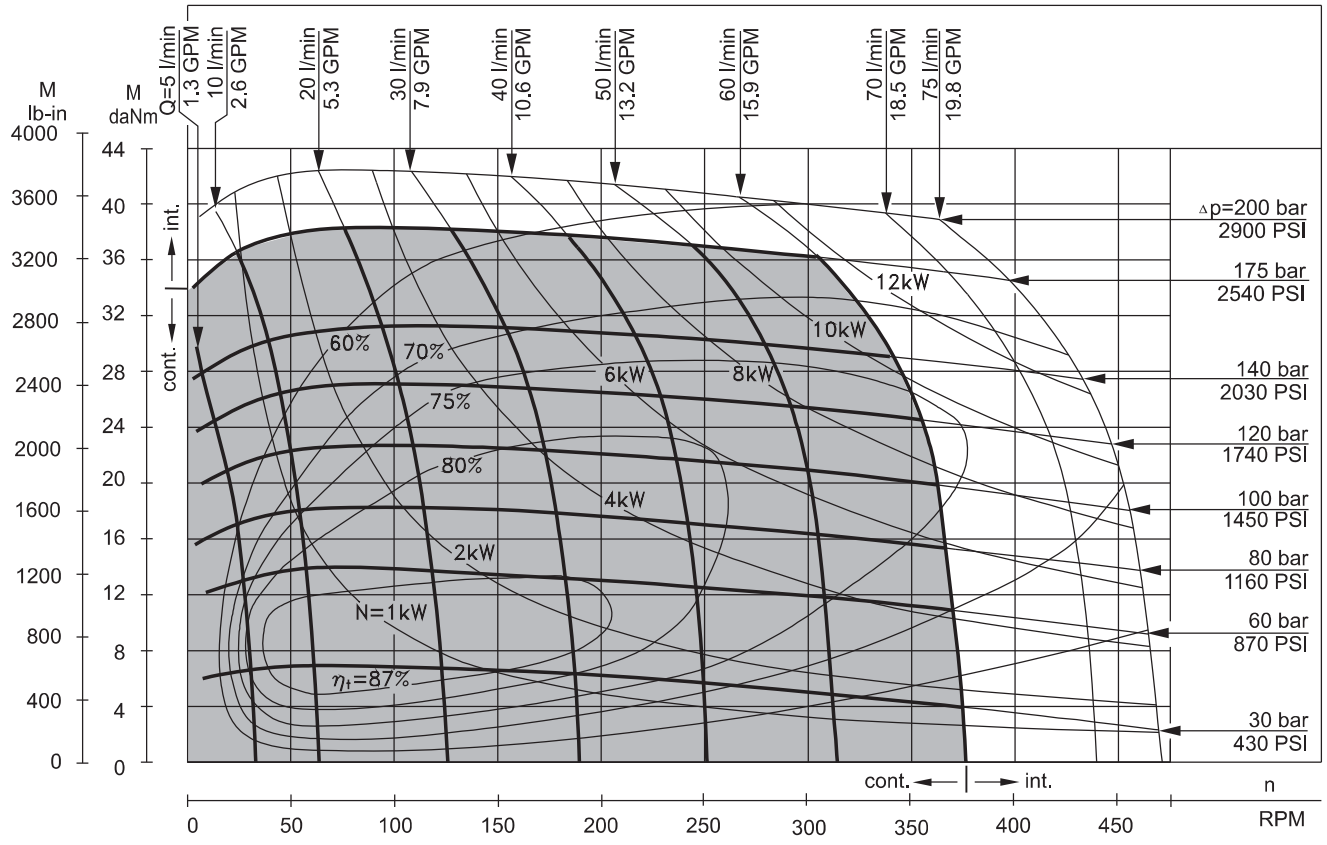
MLHR 125



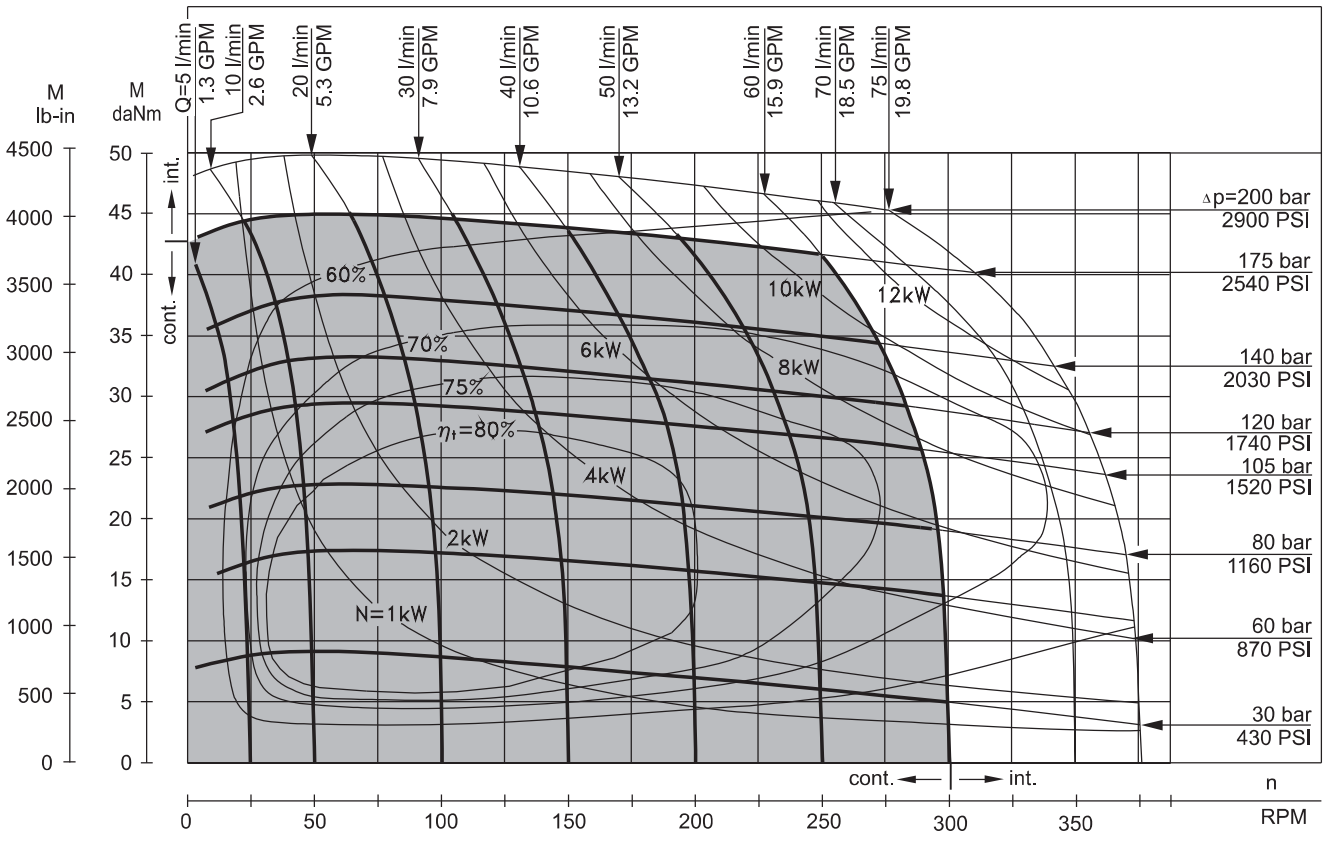
The function diagrams data is for average performance of randomly selected motors at back pressure 72.5÷145 PSI [5÷10 bar] and oil with viscosity of 150 SUS [32 mm²/s] at 122°F [50°C].

FUNCTION DIAGRAMS

MLHR 160



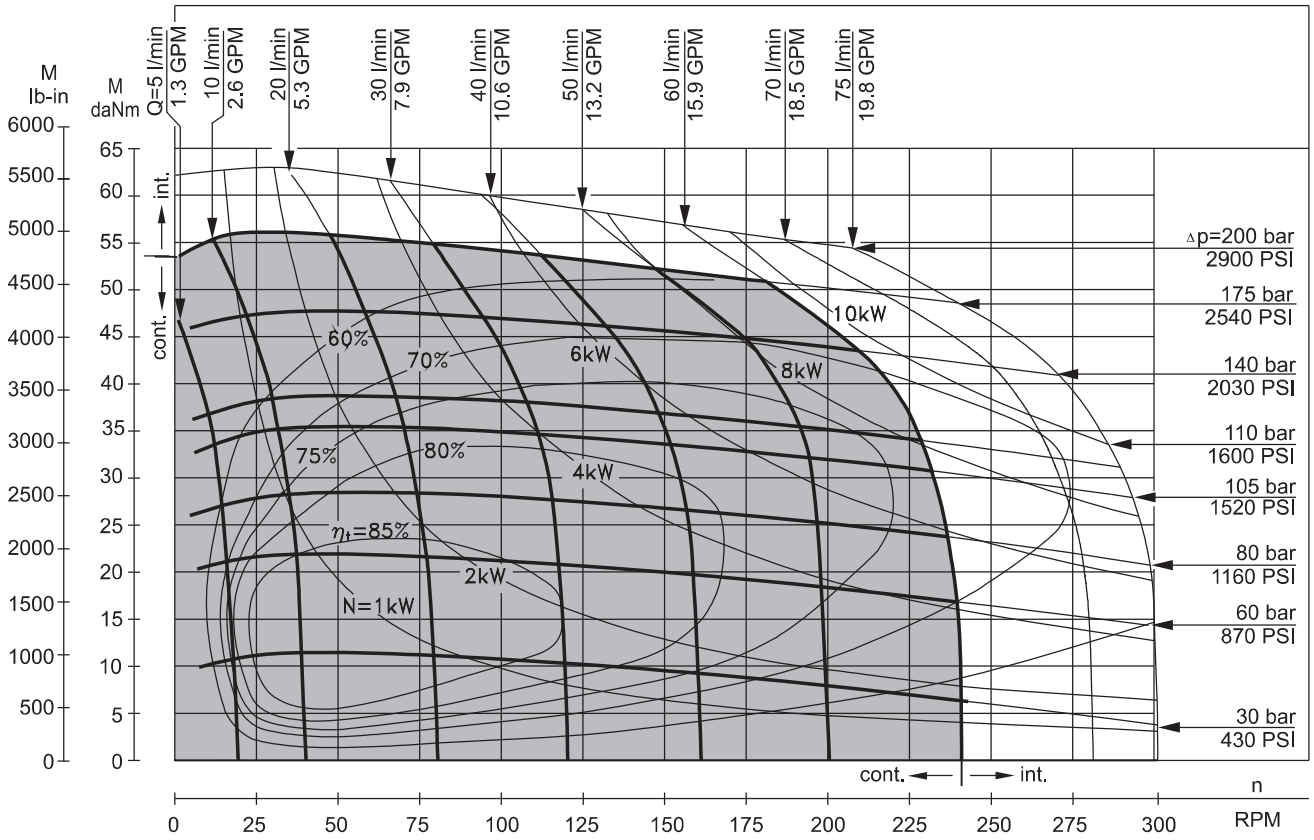
MLHR 200



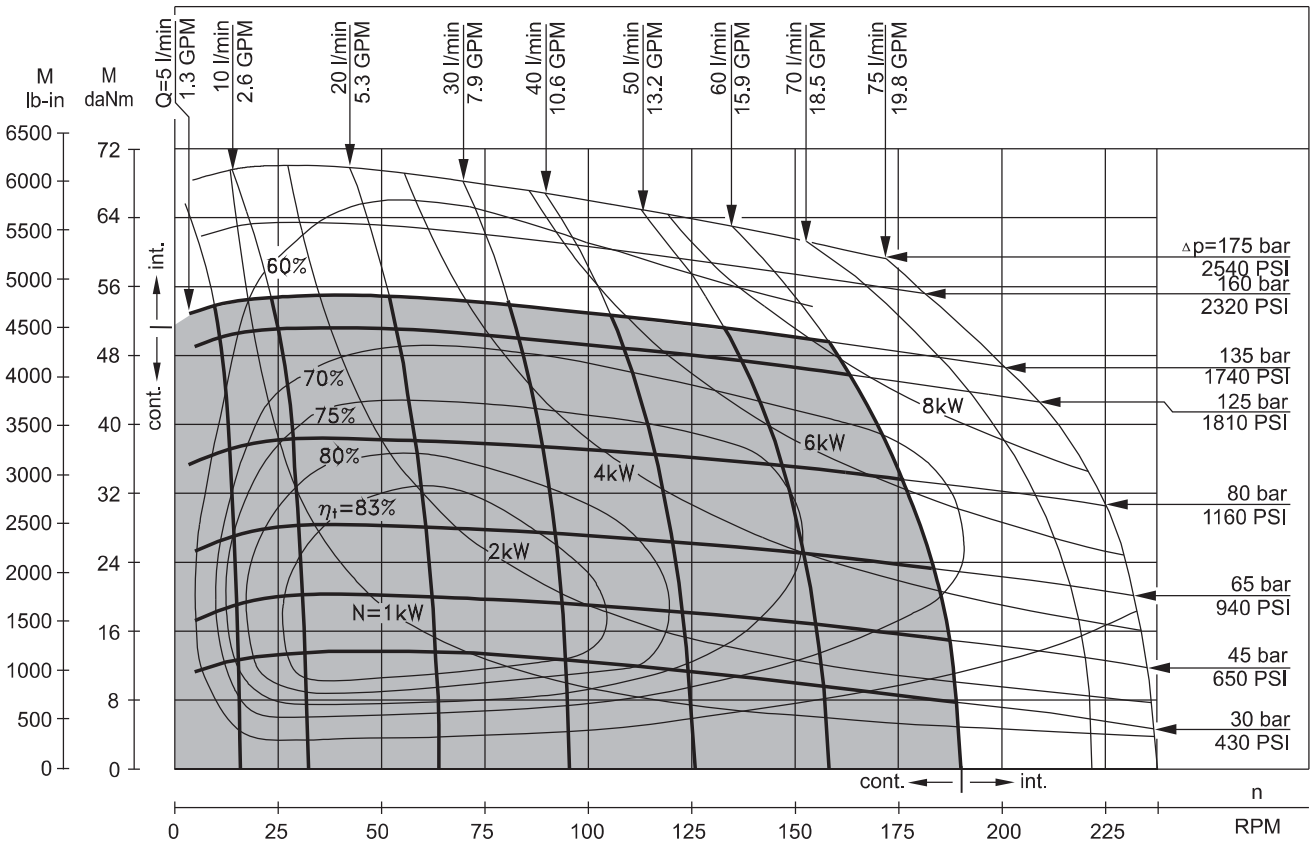
The function diagrams data is for average performance of randomly selected motors at back pressure 72.5÷145 PSI [5÷10 bar] and oil with viscosity of 150 SUS [32 mm²/s] at 122°F [50°C].

FUNCTION DIAGRAMS

MLHR 250



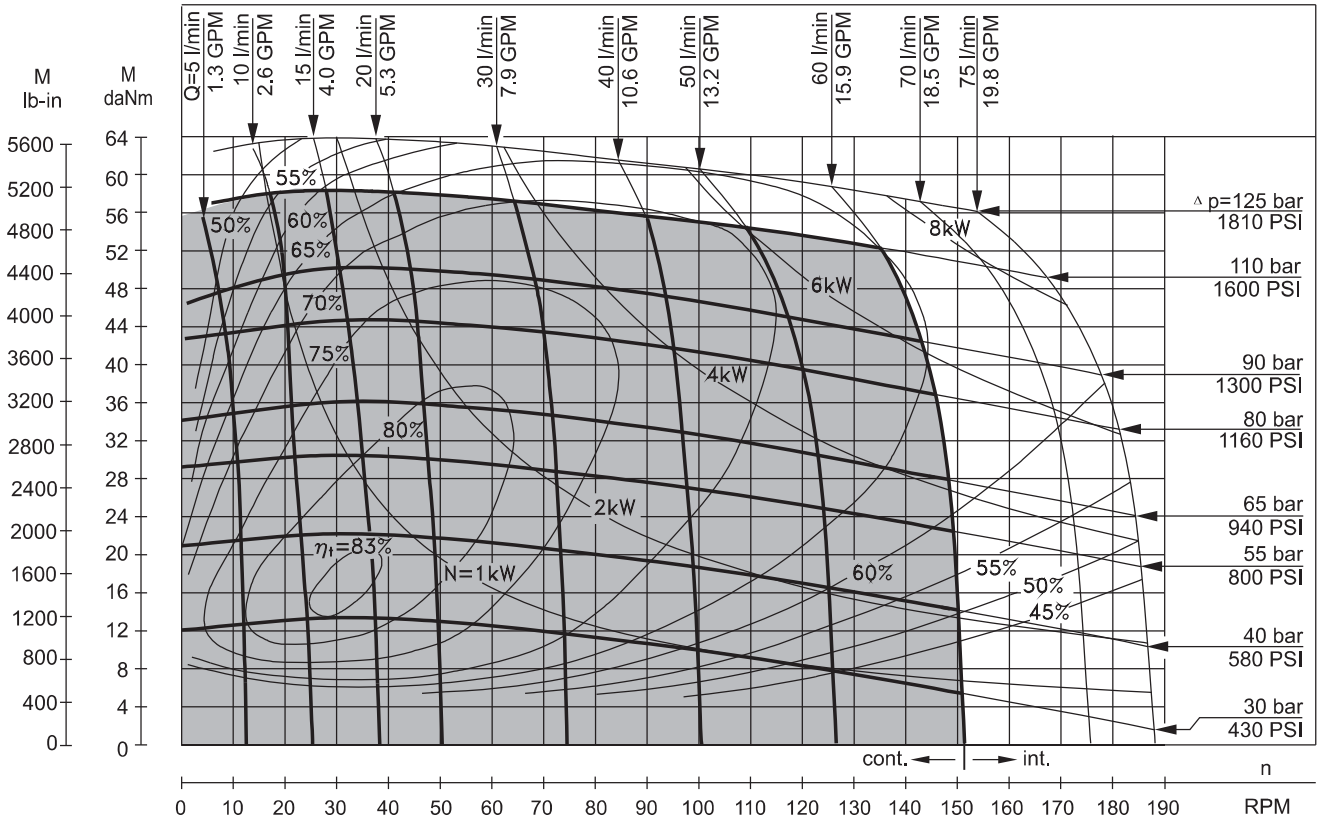
MLHR 315



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

FUNCTION DIAGRAMS

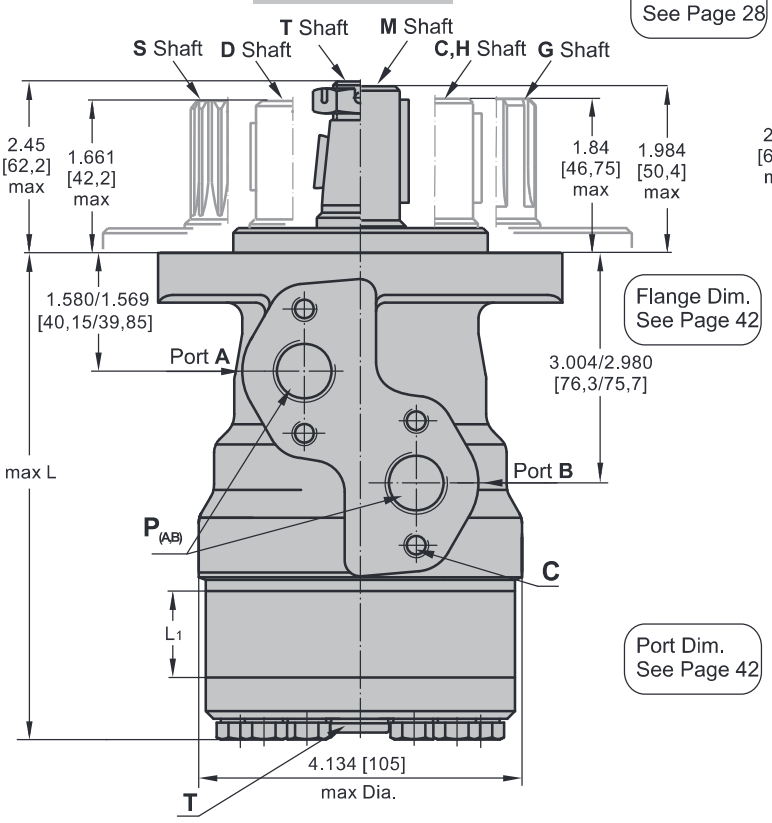
MLHR 400



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

DIMENSIONS AND MOUNTING DATA

MLHR, MLHRF

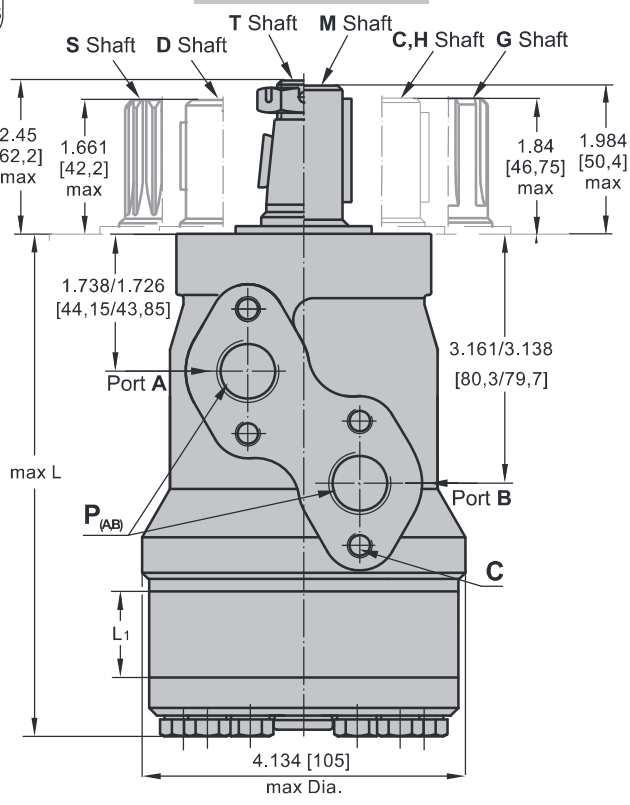


Shaft Dim. See Page 28

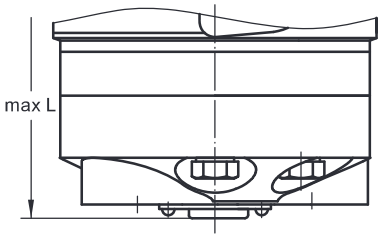
Flange Dim. See Page 42

Port Dim. See Page 42

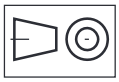
MLHRQ, MLHRM

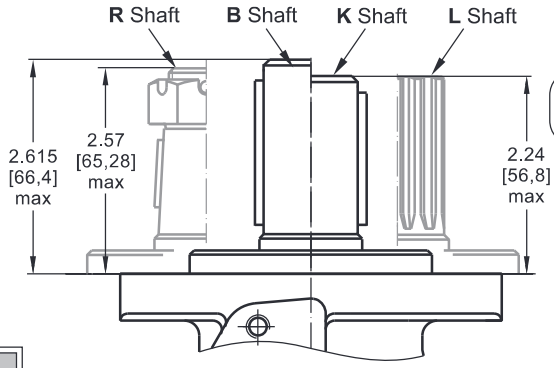


Version 6 7 8 9
Rear ports



in [mm]





Shaft Dim. See Page 29

	Versions			
	2, 6	3, 9	4, 7	5, 8
C	4xM8	4xM8	4x5/16-18 UNC	4x5/16-18 UNC
P(A,B)	2xG½	2xM22x1,5	2x7/8-14 UNF	2x½-14 NPTF
T	G¼	M14x1,5	7/16-20 UNF	7/16-20 UNF

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

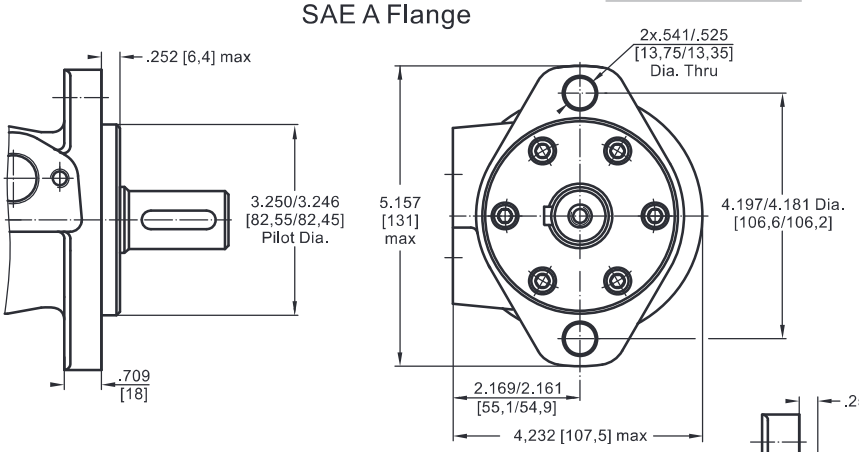
Reverse Rotation
Viewed from Shaft End
Port **A** Pressurized - **CCW**
Port **B** Pressurized - **CW**

Type	Lmax, in [mm]		Type	Lmax, in [mm]		L1, in [mm]
	Versions 2,3,4,5	*Versions 6,7,8,9		Versions 2,3,4,5	*Versions 6,7,8,9	
MLHR(F) 50	5.51 [140,0]	6.14 [156,0]	MLHRQ(M) 50	5.67 [144,0]	6.30 [160,0]	.35 [9,0]
MLHR(F) 80	5.71 [145,0]	6.34 [161,0]	MLHRQ(M) 80	5.87 [149,0]	6.50 [165,0]	.55 [14,0]
MLHR(F) 100	5.85 [148,5]	6.48 [164,5]	MLHRQ(M) 100	6.00 [152,5]	6.63 [168,5]	.69 [17,4]
MLHR(F) 125	6.00 [152,5]	6.63 [168,5]	MLHRQ(M) 125	6.18 [157,0]	6.81 [173,0]	.86 [21,8]
MLHR(F) 160	6.24 [158,5]	6.87 [174,5]	MLHRQ(M) 160	6.42 [163,0]	7.05 [179,0]	1.09 [27,8]
MLHR(F) 200	6.52 [165,5]	7.15 [181,5]	MLHRQ(M) 200	6.69 [170,0]	7.32 [186,0]	1.37 [34,8]
MLHR(F) 250	6.87 [174,5]	7.50 [190,5]	MLHRQ(M) 250	7.03 [178,5]	7.60 [194,5]	1.71 [43,5]
MLHR(F) 315	7.30 [185,5]	7.93 [201,5]	MLHRQ(M) 315	7.48 [190,0]	8.11 [206,0]	2.16 [54,8]
MLHR(F) 400	7.89 [200,5]	8.52 [216,5]	MLHRQ(M) 400	8.05 [204,5]	8.68 [220,5]	2.73 [69,4]

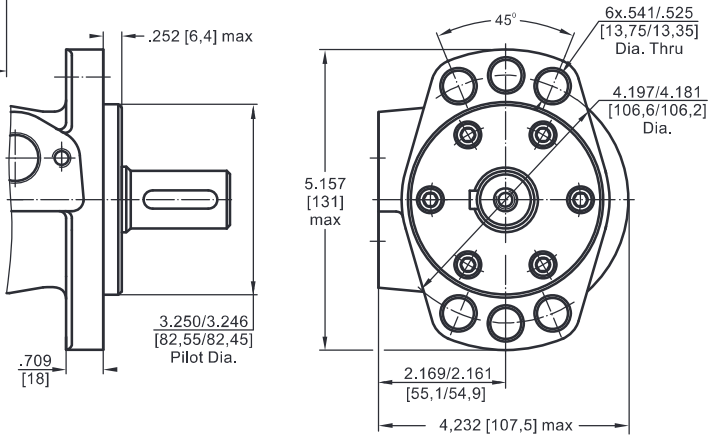
* - For Rear Ported Motors.

MOUNTING

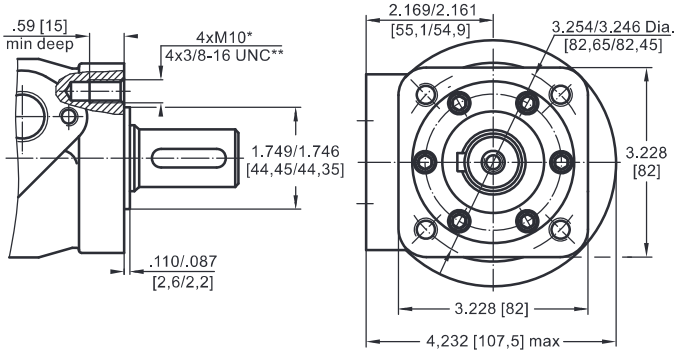
SAE A Flange



F - Magneto Flange



M and Q - Square Flange

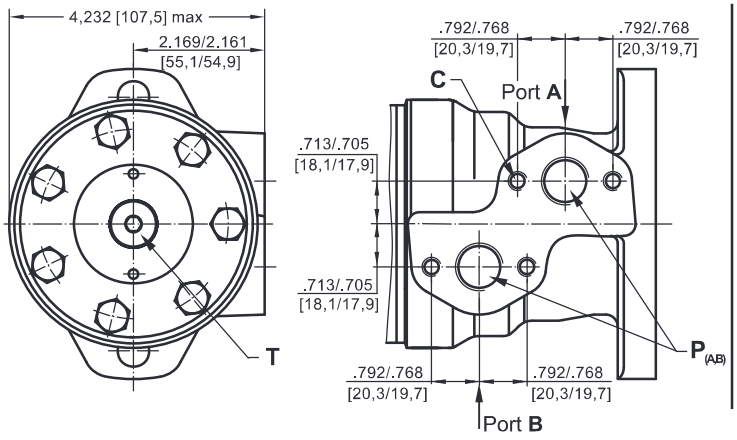


* For **M** Flange
** For **Q** Flange

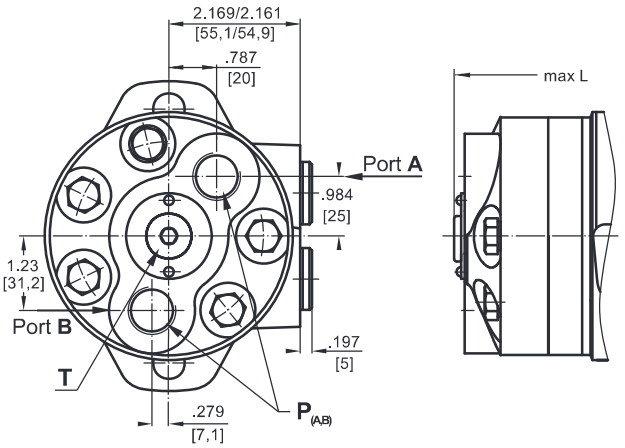
in [mm]

PORTS

Side Ports
Version 2 3 4 5



Rear Ports
Version 6 7 8 9



	Versions			
	2 , 6	3 , 9	4 , 7	5 , 8
C	4xM8	4xM8	4x5/16-18 UNC	4x5/16-18 UNC
P(A,B)	2xG½	2xM22x1,5	2x7/8-14 UNF	2x½-14 NPTF
T	G¼	M14x1,5	7/16-20 UNF	7/16-20 UNF

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
M L H R									

Pos.1 - Mounting Flange

omit - SAE A, two holes
F - Magneto, six holes
M - Square metric, four bolts M10
Q - Square, four bolts

Pos.2 - Displacement code

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

Pos.3 - Shaft Extensions* [see pages 28 and 29]

C - 1" [25,4] straight, Parallel key
VC - 1" [25,4] straight, Parallel key w/ corrosion resistant bushing
D - $^7/_8$" [22,2] straight, Parallel key
G - 1" [25,4] SAE 6B Splined
H - 1" [25,4] straight w/ .406 [10,3] Crosshole
M - 25 mm straight, Parallel key
VM - 25 mm straight, Parallel key w/ corrosion resistant bushing
S - $^7/_8$" [22,2] 13T Splined
T - 1" [25,4] SAE J501 Tapered
B - 32 mm straight, Parallel key
K - 1¼" [31,75] straight, Parallel key
L - 1¼" [31,75] 14T Splined
R - 1¼" [31,75] SAE J501 Tapered

Pos.4 - Option [needle bearings]

omit - none
N - with needle bearings

Pos.5 - Port Size/Type [standard manifold to each]

2 - side ports, 2xG1/2, G1/4, BSP thread, ISO 228
3 - side ports, 2xM22x1,5, M14x1,5, metric thread, ISO 262
4 - side ports, 2x7/8-14 UNF, O-ring, 7/16-20 UNF
5 - side ports, 2x1/2-14 NPTF, 7/16-20 UNF
6 - rear ports, 2xG1/2, G1/4, BSP thread, ISO 228
7 - rear ports, 2x7/8-14 UNF, O-ring, 7/16-20 UNF
8 - rear ports, 2x1/2-14 NPTF, 7/16-20 UNF
9 - rear ports, 2xM22x1,5, M14x1,5, metric thread, ISO 262

Pos.6 - Shaft Seal Version [see page 31]

omit - 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 - Special Features [see page 103]

Pos.9 - Design Series

omit - Factory specified

Notes:
The following combinations are not allowed: - **Q** and **M** flange with **B**, **K**, **L**, **R** shafts;
- **N** option with **B**, **K**, **L**, **R** shafts, **U** option or **RS** option;
- **B**, **K**, **L**, **R** shafts with **U** option.

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

The hydraulic motors are mangano-phosphatized as standard.