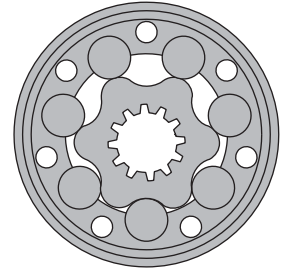


HYDRAULIC MOTOR-BRAKE B/MR



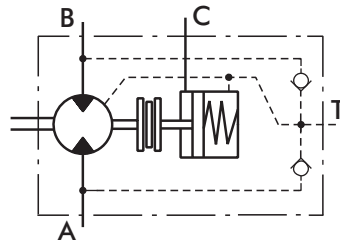
APPLICATION

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



CONTENTS

Specification data	22÷23
Dimensions and mounting	24÷25
Shaft extensions	25
Permissible shaft loads	26
Order code	26



OPTIONS

- » Model - Spool valve, roll-gerotor
- » Fully integrated friction disk brake
- » Side port
- » Shaft - straight
- » BSPP ports

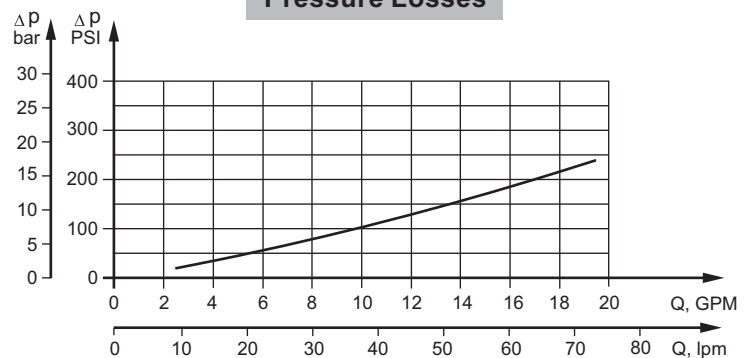
GENERAL

Max. Displacement, cm ³ /rev [in ³ /rev]	397 [24.4]
Max. Speed, [RPM]	600
Max. Torque, daNm [lb-in]	cont.: 61 [5400] int.: 57 [5045]
Max. Output, kW [HP]	14,5 [19.5]
Max. Pressure Drop, bar [PSI]	cont.: 175 [2540] int.: 200 [2900]
Max. Oil Flow, lpm [GPM]	75 [19.8]
Min. Speed, [RPM]	10
Permissible Shaft Loads, daN [lb-in]	P _a =200 [450]
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

Type		B/MR 80	B/MR 100	B/MR 125	B/MR 160	B/MR 160 CB	B/MR 200	B/MR 200 CB
Displacement, cm ³ /rev [in ³ /rev]		80,3 [4.90]	99,8 [6.09]	125,7 [7.67]	159,6 [9.74]		199,8 [12.19]	
Max. Speed,	Cont.	500	500	475	375		300	
[RPM]	Int.*	600	600	600	470		375	
Max. Torque,	Cont.	19,5 [1725]	24 [2125]	30 [2655]	30 [2655]	39 [3450]	30 [2655]	45 [3980]
daNm [lb-in]	Int.*	22[1947]	28 [2480]	34 [3010]	39 [3450]	43 [3805]	39 [3450]	50 [4425]
	Peak**	27 [2390]	32 [2832]	37 [3275]	46 [4070]	46 [4070]	56 [4960]	56 [4955]
Max. Output,	Cont.	8,4 [11.2]	10,8 [14.5]	12,5 [16.8]	10 [13.4]	11,5 [15.4]	7,8 [10.5]	11 [14.75]
kW [HP]	Int.*	9,6 [12.9]	12 [16.1]	14,5 [19.5]	12,5 [16.8]	14 [18.8]	12,4 [16.6]	13 [17.4]
Max. Pressure Drop,	Cont.	175 [2540]	175 [2540]	175 [2540]	135 [1960]	175 [2540]	105 [1523]	175 [2540]
	Int.*	200 [2900]	200 [2900]	200 [2900]	175 [2540]	200 [2900]	145 [2103]	200 [2900]
bar [PSI]	Peak**	225 [3263]	225 [3263]	225 [3263]	225 [3263]	225 [3263]	225 [3263]	225 [3263]
Max. Oil Flow,	Cont.	40 [10.5]	50 [13.2]	60 [15.9]	60 [15.9]		60 [15.9]	
l/min [GPM]	Int.*	48 [12.7]	60 [15.9]	75 [19.8]	75 [19.8]		75 [19.8]	
Max. Inlet	Cont.	175 [2540]						
Pressure,	Int.*	200 [2900]						
bar [PSI]	Peak**	225 [3260]						
Max. Starting Pressure, bar [PSI]		10 [145]	10 [145]	9 [130]	7 [102]		5 [73]	
Min. Starting	At max.press.drop Cont	15 [1330]	20 [1770]	25 [2215]	24 [2124]	32 [2832]	26 [2301]	41 [3628]
Torque, daNm [lb-in]	At max.press.drop Int.*	17 [1505]	23 [2035]	28 [2480]	32 [2832]	37 [3275]	33 [2920]	46 [4071]
Min. Speed***, [RPM]		10	10	10	10	10	10	10
Static Torque of Brake, daNm [lb-in]		55 [4868]						
Min. Brake Release Pressure****, bar [PSI]		13 [190]						
Max.Opening Pressure, bar [PSI]		200 [2900]						
Weight, kg [lb]		11,0 [24.3]	11,2 [24.7]	11,4 [25.2]	11,6 [25.6]	11,7 [25.8]	12,2 [26.9]	12,3 [27.12]

* 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.

**** Motor-brakes must always have a drain line. The brake release pressure is the difference between the pressure in the brake release line and the pressure in the drain line.

- 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)

Type		B/MR 250	B/MR 250 CB	B/MR 315	B/MR 315 CB	B/MR 400	B/MR 400 CB
Displacement, cm ³ /rev [in ³ /rev]		250,1 [15.26]		315,7 [19.26]		397 [24.4]	
Max. Speed, [RPM]	Cont.	240		190		150	
	Int.*	300		240		190	
Max. Torque daNm [lb-in]	Cont.	30 [2655]	54 [4780]	30 [2655]	55 [4868]	30 [2655]	55 [4868]
	Int.*	39 [3450]	57 [5045]	42 [3717]	57 [5045]	43 [3805]	57 [5045]
	Peak**	60 [5310]	71 [6285]	61 [5400]	71 [6285]	60 [5310]	70 [6195]
Max. Output kW [HP]	Cont.	6,2 [8.3]	10 [13.4]	4,5 [6.1]	9 [12.1]	2,2 [2.9]	7 [9.4]
	Int.*	9,5 [12.7]	11 [14.7]	7,5 [10.1]	10 [13.4]	5,6 [7.5]	8,7 [11.7]
Max. Pressure Drop, bar [PSI]	Cont.	85 [1233]	175 [2540]	65 [942]	135 [1958]	45 [652]	105 [1523]
	Int.*	115 [1668]	185 [2683]	90 [1305]	145 [2103]	75 [1087]	115 [1668]
	Peak**	200 [2900]	225 [3263]	150 [2175]	180 [2610]	120 [1740]	140 [2030]
Max. Oil Flow l/min [GPM]	Cont.	60 [15.9]					
	Int.*	75 [19.8]					
Max. Inlet Pressure bar [PSI]	Cont.	175 [2540]					
	Int.*	200 [2900]					
	Peak**	225 [3260]					
Max. Starting Pressure bar [PSI]		5 [73]		5 [73]		5 [73]	
Min. Starting Torque, daNm [lb-in]	At max.press.drop Cont	24 [2125]	50 [4425]	26 [2300]	50 [4425]	24 [2125]	44 [3895]
	At max.press.drop Int.*	31 [2745]	51,5 [4560]	35 [3100]	51,8 [4585]	38 [3364]	50 [4425]
Min. Speed***, [RPM]		10	10	10	10	10	10
Static Torque of Brake, daNm [lb-in]		55 [4868]					
Min. Brake Release Pressure****, bar [PSI]		13 [190]					
Max. Opening Pressure, bar [PSI]		200 [2900]					
Weight, kg [lb]		12,6 [27.8]	12,7 [28]	13,3 [29.3]	13,4 [29.5]	14 [30.9]	14,1 [31.1]

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

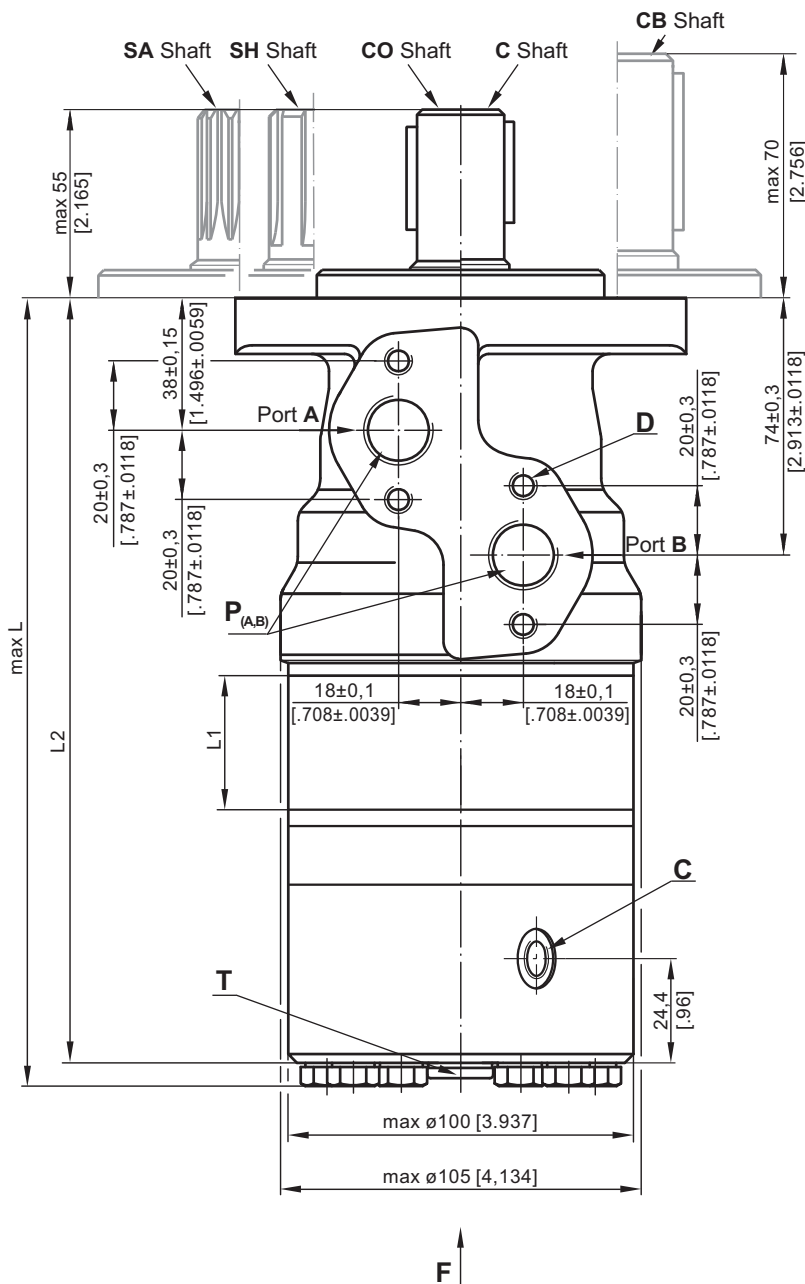
** Peak load: the permissible values may occur for max. 1% of every minute.

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

**** Motor-brakes must always have a drain line. The brake release pressure is the difference between the pressure in the brake release line and the pressure in the drain line.

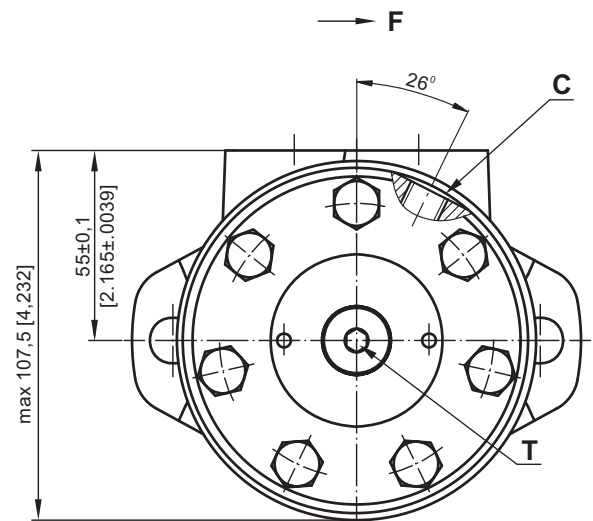
- Intermittent speed and intermittent pressure must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4). If using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

DIMENSIONS AND MOUNTING DATA



Shaft Dim.
See Page 25

Flange Dim.
See Page 25



- D** : 4xM8 - 13 mm [.51 in] depth
C : G1/4 - 12 [.47 in] mm depth
P_(A,B) : 2xG1/2 - 15 [.59 in] mm depth
T : G1/4 - 10 mm [.393 in] depth

Type	L1, mm [in]	L2, mm [in]	L, mm [in]
B/MR 80	14,0 [.551]	205,5 [8.091]	213,5 [8.405]
B/MR 100	17,4 [.685]	209,0 [8.228]	217,0 [8.543]
B/MR 125	21,8 [.858]	213,5 [8.405]	221,5 [8.720]
B/MR 160	27,8 [1.095]	219,5 [8.642]	227,5 [8.957]
B/MR 200	34,8 [1.37]	226,5 [8.917]	234,5 [9.232]
B/MR 250	43,5 [1.713]	235,0 [9.252]	243,0 [9.567]
B/MR 315	54,8 [2.157]	246,5 [9.705]	254,5 [10.02]
B/MR 400	69,4 [2.732]	261,0 [10.275]	269,0 [10.59]

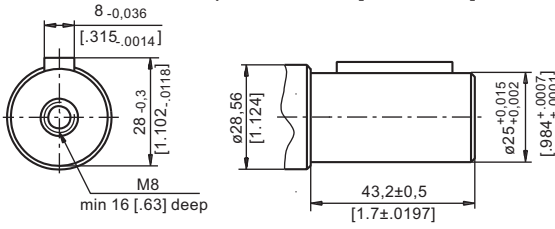


Standard Rotation
 Viewed from Shaft End
 Port A Pressurized - **CW**
 Port B Pressurized - **CCW**

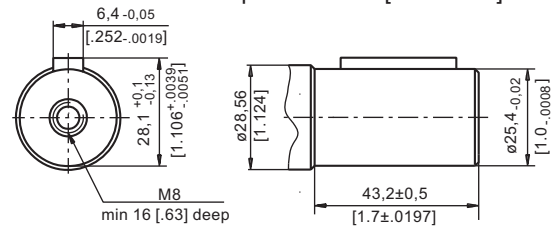
Reverse Rotation
 Viewed from Shaft End
 Port A Pressurized - **CCW**
 Port B Pressurized - **CW**

SHAFT EXTENSIONS

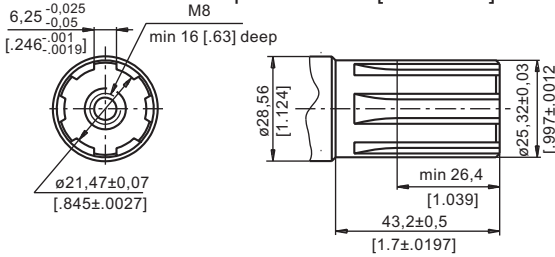
C - $\phi 25$ straight, Parallel key A8x7x32 DIN 6885
Max. Torque 34 daNm [3010 lb-in]



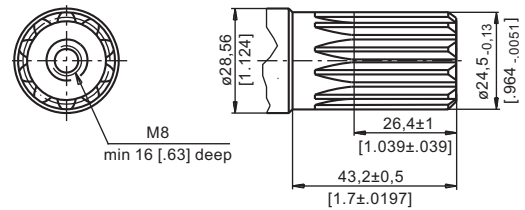
CO - $\phi 1$ " straight, Parallel key $\frac{1}{4}$ "x $\frac{1}{4}$ "x $\frac{1}{4}$ " BS46
Max. Torque 34 daNm [3010 lb-in]



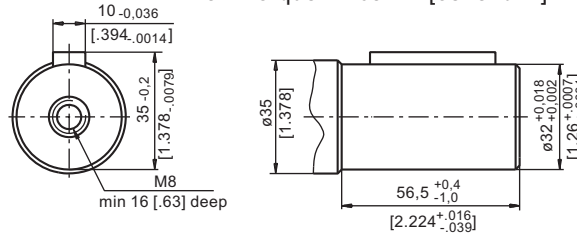
SH - splined, BS 2059 (SAE 6B)
Max. Torque 40 daNm [3540 lb-in]



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

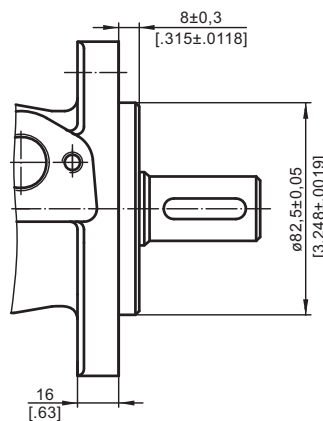
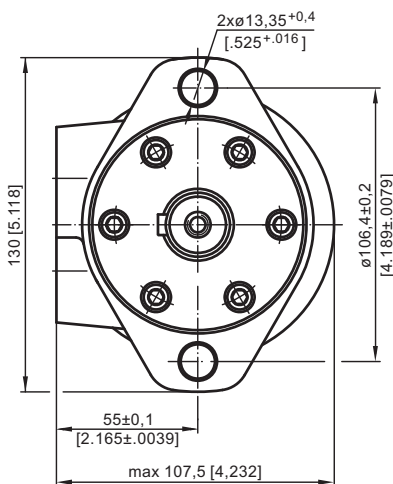


CB - $\phi 32$ straight, Parallel key A10x8x45 DIN 6885
Max. Torque 77 daNm [6815 lb-in]

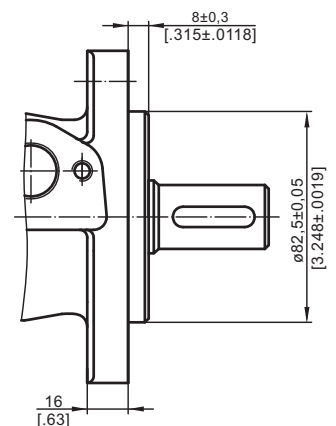
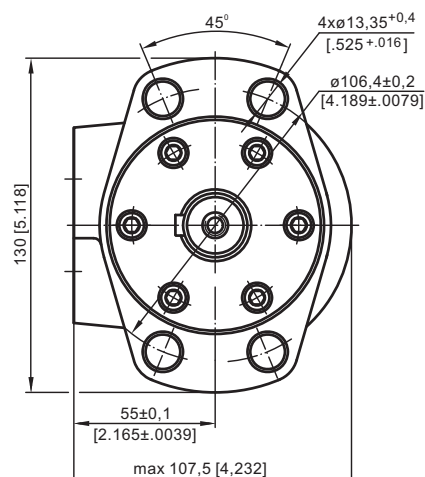


MOUNTING

Oval Mount (2 Holes)

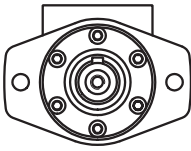
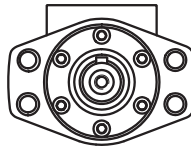


F - Oval Mount (4 Holes)



PERMISSIBLE SHAFT LOADS

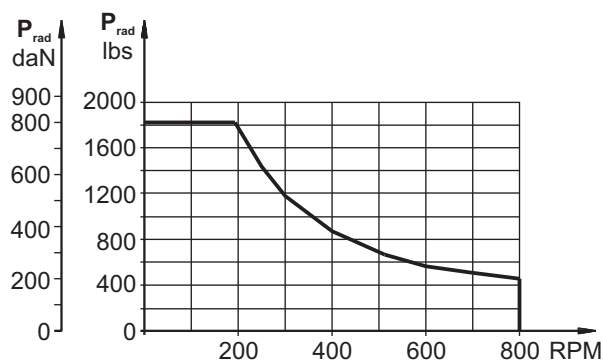
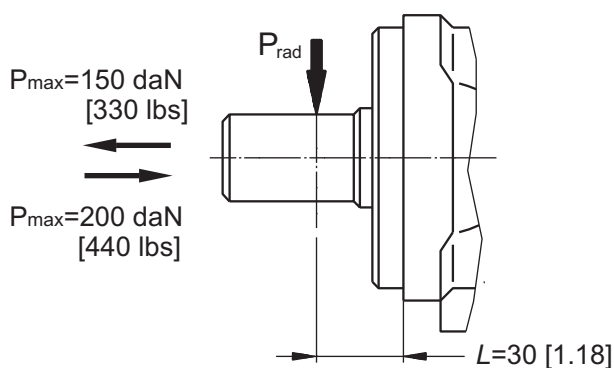
The permissible radial shaft load P_{rad} depends on the speed n , RPM; distance L from the point of load to the mounting flange and shaft version.

Mounting Flange		
Shaft Version	cylindrical - C, CO splined - SH, SA	cylindrical - CB
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*
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*

* $n \leq 200$ 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]



ORDER CODE

	1	2	3	4	5
B / M R					

Pos.1 - Mounting Flange

- omit - Oval mount, two holes
F - Oval mount, four holes

Pos.2 - Displacement code

- 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.3 - Shaft Extensions*

- C** - $\varnothing 25$ straight, Parallel key A8x7x32 DIN6885
CO - $\varnothing 1$ " straight, Parallel key $\frac{1}{4}$ "x $\frac{1}{4}$ "x1 $\frac{1}{4}$ " BS46
SH - $\varnothing 25,32$ splined BS 2059 (SAE 6B)
SA - $\varnothing 24,5$ splined B 25x22 DIN 5482
CB - $\varnothing 32$ straight, Parallel key A10x8x45 DIN 6885

Pos.4 - Special Features (see page 68)

Pos.5 - Design Series

- omit - Factory specified

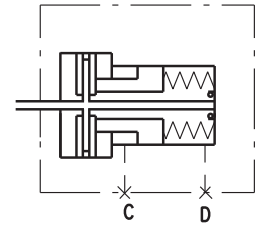
NOTES: * The permissible output torque for shafts must not be exceeded!

The motor-brakes are mangano-phosphatized as standard.

HYDRAULIC DISC BRAKES B...T- Wet

B..T brake is designed to be mounted to the wheels of low-speed agricultural and construction vehicles.

The advantage of these brakes is that despite the smallest possible dimensions they preserve long-term life of the bearings at high radial shaft load.



SPECIFICATION DATA

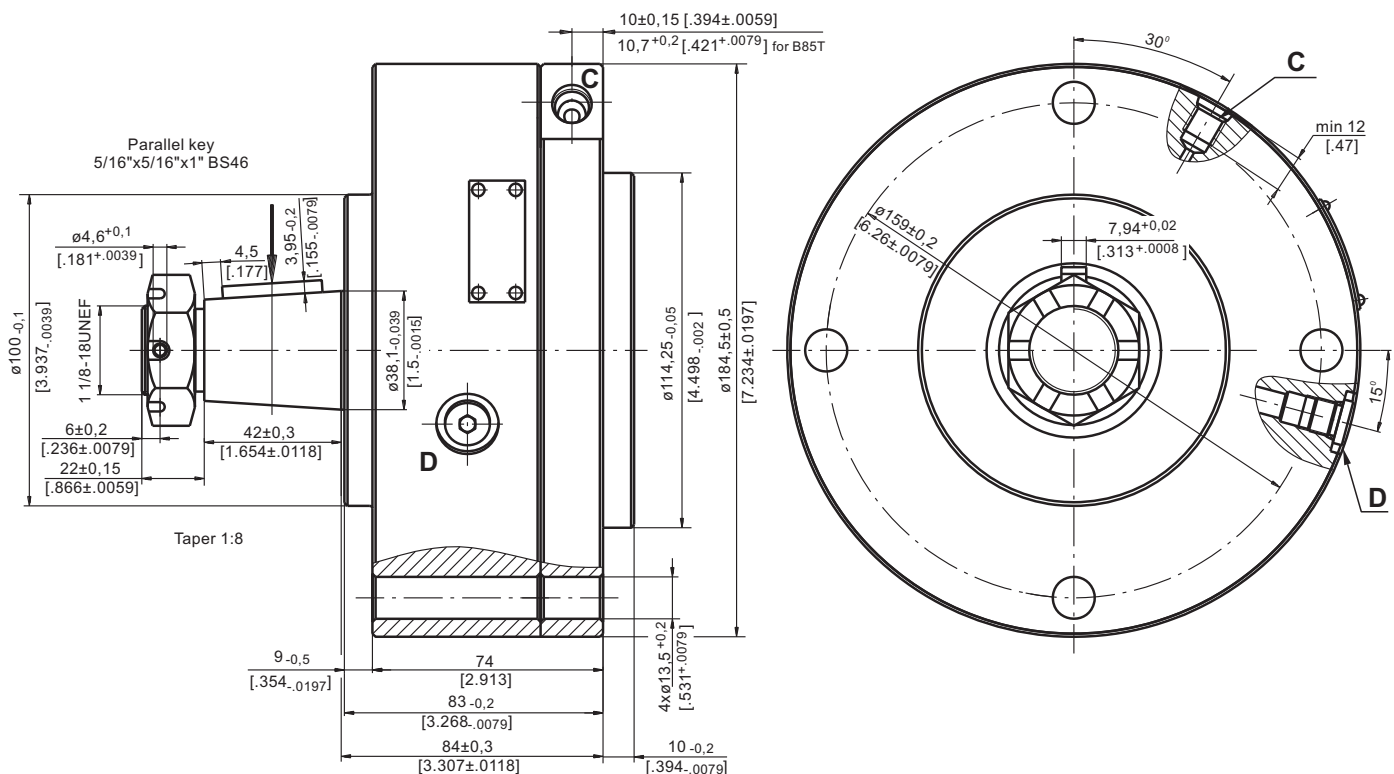
Type	B50T	B55T	B60T	B65T	B85T
Static Torque of Brake, daNm [lb-in]*	50 [4425]	55 [4870]	60 [5310]	65 [5750]	85 [7525]
Initial Release Pressure, bar [PSI]	16 [232]	16 [232]	16 [232]	17 [246]	18 [260]
Full Release Pressure, bar [PSI]	19 [275]	19 [275]	19 [275]	20 [290]	22 [320]
Max. Operating Pressure, bar [PSI]	240 [3480]	240 [3480]	240 [3480]	240 [3480]	240 [3480]
Max. Speed, RPM	60	60	60	60	60
Cont. Radial Shaft Load daN [lbs]**	1000 [2250]	1000 [2250]	1000 [2250]	1000 [2250]	1500 [3370]
Max. Radial Shaft Load daN [lbs]***	2150 [4830]	2150 [4830]	2150 [4830]	2150 [4830]	2250 [5060]

* At 0 bar [0 PSI] back pressure

** At radial shaft load of 1000 daN [2250 lbs], applied at center-line of the key and speed of rotation 60 RPM, the bearing life is 1000 hours.

*** The permissible values of radial shaft load may occur for max. 10% of every minute

DIMENSIONS AND MOUNTING DATA



C : Brake Release Port -7/16-20 UNF
SAE J1926-1/ISO 11926-1

D : Drainage Tap - 7/16-20 UNF

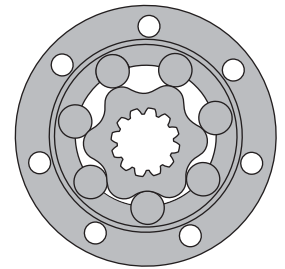


HYDRAULIC MOTORS HW



APPLICATION

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



CONTENTS

Specification data	103÷104
Function diagrams	105÷111
Dimensions and mounting	112÷116
Permissible shaft Seal Pressure ...	116
Shaft extensions	117÷118
Permissible shaft loads	118
Order code	119

OPTIONS

- » Model - Spool valve, roll-gerotor
- » Wheel and flange mount
- » Shafts - straight, splined and tapered
- » BSPP and SAE ports
- » Other special features

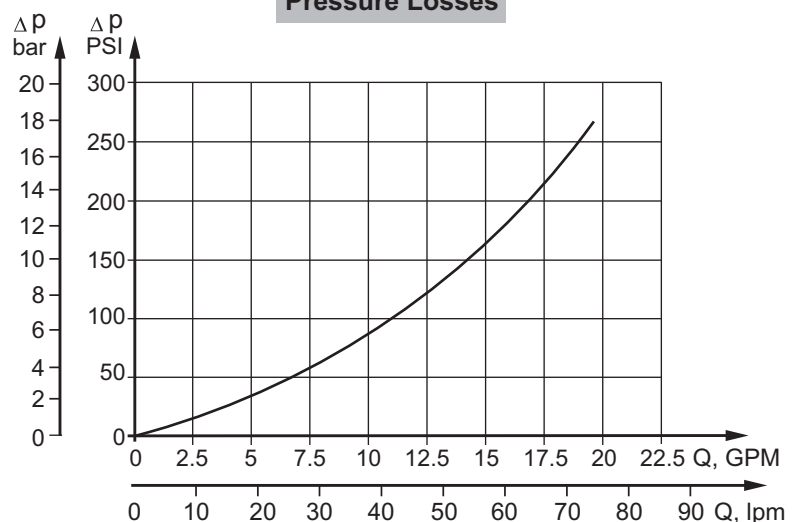
GENERAL

Max. Displacement, cm ³ /rev [in ³ /rev]	550 [33.55]
Max. Speed, [RPM]	497
Max. Torque, daNm [in-lb]	cont.: 96 [8500] int.: 105 [9293]
Max. Output, kW [HP]	23,1 [31]
Max. Pressure Drop, bar [PSI]	cont.: 205 [3000] int.: 225 [3260]
Max. Oil Flow, lpm [GPM]	115 [30.4]
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

Type		HW 125	HW 160	HW 200	HW 235	HW 250	HW 300	HW 315
Displacement, cm³/rev [in³/rev]		126 [7.69]	157,8 [9.64]	201,3 [12.28]	235,3 [14.33]	252 [15.37]	300 [18.3]	314,9 [19.21]
Max. Speed, [RPM]	cont.	357	380	373	319	298	250	238
	int.*	476	475	497	425	397	333	318
Max. Torque daNm [in-lb]	cont.	35 [3098]	44 [3894]	55 [4868]	64,5 [5710]	69 [6107]	81 [7170]	85 [7523]
	int.*	38,5 [3408]	48 [4248]	60 [5310]	70 [6196]	75 [6638]	89 [7877]	93 [8230]
Max. Output, kW [HP]	cont.	16,2 [21.7]	17,6 [23.6]	18,6 [24.9]	18,2 [24.4]	16,8 [22.5]	16,5 [22]	16,4 [21.9]
	int.*	19,8 [26.6]	21,6 [29]	23,1 [31]	22,6 [30.3]	20,8 [27.9]	20,8 [27.9]	20,8 [27.9]
Max. Pressure Drop, bar [PSI]	cont.	205 [2970]	205 [2970]	205 [2970]	205 [2970]	205 [2970]	205 [2970]	205 [2970]
	int.*	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]
Max. Oil Flow lpm [GPM]	cont.	45 [12]	60 [16]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]
	int.*	60 [16]	75 [20]	100 [26.4]	100 [26.4]	100 [26.4]	100 [26.4]	100 [26.4]
Max. Inlet Pressure, bar [PSI]	cont.	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]
	int.*	250 [3625]	250 [3625]	250 [3625]	250 [3625]	250 [3625]	250 [3625]	250 [3625]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		10 [145]	10 [145]	10 [145]	10 [145]	10 [145]	10 [145]	10 [145]
Min. Starting Torque daNm [in-lb]	at max. press. drop cont.	28,7 [2540]	36 [3186]	45,1 [3991]	52,8 [4673]	56,5 [5000]	66,4 [5877]	69,7 [6169]
	at max. press. drop int.*	31,5 [2788]	39,3 [3478]	49,2 [4355]	57,4 [5080]	61,5 [5443]	72,9 [6452]	76,2 [6744]
Min. Speed**, [RPM]		10	10	10	10	10	10	10
Weight, avg. kg [lb]	HW	14,3 [31.5]	14,6 [32.2]	15,1 [33.3]	15,5 [34.2]	15,7 [34.6]	16,1 [35.5]	16,3 [35.9]
	HWF	12,8 [28.2]	13,1 [28.9]	13,6 [30.0]	14,0 [30.9]	14,2 [31.3]	14,6 [32.2]	14,8 [32.6]
	HWFR(FV)	14,8 [32.6]	15,1 [33.3]	15,6 [34.4]	16,0 [35.3]	16,2 [35.7]	16,6 [36.6]	16,8 [37.0]
	HWS	14,0 [30.9]	14,3 [31.5]	14,8 [32.6]	15,2 [33.5]	15,4 [34.0]	15,8 [34.8]	16,0 [35.3]
	HWSR	16,0 [35.3]	16,3 [35.9]	16,8 [37.0]	17,2 [37.9]	17,4 [38.4]	17,8 [39.2]	18,0 [39.7]
	HWD	14,5 [31.9]	14,8 [32.6]	15,3 [33.7]	15,7 [34.6]	15,9 [35.1]	16,3 [35.9]	16,5 [36.4]
	HWV	14,0 [30.86]	14,3 [31.5]	14,8 [32.6]	15,2 [33.5]	15,4 [33.9]	15,8 [34.8]	16,0 [35.2]
	HWE	14,7 [32.4]	15,0 [33.1]	15,5 [34.2]	15,9 [35.1]	16,1 [35.5]	16,5 [36.4]	16,7 [36.8]
	HWSE	14,4 [31.8]	14,7 [32.4]	15,2 [33.5]	15,6 [34.4]	15,8 [34.8]	16,2 [35.7]	16,4 [36.2]
	HWFE	13,2 [29.1]	13,5 [29.8]	14,0 [30.86]	14,4 [31.8]	14,6 [32.2]	15,0 [33.1]	15,2 [33.5]

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

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

*** For "E"-option it is not recommendable a flow bigger than 75% of the nominal flow rate.

- Intermittent speed and intermittent pressure drop 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

Type		HW 350	HW 370	HW 400	HW 470	HW 500	HW 535	HW 550
Displacement, cm³/rev [in³/rev]		347,8 [21.21]	369,2 [22.51]	396,8 [24.2]	470,6 [28.71]	502,4 [30.65]	535 [32.7]	550 [33.55]
Max. Speed, [RPM]	cont.	216	203	189	159	149	140	136
	int.*	288	271	252	244	229	215	209
Max. Torque daNm [in-lb]	cont.	94 [8320]	96 [8497]	96 [8497]	92 [8143]	91 [8054]	90 [7966]	89 [7877]
	int.*	102 [9028]	105 [9293]	98 [8674]	101 [8939]	101 [8939]	104 [9205]	105 [9293]
Max. Output, kW [HP]	cont.	16,5 [22]	13,2 [17.7]	12,5 [16.8]	10,6 [14.2]	10,8 [14.5]	9,4 [12.6]	9 [12]
	int.*	20,8 [27.9]	19,2 [25.7]	18,5 [24.8]	17,4 [23.3]	17,8 [23.9]	16,4 [22]	15,8 [21.2]
Max. Pressure Drop, bar [PSI]	cont.	205 [2970]	200 [2900]	185 [2680]	150 [2180]	140 [2030]	130 [1885]	125 [1815]
	int.*	225 [3260]	220 [3200]	190 [2760]	165 [2390]	155 [2250]	150 [2180]	145 [2105]
Max. Oil Flow lpm [GPM]	cont.	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]
	int.*	100 [26.4]	100 [26.4]	100 [26.4]	115 [30.4]	115 [30.4]	115 [30.4]	115 [30.4]
Max. Inlet Pressure, bar [PSI]	cont.	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]
	int.*	250 [3625]	250 [3625]	250 [3625]	250 [3625]	250 [3625]	250 [3625]	250 [3625]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		10 [145]	10 [145]	10 [145]	10 [145]	10 [145]	10 [145]	10 [145]
Min. Starting Torque daNm [in-lb]	at max. press. drop cont.	77 [6815]	79,5 [7036]	78,7 [6966]	75,4 [6674]	74,6 [6603]	73,8 [6532]	72,9 [6452]
	at max. press. drop int.*	83,6 [7400]	86 [7612]	80,3 [7107]	82,8 [7328]	82,8 [7328]	85,2 [7540]	84,4 [7470]
Min. Speed**, [RPM]		8	8	8	8	8	5	5
Weight, avg. kg [lb]	HW	16,7 [36.8]	16,9 [37.3]	17,3 [38.1]	18,1 [39.9]	18,4 [40.6]	18,8 [41.5]	18,9 [41.7]
	HWF	15,2 [33.5]	15,4 [34.0]	15,8 [34.8]	16,6 [36.6]	16,9 [37.3]	17,3 [38.1]	17,4 [38.3]
	HWFR(FV)	17,2 [37.9]	17,4 [38.4]	17,8 [39.2]	18,6 [41.0]	18,9 [41.7]	19,3 [42.5]	19,4 [42.8]
	HWS	16,4 [36.2]	16,6 [36.6]	17,0 [37.5]	17,8 [39.2]	18,1 [39.9]	18,5 [40.8]	18,6 [41.0]
	HWSR	18,4 [40.6]	18,6 [41.0]	19,0 [41.9]	19,8 [43.7]	20,1 [44.3]	20,5 [45.2]	20,6 [45.4]
	HWD	16,8 [37.0]	17,1 [37.7]	17,5 [38.6]	18,3 [40.3]	18,6 [41.0]	19,0 [41.9]	19,1 [42.1]
	HWV	16,4 [36.2]	16,6 [36.6]	17,0 [37.5]	17,8 [39.7]	18,1 [39.9]	18,5 [40.8]	18,6 [41.0]
	HWE	17,1 [37.7]	17,3 [38.1]	17,7 [39.0]	18,5 [40.8]	18,9 [41.7]	19,2 [42.3]	19,3 [42.5]
	HWSE	16,8 [37.0]	17,0 [37.5]	17,4 [38.4]	18,2 [40.1]	18,5 [40.8]	18,9 [41.7]	19,0 [41.9]
	HWFE	15,6 [34.4]	15,8 [34.8]	16,2 [35.7]	17,0 [37.5]	17,3 [38.1]	17,7 [39.0]	17,8 [39.7]

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

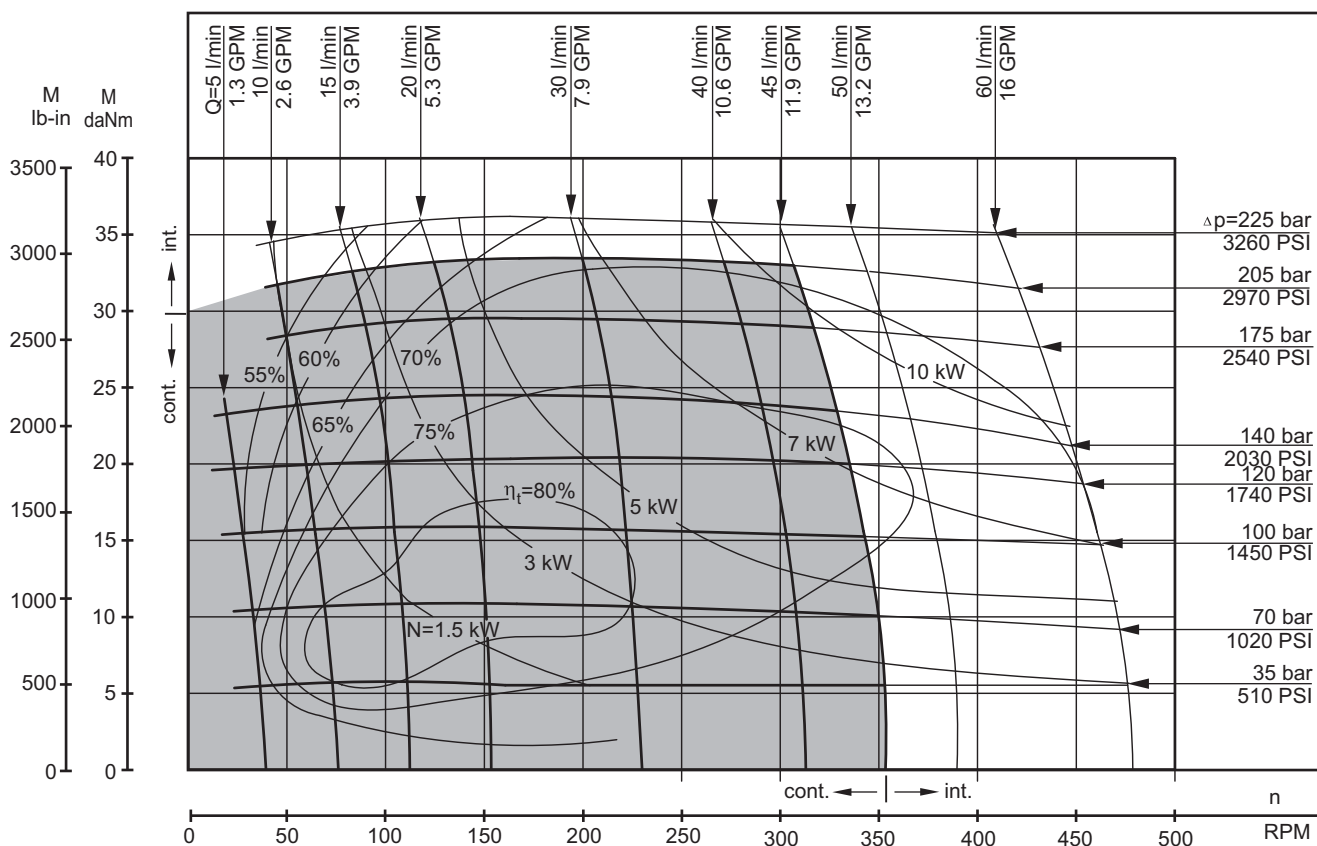
** For speeds lower than given, consult factory or your regional manager.

*** For "E"-option it is not recommendable a flow bigger than 75% of the nominal flow rate.

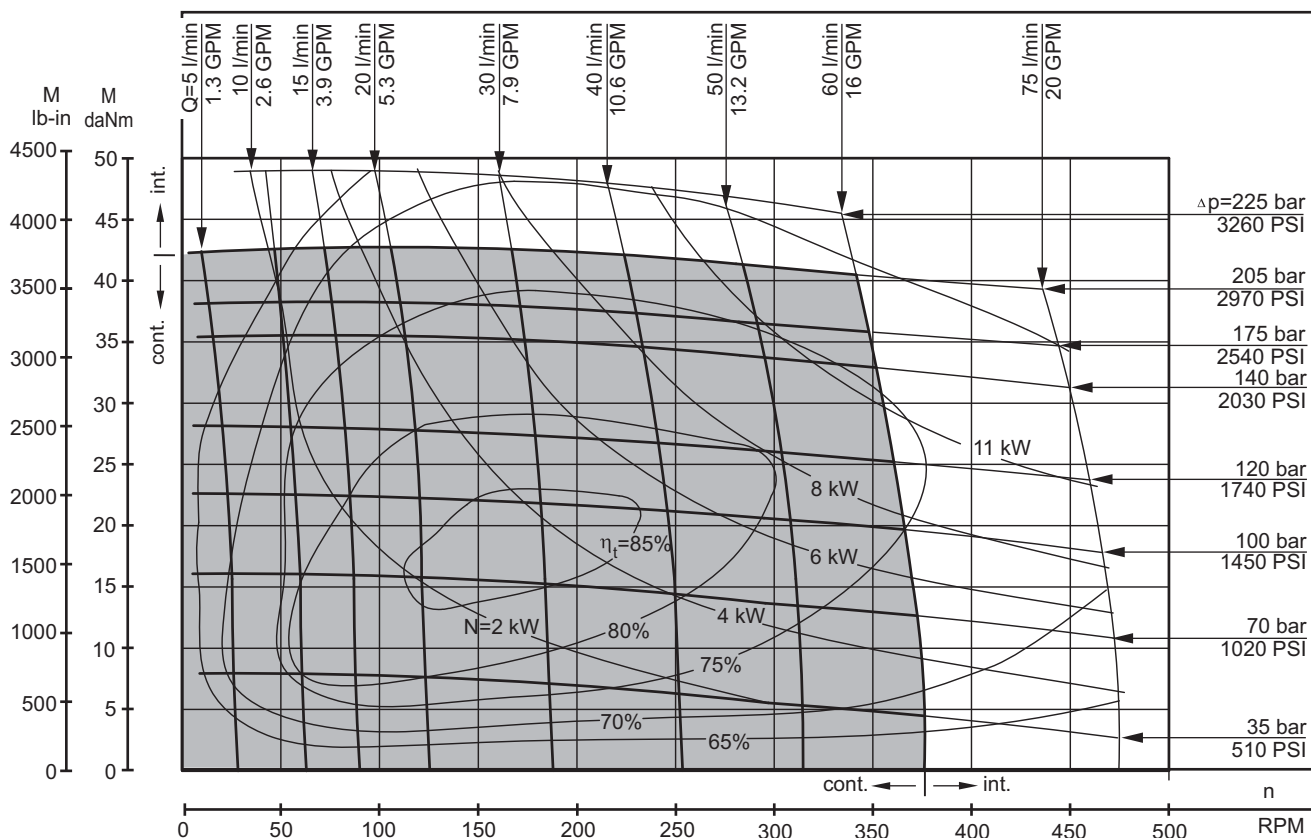
- Intermittent speed and intermittent pressure drop must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).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

HW 125



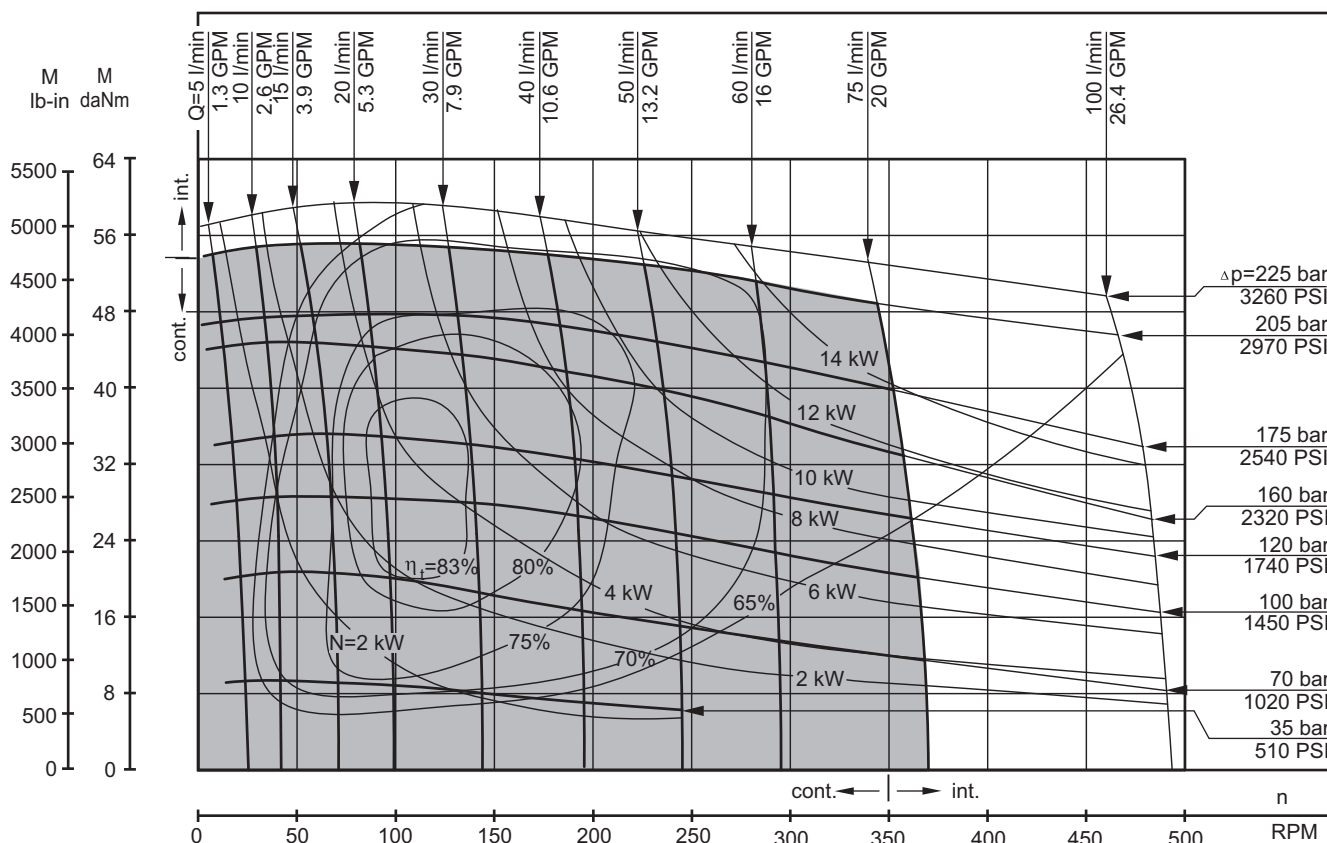
HW 160



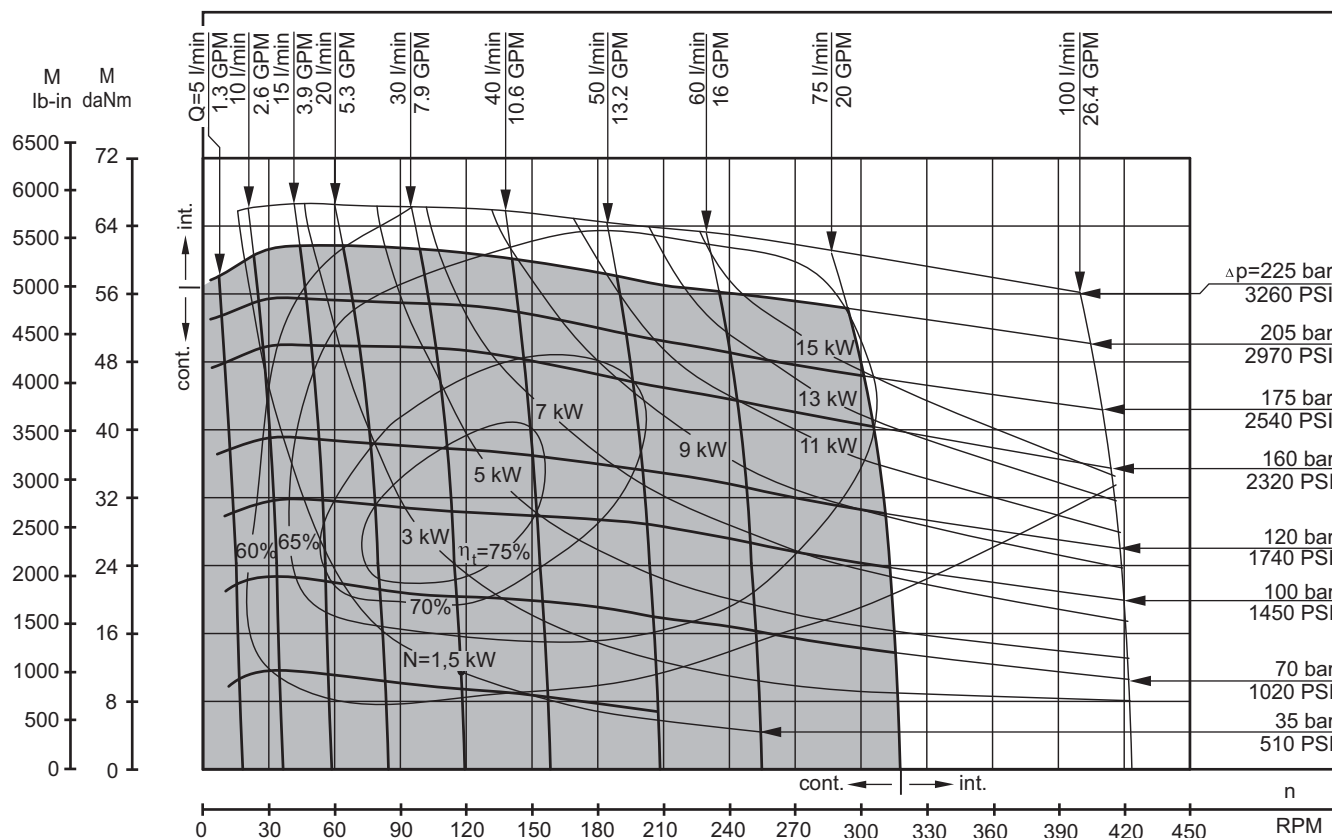
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 200



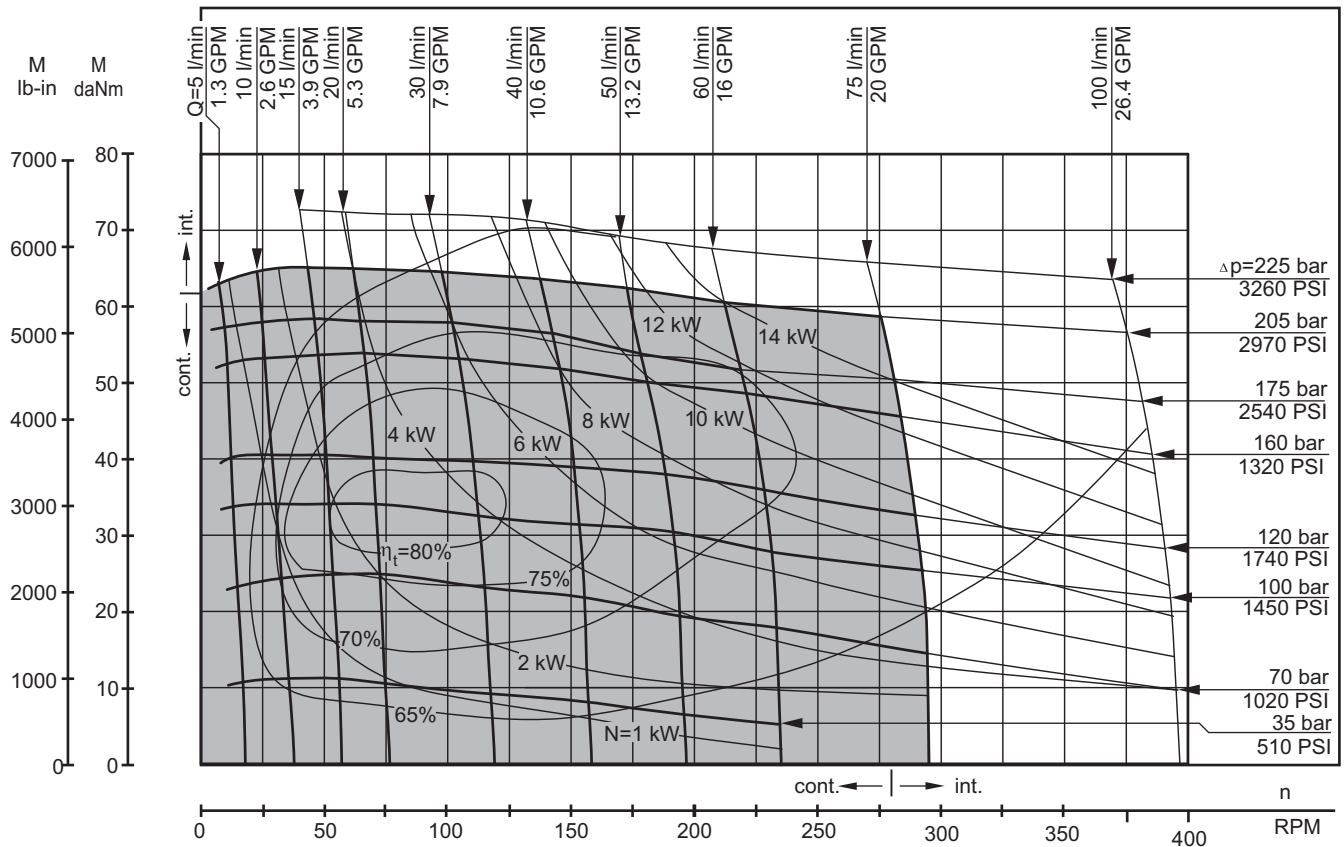
HW 235



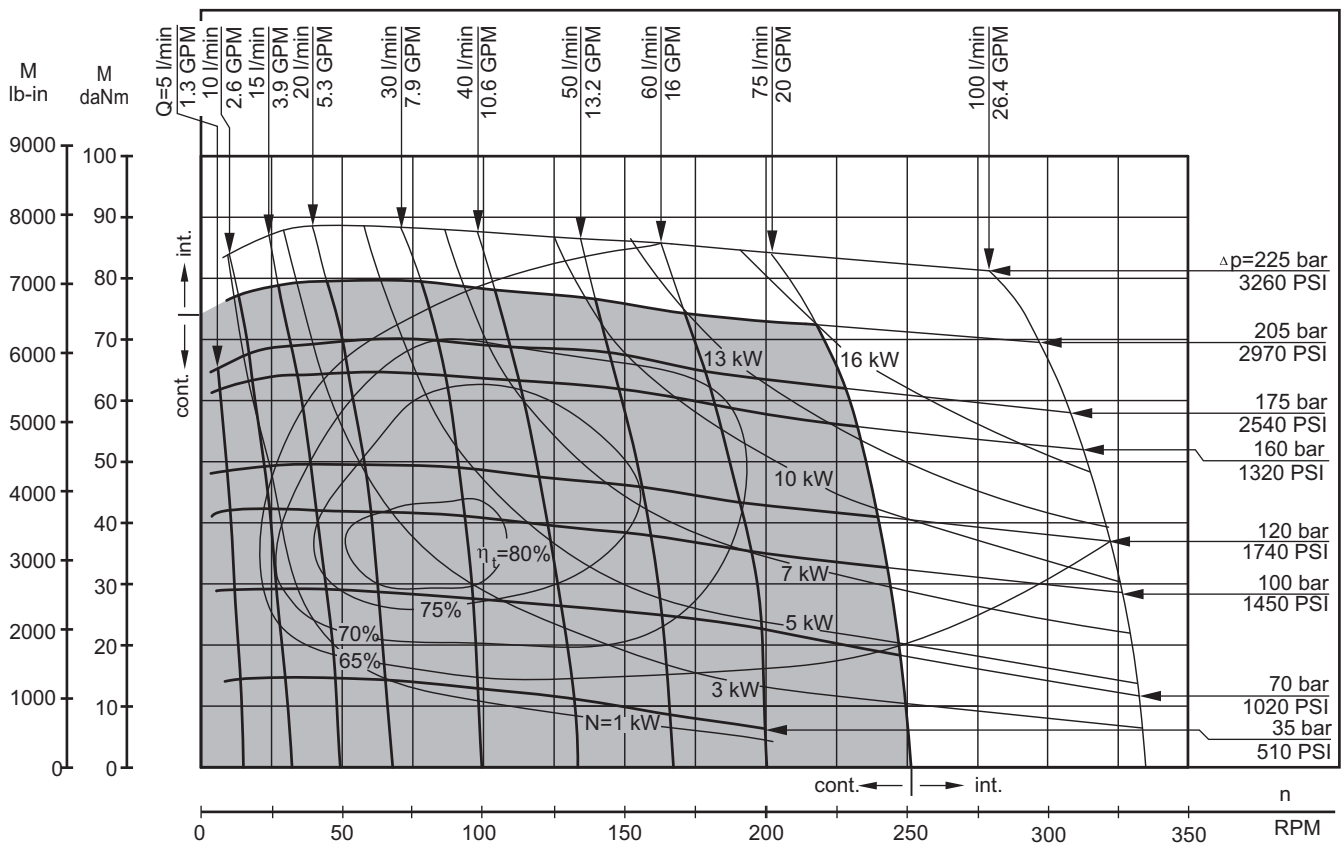
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 250



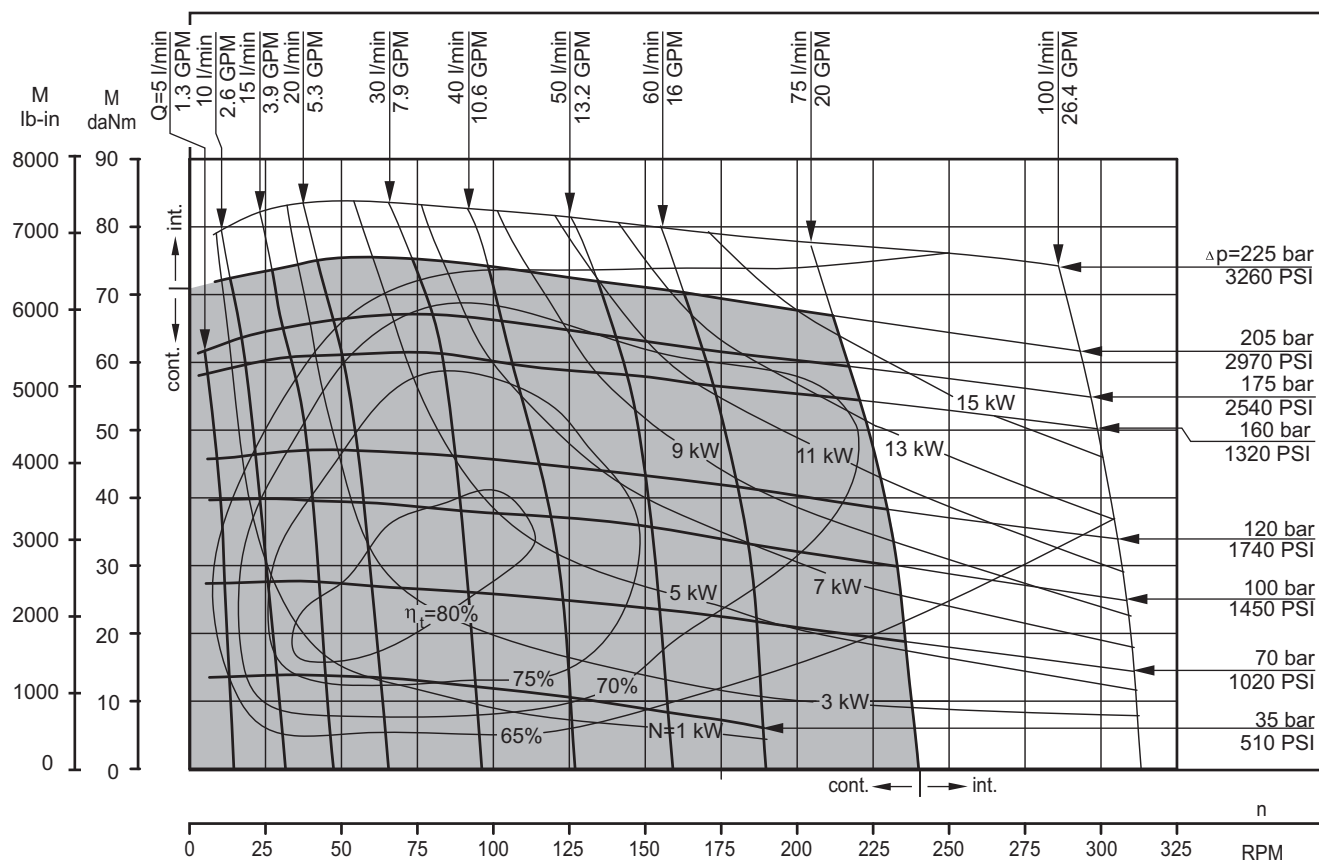
HW 300



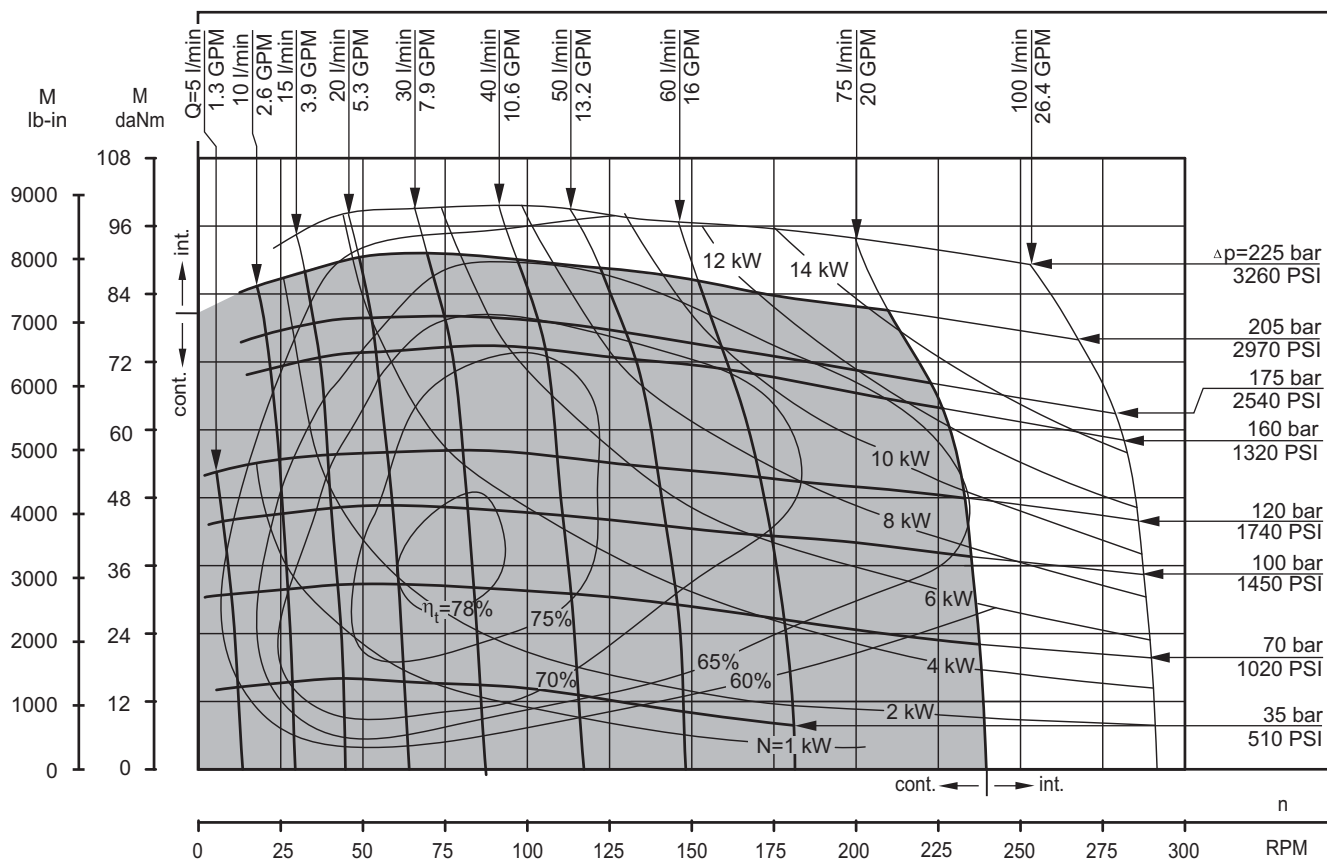
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 315



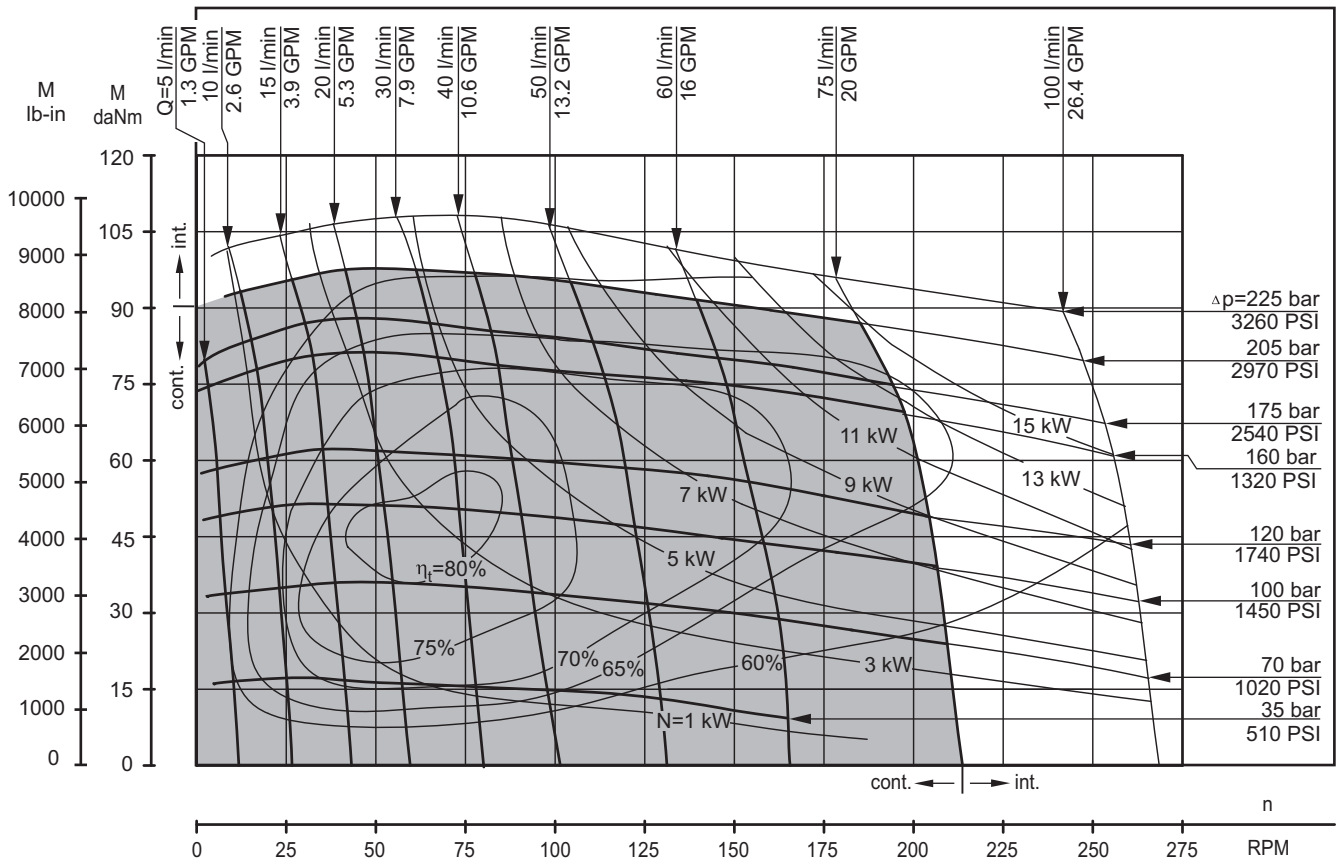
HW 350



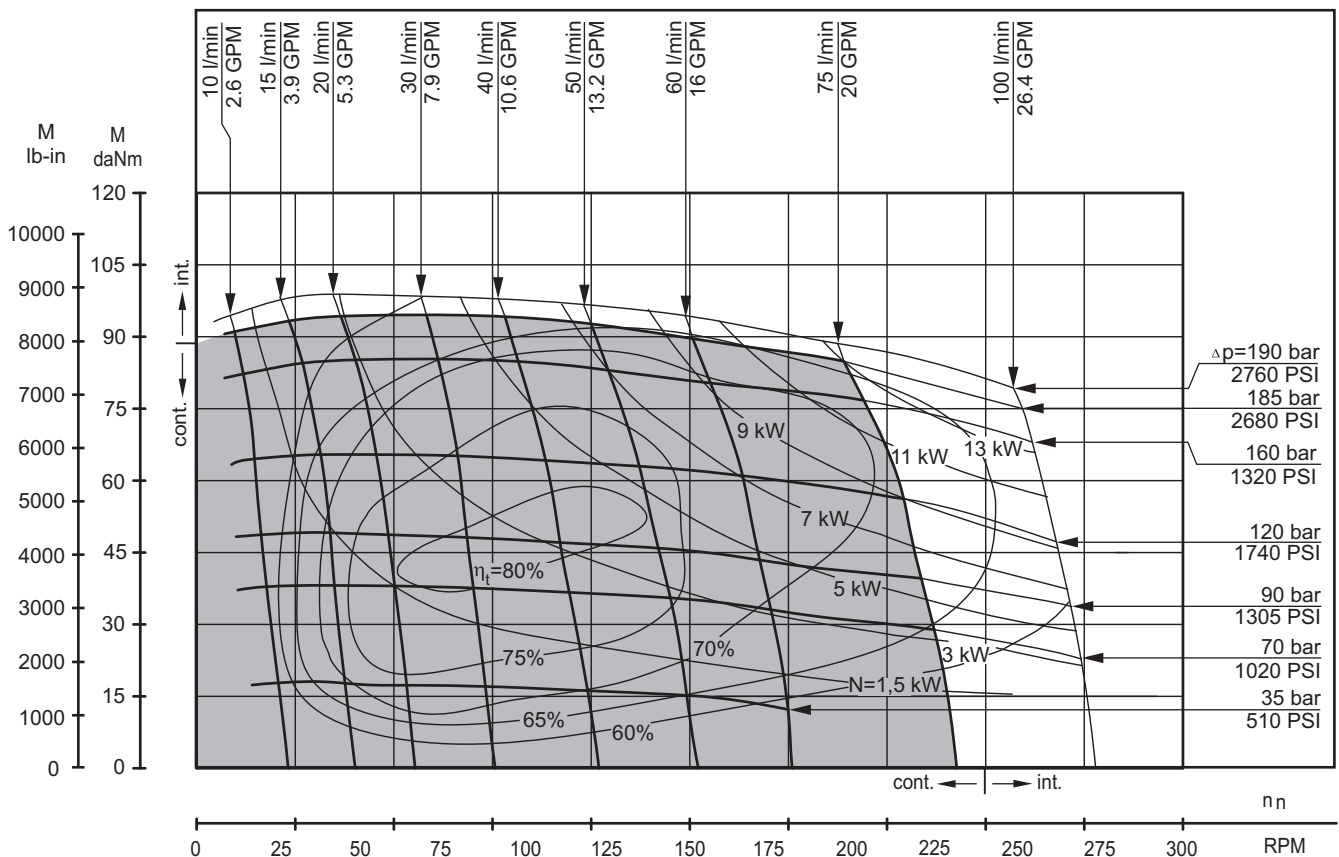
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 370



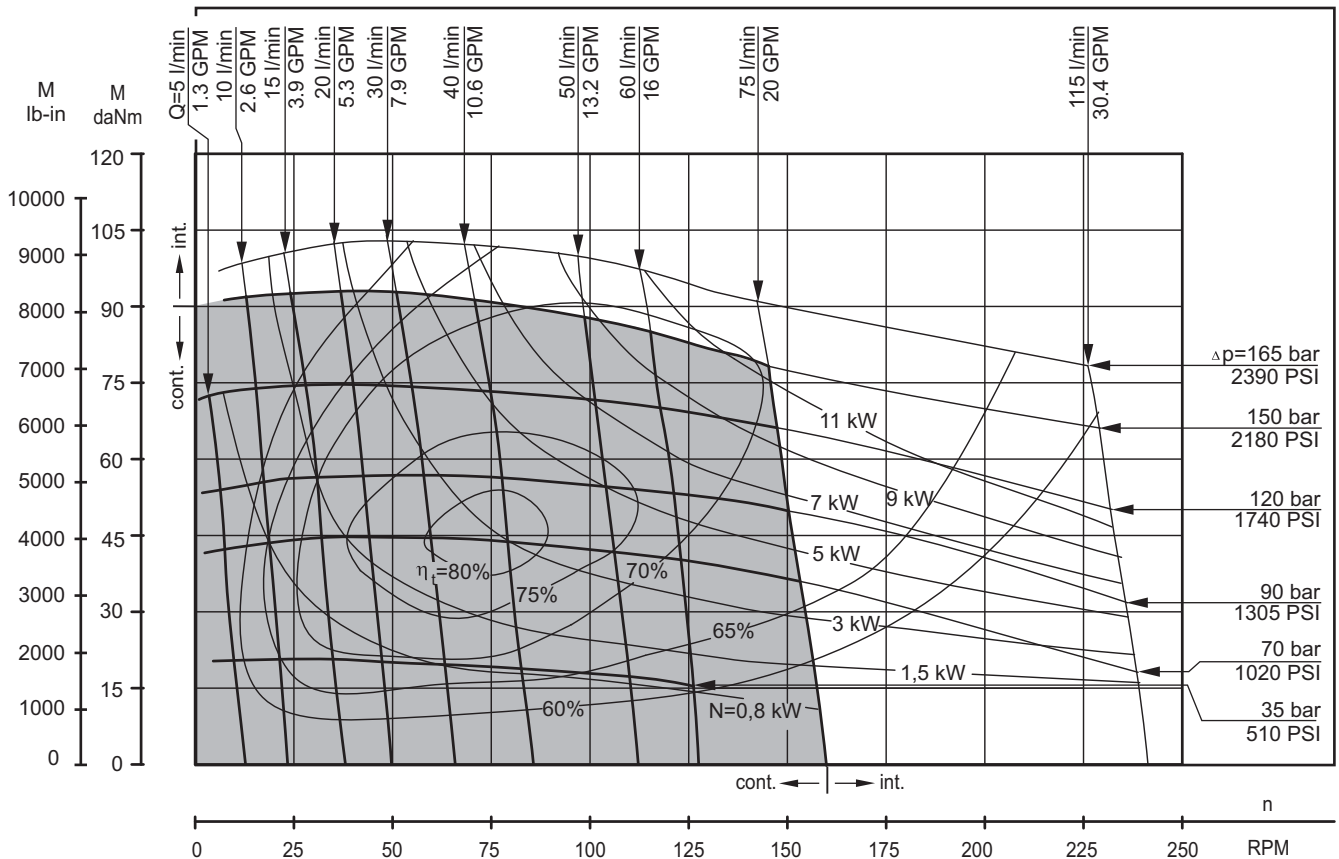
HW 400



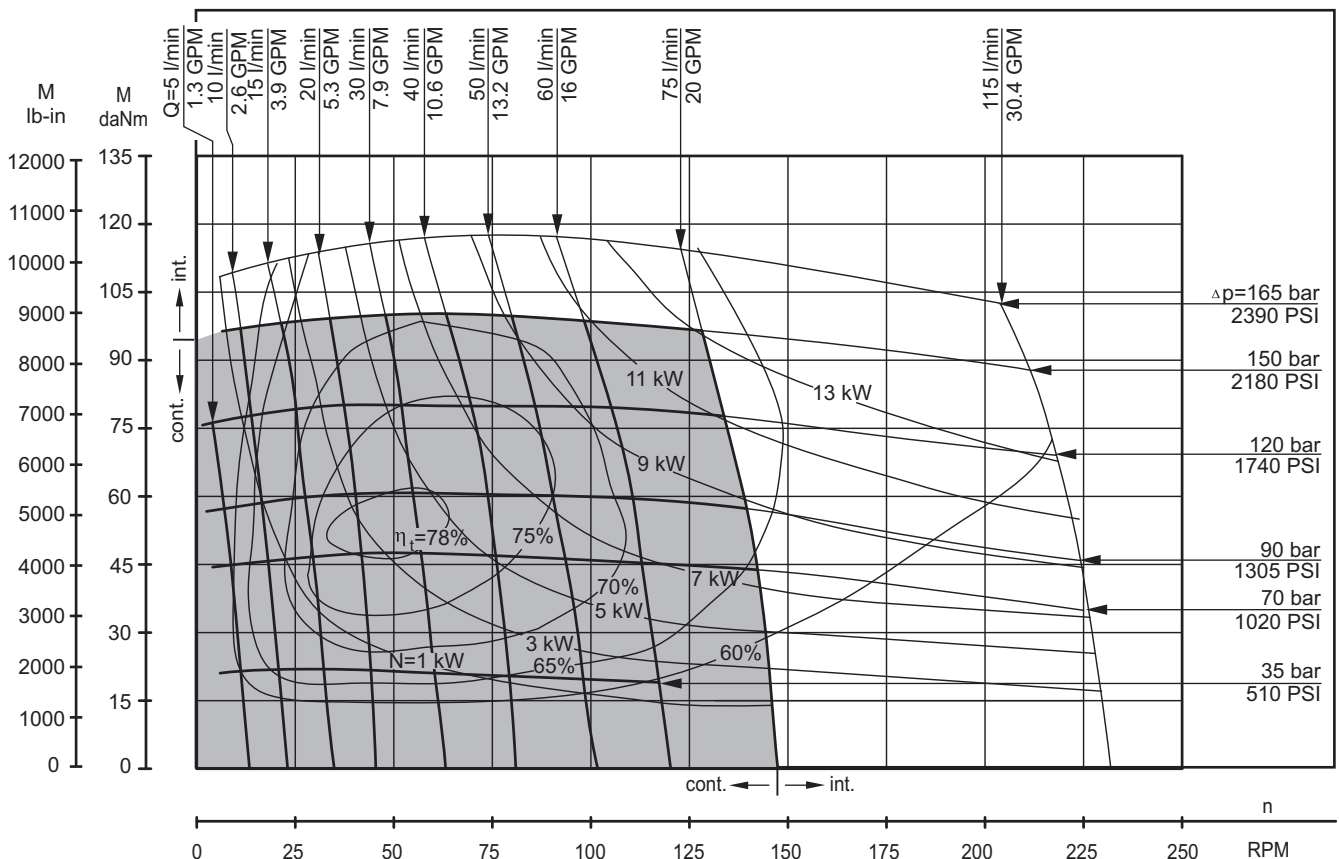
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 470



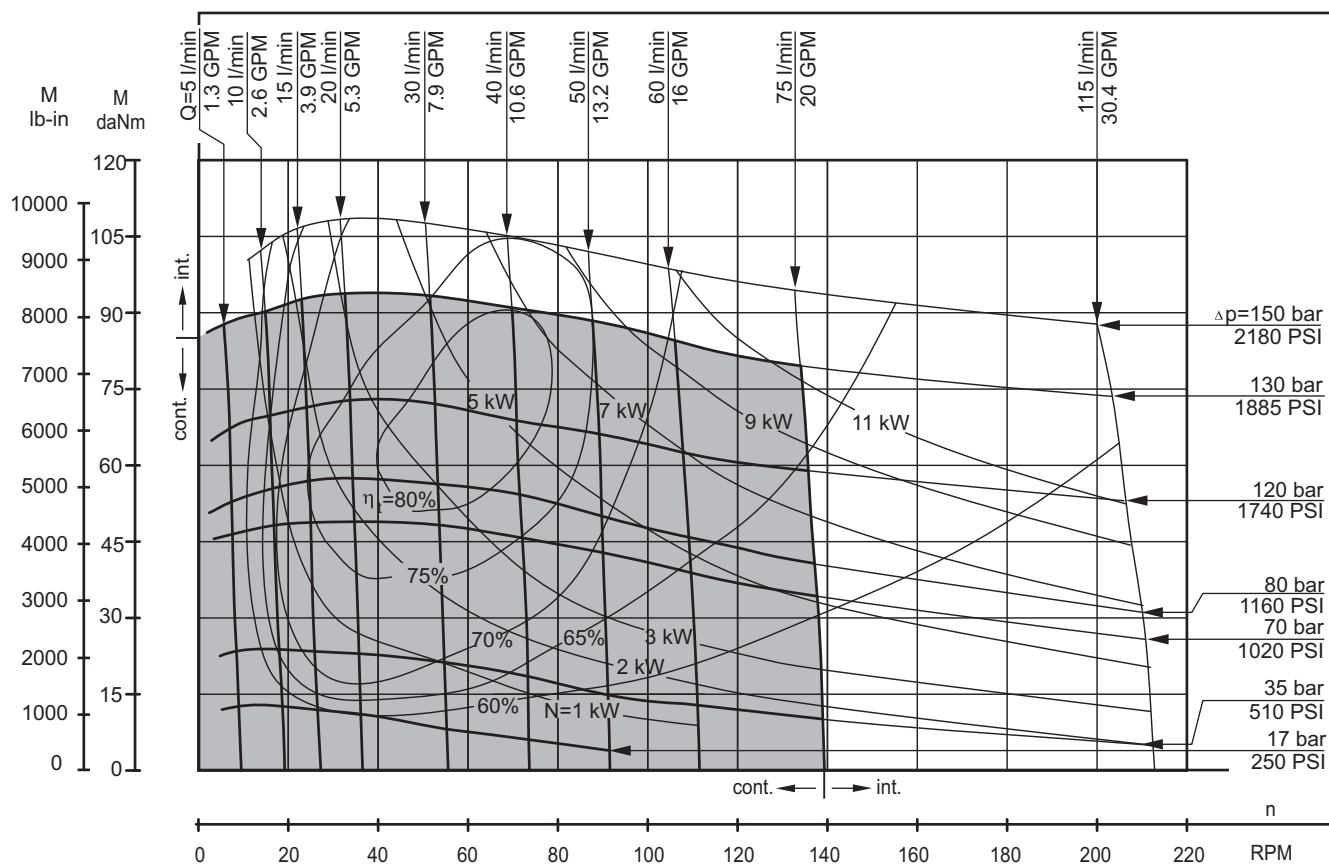
HW 500



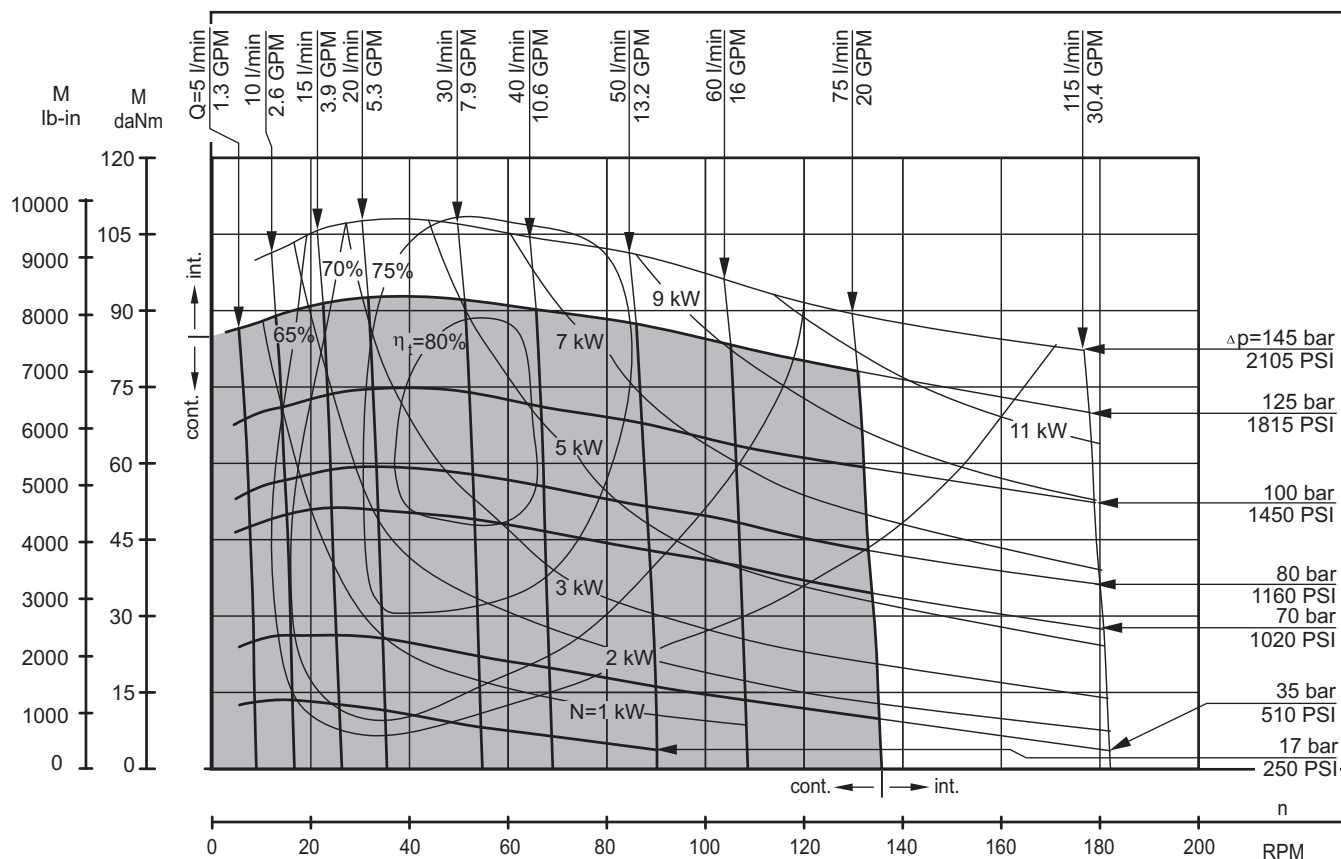
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 535



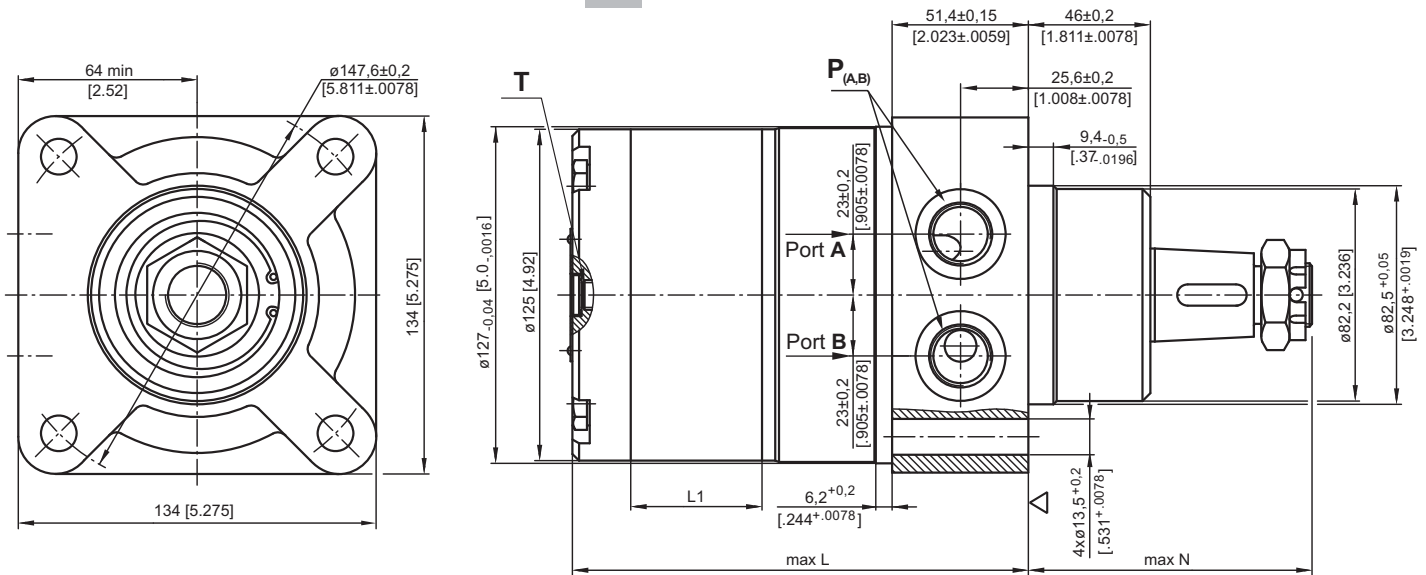
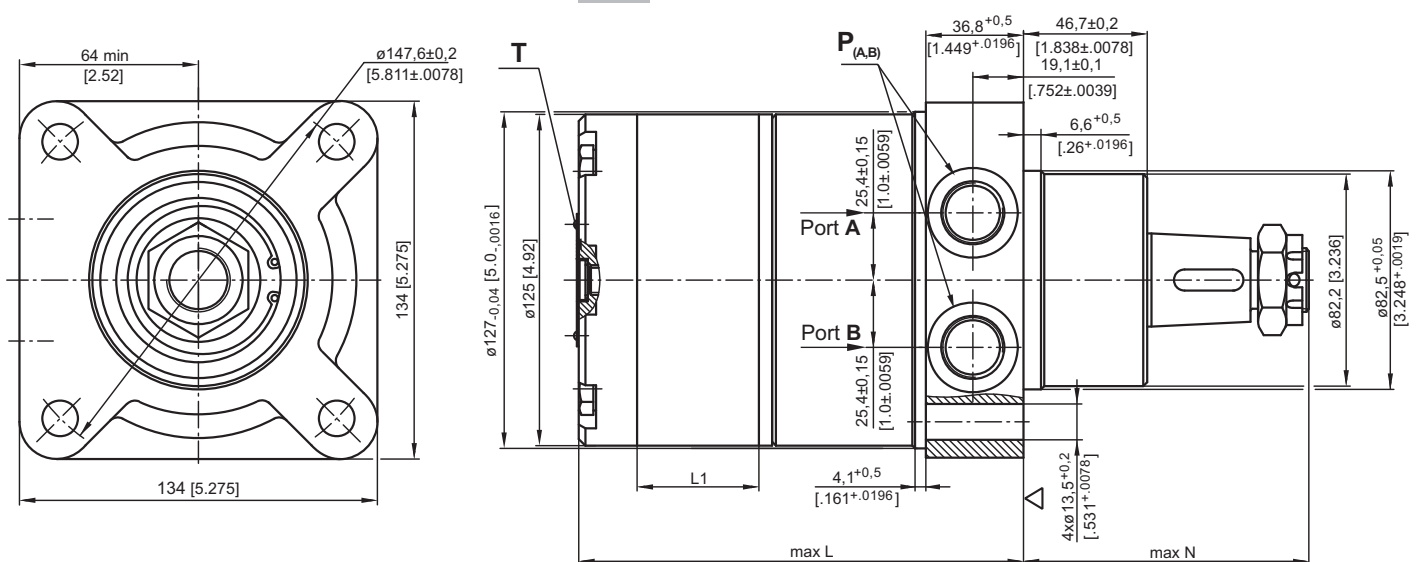
HW 550



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

HW - Wheel Mount

**HWS** - Wheel Mount

Type	*L, mm [in]	L ₁ , mm [in]
HW 125	140,5 [5.51]	17,4 [.68]
HW 160	145,0 [5.71]	21,8 [.86]
HW 200	151,0 [5.95]	27,8 [1.09]
HW 235	155,5 [6.12]	32,5 [1.28]
HW 250	158,0 [6.22]	34,8 [1.37]
HW 300	164,5 [6.48]	41,4 [1.63]
HW 315	166,5 [6.56]	43,5 [1.71]
HW 350	171,0 [6.73]	48,0 [1.89]
HW 370	174,0 [6.85]	51,0 [2.01]
HW 400	178,0 [7.01]	54,8 [2.16]
HW 470	188,0 [7.40]	65,0 [2.56]
HW 500	192,5 [7.58]	69,4 [2.73]
HW 535	197,0 [7.76]	74,1 [2.92]
HW 550	199,0 [7.84]	76,0 [2.99]

▽ - Motor Mounting Surface

	Versions	
	2	4
P _(A,B)	2xG $\frac{1}{2}$	2x $\frac{7}{8}$ -14UNF, O-ring
T	G $\frac{1}{4}$	$\frac{7}{16}$ -20UNF, O-ring

Note: For N see pages 117 and 118.

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

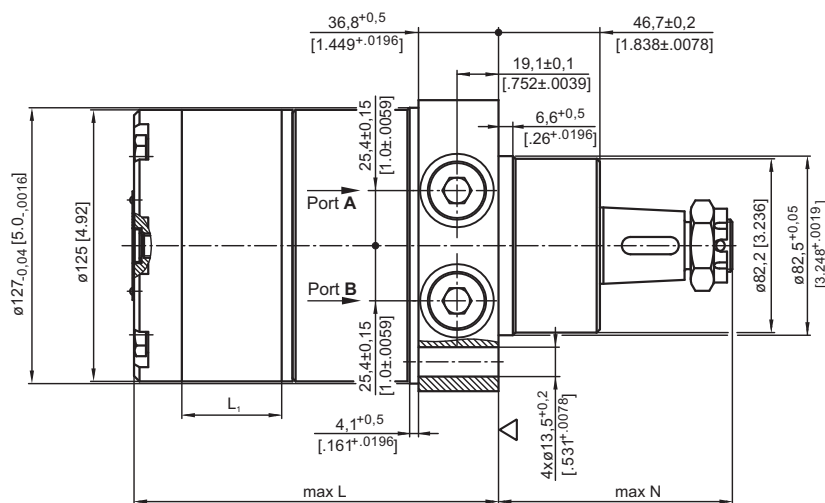
Reverse Rotation
Viewed from Shaft End
Port **A** Pressurized - **CCW**
Port **B** Pressurized - **CW**



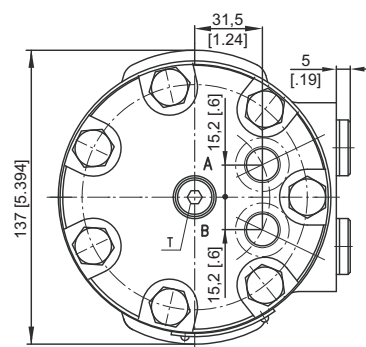
* For **LSV** option the dimension **L** is 3 mm [.118 in] greater.

DIMENSIONS AND MOUNTING DATA

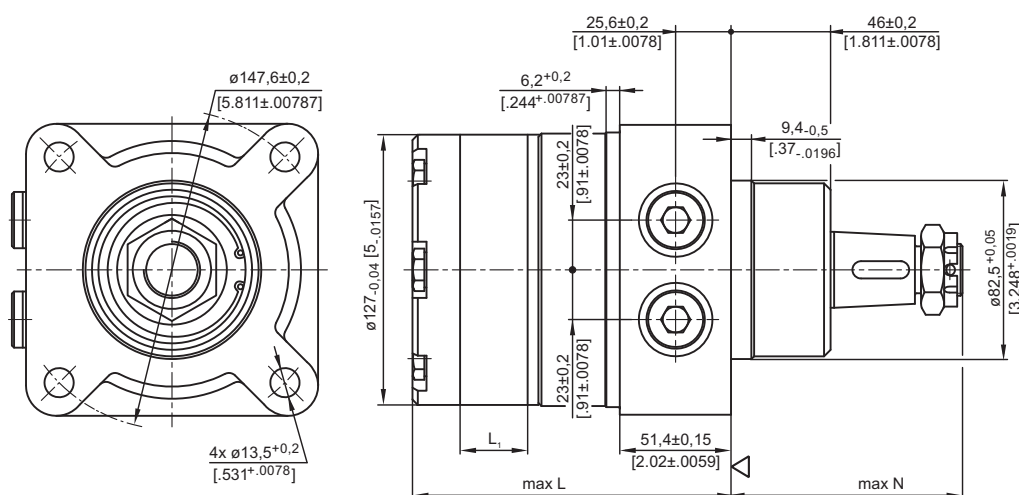
HWSE - Wheel Mount, rear ports



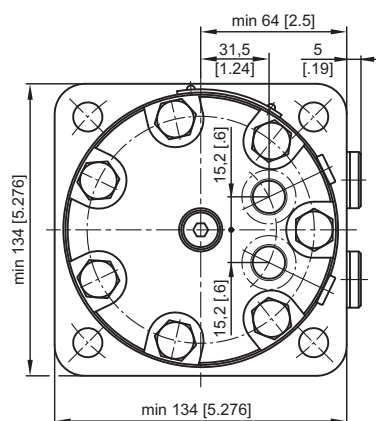
HWFE - Magneto Mount



HWE - Wheel Mount, rear ports



HW(S)E



Type	*L, mm [in]		L _i , mm [in]
	HWE, HWSE	HWFE	
HW... 125	145,5 [5.73]	189,0 [7.44]	17,4 [.68]
HW... 160	150,0 [5.91]	193,5 [7.62]	21,8 [.86]
HW... 200	156,0 [6.14]	199,5 [7.85]	27,8 [1.09]
HW... 235	160,5 [6.32]	204,0 [8.03]	32,5 [1.28]
HW... 250	163,0 [6.42]	206,5 [8.13]	34,8 [1.37]
HW... 300	169,5 [6.67]	213,0 [8.39]	41,4 [1.63]
HW... 315	171,5 [6.75]	215,0 [8.46]	43,5 [1.71]
HW... 350	176,0 [6.93]	219,5 [8.64]	48,0 [1.89]
HW... 370	179,0 [7.05]	222,5 [8.76]	51,0 [2.01]
HW... 400	183,0 [7.20]	226,5 [8.92]	54,8 [2.16]
HW... 470	193,0 [7.60]	236,5 [9.31]	65,0 [2.56]
HW... 500	197,5 [7.78]	241,0 [9.49]	69,4 [2.73]
HW... 535	202,0 [7.95]	245,5 [9.67]	74,1 [2.92]
HW... 550	204,0 [8.03]	247,5 [9.74]	76,0 [2.99]

▽ - Motor Mounting Surface

	Versions	
	5	6
P _(A,B)	2xG $\frac{3}{8}$	2x $\frac{9}{16}$ -18 UNF O-ring
T	G $\frac{1}{4}$	$\frac{7}{16}$ -20 UNF, O-ring

Note: For N see pages 117 and 118.

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

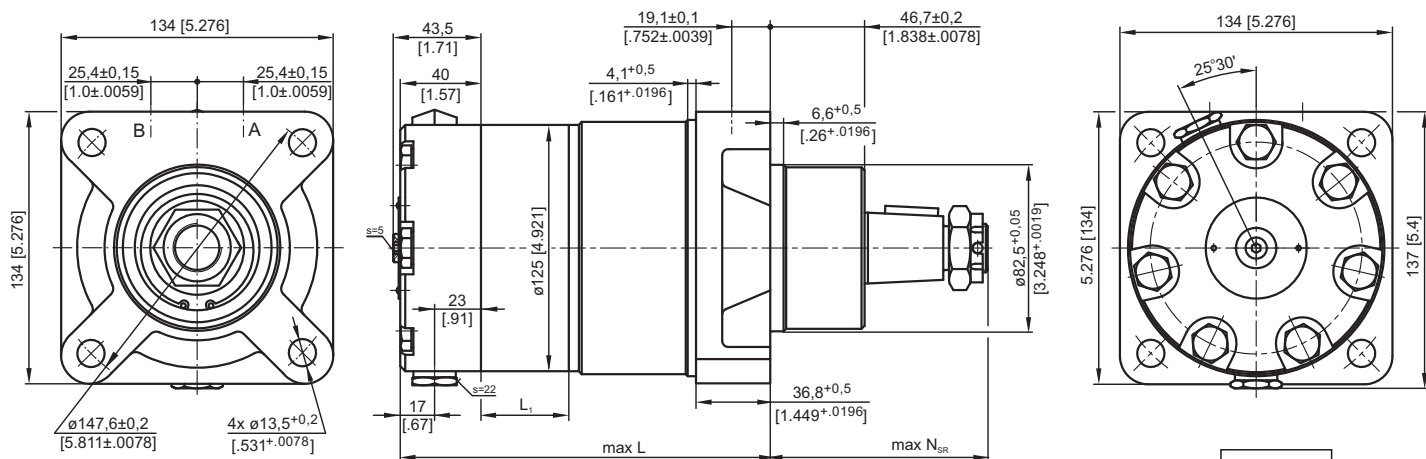
Reverse Rotation
Viewed from Shaft End
Port **A** Pressurized - **CCW**
Port **B** Pressurized - **CW**



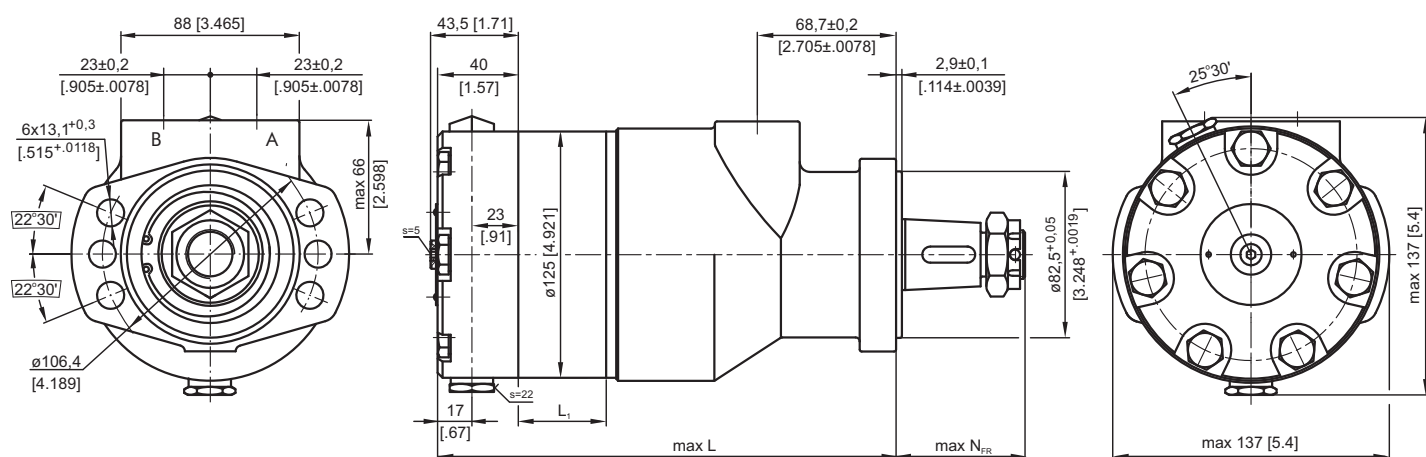
* For **LSV** option the dimension **L** is 3 mm [.118 in] greater.

DIMENSIONS AND MOUNTING DATA

HWSR - Wheel mount, relief valves



HWFR - Wheel mount, six holes, relief valves



▽ - Motor Mounting Surface

	Versions	
	2	4
P _(A,B)	2xG ¹ / ₂	2x ⁷ / ₈ -14UNF, O-ring

Note: For N_{FR} and N_{SR} see pages 117 and 118.

Standard Rotation

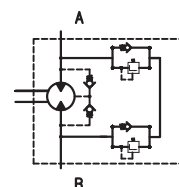
Viewed from Shaft End

Port A Pressurized - CW
Port B Pressurized - CCW

Reverse Rotation

Viewed from Shaft End

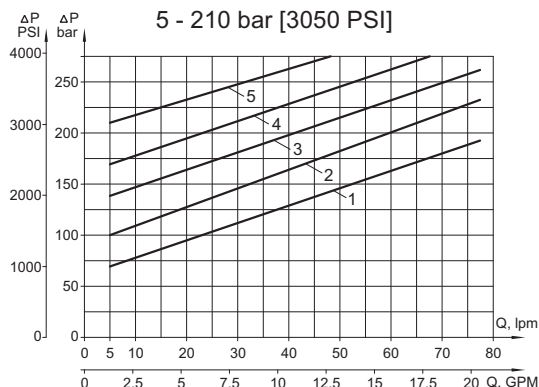
Port A Pressurized - CCW
Port B Pressurized - CW



Type	*L, mm [in]		L _i , mm [in]
	HWSR	HWFR	
HW... 125	158,5 [6.24]	202,0 [7.95]	17,4 [0.68]
HW... 160	163,0 [6.42]	206,5 [8.13]	21,8 [0.86]
HW... 200	169,0 [6.65]	212,5 [8.37]	27,8 [1.09]
HW... 235	173,5 [6.83]	217,0 [8.54]	32,5 [1.28]
HW... 250	176,0 [6.93]	219,5 [8.64]	34,8 [1.37]
HW... 300	182,5 [7.19]	226,0 [8.89]	41,4 [1.63]
HW... 315	184,5 [7.26]	228,0 [8.98]	43,5 [1.71]
HW... 350	189,0 [7.44]	232,5 [9.15]	48,0 [1.89]
HW... 370	192,0 [7.56]	235,5 [9.27]	51,0 [2.01]
HW... 400	196,0 [7.72]	239,5 [9.43]	54,8 [2.16]
HW... 470	206,0 [8.11]	249,5 [9.82]	65,0 [2.56]
HW... 500	210,5 [8.29]	254,0 [10.00]	69,4 [2.73]
HW... 535	215,0 [8.46]	258,8 [10.19]	74,1 [2.92]
HW... 550	217,0 [8.54]	260,5 [10.26]	76,0 [2.99]

**Pressure Settings at Flow Q=5 lpm [1.32 GPM]
32 mm²/s [150 SUS]; 50°C [122°F]**

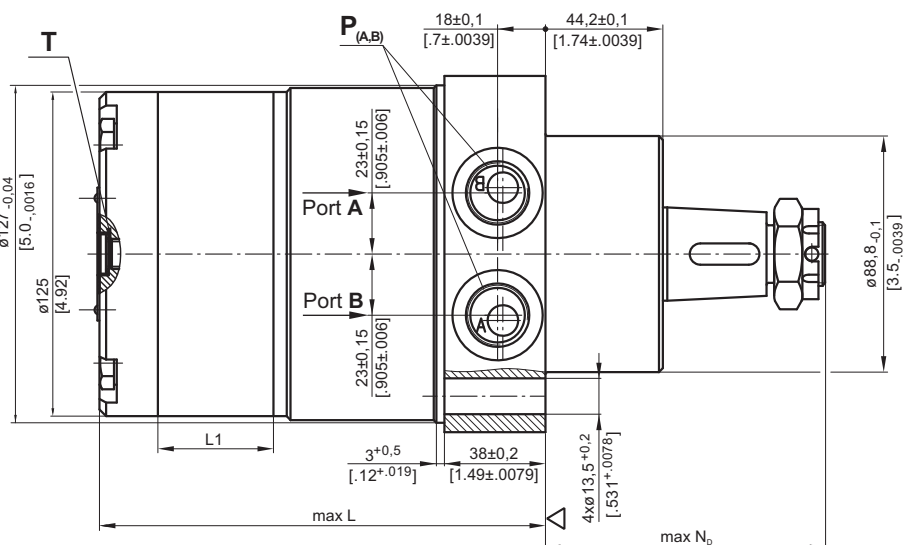
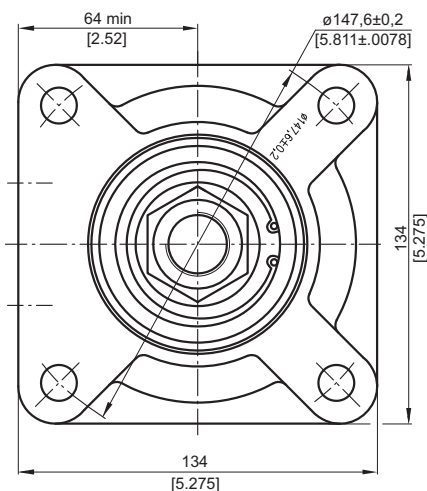
- 1 - 70 bar [1015 PSI]
- 2 - 100 bar [1450 PSI]
- 3 - 140 bar [2030 PSI]
- 4 - 170 bar [2470 PSI]
- 5 - 210 bar [3050 PSI]



* For LSV option the dimension L is 3 mm [0.118 in] greater.

DIMENSIONS AND MOUNTING DATA

D Wheel Mount



Versions		
	2	4
P _(A,B)	2xG $\frac{1}{2}$	2x $\frac{7}{16}$ -14UNF, O-ring
T	G $\frac{1}{4}$	$\frac{7}{16}$ -20UNF, O-ring

* For LSV option the dimension L is 3 mm [.118 in] greater.

Type	*L, mm [in]		L _v , mm [in]
	HWV	HWV	
HW... 125	142,0 [5.59]	140,5 [5.53]	17,4 [.68]
HW... 160	147,0 [5.79]	145,0 [5.71]	21,8 [.86]
HW... 200	153,0 [6.02]	151,0 [5.94]	27,8 [1.09]
HW... 235	158,0 [6.22]	155,5 [6.12]	32,5 [1.28]
HW... 250	160,0 [6.30]	158,0 [6.22]	34,8 [1.37]
HW... 300	166,5 [6.56]	164,5 [6.46]	41,4 [1.63]
HW... 315	169,0 [6.65]	166,5 [6.56]	43,5 [1.71]
HW... 350	173,5 [6.83]	171,0 [6.73]	48,0 [1.89]
HW... 370	176,5 [6.95]	174,0 [6.85]	51,0 [2.01]
HW... 400	180,0 [7.09]	178,0 [7.01]	54,8 [2.16]
HW... 470	190,5 [7.50]	188,0 [7.40]	65,0 [2.56]
HW... 500	194,5 [7.66]	192,5 [7.58]	69,4 [2.73]
HW... 535	199,5 [7.85]	197,0 [7.76]	74,1 [2.92]
HW... 550	201,5 [7.93]	199,0 [7.83]	76,0 [2.99]

Note: For N_b and N_v see pages 117 and 118.

▽ - Motor Mounting Surface

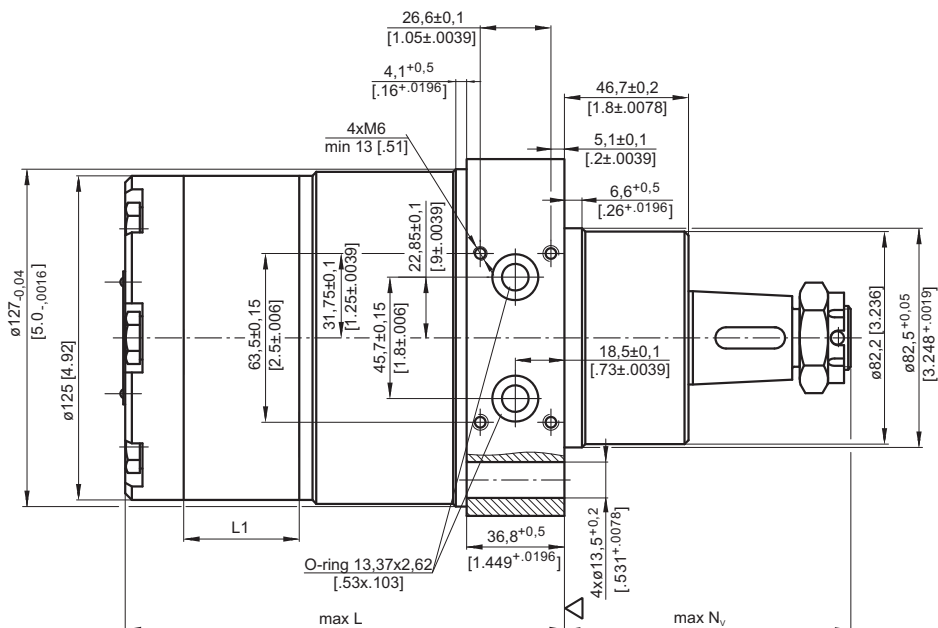
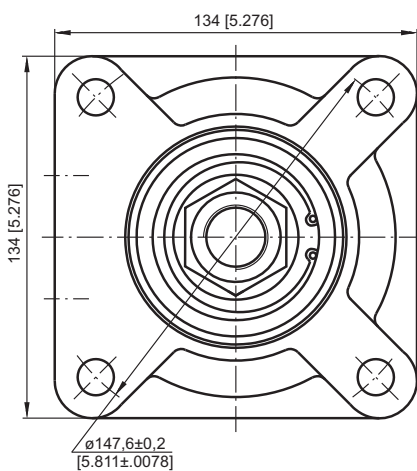


Standard Rotation
Viewed from Shaft End
Port A Pressurized - **CW**
Port B Pressurized - **CCW**

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

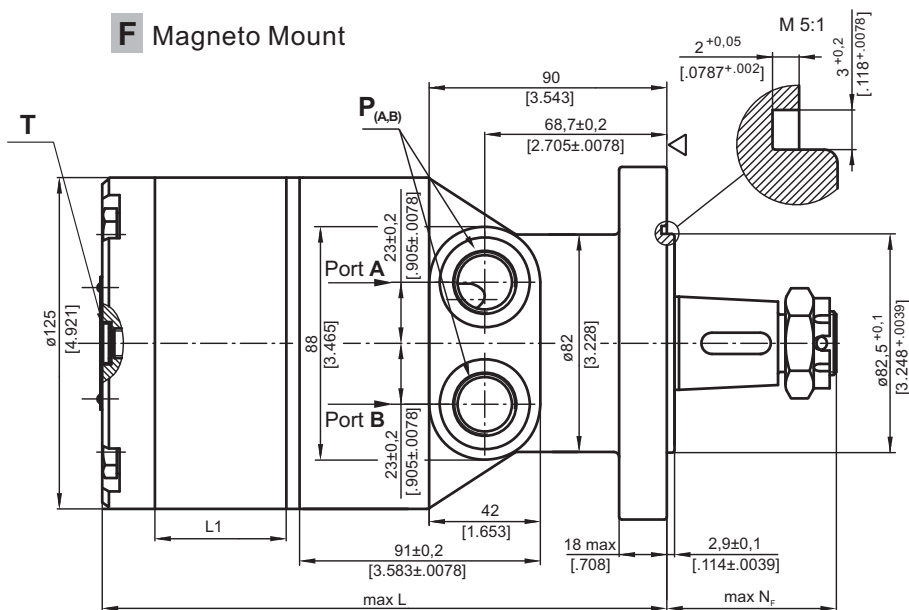
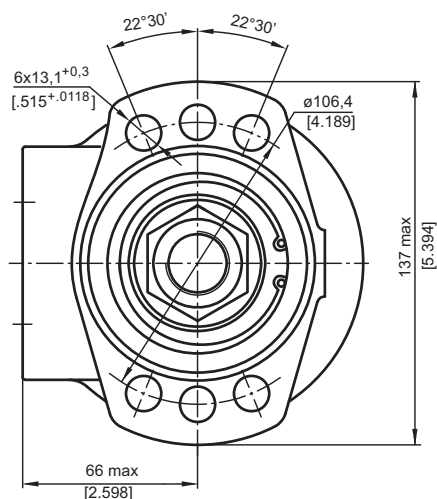
Versions		
	2	4
T	G $\frac{1}{4}$	$\frac{7}{16}$ -20UNF, O-ring

V Wheel Mount



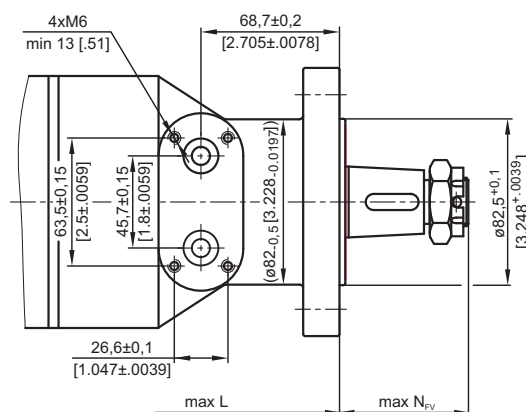
DIMENSIONS AND MOUNTING DATA

F Magneto Mount



Type	*L, mm [in]	L ₁ , mm [in]
HWF(V) 125	184,0 [7.24]	17,4 [.68]
HWF(V) 160	188,5 [7.42]	21,8 [.86]
HWF(V) 200	194,5 [7.66]	27,8 [1.09]
HWF(V) 235	199,0 [7.84]	32,5 [1.28]
HWF(V) 250	201,5 [7.93]	34,8 [1.37]
HWF(V) 300	208,0 [8.20]	41,4 [1.63]
HWF(V) 315	210,0 [8.27]	43,5 [1.71]
HWF(V) 350	214,5 [8.45]	48,0 [1.89]
HWF(V) 370	217,5 [8.56]	51,0 [2.01]
HWF(V) 400	221,5 [8.72]	54,8 [2.16]
HWF(V) 470	231,5 [9.11]	65,0 [2.56]
HWF(V) 500	236,0 [9.29]	69,4 [2.73]
HWF(V) 535	240,5 [9.47]	74,1 [2.92]
HWF(V) 550	242,5 [9.55]	76,0 [2.99]

HWFV - Wheel mount, six holes, relief valves



	Versions	
	2	4
P _(A,B)	2xG _{1/2}	2x ⁷ / ₁₆ -14UNF, O-ring
T	G ¹ / ₄	⁷ / ₁₆ -20UNF, O-ring



Note: For N_F
and N_{FV} see pages
117 and **118**.

▽ - Motor Mounting Surface

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**

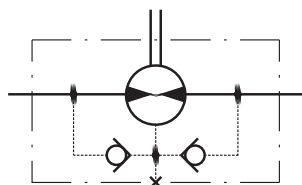
* For LSV option the dimension L is 3 mm [.118 in] greater.

MAX. PERMISSIBLE SHAFT SEAL PRESSURE

HW... motors with drain connection:

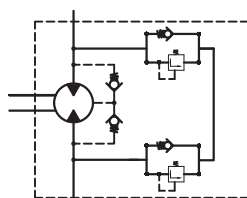
The shaft seal pressure equals the pressure in the drain line.

HW, HWF, HWS, HWD, HWV

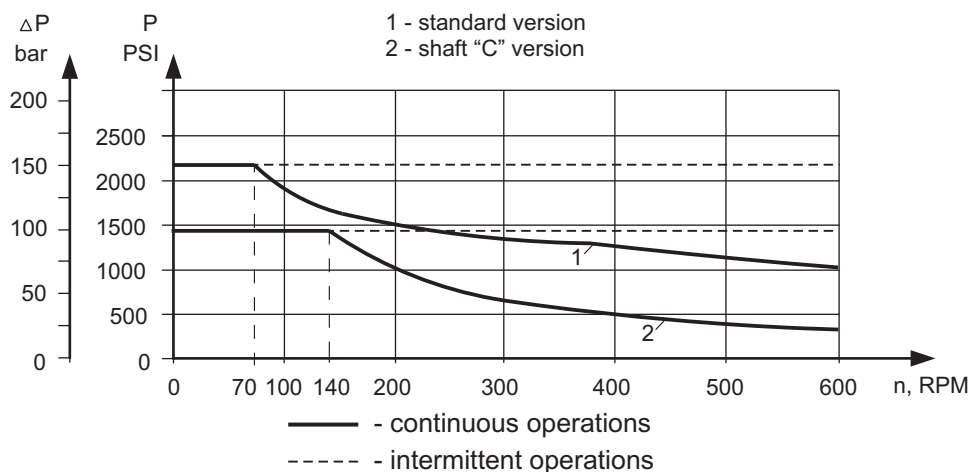


HWFR, HWSR

A

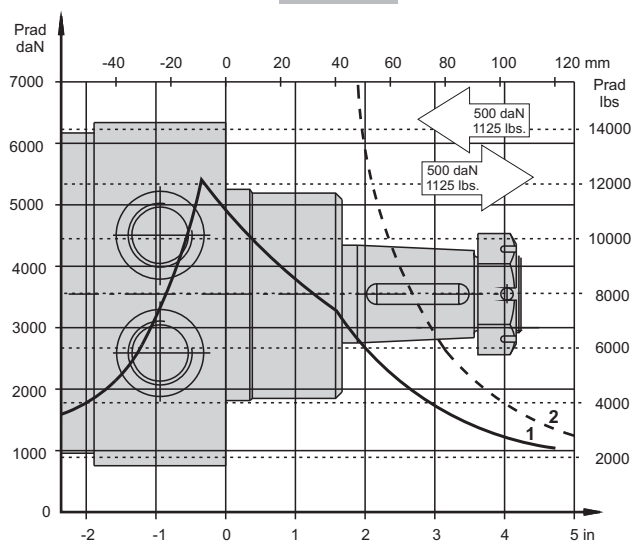


B

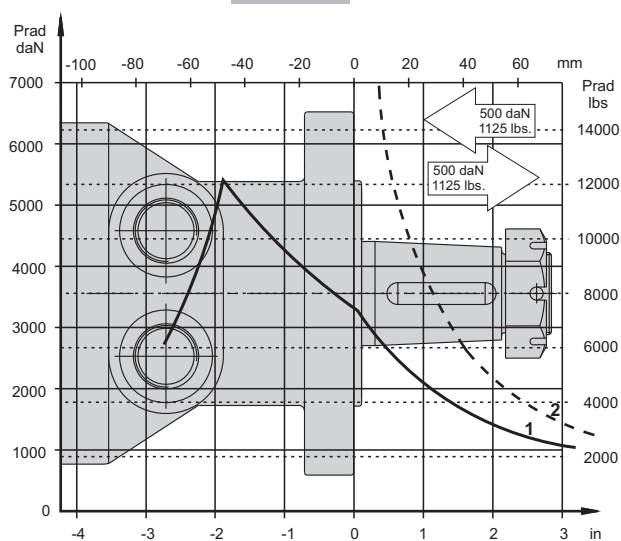


PERMISSIBLE SHAFT LOADS

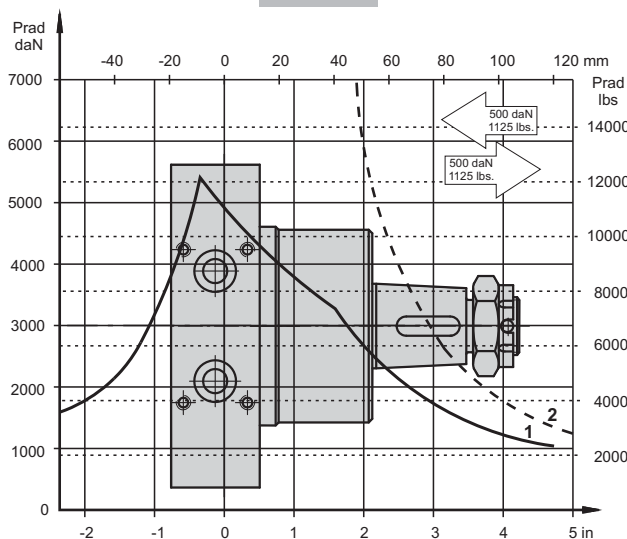
HW...



HWF...



HWV...

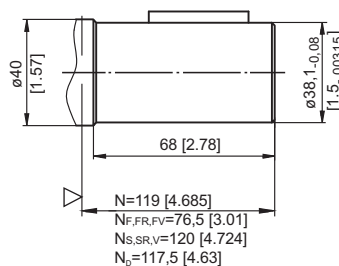
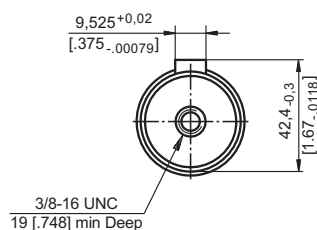


- 1 - Bearing curve: The curve applies to a B10 bearing life of 2000 hours at 100 RPM.
2 - Shaft curve: The curve represents Max. permissible radial shaft load with safety factor 3:1.

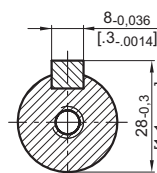
SHAFT EXTENSIONS

C - 1½" [38,1] straight, Parallel key ⅜"x⅜"x1½" BS46
Max. Torque 120 daNm [10630 lb-in]

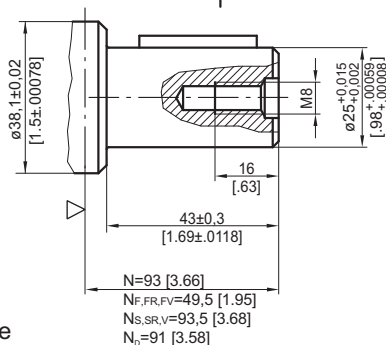
CO - ø25, straight, Parallel key A8x7x32 DIN 6885
Max. Torque 40 daNm [3540 lb-in]



W-W



W



W

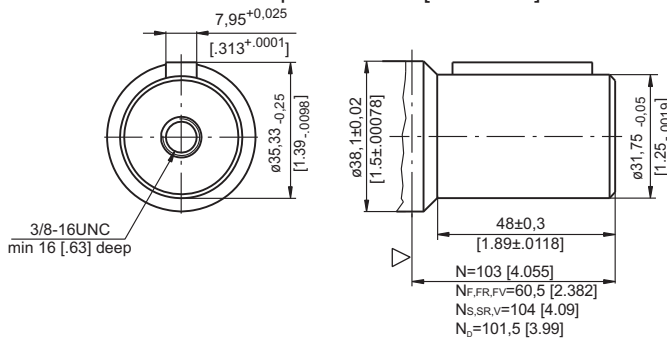
▽ - Motor Mounting Surface



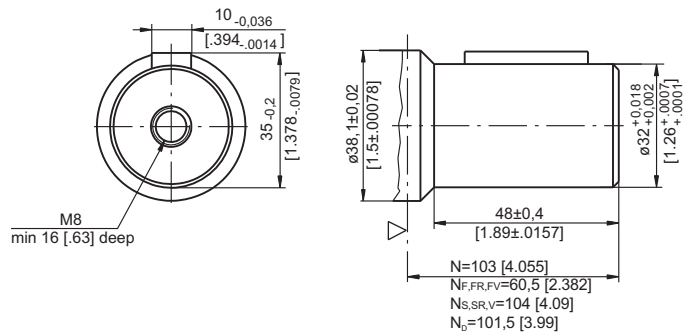
N - for standard flange
N_F - for F flange
N_{FR} - for FR flange
N_{FV} - for FV flange
N_S - for S flange
N_{SR} - for SR flange
N_D - for D flange
N_V - for V flange

SHAFT EXTENSIONS [continued]

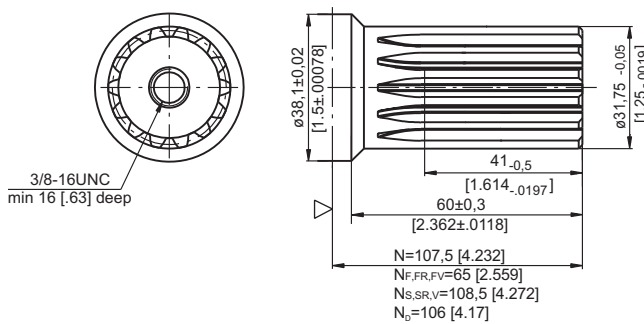
K - 1 1/4" straight, Parallel key 5/16"x5/16"x1 1/2" BS46
Max. Torque 77 daNm [6815 lb-in]



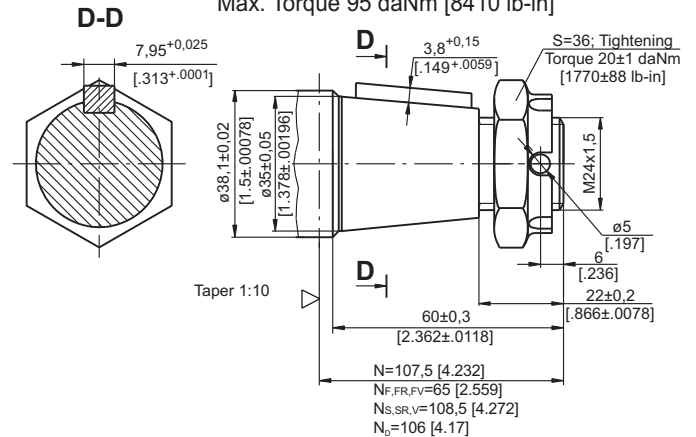
M - ø32 straight, Parallel key A10x8x32 DIN 6885
Max. Torque 77 daNm [6815 lb-in]



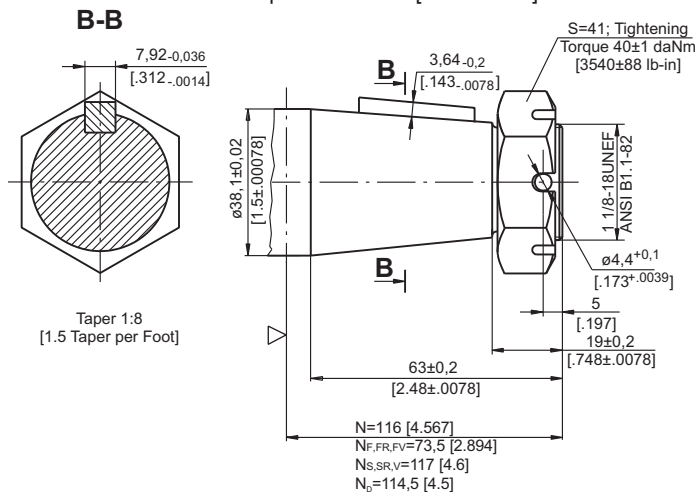
L - ø1 1/4" splined 14T, DP12/24 ANSI B92.1-1976 Norm
Max. Torque 95 daNm [8410 lb-in]



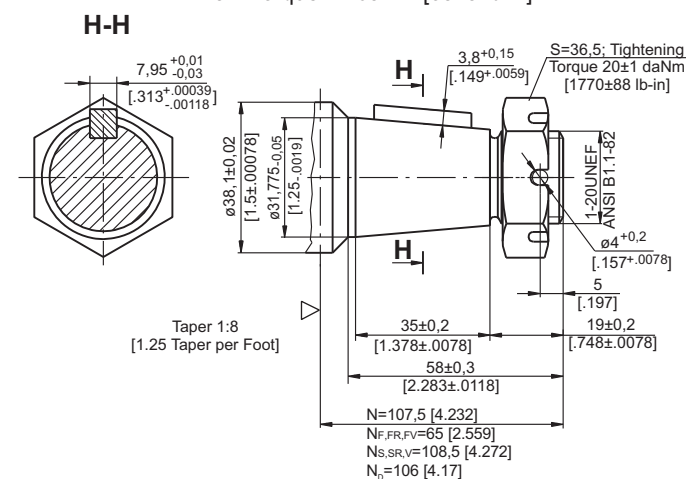
KB - ø35 tapered 1:10, Parallel key 5/16"x5/16"x1 1/4" BS46
Max. Torque 95 daNm [8410 lb-in]



T - 1 1/2" tapered 1:8, Parallel key 5/16"x5/16"x1 1/4" BS46
Max. Torque 120 daNm [10620 lb-in]



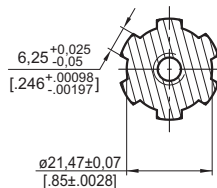
R - 1 1/4" tapered 1:8, Parallel key 5/16"x5/16"x1" BS46
Max. Torque 77 daNm [6815 lb-in]



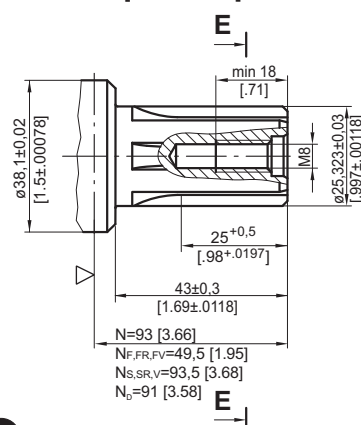
SH - ø1" splined BS 2059, SAE 6B
Max. Torque 40 daNm [3540 lb-in]



E-E



N - for standard flange
N_F - for F flange
N_{FR} - for FR flange
N_{FV} - for FV flange
N_S - for S flange
N_{SR} - for SR flange
N_D - for D flange
N_V - for V flange



▽ - Motor Mounting Surface

ORDER CODE

	1	2	3	4	5	6	7	8	9
HW								/	

Pos.1 - Mounting Flange

omit	- Wheel mount, four holes
E	- Wheel mount, four holes, rear ports
F	- Oval mount, six holes
FR	- Oval mount, six holes, relief valves
FV	- Oval mount, six holes, relief valves
FE	- Oval mount, six holes, rear ports
S	- Wheel mount, four holes
SR	- Wheel mount, four holes, relief valves
SE	- Wheel mount, four holes, rear ports
D	- Wheel mount, four holes; mounting on ø88,8 [3.5]
V^{1)*}	- Wheel mount, four holes, valves

Pos.2 - Displacement code

125	- 126,0 cm ³ /rev [7.69 in ³ /rev]
160	- 158,0 cm ³ /rev [9.64 in ³ /rev]
200	- 201,3 cm ³ /rev [12.28 in ³ /rev]
235	- 235,0 cm ³ /rev [14.33 in ³ /rev]
250	- 252,0 cm ³ /rev [15.37 in ³ /rev]
300	- 300,0 cm ³ /rev [18.30 in ³ /rev]
315	- 314,9 cm ³ /rev [19.21 in ³ /rev]
350	- 347,8 cm ³ /rev [21.21 in ³ /rev]
370	- 369,0 cm ³ /rev [22.51 in ³ /rev]
400	- 396,8 cm ³ /rev [24.20 in ³ /rev]
470	- 470,6 cm ³ /rev [28.71 in ³ /rev]
500	- 502,4 cm ³ /rev [30.65 in ³ /rev]
535	- 536,0 cm ³ /rev [32.70 in ³ /rev]
550	- 550,0 cm ³ /rev [33.55 in ³ /rev]

Pos.3 - Shaft Extensions^{2)*}

K	- 1 1/4" [31,75] straight, Parallel key ⁵ / ₁₆ " x ⁵ / ₁₆ " x 1 1/2" BS46
KB	- ø35 tapered 1:10, Parallel key ⁵ / ₁₆ " x ⁵ / ₁₆ " x 1 1/4" BS46
L	- 1 1/4" [31,75] splined 14T, ANSI B92.1-1976
M	- ø32 straight, Parallel key A10x8x32 DIN 6885
R	- 1 1/4" [31,75] Tapered 1:8, Parallel key ⁵ / ₁₆ " x ⁵ / ₁₆ " x 1 1/4" BS46
T	- 1 1/2" [38,1] Tapered 1:8, Parallel key ⁵ / ₁₆ " x ⁵ / ₁₆ " x 1 1/4" BS46
C	- 1 1/2" [38,1] straight, Parallel key ³ / ₈ " x ³ / ₈ " x 1 1/2" BS46
CO	- ø25, straight, Parallel key A8x7x32 DIN 6885
SH	- ø1" splined BS 2059, SAE 6B

Pos.4 - Ports

2	- side ports, 2xG1/2, G1/4, BSP thread, ISO 228
4	- side ports, 2x7/8-14 UNF, O-ring, 7/16-20 UNF
5^{3)*}	- rear ports, 2xG3/8, G1/4, BSP thread, ISO 228
6^{3)*}	- rear ports, 2x9/16-18 UNF, O-ring, 7/16-20 UNF

Pos.5 - Special Features^{4)*, 5)*, 6)*} [\[see page 120\]](#)

Pos.6 - Valves Pressure Range, bar^{7)*}

/	- 70, 100, 140, 170, 210
---	--------------------------

Pos.7 - Design Series

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

NOTES:

- ^{1)*} Flange **V** is for versions 2 and 4 - drainage only!
- ^{2)*} The permissible output torque for shafts must not be exceeded!
- ^{3)*} For **E**-version only!
- ^{4)*} If the code on pos.5 is not specified in the order, it will be considered as LL-option.
- ^{5)*} Colour at customer's request.
- ^{6)*} Non painted feeding surfaces, colour at customer's request.
- ^{7)*} For **SR** and **FR** only!

E-version is not available with **SR** and **FR**!!!

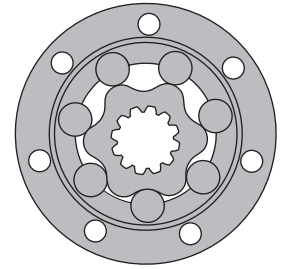
The hydraulic motors are mangano-phosphatized as standard.

HYDRAULIC MOTORS HW



APPLICATION

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



CONTENTS

Specification data	103÷104
Function diagrams	105÷111
Dimensions and mounting	112÷116
Permissible shaft Seal Pressure ...	116
Shaft extensions	117÷118
Permissible shaft loads	118
Order code	119

OPTIONS

- » Model - Spool valve, roll-gerotor
- » Wheel and flange mount
- » Shafts - straight, splined and tapered
- » BSPP and SAE ports
- » Other special features

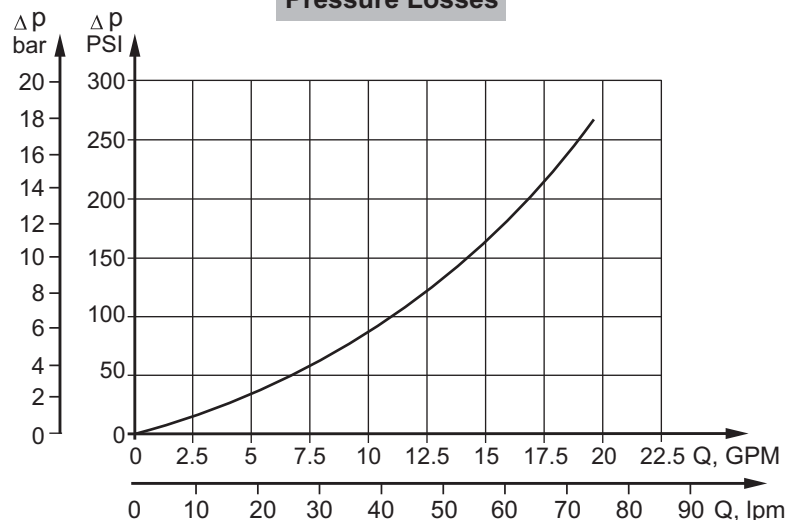
GENERAL

Max. Displacement, cm ³ /rev [in ³ /rev]	550 [33.55]
Max. Speed, [RPM]	497
Max. Torque, daNm [in-lb]	cont.: 96 [8500] int.: 105 [9293]
Max. Output, kW [HP]	23,1 [31]
Max. Pressure Drop, bar [PSI]	cont.: 205 [3000] int.: 225 [3260]
Max. Oil Flow, lpm [GPM]	115 [30.4]
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

Type		HW 125	HW 160	HW 200	HW 235	HW 250	HW 300	HW 315
Displacement, cm³/rev [in³/rev]		126 [7.69]	157,8 [9.64]	201,3 [12.28]	235,3 [14.33]	252 [15.37]	300 [18.3]	314,9 [19.21]
Max. Speed, [RPM]	cont.	357	380	373	319	298	250	238
	int.*	476	475	497	425	397	333	318
Max. Torque daNm [in-lb]	cont.	35 [3098]	44 [3894]	55 [4868]	64,5 [5710]	69 [6107]	81 [7170]	85 [7523]
	int.*	38,5 [3408]	48 [4248]	60 [5310]	70 [6196]	75 [6638]	89 [7877]	93 [8230]
Max. Output, kW [HP]	cont.	16,2 [21.7]	17,6 [23.6]	18,6 [24.9]	18,2 [24.4]	16,8 [22.5]	16,5 [22]	16,4 [21.9]
	int.*	19,8 [26.6]	21,6 [29]	23,1 [31]	22,6 [30.3]	20,8 [27.9]	20,8 [27.9]	20,8 [27.9]
Max. Pressure Drop, bar [PSI]	cont.	205 [2970]	205 [2970]	205 [2970]	205 [2970]	205 [2970]	205 [2970]	205 [2970]
	int.*	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]
Max. Oil Flow lpm [GPM]	cont.	45 [12]	60 [16]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]
	int.*	60 [16]	75 [20]	100 [26.4]	100 [26.4]	100 [26.4]	100 [26.4]	100 [26.4]
Max. Inlet Pressure, bar [PSI]	cont.	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]
	int.*	250 [3625]	250 [3625]	250 [3625]	250 [3625]	250 [3625]	250 [3625]	250 [3625]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		10 [145]	10 [145]	10 [145]	10 [145]	10 [145]	10 [145]	10 [145]
Min. Starting Torque daNm [in-lb]	at max. press. drop cont.	28,7 [2540]	36 [3186]	45,1 [3991]	52,8 [4673]	56,5 [5000]	66,4 [5877]	69,7 [6169]
	at max. press. drop int.*	31,5 [2788]	39,3 [3478]	49,2 [4355]	57,4 [5080]	61,5 [5443]	72,9 [6452]	76,2 [6744]
Min. Speed**, [RPM]		10	10	10	10	10	10	10
Weight, avg. kg [lb]	HW	14,3 [31.5]	14,6 [32.2]	15,1 [33.3]	15,5 [34.2]	15,7 [34.6]	16,1 [35.5]	16,3 [35.9]
	HWF	12,8 [28.2]	13,1 [28.9]	13,6 [30.0]	14,0 [30.9]	14,2 [31.3]	14,6 [32.2]	14,8 [32.6]
	HWFR(FV)	14,8 [32.6]	15,1 [33.3]	15,6 [34.4]	16,0 [35.3]	16,2 [35.7]	16,6 [36.6]	16,8 [37.0]
	HWS	14,0 [30.9]	14,3 [31.5]	14,8 [32.6]	15,2 [33.5]	15,4 [34.0]	15,8 [34.8]	16,0 [35.3]
	HWSR	16,0 [35.3]	16,3 [35.9]	16,8 [37.0]	17,2 [37.9]	17,4 [38.4]	17,8 [39.2]	18,0 [39.7]
	HWD	14,5 [31.9]	14,8 [32.6]	15,3 [33.7]	15,7 [34.6]	15,9 [35.1]	16,3 [35.9]	16,5 [36.4]
	HWV	14,0 [30.86]	14,3 [31.5]	14,8 [32.6]	15,2 [33.5]	15,4 [33.9]	15,8 [34.8]	16,0 [35.2]
	HWE	14,7 [32.4]	15,0 [33.1]	15,5 [34.2]	15,9 [35.1]	16,1 [35.5]	16,5 [36.4]	16,7 [36.8]
	HWSE	14,4 [31.8]	14,7 [32.4]	15,2 [33.5]	15,6 [34.4]	15,8 [34.8]	16,2 [35.7]	16,4 [36.2]
	HWFE	13,2 [29.1]	13,5 [29.8]	14,0 [30.86]	14,4 [31.8]	14,6 [32.2]	15,0 [33.1]	15,2 [33.5]

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

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

*** For "E"-option it is not recommendable a flow bigger than 75% of the nominal flow rate.

- Intermittent speed and intermittent pressure drop 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

Type		HW 350	HW 370	HW 400	HW 470	HW 500	HW 535	HW 550
Displacement, cm³/rev [in³/rev]		347,8 [21.21]	369,2 [22.51]	396,8 [24.2]	470,6 [28.71]	502,4 [30.65]	535 [32.7]	550 [33.55]
Max. Speed, [RPM]	cont.	216	203	189	159	149	140	136
	int.*	288	271	252	244	229	215	209
Max. Torque daNm [in-lb]	cont.	94 [8320]	96 [8497]	96 [8497]	92 [8143]	91 [8054]	90 [7966]	89 [7877]
	int.*	102 [9028]	105 [9293]	98 [8674]	101 [8939]	101 [8939]	104 [9205]	105 [9293]
Max. Output, kW [HP]	cont.	16,5 [22]	13,2 [17.7]	12,5 [16.8]	10,6 [14.2]	10,8 [14.5]	9,4 [12.6]	9 [12]
	int.*	20,8 [27.9]	19,2 [25.7]	18,5 [24.8]	17,4 [23.3]	17,8 [23.9]	16,4 [22]	15,8 [21.2]
Max. Pressure Drop, bar [PSI]	cont.	205 [2970]	200 [2900]	185 [2680]	150 [2180]	140 [2030]	130 [1885]	125 [1815]
	int.*	225 [3260]	220 [3200]	190 [2760]	165 [2390]	155 [2250]	150 [2180]	145 [2105]
Max. Oil Flow lpm [GPM]	cont.	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]
	int.*	100 [26.4]	100 [26.4]	100 [26.4]	115 [30.4]	115 [30.4]	115 [30.4]	115 [30.4]
Max. Inlet Pressure, bar [PSI]	cont.	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]
	int.*	250 [3625]	250 [3625]	250 [3625]	250 [3625]	250 [3625]	250 [3625]	250 [3625]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		10 [145]	10 [145]	10 [145]	10 [145]	10 [145]	10 [145]	10 [145]
Min. Starting Torque daNm [in-lb]	at max. press. drop cont.	77 [6815]	79,5 [7036]	78,7 [6966]	75,4 [6674]	74,6 [6603]	73,8 [6532]	72,9 [6452]
	at max. press. drop int.*	83,6 [7400]	86 [7612]	80,3 [7107]	82,8 [7328]	82,8 [7328]	85,2 [7540]	84,4 [7470]
Min. Speed**, [RPM]		8	8	8	8	8	5	5
Weight, avg. kg [lb]	HW	16,7 [36.8]	16,9 [37.3]	17,3 [38.1]	18,1 [39.9]	18,4 [40.6]	18,8 [41.5]	18,9 [41.7]
	HWF	15,2 [33.5]	15,4 [34.0]	15,8 [34.8]	16,6 [36.6]	16,9 [37.3]	17,3 [38.1]	17,4 [38.3]
	HWFR(FV)	17,2 [37.9]	17,4 [38.4]	17,8 [39.2]	18,6 [41.0]	18,9 [41.7]	19,3 [42.5]	19,4 [42.8]
	HWS	16,4 [36.2]	16,6 [36.6]	17,0 [37.5]	17,8 [39.2]	18,1 [39.9]	18,5 [40.8]	18,6 [41.0]
	HWSR	18,4 [40.6]	18,6 [41.0]	19,0 [41.9]	19,8 [43.7]	20,1 [44.3]	20,5 [45.2]	20,6 [45.4]
	HWD	16,8 [37.0]	17,1 [37.7]	17,5 [38.6]	18,3 [40.3]	18,6 [41.0]	19,0 [41.9]	19,1 [42.1]
	HWV	16,4 [36.2]	16,6 [36.6]	17,0 [37.5]	17,8 [39.7]	18,1 [39.9]	18,5 [40.8]	18,6 [41.0]
	HWE	17,1 [37.7]	17,3 [38.1]	17,7 [39.0]	18,5 [40.8]	18,9 [41.7]	19,2 [42.3]	19,3 [42.5]
	HWSE	16,8 [37.0]	17,0 [37.5]	17,4 [38.4]	18,2 [40.1]	18,5 [40.8]	18,9 [41.7]	19,0 [41.9]
	HWFE	15,6 [34.4]	15,8 [34.8]	16,2 [35.7]	17,0 [37.5]	17,3 [38.1]	17,7 [39.0]	17,8 [39.7]

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

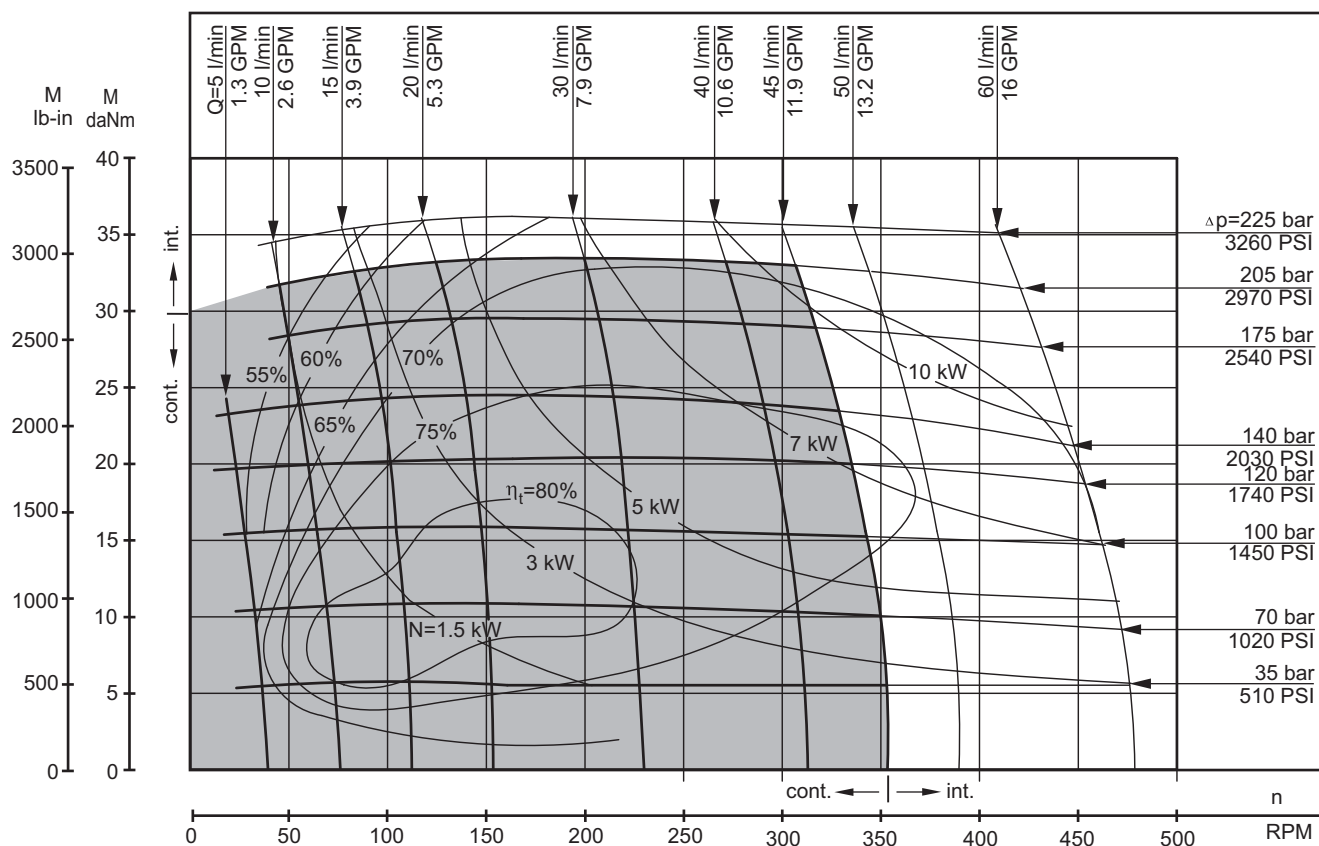
** For speeds lower than given, consult factory or your regional manager.

*** For "E"-option it is not recommendable a flow bigger than 75% of the nominal flow rate.

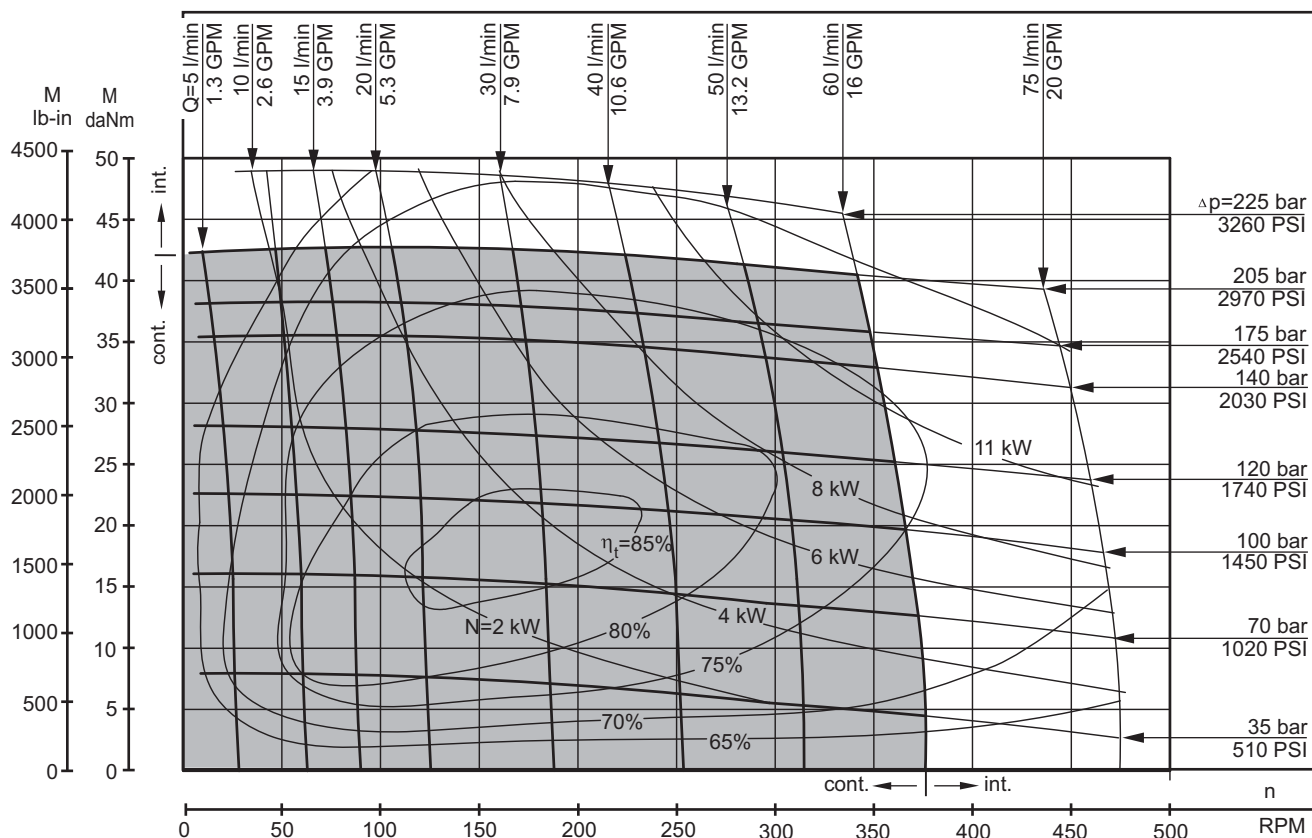
- Intermittent speed and intermittent pressure drop must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).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

HW 125



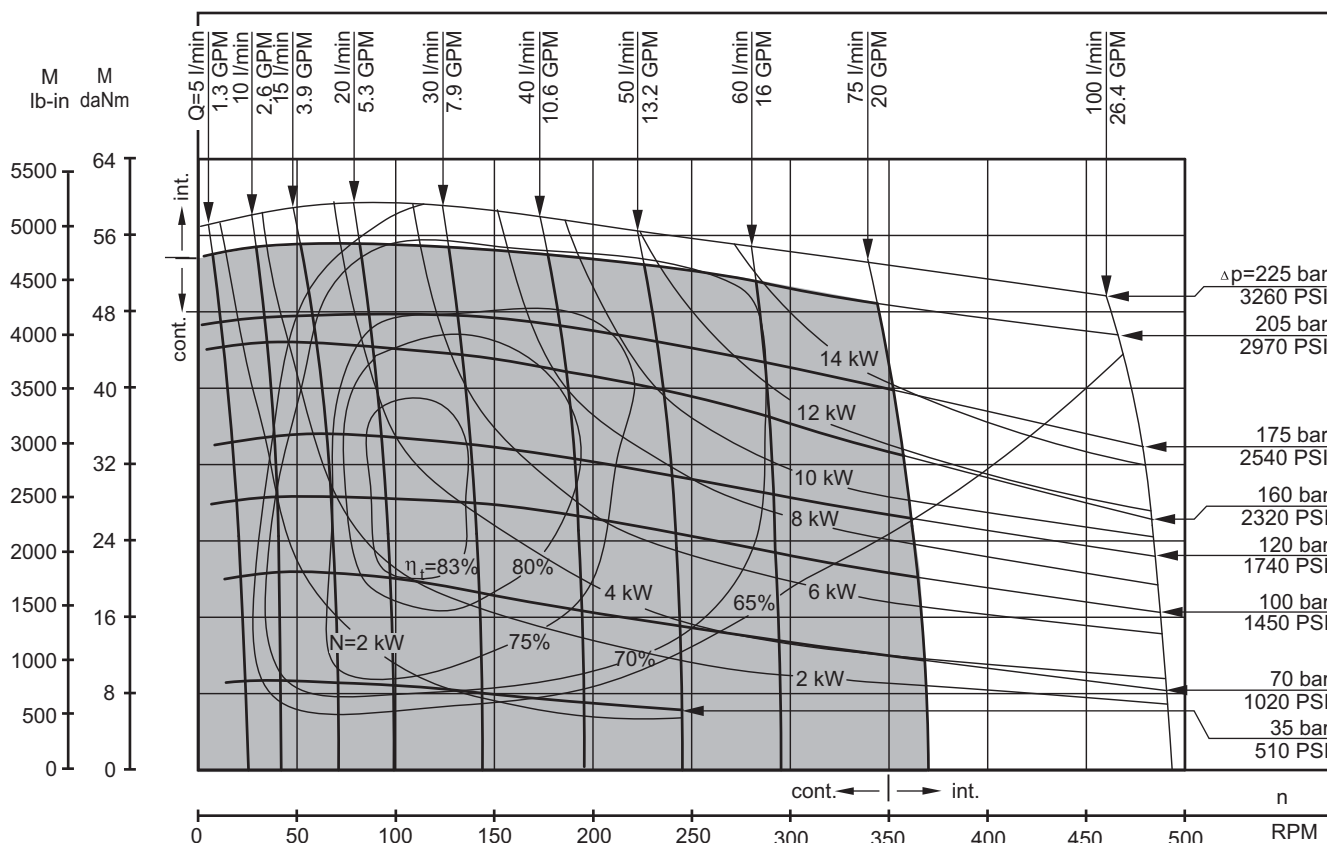
HW 160



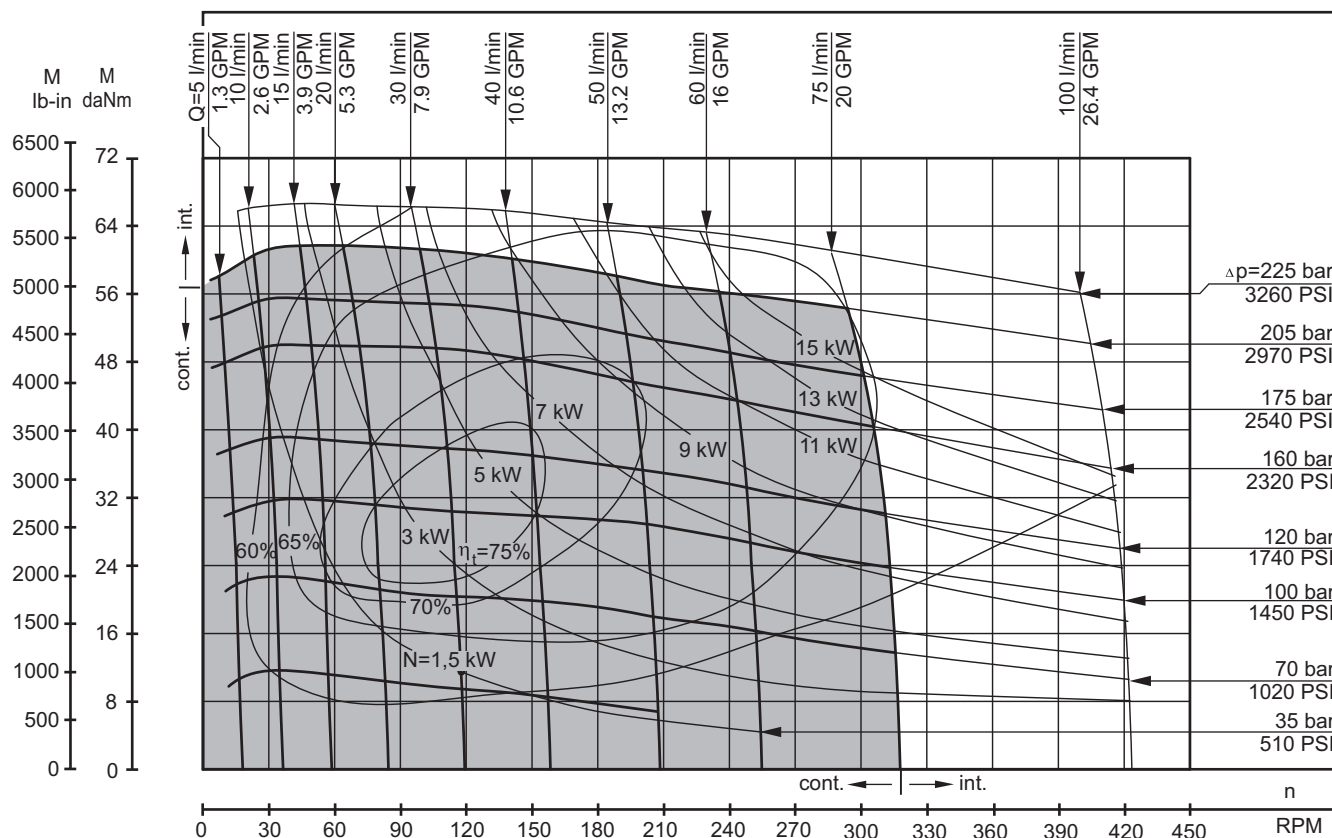
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 200



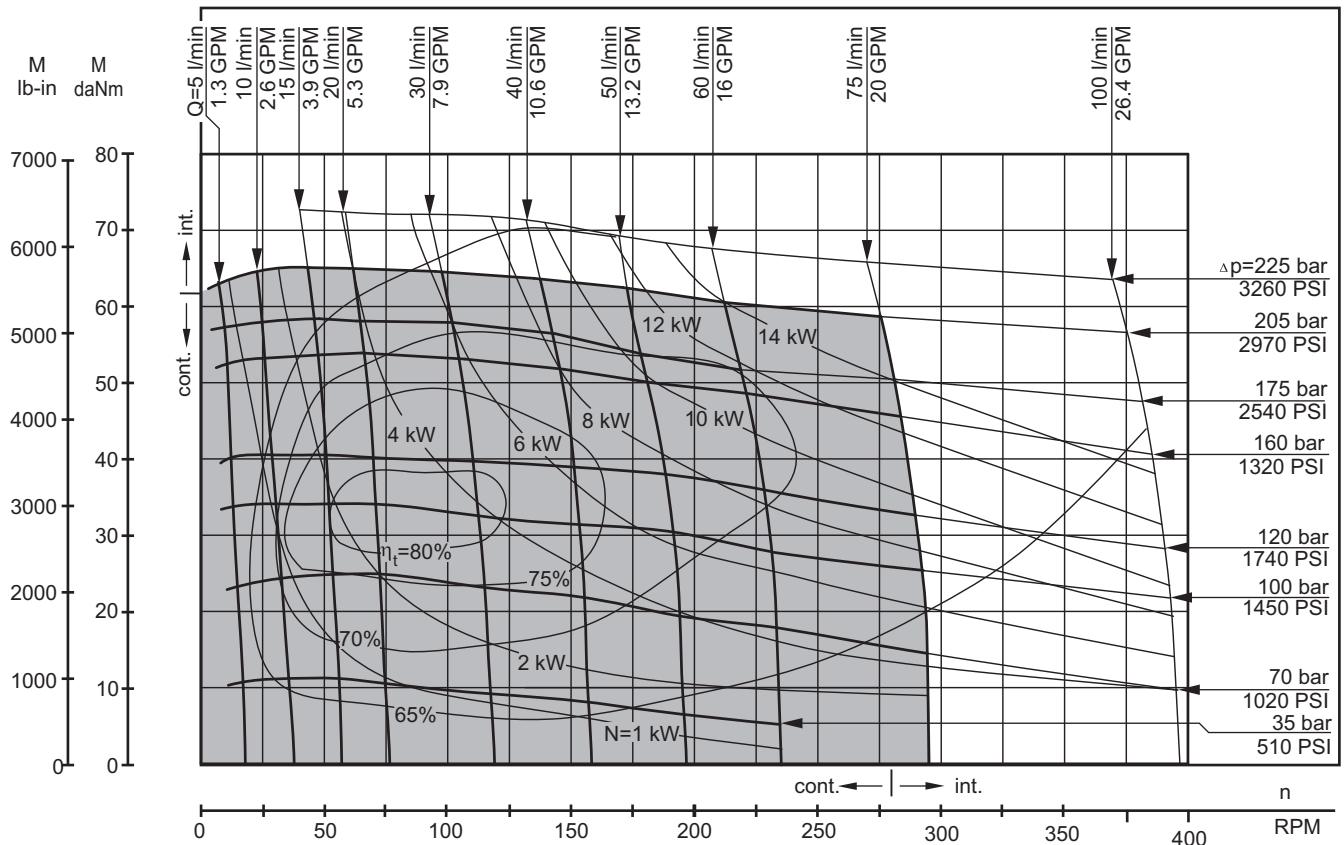
HW 235



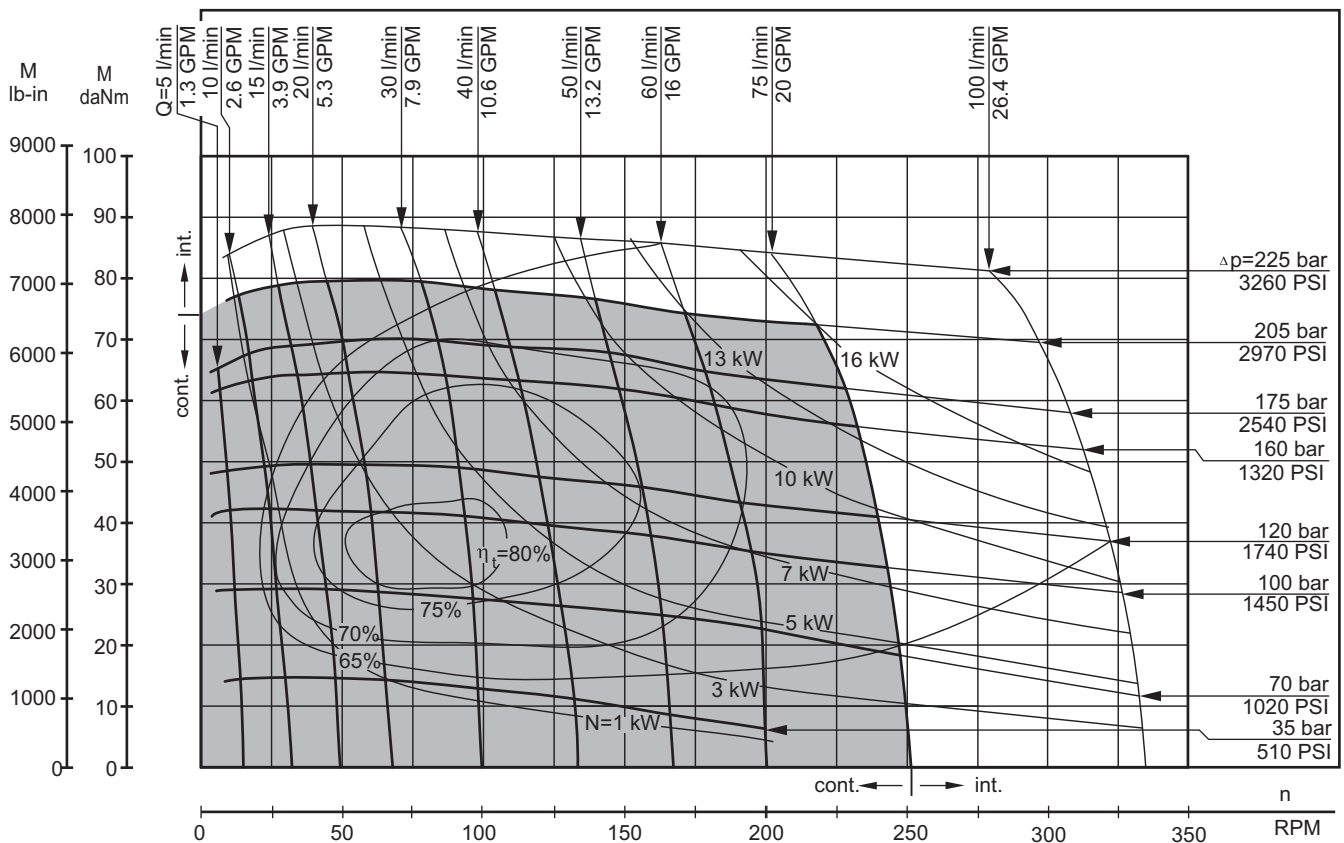
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 250



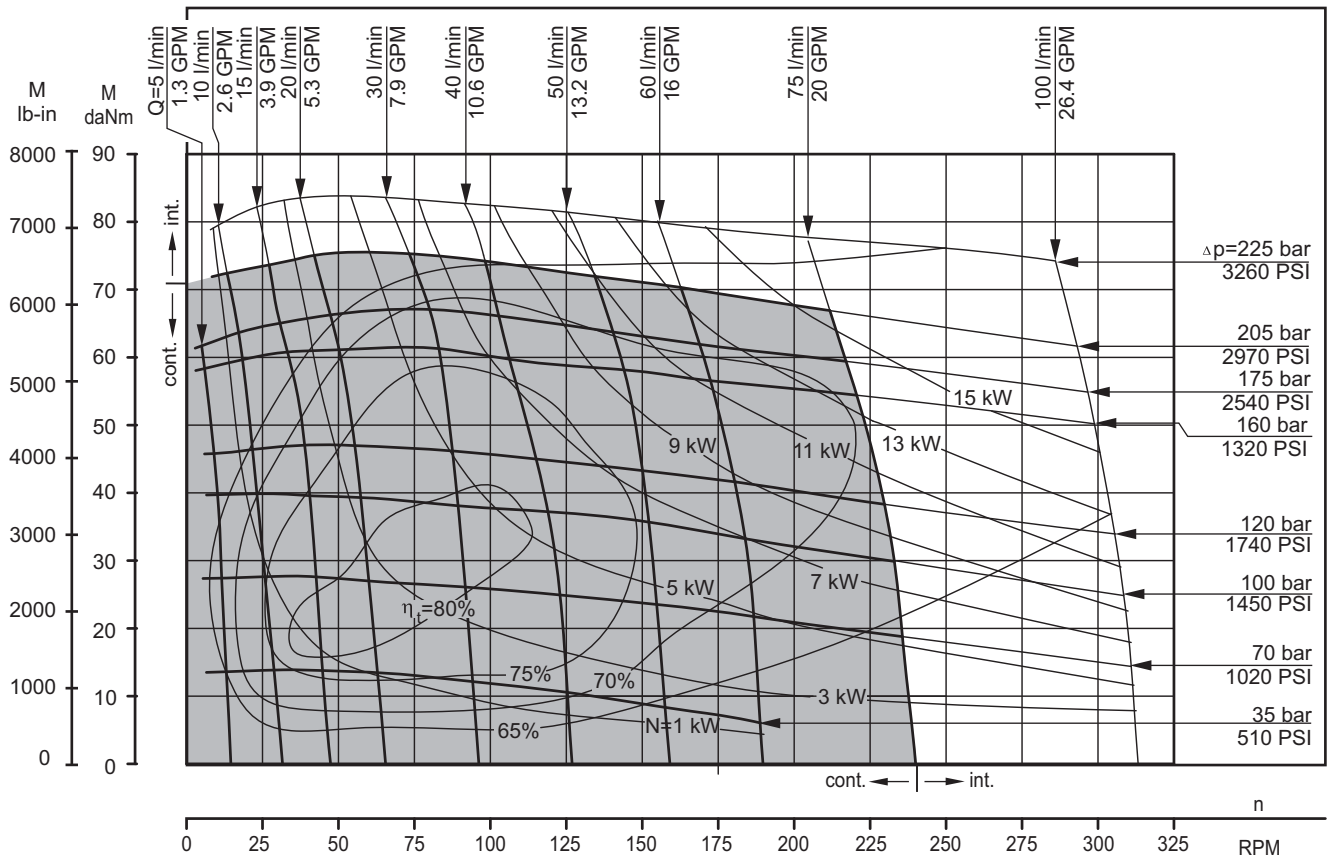
HW 300



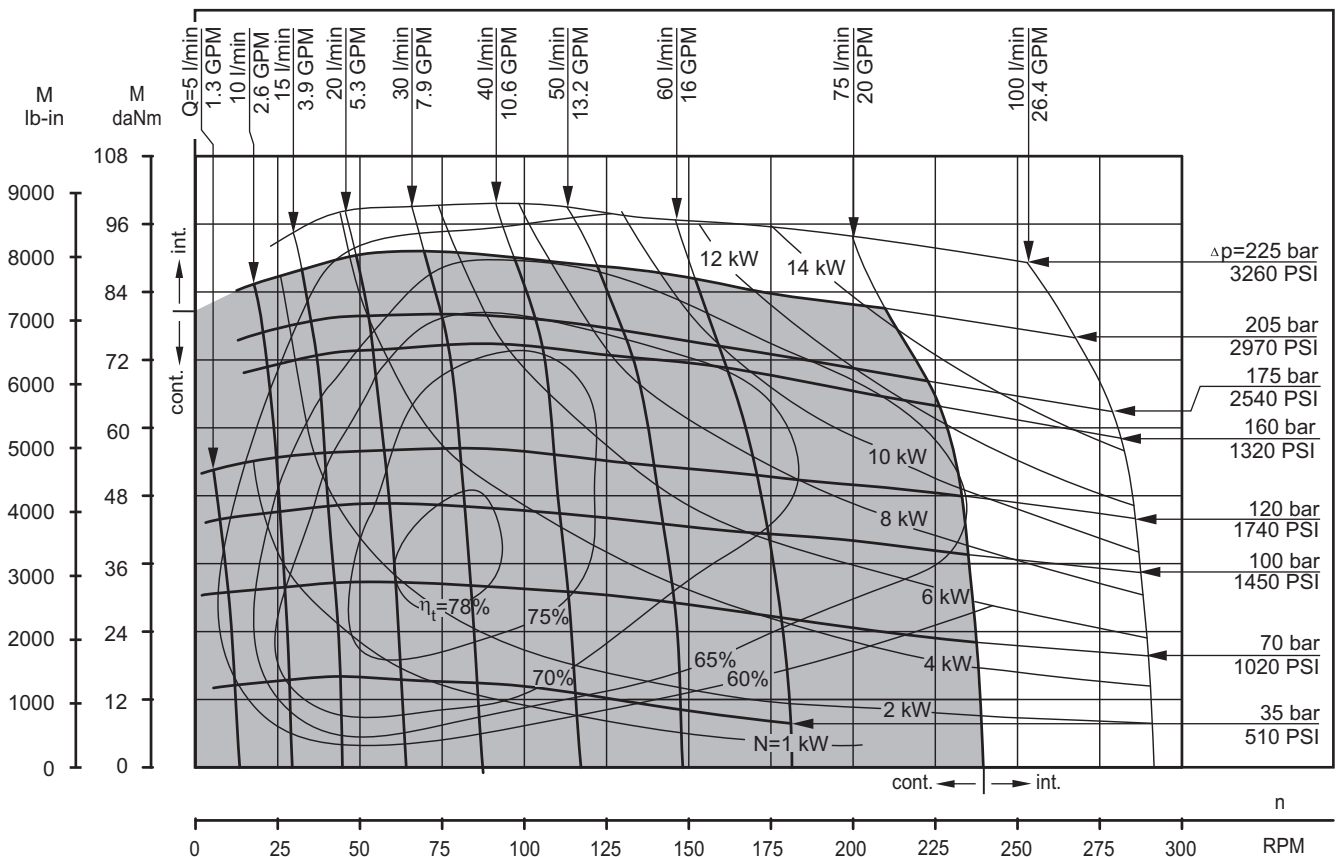
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 315



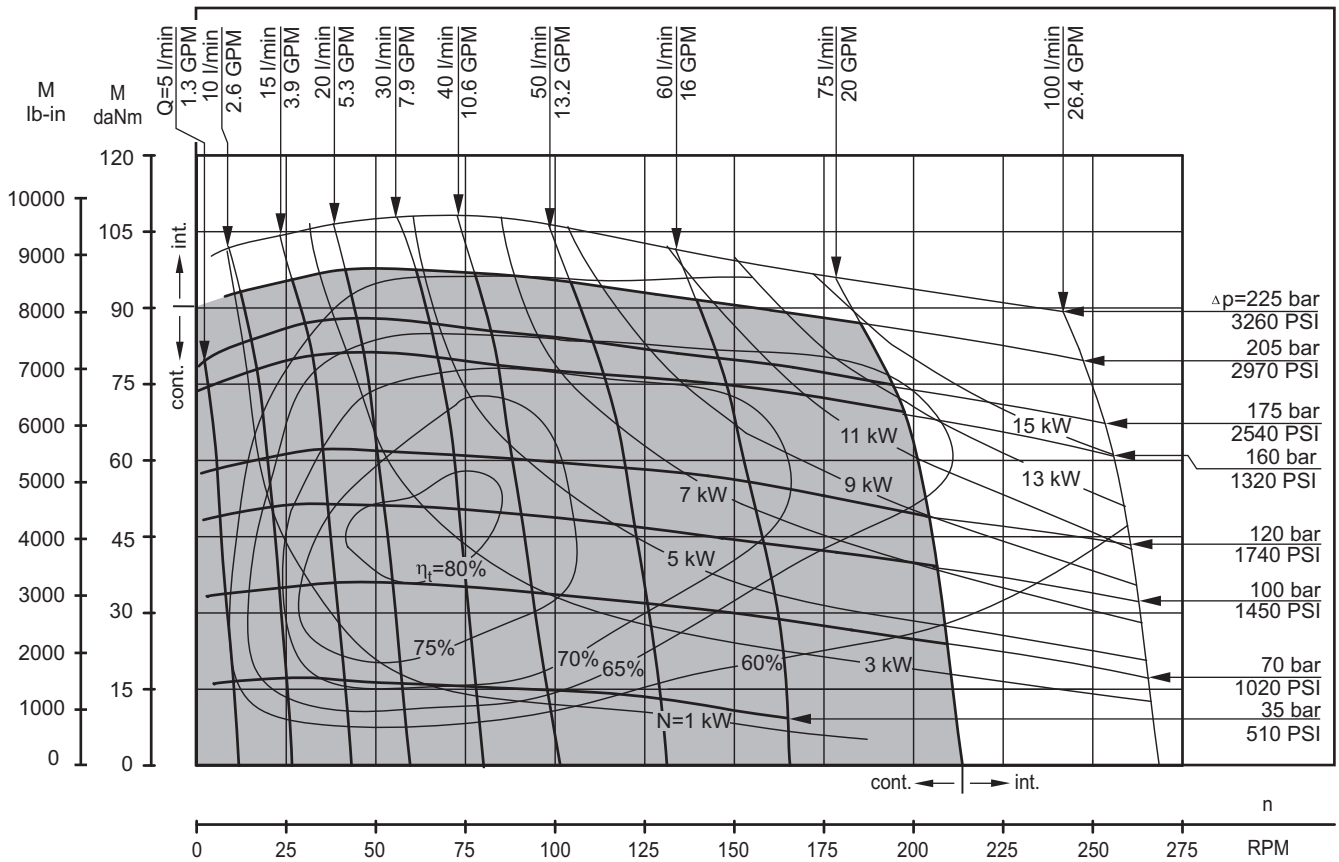
HW 350



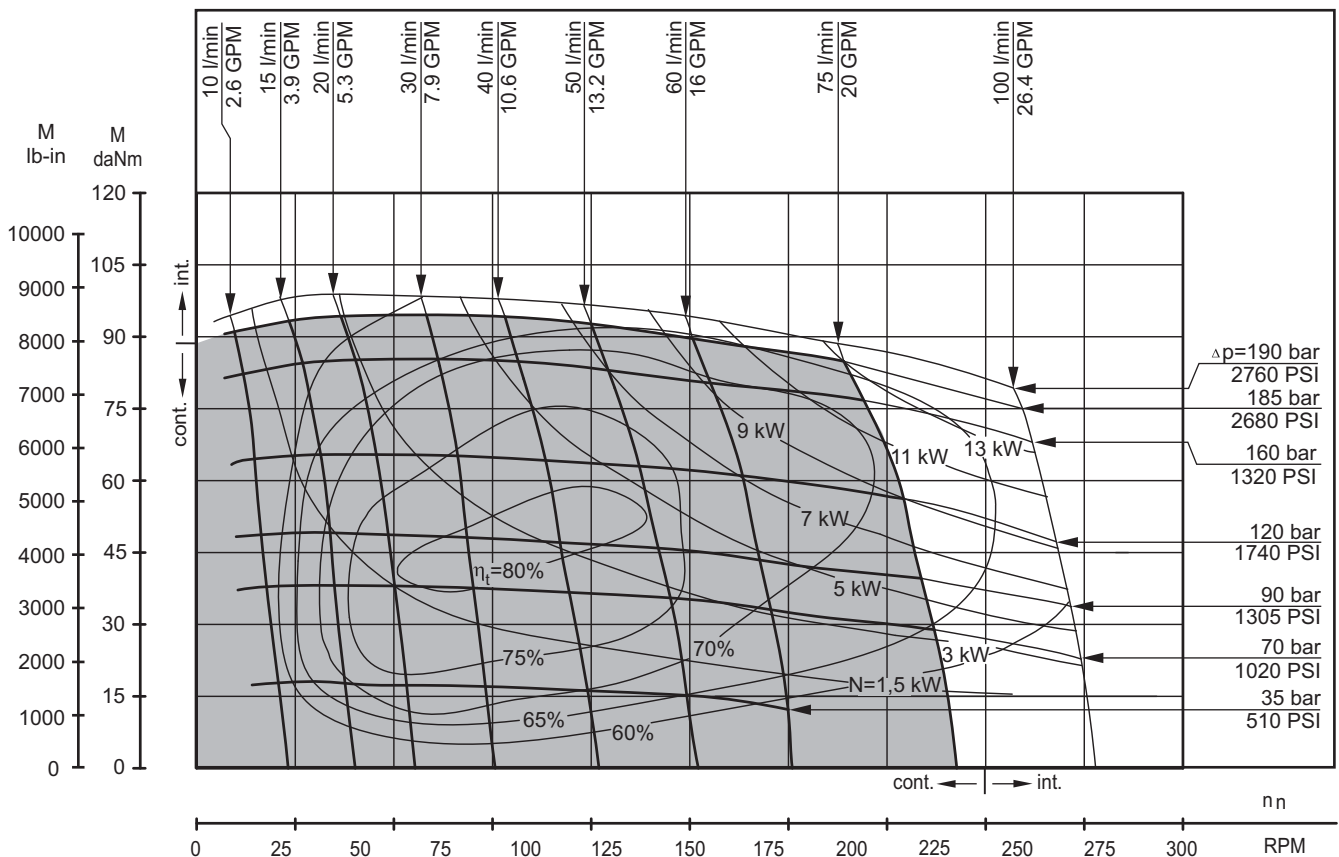
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 370



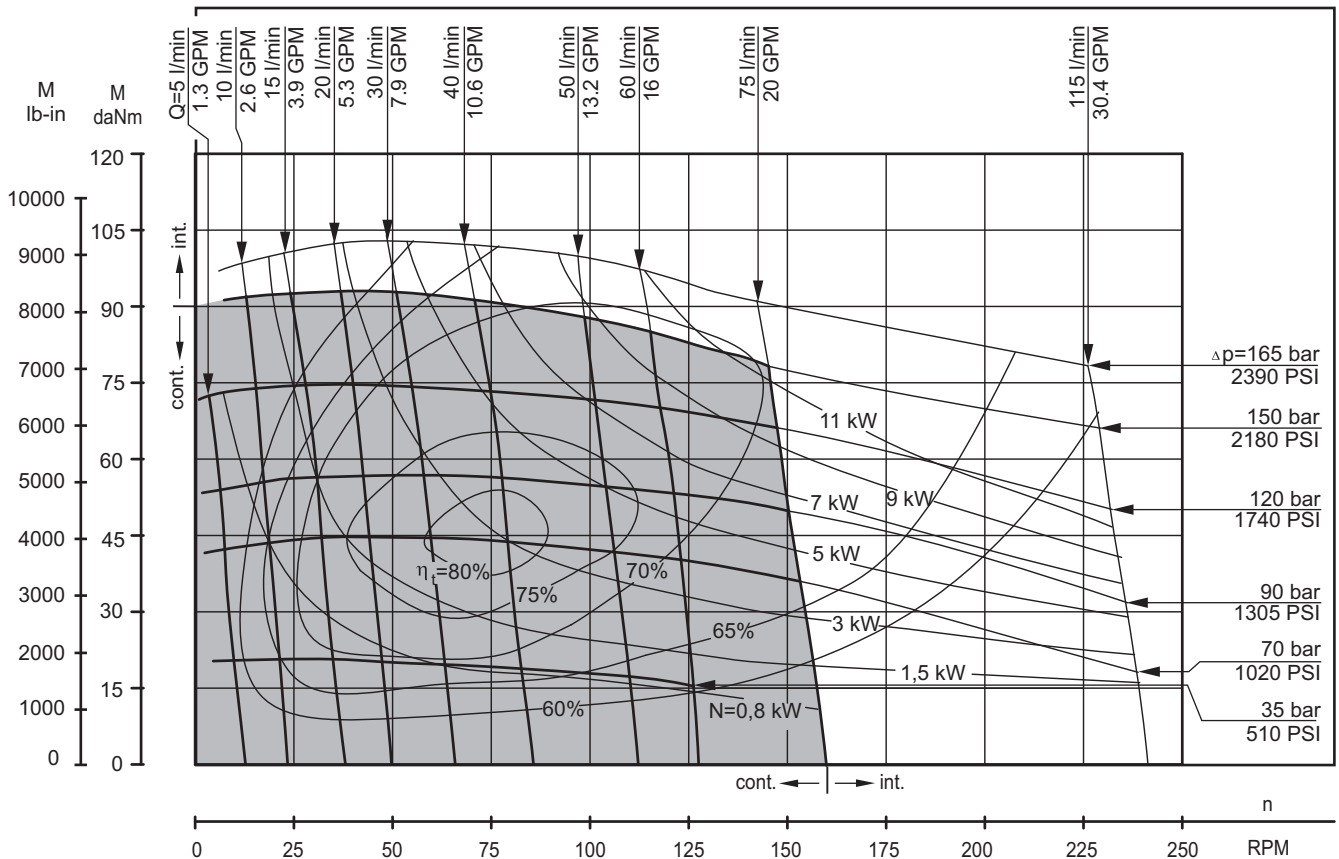
HW 400



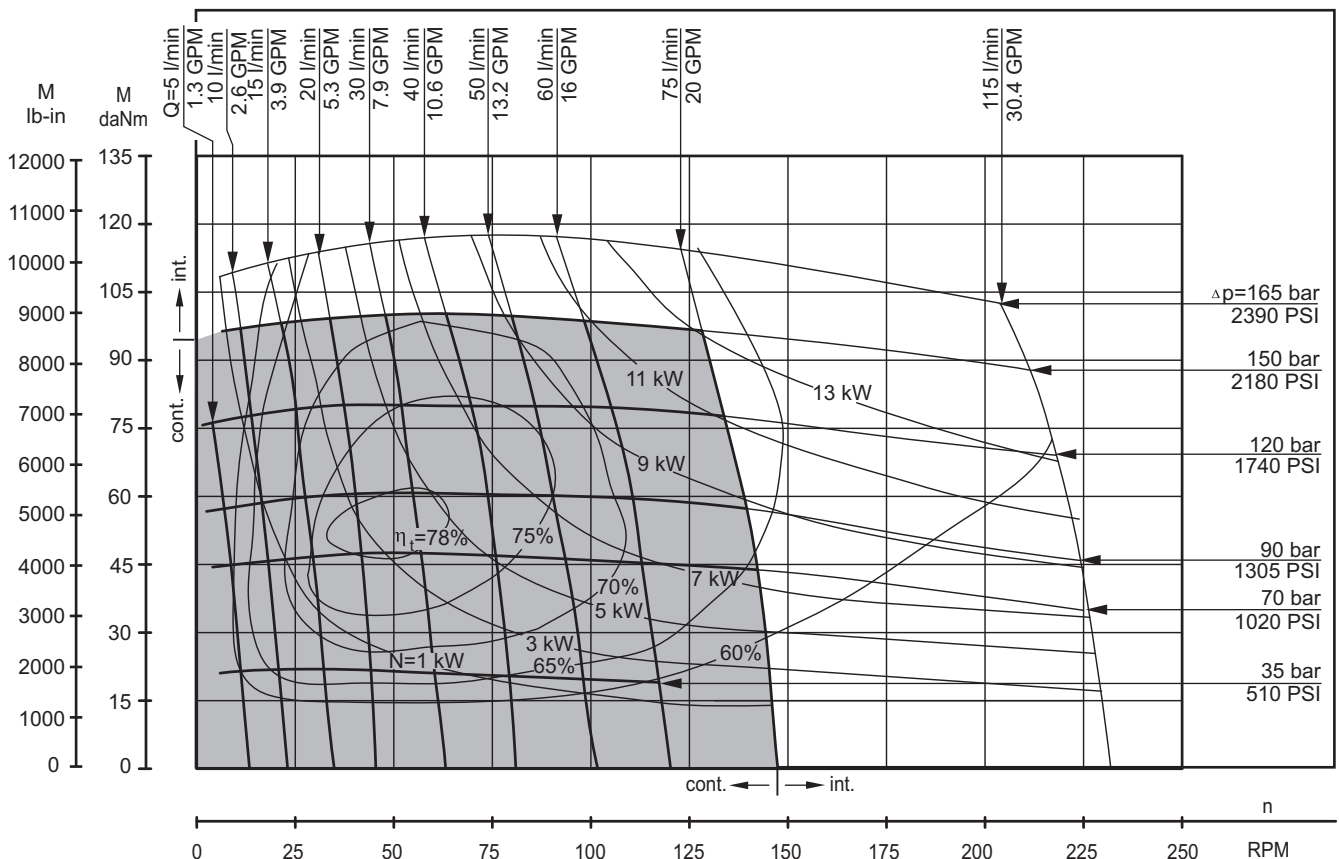
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 470



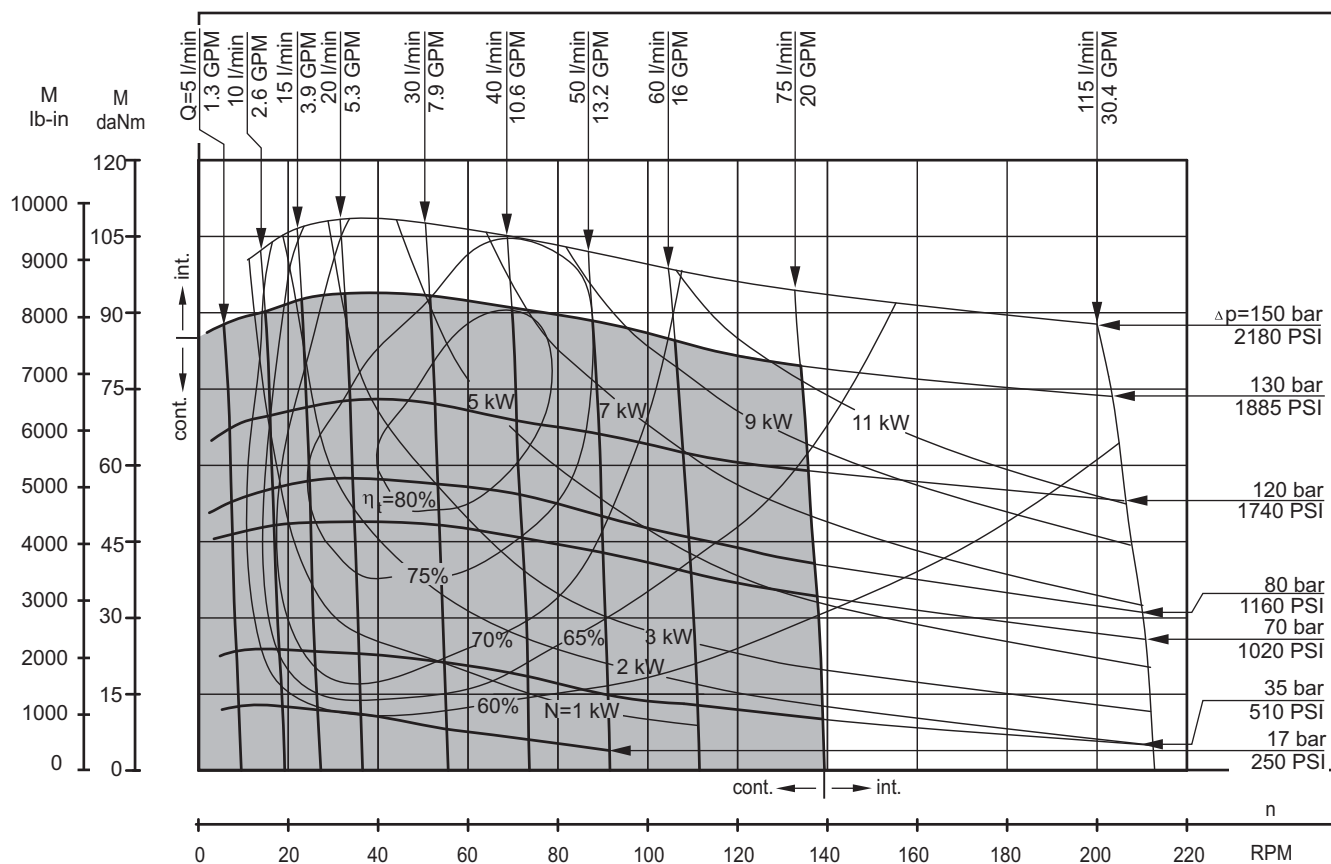
HW 500



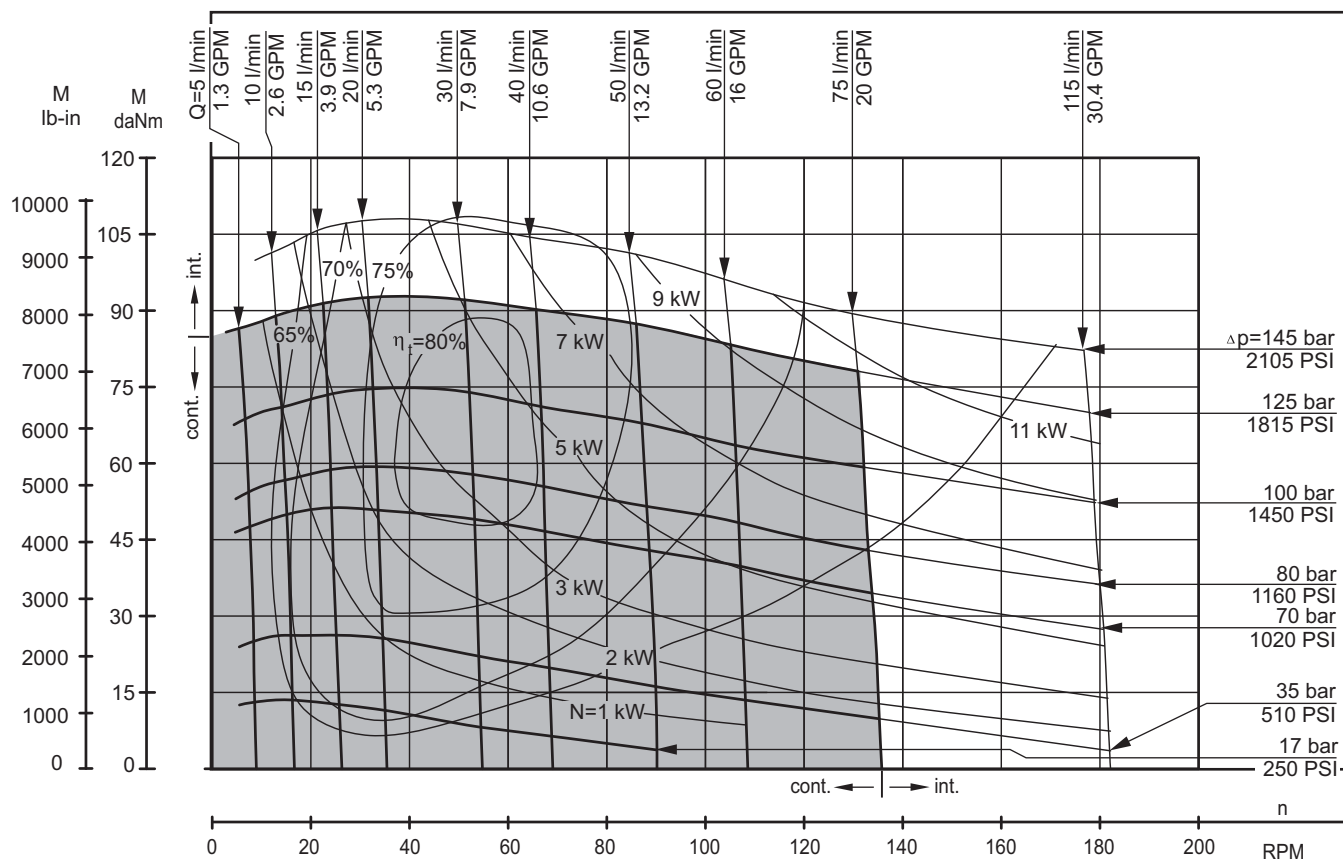
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 535



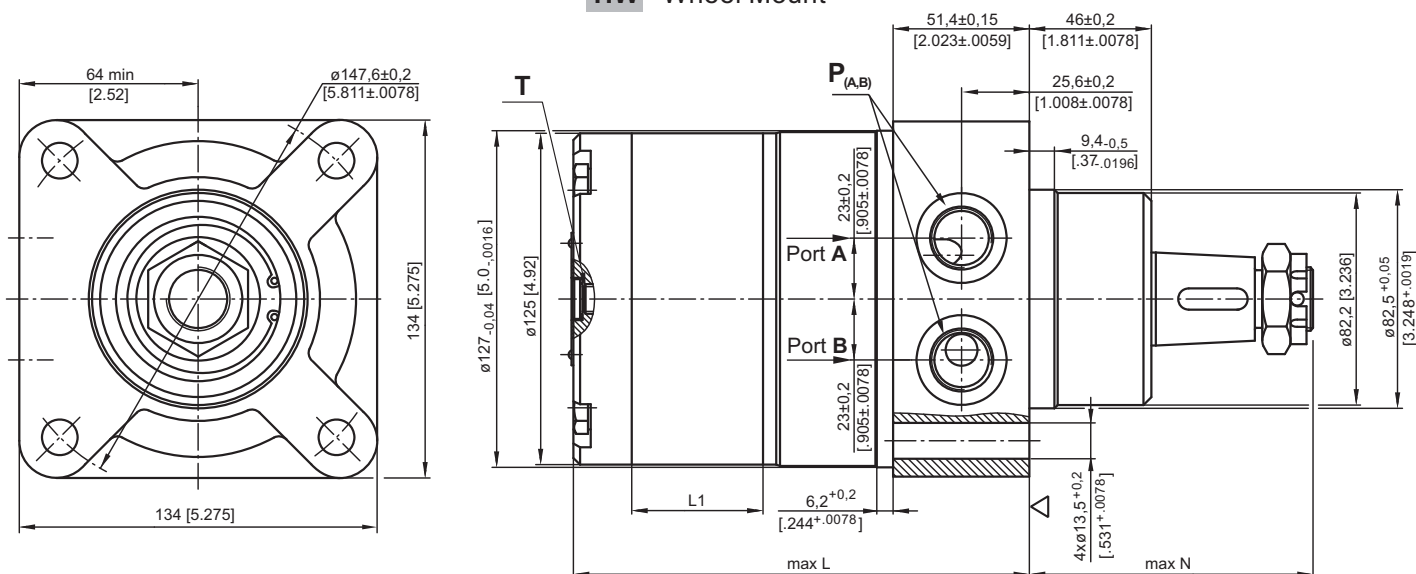
HW 550



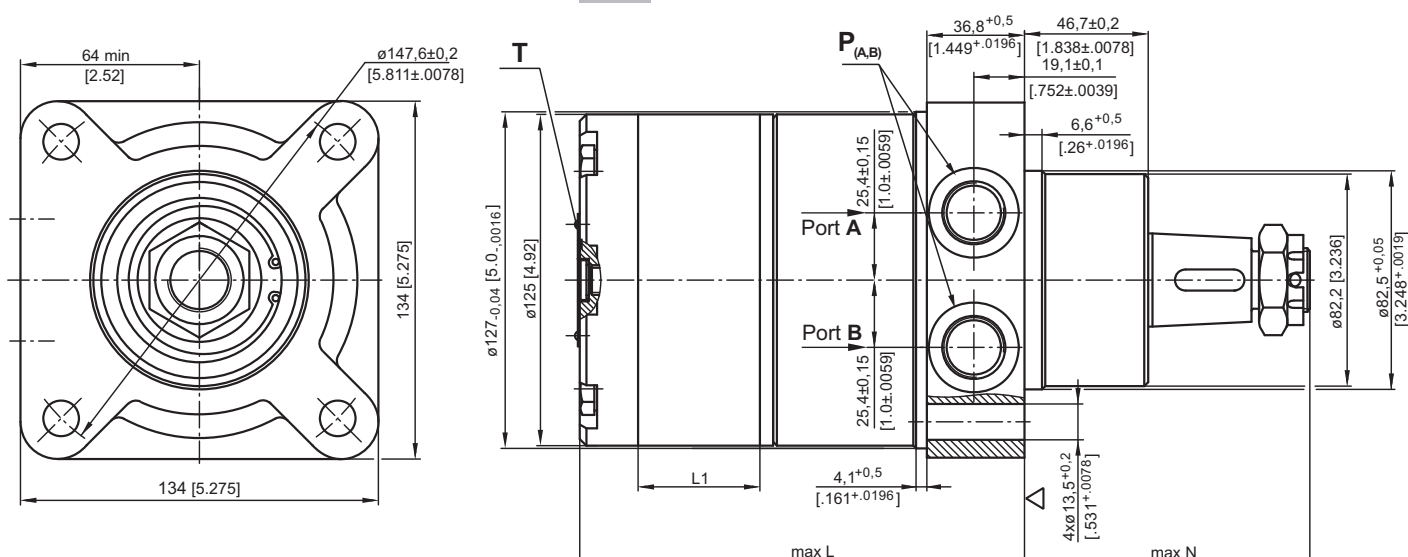
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

DIMENSIONS AND MOUNTING DATA

HW - Wheel Mount



HWS - Wheel Mount



Type	*L, mm [in]	L ₁ , mm [in]
HW 125	140,5 [5.51]	17,4 [0.68]
HW 160	145,0 [5.71]	21,8 [0.86]
HW 200	151,0 [5.95]	27,8 [1.09]
HW 235	155,5 [6.12]	32,5 [1.28]
HW 250	158,0 [6.22]	34,8 [1.37]
HW 300	164,5 [6.48]	41,4 [1.63]
HW 315	166,5 [6.56]	43,5 [1.71]
HW 350	171,0 [6.73]	48,0 [1.89]
HW 370	174,0 [6.85]	51,0 [2.01]
HW 400	178,0 [7.01]	54,8 [2.16]
HW 470	188,0 [7.40]	65,0 [2.56]
HW 500	192,5 [7.58]	69,4 [2.73]
HW 535	197,0 [7.76]	74,1 [2.92]
HW 550	199,0 [7.84]	76,0 [2.99]

▽ - Motor Mounting Surface

	Versions	
	2	4
P _(A,B)	2xG _{1/2}	2x ⁷ / ₈ -14UNF, O-ring
T	G _{1/4}	⁷ / ₁₆ -20UNF, O-ring

Note: For N see pages 117 and 118.

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

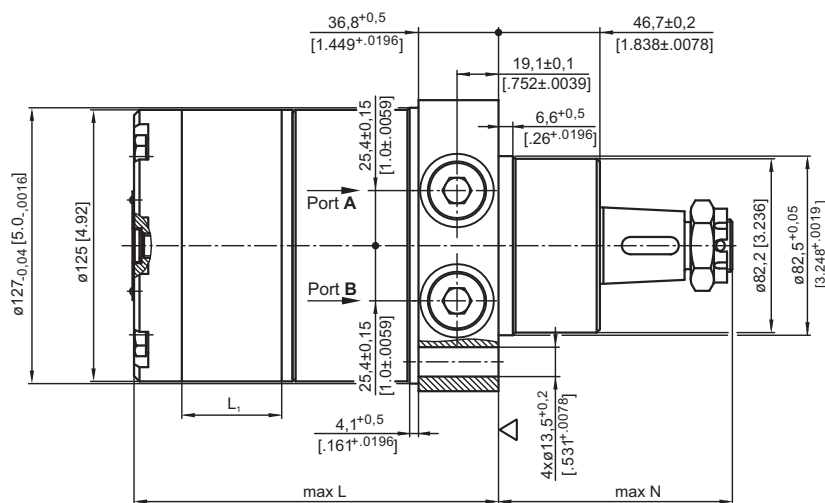
Reverse Rotation
Viewed from Shaft End
Port A Pressurized - CCW
Port B Pressurized - CW



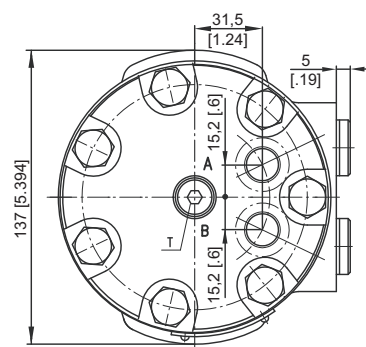
* For LSV option the dimension L is 3 mm [0.118 in] greater.

DIMENSIONS AND MOUNTING DATA

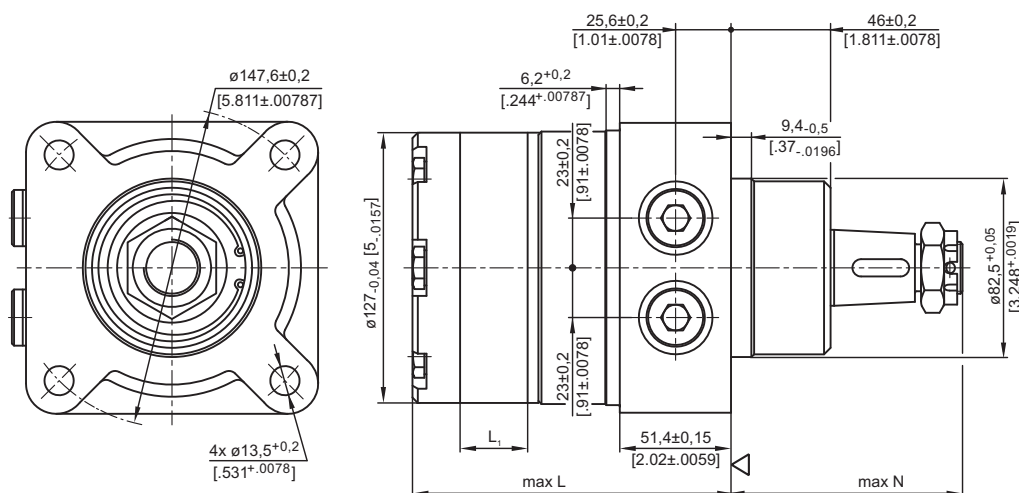
HWSE - Wheel Mount, rear ports



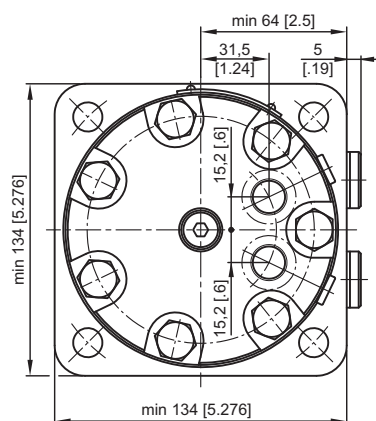
HWFE - Magneto Mount



HWE - Wheel Mount, rear ports



HW(S)E



Type	*L, mm [in]		L ₁ , mm [in]
	HWE, HWSE	HWFE	
HW... 125	145,5 [5.73]	189,0 [7.44]	17,4 [.68]
HW... 160	150,0 [5.91]	193,5 [7.62]	21,8 [.86]
HW... 200	156,0 [6.14]	199,5 [7.85]	27,8 [1.09]
HW... 235	160,5 [6.32]	204,0 [8.03]	32,5 [1.28]
HW... 250	163,0 [6.42]	206,5 [8.13]	34,8 [1.37]
HW... 300	169,5 [6.67]	213,0 [8.39]	41,4 [1.63]
HW... 315	171,5 [6.75]	215,0 [8.46]	43,5 [1.71]
HW... 350	176,0 [6.93]	219,5 [8.64]	48,0 [1.89]
HW... 370	179,0 [7.05]	222,5 [8.76]	51,0 [2.01]
HW... 400	183,0 [7.20]	226,5 [8.92]	54,8 [2.16]
HW... 470	193,0 [7.60]	236,5 [9.31]	65,0 [2.56]
HW... 500	197,5 [7.78]	241,0 [9.49]	69,4 [2.73]
HW... 535	202,0 [7.95]	245,5 [9.67]	74,1 [2.92]
HW... 550	204,0 [8.03]	247,5 [9.74]	76,0 [2.99]

▽ - Motor Mounting Surface

	Versions	
	5	6
P _(A,B)	2xG 3/8	2x ⁹ / ₁₆ -18 UNF O-ring
T	G 1/4	⁷ / ₁₆ -20 UNF, O-ring

Note: For N see pages 117 and 118.

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

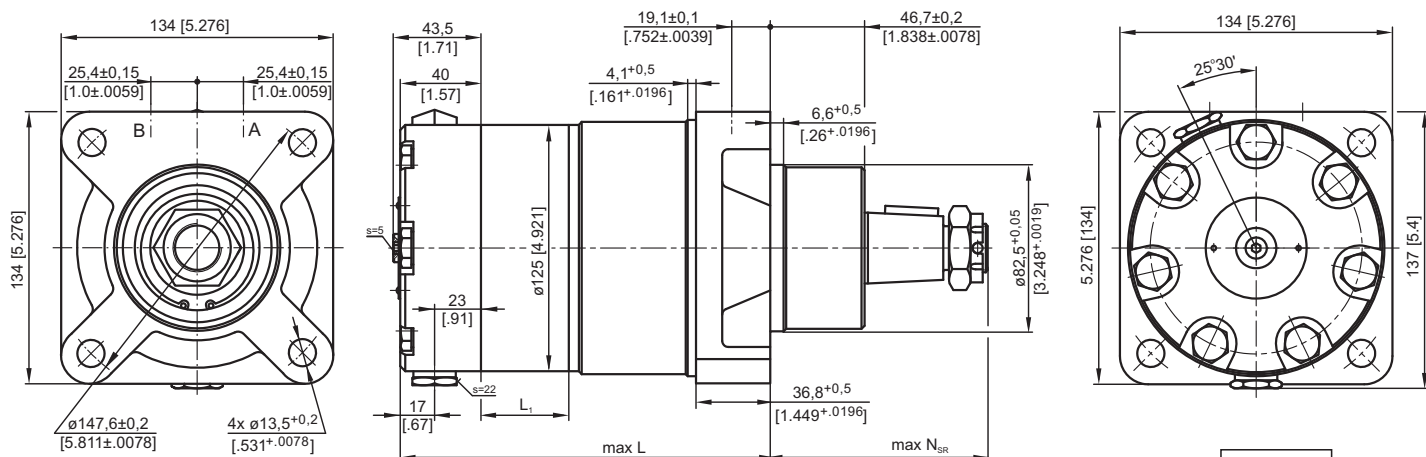
Reverse Rotation
Viewed from Shaft End
Port **A** Pressurized - **CCW**
Port **B** Pressurized - **CW**



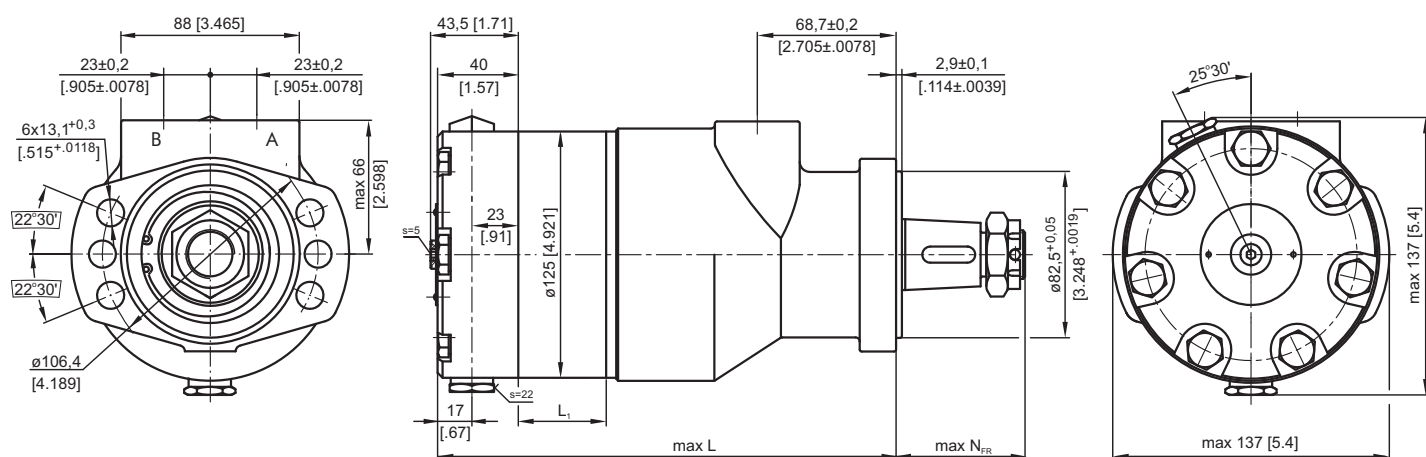
* For **LSV** option the dimension **L** is 3 mm [.118 in] greater.

DIMENSIONS AND MOUNTING DATA

HWSR - Wheel mount, relief valves



HWFR - Wheel mount, six holes, relief valves



▽ - Motor Mounting Surface

	Versions	
	2	4
P_(A,B)	2xG $\frac{1}{2}$	2x $\frac{7}{8}$ -14UNF, O-ring

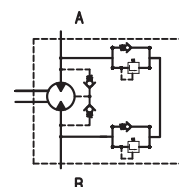
Note: For N_{FR} and N_{SR} see pages 117 and 118.

Standard Rotation

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

Reverse Rotation

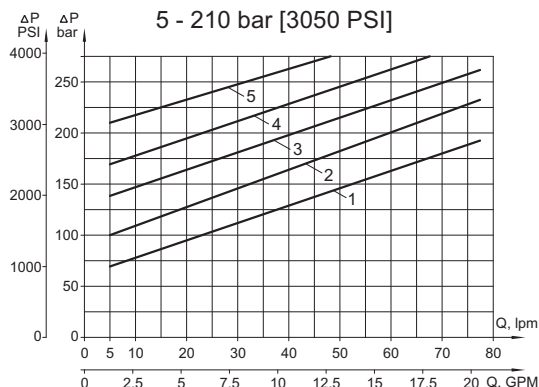
Viewed from Shaft End
Port A Pressurized - CCW
Port B Pressurized - CW



Type	*L, mm [in]		L _i , mm [in]
	HWSR	HWFR	
HW... 125	158,5 [6.24]	202,0 [7.95]	17,4 [6.8]
HW... 160	163,0 [6.42]	206,5 [8.13]	21,8 [8.6]
HW... 200	169,0 [6.65]	212,5 [8.37]	27,8 [1.09]
HW... 235	173,5 [6.83]	217,0 [8.54]	32,5 [1.28]
HW... 250	176,0 [6.93]	219,5 [8.64]	34,8 [1.37]
HW... 300	182,5 [7.19]	226,0 [8.89]	41,4 [1.63]
HW... 315	184,5 [7.26]	228,0 [8.98]	43,5 [1.71]
HW... 350	189,0 [7.44]	232,5 [9.15]	48,0 [1.89]
HW... 370	192,0 [7.56]	235,5 [9.27]	51,0 [2.01]
HW... 400	196,0 [7.72]	239,5 [9.43]	54,8 [2.16]
HW... 470	206,0 [8.11]	249,5 [9.82]	65,0 [2.56]
HW... 500	210,5 [8.29]	254,0 [10.00]	69,4 [2.73]
HW... 535	215,0 [8.46]	258,8 [10.19]	74,1 [2.92]
HW... 550	217,0 [8.54]	260,5 [10.26]	76,0 [2.99]

**Pressure Settings at Flow Q=5 lpm [1.32 GPM]
32 mm²/s [150 SUS]; 50°C [122°F]**

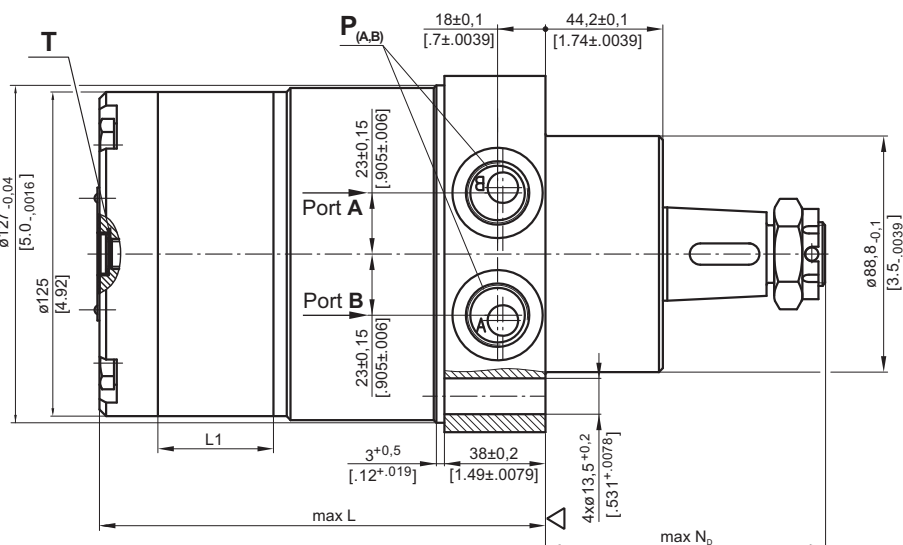
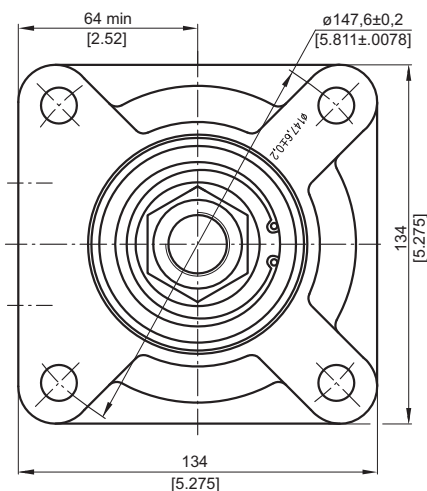
- 1 - 70 bar [1015 PSI]
- 2 - 100 bar [1450 PSI]
- 3 - 140 bar [2030 PSI]
- 4 - 170 bar [2470 PSI]
- 5 - 210 bar [3050 PSI]



* For LSV option the dimension L is 3 mm [1.18 in] greater.

DIMENSIONS AND MOUNTING DATA

D Wheel Mount



Versions		
	2	4
P _(A,B)	2xG $\frac{1}{2}$	2x $\frac{7}{16}$ -14UNF, O-ring
T	G $\frac{1}{4}$	$\frac{7}{16}$ -20UNF, O-ring

* For LSV option the dimension L is 3 mm [.118 in] greater.

Type	*L, mm [in]		L ₁ , mm [in]
	HWV	HWV	
HW... 125	142,0 [5.59]	140,5 [5.53]	17,4 [.68]
HW... 160	147,0 [5.79]	145,0 [5.71]	21,8 [.86]
HW... 200	153,0 [6.02]	151,0 [5.94]	27,8 [1.09]
HW... 235	158,0 [6.22]	155,5 [6.12]	32,5 [1.28]
HW... 250	160,0 [6.30]	158,0 [6.22]	34,8 [1.37]
HW... 300	166,5 [6.56]	164,5 [6.46]	41,4 [1.63]
HW... 315	169,0 [6.65]	166,5 [6.56]	43,5 [1.71]
HW... 350	173,5 [6.83]	171,0 [6.73]	48,0 [1.89]
HW... 370	176,5 [6.95]	174,0 [6.85]	51,0 [2.01]
HW... 400	180,0 [7.09]	178,0 [7.01]	54,8 [2.16]
HW... 470	190,5 [7.50]	188,0 [7.40]	65,0 [2.56]
HW... 500	194,5 [7.66]	192,5 [7.58]	69,4 [2.73]
HW... 535	199,5 [7.85]	197,0 [7.76]	74,1 [2.92]
HW... 550	201,5 [7.93]	199,0 [7.83]	76,0 [2.99]

Note: For N_b and N_v see pages 117 and 118.

▽ - Motor Mounting Surface

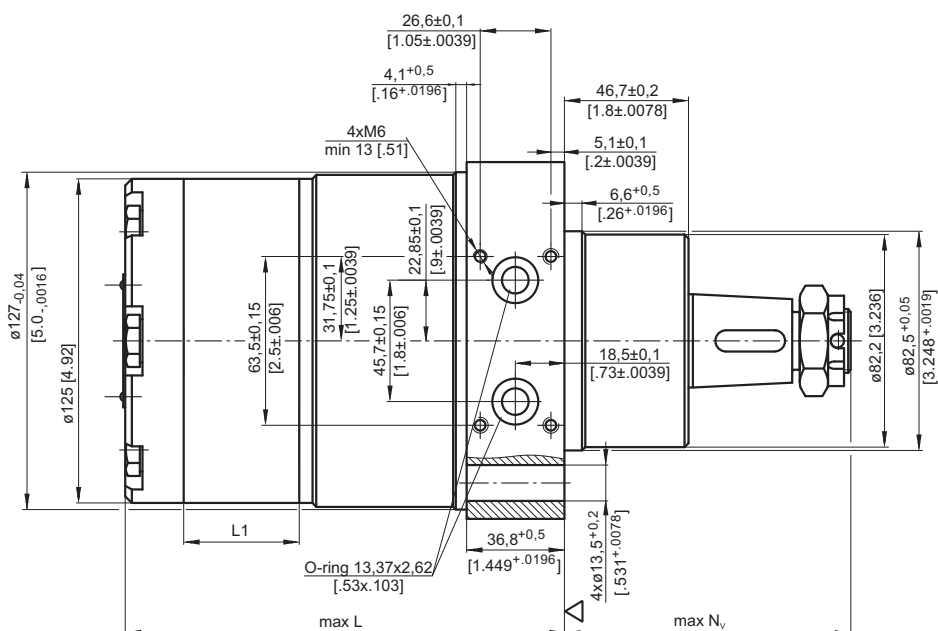
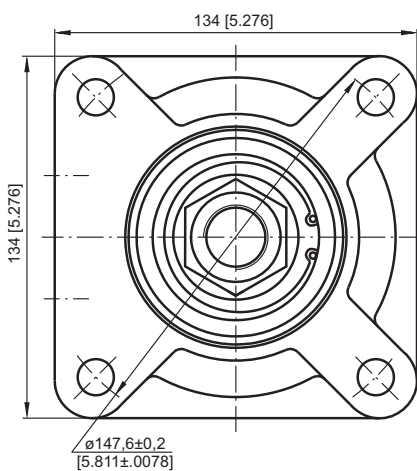


Standard Rotation
Viewed from Shaft End
Port A Pressurized - CW
Port B Pressurized - CCW

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

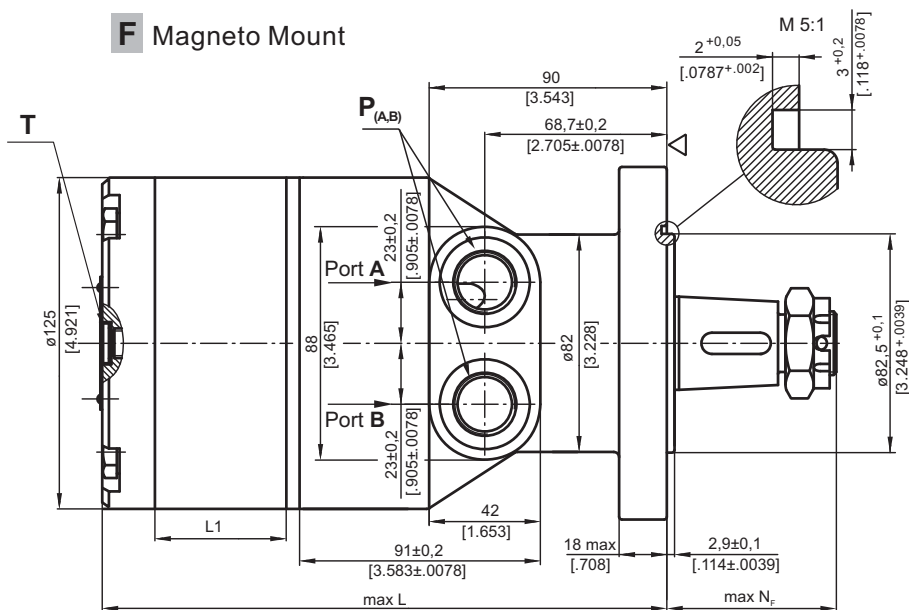
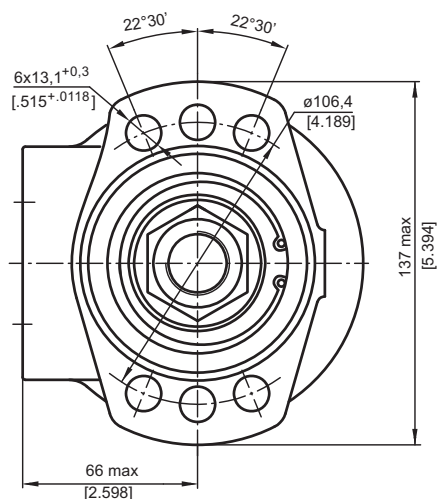
Versions		
	2	4
T	G $\frac{1}{4}$	$\frac{7}{16}$ -20UNF, O-ring

V Wheel Mount



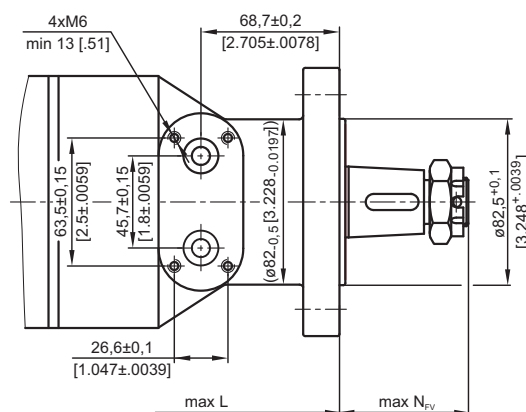
DIMENSIONS AND MOUNTING DATA

F Magneto Mount



Type	*L, mm [in]	L ₁ , mm [in]
HWF(V) 125	184,0 [7.24]	17,4 [.68]
HWF(V) 160	188,5 [7.42]	21,8 [.86]
HWF(V) 200	194,5 [7.66]	27,8 [1.09]
HWF(V) 235	199,0 [7.84]	32,5 [1.28]
HWF(V) 250	201,5 [7.93]	34,8 [1.37]
HWF(V) 300	208,0 [8.20]	41,4 [1.63]
HWF(V) 315	210,0 [8.27]	43,5 [1.71]
HWF(V) 350	214,5 [8.45]	48,0 [1.89]
HWF(V) 370	217,5 [8.56]	51,0 [2.01]
HWF(V) 400	221,5 [8.72]	54,8 [2.16]
HWF(V) 470	231,5 [9.11]	65,0 [2.56]
HWF(V) 500	236,0 [9.29]	69,4 [2.73]
HWF(V) 535	240,5 [9.47]	74,1 [2.92]
HWF(V) 550	242,5 [9.55]	76,0 [2.99]

HWFV - Wheel mount, six holes, relief valves



	Versions	
	2	4
P _(A,B)	2xG _{1/2}	2x ⁷ / ₁₆ -14UNF, O-ring
T	G ¹ / ₄	⁷ / ₁₆ -20UNF, O-ring



Note: For N_F
and N_{FV} see pages
117 and **118**.

▽ - Motor Mounting Surface

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**

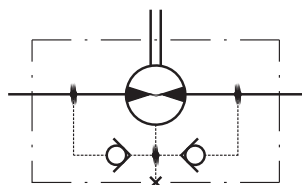
* For LSV option the dimension L is 3 mm [.118 in] greater.

MAX. PERMISSIBLE SHAFT SEAL PRESSURE

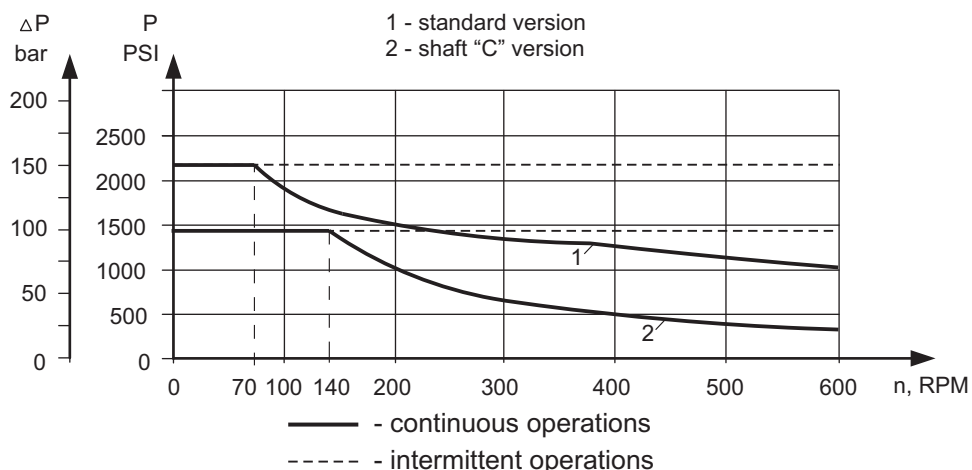
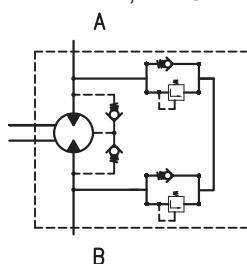
HW... motors with drain connection:

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

HW, HWF, HWS, HWD, HWV

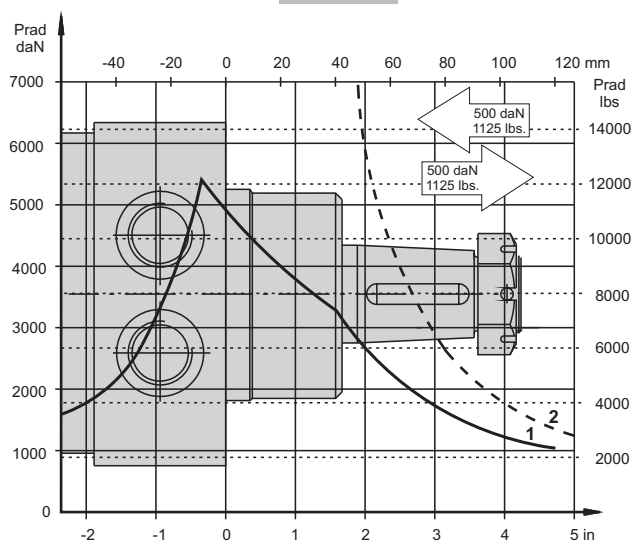


HWFR, HWSR

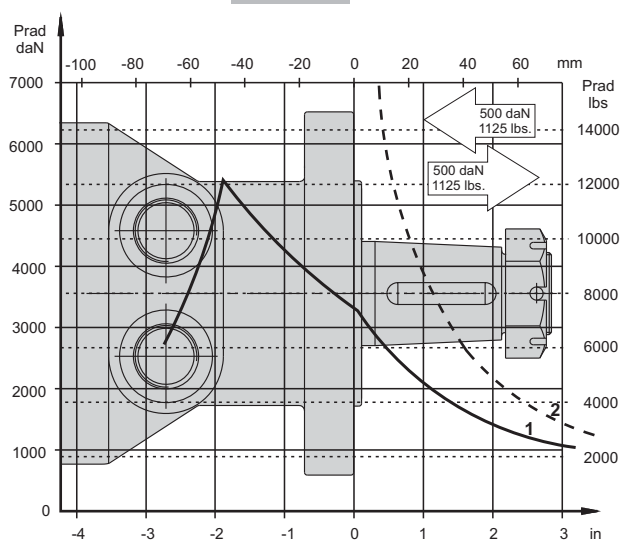


PERMISSIBLE SHAFT LOADS

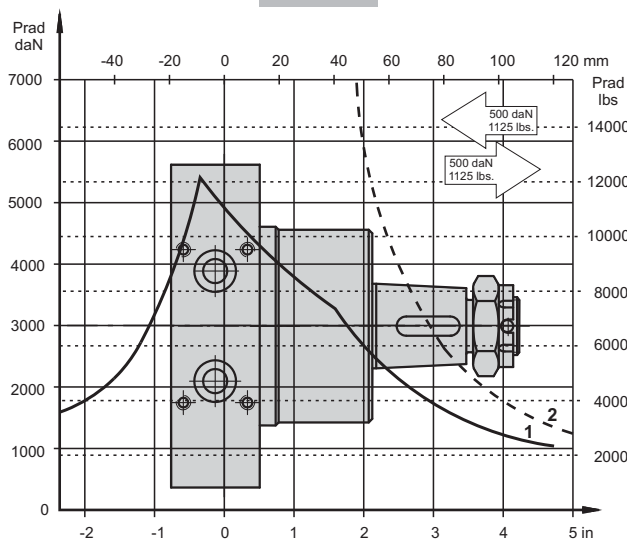
HW...



HWF...



HWV...

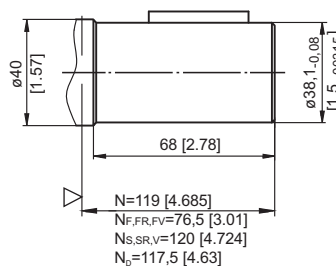
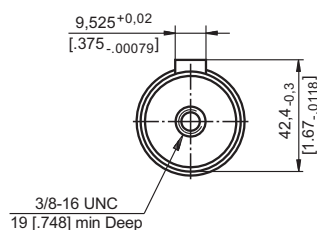


- 1 - Bearing curve: The curve applies to a B10 bearing life of 2000 hours at 100 RPM.
2 - Shaft curve: The curve represents Max. permissible radial shaft load with safety factor 3:1.

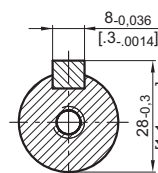
SHAFT EXTENSIONS

C - 1½" [38,1] straight, Parallel key ⅜"x⅜"x1½" BS46
Max. Torque 120 daNm [10630 lb-in]

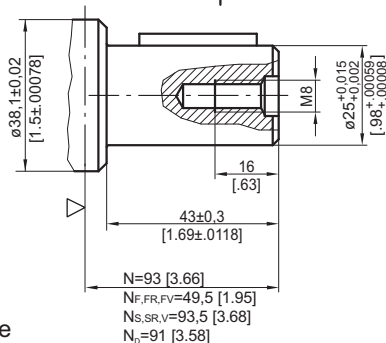
CO - ø25, straight, Parallel key A8x7x32 DIN 6885
Max. Torque 40 daNm [3540 lb-in]



W-W



W



W

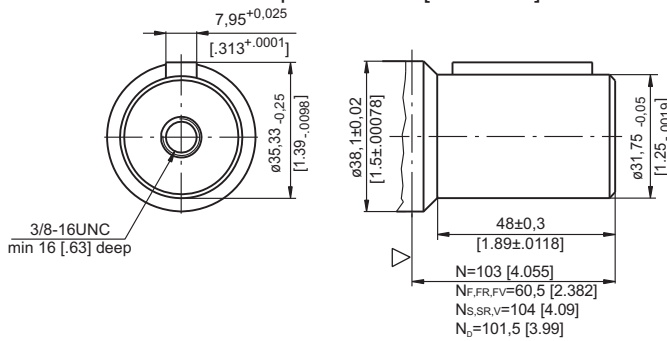
▽ - Motor Mounting Surface



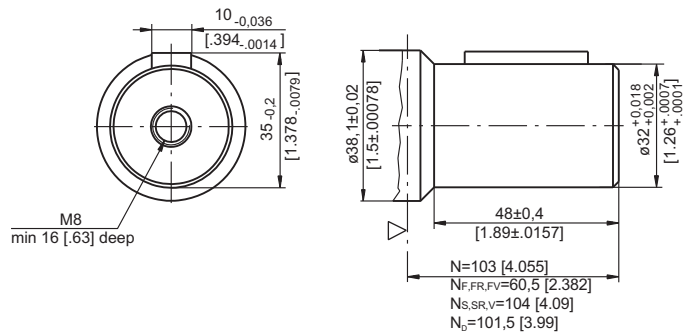
- N - for standard flange
N_F - for F flange
N_{FR} - for FR flange
N_{FV} - for FV flange
N_S - for S flange
N_{SR} - for SR flange
N_D - for D flange
N_V - for V flange

SHAFT EXTENSIONS [continued]

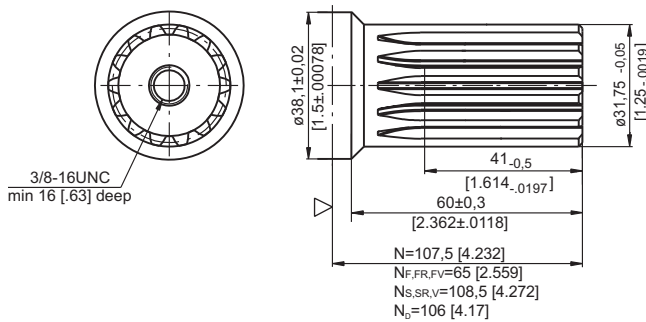
K - 1 1/4" straight, Parallel key 5/16"x5/16"x1 1/2" BS46
Max. Torque 77 daNm [6815 lb-in]



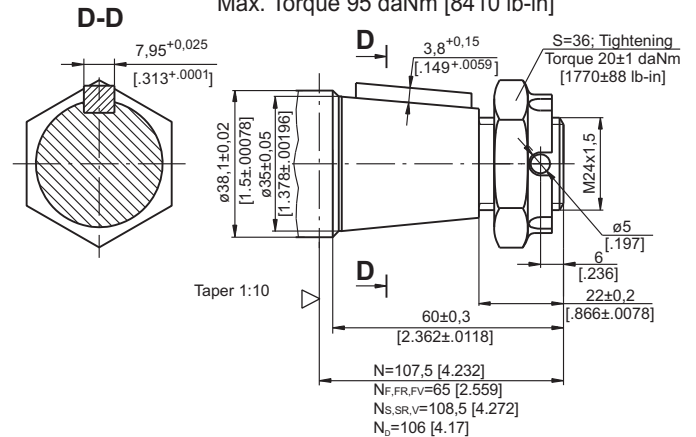
M - $\phi 32$ straight, Parallel key A10x8x32 DIN 6885
Max. Torque 77 daNm [6815 lb-in]



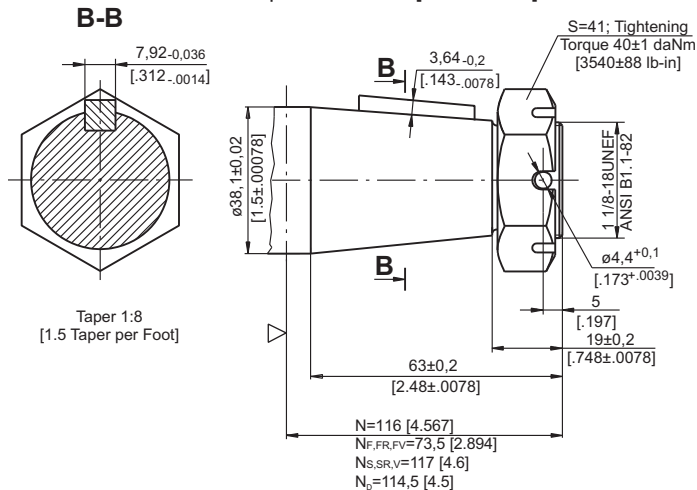
L - $\phi 1 1/4$ " splined 14T, DP12/24 ANSI B92.1-1976 Norm
Max. Torque 95 daNm [8410 lb-in]



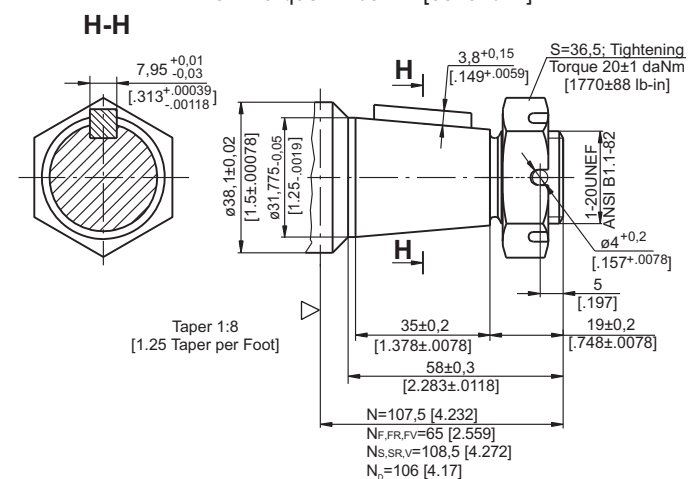
KB - $\phi 35$ tapered 1:10, Parallel key 5/16"x5/16"x1 1/4" BS46
Max. Torque 95 daNm [8410 lb-in]



T - 1 1/2" tapered 1:8, Parallel key 5/16"x5/16"x1 1/4" BS46
Max. Torque 120 daNm [10620 lb-in]



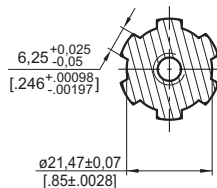
R - 1 1/4" tapered 1:8, Parallel key 5/16"x5/16"x1" BS46
Max. Torque 77 daNm [6815 lb-in]



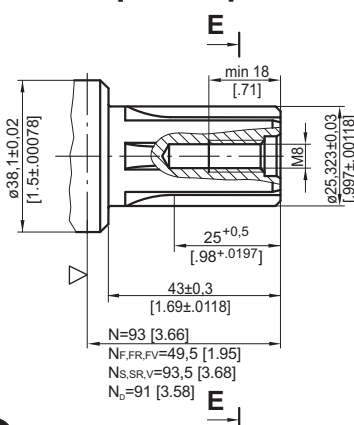
SH - $\phi 1$ " splined BS 2059, SAE 6B
Max. Torque 40 daNm [3540 lb-in]



E-E



- N - for standard flange
- N_F - for F flange
- N_{FR} - for FR flange
- N_{FV} - for FV flange
- N_S - for S flange
- N_{SR} - for SR flange
- N_D - for D flange
- N_V - for V flange



▽ - Motor Mounting Surface

ORDER CODE

	1	2	3	4	5	6	7	8	9
HW								/	

Pos.1 - Mounting Flange

omit	- Wheel mount, four holes
E	- Wheel mount, four holes, rear ports
F	- Oval mount, six holes
FR	- Oval mount, six holes, relief valves
FV	- Oval mount, six holes, relief valves
FE	- Oval mount, six holes, rear ports
S	- Wheel mount, four holes
SR	- Wheel mount, four holes, relief valves
SE	- Wheel mount, four holes, rear ports
D	- Wheel mount, four holes; mounting on ø88,8 [3.5]
V^{1)*}	- Wheel mount, four holes, valves

Pos.2 - Displacement code

125	- 126,0 cm ³ /rev [7.69 in ³ /rev]
160	- 158,0 cm ³ /rev [9.64 in ³ /rev]
200	- 201,3 cm ³ /rev [12.28 in ³ /rev]
235	- 235,0 cm ³ /rev [14.33 in ³ /rev]
250	- 252,0 cm ³ /rev [15.37 in ³ /rev]
300	- 300,0 cm ³ /rev [18.30 in ³ /rev]
315	- 314,9 cm ³ /rev [19.21 in ³ /rev]
350	- 347,8 cm ³ /rev [21.21 in ³ /rev]
370	- 369,0 cm ³ /rev [22.51 in ³ /rev]
400	- 396,8 cm ³ /rev [24.20 in ³ /rev]
470	- 470,6 cm ³ /rev [28.71 in ³ /rev]
500	- 502,4 cm ³ /rev [30.65 in ³ /rev]
535	- 536,0 cm ³ /rev [32.70 in ³ /rev]
550	- 550,0 cm ³ /rev [33.55 in ³ /rev]

Pos.3 - Shaft Extensions^{2)*}

K	- 1 1/4" [31,75] straight, Parallel key ⁵ / ₁₆ " x ⁵ / ₁₆ " x 1 1/2" BS46
KB	- ø35 tapered 1:10, Parallel key ⁵ / ₁₆ " x ⁵ / ₁₆ " x 1 1/4" BS46
L	- 1 1/4" [31,75] splined 14T, ANSI B92.1-1976
M	- ø32 straight, Parallel key A10x8x32 DIN 6885
R	- 1 1/4" [31,75] Tapered 1:8, Parallel key ⁵ / ₁₆ " x ⁵ / ₁₆ " x 1 1/4" BS46
T	- 1 1/2" [38,1] Tapered 1:8, Parallel key ⁵ / ₁₆ " x ⁵ / ₁₆ " x 1 1/4" BS46
C	- 1 1/2" [38,1] straight, Parallel key ³ / ₈ " x ³ / ₈ " x 1 1/2" BS46
CO	- ø25, straight, Parallel key A8x7x32 DIN 6885
SH	- ø1" splined BS 2059, SAE 6B

Pos.4 - Ports

2	- side ports, 2xG1/2, G1/4, BSP thread, ISO 228
4	- side ports, 2x7/8-14 UNF, O-ring, 7/16-20 UNF
5^{3)*}	- rear ports, 2xG3/8, G1/4, BSP thread, ISO 228
6^{3)*}	- rear ports, 2x9/16-18 UNF, O-ring, 7/16-20 UNF

Pos.5 - Special Features^{4)*, 5)*, 6)*} [\[see page 120\]](#)

Pos.6 - Valves Pressure Range, bar^{7)*}

/	- 70, 100, 140, 170, 210
----------	--------------------------

Pos.7 - Design Series

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

NOTES:

- ^{1)*} Flange **V** is for versions 2 and 4 - drainage only!
- ^{2)*} The permissible output torque for shafts must not be exceeded!
- ^{3)*} For **E**-version only!
- ^{4)*} If the code on pos.5 is not specified in the order, it will be considered as LL-option.
- ^{5)*} Colour at customer's request.
- ^{6)*} Non painted feeding surfaces, colour at customer's request.
- ^{7)*} For **SR** and **FR** only!

E-version is not available with **SR** and **FR**!!!

The hydraulic motors are mangano-phosphatized as standard.

HYDRAULIC DISC BRAKES LB, LBS, LBV- Wet



APPLICATION

Heavy Duty machinery
Wheel drives
Material handling
Mining
Agricultural machines
Conveyors
Door openers and swing drives etc.



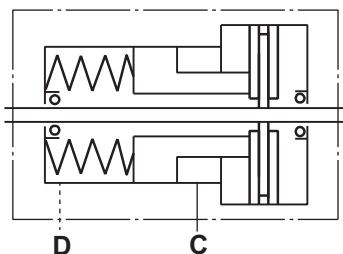
GENERAL

Fluid type	Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)
Temperature range, °C [°F]	-40÷140 [-40÷284]
Viscosity range, mm²/s	20÷75 [98÷347]
Filtration	ISO code 20/16 (nominal filtration of 25 microns)
Maintenance	Changed after the first 50-100 h, then after every 500-1500 h.

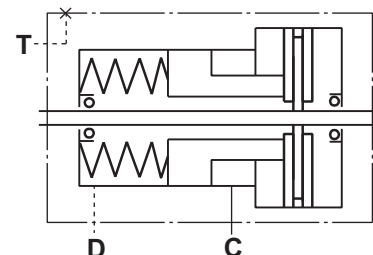
CONTENTS

Hydraulic Disc Brake for MP, MR and MS Motors type LB/288	4÷5
Hydraulic Disc Brake for MSS and MSV type LBS(V)/289	6
Hydraulic Disc Brake for MSS and MSV type LBS(V)/290	7
Output Shafts for LBS(LBV)/289, 290	8
Specification data for LBS(LBV)/289, 290	8
Load curve for LBS(LBV)/289, 290	8
Internal Spline data for .../289,290 and .../314,315.....	9
Order code for LB/288,LBS(LBV)/289, 290	9
Hydraulic Disc Brake for MTS and MTV type LBS(LBV)/314	10
Hydraulic Disc Brake for MTS and MTV type LBS(LBV)/315	11
Specification data for LBS(LBV)/314, 315	12
Load curve for LBS(LBV)/314, 315	12
Output Shafts for LBS(LBV)/314, 315	13
Order code for LBS(LBV)/314, 315	13
Hydraulic Disc Brake for MVS type LBS/313	14
Load curve for LBS/313	14
Hydraulic Disc Brake for MVS type LBS/316	15
Load curve for LBS/316	15
Specification data for LBS/313, 316.....	16
Output Shafts for LBS/313, 316	16
Internal Spline data for LBS/313, 316	17
Order code for LBS/313, 316	17

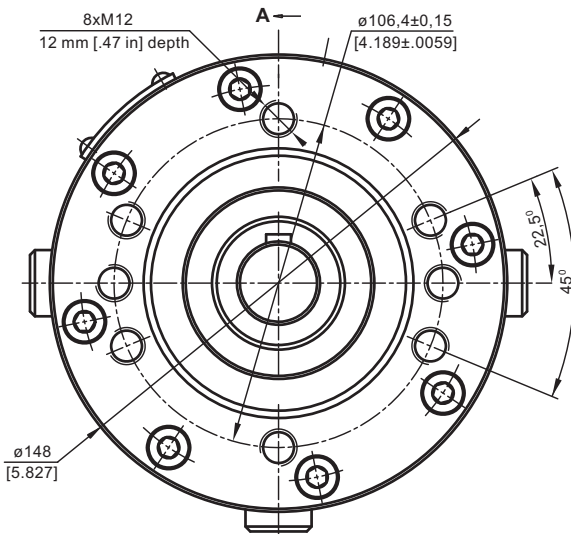
LB, LBS



LBV



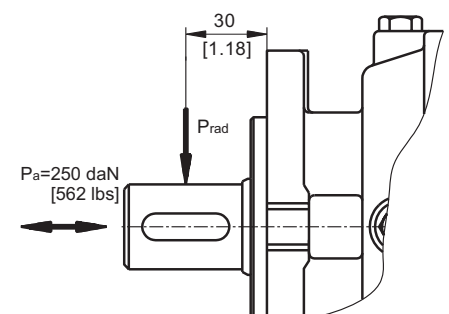
TYPE LB/288



* - For Input Shaft Hole Versions **SH** and **SB**.

The graph shows the relationship between rotational speed n (RPM) and radiated power P_{rad} (daN and lbs) for a 1000 W motor. The power decreases as the rotational speed increases.

n (RPM)	P_{rad} (daN)	P_{rad} (lbs)
100	~800	~1800
200	~550	~1250
400	~400	~900
600	~350	~800
800	~300	~700



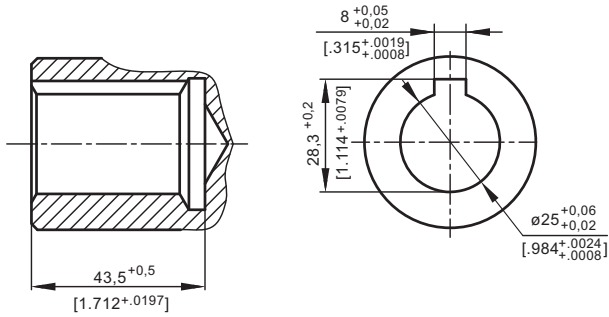
*Static torque is obtained at working pressure - 0 bar [0 PSI].

LB

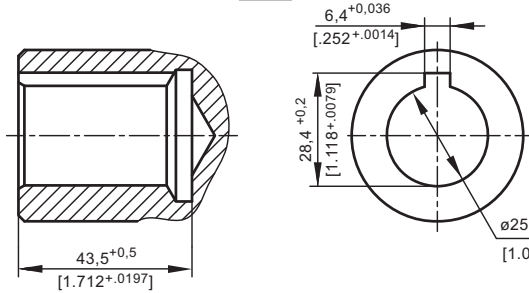
BRAKE

INPUT SHAFT HOLES

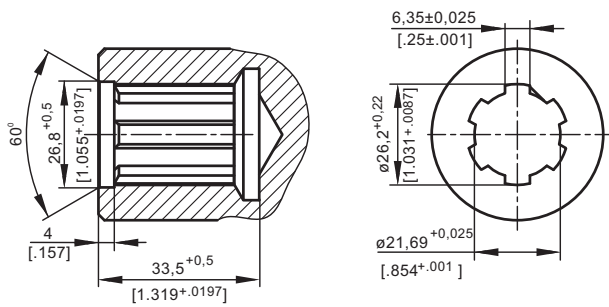
C



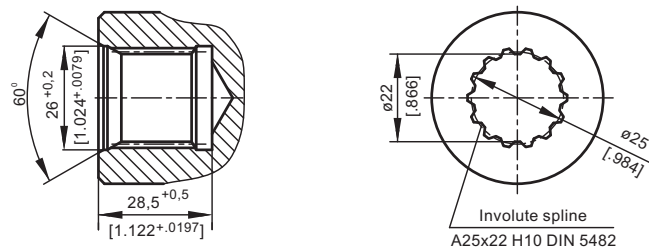
CO



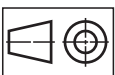
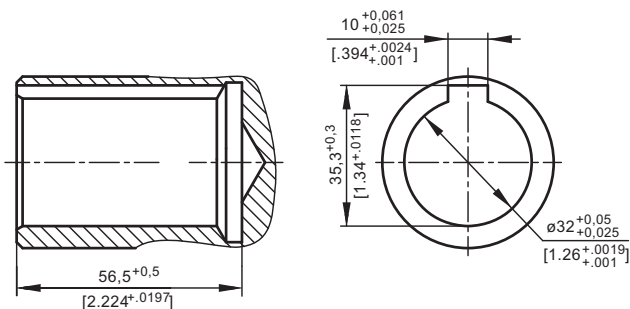
SH



SB



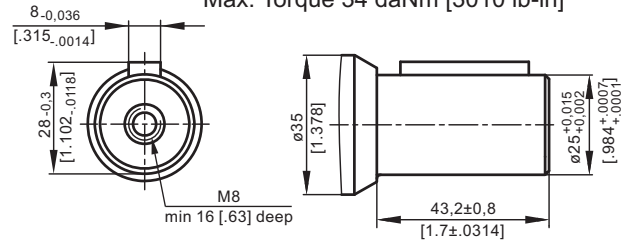
CB



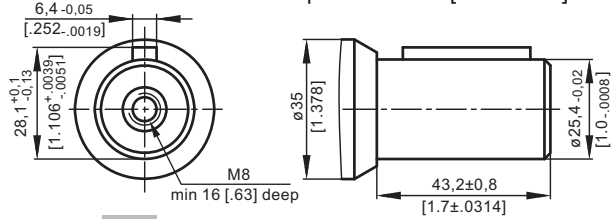
mm [in]

OUTPUT SHAFT EXTENSIONS

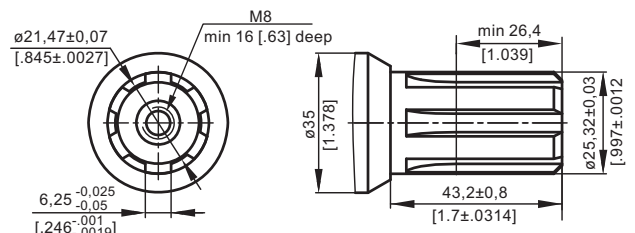
C - $\phi 25$ straight, Parallel key A8x7x32 DIN 6885
Max. Torque 34 daNm [3010 lb-in]



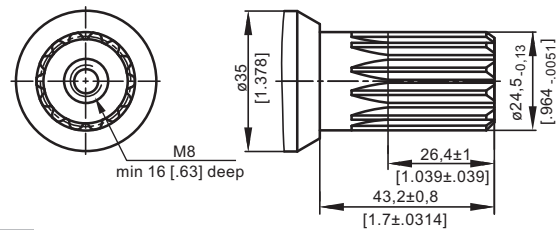
CO - $\phi 1"$ straight, Parallel key $\frac{1}{4} \times \frac{1}{4} \times 1 \frac{1}{4}$ BS46
Max. Torque 34 daNm [3010 lb-in]



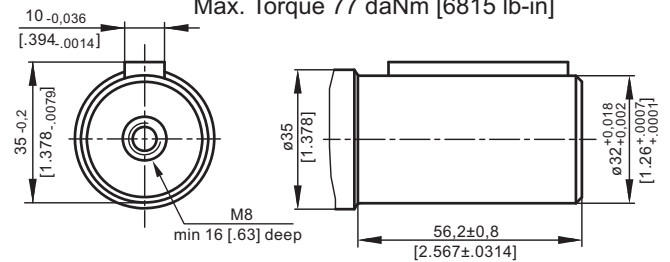
SH - splined, BS 2059 (SAE 6B)
Max. Torque 40 daNm [3540 lb-in]



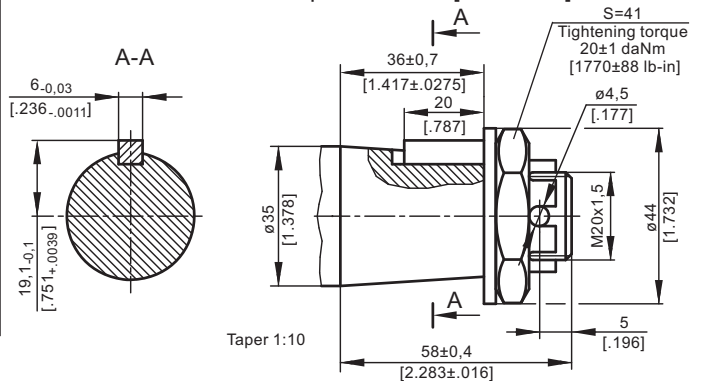
SA - splined, B25x22h9 DIN 5482
Max. Torque 40 daNm [3540 lb-in]



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

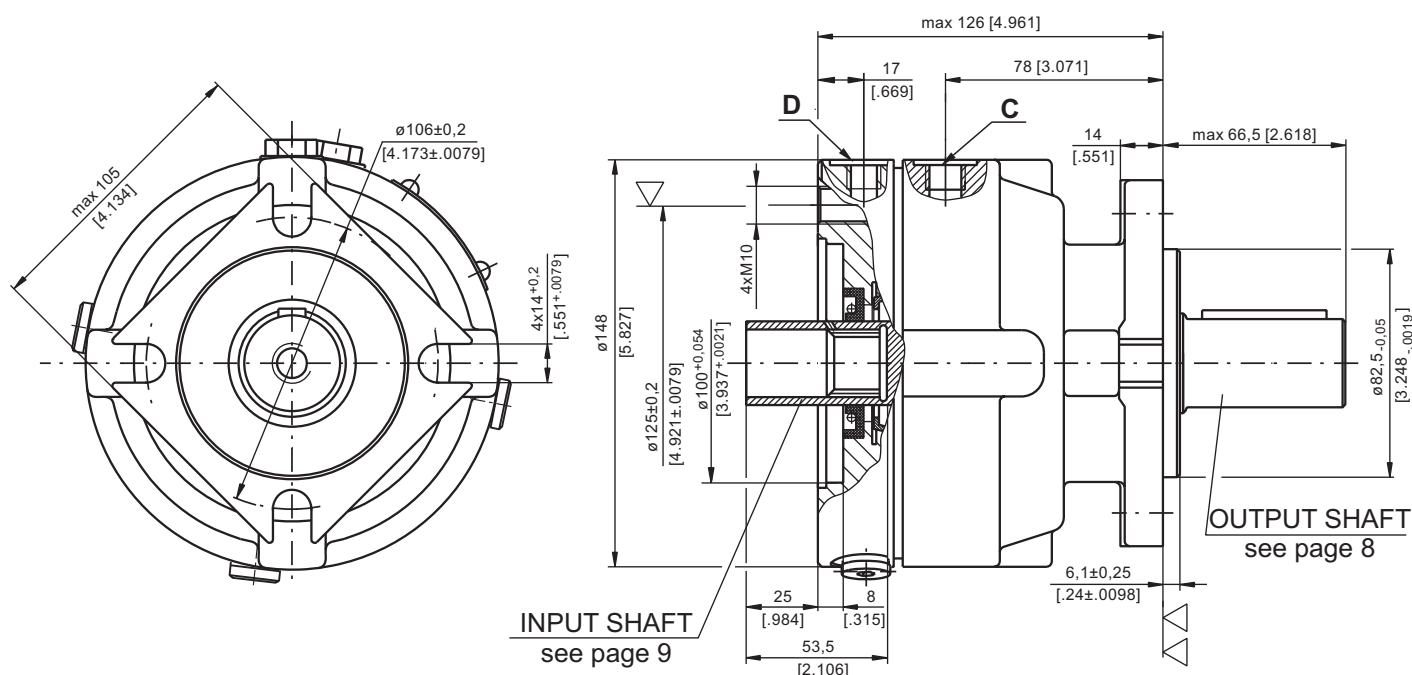


KB - tapered 1:10, Parallel key B6x6x20 DIN 6885
Max. Torque 95 daNm [8400 lb-in]



HYDRAULIC DISC BRAKE FOR FLANGE ATTACHMENT TO MSS AND MSV HYDRAULIC MOTORS

TYPE LBS/289



▽ - Place for attachment:

LBS - tightening torque for screw M10x35 - 8.8 DIN 912 - 5 daNm [440 lb-in]

LBV - tightening torque for screw M10xL - 12.9 DIN 931 - 6⁺¹ daNm [530⁺⁹⁰ lb-in]

▽▽ - Place for attachment



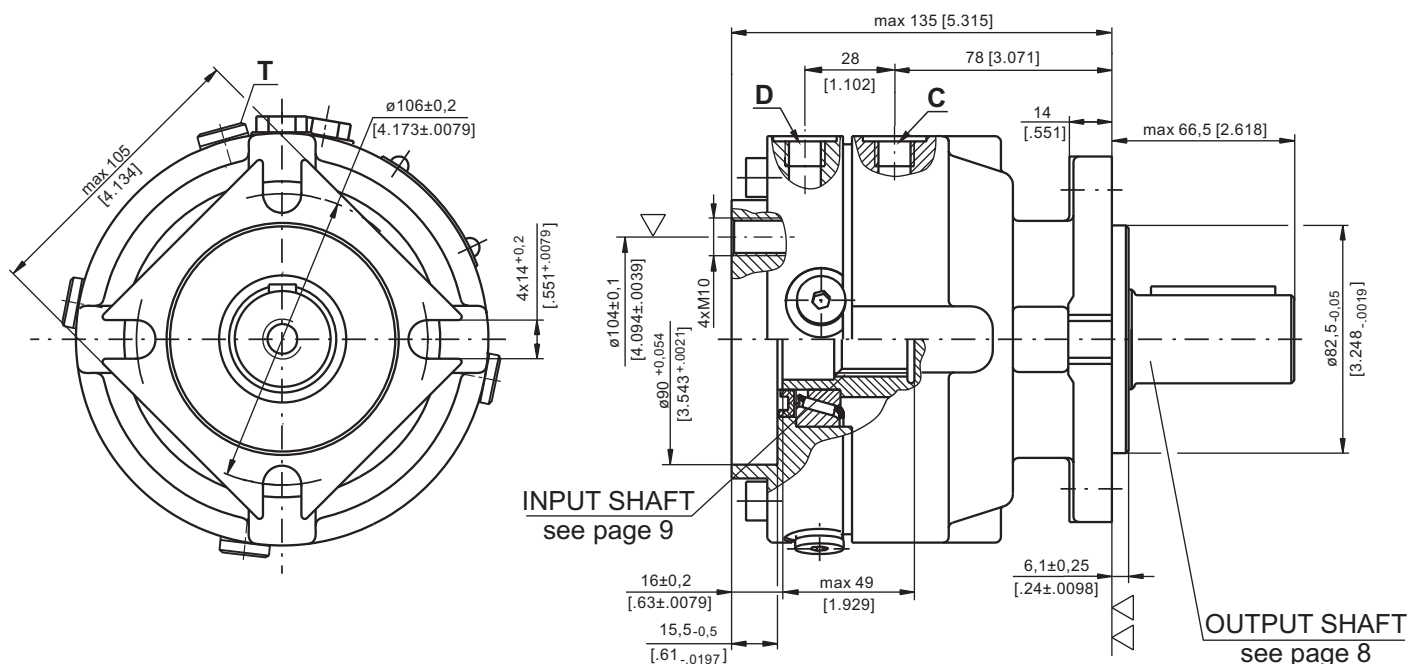
mm [in]

C: Brake release Port - G $\frac{1}{4}$, 9 mm [0.35 in] depth

D: Drain plug for the Brake - G $\frac{1}{4}$, 9 mm [0.35 in] depth

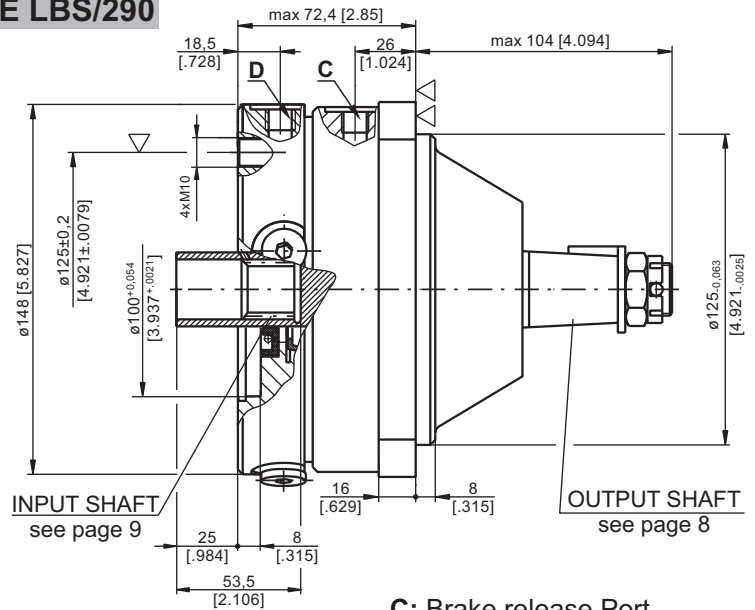
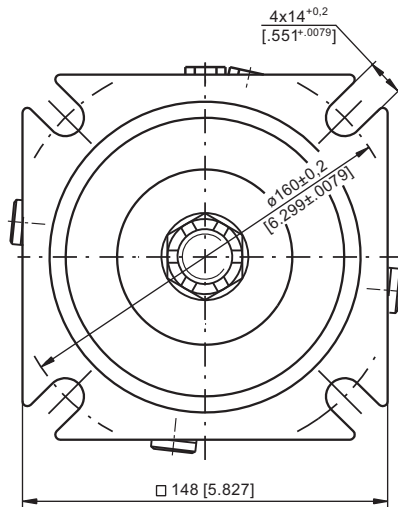
T: Drain plug for the Motor - G $\frac{1}{4}$, 9 mm [0.35 in] depth

TYPE LBV/289



HYDRAULIC DISC BRAKE FOR FLANGE ATTACHMENT TO MSS AND MSV HYDRAULIC MOTORS

TYPE LBS/290



▽ - Place for attachment:

LBS - tightening torque for screw M10x35 - 8.8 DIN 912 - 5 daNm [440 lb-in]

LBV - tightening torque for screw M10xL - 12.9 DIN 931 - 6⁺ daNm [530⁹⁰ lb-in]

▽▽ - Place for attachment

C: Brake release Port

- G¹/₄, 9 mm [.35 in] depth

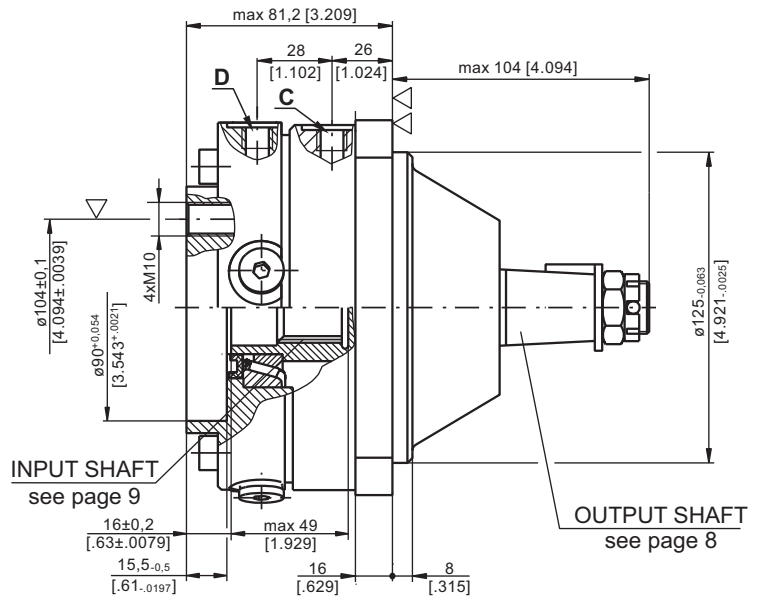
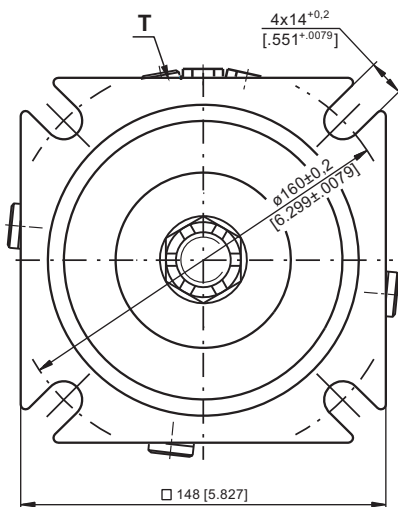
D: Drain plug for the Brake

- G¹/₄, 9 mm [.35 in] depth

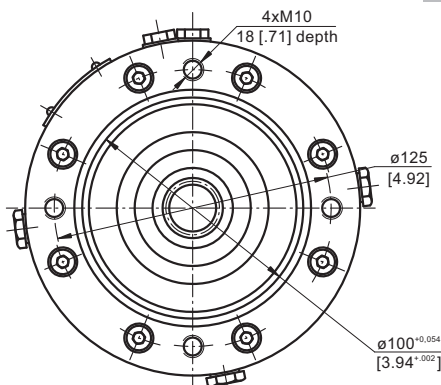
T: Drain plug for the Motor

- G¹/₄, 9 mm [.35 in] depth

TYPE LBV/290

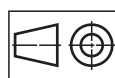
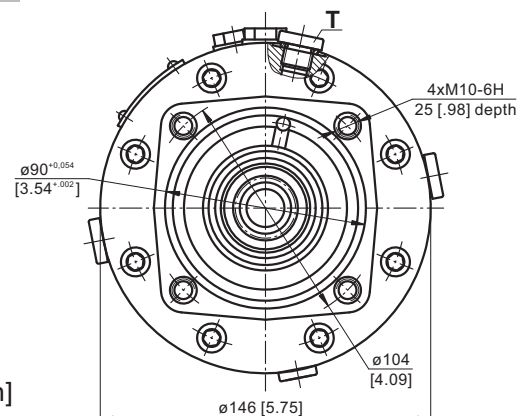


TYPE LBS/289(290)



INPUT FACE For Versions 289 and 290

TYPE LBV/289(290)

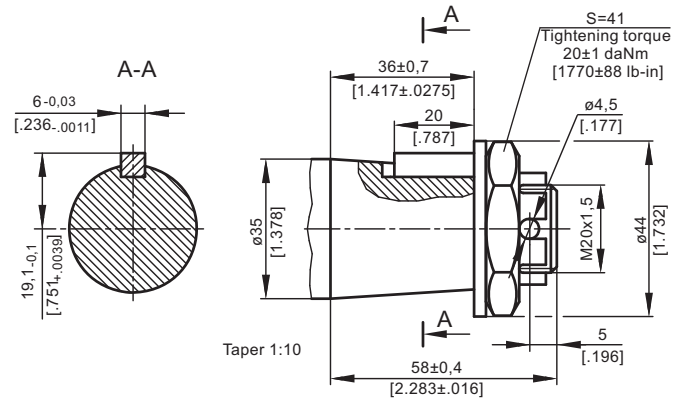
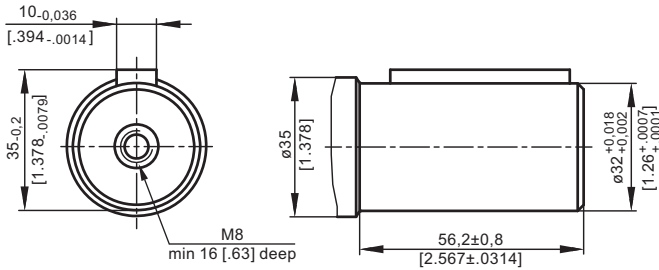


mm [in]

OUTPUT SHAFT EXTENSIONS

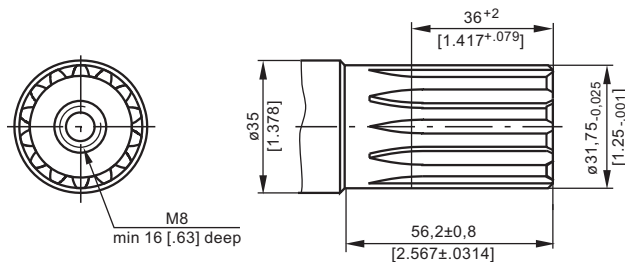
CB - $\varnothing 32$ straight, Parallel key A10x8x45 DIN 6885
Max. Torque 77 daNm [6815 lb-in]

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



SPECIFICATION DATA

SH - $\varnothing 1\frac{1}{4}$ " splined 14T, DP12/24 ANS B92.1-1970
Max. Torque 95 daNm [8400 lb-in]



Description LBS/289(290) LBV/289(290)	21	32	43	63
*Min. Static Torque, daNm [lb-in]	20-22 [1770-1947]	31-34 [2743-3009]	41-45 [3628-3982]	61-64 [5399-5665]
Opening Pressure, bar [PSI]	min 12-13 [174-188] max 300 [4350]	18-20 [260-290]	24-26 [348-377]	38-39 [550-565]
Min. oil quantity for brake releasing cm ³ [in ³]	7 - 8 [.427 - .488]			
Oil volume cm ³ [in ³]	50 - 120 [3.05 - 7.35]			
Max. Pressure in drain space bar [PSI]	5 [72]			
Weight kg [lb]	9 [19.8]			

*Static torque is obtained at working pressure - 0 bar [0 PSI].

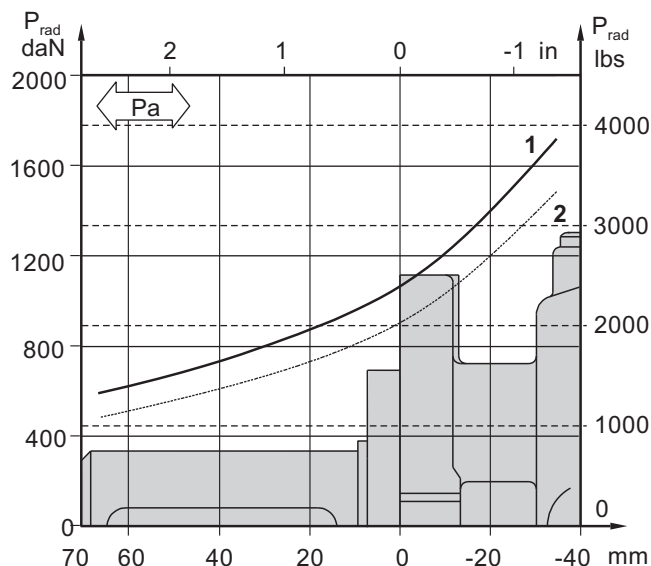
LOAD CURVE

The curve applies to a B10 bearing life of 3000 hours at 200 RPM.

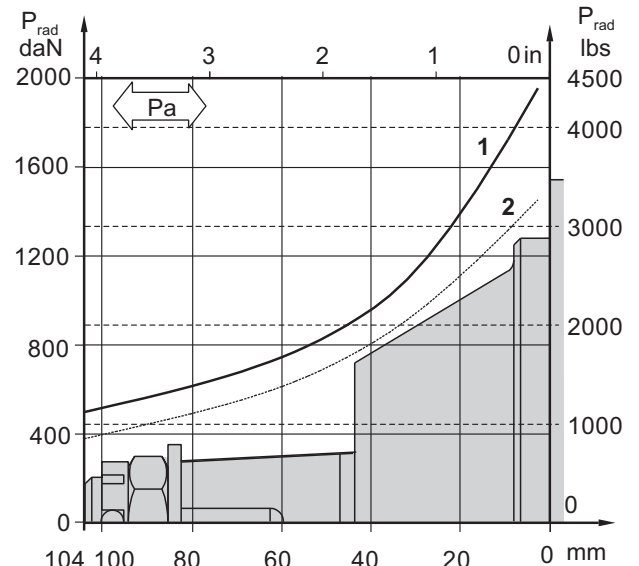
1: Pa<350 daN [787 lbs]

2: Pa=500 daN [1125 lbs]

LBS(V)/289



LBS(V)/290

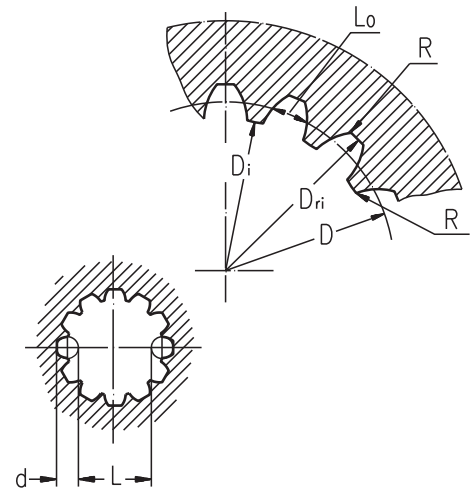


INTERNAL SPLINE DATA FOR THE ATTACHED COMPONENT

Standard *ANS B92.1-1970, class 5*

[*m=2.1166*]

Fillet Root Side Fit		LBS(V)/289 LBS(V)/290		LBS(V)/314 LBS(V)/315	
		mm	inch	mm	inch
Number of Teeth	z	12	12	16	16
Diametral Pitch	DP	12/24	12/24	12/24	12/24
Pressure Angle		30°	30°	30°	30°
Pitch Dia.	D	25,4	1	33,8656	1.3333
Major Dia.	D _{ri}	28,0 ^{-0,1}	1.1 ÷ 1.098	38,4 ^{+0,4}	1.5118÷1.5275
Minor Dia.	D _i	23,0 ^{+0,033}	.907 ÷ .905	32,15 ^{+0,06}	1.2657÷1.2673
Space Width [Circular]Lo		4,308±0,020	.1704 ÷ .1688	4,516±0,037	.1763÷.1791
Fillet Radius	R	0,2	.008	0,5	.02
Max. Measurement between Pins	L	17,62 ^{+0,15}	.699 ÷ .694	26,9 ^{+0,10}	1.063÷1.059
Pin Dia.	d	4,835±0,001	.19039÷.19031	4,835±0,001	.19026÷.19034
Corrected	x.m	+0,8	+.031	+1,0	+.039


ORDER CODE - LB/288

1	2	3	4	5
LB/288	-			

Pos.1 - Input Shaft Hole

C, CO, SH, CB, SB

Pos.2 - Static Torque code (See Specification data)

7, 14, 21, 32, 43, 63

Pos.3 - Output Shaft Extensions*

- C** - ø25 straight, Parallel key A8x7x32 DIN 6885
- CO** - ø1" straight, Parallel key ¼"x¼"x1¼" BS46
- SH** - ø25,32 splined BS 2059 (SAE 6B)
- SA** - ø24,5 splined B25x22 DIN 5482

CB - ø32 straight, Parallel key A10x8x45 DIN 6885

KB - ø35 tapered 1:10, Parallel key B6x6x20 DIN6885

Pos.4 - Option (Paint)**

omit - no Paint

P - Painted

PC - Corrosion Protected Paint

Pos.5 - Design Series

omit - Factory specified

ORDER CODE - LBS, LBV

1	2	3	4	5	6
LB	/	-			

Pos.1 - Type

- S** - Disc Brake for short motor S- MSS
- V** - Disc Brake for very short motor V- MSV

Pos.2 - Design code

- 289** - for MSS and MSV Motors
- 290** - for MSS and MSV Motors (Wheel Mount)

Pos.3 - Static Torque code (See Specification data)

21, 32, 43, 63

Pos.4 - Output Shaft Extensions*

- CB** - ø32 straight, Parallel key A10x8x45 DIN 6885
- KB** - ø35 tapered 1:10, Parallel key B6x6x20 DIN6885
- SH** - ø1¼" splined 14T ANS B92.1-1970

Pos.5 - Option (Paint)**

omit - no Paint

P - Painted

PC - Corrosion Protected Paint

Pos.6 - Design Series

omit - Factory specified

NOTES:

- * The permissible output torque for shafts must not be exceeded! For Max. Torque values see data on page 5 and 8.
- ** The color is by customer's request.

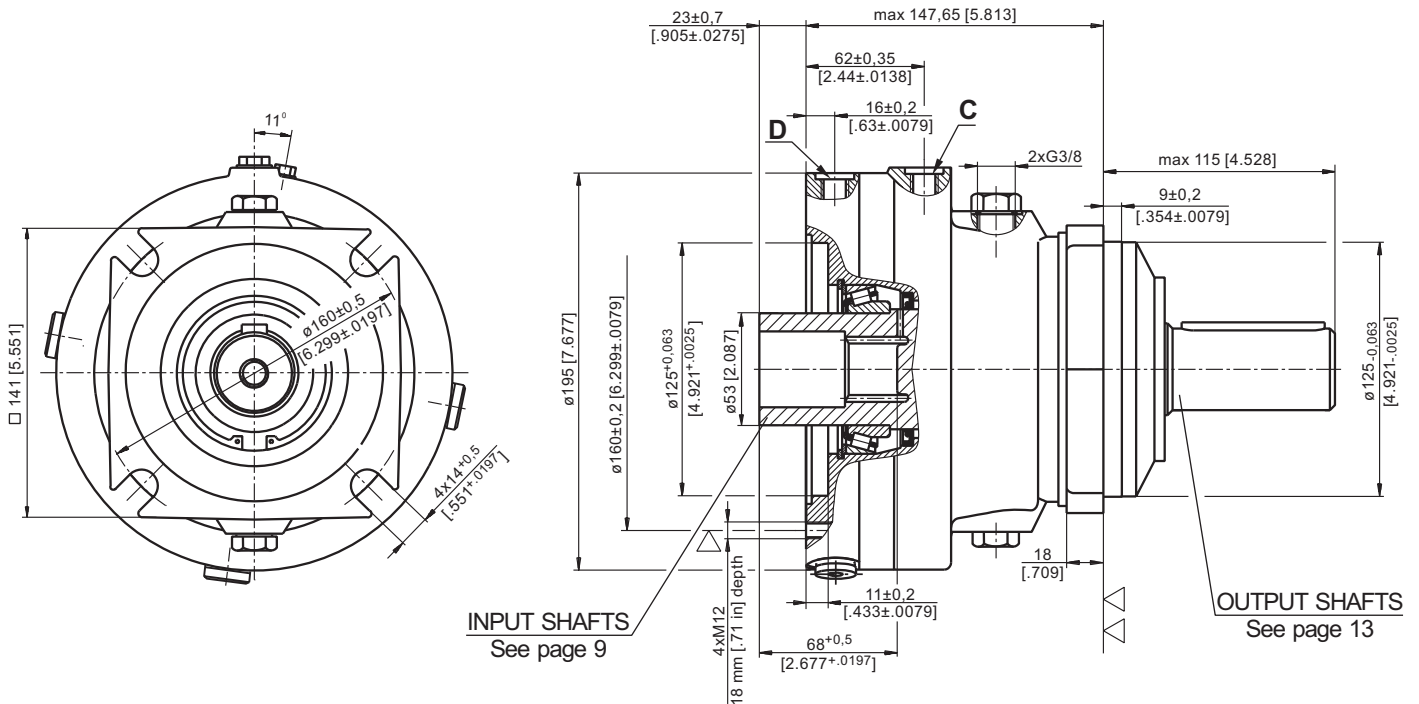
The Disc Brakes are mangano-phosphatized as standard.

ATTENTION:

1. Hydraulic brake is delivered without oil (it is lubricated only).
2. Hydraulic brake is filled through the drain port **D**. Space is filled with 50 ÷ 120 cm³ [3.05÷7.32 in³] mineral oil HLP (DIN 51524) or HM (ISO 6743/4). For LB/288 fill oil after hydraulic motor assembly.
3. In all brakes, friction discs and separators should be lubricated.

HYDRAULIC DISC BRAKES FOR FLANGE ATTACHMENT TO MTS AND MTV HYDRAULIC MOTORS

TYPE LBS/314

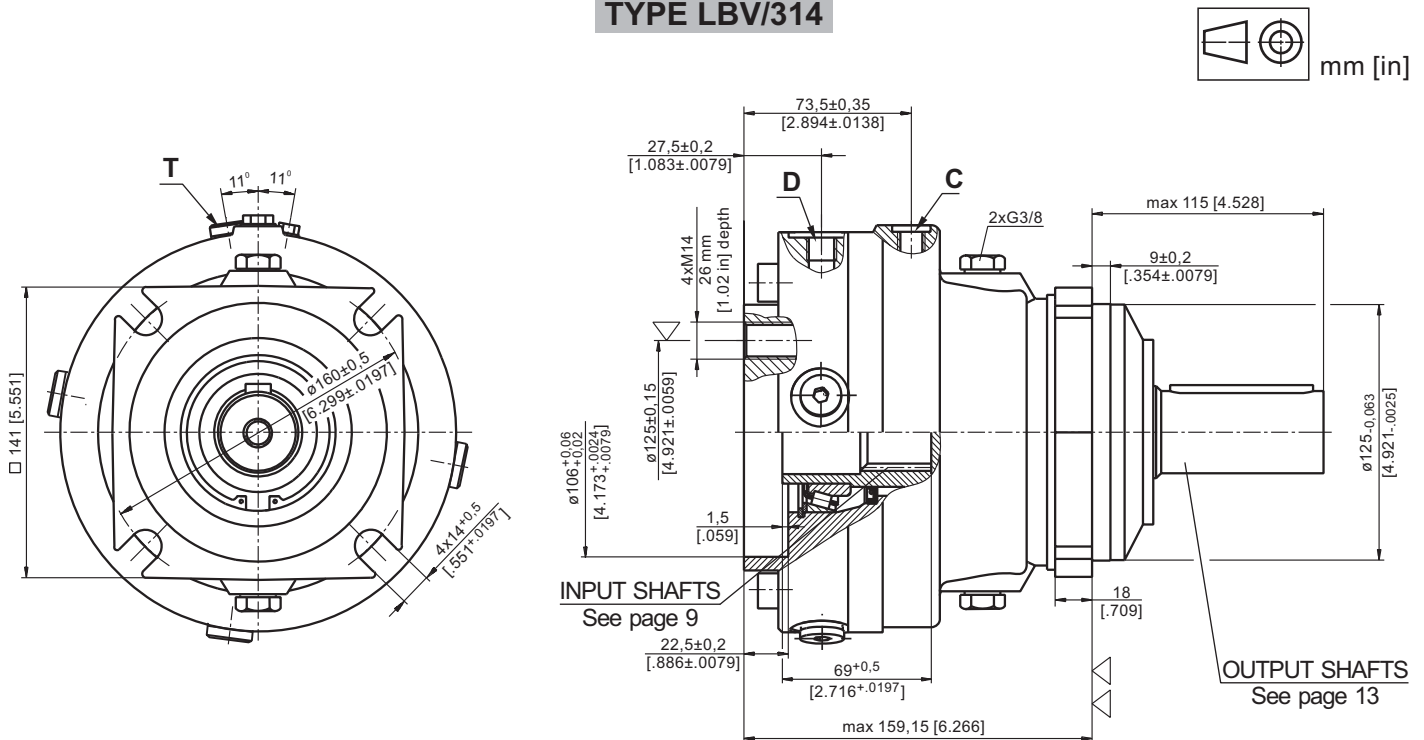


▽ - Place for attachment
(tightening torque for screw M12x30- 8.8 DIN 912,
7 daNm [620 lb-in])

▽▽ - Place for attachment

C: Brake release Port - G $\frac{1}{4}$, 12 mm [.47 in] depth
D: Drainage tap - G $\frac{1}{4}$, 12 mm [.47 in] depth

TYPE LBV/314



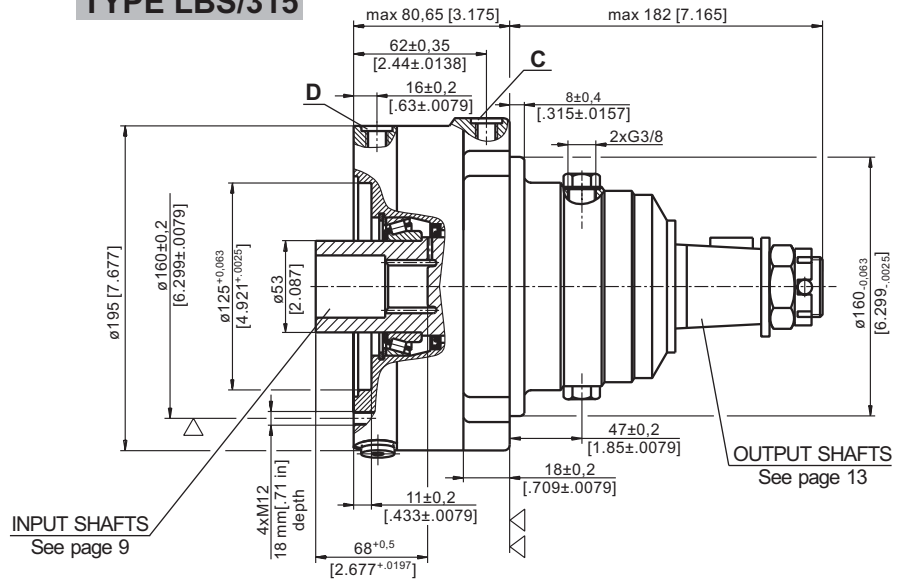
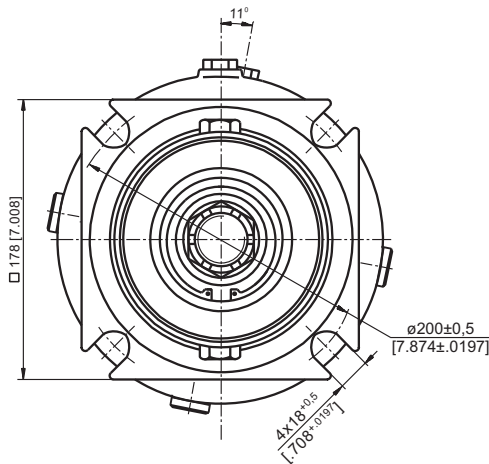
▽ - Place for attachment
(tightening torque for screw M14xL - 8.8 DIN 912,
11,5 daNm [1020 lb-in])

▽▽ - Place for attachment

C: Brake release Port - G $\frac{1}{4}$, 9 mm [.35 in] depth
D: Drain plug for the Brake - G $\frac{1}{4}$, 9 mm [.35 in] depth
T: Drain plug for the Motor - G $\frac{1}{4}$, 9 mm [.35 in] depth

HYDRAULIC DISC BRAKES FOR FLANGE ATTACHMENT TO MTS AND MTV HYDRAULIC MOTORS

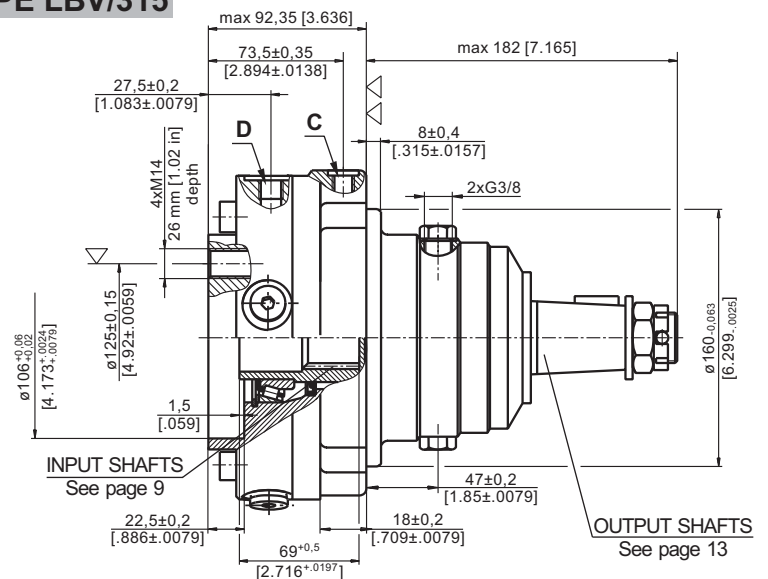
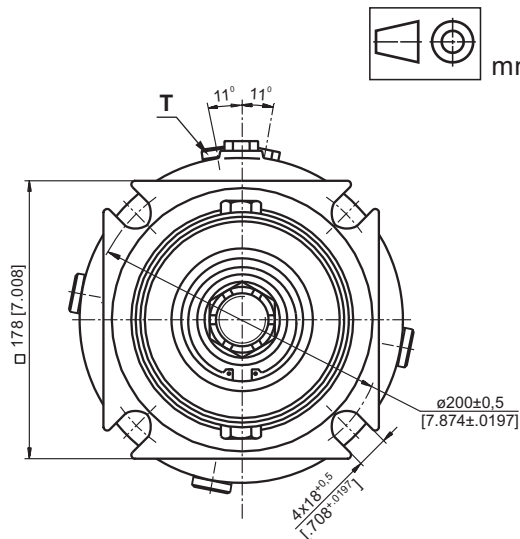
TYPE LBS/315



- ▽ - Place for attachment (tightening torque for screw M12x30- 8.8 DIN 912, 7 daNm [620 lb-in])
▽▽ - Place for attachment

- C:** Brake release Port - G $\frac{1}{4}$, 12 mm [.47 in] depth
D: Drainage tap - G $\frac{1}{4}$, 12 mm [.47 in] depth

TYPE LBV/315

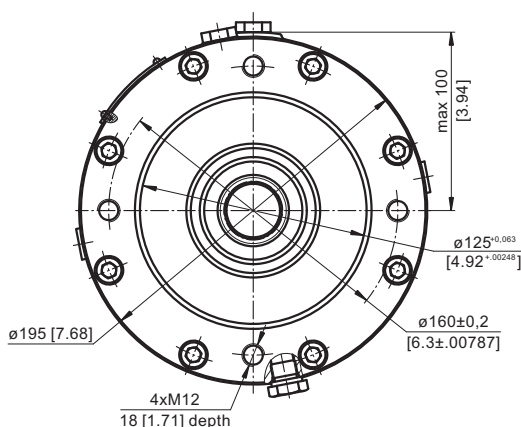


- ▽ - Place for attachment (tightening torque for screw M14xL - 8.8 DIN 912, 11,5 daNm [1020 lb-in])
▽▽ - Place for attachment

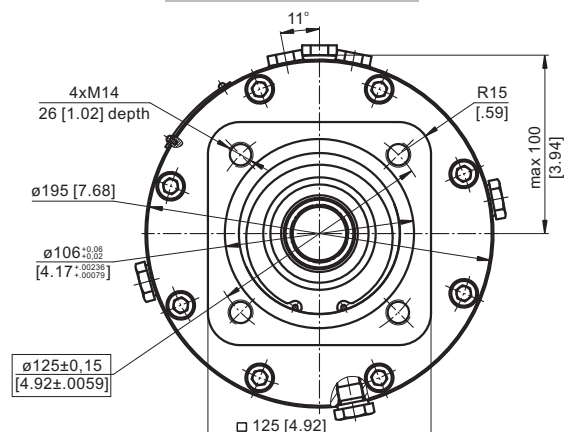
- C:** Brake release Port - G $\frac{1}{4}$, 9 mm [.35 in] depth
D: Drain plug for the Brake - G $\frac{1}{4}$, 9 mm [.35 in] depth
T: Drain plug for the Motor - G $\frac{1}{4}$, 9 mm [.35 in] depth

INPUT FACE For Versions 314 and 315

TYPE LBS/314(315)



TYPE LBV/314(315)



SPECIFICATION DATA

Description LBS/314,315	21	29	43	65	85	110	130
*Min. Static Torque, daNm [lb-in]	18-23 [1593-2036]	28-33 [2478-2921]	42-46 [3717-4071]	61-70 [5399-6196]	83-92 [7346-8143]	108-118 [9559-10444]	126-136 [11152-12037]
Opening Pressure min** bar [PSI]	4-5 [58-72]	6-7 [87-101]	9-10 [130-145]	13-15 [188-217]	18-20 [261-290]	23-25 [333-362]	27-29 [391-420]
	max 300 [4350]						
Min. oil quantity for brake releasing cm ³ [in ³]	8-9 [.488-.549]						
Oil volume cm ³ [in ³]	250						
Max. Pressure in drain space bar [PSI]	5 [72]						
Weight for .../314 kg [lb]	24 [52.9]						
	.../315 25 [55.1]						

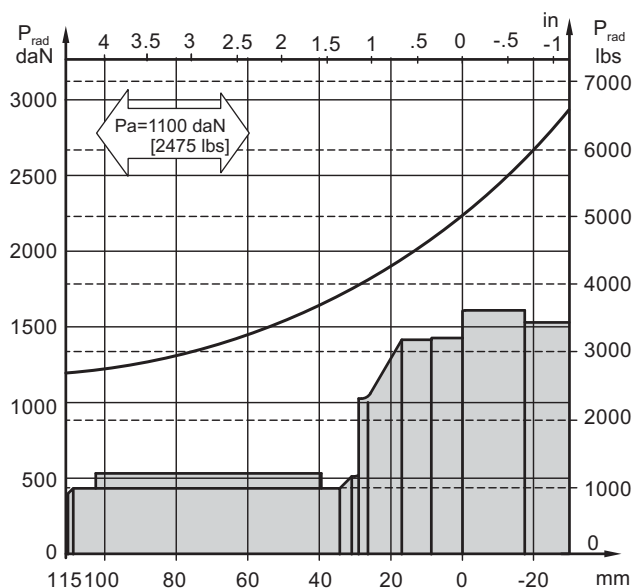
*Static torque is obtained at working pressure - 0 bar.

**The indicated value is a difference between the inlet pressure for driving of the brake and the drain pressure.

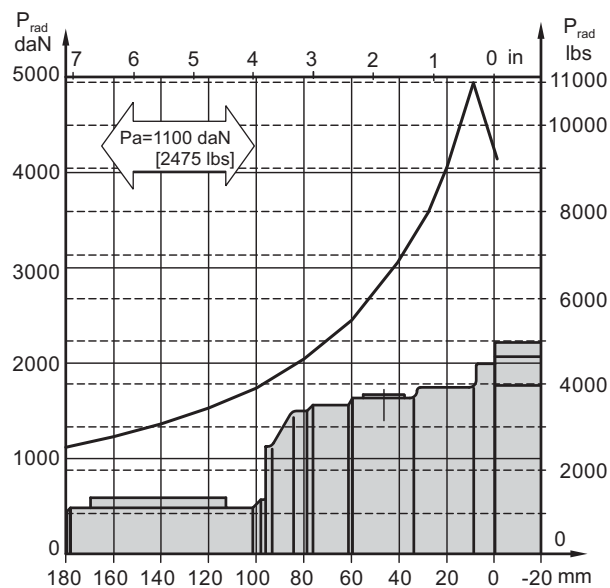
Brakes must always have a drain line

LOAD CURVE

LBS(V) ... /314

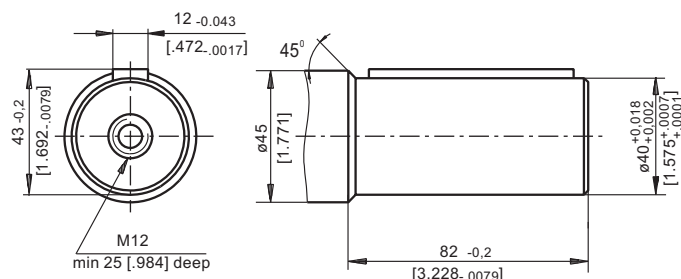


LBS(V) ... /315

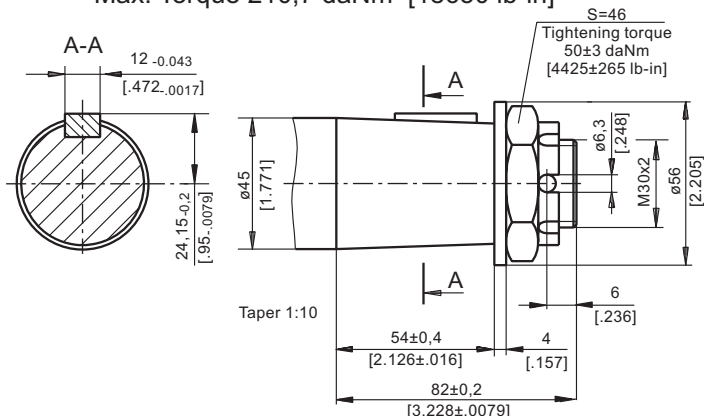


OUTPUT SHAFT EXTENSIONS

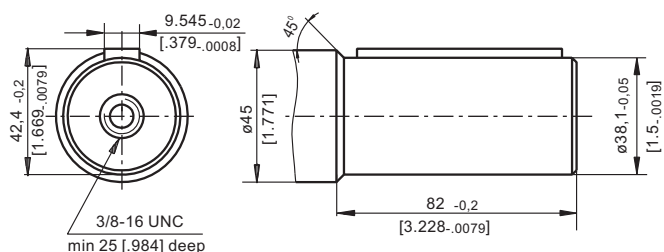
C - $\varnothing 40$ straight, Parallel key A12x8x70 DIN 6885
Max. Torque 132,8 daNm [11755 In-in]



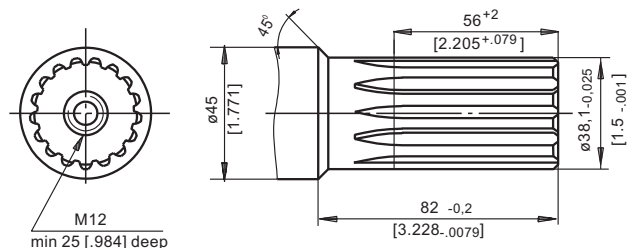
K -tapered 1:10, Parallel key B12x8x28 DIN 6885
Max. Torque 210,7 daNm [18650 lb-in]



CO - $\varnothing 1\frac{1}{2}$ " straight, Parallel key $\frac{3}{8}$ "x $\frac{3}{8}$ "x $2\frac{1}{4}$ " BS46
Max. Torque 132,8 daNm [11755 In-in]



SH - $\varnothing 1\frac{1}{2}$ " splined 17T, DP 12/24 ANSI B92.1-1976
Max. Torque 132,8 daNm [11755 In-in]



ORDER CODE

1	2	3	4	5	6
LB	/	-			

Pos.1 - Type

- S** - Disc Brake for short motor **S** - MTS
V - Disc Brake for very short motor **V** - MTV

Pos.2 - Design code

- 314** - for MTS and MTV Motors
315 - for MTS and MTV Motors (Wheel Mount)

Pos.3 - Static Torque code (See Specification data)

21, 29, 43, 65, 85, 110, 130

Pos.4 - Output Shaft Extensions*

- C** - $\varnothing 40$ straight, Parallel key A12x8x70 DIN 6885
CO - $\varnothing 1\frac{1}{2}$ " straight, Parallel key $\frac{3}{8}$ "x $\frac{3}{8}$ "x $2\frac{1}{4}$ " BS46
SH - $\varnothing 1\frac{1}{2}$ " splined 17T, ANSI B92.1-1976
K - $\varnothing 45$ tapered 1:10, Parallel key B12x8x28 DIN6885

Pos.5 - Option (Paint)**

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

Pos.6 - Design Series

- omit - Factory specified

NOTES:

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

** The color is by customer's request.

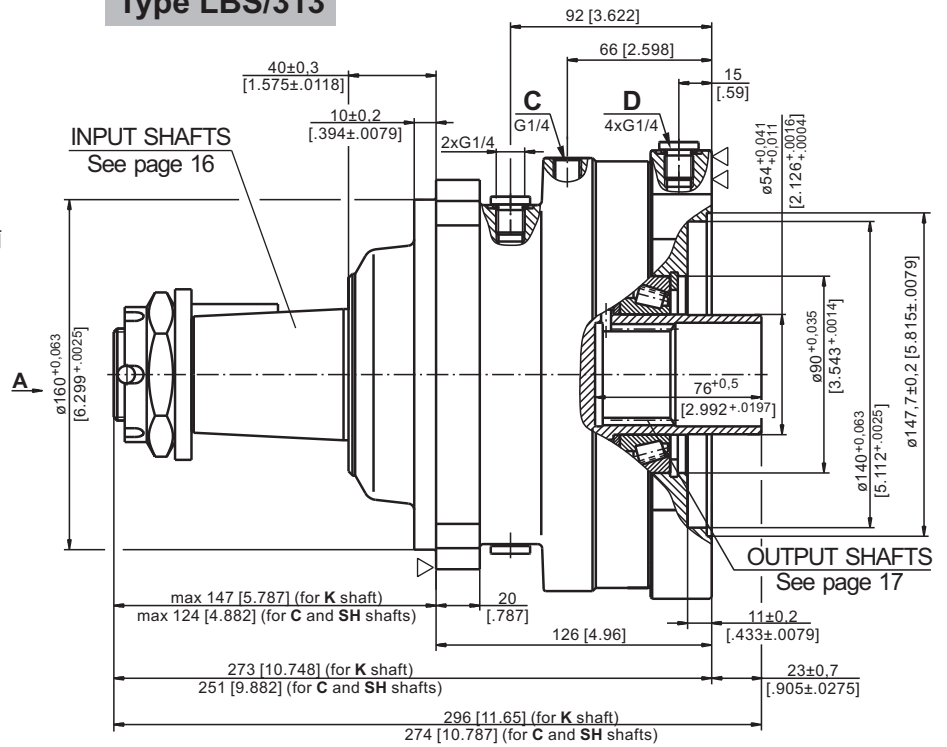
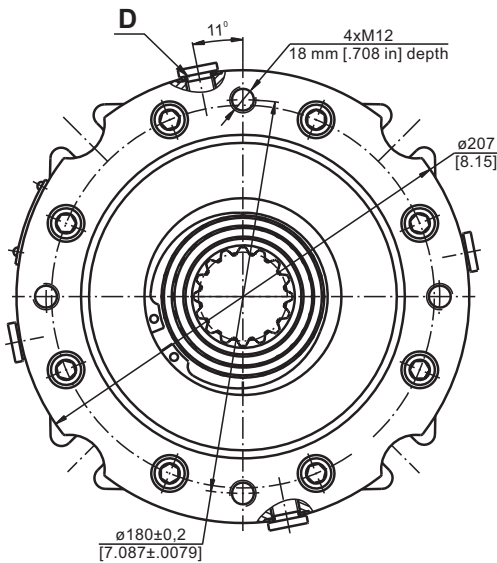
The Disc Brakes are mangano-phosphatized as standard.

ATTENTION:

- Hydraulic brake is delivered without oil (it is lubricated only).
- Fill the brake through the drain port **D** with $50 \div 120 \text{ cm}^3$ [3.05÷7.32 in³] mineral oil HLP (DIN 51524) or HM (ISO 6743/4). LB/288 must be filled after the motor is assembled on the brake.
- In all brakes, friction discs and separators should be lubricated.

HYDRAULIC DISC BRAKES FOR FLANGE ATTACHMENT TO MVS HYDRAULIC MOTORS

Type LBS/313

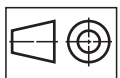


C: Brake release Port - G $\frac{1}{4}$, 12 mm [.47 in] depth

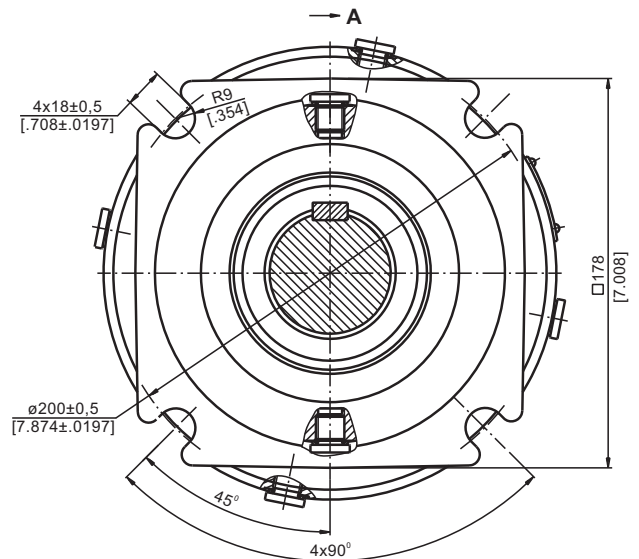
D: Drainage tap - G $\frac{1}{4}$, 12 mm [.47 in] depth

▽ - Place for attachment

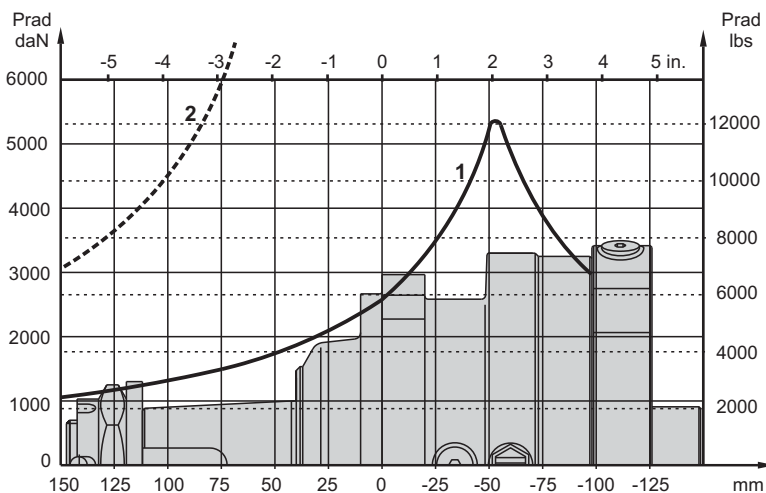
▽▽ - Place for attachment
(tightening torque for screw M12x35 - 8.8 DIN 912,
7 daNm [620 lb-in])



mm [in]



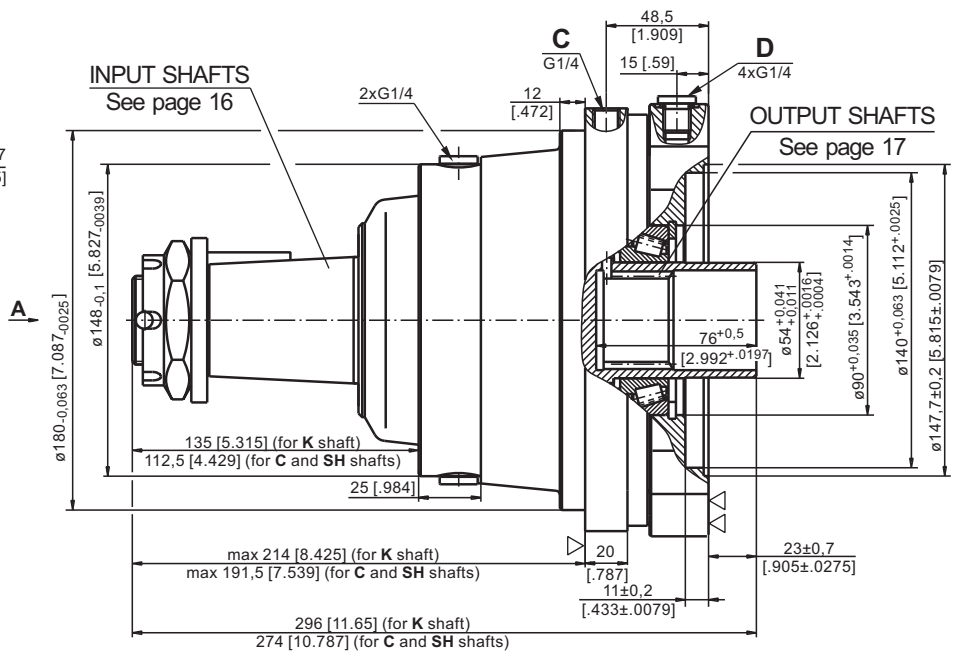
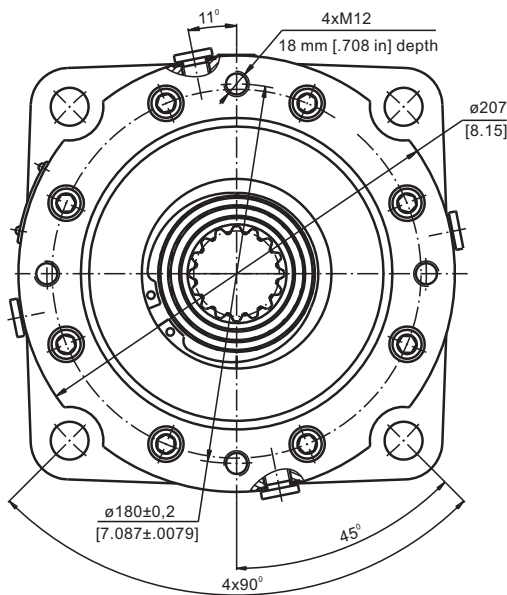
PERMISSIBLE SHAFT LOADS



- 1 - Bearing curve: The curve applies to a B10 bearing life of 3000 hours at 200 RPM.
- 2 - Shaft curve: The curve represents Max. permissible radial shaft load with safety factor 3:1.

HYDRAULIC DISC BRAKES FOR FLANGE ATTACHMENT TO MVS HYDRAULIC MOTORS

Type LBS/316

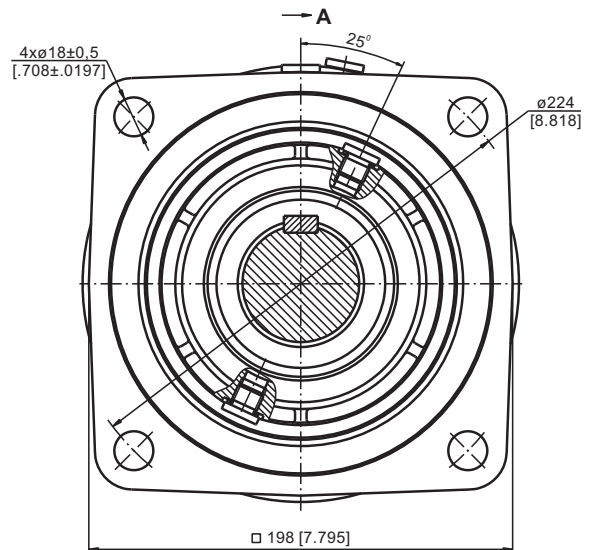


C: Brake release Port - G $\frac{1}{4}$, 12 mm [.47 in] depth

D: Drainage tap - G $\frac{1}{4}$, 12 mm [.47 in] depth

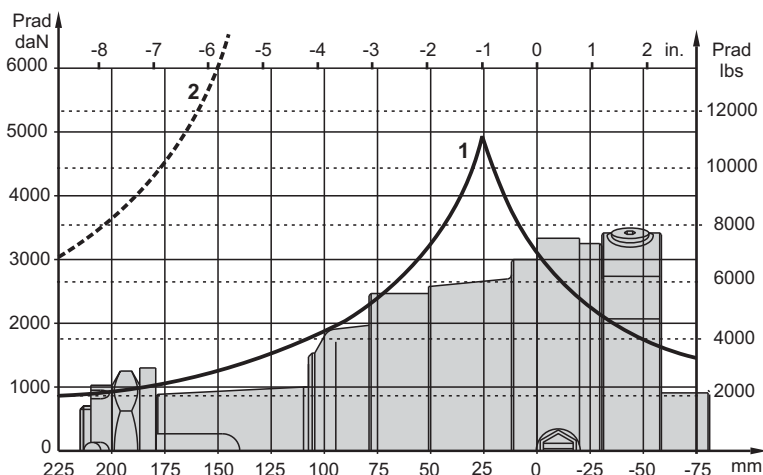
▽- Place for attachment

▽▽- Place for attachment
(tightening torque for screw M12x35 - 8.8 DIN 912,
7 daNm [620 lb-in])



mm [in]

PERMISSIBLE SHAFT LOADS



1 - Bearing curve: The curve applies to a B10 bearing life of 3000 hours at 200 RPM.

2 - Shaft curve: The curve represents Max. permissible radial shaft load with safety factor 3:1.

SPECIFICATION DATA

Description LBS/313,316	21	29	43	65	85	110	130
*Min. Static Torque, daNm [lb-in]	18-23 [1593-2036]	28-33 [2478-2921]	42-47 [3717-4160]	61-71 [5399-6285]	83-94 [7346-8320]	108-118 [9559-10444]	127-137 [11240-12125]
Opening Pressure min** bar [PSI]	4-5 [58-72]	6-7 [87-101]	9-10 [130-145]	13-15 [188-217]	18-20 [261-290]	23-25 [333-362]	27-29 [391-420]
max	300 [4350]						
Min. oil quantity for brake releasing cm ³ [in ³]	8 ÷ 9 [.488 ÷ .549]						
Oil volume cm ³ [in ³]	250 [15.25]						
Max. Pressure in drain space bar [PSI]	5 [72]						
Weight for .../313 kg [lb]	25 [55.1]						
.../316	26 [57.3]						

*Static torque is obtained at working pressure - 0 bar.

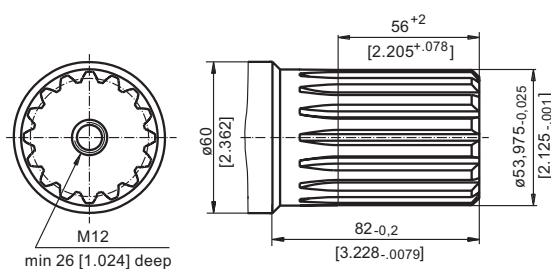
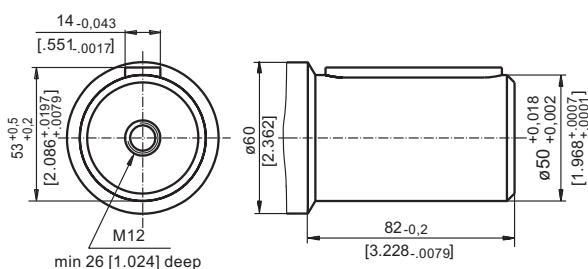
**The indicated value is a difference between the inlet pressure for driving of the brake and the drain pressure.

Brakes must always have a drain line

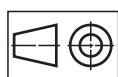
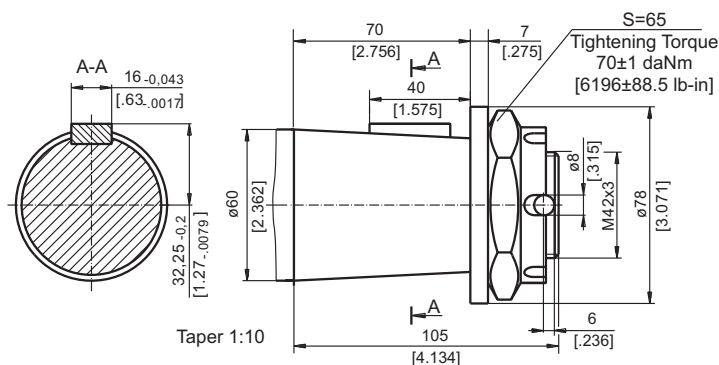
SHAFT EXTENSIONS

C - ø50 straight, Parallel key A14x9x70 DIN 6885

SH - ø2 1/8" splined, 16 DP 8/16 ANS B92.1-1976



K -tapered 1:10, Parallel key B16x10x32 DIN 6885

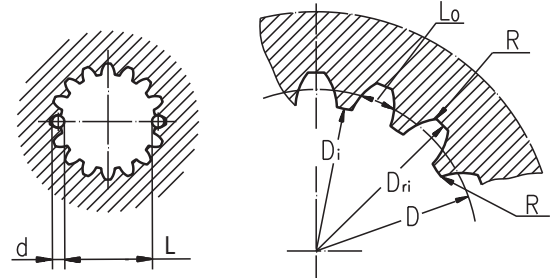


mm [in]

INTERNAL SPLINE DATA FOR THE ATTACHED COMPONENT

Standard *ANS B92.1-1970, class 5*
[m=2.54; corrected x.m=+1,0]

Fillet Root Side Fit		mm	inch
Number of Teeth	z	16	16
Diametral Pitch	DP	10/20	10/20
Pressure Angle		30°	30°
Pitch Dia.	D	40,640	1.6
Major Dia.	D _{ri}	45,2 ^{+0,4}	1.796÷1.780
Minor Dia.	D _i	38,5 ^{+0,039}	1.5175÷1.516
Space Width [Circular]	Lo	5,18±0,037	.2055÷.2025
Fillet Radius	R	0,4	.015
Max. Measurement between Pins	L	32,47 ^{+0,15}	1.284÷1.278
Pin Dia.	d	5,6±0,001	.22051÷.22043



Hardening Specification:
 HV=750±50 on the surface.
 HV=560 at 0,7±0,2 mm [.035±.019in] case depth
 Material: 20 MoCr4 EN 10084 or better.

ORDER CODE

	1		2	3	4	5
LBS/		-				

Pos.1 - Designe code

313 - for MVS Motors

316 - for MVS Motors (Wheel mount)

Pos.2 - Static Torque code (See Specification data)

21, 29, 43, 65, 85, 110, 130

Pos.3 - Output Shaft Extensions*

C - ø50 straight, Parallel key A14x9x70 DIN6885

SH - ø2 1/8" splined, ANSI B92.1-1976

K - ø60 tapered 1:10, Parallel key B16x10x32 DIN6885

Pos.4 - Option (Paint)**

omit - no Paint

P - Painted

PC - Corrosion Protected Paint

Pos.5 - Design Series

omit - Factory specified

NOTES:

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

** The color is by customer's request.

The Disc Brakes are mangano-phosphatized as standard.

ATTENTION:

1. Hydraulic brake is delivered without oil (it is lubricated only).

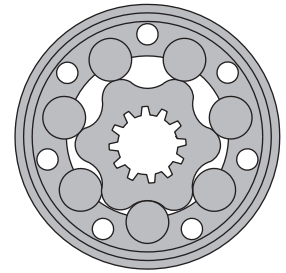
2. In all brakes, friction discs and separators should be lubricated. Space is filled with 150 ÷ 300 cm³ [9.15 ÷ 18.3 in³] mineral oil HLP (DIN 51524) or HM (ISO 6743/4).

HYDRAULIC MOTORS MH



APPLICATION

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



CONTENTS

Specification data	94
Function diagrams	95÷97
Permissible shaft loads	97
Dimensions and mounting	98
Permissible shaft seal pressure.....	99
Tacho connection.....	100
Shaft extensions	100
Order code	101

OPTIONS

- » Model - Spool valve, roll-gerotor
- » Flange mount
- » Shafts - straight, splined and tapered
- » Metric and BSPP ports
- » Other special features

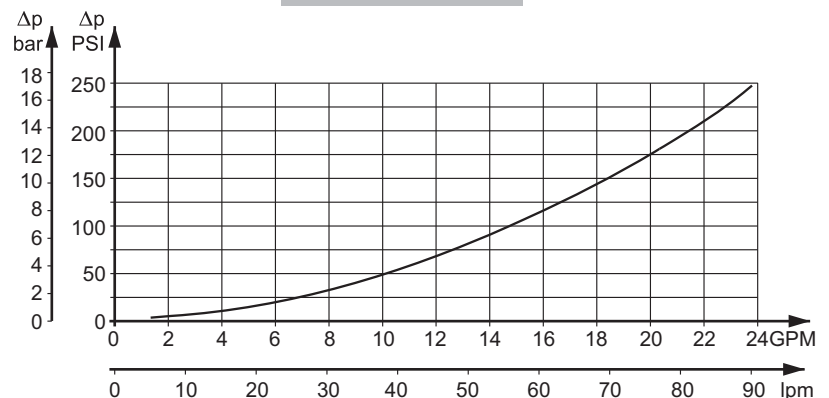
GENERAL

Max. Displacement, cm ³ /rev [in ³ /rev]	502,4 [30.7]
Max. Speed, [RPM]	445
Max. Torque, daNm [lb-in]	cont.: 84 [7434] int.: 104 [9204]
Max. Output, kW [HP]	18,5 [24.8]
Max. Pressure Drop, bar [PSI]	cont.: 175 [2540] int.: 200 [2900]
Max. Oil Flow, lpm [GPM]	90 [23.78]
Min. Speed, [RPM]	5
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

Type		MH 200	MH 250	MH 315	MH 400	MH 500
Displacement, cm ³ /rev [in ³ /rev]		201,3 [12.3]	252 [15.4]	314,9 [19.2]	396,8 [24.2]	502,4 [30.7]
Max. Speed,	Cont.	370	295	235	185	150
[RPM]	Int.*	445	350	285	225	180
Max. Torque	Cont.	51 [4510]	61 [5398]	74 [6548]	84 [7434]	82 [7257]
daNm [lb-in]	Int.*	58 [5130]	70 [6195]	82 [7257]	98 [8673]	104 [9204]
	Peak**	64 [5064]	79 [6992]	98 [8673]	109 [9647]	117 [10350]
Max. Output	Cont.	16 [21]	16 [21]	14 [18.7]	12,5 [16.7]	11 [14.7]
kW [HP]	Int.*	18,5 [24.8]	18,5 [24.8]	15,5 [20.7]	15 [20.1]	14 [18.7]
Max. Pressure	Cont.	175 [2540]	175 [2540]	175 [2540]	155 [2240]	125 [1810]
Drop	Int.*	200 [2900]	200 [2900]	200 [2900]	190 [2750]	160 [2320]
bar [PSI]	Peak**	225 [3260]	225 [3260]	225 [3260]	210 [3045]	180 [2610]
Max. Oil Flow	Cont.	75 [19.81]	75 [19.81]	75 [19.81]	75 [19.81]	75 [19.81]
lpm [GPM]	Int.*	90 [23.78]	90 [23.78]	90 [23.78]	90 [23.78]	90 [23.78]
Max. Inlet Pressure	Cont.	200 [2900]	200 [2900]	200 [2900]	200 [2900]	200 [2900]
bar [PSI]	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,	At max.press.dropCont	39 [3450]	52 [4600]	66 [5840]	72 [6370]	72 [6370]
daNm [lb-in]	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.

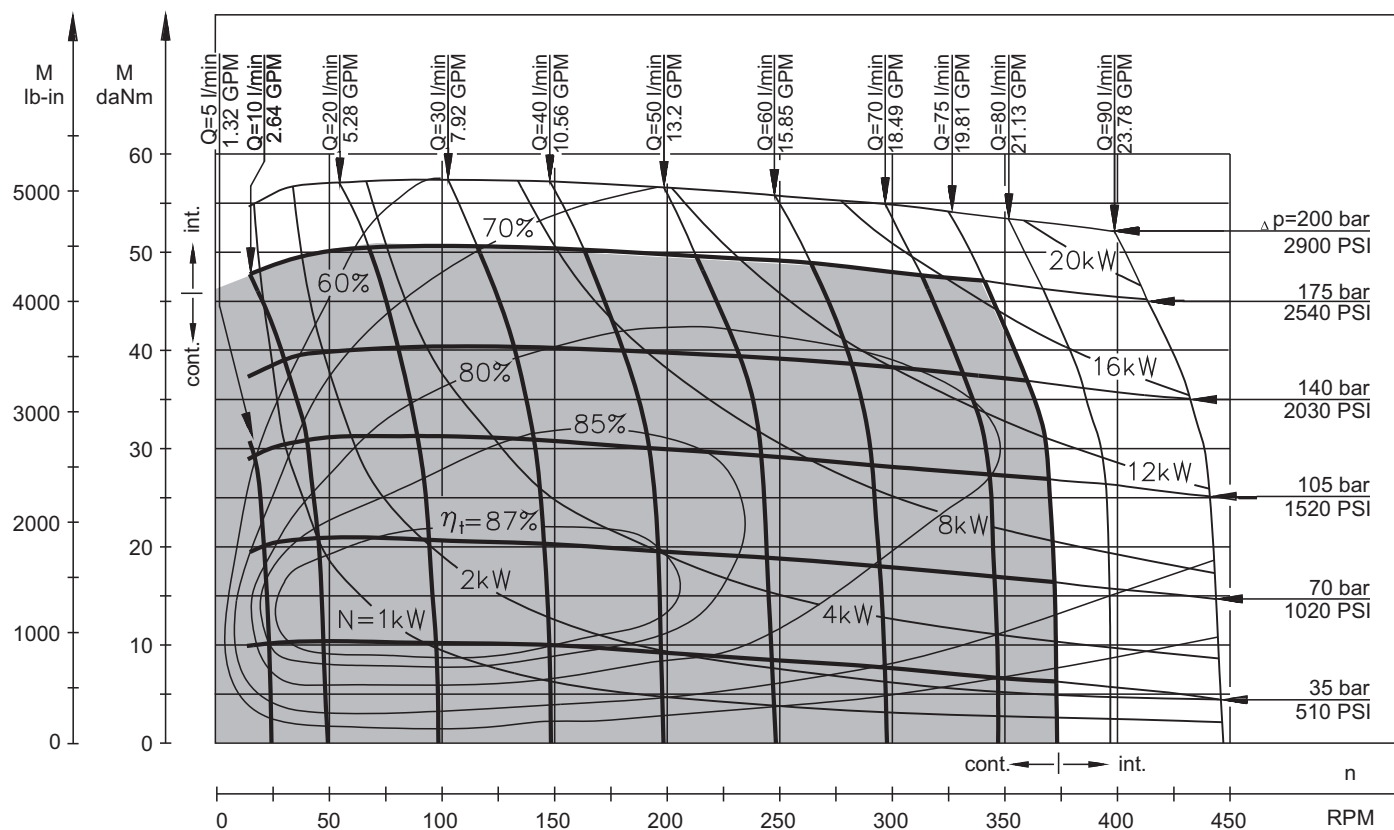
** Peak load: the permissible values may occur for max. 1% of every minute.

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

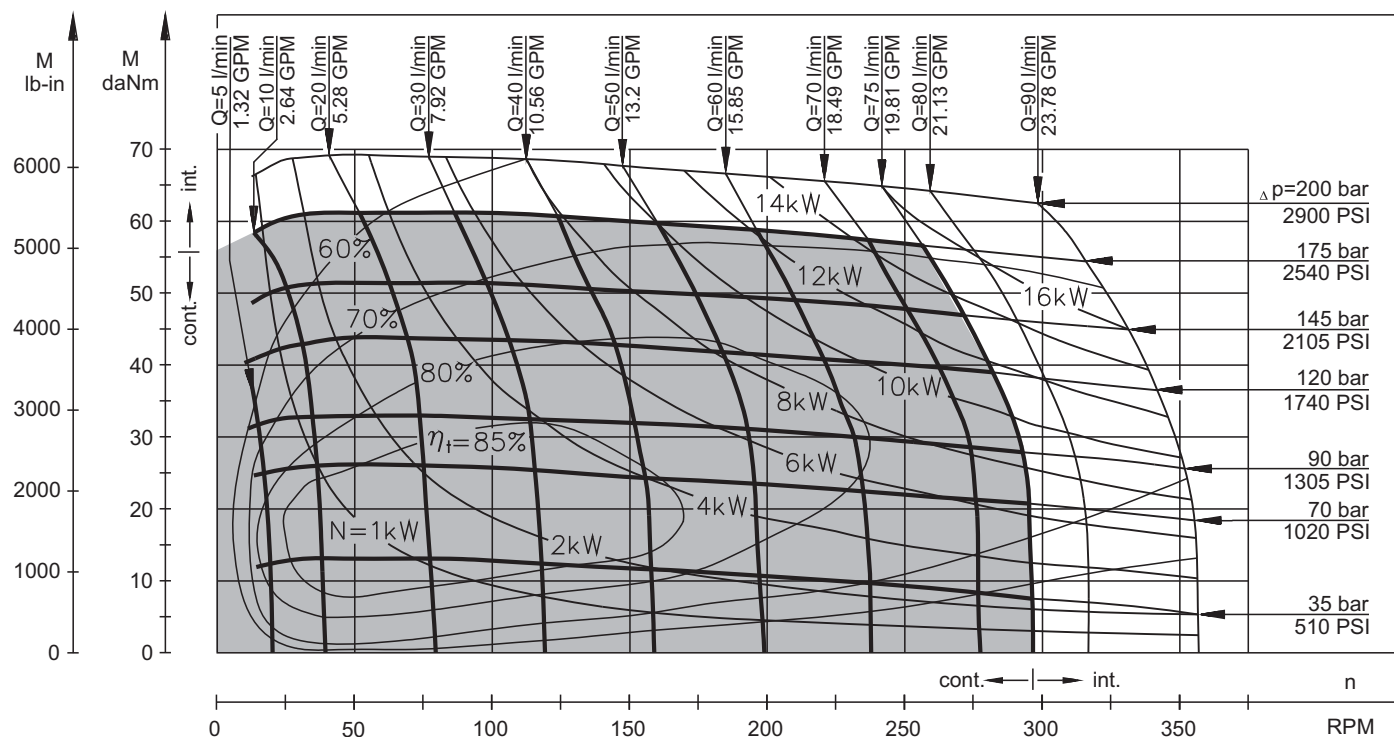
- Intermittent speed and intermittent pressure must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).
If using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



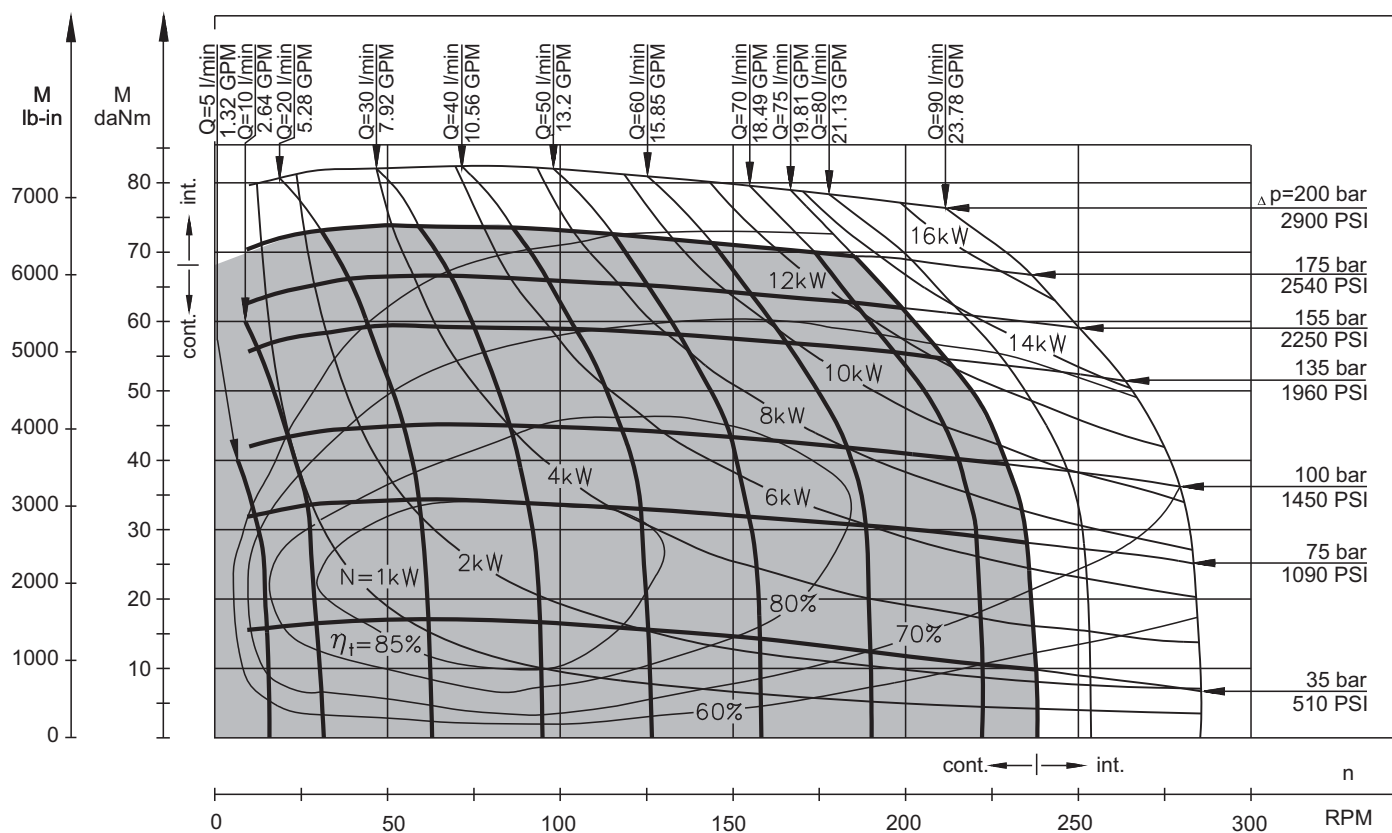
MH 250



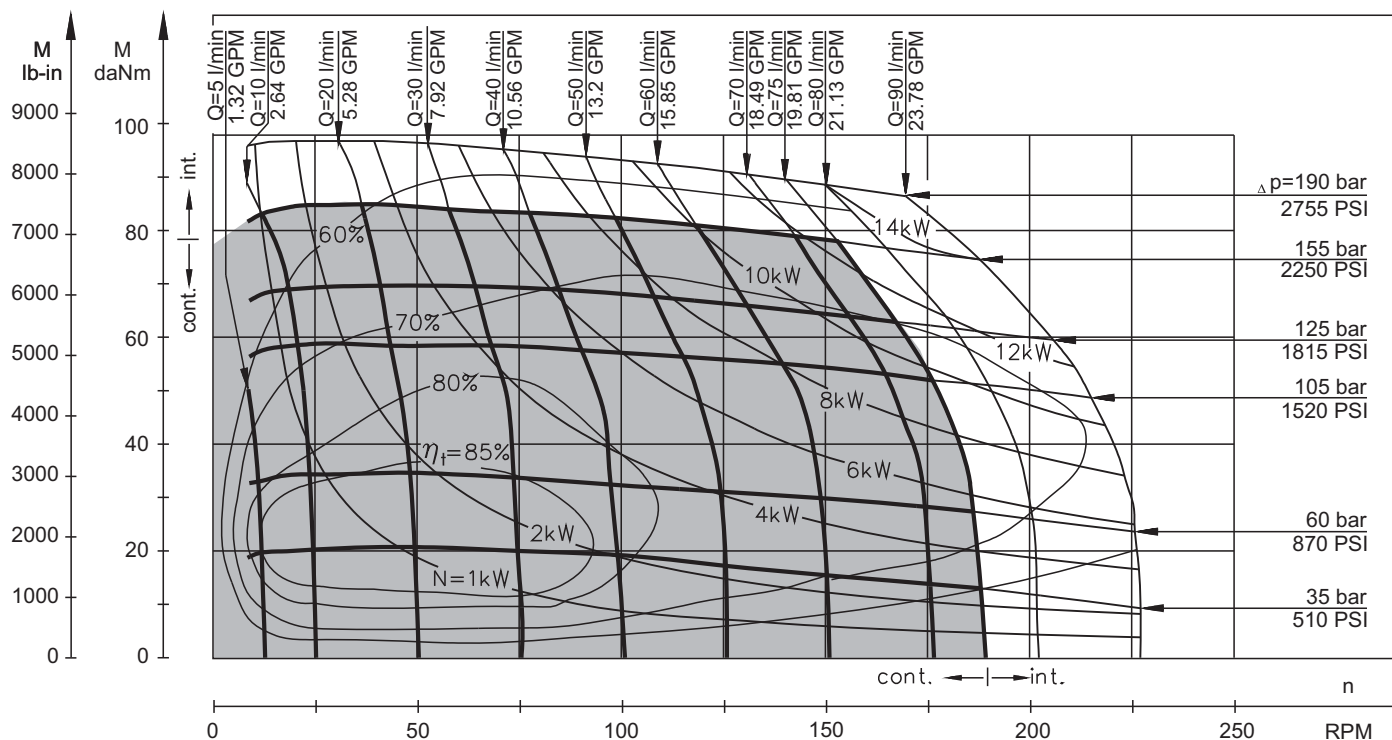
The function diagrams data is for average performance of randomly selected motors at back pressure 5 ± 10 bar [72.5±145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MH 315



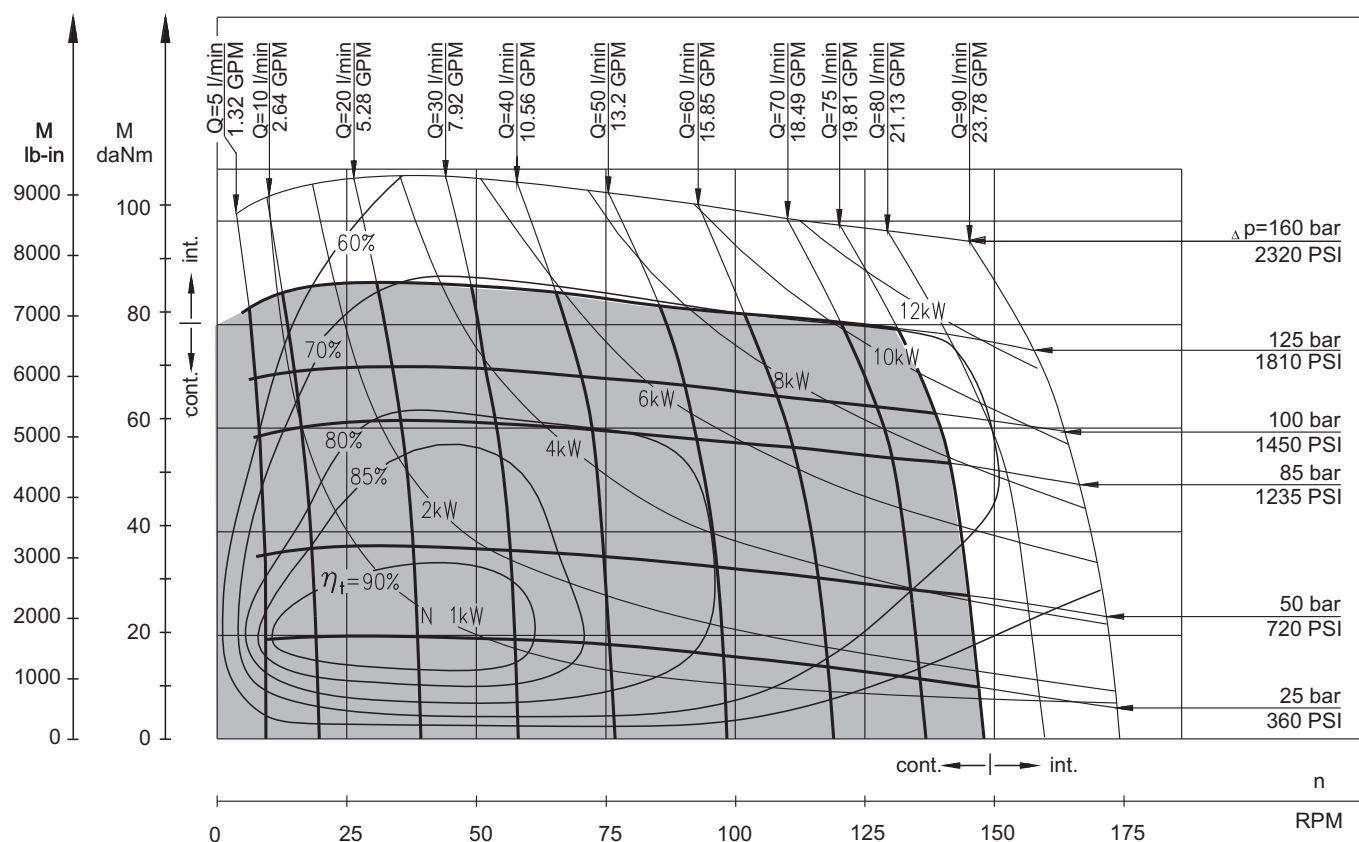
MH 400



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

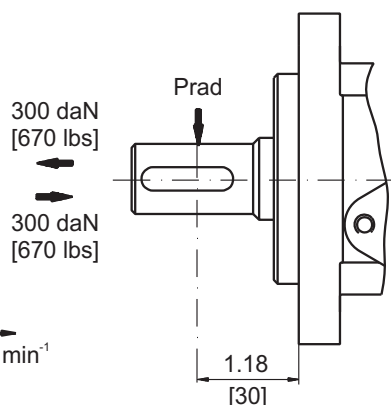
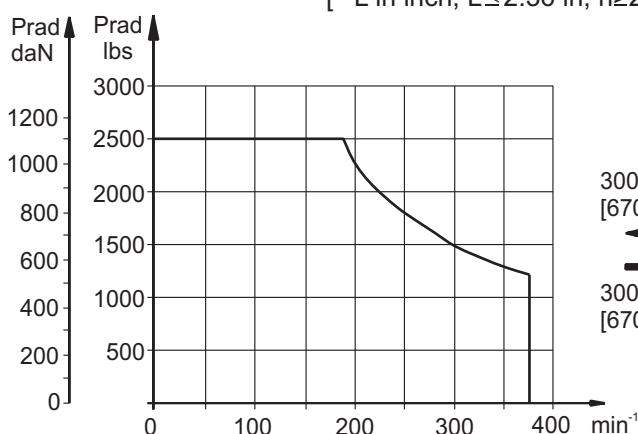
The permissible radial shaft load P_{rad} depends on the speed (RPM) and distance (L) from the point of load to the mounting flange.

$$\text{Radial Shaft Load } P_{rad} = \frac{1100}{n} \times \frac{25000}{103.5+L}, \text{ daN*}$$

[*L in mm; L ≤ 60 mm; n ≥ 200 RPM]

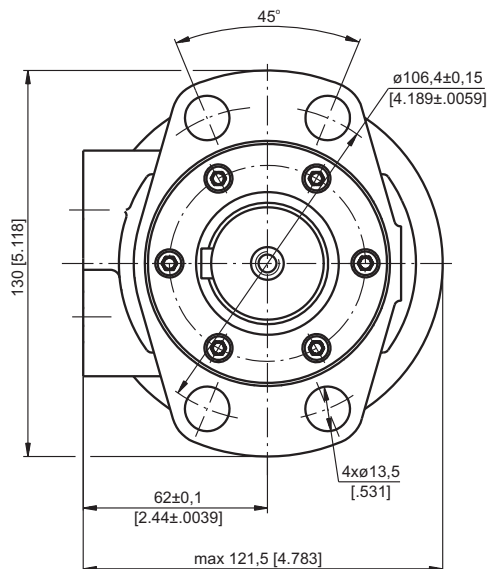
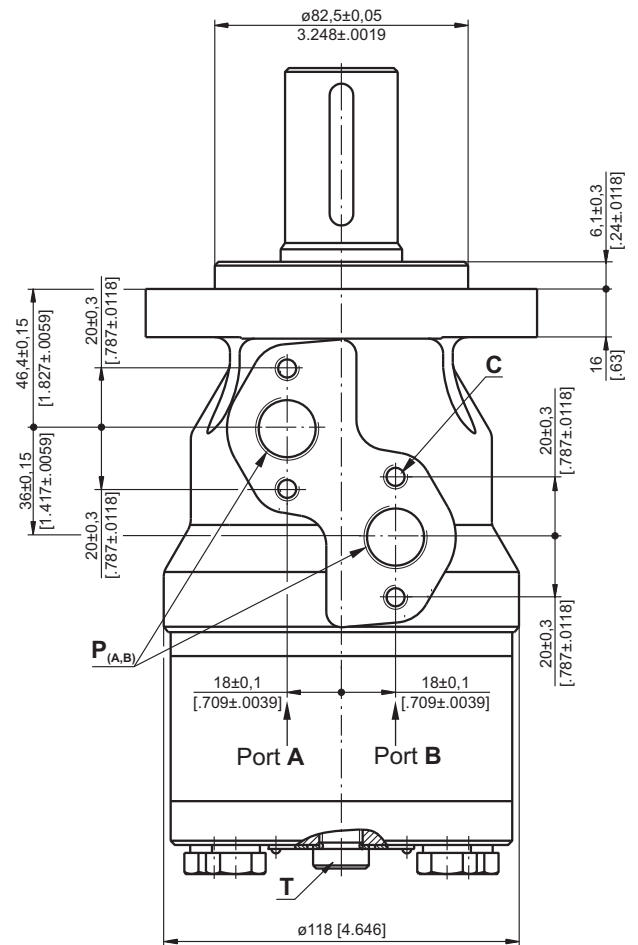
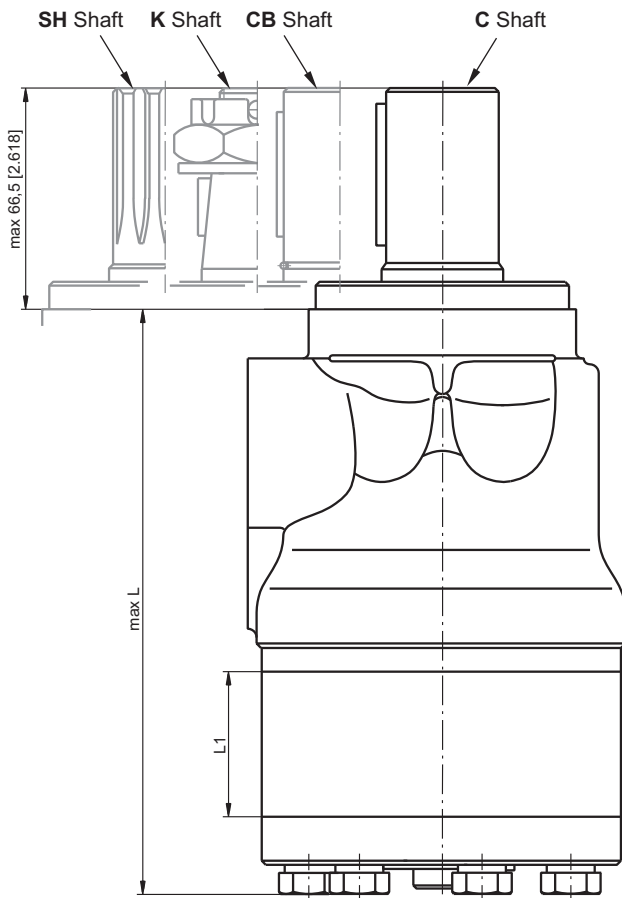
$$\text{Radial Shaft Load } P_{rad} = \frac{1100}{\text{RPM}} \times \frac{2215}{4.075+L}, \text{ lbs**}$$

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



DIMENSIONS AND MOUNTING DATA

Magneto Mount (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**

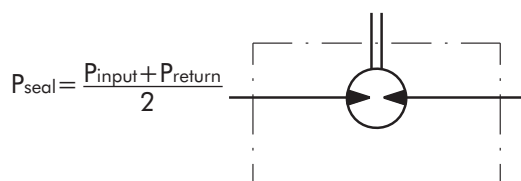
Port B Pressurized - **CW**



MAX. PERMISSIBLE SHAFT SEAL PRESSURE FOR MH MOTORS

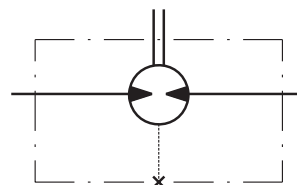
MH...U1 motors with high pressure seal and without drain connection:

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



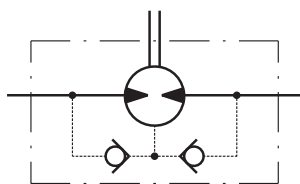
MH...U motors with high pressure seal and drain connection:

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



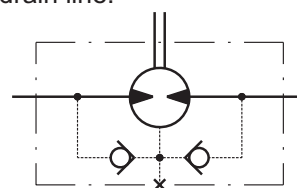
MH...1 motors with standard shaft seal and without drain connection:

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

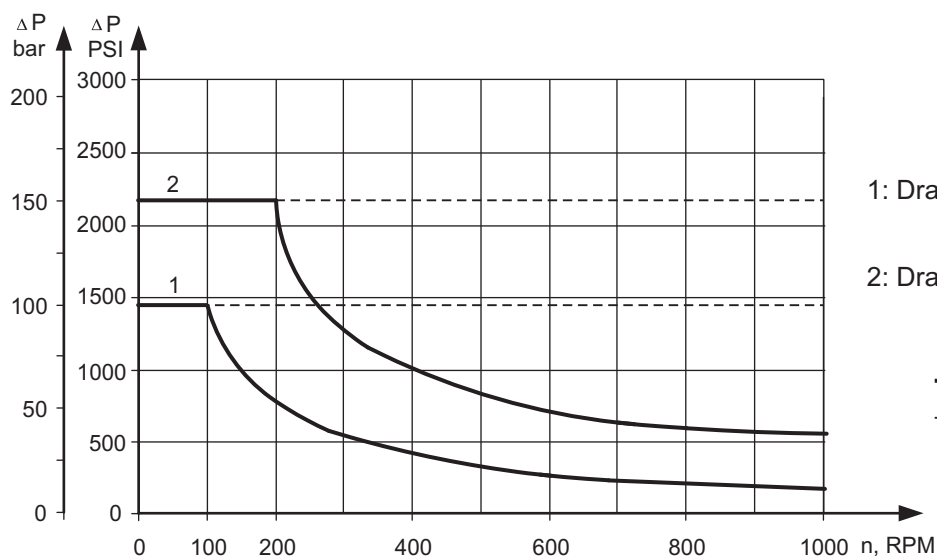


MH... motors with standard shaft seal and with drain connection:

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



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



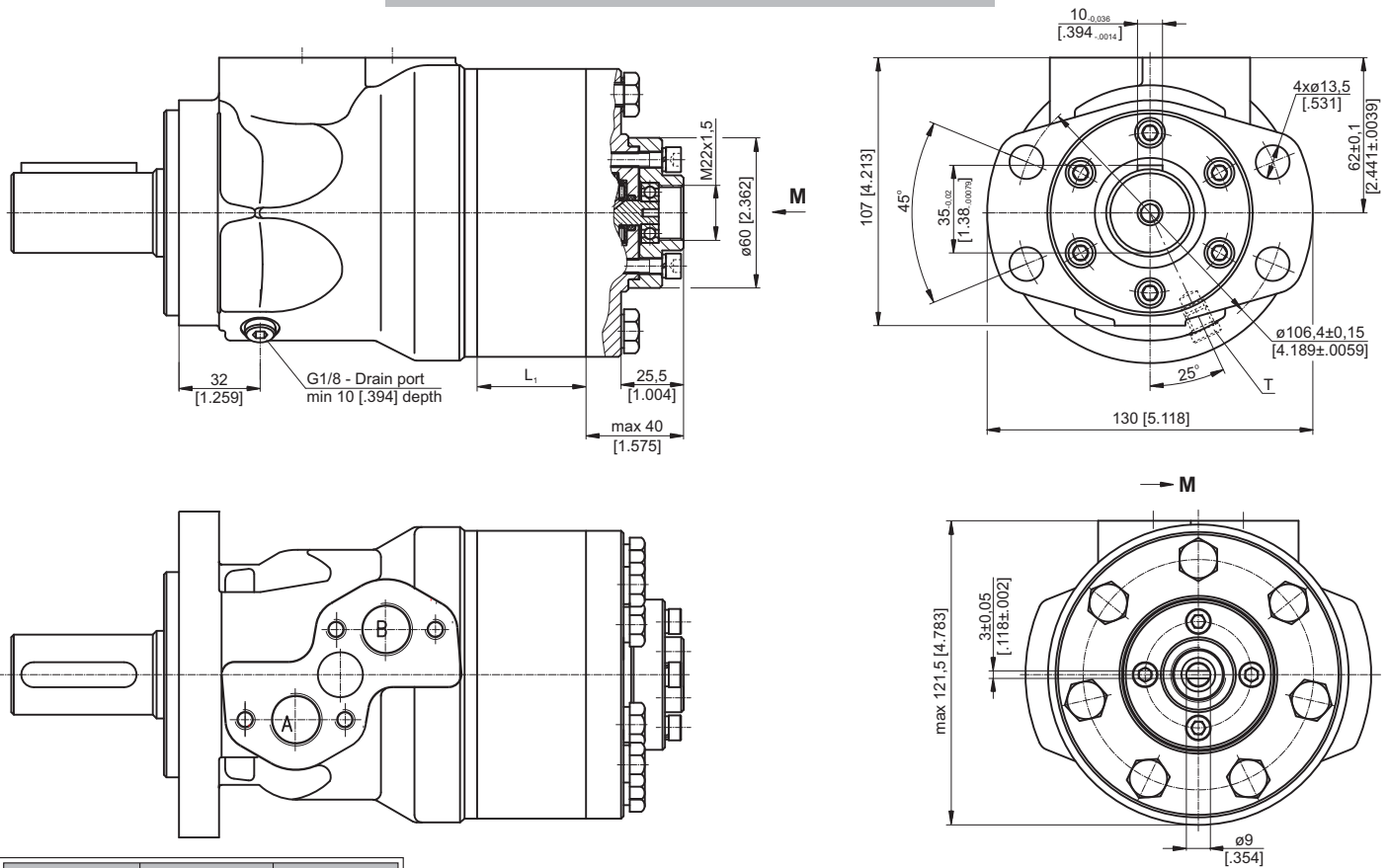
1: Drawing for Standard Shaft Seal

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

— - continuous operations

- - - - intermittent operations

MOTORS WITH TACHO CONNECTION

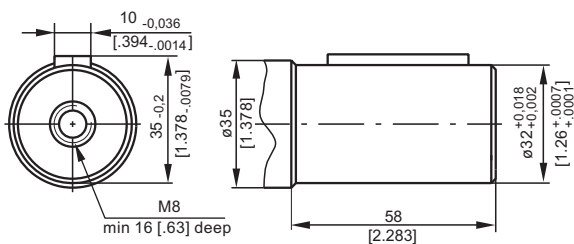


Type	L, mm [in]	L ₁ , mm [in]
MH 200	191 [7.52]	27,8 [1.09]
MH 250	198 [7.79]	34,8 [1.37]
MH 315	207 [8.15]	43,5 [1.71]
MH 400	218 [8.58]	54,8 [2.16]
MH 500	233 [9.17]	69,4 [2.73]

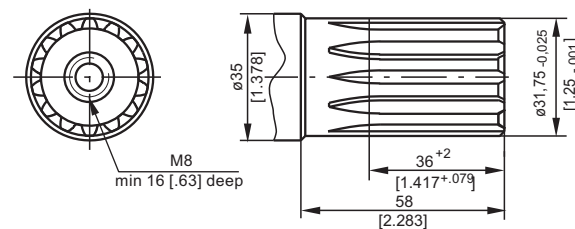


SHAFT EXTENSIONS

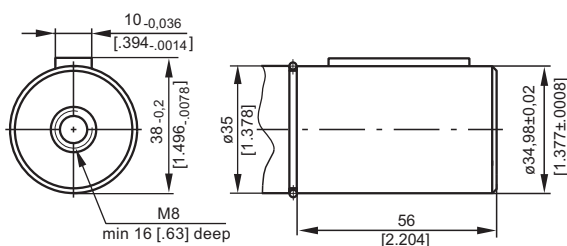
C - ø32 straight, Parallel key A10x8x45 DIN 6885
Max. Torque 77 daNm [6815 lb-in]



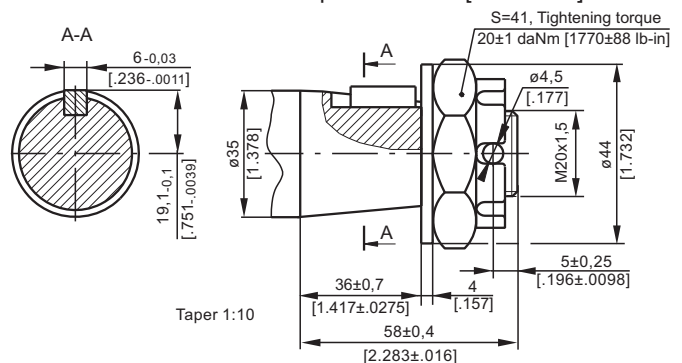
SH - ø1¼" splined 14T, DP 12/24 ANSI B92.1-1976
Max. Torque 95 daNm [8400 lb-in]



CB - ø35 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
M H							

Pos.1 - Displacement code

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

Pos.2 - Shaft Extensions*

C	- ø32 straight, Parallel key A10x8x45 DIN 6885
SH	- ø1¼" splined 14T ANSI B92.1-1970
CB**	- ø35 straight, Parallel key A10x8x45 DIN 6885
K	- ø35 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 120)

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.

HYDRAULIC MOTORS MM

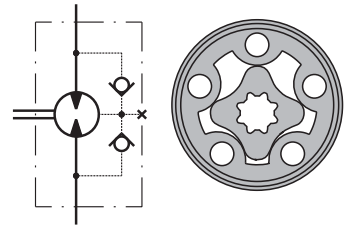


CONTENTS

Specification data	5
Function diagrams	6÷8
Dimensions and mounting ...	9÷10
Shaft extensions	11
Permissible shaft loads	11
Order code	12

APPLICATION

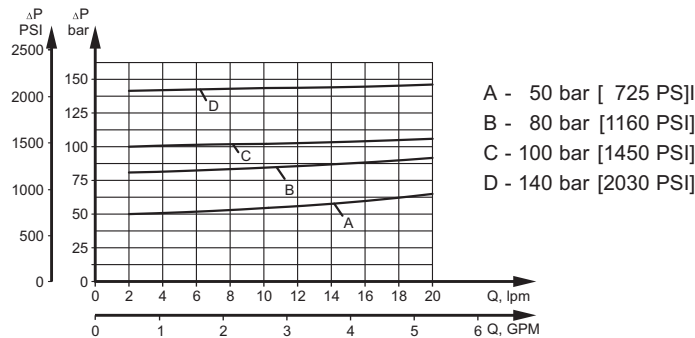
- » Conveyors
- » Textile machines
- » Mining machinery
- » Machine tools
- » Ventilators
- » Construction plant equipment and access platforms etc.



OPTIONS

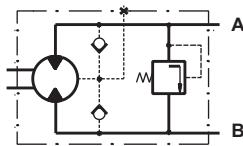
- » Model - Spool valve, gerotor
- » With or without flange
- » Side and rear ports
- » Series with pressure valve(s)
- » Shafts - straight and splined
- » Metric and BSPP ports
- » Speed sensing;
- » Other special features

Pressure Settings at Flow Q=.53 GPM [2 lpm], 150 SUS [32 mm²/s], 50°C [122°F]



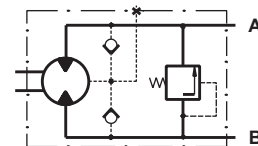
MMP Series with Integrated Internal Crossover Relief Valve

A → B, Δp=100 or 50 bar [1450 or 725 PSI]

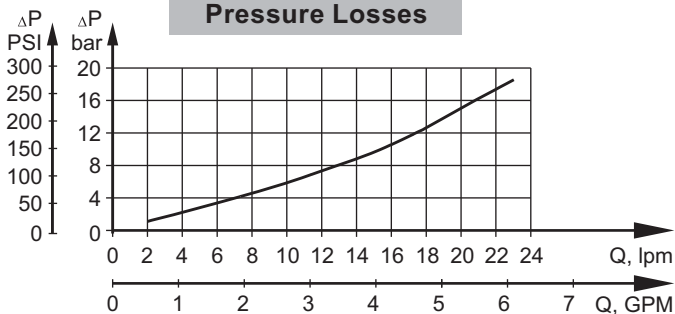


MMP Series with Integrated Internal Crossover Relief Valve

B → A, Δp=100 or 50 bar [1450 or 725 PSI]

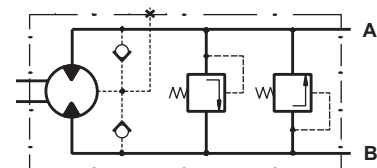


Pressure Losses



MMD Series with Integrated Internal Crossover Relief Valves

A ↔ B, Δp=100 or 50 bar [1450 or 725 PSI]



GENERAL

Max. Displacement,	cm³/rev [in³/rev]	50 [3.05]
Max. Speed,	[RPM]	2440
Max. Torque,	daNm [lb-in]	cont.: 4,5 [398] int.: 5,8 [513]
Max. Output,	kW [HP]	3,2 [4.3]
Max. Pressure Drop,	bar [PSI]	cont.: 105 [1500] int.: 140 [2030]
Max. Oil Flow,	lpm [GPM]	25 [6.6]
Min. Speed,	[RPM]	20
Pressure fluid	Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)	
Temperature range,	°C [°F]	-40÷140 [-40÷284]
Optimal Viscosity range,	mm²/s [SUS]	20÷75 [98÷347]
Filtration	ISO code 20/16 (Min. recommended fluid filtration of 25 microns)	

SPECIFICATION DATA

Type		MM 8	MM 12.5	MM 20	MM 32	MM 40	MM 50
Displacement, cm ³ /rev [in ³ /rev]		8,2 [50]	12,5 [77]	19,9 [1.22]	31,6 [1.93]	39,8 [2.43]	50 [3.08]
Max. Speed, [RPM]	Cont.	1950	1550	1000	630	500	400
	Int.*	2450	1940	1250	800	630	500
Max. Torque daNm [lb-in]	Cont.	1,1 [95]	1,6 [140]	2,5 [220]	4,0 [350]	4,5 [400]	4,6 [410]
	Int.*	1,5 [135]	2,3 [200]	3,5 [310]	5,7 [500]	7,0 [620]	8,8 [780]
	Peak**	2,1 [187]	3,3 [293]	5,1 [453]	6,4 [568]	8,2 [725]	10,0 [885]
Max. Output kW [HP]	Cont.	1,8 [2.4]	2,4 [3.2]	2,4 [3.2]	2,4 [3.2]	2,2 [3.0]	1,8 [2.4]
	Int.*	2,6 [3.5]	3,2 [4.3]	3,2 [4.3]	3,2 [4.3]	3,2 [4.3]	3,2 [4.3]
Max. Pressure Drop bar [PSI]	Cont.	100 [1450]	100 [1450]	100 [1450]	100 [1450]	90 [1310]	70 [1020]
	Int.*	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]
	Peak**	200 [2900]	200 [2900]	200 [2900]	160 [2320]	160 [2320]	160 [2320]
Max. Oil Flow lpm [GPM]	Cont.	16 [4.2]	20 [5.3]	20 [5.3]	20 [5.3]	20 [5.3]	20 [5.3]
	Int.*	20 [5.3]	25 [6.6]	25 [6.6]	25 [6.6]	25 [6.6]	25 [6.6]
Max. Inlet Pressure bar [PSI]	Cont.	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]
	Int.*	175 [2540]	175 [2540]	175 [2540]	175 [2540]	175 [2540]	175 [2540]
	Peak**	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]
Max. Return Pressure without Drain Line or Max. Pressure in Drain Line, bar [PSI]	Cont. 0-100 RPM	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]
	Cont. 100-400 RPM	105 [1500]	105 [1500]	105 [1500]	105 [1500]	105 [1500]	105 [1500]
	Cont. 400-800 RPM	50 [725]	50 [725]	50 [725]	50 [725]	50 [725]	50 [725]
	Cont. >800 RPM	20 [290]	20 [290]	20 [290]	-	-	-
	Int.* 0-max. RPM	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]
Max. Return Pressure with Drain Line bar [PSI]	Cont.	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]
	Int.*	175 [2540]	175 [2540]	175 [2540]	175 [2540]	175 [2540]	175 [2540]
	Peak**	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		4 [60]	4 [60]	4 [60]	4 [60]	4 [60]	4 [60]
Min. Starting Torque daNm [lb-in]	At max. press. drop Cont.	0,7 [60]	1,2 [105]	2,1 [185]	3,4 [300]	3,8 [335]	4,1 [365]
	At max. press. drop Int.*	1,0 [90]	1,7 [150]	2,9 [255]	4,8 [425]	6,2 [550]	7,9 [700]
Min. Speed***, [RPM]		50	40	30	30	25	20
Weight, kg [lb] For "F" flange: + 0,200 [.441]	MM	1,9 [4.2]	2,0 [4.41]	2,1 [4.63]	2,2 [4.85]	2,3 [5.07]	2,5 [5.51]
	MMF(S)	2,0 [4.41]	2,1 [4.63]	2,2 [4.85]	2,3 [5.07]	2,4 [5.29]	2,6 [5.73]
	MMP	2,2 [4.85]	2,3 [5.07]	2,4 [5.29]	2,5 [5.51]	2,6 [5.73]	2,8 [6.17]
	MMD	2,6 [5.73]	2,7 [5.95]	2,8 [6.17]	2,9 [6.39]	3,0 [6.61]	3,2 [7.05]

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

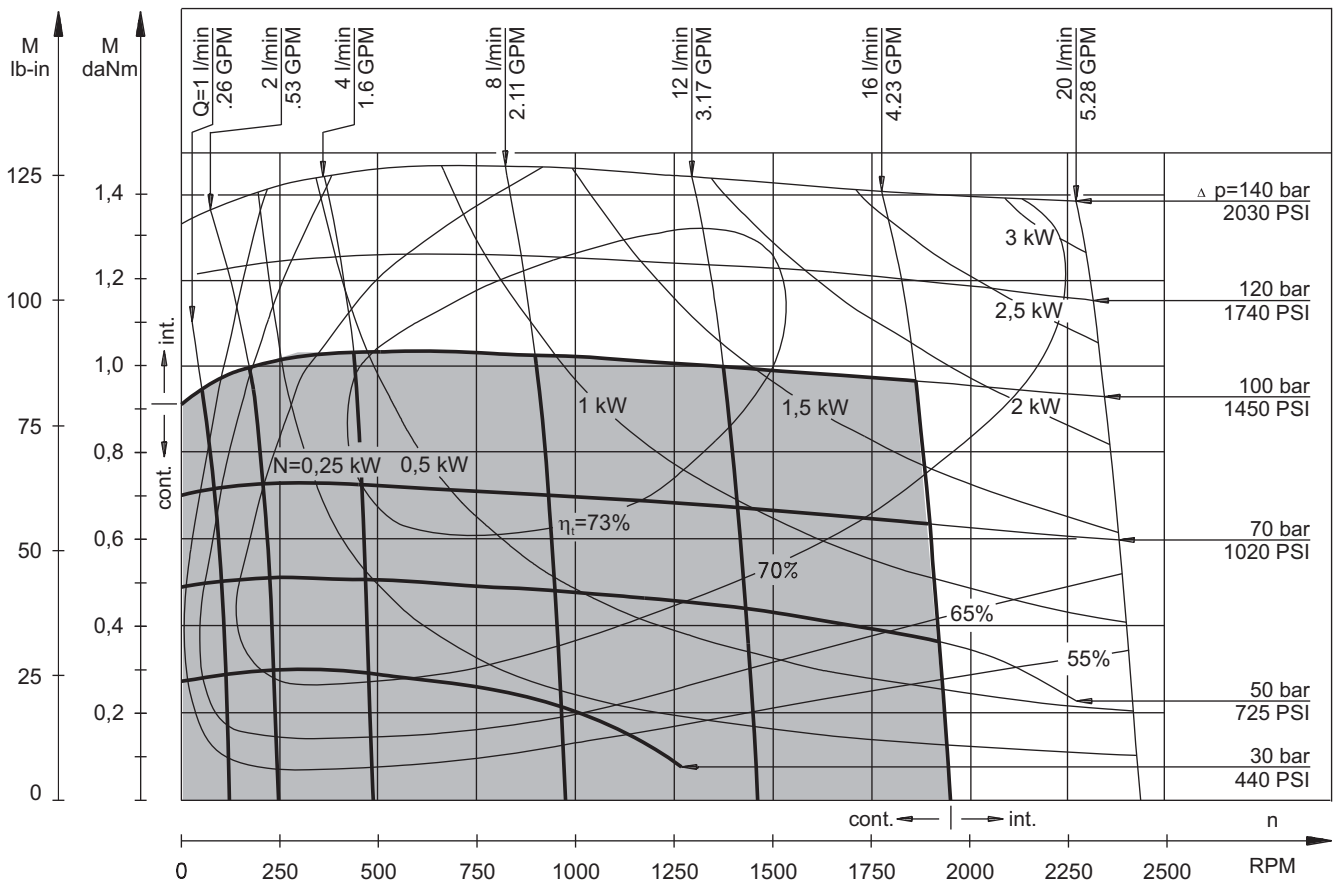
** Peak load: the permissible values may occur for max. 1% of every minute.

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

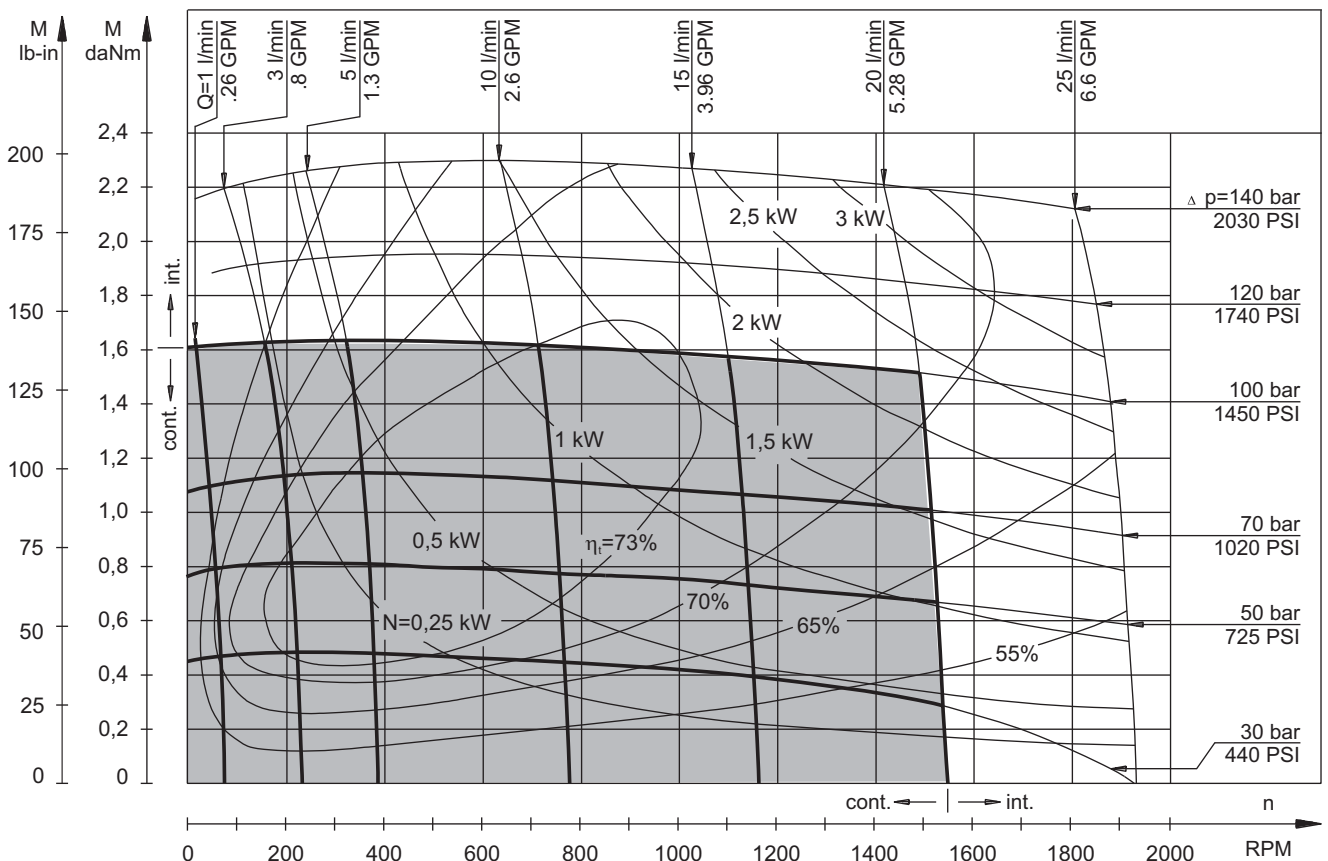
- Intermittent speed and intermittent pressure must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).
If using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

MM 8



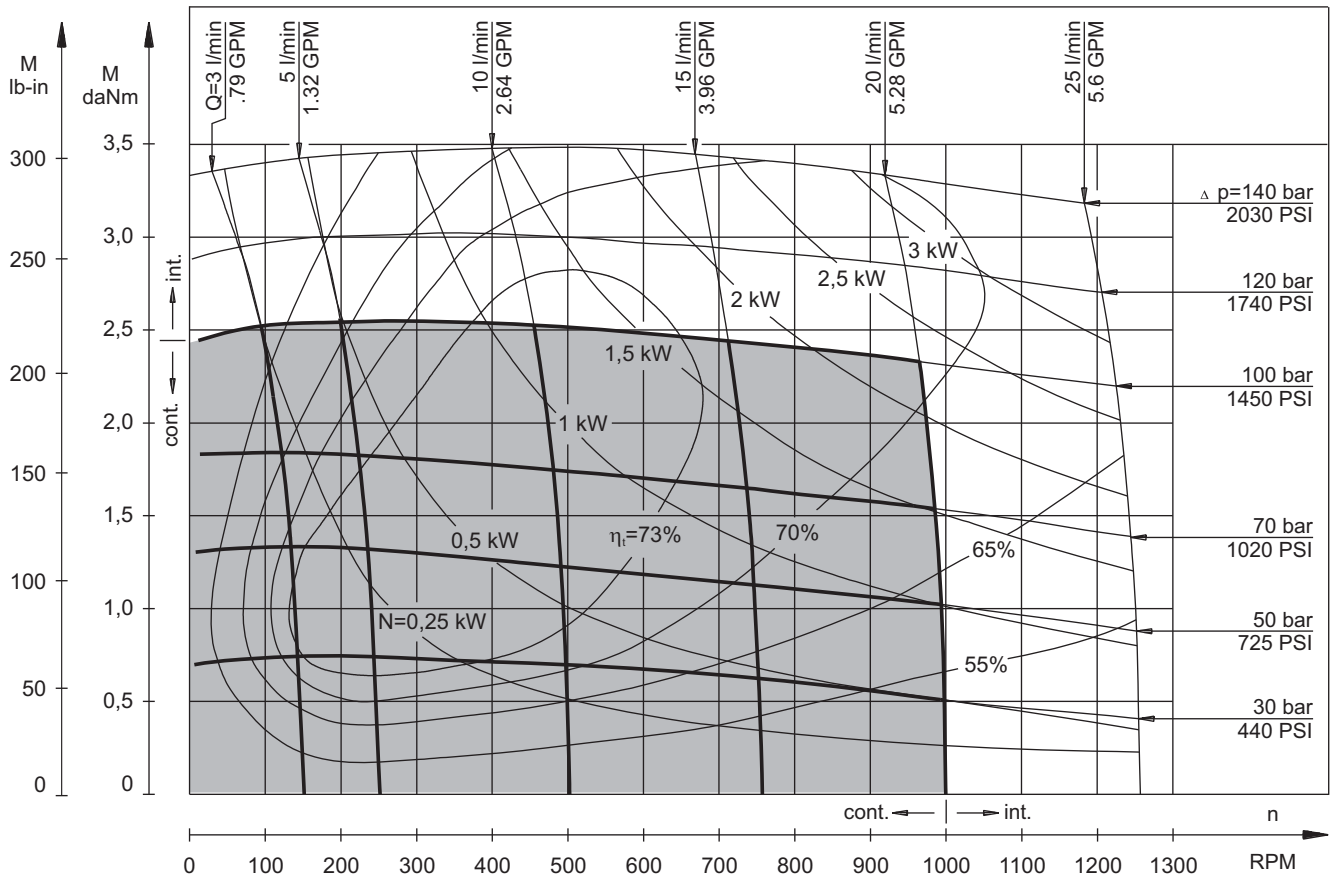
MM 12,5



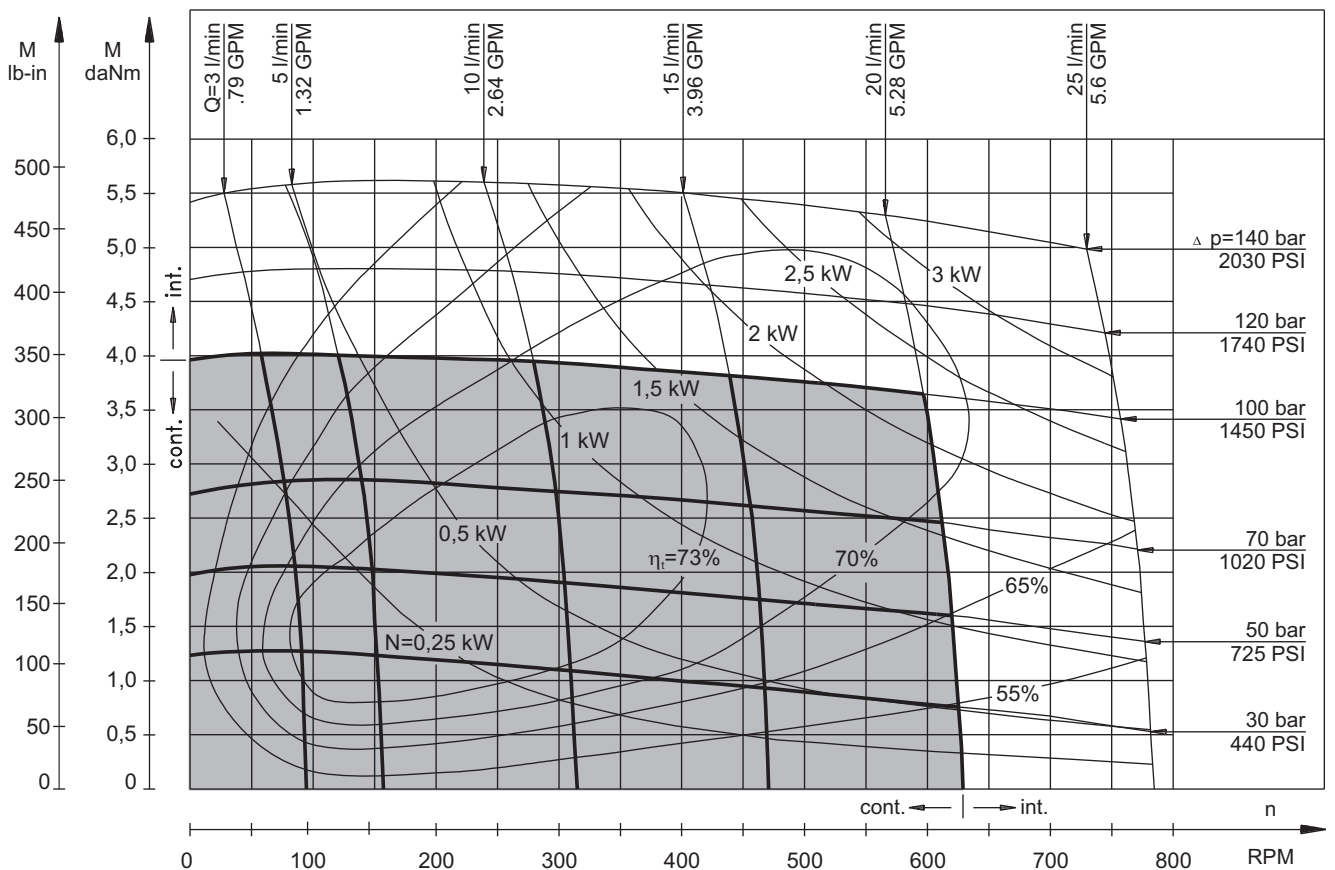
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MM 20



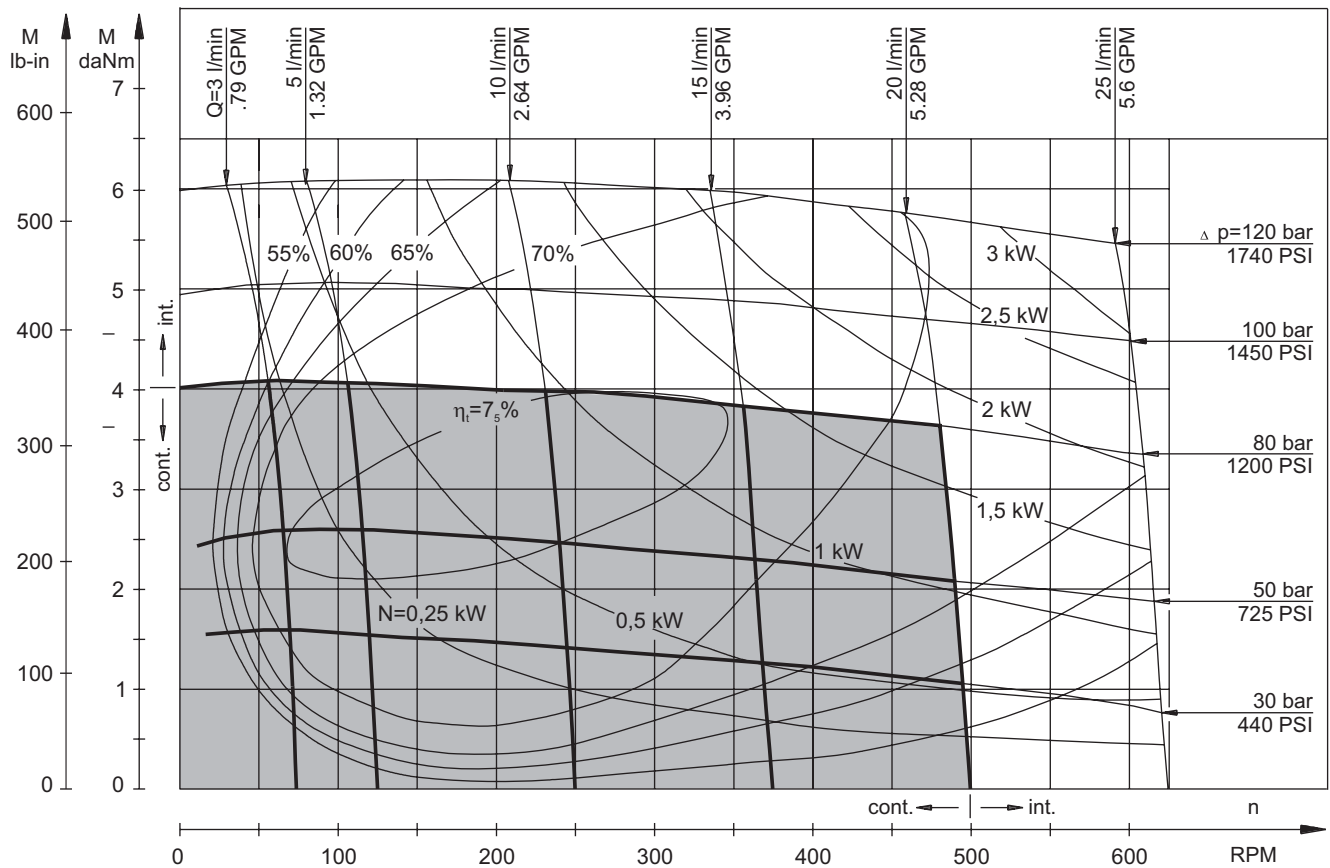
MM 32



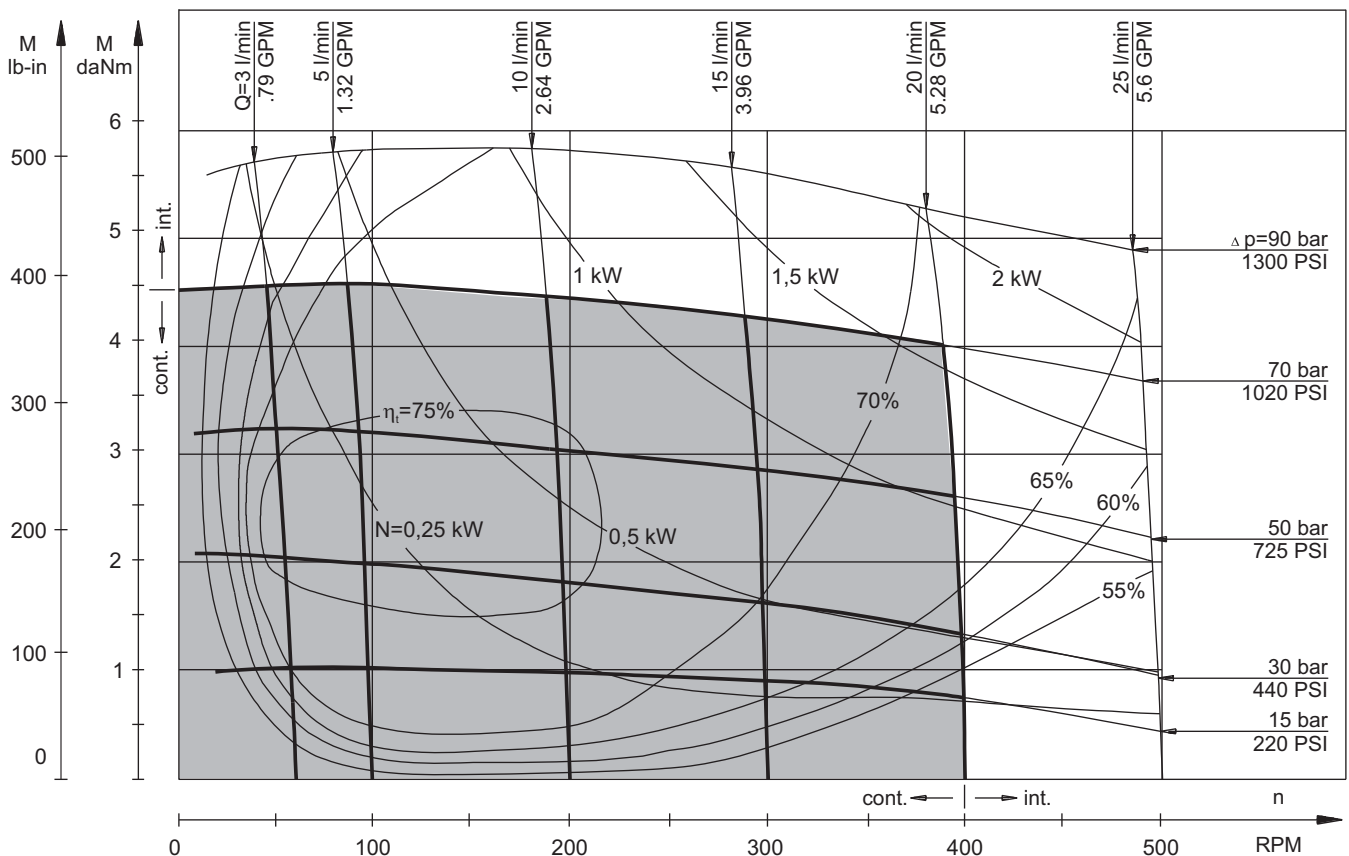
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MM 40



MM 50



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

DIMENSIONS AND MOUNTING DATA
MM, MMS, MMP, MMD

Three Bolts Mount

SH Shaft **C Shaft** **CK Shaft**

Shaft Dim.
See Page 11

Flange Dim.
See Page 10

F Oval Mount (2 Holes)

Rear Ports

S Side Ports

P Side Ports

D Side Ports

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**

Port Dim.
See Page 10

P_(A,B): 2xG3/8 or 2xM18x1,5 - 12 mm [.47 in] depth

T: G1/8 or M10x1 - 10 mm [.39 in] depth

Type	L, mm [in]	Type	L, mm [in]	L ₁ , mm [in]
MM 8	104 [4.094]	MMS 8	105 [4.134]	3,5 [.138]
MM 12,5	106 [4.173]	MMS 12,5	107 [4.213]	5,5 [.217]
MM 20	109 [4.291]	MMS 20	110 [4.331]	8,5 [.335]
MM 32	114 [4.488]	MMS 32	115 [4.528]	13,5 [.531]
MM 40	117,5 [4.626]	MMS 40	118,5 [4.665]	17 [.669]
MM 50	121,5 [4.783]	MMS 50	122,5 [4.823]	21 [.827]

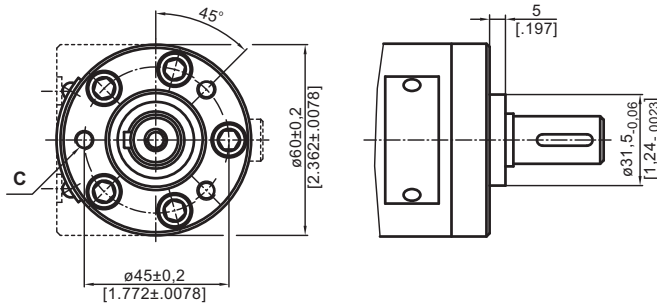
Type	L, mm [in]	Type	L, mm [in]	L ₁ , mm [in]
MMP 8	115 [4.528]	MMD 8	134 [5.276]	3,5 [.138]
MMP 12,5	117 [4.606]	MMD 12,5	136 [5.354]	5,5 [.217]
MMP 20	120 [4.724]	MMD 20	139 [5.472]	8,5 [.335]
MMP 32	125 [4.921]	MMD 32	144 [5.669]	13,5 [.531]
MMP 40	128,5 [5.039]	MMD 40	147,5 [5.807]	17 [.669]
MMP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

For "F" Flange +3,5 mm

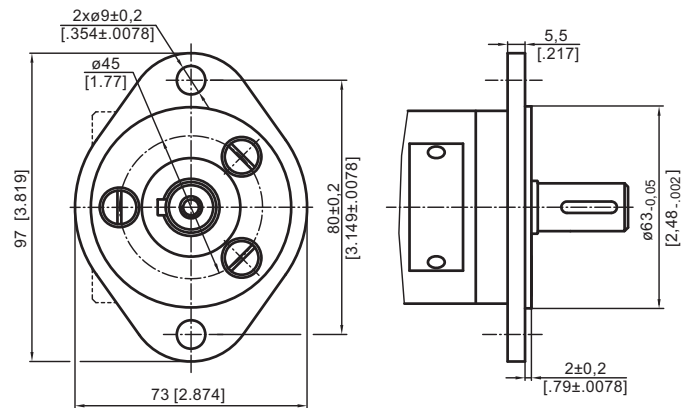


MOUNTING

Three Bolts Mount

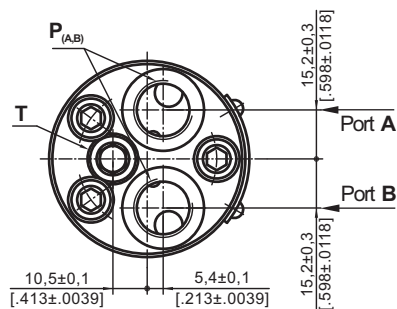


F Oval Mount (2 Holes)

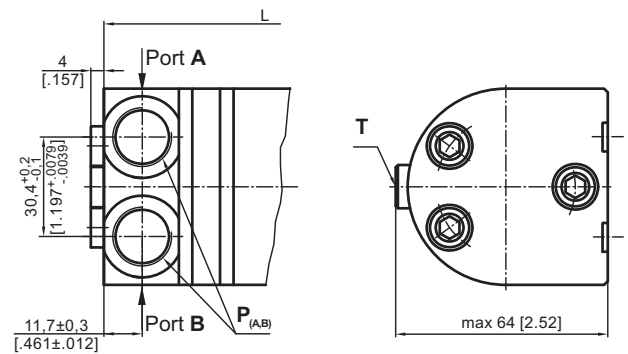


PORTS

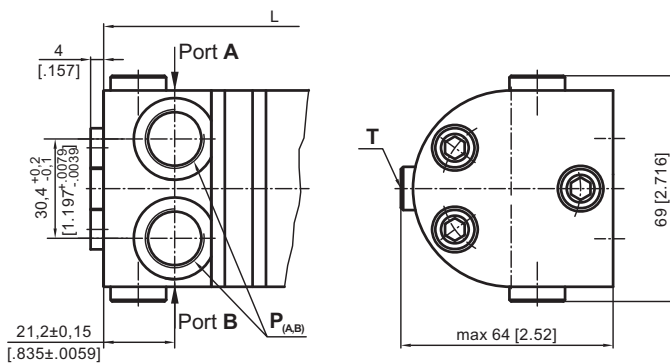
Rear Ports



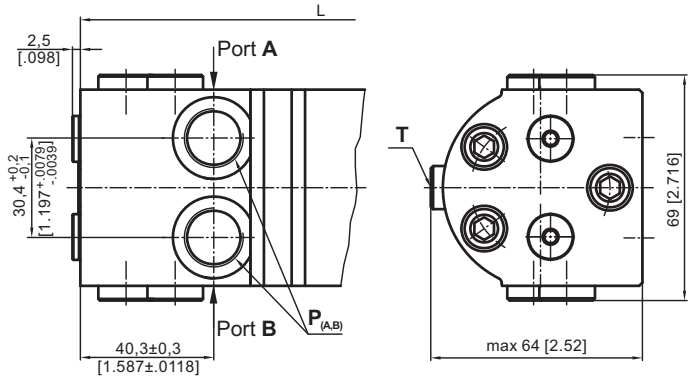
S Side Ports



P Side Ports with
Single Crossover Relief Valve



D Side Ports with
Dual Crossover Relief Valve



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

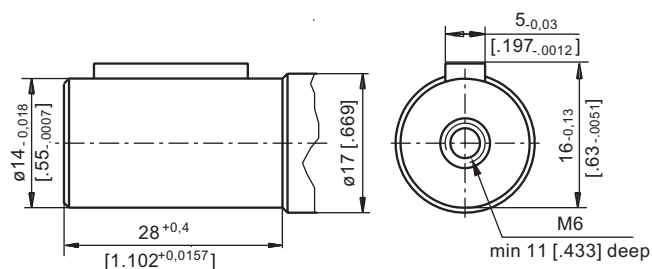
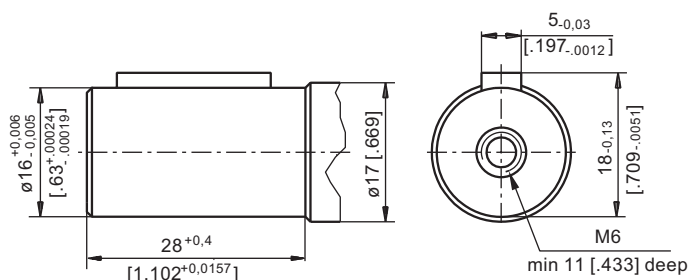
Reverse Rotation
Viewed from Shaft End
Port A Pressurized - **CCW**
Port B Pressurized - **CW**

C : 3xM6 - 12 mm [.47 in] depth
P_(A,B) : 2xG3/8 or 2xM18x1,5 - 12 mm [.47 in] depth
T : G1/8 or M10x1 - 10 mm [.39 in] depth

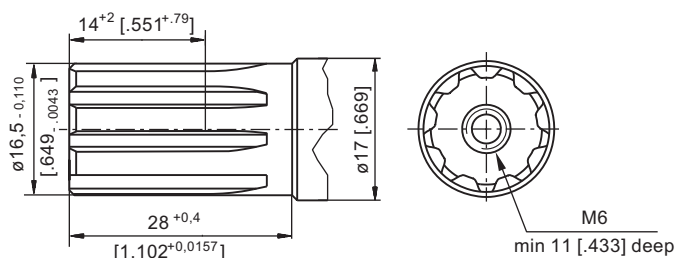
SHAFT EXTENSIONS

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

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

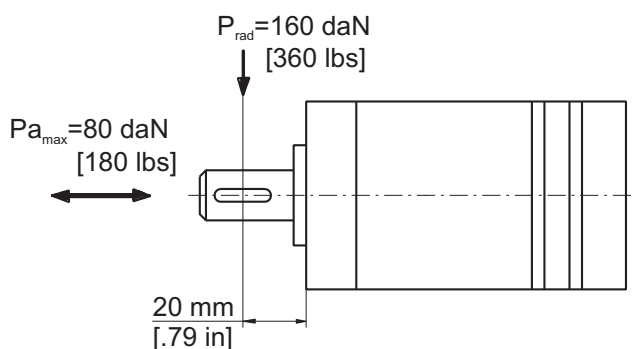


SH - $\varnothing 16,5$ Splined, B17x14 DIN 5482
Max. Torque 4,4 daNm [390 lb-in]



mm [in]

PERMISSIBLE SHAFT LOAD



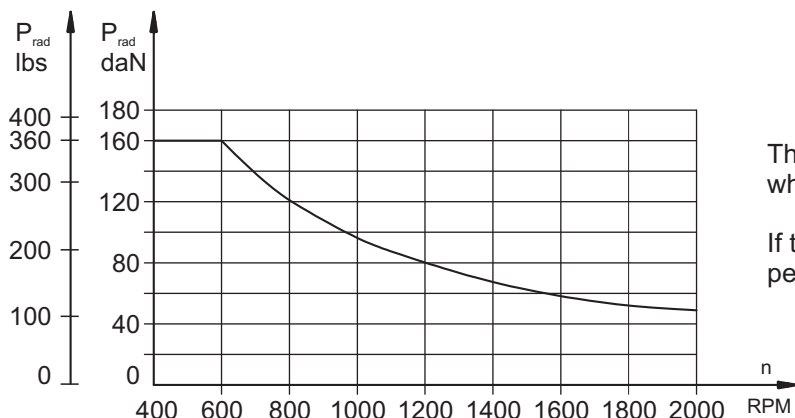
The permissible radial shaft load [Prad] is calculated from the distance [L] between the point of load application and the mounting surface:

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

[L in mm; $L \leq 80$ mm]

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

[L in inch; $L \leq 3,15$ in]



The drawing shows the permissible radial load when $L=20$ mm [0,79 in].

If the calculated shaft load exceeds the permissible, a flexible coupling must be used.

ORDER CODE

	1	2	3	4	5	6	7	8	9	10
M M										

Pos.1 - Adjustment Option

- omit - without valve
P* - Side ports with single crossover relief valve
D* - Side ports with dual crossover relief valve

Pos.2 - Mounting Flange

- omit - Three bolts mount
F - Oval mount, two holes

Pos.3 - Port type (not valid for P and D version)

- omit - Rear ports
S - Side ports

Pos.4 - Displacement code

- 8** - 8,2 cm³/rev [.5 in³/rev]
12.5 - 12,9 cm³/rev [.79 in³/rev]
20 - 20,0 cm³/rev [1.22 in³/rev]
32 - 31,8 cm³/rev [1.93 in³/rev]
40 - 40,0 cm³/rev [2.44 in³/rev]
50 - 50,0 cm³/rev [3.05 in³/rev]

Pos. 5 - Shaft Extensions*

- C** - ø16 straight, Parallel key A5x5x16 DIN6885
VC - ø16 straight, Parallel key A5x5x16 DIN6885
with corrosion resistant bushing
CK - ø14 straight, Parallel key 5x5x16 DIN6885
SH - ø16,5 splined, B17x14 DIN 5482

Pos. 6 - Ports

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

Pos. 7 - Line to control (see page 4)**

- /L** - B → A (left running)
/R - A → B (right running)

Pos. 8 - Valve Rated Pressure***

- /50** - Δp=50 bar [725 PSI]
/80 - Δp=80 bar [1160 PSI]
/100 - Δp=100 bar [1450 PSI]
/140 - Δp=140 bar [2030 PSI]

Pos. 9 - Special Features (see page 120)

Pos.10 - Design Series

- omit - Factory specified

NOTES:

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

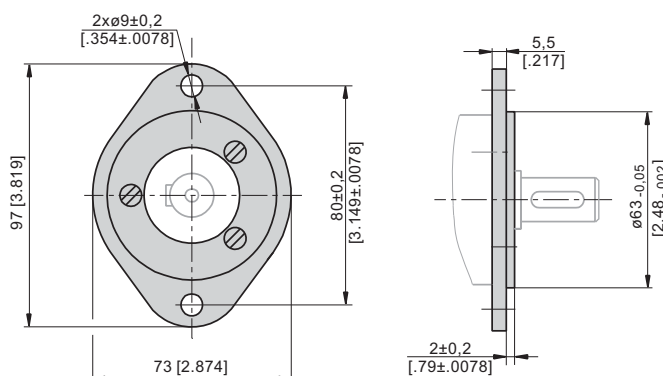
⚠ **MMP** and **MMD** are available with new crossover relief valves with improved characteristics. The new valves allow easier pressure setting in a wider range: from 50 bar [725 PSI] to 140 bar [2030 PSI]. For more information about MMP and MMD - series 2 please contact with "M+S Hydraulic".

The Valve pressure setting must be at flow rate of 2 lpm [.53 GPM].

The hydraulic motors are mangano - phosphatized as standard.

F - FLANGE (2 Holes)

Order No for Flange:48443 014 00



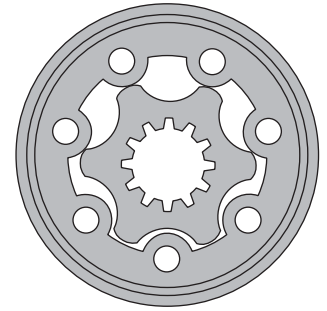
F Flange is mounted to the motor with 3 screws - M6x14. Tightening Torque: 5-6 Nm [44-53 lb-in].

HYDRAULIC MOTORS MP



APPLICATION

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



CONTENTS

Specification data	14÷17
Function diagrams	18÷24
Dimensions and mounting	25÷26
Wheel motor	27
Shaft extensions	28
Permissible shaft loads	29
Permissible shaft Seal Pressure ...	30
Order code	31

OPTIONS

- » Model - Spool valve, gerotor
- » Flange and wheel 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

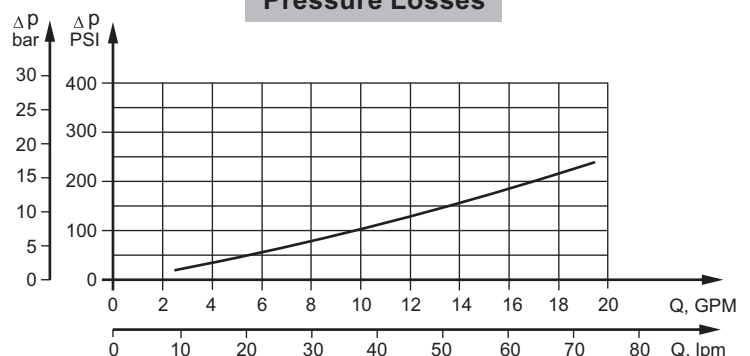
GENERAL

Max. Displacement, cm ³ /rev [in ³ /rev]	623,6 [38.05]
Max. Speed, [RPM]	1815
Max. Torque, daNm [lb-in]	cont.:50 [4415] int.: 64 [5565]
Max. Output, kW [HP]	12,8 [17.1]
Max. Pressure Drop, bar [PSI]	cont.:140 [2030] int.:175 [2540]
Max. Oil Flow, lpm [GPM]	75 [19.8]
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 MP... motors with **C**, **CO**, **SH**, **K** and **SA** shafts.
(ø28,56 sealing diameter)

Type		MP 25	MP 32	MP 40	MP 50	MP 80	MP 100	MP 125
Displacement, cm³/rev [in³/rev]		28,4 [1.73]	34,5 [2,1]	40,5 [2.47]	49,5 [3.02]	79,2 [4.83]	99 [6.04]	123,8 [7.55]
Max. Speed, [RPM]	Cont.	1408	1450	1480	1210	755	605	486
	Int.*	1584	1594	1555	1515	945	755	605
Max. Torque daNm [lb-in]	Cont.	3,3 [290]	4,3 [380]	6,2 [550]	9,4 [835]	15,1 [1340]	19,3 [1710]	23,7 [2100]
	Int.*	4,7 [415]	6,1 [540]	8,2 [730]	11,9 [1050]	19,5 [1725]	23,7 [2100]	29,8 [2640]
	Peak**	6,7 [595]	8,6 [760]	10,7 [950]	14,3 [1285]	22,4 [1985]	27,5 [2435]	36,5 [3235]
Max. Output kW [HP]	Cont.	4,5 [6.0]	5,8 [7.8]	8,4 [11.5]	10,1 [13.5]	10,2 [13.7]	10,5 [14.1]	10,2 [13.7]
	Int.*	6,1 [8.2]	7,8 [10.5]	11,6 [15.5]	12,2 [16.1]	12,5 [16.8]	12,8 [17.1]	12 [16.1]
Max. Pressure Drop bar [PSI]	Cont.	100 [1450]	100 [1450]	120 [1750]	140 [2030]	140 [2030]	140 [2030]	140 [2030]
	Int.*	140 [2030]	140 [2030]	155 [2250]	175 [2540]	175 [2540]	175 [2540]	175 [2540]
	Peak**	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]
Max. Oil Flow lpm [GPM]	Cont.	40 [10.5]	50 [13.2]	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]
	Int.*	45 [11.9]	55 [14.5]	70 [18.5]	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]
	Int.*	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]
Max. Return Pressure with Drain Line bar [PSI]	Cont.	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]
	Peak**	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]	10 [145]	10 [145]	10 [145]	9 [131]
Min. Starting Torque daNm [lb-in]	At max.press. drop Cont.	3,0 [265]	4,0 [355]	5,4 [480]	7,8 [690]	13,2 [1170]	16,6 [1470]	20,7 [1830]
	At max.press. drop Int.*	4,2 [370]	5,6 [500]	6,8 [600]	10 [885]	16,8 [1490]	21 [1860]	26,6 [2360]
Min. Speed***, [RPM]		20	15	10	10	10	10	10
Weight, kg [lb] For rear ports +0,450 [.992]	MP(F)(N)	5,6 [12.3]	5,6 [12.3]	5,7 [12.6]	5,8 [12.8]	5,9 [13.2]	6,1 [13.5]	6,2 [13.7]
	MPW(N)	5,3 [11.7]	5,3 [11.7]	5,4 [11.9]	5,5 [12.1]	5,6 [12.4]	5,8 [12.8]	5,9 [13]
	MPQ(N)	5,0 [11.1]	5,0 [11.1]	5,1 [11.2]	5,2 [11.5]	5,3 [11.7]	5,5 [12.1]	5,6 [12.3]

* 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.

- 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 MP... motors with **C, CO, SH, K** and **SA** shafts.
(ø28,56 sealing diameter)

Type		MP 160	MP 200	MP 250	MP 315	MP 400	MP 500	MP 630
Displacement, cm³/rev [in³/rev]		158,4 [9.66]	198 [12.1]	247,5 [15.1]	316,8 [19.3]	396 [24.16]	495 [30.2]	623,6 [38.05]
Max. Speed, [RPM]	Cont.	378	303	242	190	150	120	95
	Int.*	472	378	303	236	189	150	120
Max. Torque daNm [lb-in]	Cont.	31,3 [2770]	36,6 [3240]	38 [3360]	38 [3360]	36 [3190]	39 [3452]	44 [3895]
	Int.*	37,8 [3345]	45,6 [4035]	58,3 [5160]	56 [4960]	59 [5240]	57 [5045]	64 [5665]
	Peak**	43,8 [3880]	55 [4870]	68,5 [6060]	85 [7505]	85,4 [7560]	78 [6903]	82 [7257]
Max. Output kW [HP]	Cont.	10,1 [13.5]	10 [13.5]	7,5 [10]	5,8 [7.9]	4,6 [6.2]	3,5 [4.7]	3,3 [4.4]
	Int.*	12,1 [16.2]	12 [16.1]	12 [16.1]	9 [12.1]	7,8 [10.5]	7,2 [9.7]	5,6 [7.5]
Max. Pressure Drop bar [PSI]	Cont.	140 [2030]	140 [2030]	110 [1600]	90 [1300]	70 [1015]	60 [870]	55 [800]
	Int.*	175 [2540]	175 [2540]	175 [2540]	140 [2030]	115 [1665]	90 [1305]	80 [1160]
	Peak**	225 [3260]	225 [3260]	225 [3260]	225 [3260]	180 [2610]	130 [1885]	110 [1740]
Max. Oil Flow lpm [GPM]	Cont.	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]
	Int.*	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]	140 [2030]	140 [2030]
	Int.*	200 [2900]	200 [2900]	200 [2900]	200 [2900]	200 [2900]	175 [2540]	175 [2540]
	Peak**	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]	140 [2030]	140 [2030]
	Int.*	200 [2900]	200 [2900]	200 [2900]	200 [2900]	200 [2900]	175 [2540]	175 [2540]
	Peak**	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		8 [116]	7 [100]	6 [87]	5 [73]	5 [73]	5 [73]	5 [73]
Min. Starting Torque daNm [lb-in]	At max.press. drop Cont.	28,2 [2500]	33,5 [2950]	33,6 [2970]	34,4 [3045]	34,5 [3050]	36 [3180]	41,5 [3670]
	At max.press. drop Int.*	35,5 [3140]	42,6 [3770]	54,2 [4795]	61,9 [5480]	60,8 [5390]	54 [4780]	62 [5480]
Min. Speed***, [RPM]		10	10	10	10	10	10	10
Weight, kg [lb] For rear ports +0,450 [.992]	MP(F)(N)	6,4 [14.1]	6,6 [14.6]	6,8 [15]	7,1 [15.6]	7,6 [16.8]	8,9 [20]	9,5 [21.4]
	MPW(N)	6,1 [13.5]	6,3 [13.9]	6,5 [14.3]	6,8 [15]	7,2 [15.9]	8,6 [19]	9,2 [20.3]
	MPQ(N)	5,8 [12.8]	6 [13.2]	6,2 [13.7]	6,5 [14.3]	6,8 [15]	8,3 [18.3]	9 [19.8]

* 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.

SPECIFICATION DATA (continued)

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

Type		MP 80	MP 100	MP 125	MP 160	MP 200
Displacement, cm³/rev [in³/rev]		79,2 [4.83]	99 [6.04]	123,8 [7.55]	158,4 [9.66]	198 [12.1]
Max. Speed, [RPM]	Cont.	755	605	486	378	303
	Int.*	945	755	605	472	378
Max. Torque daNm [lb-in]	Cont.	15,1 [1340]	19,3 [1710]	23,7 [2100]	31,3 [2770]	36,6 [3240]
	Int.*	19,5 [1725]	23,7 [2100]	29,8 [2640]	37,8 [3345]	45,6 [4035]
	Peak**	22,4 [1985]	27,5 [2435]	36,5 [3235]	43,8 [3880]	55 [4870]
Max. Output kW [HP]	Cont.	10,2 [13.7]	10,5 [14.1]	10,2 [13.7]	10,1 [13.5]	10 [13.5]
	Int.*	12,5 [16.8]	12,8 [17.1]	12 [16.1]	12,1 [16.2]	12 [16.1]
Max. Pressure Drop bar [PSI]	Cont.	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]
	Int.*	175 [2540]	175 [2540]	175 [2540]	175 [2540]	175 [2540]
	Peak**	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]
Max. Oil Flow lpm [GPM]	Cont.	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]
	Int.*	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]
	Int.*	200 [2900]	200 [2900]	200 [2900]	200 [2900]	200 [2900]
	Peak**	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]
	Int.*	200 [2900]	200 [2900]	200 [2900]	200 [2900]	200 [2900]
	Peak**	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		10 [145]	10 [145]	9 [131]	8 [116]	7 [100]
Min. Starting Torque daNm [lb-in]	At max.press. drop Cont.	13,2 [1170]	16,6 [1470]	20,7 [1830]	28,2 [2500]	33,5 [2950]
	At max.press. drop Int.*	16,8 [1490]	21 [1860]	26,6 [2360]	35,5 [3140]	42,6 [3770]
Min. Speed***, [RPM]		10	10	10	10	10
Weight, kg [lb] For rear ports +0,450 [.992]	MP(F)...B	6 [13.2]	6,2 [13.7]	6,3 [13.9]	6,5 [14.3]	6,7 [14.8]

* 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.

SPECIFICATION DATA (continued)

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

Type		MP 250	MP 315	MP 400	MP 500	MP 630
Displacement, cm³/rev [in³/rev]		247,5 [15.1]	316,8 [19.3]	396 [24.16]	495 [30.2]	623,6 [38.05]
Max. Speed, [RPM]	Cont.	242	190	150	120	95
	Int.*	303	236	189	150	120
Max. Torque daNm [lb-in]	Cont.	47 [4160]	48 [4360]	50 [4415]	39 [3452]	44 [3895]
	Int.*	58,3 [5160]	56 [4960]	59 [5240]	57 [5045]	64 [5665]
	Peak**	68,5 [6060]	85 [7505]	85,4 [7560]	78 [6903]	82 [7257]
Max. Output kW [HP]	Cont.	9 [12.1]	7,6 [10.2]	6,2 [8.3]	3,5 [4.7]	3,3 [4.4]
	Int.*	12 [16.1]	9 [12.1]	7,8 [10.5]	7,2 [9.7]	5,6 [7.5]
Max. Pressure Drop bar [PSI]	Cont.	140 [2030]	120 [1740]	95 [1400]	60 [870]	55 [800]
	Int.*	175 [2540]	140 [2030]	115 [1670]	90 [1305]	80 [1160]
	Peak**	225 [3260]	225 [3260]	180 [2610]	130 [1885]	110 [1740]
Max. Oil Flow lpm [GPM]	Cont.	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]
	Int.*	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]	140 [2030]	140 [2030]
	Int.*	200 [2900]	200 [2900]	200 [2900]	175 [2540]	175 [2540]
	Peak**	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]	140 [2030]	140 [2030]
	Int.*	200 [2900]	200 [2900]	200 [2900]	175 [2540]	175 [2540]
	Peak**	225 [3260]	225 [3260]	225 [3260]	225 [3260]	225 [3260]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		6 [87]	5 [73]	5 [73]	5 [73]	5 [73]
Min. Starting Torque daNm [lb-in]	At max.press. drop Cont.	42,8 [3790]	4050 [45,8]	46,8 [4140]	36 [3180]	41,5 [3670]
	At max.press. drop Int.*	54,2 [4795]	5480 [61,9]	60,8 [5390]	54 [4780]	62 [5480]
Min. Speed***, [RPM]		10	10	10	10	10
Weight, kg [lb] For rear ports +0,450 [.992]	MP(F)...B	6,9 [15.2]	7,2 [15.9]	7,7 [17]	9,0 [19.9]	9,6 [21.2]

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

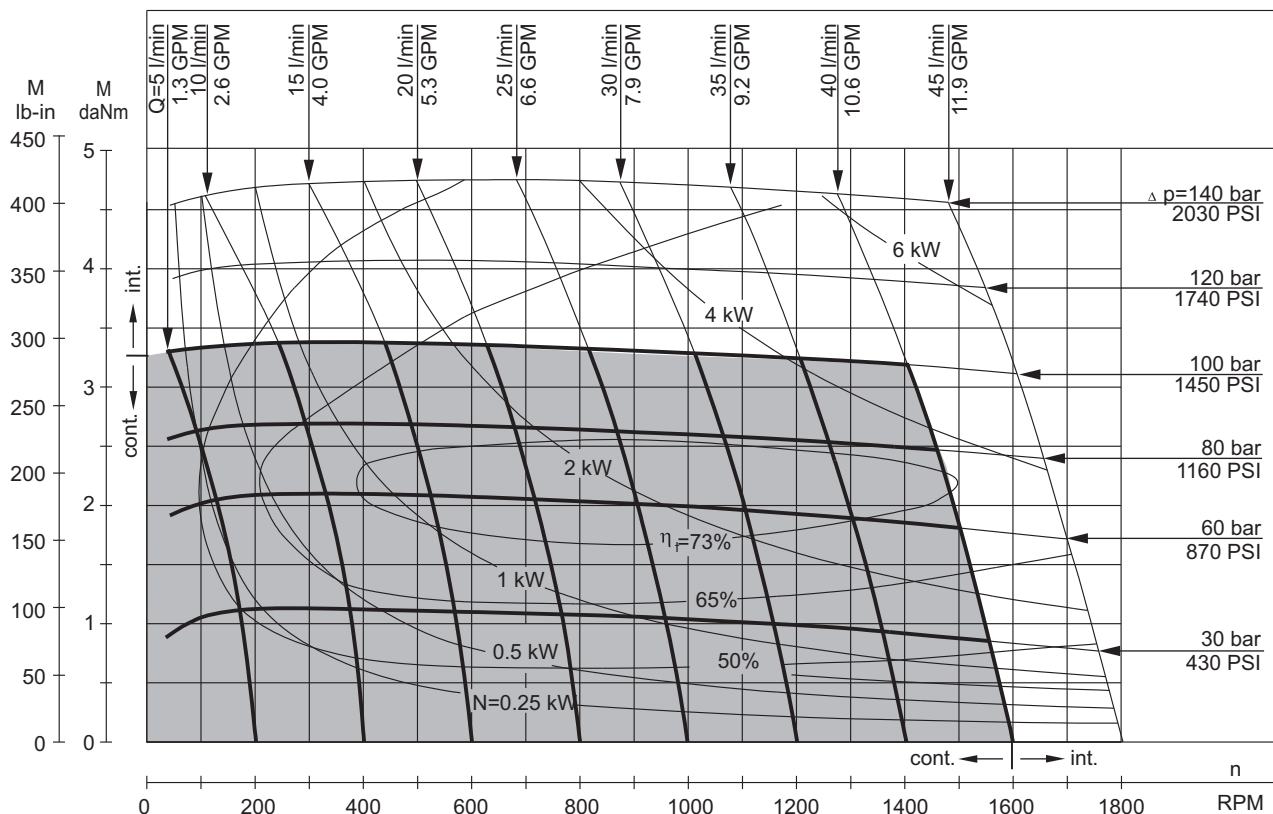
** Peak load: the permissible values may occur for max. 1% of every minute.

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

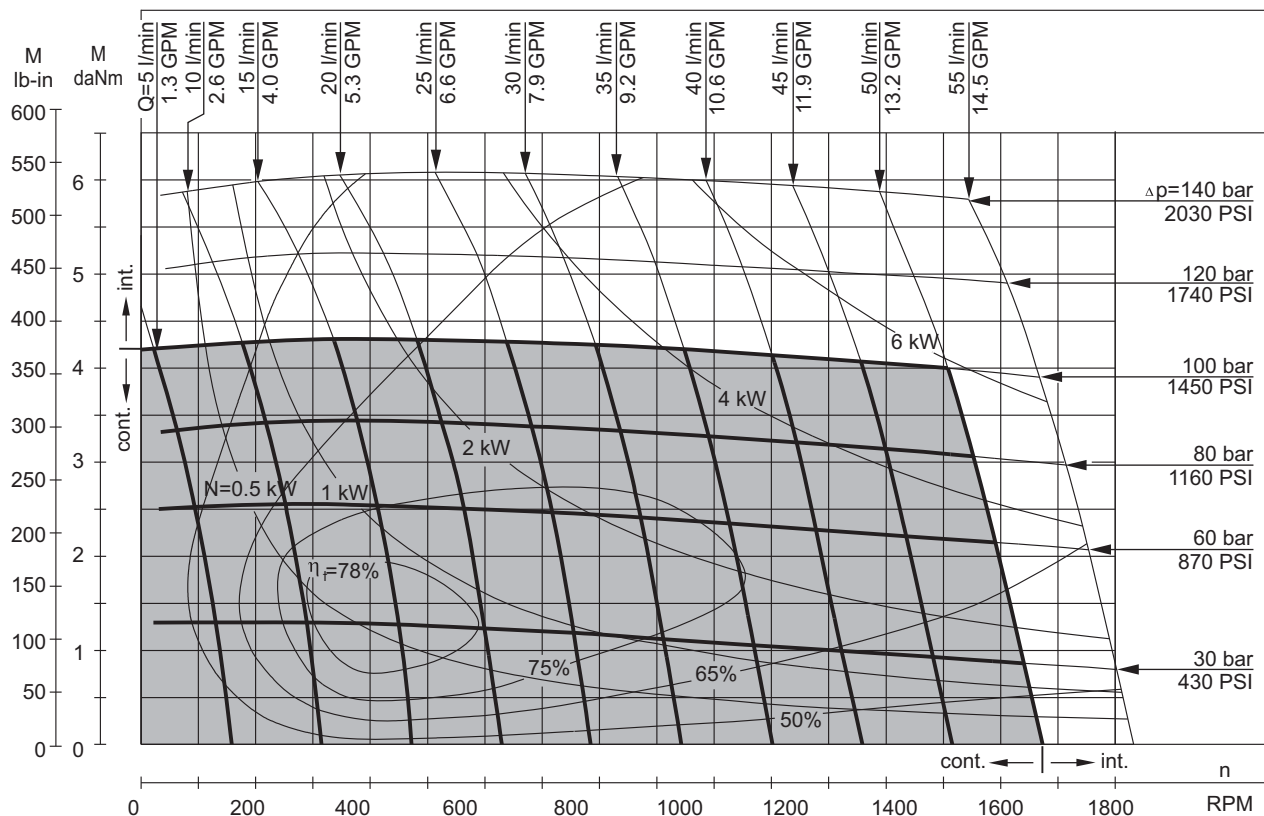
- Intermittent speed and intermittent pressure must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).
If using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

MP 25



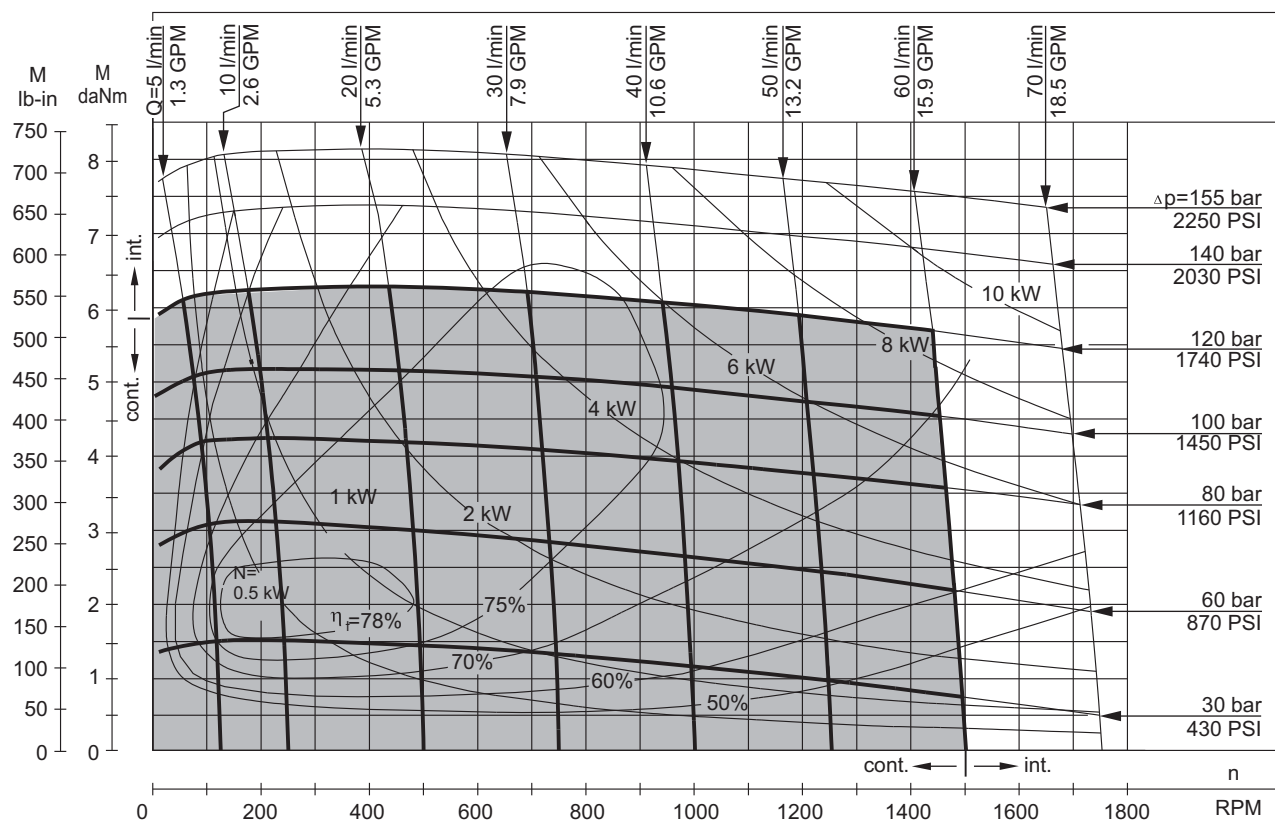
MP 32



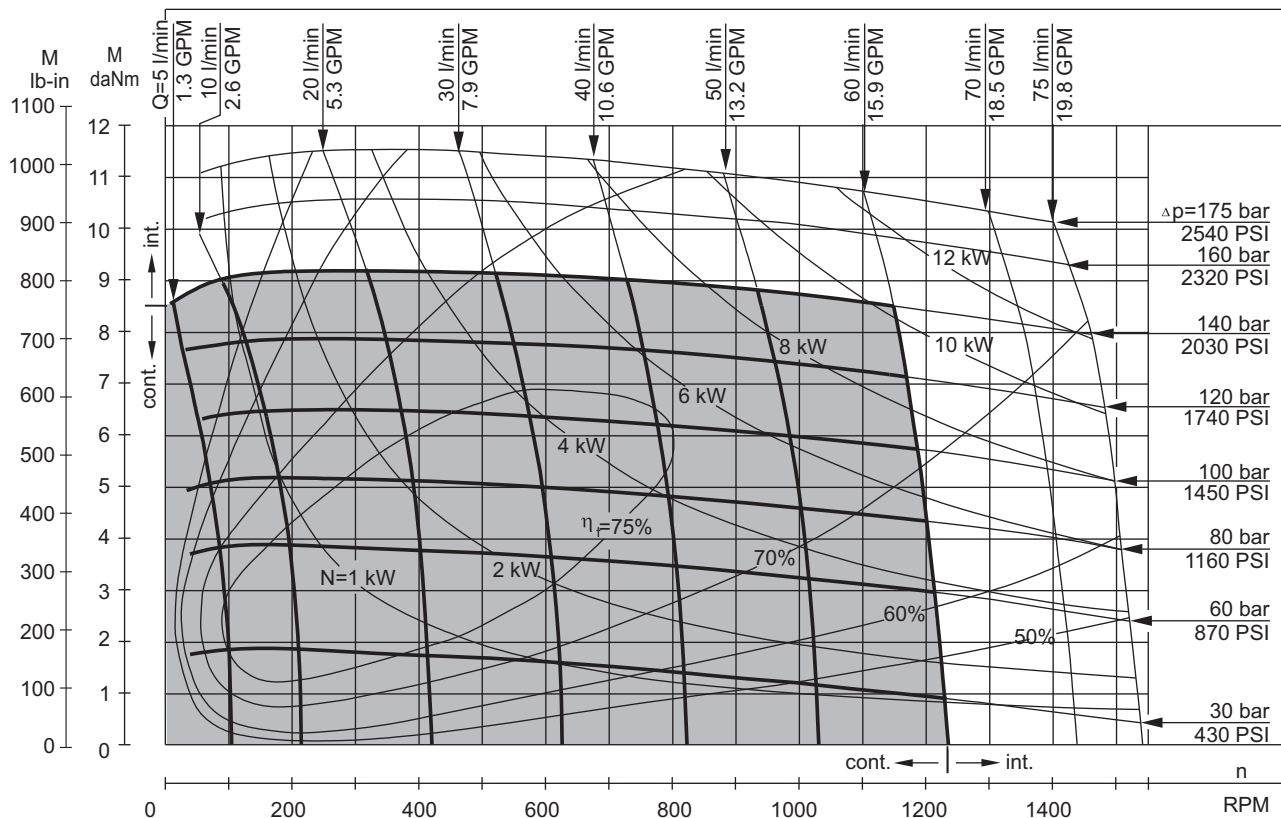
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MP 40



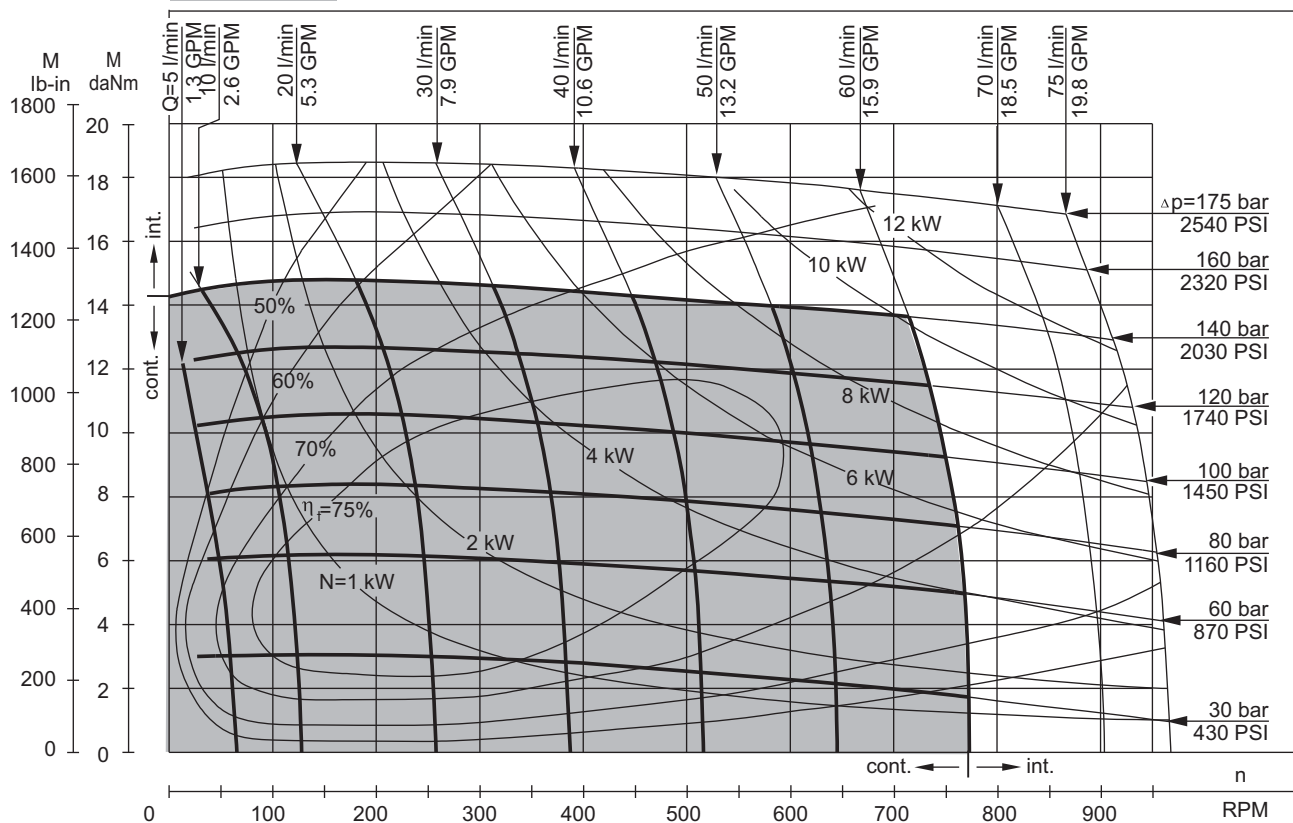
MP 50



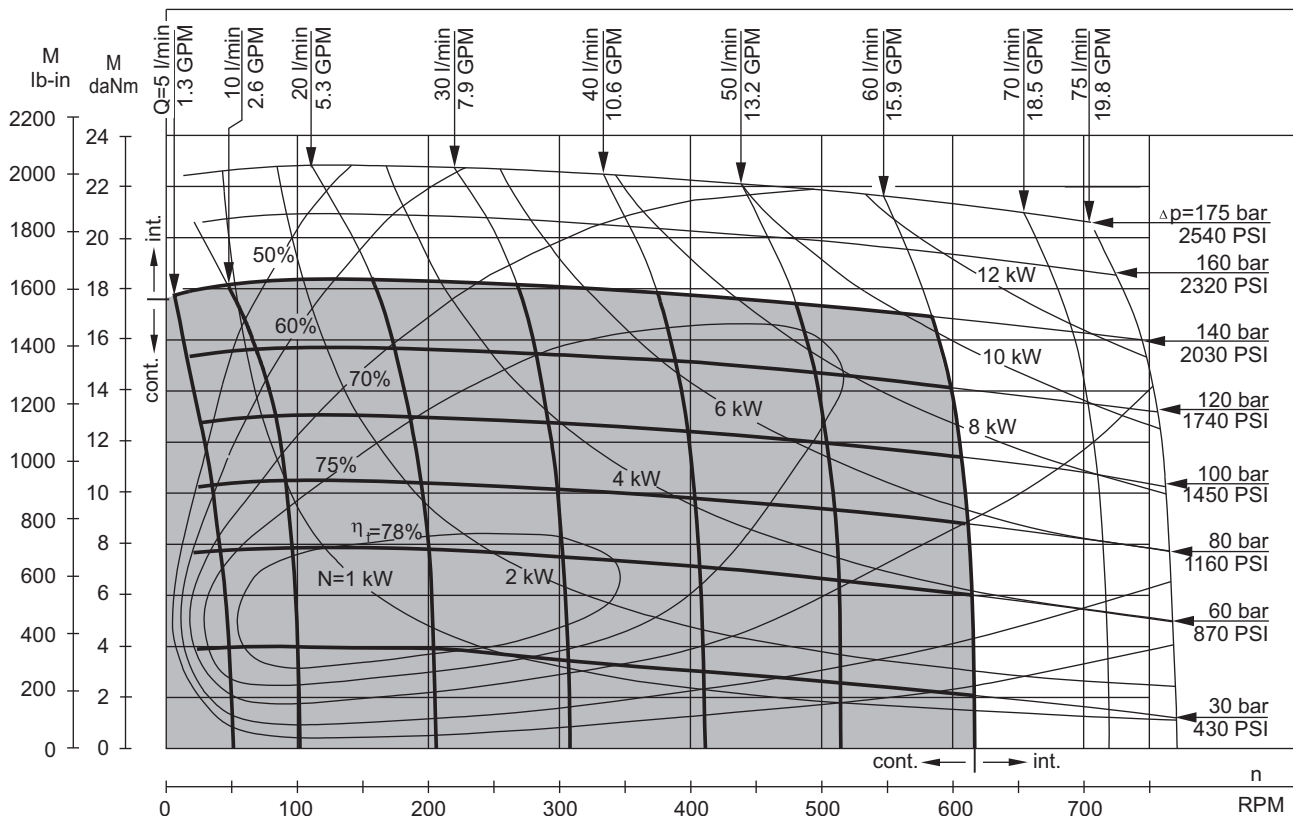
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MP 80



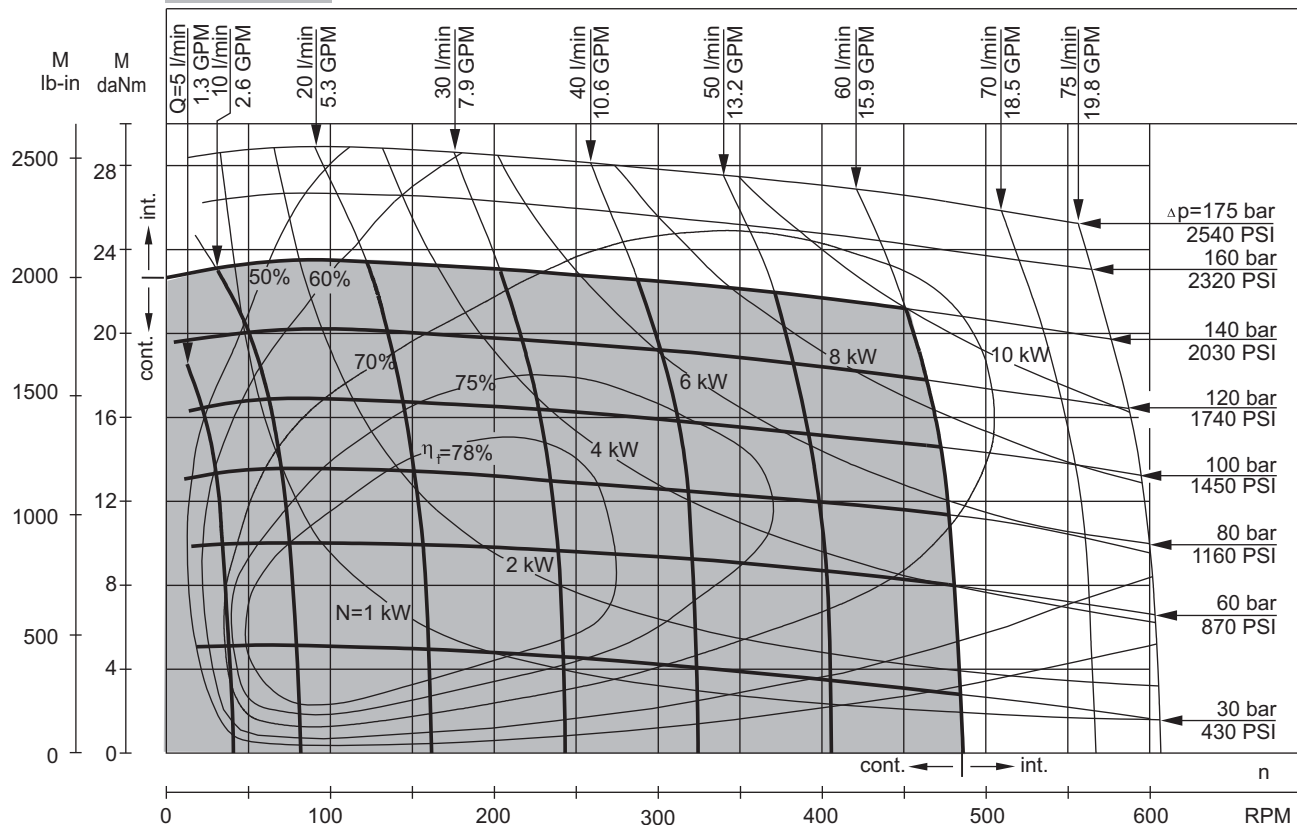
MP 100



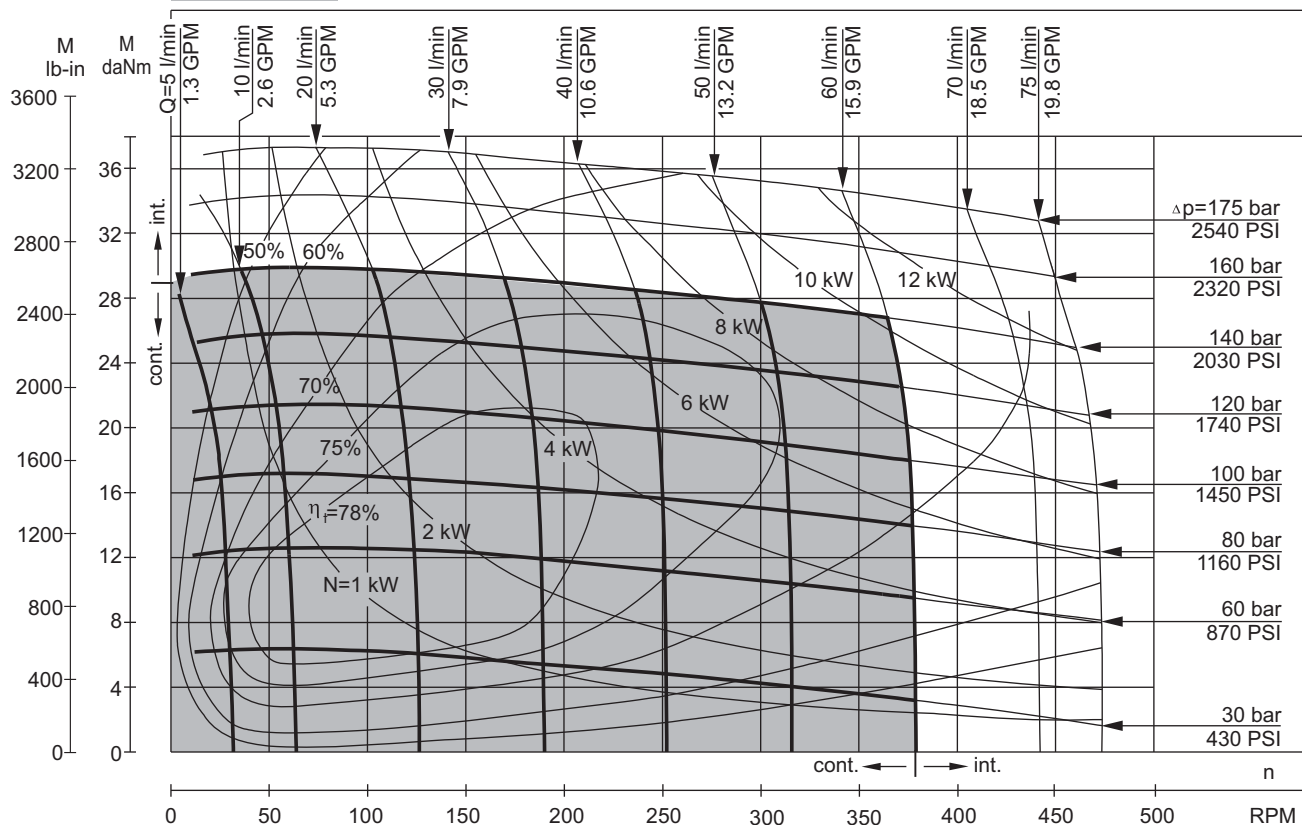
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MP 125



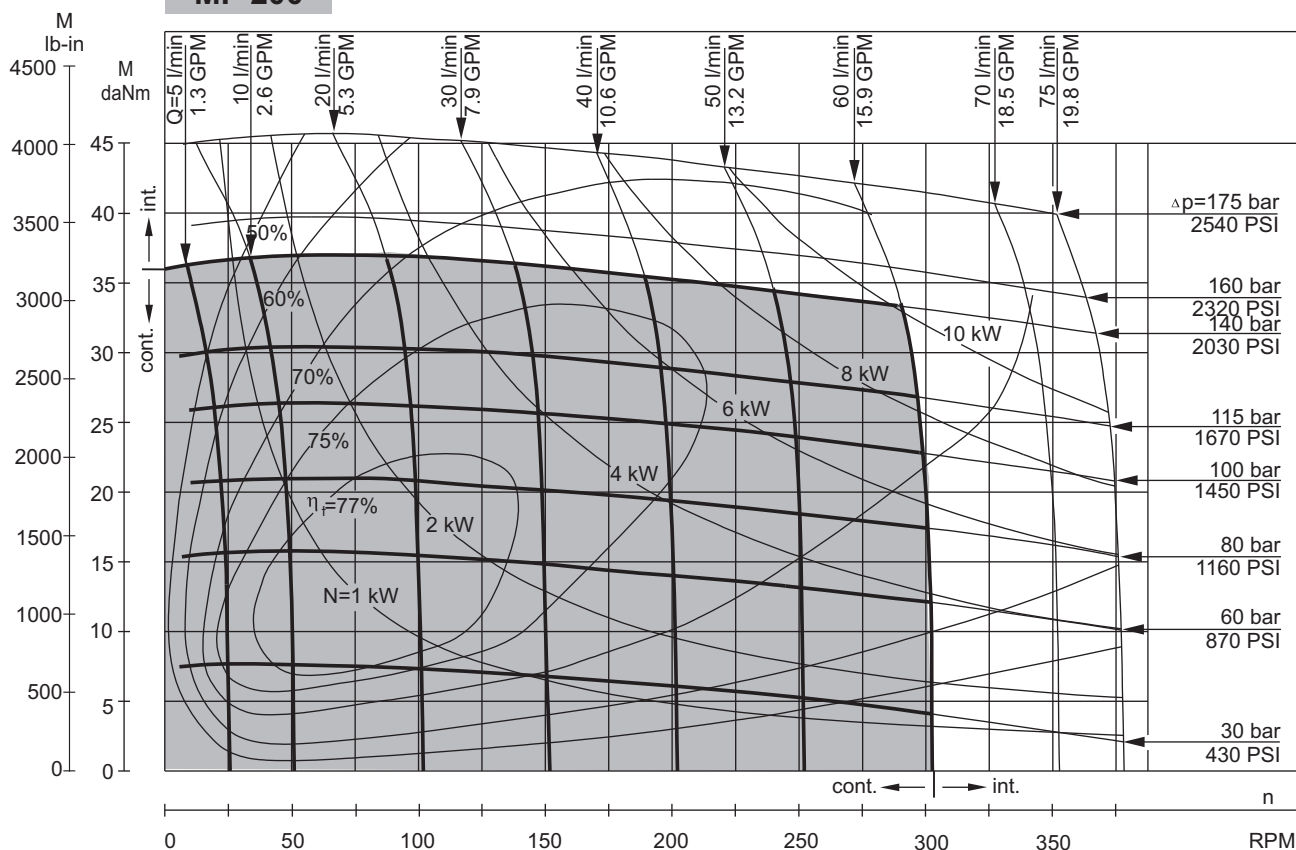
MP 160



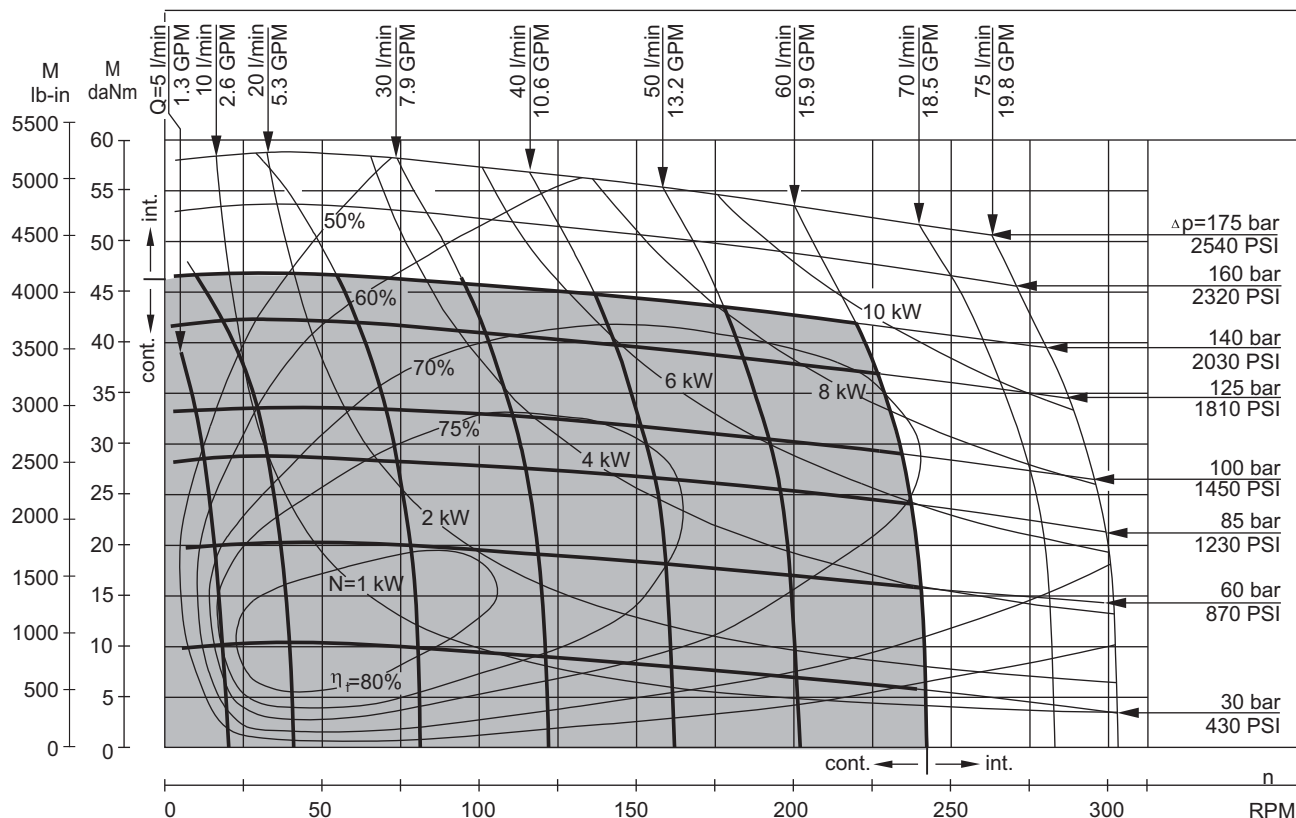
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MP 200



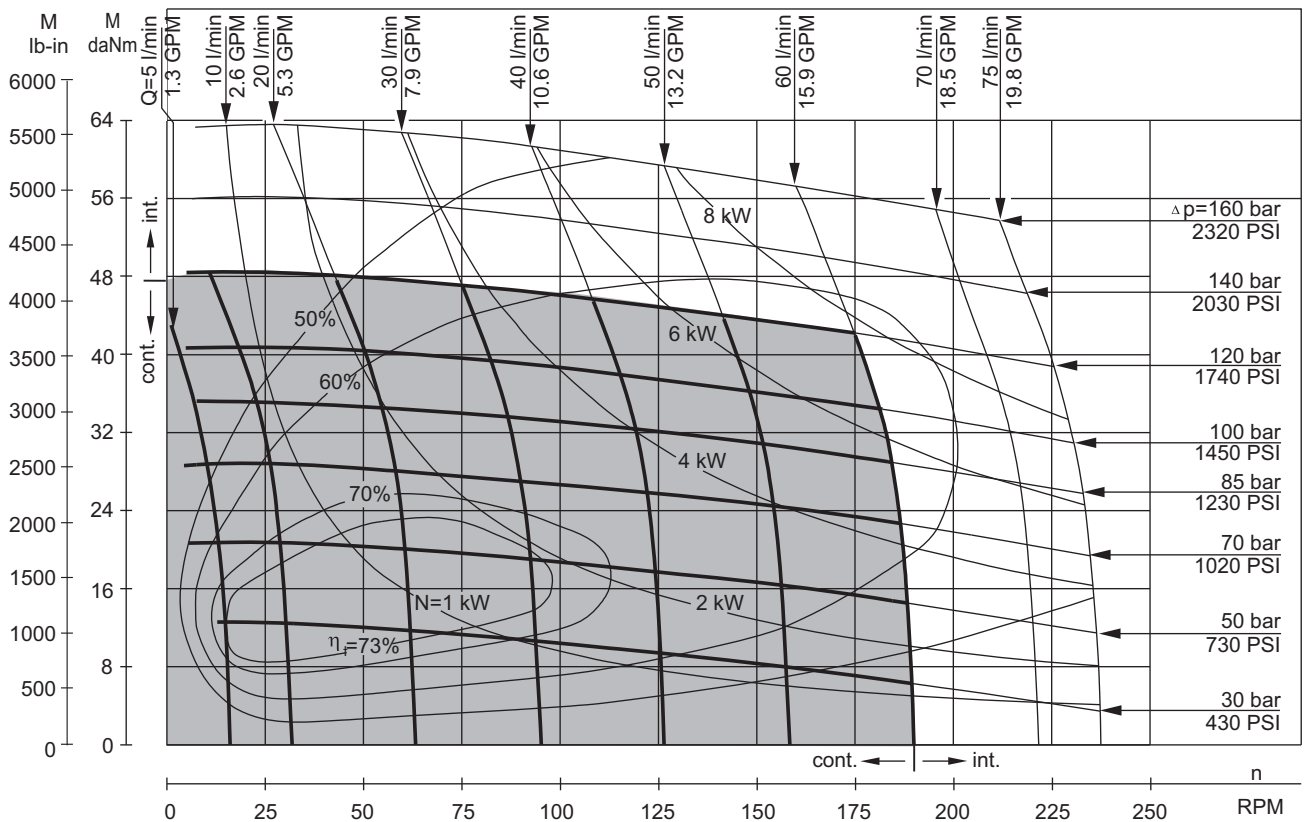
MP 250



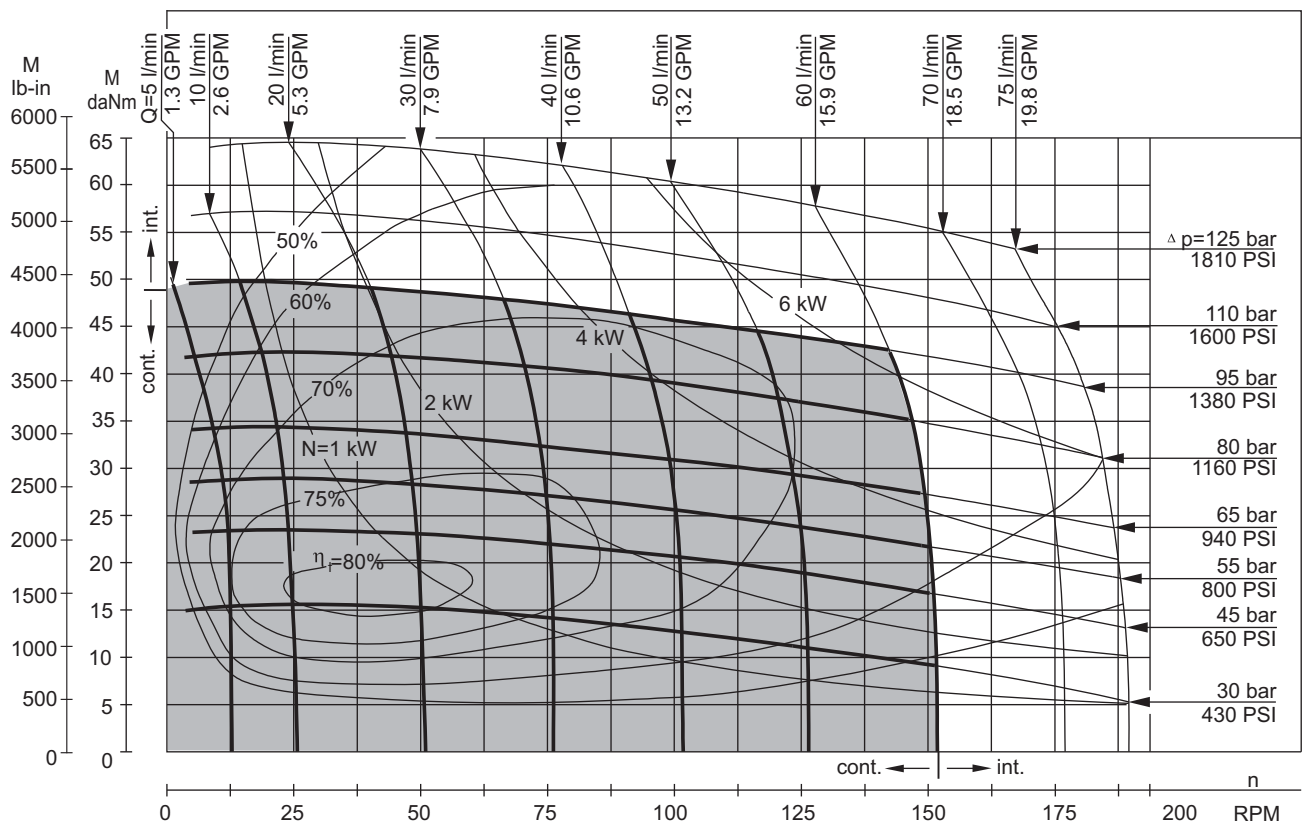
The function diagrams data is for average performance of randomly selected motors at back pressure 5 ± 10 bar [72.5±145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MP 315



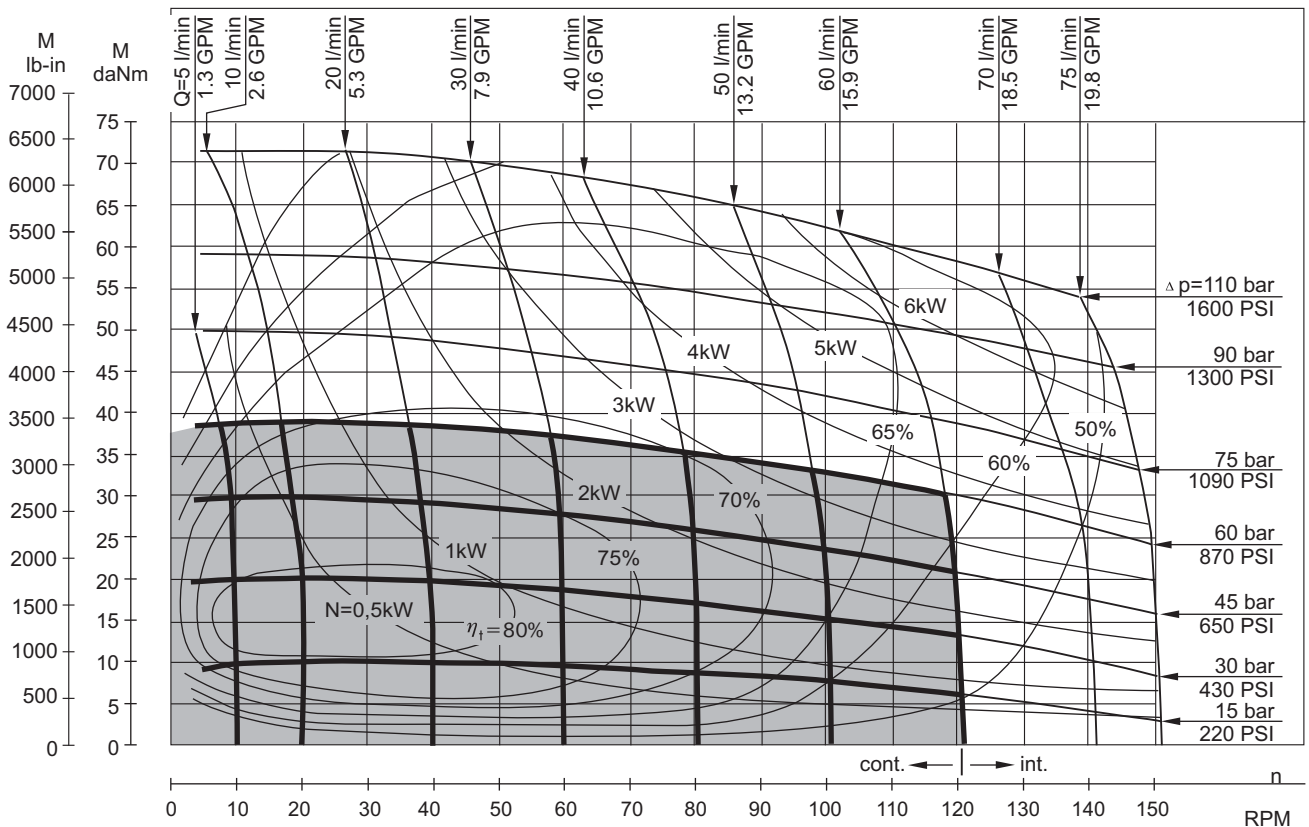
MP 400



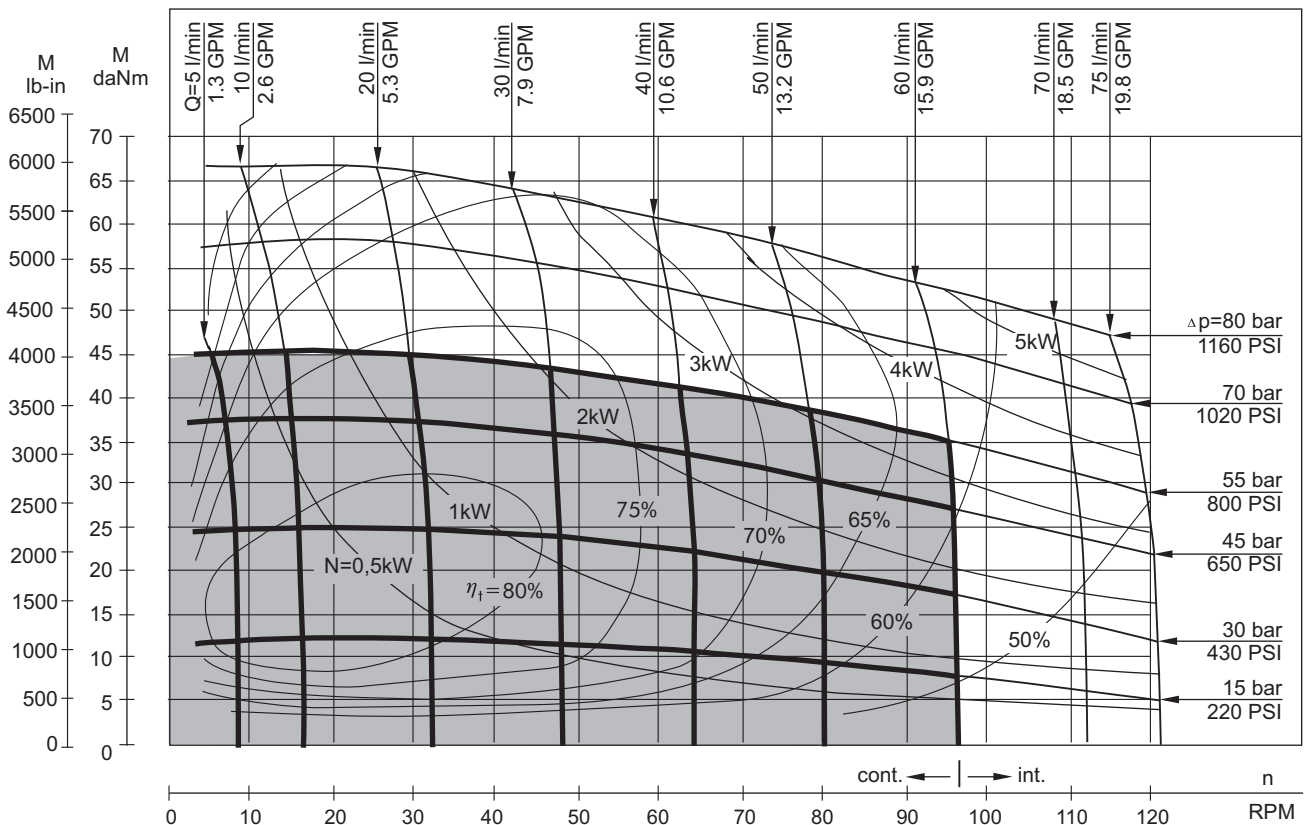
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MP 500

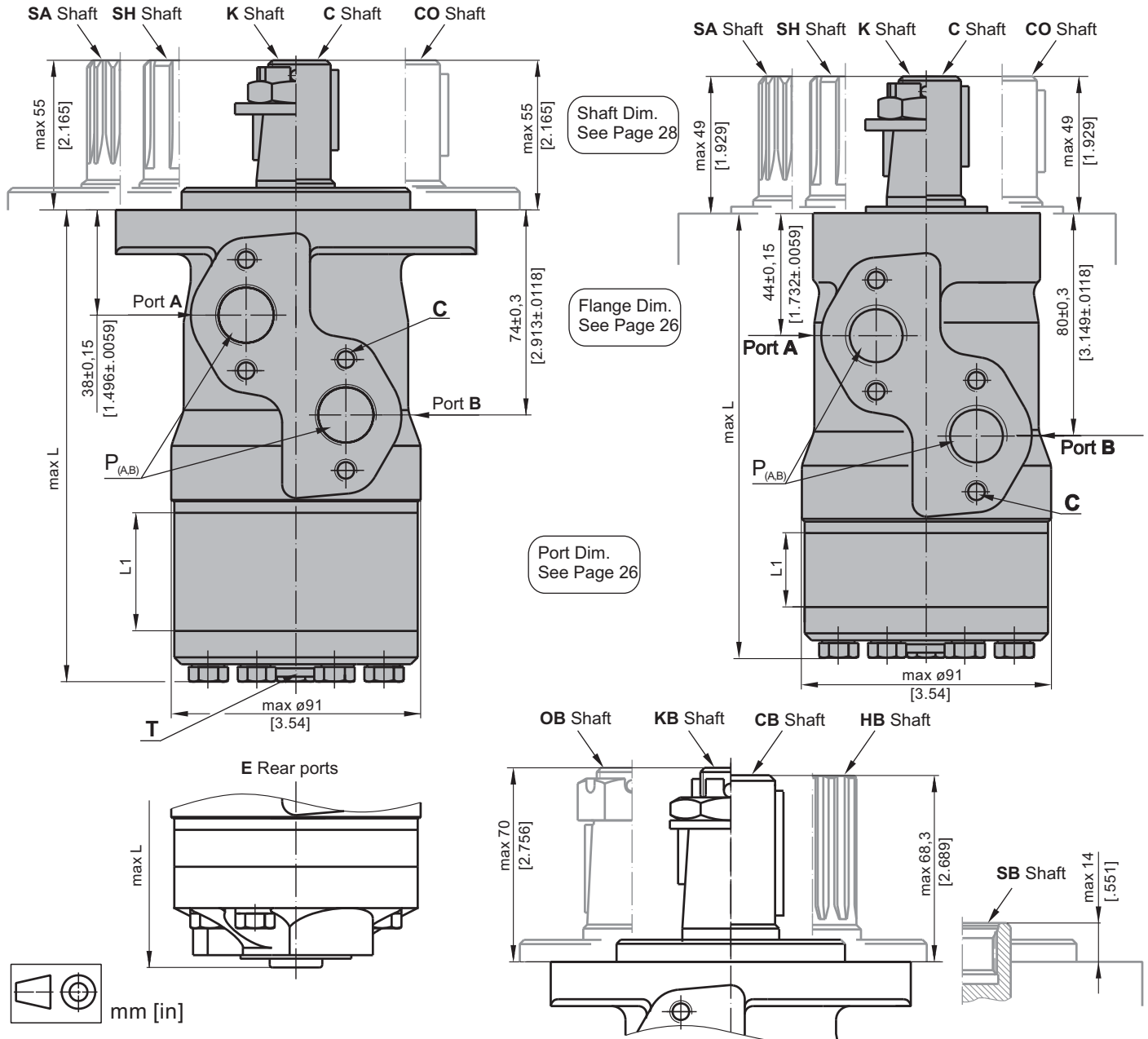


MP 630



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 - **CCW**

Reverse Rotation

Viewed from Shaft End

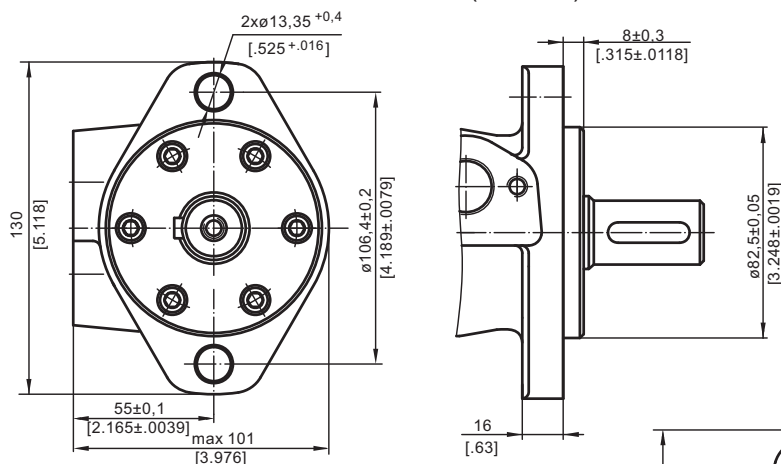
Port A Pressurized - **CCW**

Port B Pressurized - **CW**

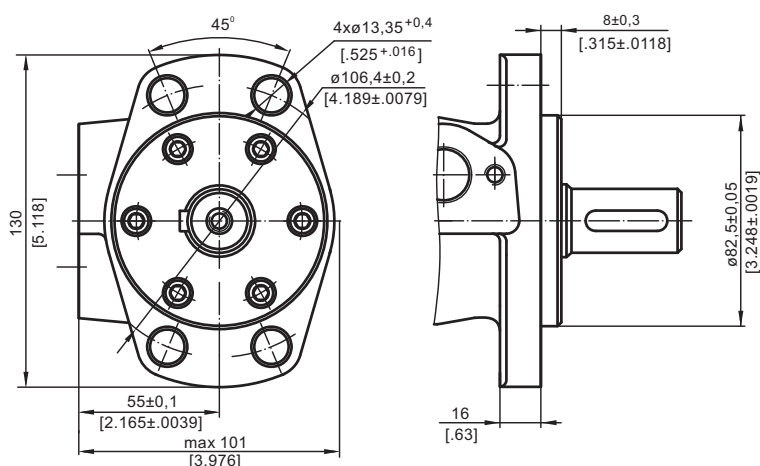
Type	L, mm [in]	Type	L, mm [in]	Type	L, mm [in]	Type	L, mm [in]	L ₁ , mm [in]
MP(F) 25	134,0 [5.28]	MPQ 25	140,5 [5.53]	MP(F)E 25	150,0 [5.91]	MPQE 25	156,5 [6.16]	5,20 [.21]
MP(F) 32	135,0 [5.31]	MPQ 32	141,5 [5.57]	MP(F)E 32	151,5 [5.96]	MPQE 32	157,5 [6.20]	6,30 [.25]
MP(F) 40	136,5 [5.37]	MPQ 40	142,5 [5.61]	MP(F)E 40	152,5 [6.00]	MPQE 40	158,5 [6.24]	7,40 [.29]
MP(F) 50	135,5 [5.33]	MPQ 50	142,0 [5.59]	MP(F)E 50	151,5 [5.96]	MPQE 50	158,0 [6.22]	6,67 [.26]
MP(F) 80	139,5 [5.49]	MPQ 80	146,0 [5.75]	MP(F)E 80	155,5 [6.12]	MPQE 80	162,0 [6.38]	10,67 [.42]
MP(F) 100	142,0 [5.59]	MPQ 100	148,5 [5.85]	MP(F)E 100	158,5 [6.24]	MPQE 100	164,5 [6.48]	13,33 [.52]
MP(F) 125	145,5 [5.73]	MPQ 125	152,0 [5.98]	MP(F)E 125	161,5 [6.36]	MPQE 125	168,0 [6.61]	16,67 [.66]
MP(F) 160	150,0 [5.91]	MPQ 160	156,5 [6.16]	MP(F)E 160	166,5 [6.56]	MPQE 160	172,5 [6.79]	21,33 [.84]
MP(F) 200	155,5 [6.12]	MPQ 200	162,0 [6.38]	MP(F)E 200	171,5 [6.75]	MPQE 200	178,0 [7.01]	26,67 [1.05]
MP(F) 250	162,0 [6.38]	MPQ 250	168,5 [6.63]	MP(F)E 250	178,5 [7.03]	MPQE 250	184,5 [7.26]	33,33 [1.31]
MP(F) 315	171,5 [6.75]	MPQ 315	178,0 [7.01]	MP(F)E 315	187,5 [7.38]	MPQE 315	194,0 [7.64]	42,67 [1.68]
MP(F) 400	182,0 [7.17]	MPQ 400	188,5 [7.42]	MP(F)E 400	198,5 [7.81]	MPQE 400	204,5 [8.05]	53,33 [2.10]
MP(F) 500	195,5 [7.70]	MPQ 500	202,0 [7.95]	MP(F)E 500	211,5 [8.33]	MPQE 500	218,0 [8.58]	66,63 [2.62]
MP(F) 630	213,0 [8.39]	MPQ 630	219,0 [8.62]	MP(F)E 630	229,0 [9.02]	MPQE 630	235,0 [9.25]	84,00 [3.31]

MOUNTING

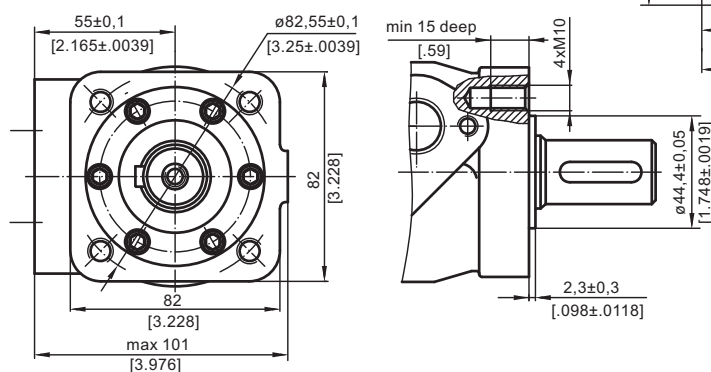
Oval Mount (2 Holes)



F - Oval Mount (4 Holes)

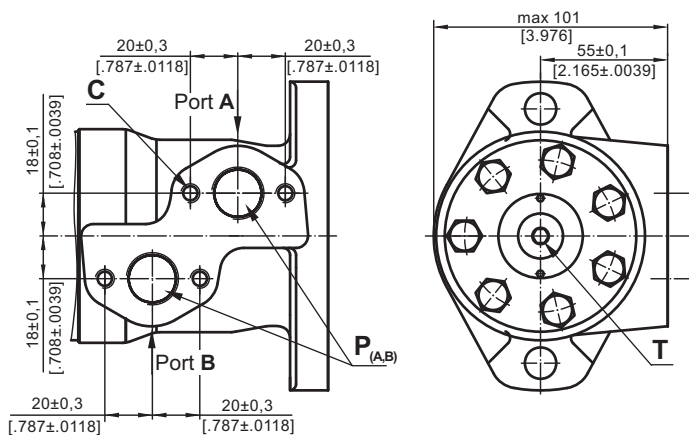


Q - Square Mount (4 Bolts)

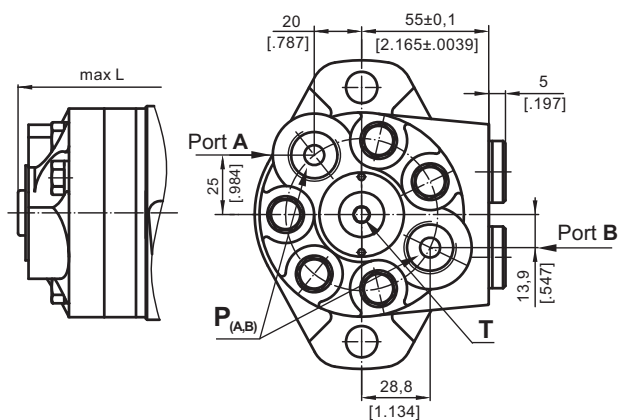


PORTS

Side Ports



E Rear Ports



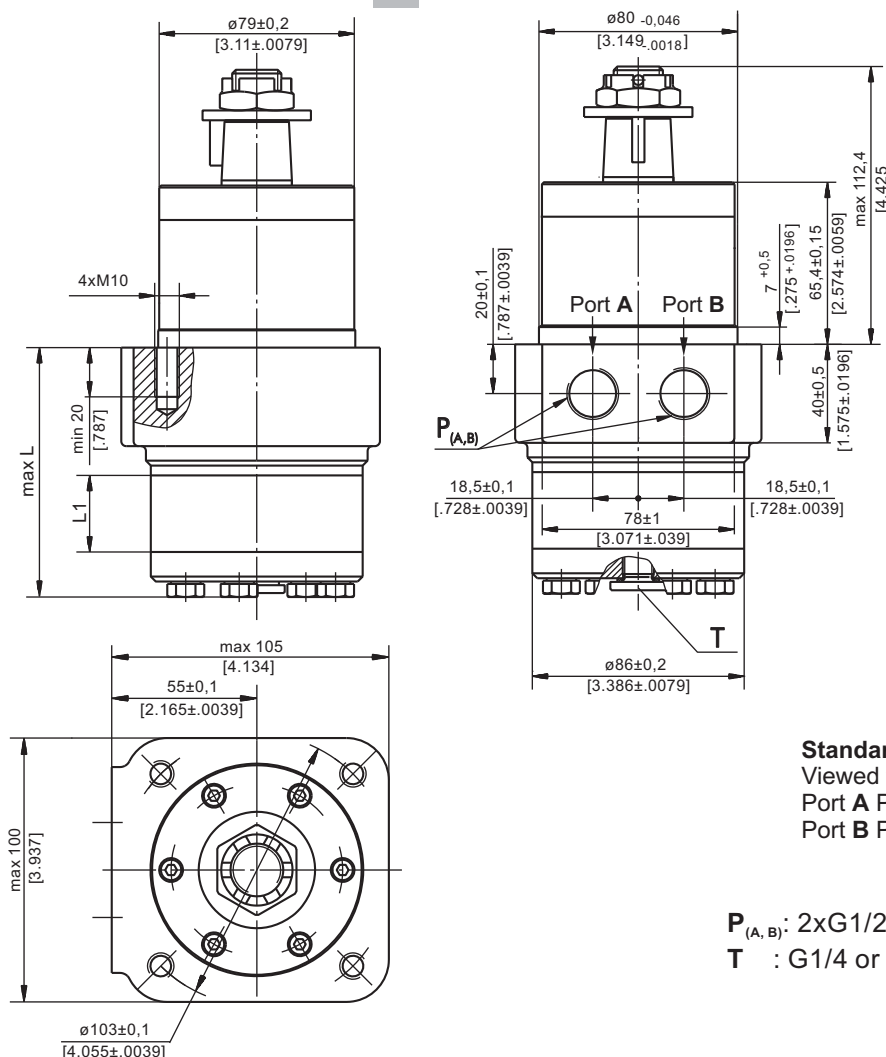
C : 4xM8 - 13 mm [.51 in] depth
P_(A,B) : 2xG1/2 or 2xM22x1,5 - 15 mm [.59 in] depth
T : G1/4 or M14x1,5 - 12 mm [.47 in] depth (plugged)

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

DIMENSIONS AND MOUNTING DATA - MPW

W - Wheel Mount



Type	L, mm [in]	L ₁ , mm [in]
MPW 25	77,0 [3.03]	5,20 [.21]
MPW 32	78,0 [3.07]	6,30 [.25]
MPW 40	79,5 [3.13]	7,40 [.29]
MPW 50	78,5 [3.09]	6,67 [.26]
MPW 80	82,5 [3.25]	10,67 [.42]
MPW 100	85,0 [3.35]	13,33 [.52]
MPW 125	88,5 [3.48]	16,67 [.66]
MPW 160	93,0 [3.66]	21,33 [.84]
MPW 200	98,5 [3.88]	26,67 [1.05]
MPW 250	105,0 [4.13]	33,33 [1.31]
MPW 315	114,5 [4.51]	42,67 [1.68]
MPW 400	125,0 [4.92]	53,33 [2.10]
MPW 500	138,5 [5.45]	66,63 [2.62]
MPW 630	156,0 [6.14]	84,00 [3.31]



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

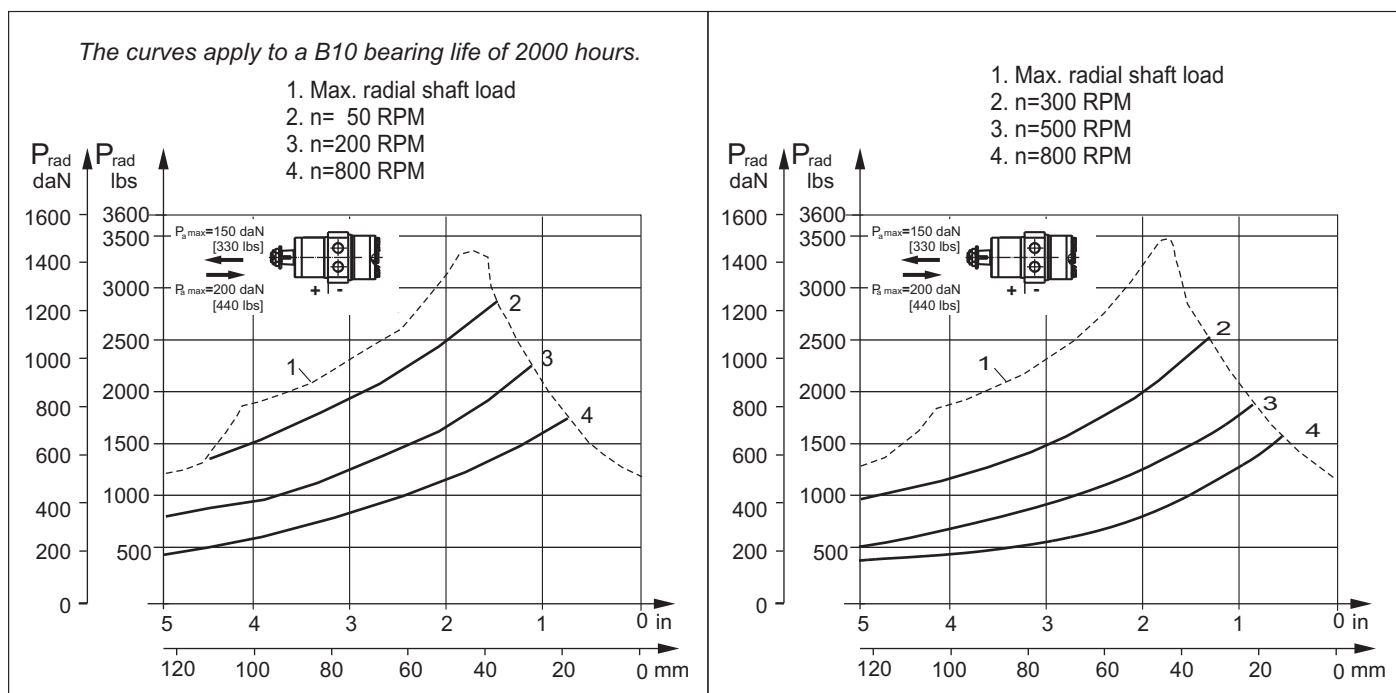
Reverse Rotation
Viewed from Shaft End
Port A Pressurized - CCW
Port B Pressurized - CW

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)

PERMISSIBLE SHAFT LOADS

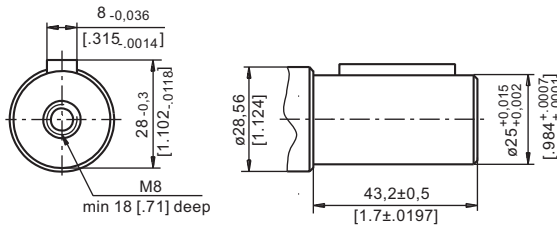
MPWN

MPW

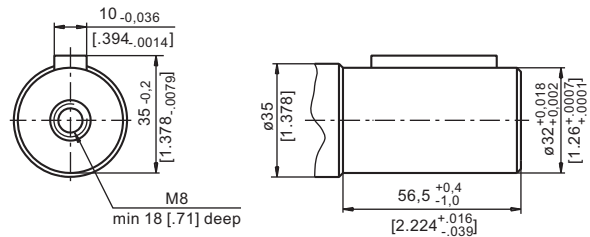


SHAFT EXTENSIONS FOR MP AND MR MOTORS

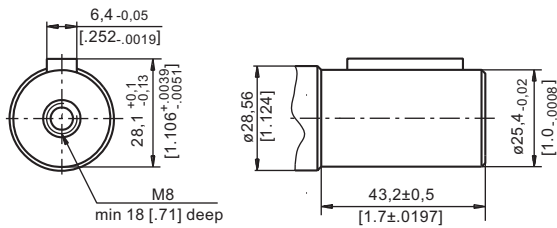
C - $\varnothing 25$ straight, Parallel key A8x7x32 DIN 6885
Max. Torque 34 daNm [3010 lb-in]



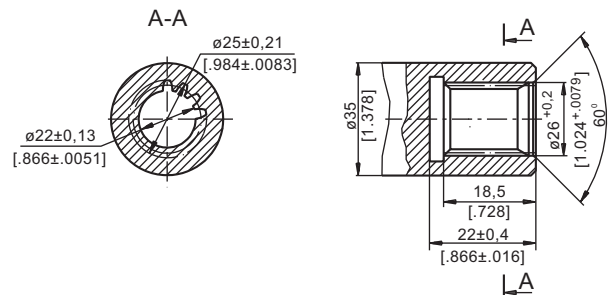
CB - $\varnothing 32$ straight, Parallel key A10x8x45 DIN 6885
Max. Torque 77 daNm [6815 lb-in]



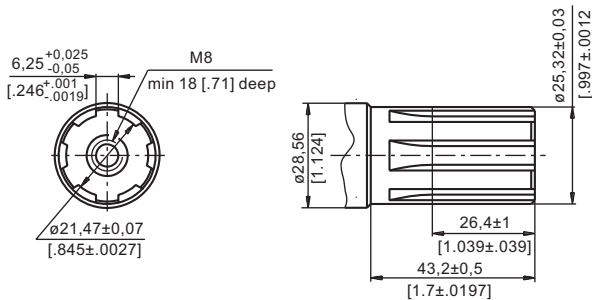
CO - $\varnothing 1$ " straight, Parallel key $\frac{1}{4}$ "x $\frac{1}{4}$ "x $\frac{1}{4}$ " BS46
Max. Torque 34 daNm [3010 lb-in]



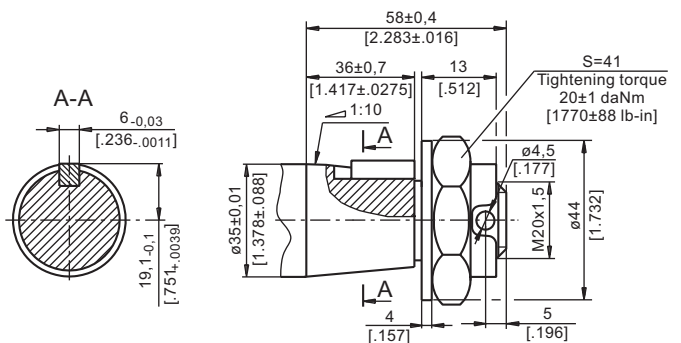
SB - splined A25x22xH10 DIN 5482
Max. Torque 34 daNm [3010 lb-in]



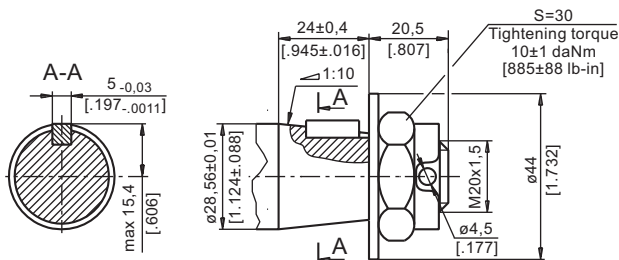
SH - splined, BS 2059 (SAE 6B)
Max. Torque 40 daNm [3540 lb-in]



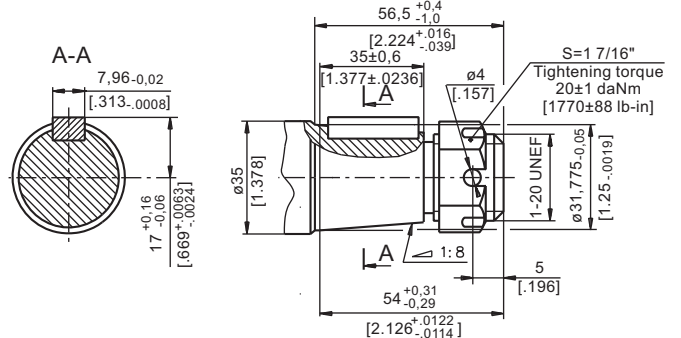
KB - tapered 1:10, Parallel key B6x6x20 DIN 6885
Max. Torque 77 daNm [6815 lb-in]



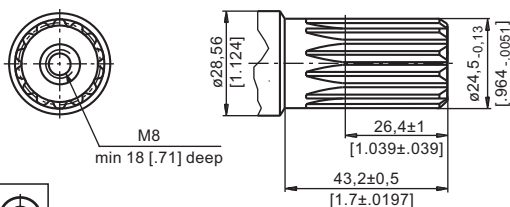
K - tapered 1:10, Parallel key B5x5x14 DIN 6885
Max. Torque 40 daNm [3540 lb-in]



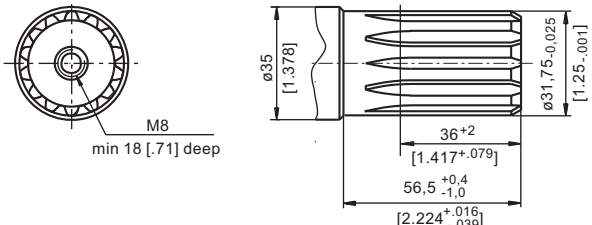
OB - tapered 1:8 SAEJ 501, Parallel key $\frac{5}{16}$ "x $\frac{5}{16}$ "x $\frac{1}{4}$ " BS46
Max. Torque 77 daNm [6815 lb-in]



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

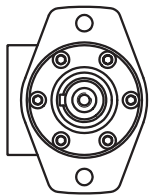
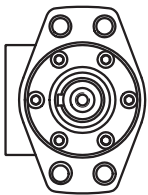
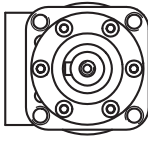


HB - $\varnothing 1\frac{1}{4}$ " splined 14T, ANSI B92.1-1976 Norm
Max. Torque 77 daNm [6815 lb-in]



PERMISSIBLE SHAFT LOADS FOR MP AND MR MOTORS

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.

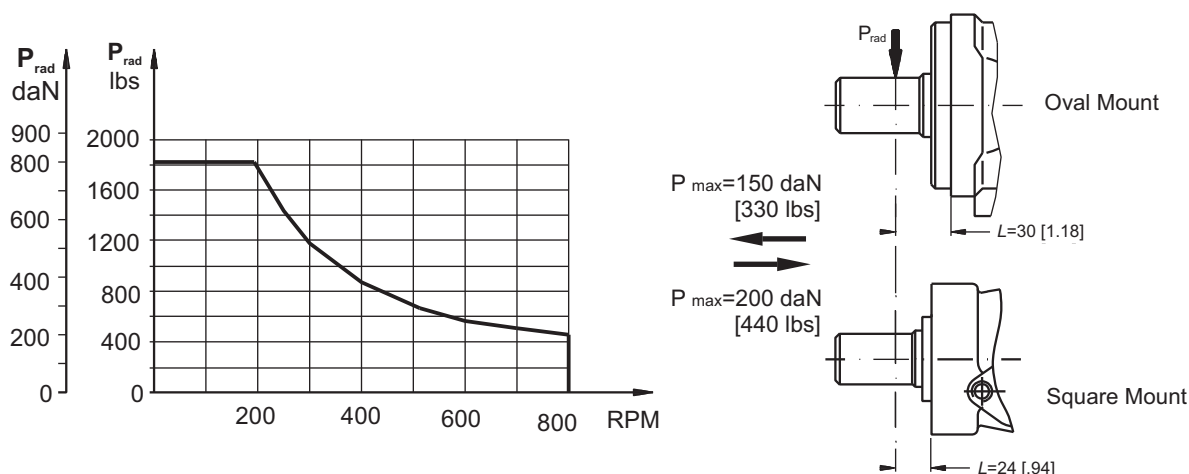
Mounting Flange			
Shaft Version	cylindrical - C, CO tapered - K, splined - SH	splined - HB cylindrical - CB	cylindrical - C, CO
Radial Shaft Load P_{rad} , in mm	$\frac{800}{n} \times \frac{25000}{95+L}, \text{ daN}^*$	$\frac{800}{n} \times \frac{18750}{95+L}, \text{ daN}^*$	$\frac{800}{n} \times \frac{25000}{101+L},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

* $n < 200$ RPM; max P_{rad} =800 daN [1800 lbs]

$n \geq 200$ RPM; $L < 55$ mm [2.2 in]

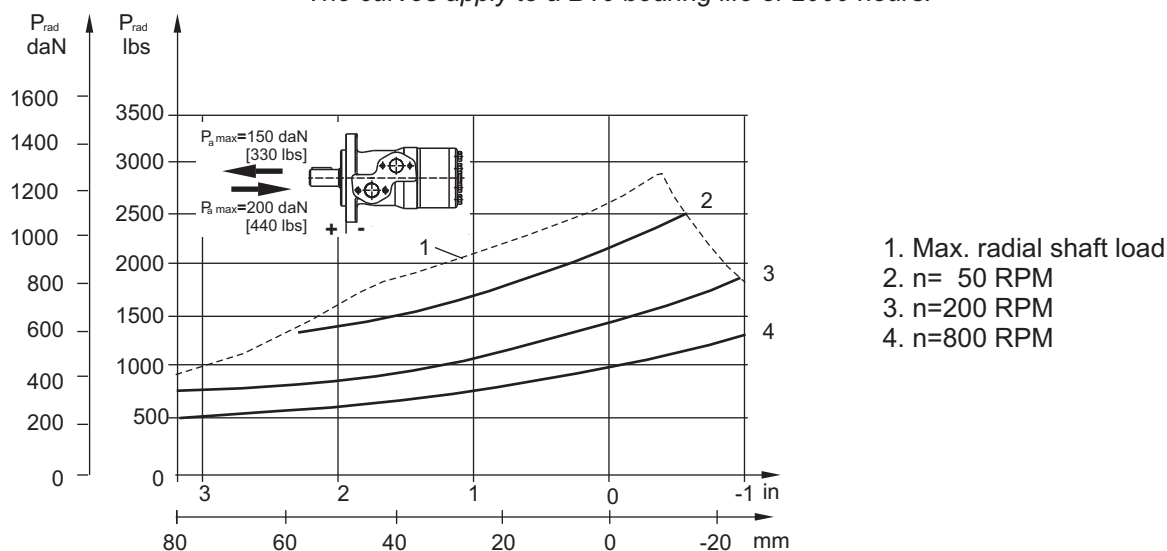
MP AND MR

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



MPN AND MRN

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

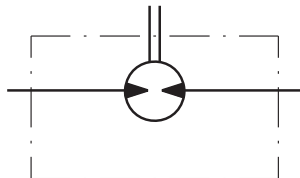


MAX. PERMISSIBLE SHAFT SEAL PRESSURE FOR MP AND MR MOTORS

MP/MR...U1 motors with high pressure seal and without drain connection:

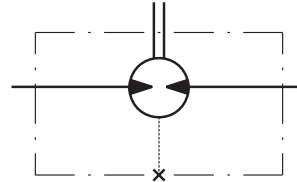
The shaft seal pressure equals the average
of input pressure and return pressure.

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



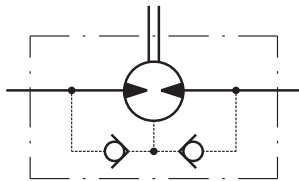
MP/MR...U motors with high pressure seal and drain connection:

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



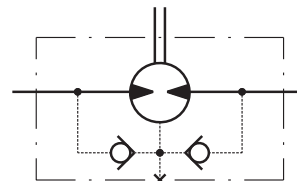
MP/MR...1 motors with low pressure seal or standard shaft seal and without drain connection:

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

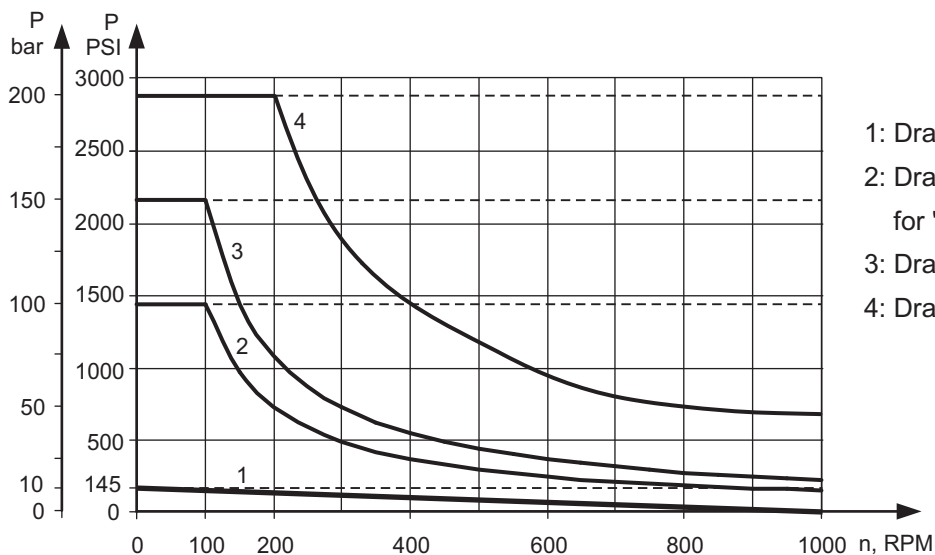


MP/MR... motors with low pressure seal or standard shaft seal and with drain connection:

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 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
M P										

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

- | | |
|------------|---|
| 25* | - 25,0 cm ³ /rev [1.52 in ³ /rev] |
| 32* | - 32,0 cm ³ /rev [1.95 in ³ /rev] |
| 40* | - 40,0 cm ³ /rev [2.44 in ³ /rev] |
| 50 | - 49,5 cm ³ /rev [3.02 in ³ /rev] |
| 80 | - 79,2 cm ³ /rev [4.83 in ³ /rev] |
| 100 | - 99,0 cm ³ /rev [6.04 in ³ /rev] |
| 125 | - 123,8 cm ³ /rev [7.55 in ³ /rev] |
| 160 | - 158,4 cm ³ /rev [9.66 in ³ /rev] |
| 200 | - 198,0 cm ³ /rev [12.10 in ³ /rev] |
| 250 | - 247,5 cm ³ /rev [15.10 in ³ /rev] |
| 315 | - 316,8 cm ³ /rev [19.30 in ³ /rev] |
| 400 | - 396,0 cm ³ /rev [24.16 in ³ /rev] |
| 500 | - 495,0 cm ³ /rev [30.20 in ³ /rev] |
| 630 | - 623,6 cm ³ /rev [38.05 in ³ /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 5/16"x5/16"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:

- * Not with Low Pressure Seal
 ** The permissible output torque for shafts must not be exceeded!

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

Displacement codes 25, 32, 40 and 50 are not allowed with **B**, **K**, **L**, **R** shafts!

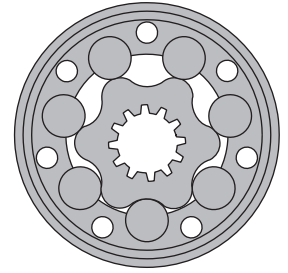
The hydraulic motors are mangano-phosphatized as standard.

HYDRAULIC MOTORS MR



APPLICATION

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



CONTENTS

Specification data	29÷30
Function diagrams	31÷39
Dimensions and mounting	40÷41
Shaft extensions	28
Permissible shaft loads	29
Permissible shaft Seal Pressure ...	30
Order code	42

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

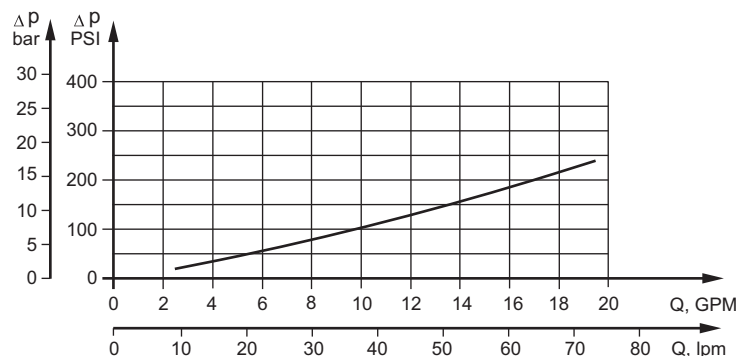
GENERAL

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.
(ø28,56 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 [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.

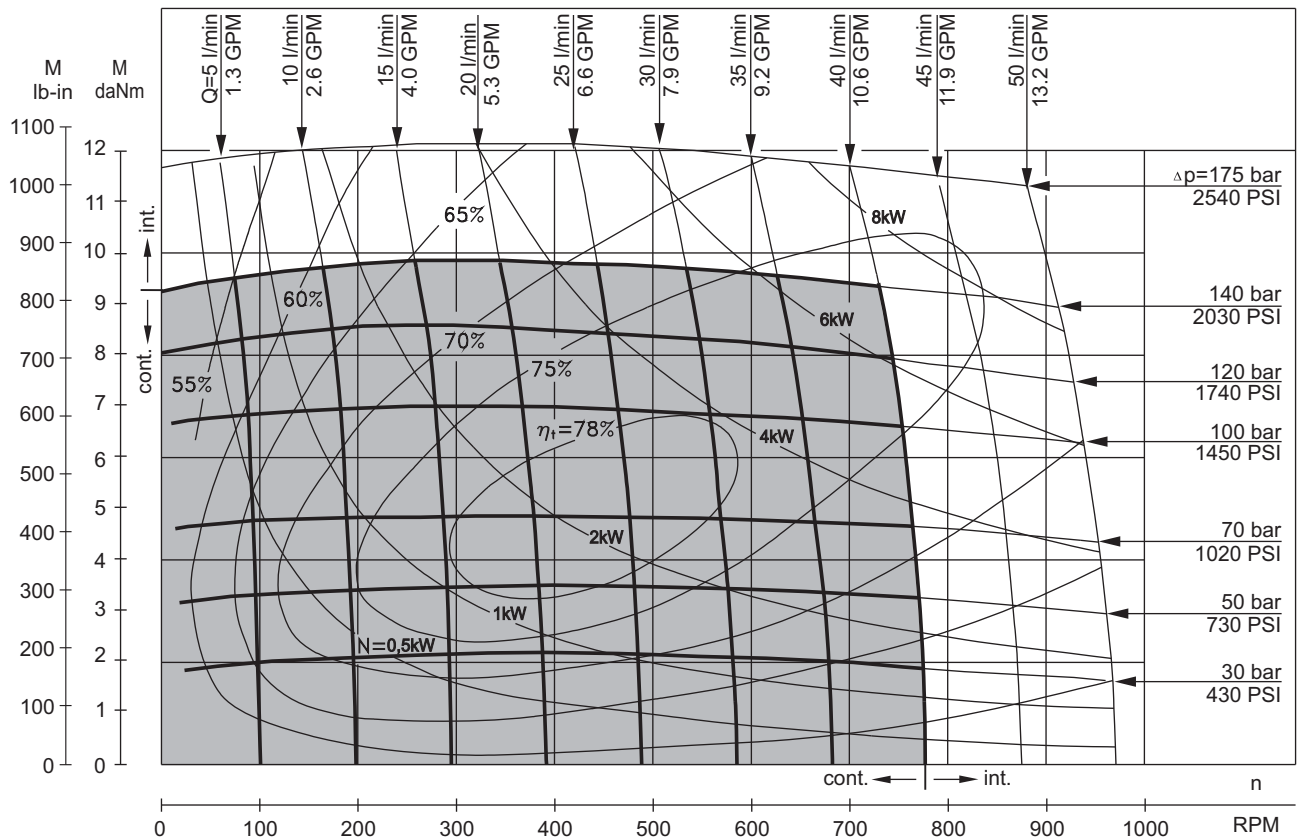
** Peak load: the permissible values may occur for max. 1% of every minute.

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

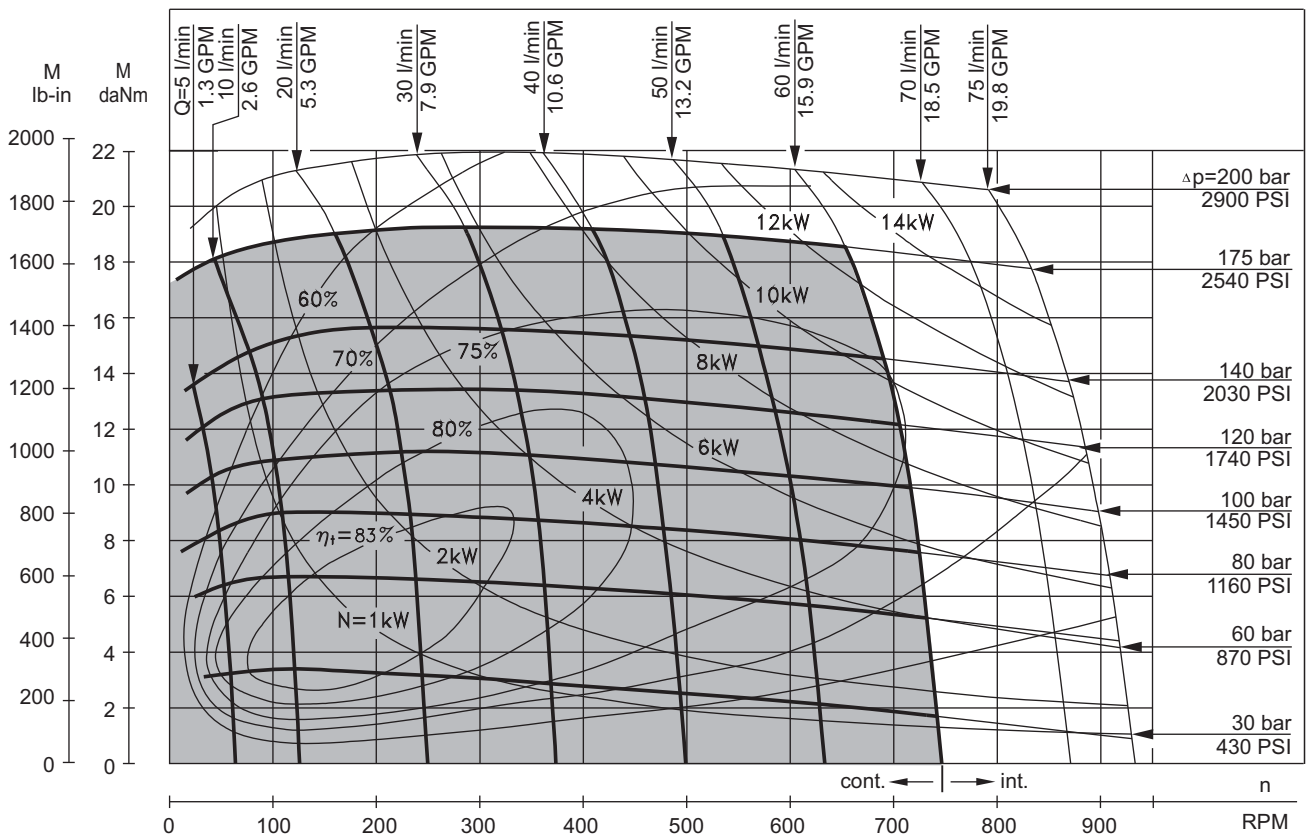
- Intermittent speed and intermittent pressure must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).
If using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



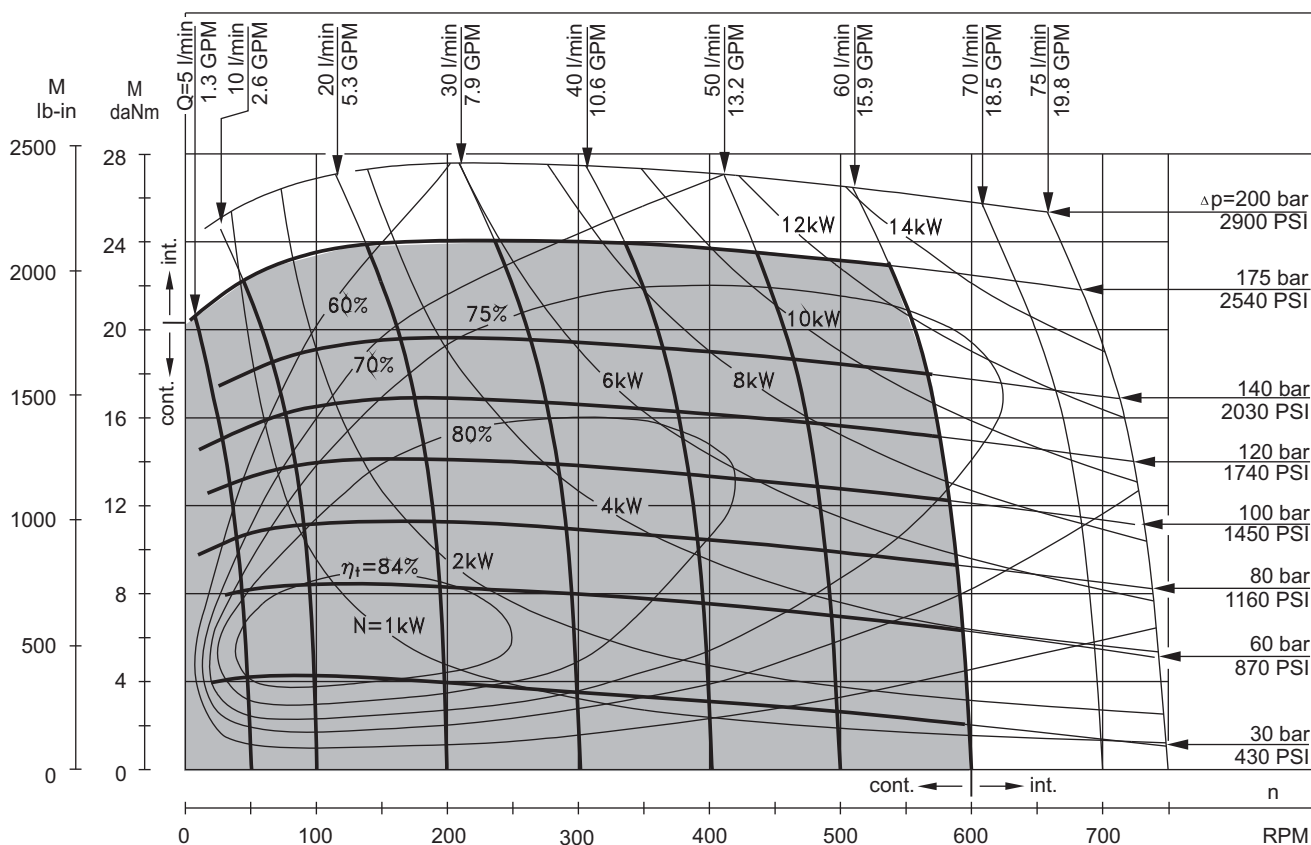
MR 80



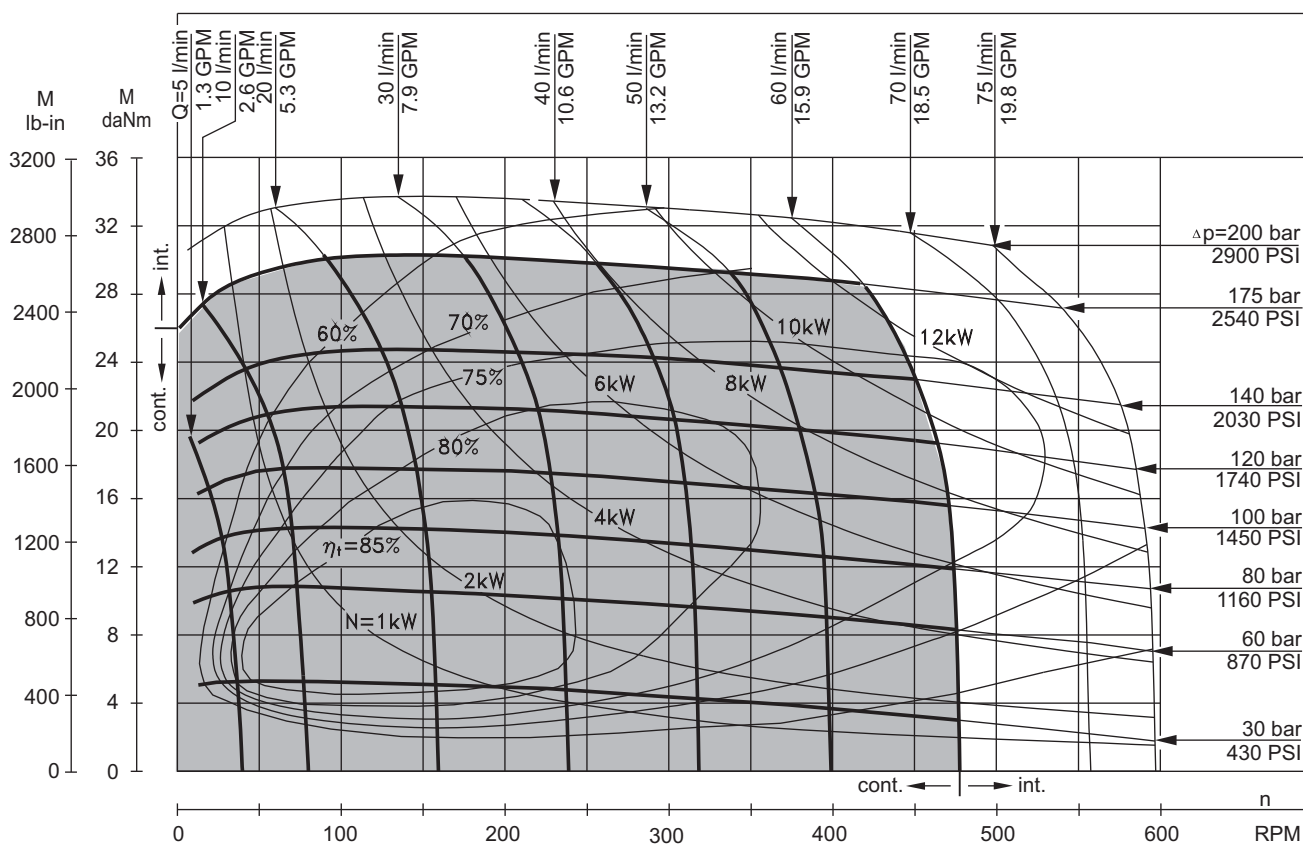
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MR 100



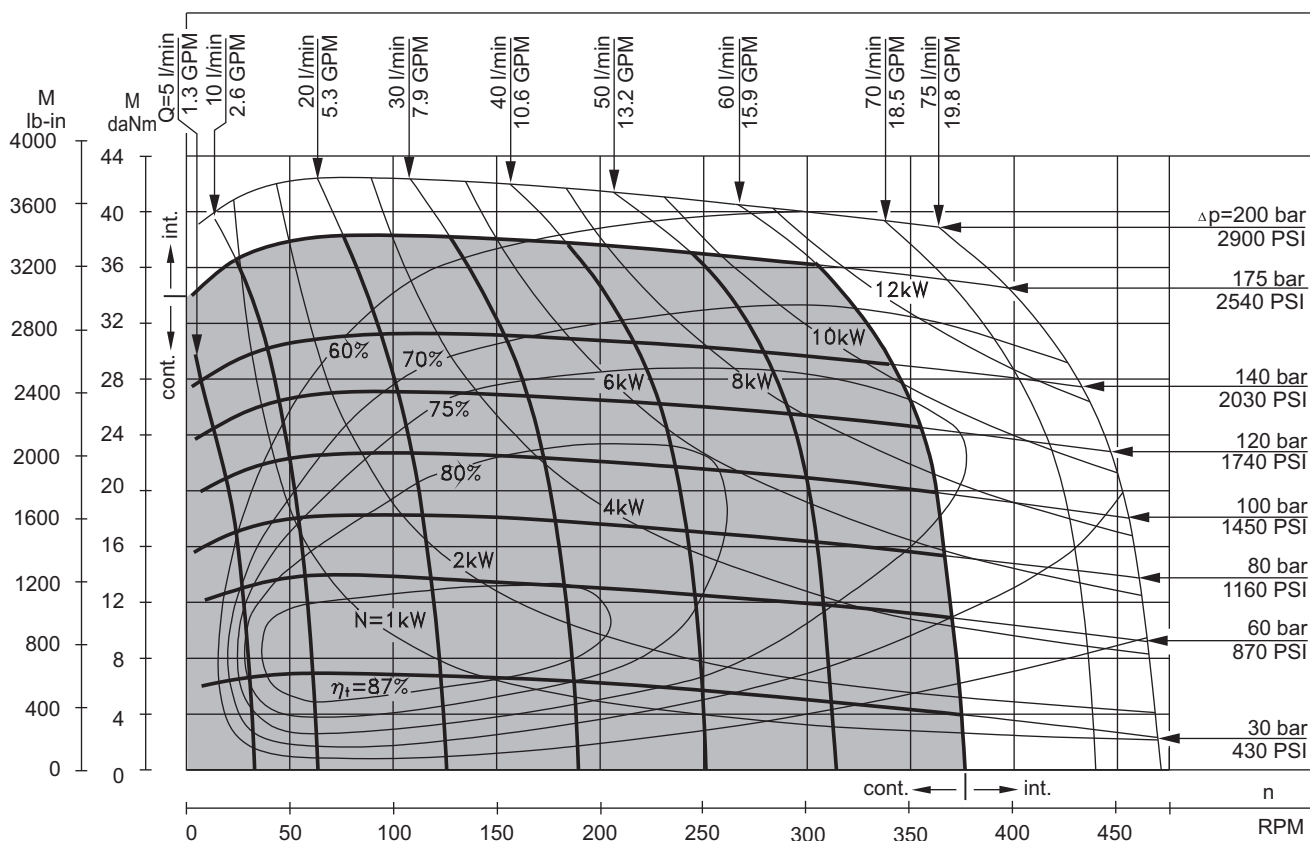
MR 125



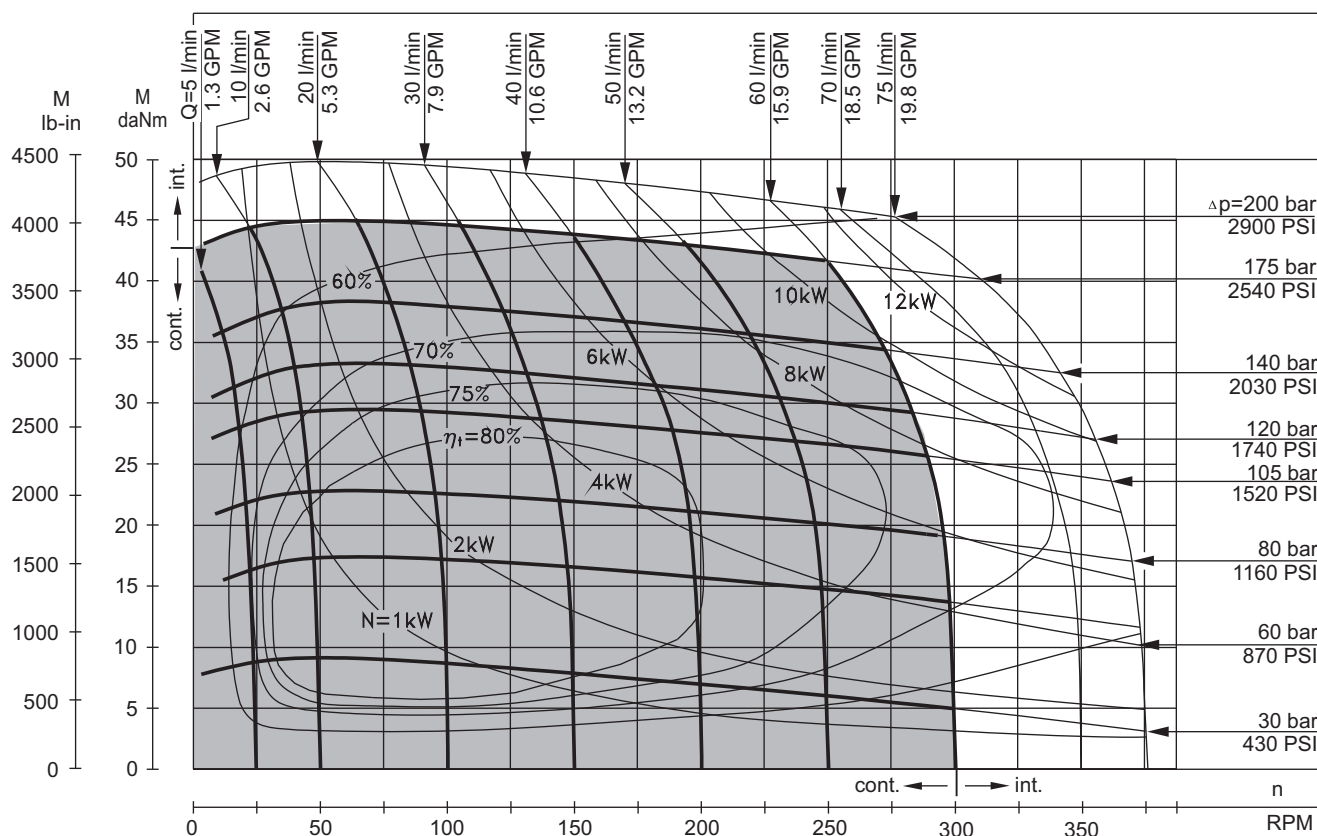
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MR 160



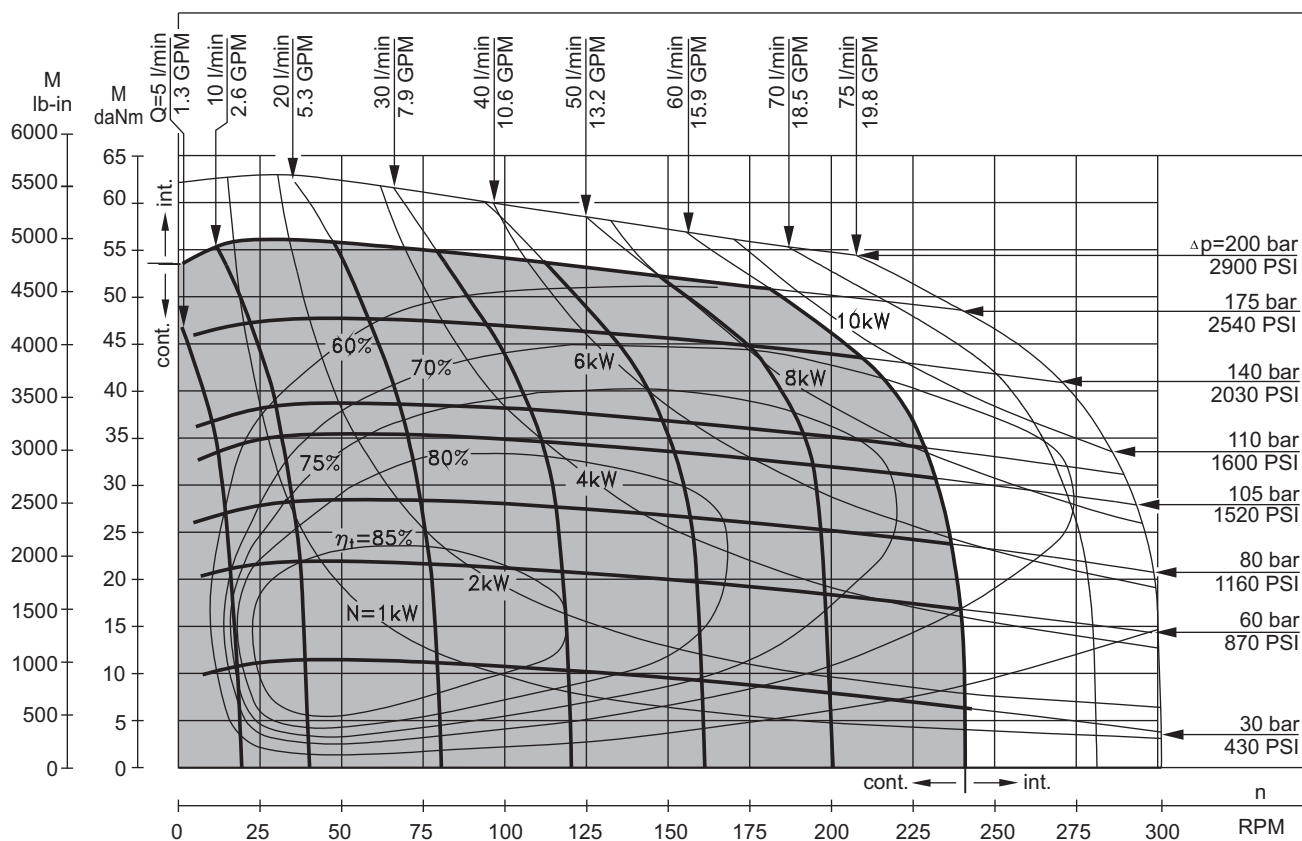
MR 200



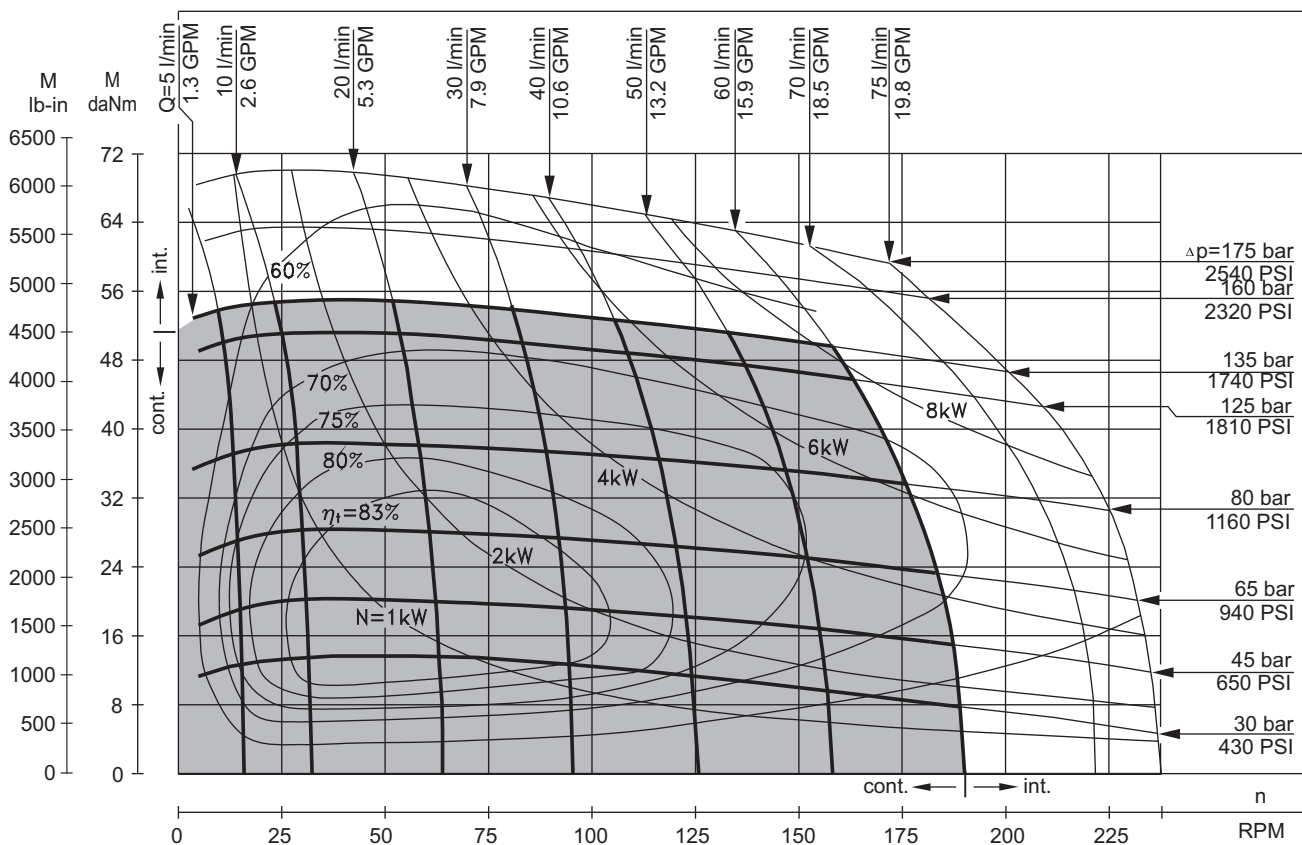
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MR 250



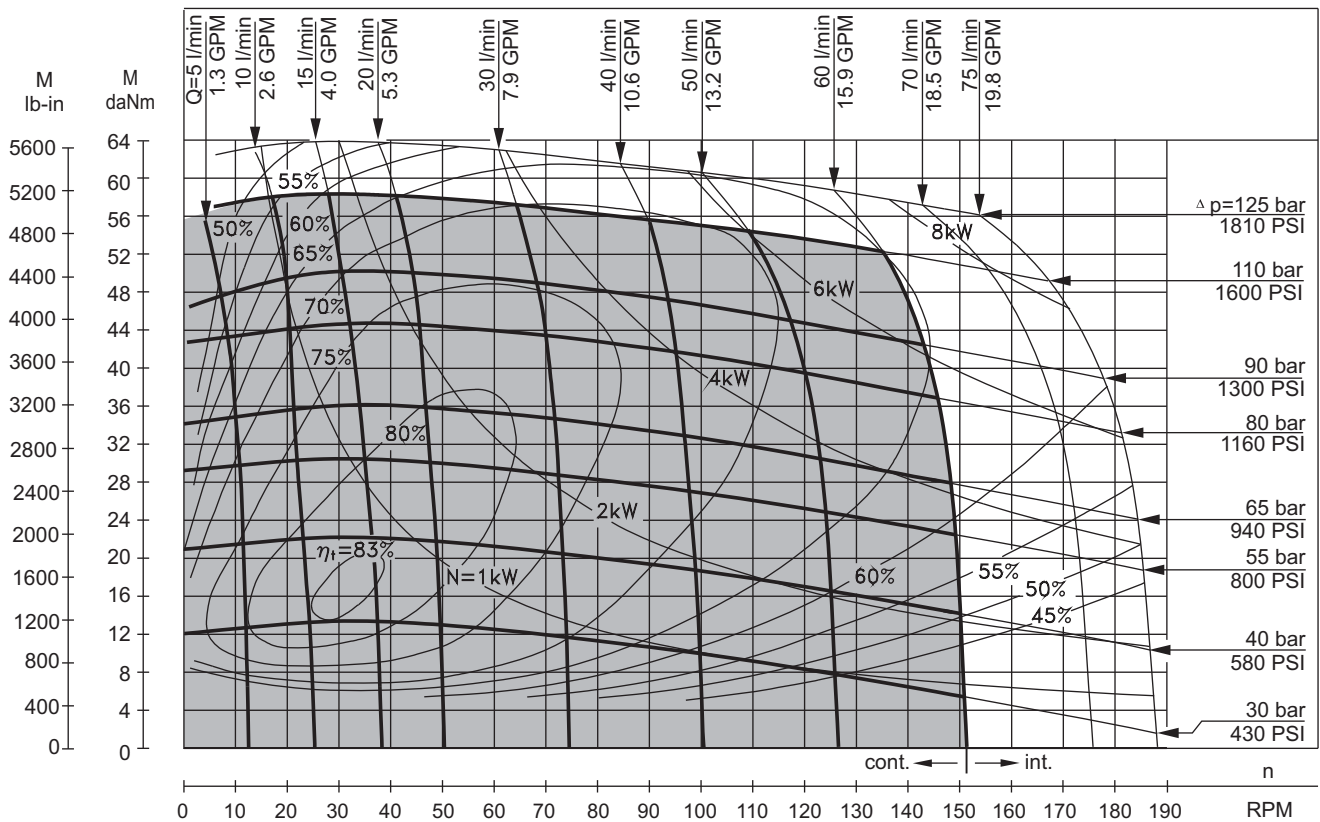
MR 315



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].

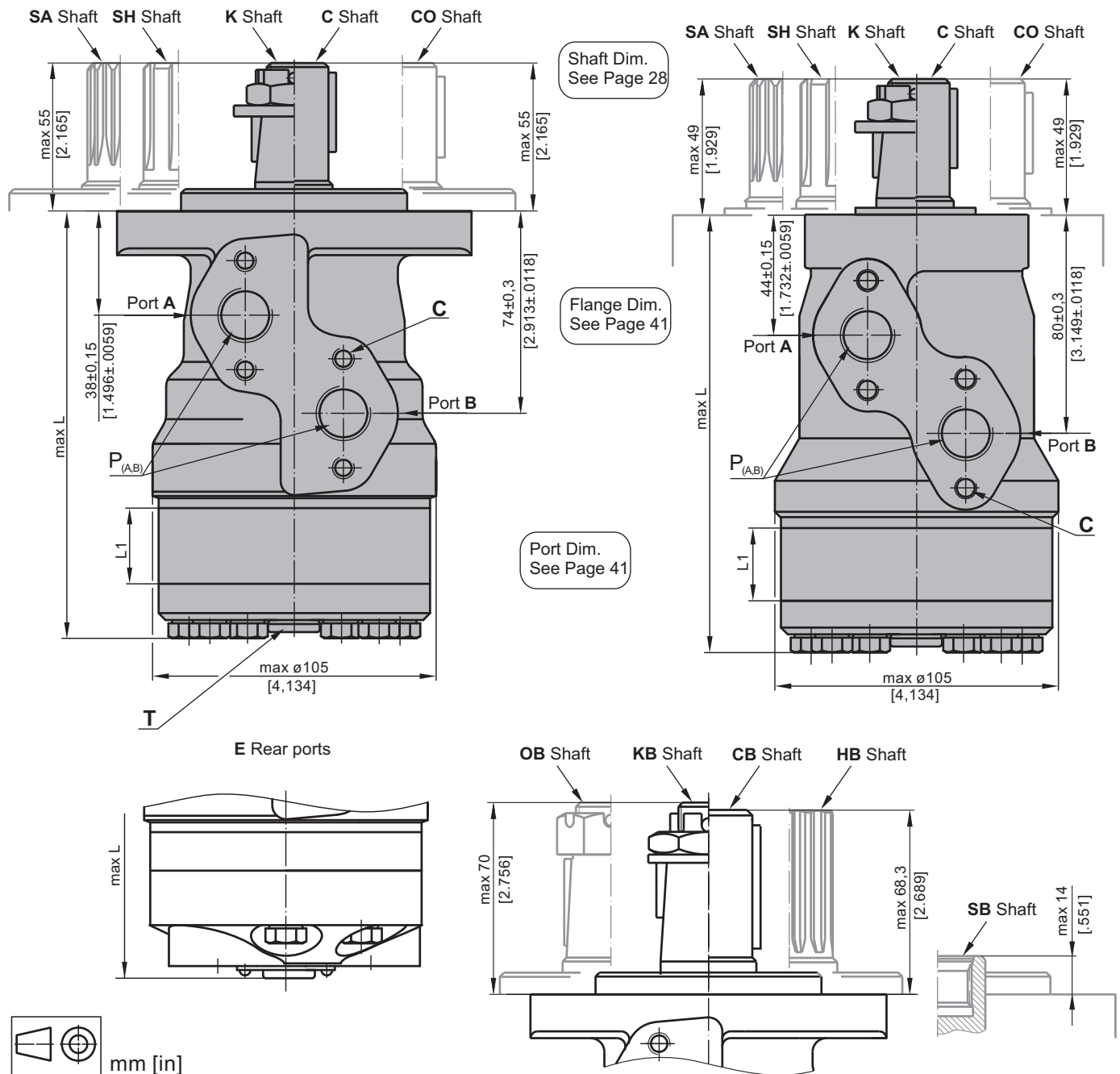
FUNCTION DIAGRAMS

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)

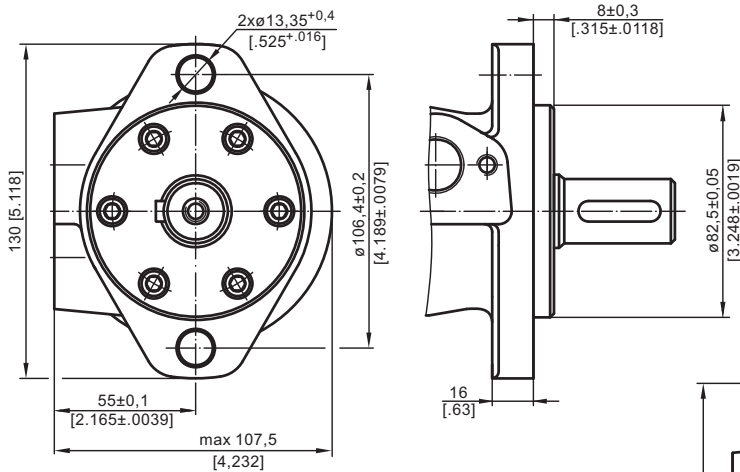
Standard Rotation
 Viewed from Shaft End
 Port A Pressurized - **CW**
 Port B Pressurized - **CCW**

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

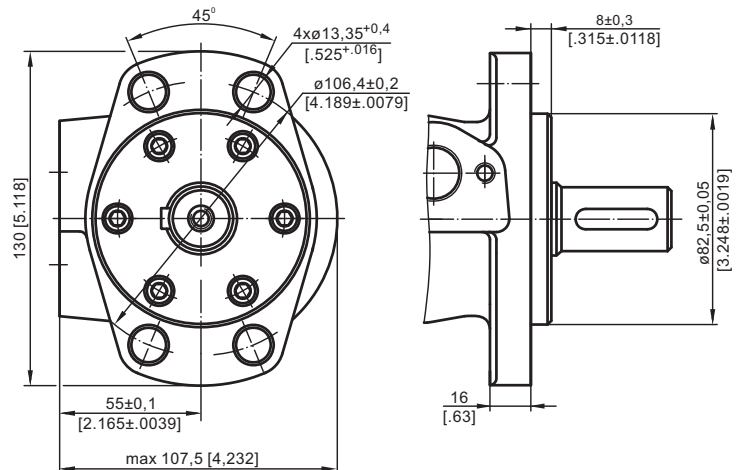
Type	L, mm [in]	Type	L, mm [in]	Type	L, mm [in]	Type	L, mm [in]	L ₁ , mm [in]
MR(F) 50	138,0 [5.43]	MRQ 50	143,5 [5.65]	MR(F)E 50	157,5 [6.20]	MRQE 50	163,5 [6.44]	9,0 [.35]
MR(F) 80	143,0 [5.63]	MRQ 80	148,5 [5.85]	MR(F)E 80	162,5 [6.40]	MRQE 80	168,5 [6.63]	14,0 [.55]
MR(F) 100	146,0 [5.75]	MRQ 100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

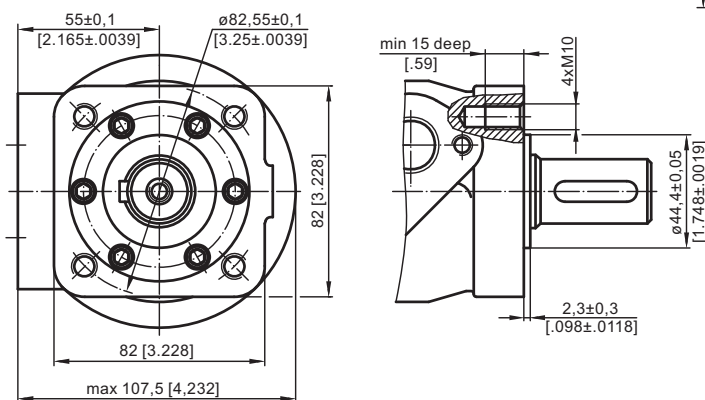
Oval Mount (2 Holes)



F - Oval Mount (4 Holes)

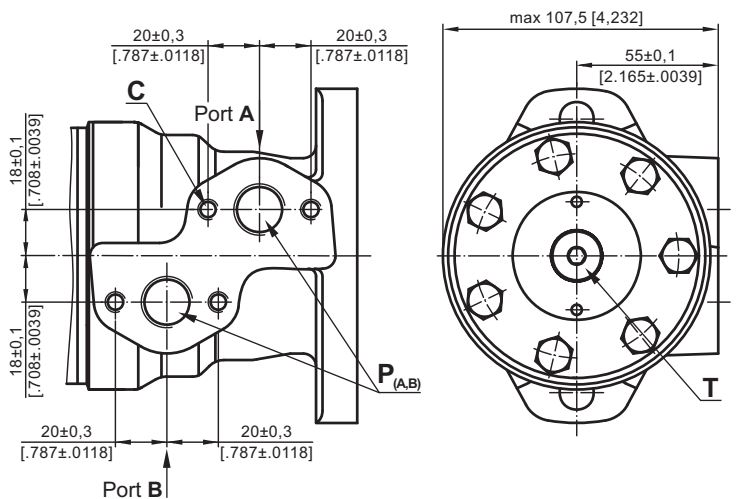


Q - Square Mount (4 Bolts)

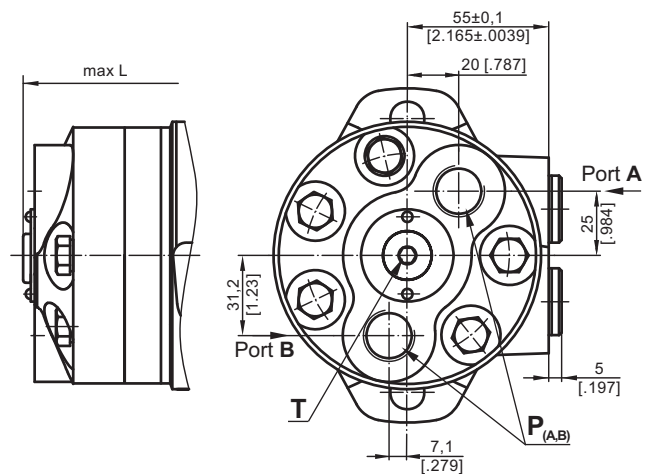


PORTS

Side Ports



E Rear Ports



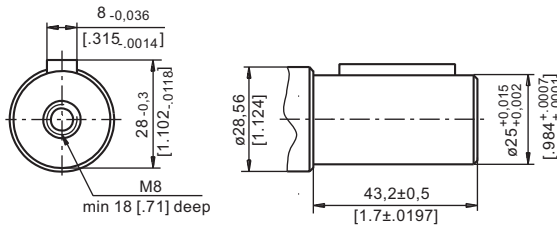
- C** : 4xM8 - 13 mm [.51 in] depth
P_(A,B) : 2xG1/2 or 2xM22x1,5 - 15 mm [.59 in] depth
T : G1/4 or M14x1,5 - 12 mm [.47 in] depth (plugged)

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

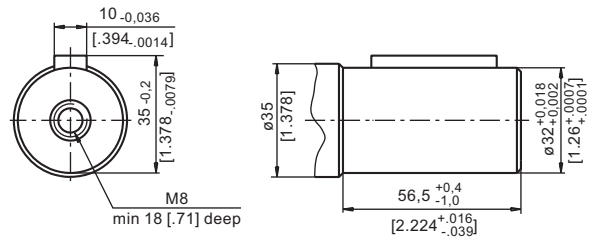
Reverse Rotation
 Viewed from Shaft End
 Port A Pressurized - CCW
 Port B Pressurized - CW

SHAFT EXTENSIONS FOR MP AND MR MOTORS

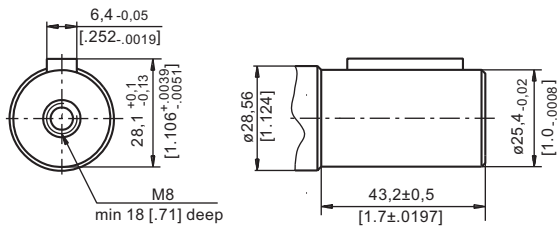
C - $\varnothing 25$ straight, Parallel key A8x7x32 DIN 6885
Max. Torque 34 daNm [3010 lb-in]



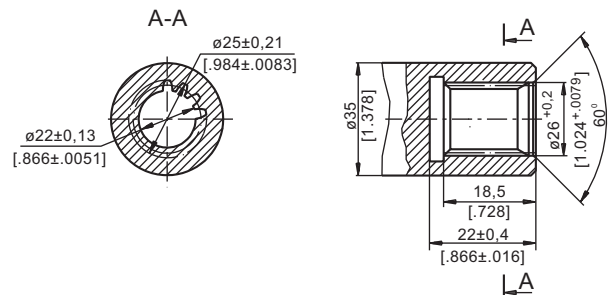
CB - $\varnothing 32$ straight, Parallel key A10x8x45 DIN 6885
Max. Torque 77 daNm [6815 lb-in]



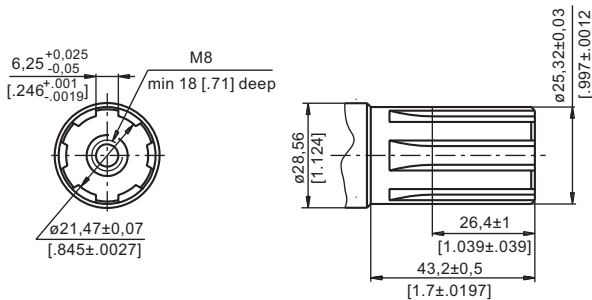
CO - $\varnothing 1$ " straight, Parallel key $\frac{1}{4}$ "x $\frac{1}{4}$ "x $\frac{1}{4}$ " BS46
Max. Torque 34 daNm [3010 lb-in]



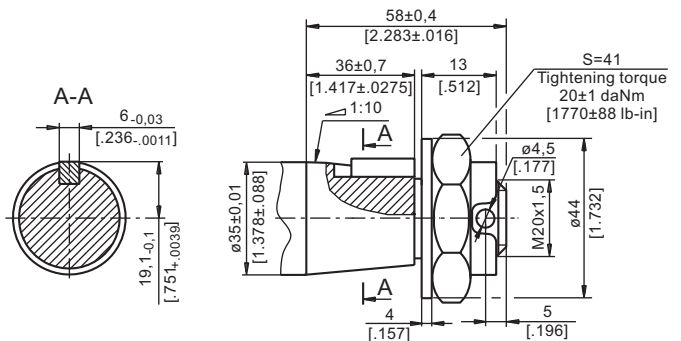
SB - splined A25x22xH10 DIN 5482
Max. Torque 34 daNm [3010 lb-in]



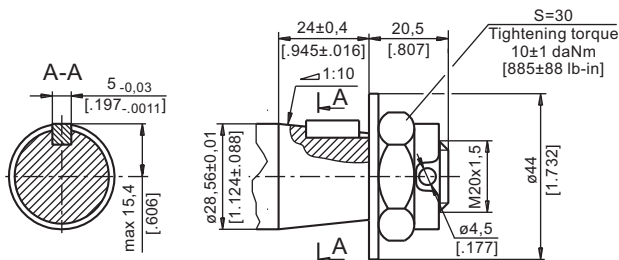
SH - splined, BS 2059 (SAE 6B)
Max. Torque 40 daNm [3540 lb-in]



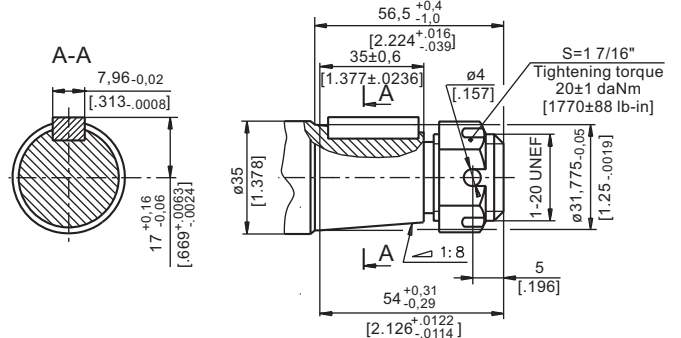
KB - tapered 1:10, Parallel key B6x6x20 DIN 6885
Max. Torque 77 daNm [6815 lb-in]



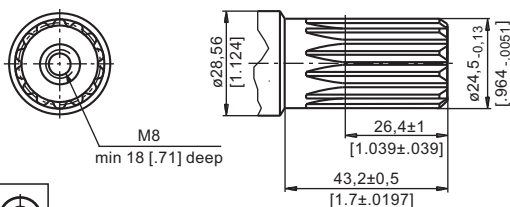
K - tapered 1:10, Parallel key B5x5x14 DIN 6885
Max. Torque 40 daNm [3540 lb-in]



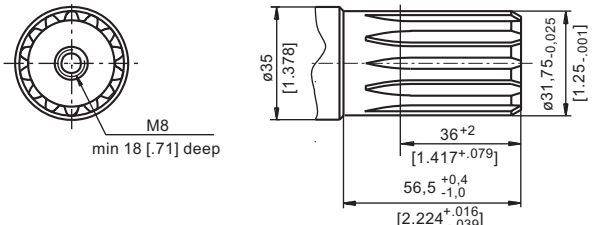
OB - tapered 1:8 SAEJ 501, Parallel key $\frac{5}{16}$ "x $\frac{5}{16}$ "x $\frac{1}{4}$ " BS46
Max. Torque 77 daNm [6815 lb-in]



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]



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 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 120)

Pos.10 - Design Series

omit - Factory specified

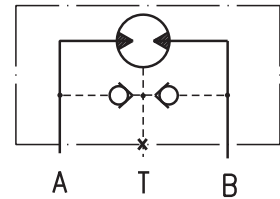
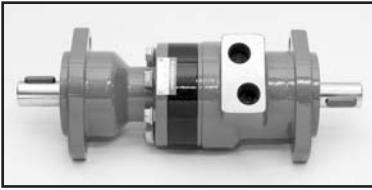
NOTES: The following combinations are not allowed:

- **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.

Hydraulic motors with Dual shaft type MRB...



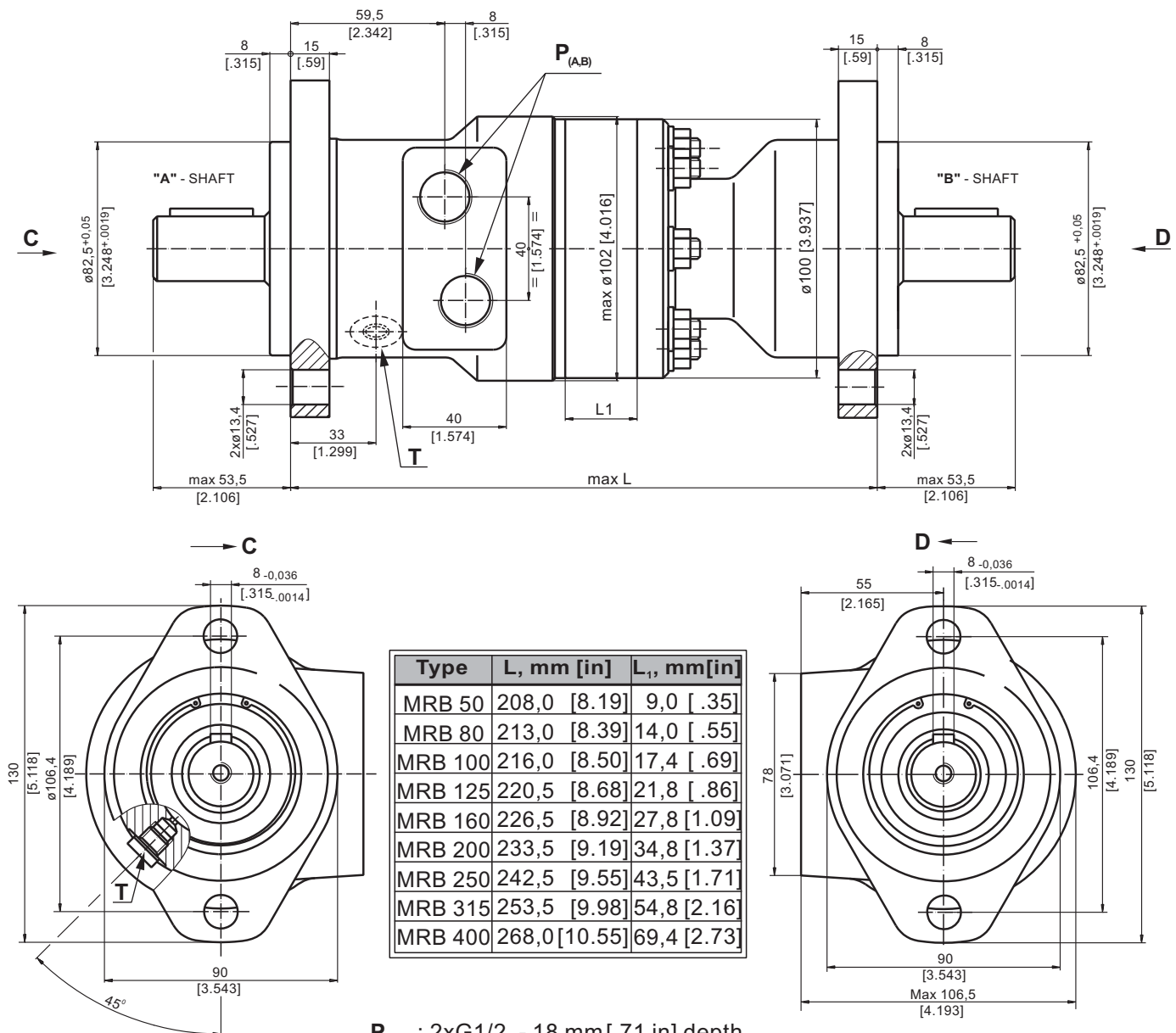
OPTIONS

- » 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;
- » Agricultural machines;
- » Food industries;
- » Mining machinery etc.

OUTLINE DIMENSINS REFERENCE



P_(A, B): 2xG1/2 - 18 mm [.71 in] depth

T : G1/8 - 9 mm [.35 in] depth (plugged)



SPECIFICATION DATA

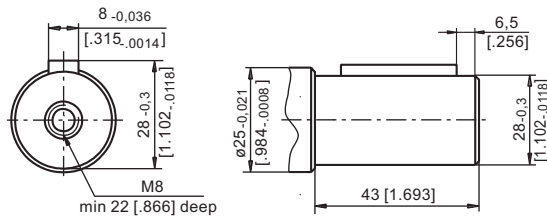
Type		MRB 50 C/C	MRB 80 C/C	MRB 100 C/C	MRB 125 C/C	MRB 160 C/C	MRB 200 C/C	MRB 250 C/C	MRB 315 C/C	MRB 400 C/C
Displacement, cm³/rev [in³/rev]		51,5[3.14]	80,3[4.9]	99,8[6.09]	125,7[7.67]	159,6[9.74]	199,8[12.19]	250,1[15.26]	315,7[19.26]	397 [24.4]
Max. Speed,	cont.	775	750	600	475	375	300	240	190	150
RPM	int.*	970	940	750	600	470	375	300	240	190
Max. Torque,	cont.	10 [885]	19,5 [1725]	24 [2125]	30 [2655]	30 [2655]	30 [2655]	30 [2655]	30 [2655]	30 [2655]
daNm [lb-in]	int.*	13 [1150]	22 [1947]	28 [2480]	34 [3010]	39 [3450]	39 [3450]	38 [3360]	42 [3720]	43 [3805]
Max. Torque "A" Shaft,	cont.	8 [710]	11,5 [1000]	12 [1060]	20 [1770]	20 [1770]	20 [1770]	20 [1770]	20 [1770]	20 [1770]
daNm [lb-in]	int.*	9,5 [840]	13 [1150]	14 [1240]	23 [2035]	23 [2035]	23 [2035]	23 [2035]	23 [2035]	23 [2035]
Max. Torque "B" Shaft,	cont.	4 [355]	11,5 [1000]	12 [1060]	20 [1770]	20 [1770]	20 [1770]	20 [1770]	20 [1770]	20 [1770]
daNm [lb-in]	int.*	5 [440]	13 [1150]	14 [1240]	23 [2035]	23 [2035]	23 [2035]	23 [2035]	23 [2035]	23 [2035]
Max. Output,	cont.	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]
[kW] [HP]	int.*	8,5 [11.9]	15 [20.1]	15 [20.1]	14,5	12,5 [17]	10 [13.4]	8 [10.7]	6,5 [8.7]	6 [8.0]
Max. Pressure Drop,	cont.	140 [2030]	175 [2540]	175 [2540]	175 [2540]	130 [1885]	110 [1600]	80 [1160]	70 [1020]	55 [800]
bar [PSI]	int.*	175 [2540]	200 [2900]	200 [2900]	200 [2900]	175 [2540]	140 [2030]	110 [1600]	100 [1450]	80 [1160]
Max. Oil Flow,	cont.	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]
lpm [GPM]	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]	75 [18.5]
Max. Return	cont. 0 - 100 RPM	75 [1090]	75 [1090]	75 [1090]	75 [1090]	75 [1090]	75 [1090]	75 [1090]	75 [1090]	75 [1090]
Pressure without	cont. 100-200 RPM	50 [730]	50 [730]	50 [730]	50 [730]	50 [730]	50 [730]	50 [730]	50 [730]	50 [730]
Drain Line, bar [PSI]	cont. 200-500 RPM	20 [290]	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]	75 [1090]

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

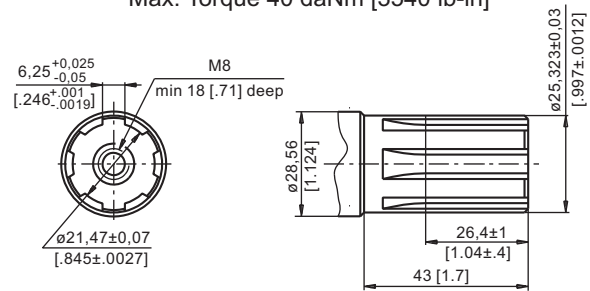
- Intermittent speed and intermittent pressure must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).
If using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

SHAFT EXTENSIONS

C - $\varnothing 25$ straight, Parallel key A8x7x30 DIN 6885
Max. Torque 34 daNm [3010 lb-in]



SH - 1" splined, BS 2059 (SAE 6B)
Max. Torque 40 daNm [3540 lb-in]

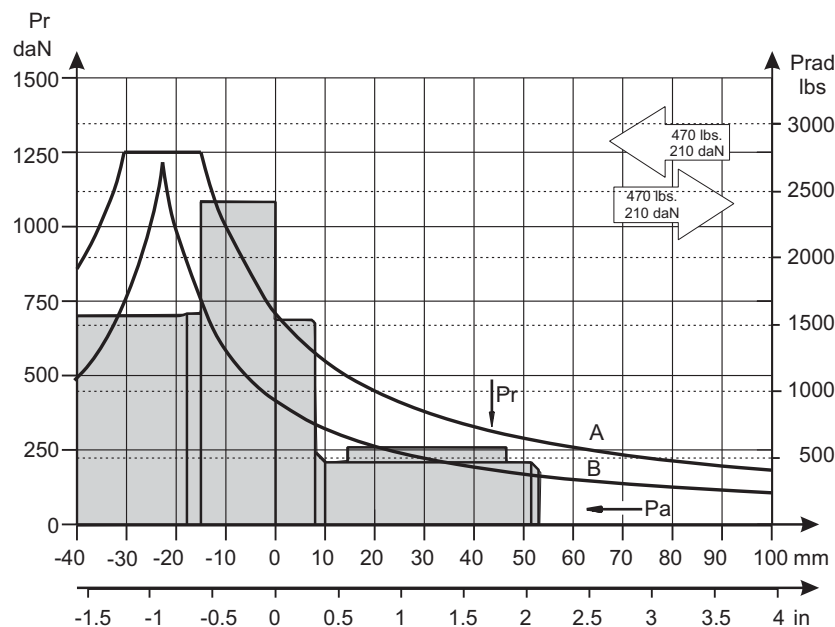


PERMISSIBLE SHAFT LOADS

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
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	- $\varnothing 25$ straight, Parallel key A8x7x30 DIN6885
SH	- 1" splined, BS 2059 (SAE 6B)

Pos.3 - "B" Shaft Extensions*

C	- $\varnothing 25$ straight, Parallel key A8x7x30 DIN6885
SH	- 1" splined, BS 2059 (SAE 6B)

Pos.4 - Special Features (see page 120)

Pos.5 - Design Series

omit - Factory specified

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

** Color at customer's request.

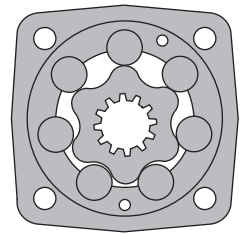
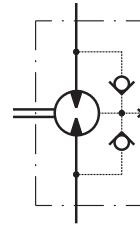
The hydraulic motors are mangano-phosphatized as standard.

HYDRAULIC MOTORS MS



APPLICATION

- » Conveyors
- » Metal working machines
- » Agricultural machines
- » Road building machines
- » Mining machinery
- » Food industries
- » Special vehicles etc.



CONTENTS

Specification data	5÷6
Function diagrams	7÷12
Dimensions and mounting	13÷16
Tacho connection	16
Permissible Shaft Seal pressure.....	16
Shaft extensions	17
Motor with Drum brake- MSB	18
Permissible shaft loads	19
Function diagram for MSB	19
Dimensions and mounting- MSS, V, U	20÷23
Internal Spline data	23
Order code	24

OPTIONS

- » Model - Disc valve, roll-gerotor
- » Flange and wheel mount
- » Short motor
- » Motor with Drum Brake
- » Tacho connection
- » Speed sensing
- » Side and rear ports
- » Shafts - straight, splined and tapered
- » SAE, Metric and BSPP ports
- » Other special features

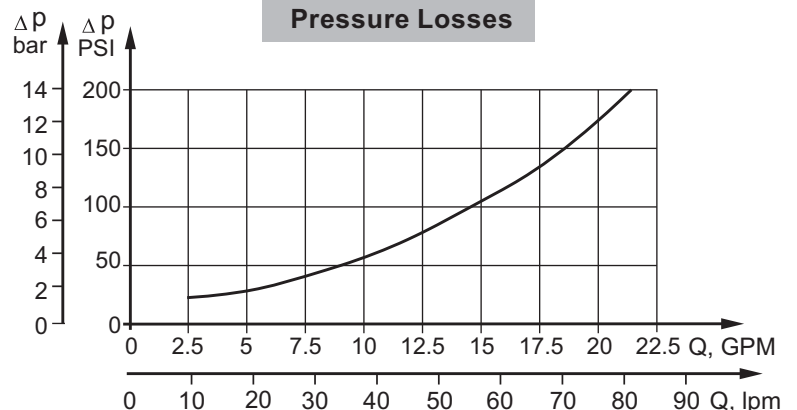
GENERAL

Max. Displacement, cm ³ /rev [in ³ /rev]	564,9 [34.47]
Max. Speed, [RPM]	1000
Max. Torque, daNm [lb-in]	cont.: 85 [7520] int.: 99 [8760]
Max. Output, kW [HP]	23 [30.8]
Max. Pressure Drop, bar [PSI]	cont.: 210 [3050] int.: 275 [3990]
Max. Oil Flow, lpm [GPM]	90 [24]
Min. Speed, [RPM]	5
Permissible Shaft Loads daN [lbs]	P _a =500 [1125]
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]
140 [2030]	20 [98]	1,5 [.396]
	35 [164]	1 [.264]
210 [3045]	20 [98]	3 [.793]
	35 [164]	2 [.528]

Pressure Losses



SPECIFICATION DATA

Type		MS 80	MS 100	MS 125	MS 160	MS 200
Displacement, cm ³ /rev [in ³ /rev]		80,5 [4.91]	100 [6.1]	125,7 [7.67]	159,7 [9.74]	200 [12.2]
Max. Speed, [RPM]	cont.	810	750	600	470	375
	Int.*	1000	900	720	560	450
Max. Torque daNm [lb-in]	cont.	24 [2120]	30,5 [2700]	37,5 [3320]	49 [4340]	61 [5400]
	Int.*	31 [2740]	39 [3450]	49 [4340]	60 [5310]	72 [6370]
Max. Output kW [HP]	cont.	15,5 [20.8]	18 [24.1]	18 [24.1]	16,5 [22.1]	16,5 [22.1]
	int.*	19,5 [26.2]	22,8 [30.2]	22,5 [30.2]	23 [30.8]	22 [29.52]
Max. Pressure Drop bar [PSI]	cont.	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]
	Int.*	275 [3990]	275 [3990]	275 [3990]	275 [3990]	275 [3990]
	peak**	295 [4280]	295 [4280]	295 [4280]	295 [4280]	295 [4280]
Max. Oil Flow lpm [GPM]	cont.	65 [17]	75 [20]	75 [20]	75 [20]	75 [20]
	Int.*	80 [21]	90 [24]	90 [24]	90 [24]	90 [24]
Max. Inlet Pressure bar [PSI]	cont.	230 [3340]	230 [3340]	230 [3340]	230 [3340]	230 [3340]
	Int.*	295 [4280]	295 [4280]	295 [4280]	295 [4280]	295 [4280]
	peak**	300 [4350]	300 [4350]	300 [4350]	300 [4350]	300 [4350]
Max. Return Pressure with Drain Line bar [PSI]	cont.	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]
	Int.*	175 [2540]	175 [2540]	175 [2540]	175 [2540]	175 [2540]
	peak**	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		12 [175]	10 [145]	10 [145]	8 [115]	8 [115]
Min. Starting Torque daNm [lb-in]	at max. press. drop cont.	18 [1590]	23 [2040]	29 [2570]	37 [3270]	47 [4160]
	at max. press. drop Int.*	23,5 [2080]	30 [2660]	38 [3360]	46 [4070]	56 [4960]
Min. Speed***, [RPM]		10	10	8	8	6
Weight, kg [lb] For Rear Ports + 0,40 [.88]	MS(F)	9,9 [21.8]	10,1 [22.2]	10,4 [22.9]	10,8 [23.8]	11,2 [24.7]
	MSW	10,4 [22.9]	10,6 [23.3]	10,9 [24]	11,3 [24.6]	11,7 [25.8]
	MSS	7,9 [17.4]	8,1 [17.8]	8,4 [18.5]	8,8 [19.4]	9,2 [20.2]
	MSV	5,8 [12.8]	6 [13.2]	6,3 [13.9]	6,7 [14.8]	7,1 [15.6]
	MSQ	10,3 [22.7]	10,5 [23.2]	10,8 [23.8]	11,2 [24.7]	11,6 [25.6]
	MSB	16,9 [37.3]	17,1 [37.7]	17,4 [38.3]	17,8 [39.2]	18,2 [41.1]

* 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)

Type		MS 250	MS 315	MS 400	MS 475	MS 525	MS 565
Displacement, cm ³ /rev [in ³ /rev]		250 [15.3]	314,9 [19.2]	397 [24.2]	474,6[28.96]	522,7 [31.88]	564,9[34.47]
Max. Speed, [RPM]	cont.	300	240	190	160	145	130
	Int.*	360	290	230	190	175	160
Max. Torque daNm [lb-in]	cont.	72 [6370]	82,5 [7300]	86,5 [7660]	85 [7520]	85 [7520]	85 [7520]
	Int.*	87 [7700]	100 [8850]	99 [8760]	99 [8760]	99 [8760]	99 [8760]
Max. Output kW [HP]	cont.	14,5 [19.4]	15 [20.1]	11 [14.8]	8,4 [11]	7,6 [10.2]	6,9 [9]
	int.*	18 [24.1]	17 [22.8]	12,5 [16.8]	11,3 [15]	10,4 [13.9]	9,6 [13]
Max. Pressure Drop bar [PSI]	cont.	200 [2900]	200 [2900]	160 [2320]	130 [1880]	115 [1670]	105 [1520]
	Int.*	250 [3630]	240 [3480]	190 [2760]	150 [2180]	135 [1960]	125 [1810]
	peak**	270 [3920]	260 [3770]	210 [3050]	170 [2470]	155 [2250]	145 [2100]
Max. Oil Flow lpm [GPM]	cont.	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]
	Int.*	90 [24]	90 [24]	90 [24]	90 [24]	90 [24]	90 [24]
Max. Inlet Pressure bar [PSI]	cont.	230 [3340]	230 [3340]	230 [3340]	230 [3340]	230 [3340]	230 [3340]
	Int.*	295 [4280]	295 [4280]	295 [4280]	295 [4280]	295 [4280]	295 [4280]
	peak**	300 [4350]	300 [4350]	300 [4350]	300 [4350]	300 [4350]	300 [4350]
Max. Return Pressure with Drain Line bar [PSI]	cont.	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]
	Int.*	175 [2540]	175 [2540]	175 [2540]	175 [2540]	175 [2540]	175 [2540]
	peak**	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		8 [115]	8 [115]	8 [115]	8 [115]	8 [115]	8 [115]
Min. Starting Torque daNm [lb-in]	at max. press. drop cont.	56 [4960]	71 [6280]	71 [6280]	71 [6280]	71 [6280]	71 [6280]
	at max. press. drop Int.*	70 [6200]	85 [7520]	84 [7430]	84 [7430]	84 [7430]	84 [7430]
Min. Speed***, [RPM]		6	5	5	5	5	5
Weight, kg [lb] For Rear Ports + 0,40 [.88]	MS(F)	11,7 [25.8]	12,4 [27.3]	13,1 [29.3]	14,1 [31]	14,6 [32.2]	15 [33.1]
	MSW	12,2 [26.9]	12,9 [28.4]	13,8 [30.4]	14,6 [32.2]	15,1 [33.3]	15,5 [34.1]
	MSS	9,7 [21.4]	10,4 [22.9]	11,3 [24.9]	12,1 [26.7]	12,6 [27.8]	13 [28.6]
	MSV	7,6 [16.7]	8,3 [18.3]	9,2 [20.2]	10 [22]	10,5 [23.1]	10,9 [24]
	MSQ	12,1 [26.7]	12,8 [28.2]	13,7 [30.2]	14,5 [32]	15 [33.1]	15,4 [33.9]
	MSB	18,7 [41.2]	19,4 [42.7]	20,3 [44.7]	21,1 [46.5]	21,6 [47.6]	23 [48.5]

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

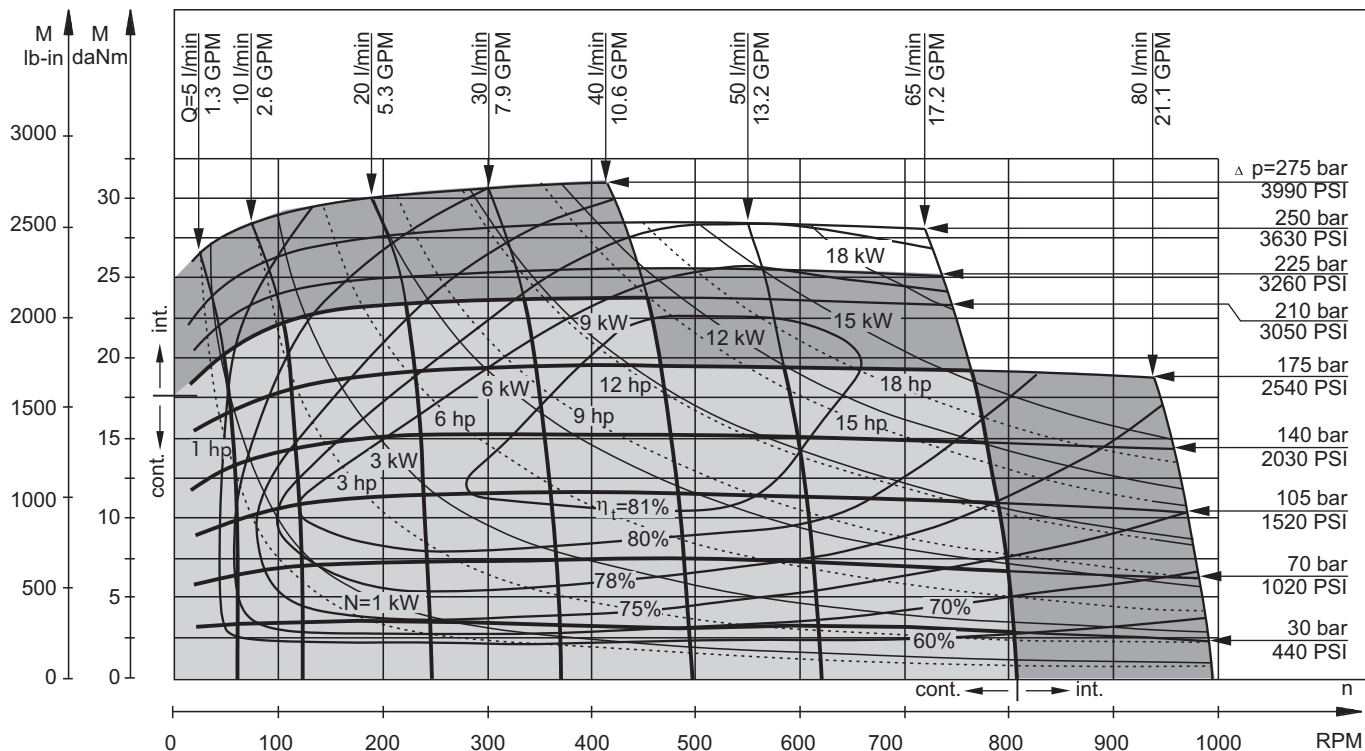
** Peak load: the permissible values may occur for max. 1% of every minute.

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

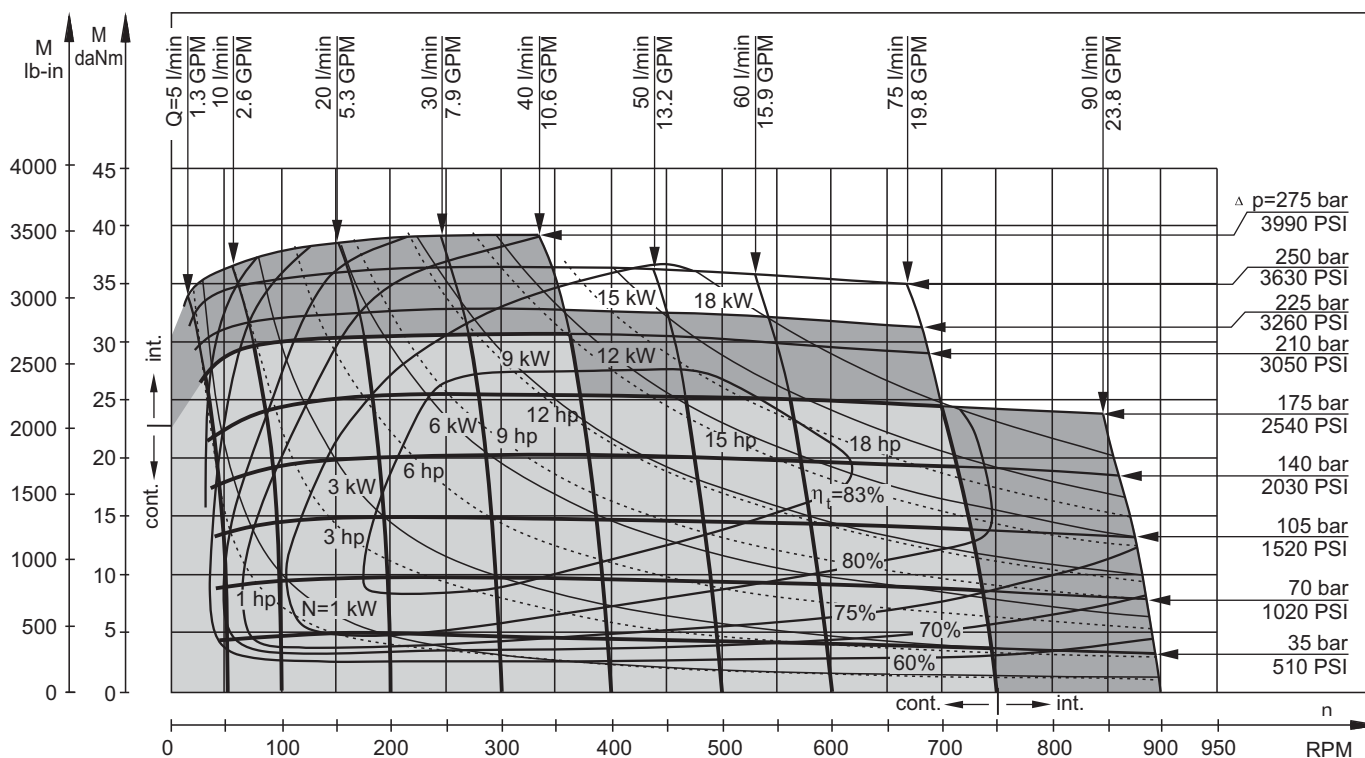
- Intermittent speed and intermittent pressure must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).
If using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

FUNCTION DIAGRAMS

MS 80



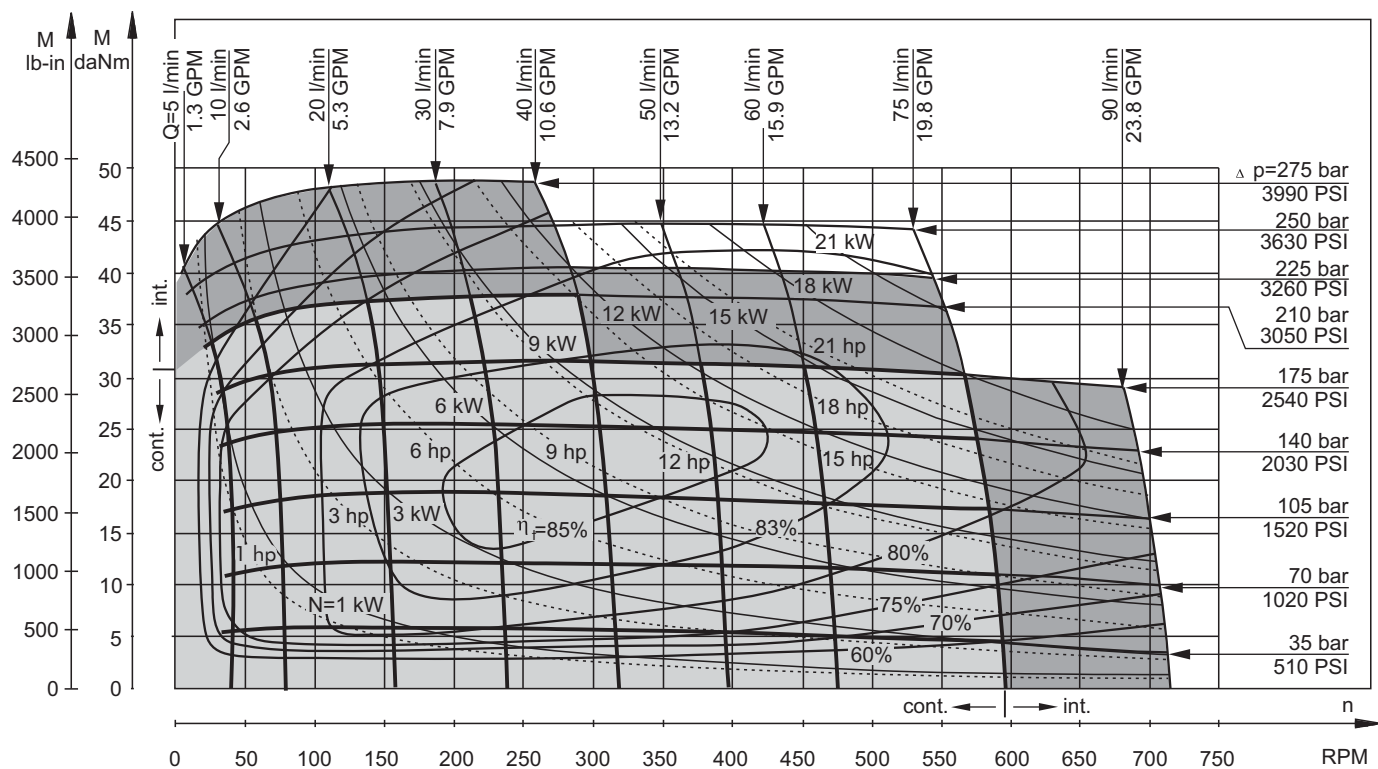
MS 100



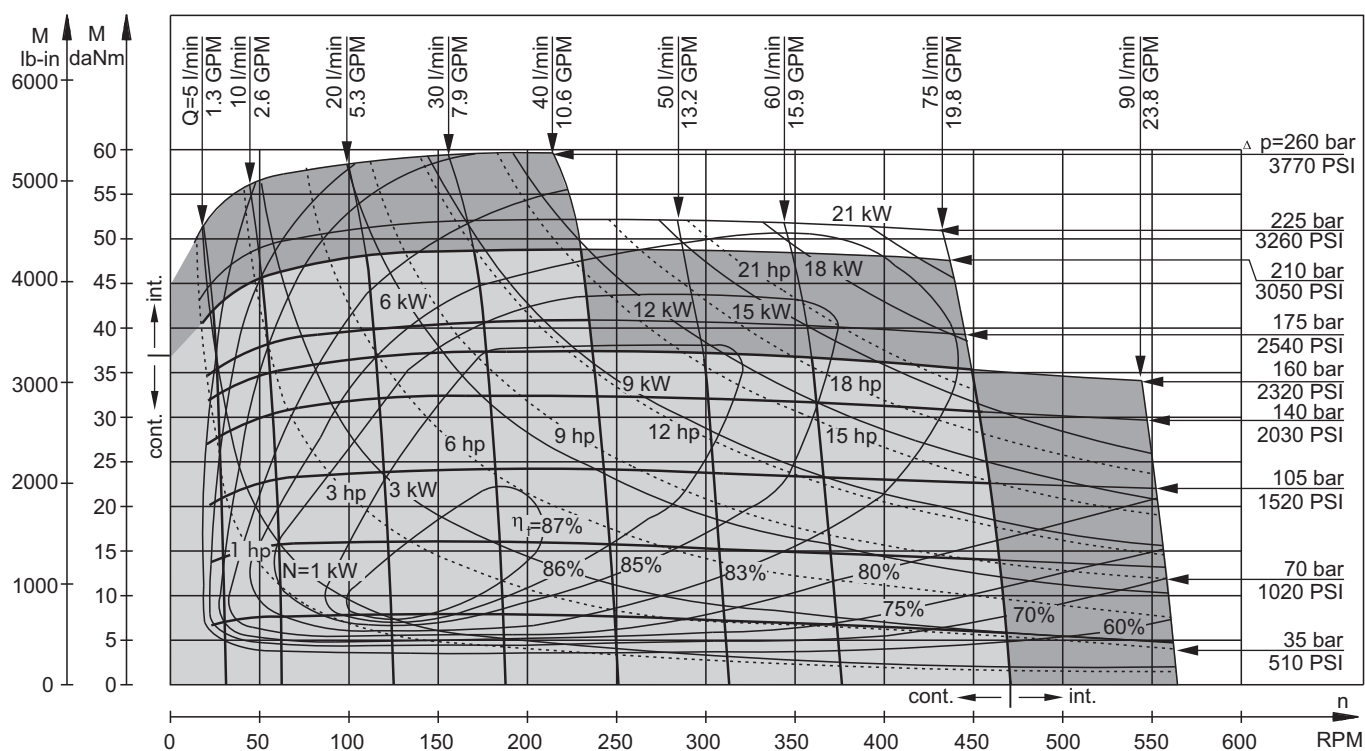
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MS 125



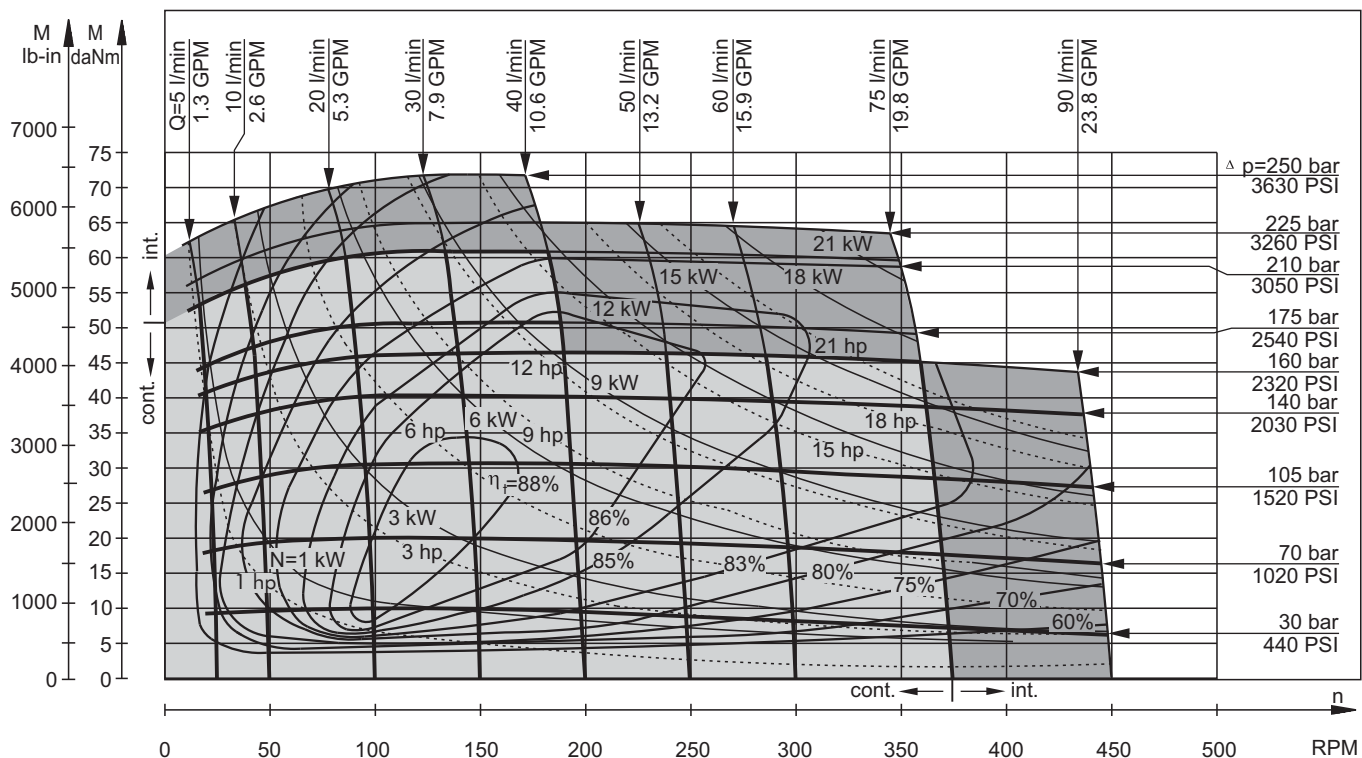
MS 160



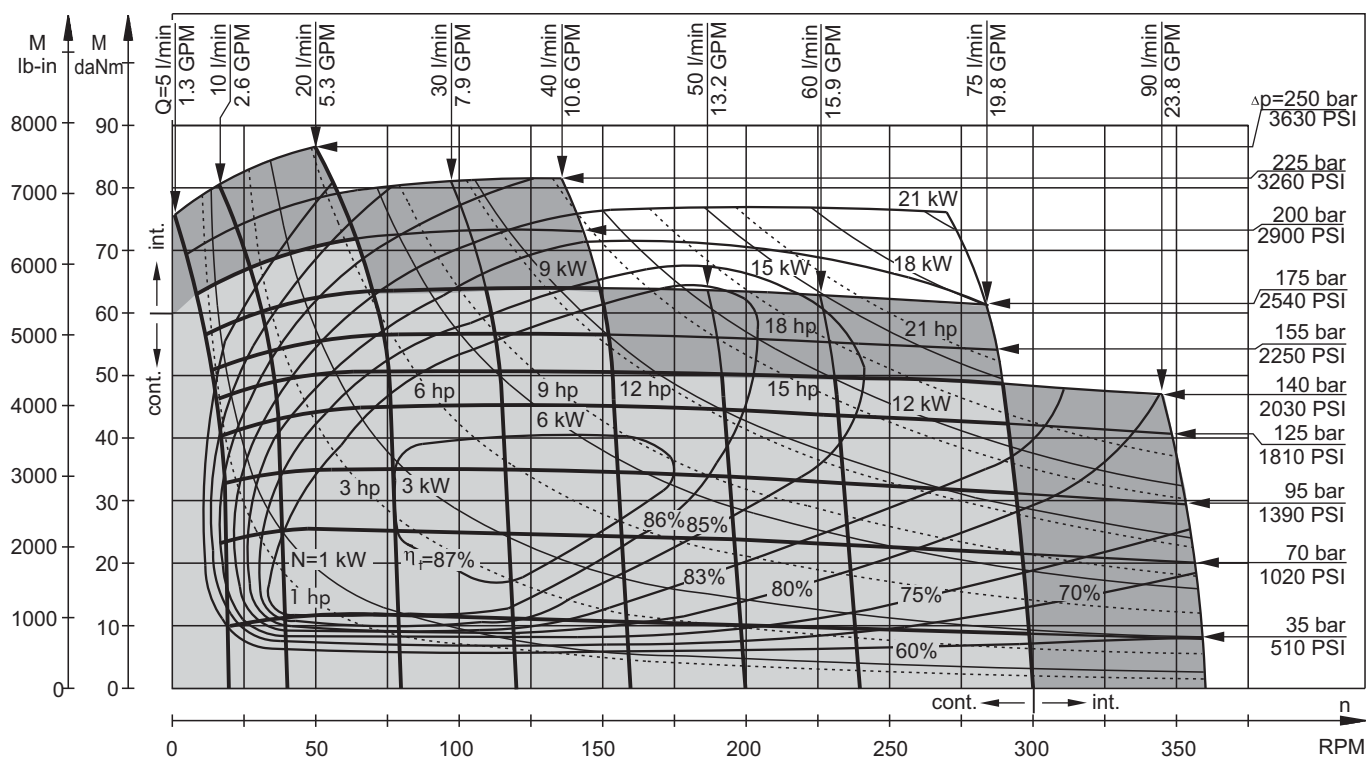
The function diagrams data is for average performance of randomly selected motors at back pressure 5±10 bar [72.5±145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MS 200



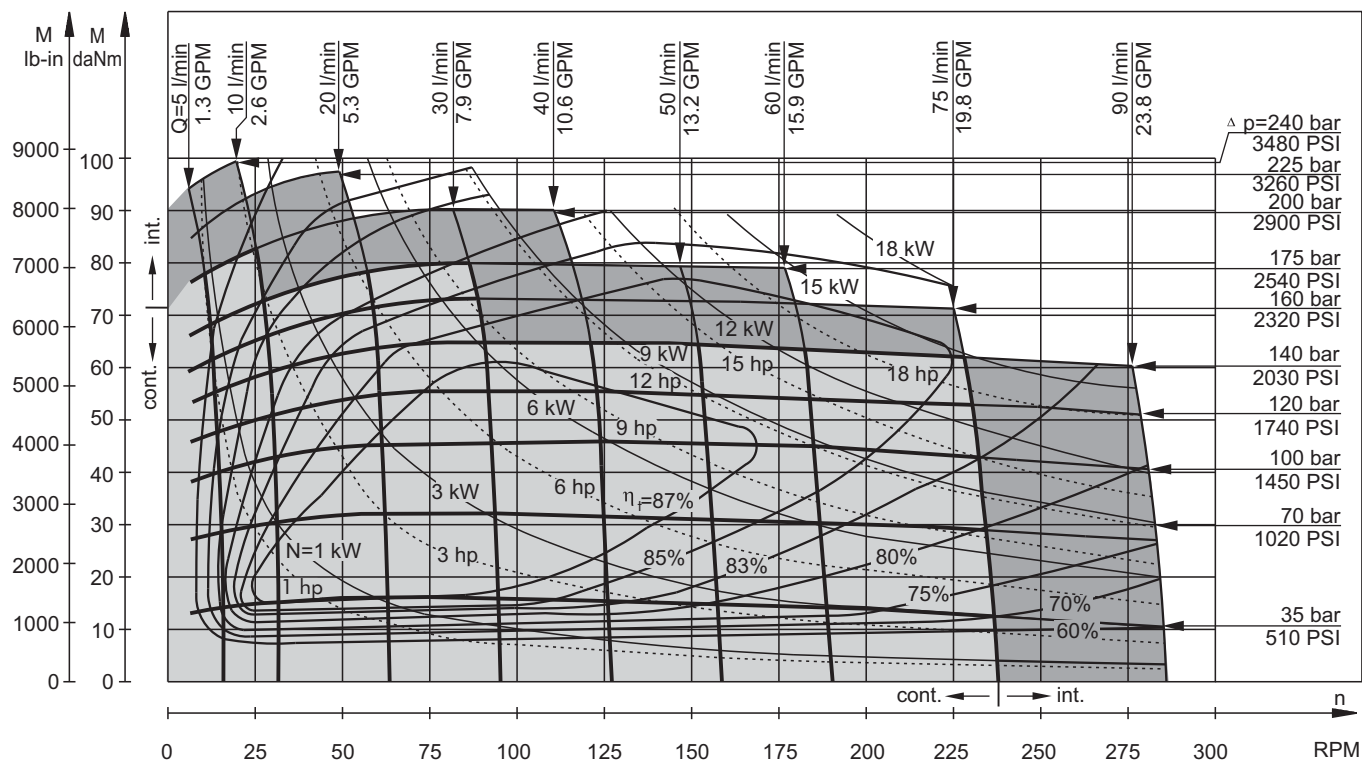
MS 250



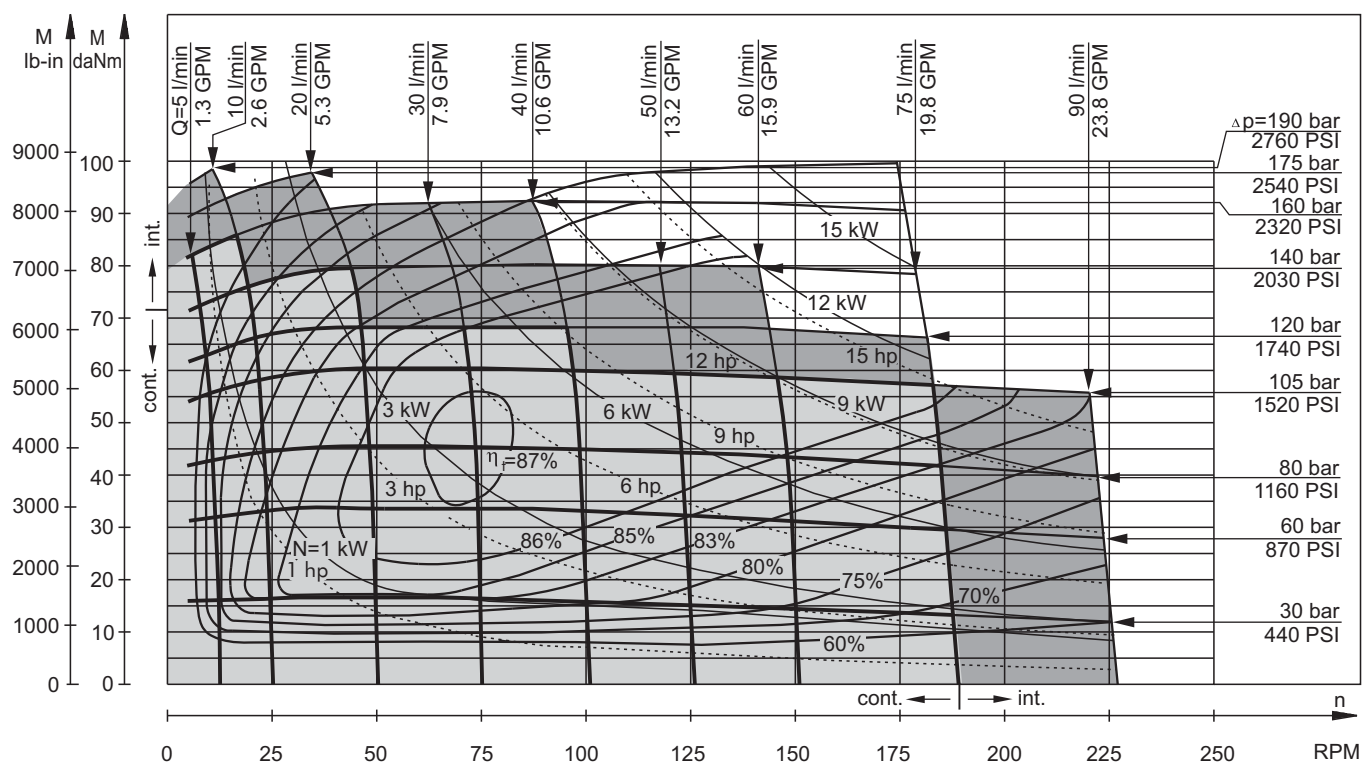
The function diagrams data is for average performance of randomly selected motors at back pressure 5 ± 10 bar [72.5 $\pm$ 145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MS 315



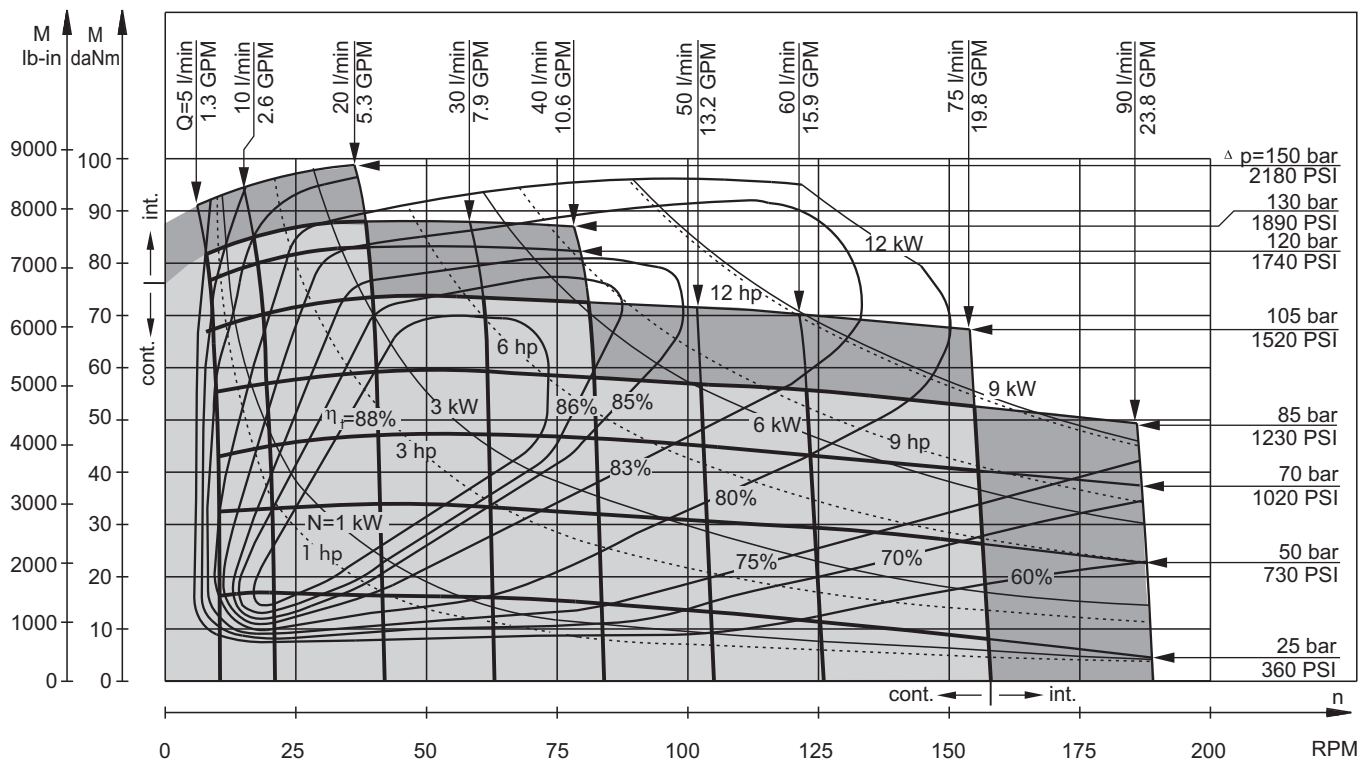
MS 400



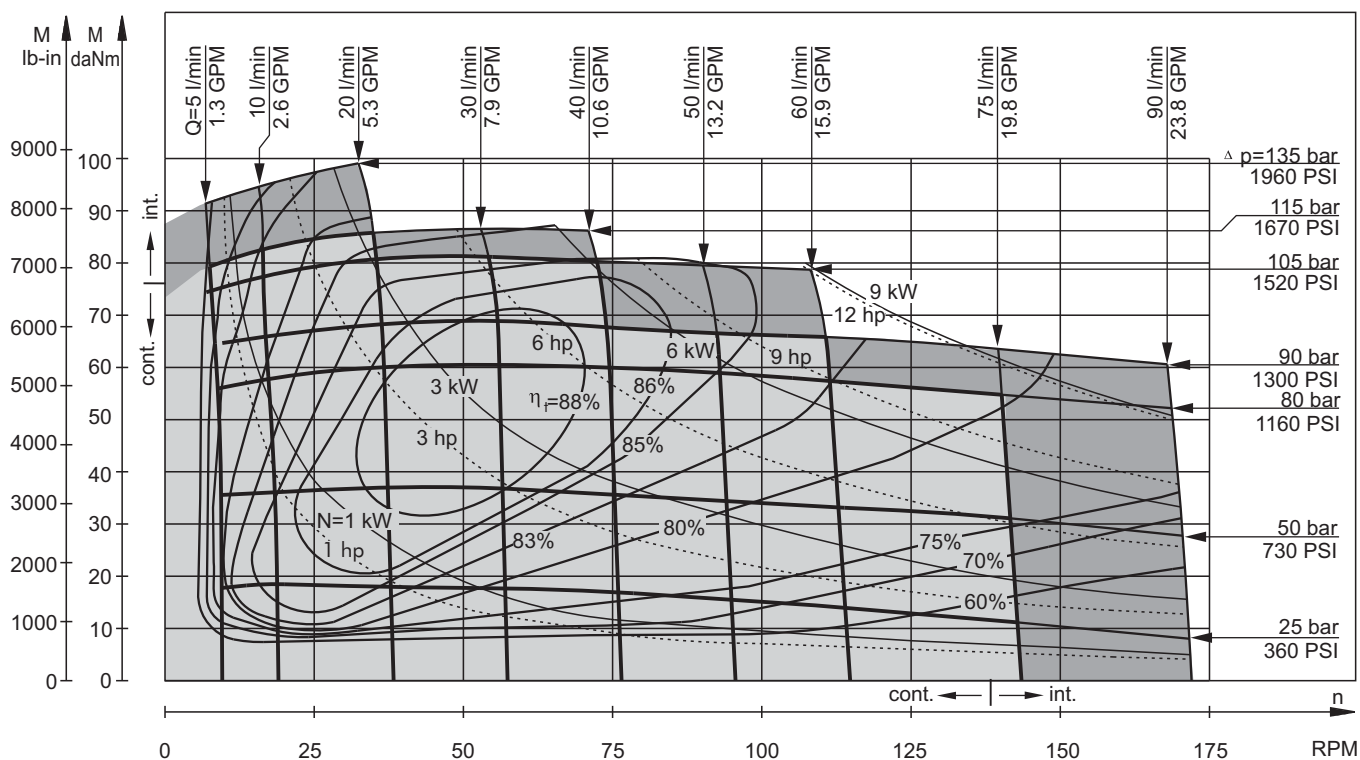
The function diagrams data is for average performance of randomly selected motors at back pressure 5±10 bar [72.5±145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MS 475



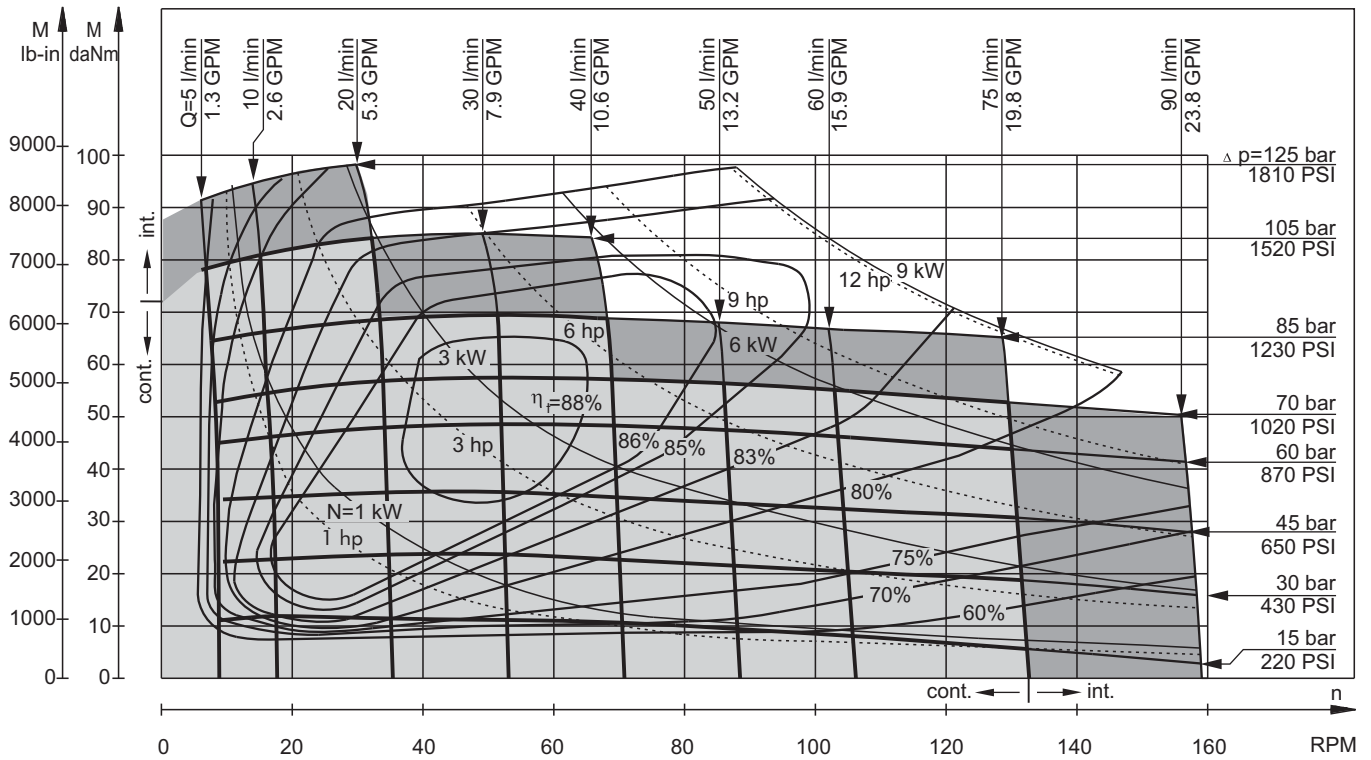
MS 525



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].

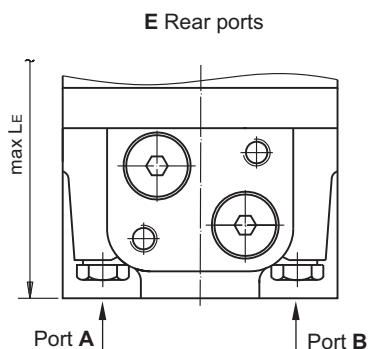
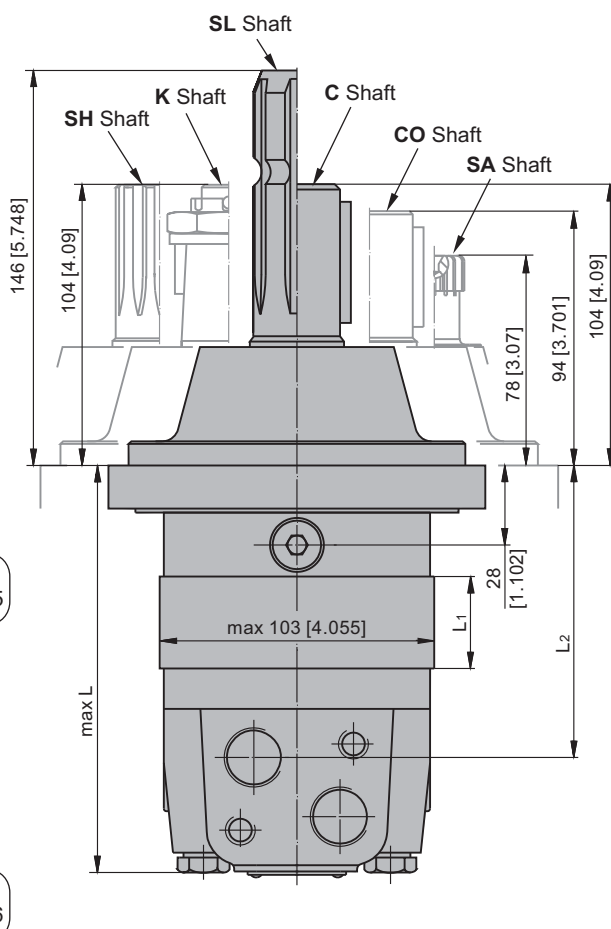
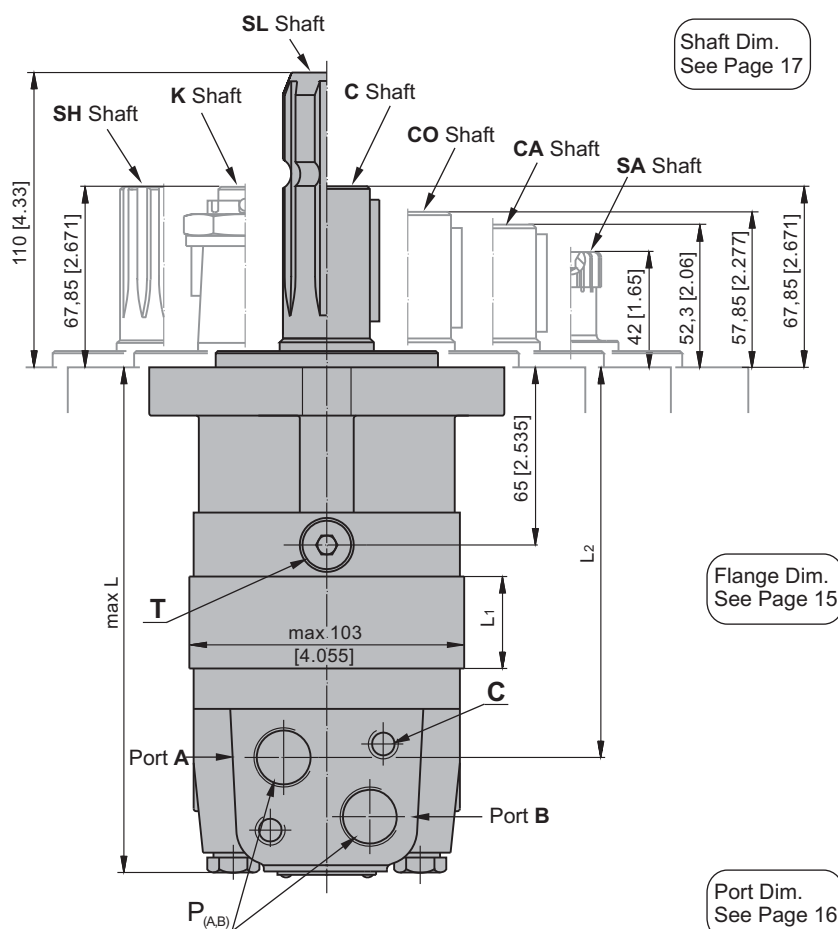
FUNCTION DIAGRAMS

MS 565



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
MS, MSF, MSA, MSW



C: 2xM10-12 mm [.47 in] depth
P_(A,B): 2xG1/2 or 2xM22x1,5-15 mm [.59 in] depth
T: G ¼ or M14x1,5- 12 mm [.47 in] depth (plugged)

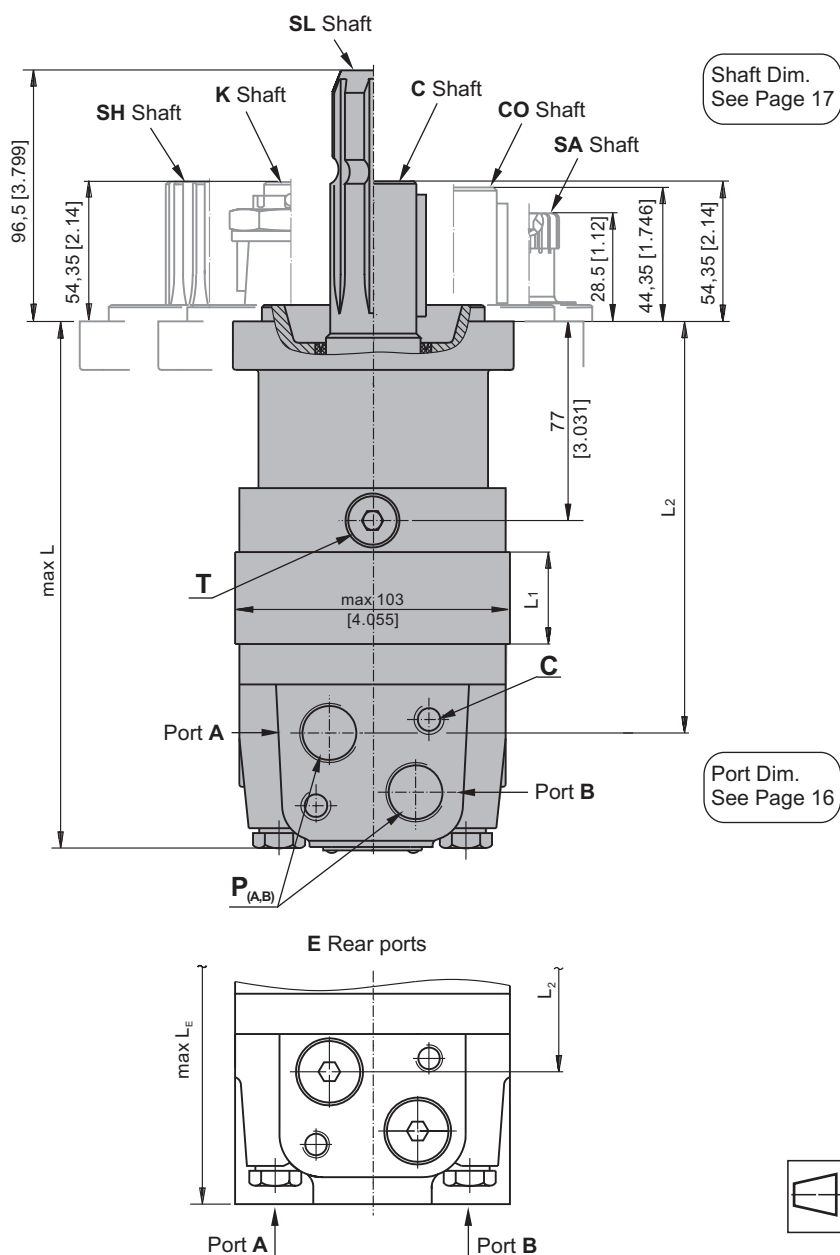
Standard Rotation
Viewed from Shaft End
Port A Pressurized - **CW**
Port B Pressurized - **CCW**

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

Type	L, mm [in]	L ₂ , mm [in]	*L _E , mm [in]	Type	L, mm [in]	L ₂ , mm [in]	*L _E , mm [in]	L ₁ , mm [in]
MS(F, A) 80	168 [6.61]	124 [4.88]	173 [6.81]	MSW 80	129 [5.08]	87 [3.43]	138 [5.43]	14,0 [.55]
MS(F, A) 100	171 [6.73]	128 [5.04]	177 [6.97]	MSW100	133 [5.23]	91 [3.58]	142 [5.59]	17,4 [.69]
MS(F, A) 125	176 [6.93]	132 [5.20]	181 [7.13]	MSW 125	137 [5.39]	95 [3.74]	146 [5.75]	21,8 [.86]
MS(F, A) 160	182 [7.17]	138 [5.43]	187 [7.36]	MSW 160	143 [5.63]	101 [3.98]	152 [5.99]	27,8 [1.09]
MS(F, A) 200	189 [7.44]	145 [5.71]	194 [7.64]	MSW 200	150 [5.91]	108 [4.25]	159 [6.26]	34,8 [1.37]
MS(F, A) 250	197 [7.76]	154 [6.06]	203 [7.99]	MSW 250	159 [6.26]	117 [4.61]	168 [6.62]	43,5 [1.71]
MS(F, A) 315	209 [8.23]	165 [6.50]	214 [8.43]	MSW 315	170 [6.69]	128 [5.04]	179 [7.05]	54,8 [2.16]
MS(F, A) 400	223 [8.78]	179 [7.05]	228 [8.98]	MSW 400	184 [7.24]	143 [5.63]	194 [7.64]	69,4 [2.73]
MS(F, A) 475	237 [9.33]	193 [7.60]	242 [9.53]	MSW 475	198 [7.79]	156 [6.14]	207 [8.15]	82,6 [3.25]
MS(F, A) 525	229 [9.02]	185 [7.28]	234 [9.21]	MSW 525	190 [7.48]	148 [5.83]	199 [7.84]	74,5 [2.93]
MS(F, A) 565	235 [9.25]	191 [7.52]	240 [9.45]	MSW 565	196 [7.72]	154 [6.06]	205 [8.07]	80,2 [3.16]

* - For Rear Ported Motors.

DIMENSIONS AND MOUNTING DATA - MSQ



C: 2xM10-12 mm [.47 in] depth
P_(A,B): 2xG1/2 or 2xM22x1,5-15 mm [.59 in] depth
T: G 1/4 or M14x1,5- 12 mm [.47 in] depth (plugged)

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

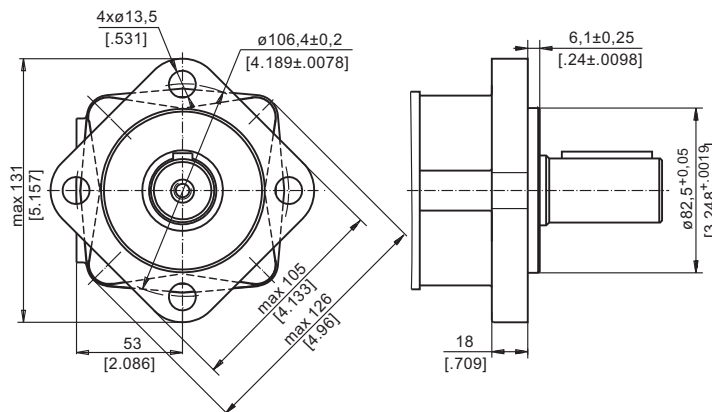
Reverse Rotation
 Viewed from Shaft End
 Port **A** Pressurized - **CCW**
 Port **B** Pressurized - **CW**

Type	L, mm [in.]	L ₂ , mm [in.]	*L _E , mm [in.]	L ₁ , mm [in.]
MSQ 80	179 [7.05]	136 [5.35]	185 [7.28]	14,0 [.55]
MSQ 100	183 [7.21]	140 [5.51]	189 [7.44]	17,4 [.69]
MSQ 125	187 [7.36]	144 [5.67]	193 [7.60]	21,8 [.86]
MSQ 160	193 [7.60]	150 [5.91]	199 [7.83]	27,8 [1.09]
MSQ 200	200 [7.87]	157 [6.18]	206 [8.11]	34,8 [1.37]
MSQ 250	209 [8.23]	166 [6.54]	215 [8.46]	43,5 [1.71]
MSQ 315	220 [8.66]	177 [6.67]	226 [8.90]	54,8 [2.16]
MSQ 400	235 [9.25]	192 [7.56]	241 [9.49]	69,4 [2.73]
MSQ 475	247 [9.72]	205 [8.07]	254 [10.0]	82,6 [3.25]
MSQ 525	240 [9.45]	197 [7.76]	246 [9.69]	74,5 [2.93]
MSQ 565	246 [9.69]	203 [7.99]	252 [9.92]	80,2 [3.16]

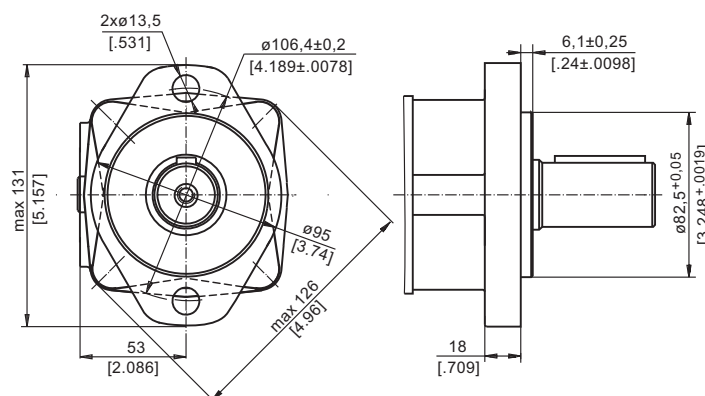
* -For Rear Ported Motors.

MOUNTING

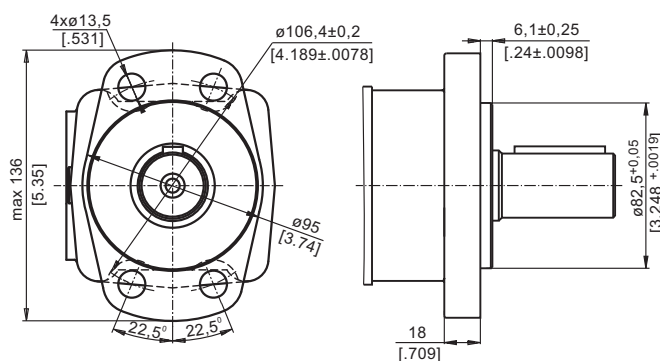
SAE A-4 Mount (4 Holes)



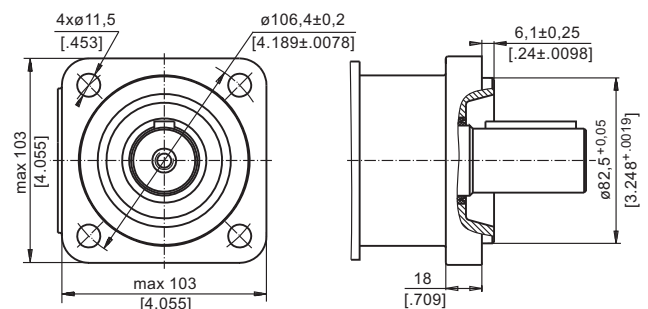
A SAE A-2 Mount (2 Holes)



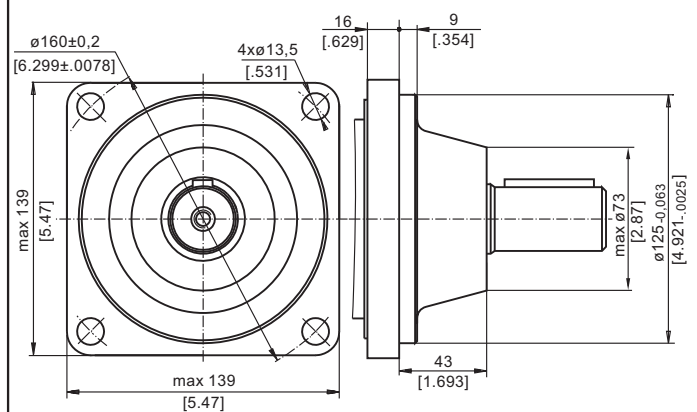
F Magneto Mount (4 Holes)



Q Square Mount (4 Holes)

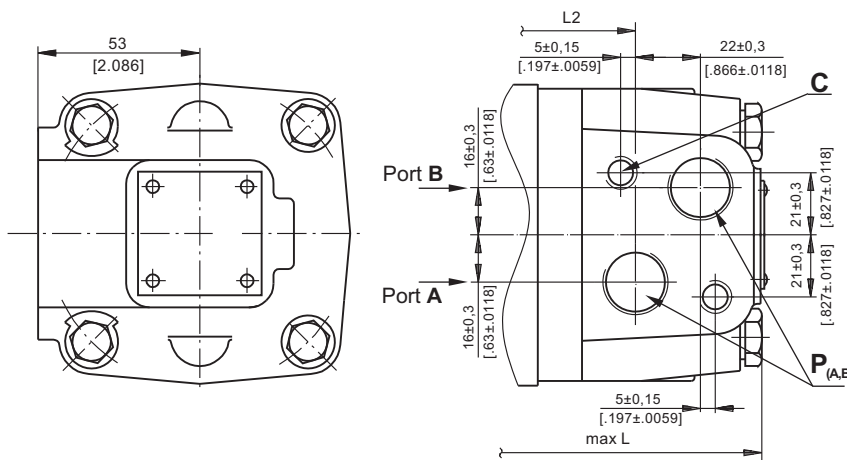


W Wheel Mount

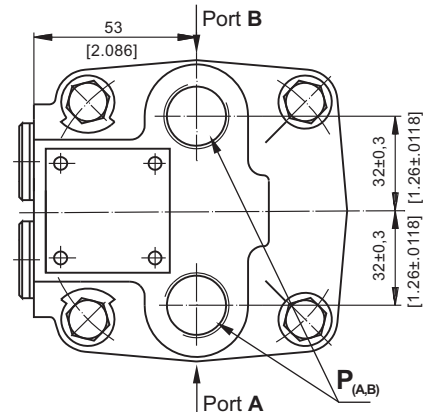


PORTS

Side Ports



E Rear Ports



Standard Rotation

Viewed from Shaft End

Port A Pressurized - CW

Port B Pressurized - CCW

Reverse Rotation

Viewed from Shaft End

Port A Pressurized - CCW

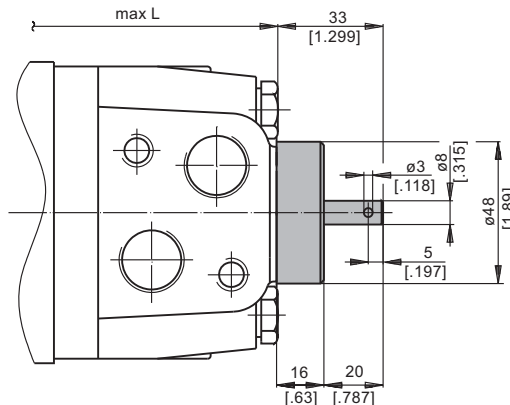
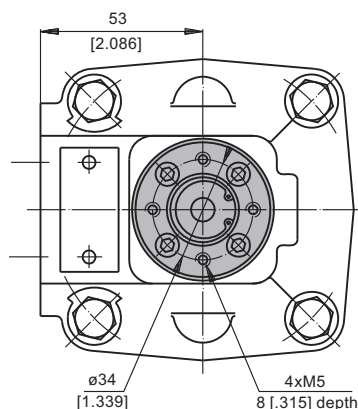
Port B Pressurized - CW

C: 2xM10-12 mm [.47 in] depth

P_(A,B): 2xG1/2 or 2xM22x1,5-15 mm [.59 in] depth

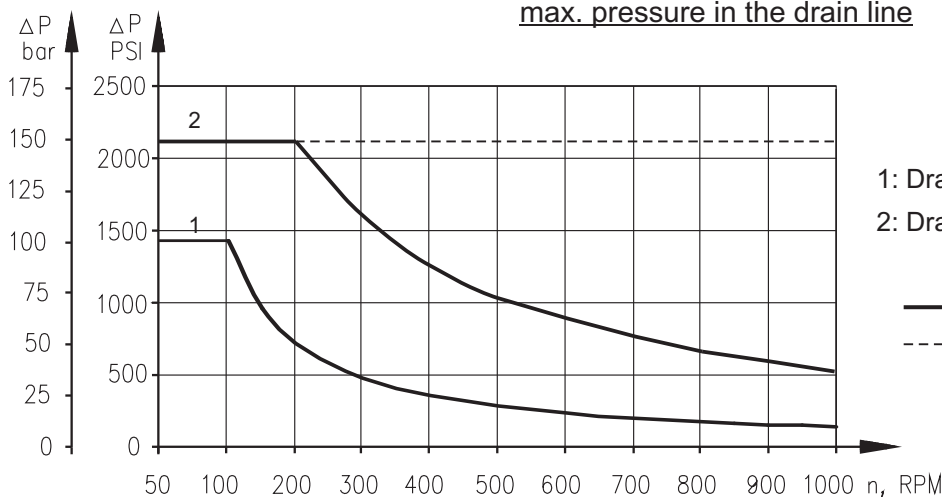
T: G 1/4 or M14x1,5- 12 mm [.47 in] depth (plugged)

MOTORS WITH TACHO CONNECTION



MAX. PERMISSIBLE SHAFT SEAL PRESSURE

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



1: Drawing for Standard Shaft Seal

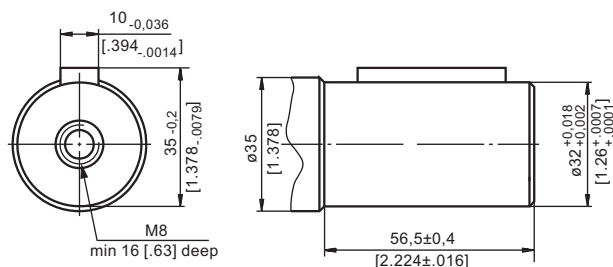
2: Drawing for High Pressure Seal ("U" Seal)

— - continuous operations

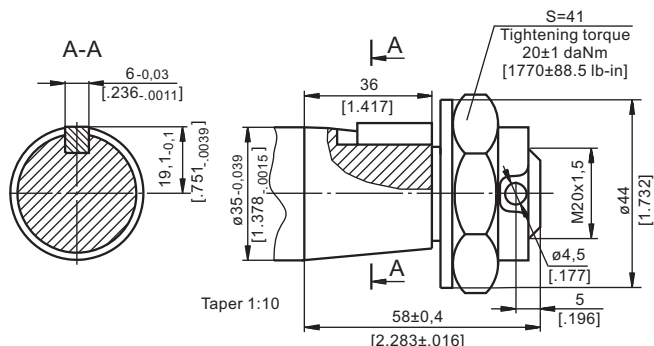
- - - - intermittent operations

SHAFT EXTENSIONS

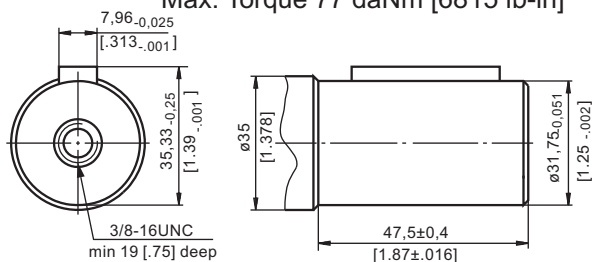
C - $\varnothing 32$ straight, Parallel key A10x8x45 DIN 6885
Max. Torque 77 daNm [6815 lb-in]



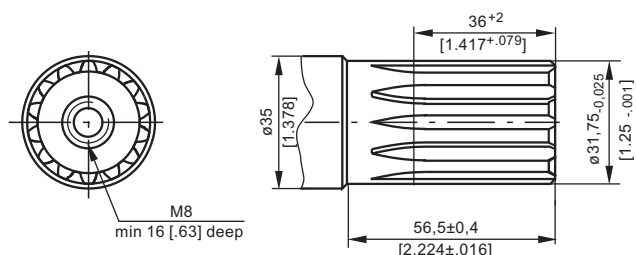
K - tapered 1:10, Parallel key B6x6x20 DIN 6885
Max. Torque 95 daNm [8400 lb-in]



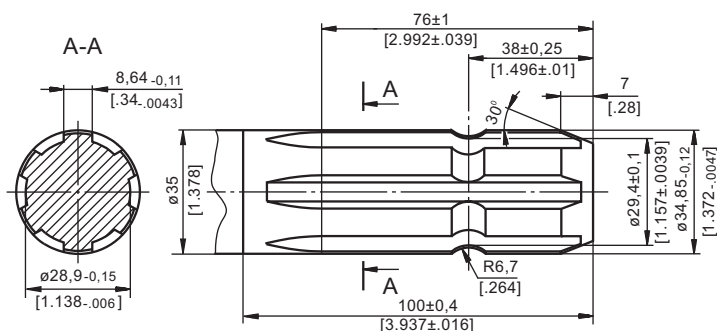
CO - $\varnothing 1\frac{1}{4}$ " straight, Parallel key $\frac{5}{16}$ "x $\frac{5}{16}$ "x $\frac{1}{4}$ " BS46
Max. Torque 77 daNm [6815 lb-in]



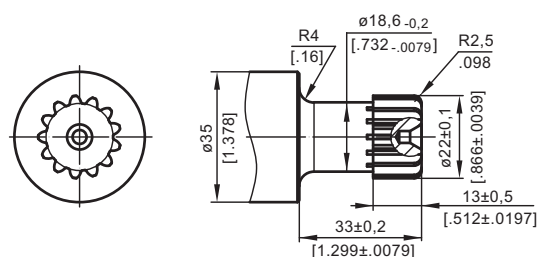
SH - $\varnothing 1\frac{1}{4}$ " splined 14T, DP12/24 ANS B92.1-1970
Max. Torque 95 daNm [8400 lb-in]



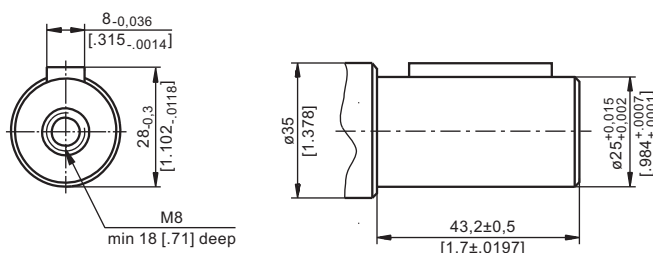
SL - $\varnothing 34,85$ p.t.o. DIN 9611 Form 1
Max. Torque 77 daNm [6815 lb-in]



SA - 7/8"-13T splined DP16/32 ANS B92.1-1970
Max. Torque 20 daNm [1770 lb-in]

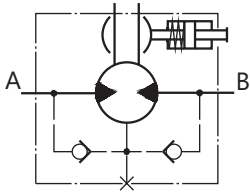


CA - $\varnothing 25$ straight, Parallel key A8x7x32 DIN 6885
Max. Torque 34 daNm [3010 lb-in]



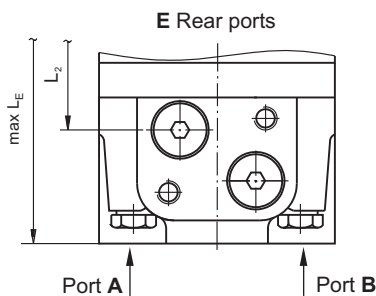
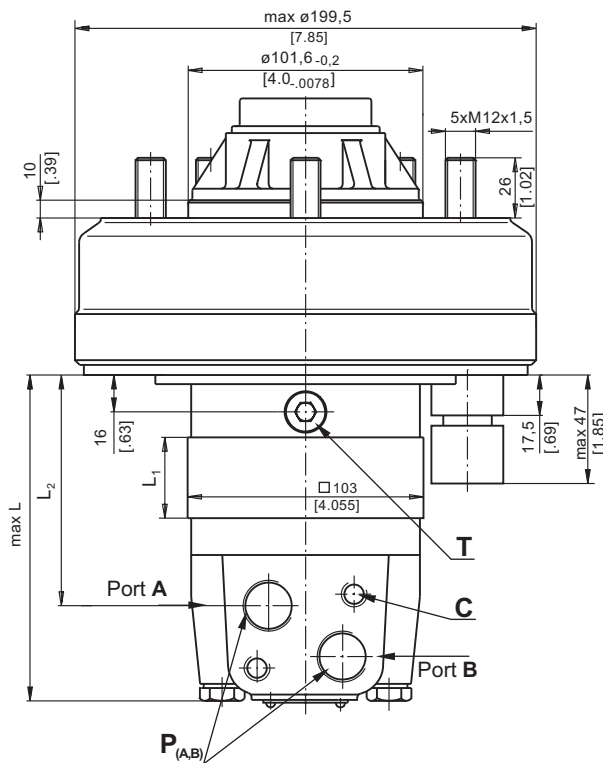
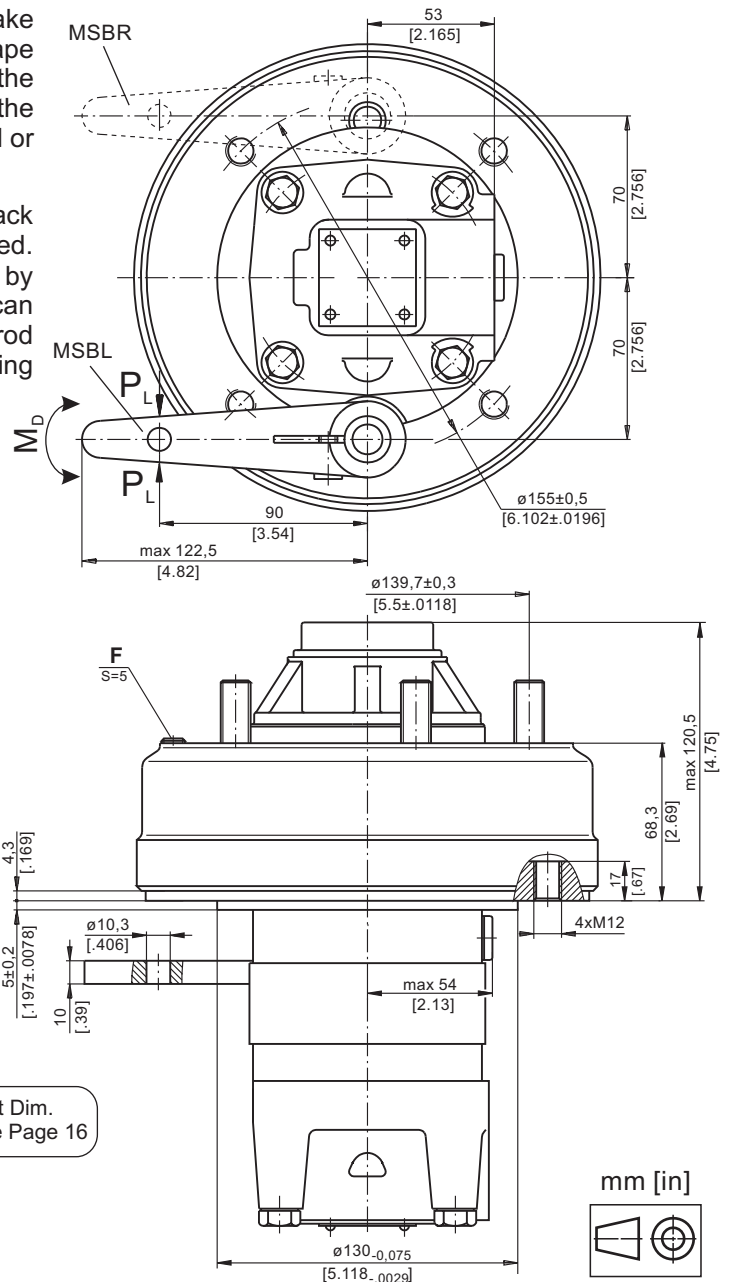
DIMENSIONS AND MOUNTING DATA

MSB Motor with Drum Brake



Actuating the brake level, the brake shaft is turned. The rectangular shape of the inner part of this shaft forces the brake pads to be pressed against the brake drum. This brakes the wheel or the winch drum.

Releasing the level, the springs pull it and the brake pads back to the initial position. The motor output shaft is released. Minimum angle adjustment is 10° . It can be adjusted by dismounting the level. Depending on the application You can choose the actuating direction of the brake level. The rod connection actuating the brake should be capable of moving at last 25 mm from neutral to extreme position.



- C** : 2xM10-12 mm [.47 in] depth
F : Inspection hole for checking brake lining
P_(A,B) : 2xG1/2 or 2xM22x1,5-15 mm [.59 in] depth
T : G 1/4 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**

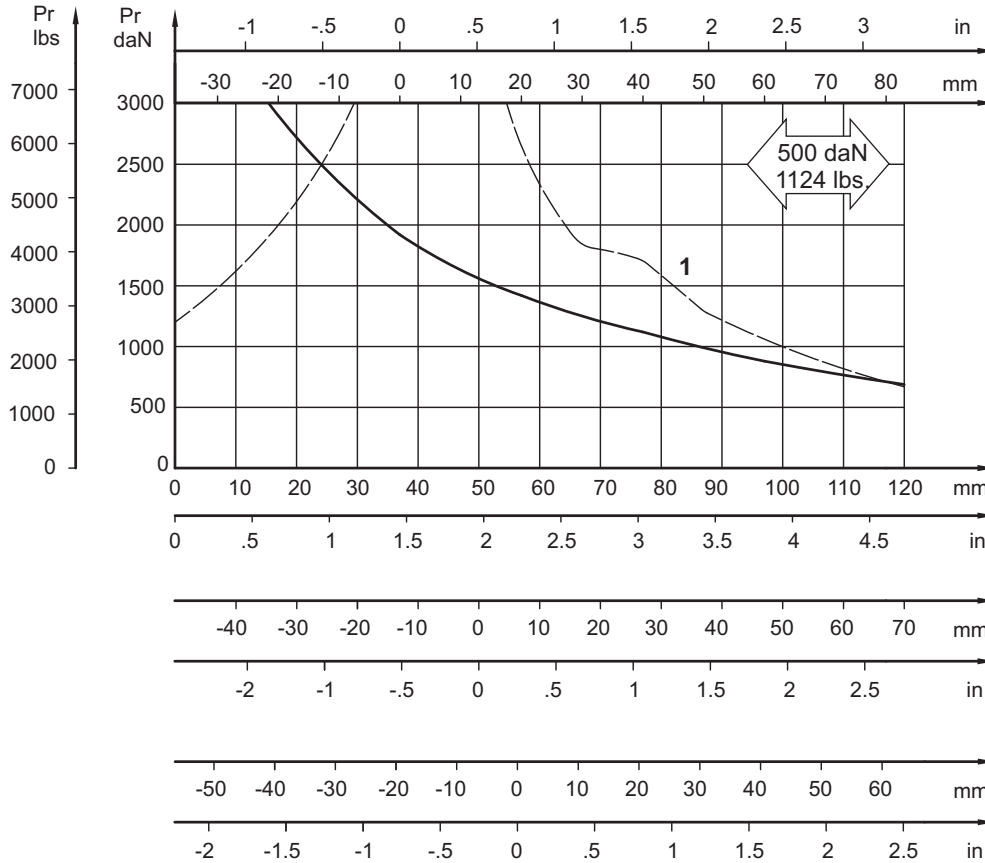
Type	L, mm[in.]	L ₁ , mm[in.]	L ₂ , mm[in.]	*L _E , mm[in.]
MSB 80	119 [4.69]	14,0 [.55]	74 [2.91]	127 [5.00]
MSB100	122 [4.80]	17,4 [.69]	77 [3.03]	130 [5.12]
MSB 125	126 [4.96]	21,8 [.86]	82 [3.23]	134 [5.28]
MSB 160	132 [5.20]	27,8 [1.09]	88 [3.47]	140 [5.51]
MSB 200	139 [5.47]	34,8 [1.37]	95 [3.74]	147 [5.79]
MSB 250	148 [5.83]	43,5 [1.71]	110 [4.33]	156 [6.14]
MSB 315	159 [6.26]	54,8 [2.16]	115 [4.53]	167 [6.57]
MSB 400	174 [6.85]	69,4 [2.73]	130 [5.12]	182 [7.17]
MSB 475	188 [7.40]	82,6 [3.25]	143 [5.63]	196 [7.72]
MSB 525	180 [7.09]	74,5 [2.93]	135 [5.32]	188 [7.40]
MSB 565	186 [7.32]	80,2 [3.16]	141 [5.55]	192 [7.56]

* -For Rear Ported Motors.

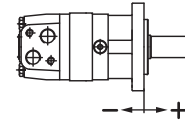
PERMISSIBLE SHAFT LOADS

The output shaft runs in tapered bearings that permit high axial and radial forces. The permissible radial load on the shaft is shown for an axial load of 0 N as function of the distance from the mounting flange to the point of load application. The curves apply to a B10 bearing life of 2000 hours at 100 RPM.

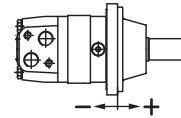
Curve "1" shows max. radial shaft load. Any shaft load exceeding the values shown by the curve will seriously reduce motor life.



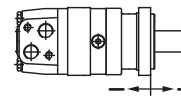
Mounting Flange:



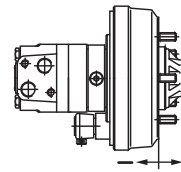
Standard
A-2
Magneto



W - Wheel



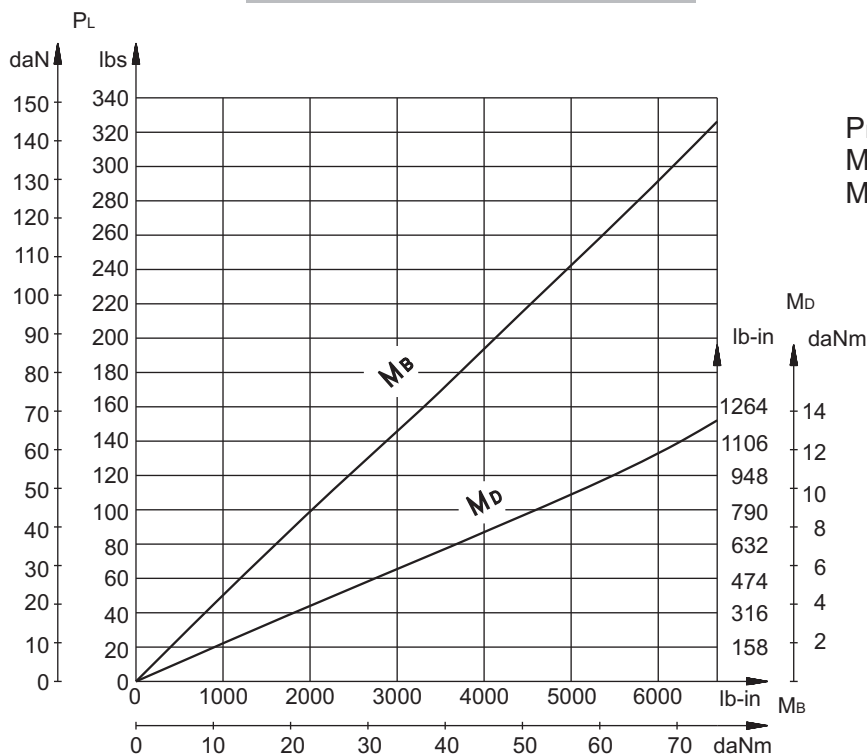
Q - Square



Drum Brake

Shaft: All type shafts except SA

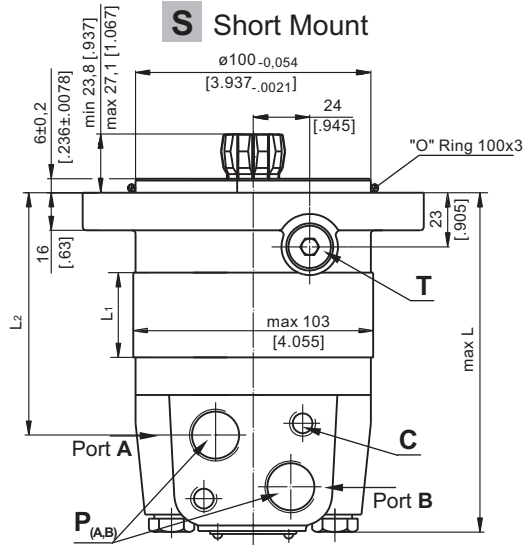
FUNCTION DIAGRAM MSB



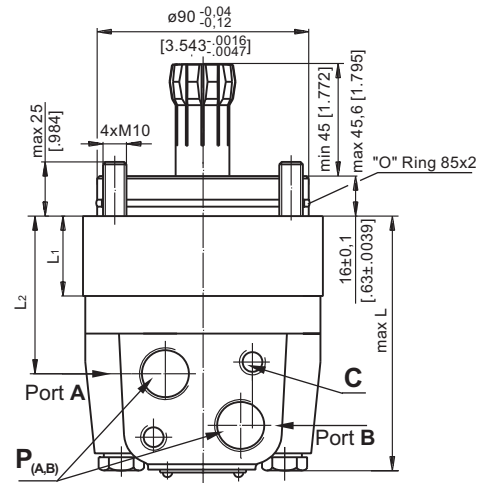
PL - Brake Lever Load
MB - Brake Torque
MD - Brake Lever Torque

DIMENSIONS AND MOUNTING DATA - MSS and MSV

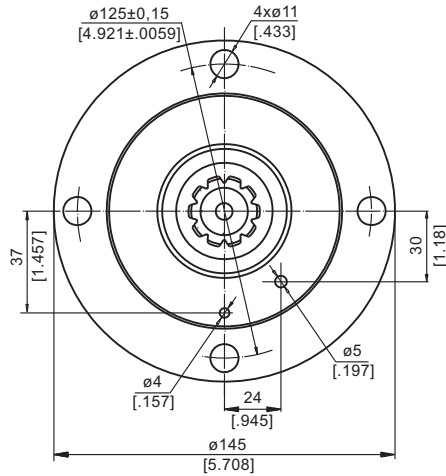
S Short Mount



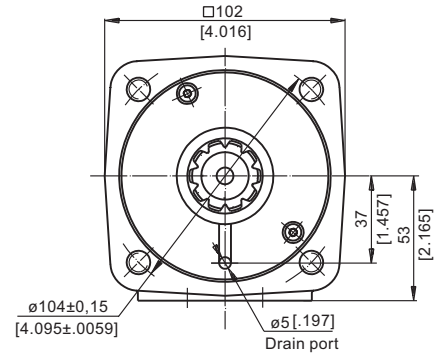
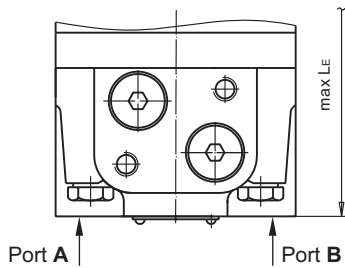
V Very Short Mount



Port Dim.
See Page 16



E Rear ports



C: 2xM10-12 mm [.47 in] depth
P_(A,B): 2xG1/2 or 2xM22x1,5-15 mm [.59 in] depth
T: G 1/4 or M14x1,5- 12 mm [.47 in] depth (plugged)

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

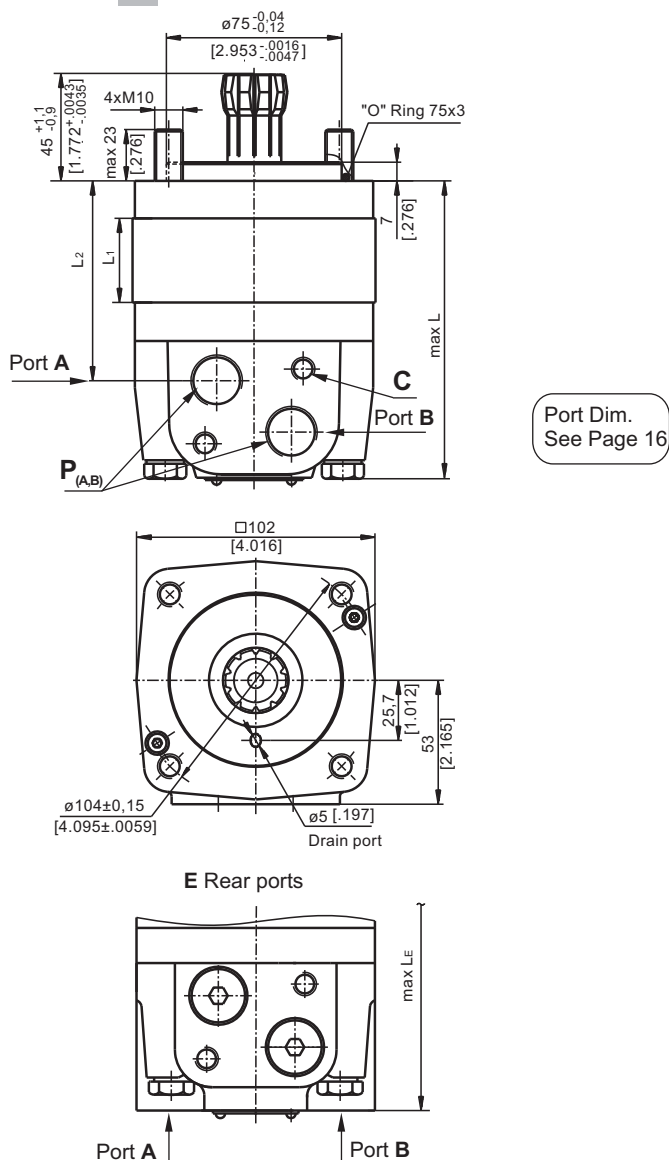
Reverse Rotation
 Viewed from Shaft End
 Port A Pressurized - **CCW**
 Port B Pressurized - **CW**

Type	L, mm [in]	L ₂ , mm [in]	*L _E , mm [in]	Type	L, mm [in]	L ₂ , mm [in]	*L _E , mm [in]	L ₁ , mm [in]
MSS 80	125 [4.92]	83 [3.27]	134 [5.28]	MSV 80	91 [3.58]	47 [1.85]	97 [3.82]	14,0 [.55]
MSS 100	129 [5.08]	87 [3.43]	138 [5.43]	MSV 100	94 [3.70]	50,5 [1.99]	100 [3.94]	17,4 [.69]
MSS 125	133 [5.24]	90 [3.54]	141 [5.55]	MSV 125	99 [3.90]	55 [2.17]	105 [4.13]	21,8 [.86]
MSS 160	139 [5.47]	96 [3.78]	147 [5.79]	MSV 160	105 [4.13]	61 [2.40]	111 [4.37]	27,8 [1.09]
MSS 200	146 [5.75]	103 [4.05]	154 [6.06]	MSV 200	112 [4.41]	68 [2.78]	118 [4.64]	34,8 [1.37]
MSS 250	155 [6.10]	112 [4.41]	163 [6.42]	MSV 250	120 [4.72]	76,5 [3.01]	126 [4.96]	43,5 [1.71]
MSS 315	166 [6.54]	123 [4.84]	174 [6.85]	MSV 315	132 [5.20]	88 [3.46]	138 [5.43]	54,8 [2.16]
MSS 400	181 [7.13]	138 [5.43]	189 [7.44]	MSV 400	146 [5.75]	103 [4.05]	153 [6.02]	69,4 [2.73]
MSS 475	194 [7.64]	152 [5.98]	203 [7.99]	MSV 475	160 [6.30]	116 [4.57]	166 [6.54]	82,6 [3.25]
MSS 525	186 [7.32]	144 [5.67]	195 [7.68]	MSV 525	152 [5.98]	108 [4.25]	158 [6.22]	74,5 [2.93]
MSS 565	192 [7.56]	150 [5.91]	201 [7.91]	MSV 565	158 [6.22]	114 [4.49]	164 [6.46]	80,2 [3.16]

* - For Rear Ported Motors.

DIMENSIONS AND MOUNTING DATA - MSU

U Ultra Short Mount



C: 2xM10-12 mm [.47 in] depth
P_(A,B): 2xG1/2 or 2xM22x1,5
15 mm [.59 in] depth

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**

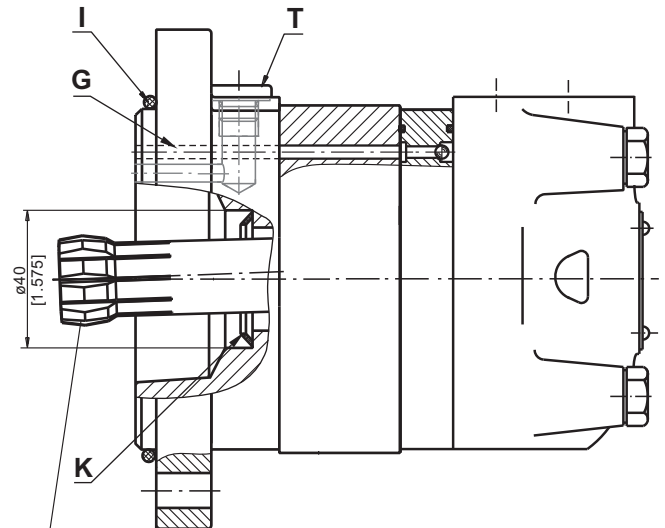
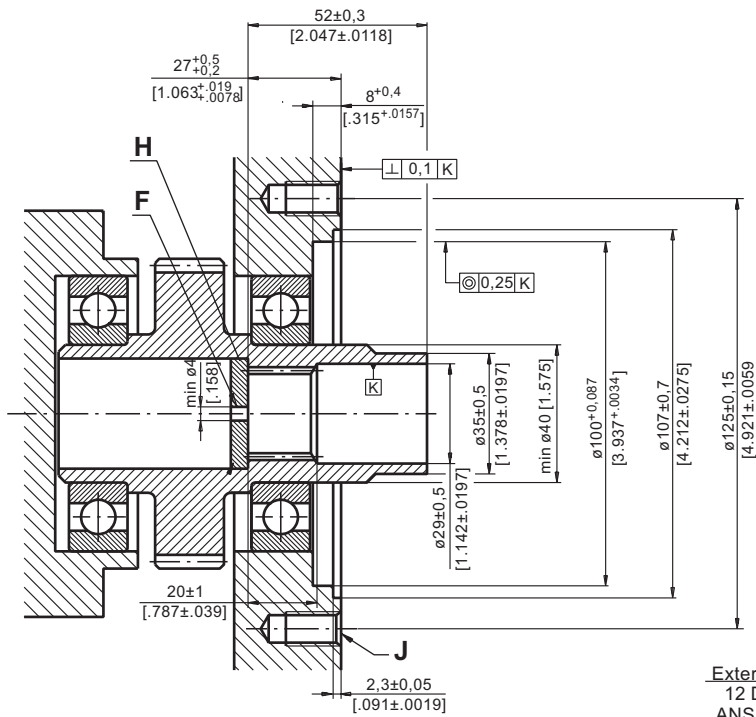
Type	L,mm[in]	L ₂ ,mm[in]	*L _E ,mm[in]	L ₁ ,mm[in]
MSU 80	105,5 [4.15]	63 [2.48]	111,5 [4.39]	14,0 [.55]
MSU 100	109 [4.29]	66,5 [2.62]	115 [4.53]	17,4 [.69]
MSU 125	113 [4.45]	71 [2.80]	119 [4.69]	21,8 [.86]
MSU 160	119 [4.69]	77 [3.03]	125 [4.92]	27,8 [1.09]
MSU 200	126 [4.96]	84 [3.31]	132 [5.20]	34,8 [1.37]
MSU 250	135 [5.32]	92,5 [3.64]	141 [5.55]	43,5 [1.71]
MSU 315	146 [5.75]	104 [4.09]	152 [5.98]	54,8 [2.16]
MSU 400	160 [6.30]	119 [4.69]	167 [6.58]	69,4 [2.73]
MSU 475	174 [6.85]	132 [5.20]	180 [7.09]	82,6 [3.25]
MSU 525	166 [6.54]	124 [4.88]	172 [6.77]	74,5 [2.93]
MSU 565	172 [6.77]	130 [5.12]	178 [7.01]	80,2 [3.16]

* -For Rear Ported Motors.



DIMENSIONS OF THE ATTACHED COMPONENT

For MSS

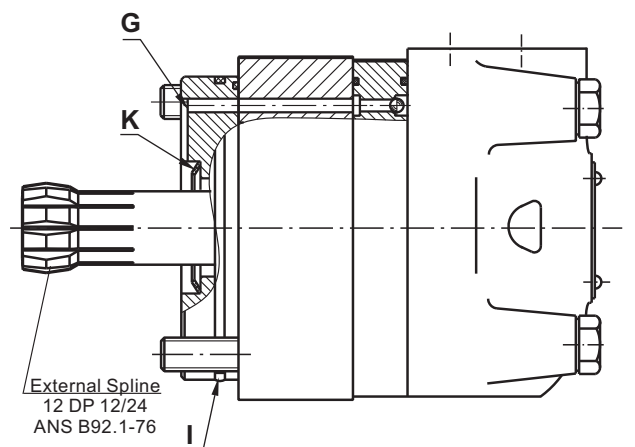
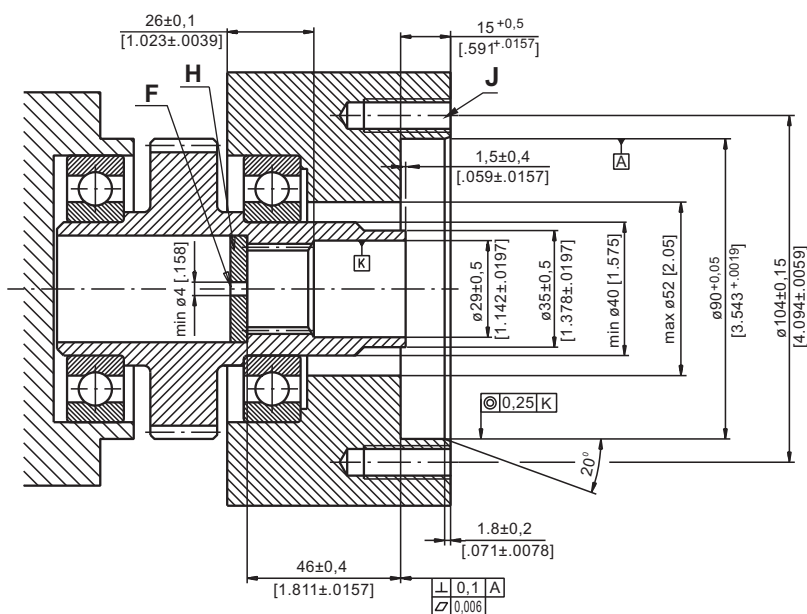


External Spline
12 DP 12/24
ANS B92.1-76

F: Oil circulation hole
H: Hardened stop plate
J: 4xM10-16 mm [.63 in] depth, 90°

G: Internal drain channel
I: O- Ring 100x3 mm [3.94x.12 in]
K: Conical seal ring
T: Drain connection G1/4 or M14x1,5

For MSV



External Spline
12 DP 12/24
ANS B92.1-76

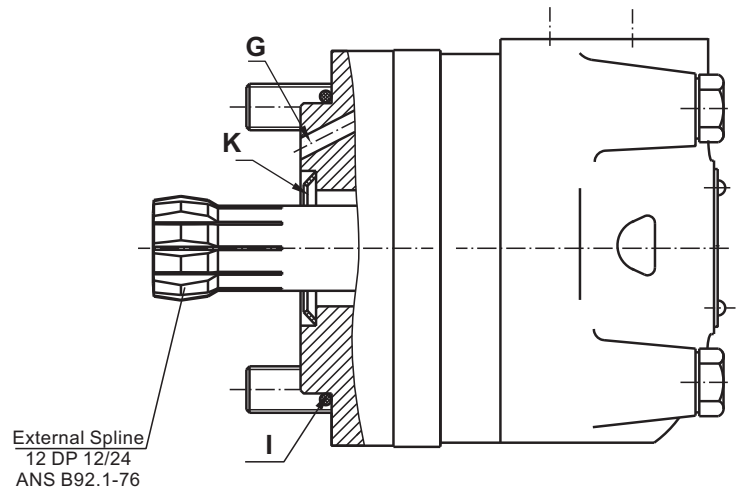
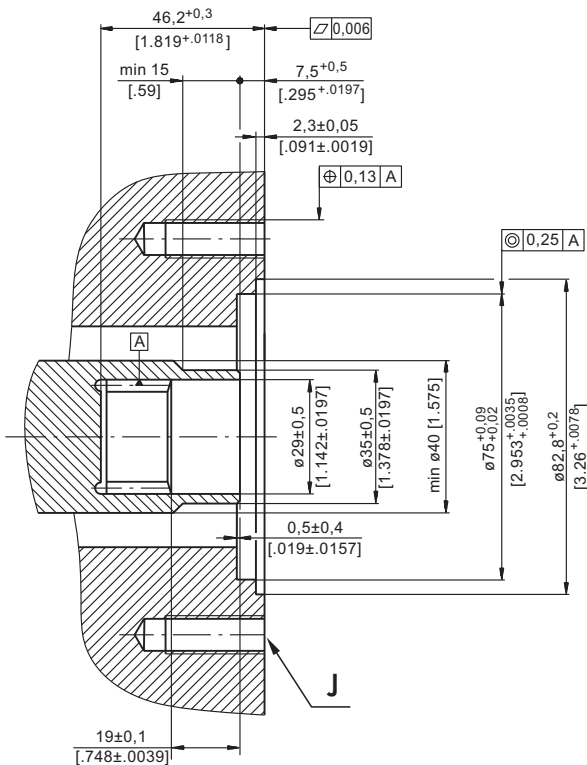
F: Oil circulation hole
H: Hardened stop plate
J: 4xM10-26 mm [1.024 in] depth, 90°

G: Internal drain channel
I: O- Ring 85x2 mm [3.346x.0787 in]
K: Conical seal ring



DIMENSIONS OF THE ATTACHED COMPONENT(continued)

For MSU



J: 4xM10-26 mm [1.024 in] depth, 90°, ø104 [4.094]

I: O- Ring 75x3 mm [2.952x.12 in]

G: Internal drain channel

K: Conical seal ring



DRAIN CONNECTION

The drain line has to be used when pressure in the return line can exceed the permissible pressure. It can be connected:

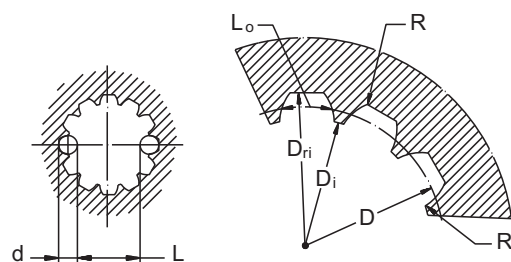
- For MSS at the drain port of the motor;
- For MSV and MSU at the drain connection of the attached component. The maximum pressure in the drain line is limited by the attached component and its shaft seal.

The drain line must be possible for oil to flow freely between motor and attached component and must be led to the tank. The maximum pressure in the drain line is limited by the attached component and its seal.

INTERNAL SPLINE DATA FOR THE ATTACHED COMPONENT

Standard ANS B92.1-1976, class 5
[*m*=2.1166; corrected *x.m*=+0,8]

Flat Root Side Fit		mm	inch
Number of Teeth	z	12	12
Diametral Pitch	DP	12/24	12/24
Pressure Angle		30°	30°
Pitch Dia.	D	25,4	1
Major Dia.	D _{ri}	28,0 _{-0,1}	1.1 ÷ 1.098
Minor Dia.	D _i	23,0 _{+0,033}	.907 ÷ .905
Space Width [Circular]	L _o	4,308±0,020	.1704 ÷ .1688
Fillet Radius	R	0,2	.008
Max. Measurement between Pins	L	17,62 _{+0,15}	.699 ÷ .694
Pin Dia.	d	4,835±0,001	.19039±.19031



Hardening Specification:

HV=750±50 on the surface

HV=560 at 0,7±0,2 mm [.035±.019 in] case depth

Material: 20 MoCr4 EN 10084 or better

ORDER CODE

	1	2	3	4	5	6	7	8
M S								

Pos.1 - Mounting Flange

omit - SAE A-4 mount, four holes

A - SAE A-2 mount, two holes

F - Magneto mount, four holes

Q - Square mount, four holes

B - Motor with drum brake

S - Short mount

V - Very short mount

U - Ultra short mount

W - Wheel mount

Pos.2 - Port type

omit - Side ports

E - Rear ports

Pos.3 - Displacement code

80 - 80,5 cm³/rev [4.91 in³/rev]

100 - 100,0 cm³/rev [6.10 in³/rev]

125 - 125,7 cm³/rev [7.67 in³/rev]

160 - 159,7 cm³/rev [9.74 in³/rev]

200 - 200,0 cm³/rev [12.20 in³/rev]

250 - 250,0 cm³/rev [15.30 in³/rev]

315 - 314,9 cm³/rev [19.20 in³/rev]

400 - 397,0 cm³/rev [24.20 in³/rev]

475 - 474,6 cm³/rev [28.96 in³/rev]

525 - 522,7 cm³/rev [31.88 in³/rev]

565 - 564,9 cm³/rev [34.47 in³/rev]

Pos.4 - Shaft Extensions*

omit - for **B**, **S**, **U** and **V** mounting flange

C - ø32 straight, Parallel key A10x8x45 DIN6885

CO - ø1¼" straight, Parallel key $\frac{5}{16}$ "x $\frac{5}{16}$ "x1¼" BS46

K - ø35 tapered 1:10, Parallel key B6x6x20 DIN6885

SL - ø34,85 p.t.o. DIN 9611 Form 1

SH - ø1¼" splined 14T ANS B92.1-1970

SA - 7/8"-13T splined ANS B92.1-1970

CA - ø25 straight, Parallel key A8x7x32 DIN6885

Pos.5 - Shaft Seal Version (see page 17)

omit - Low pressure seal

U - High pressure seal

Pos. 5 - Ports

omit - BSPP (ISO 228)

M - Metric (ISO 262)

Pos. 6 - Actuating Direction**

/R - Right

/L - Left

Pos. 7 - Special Features (see page 51)

Pos. 8 - Design Series

omit - Factory specified

NOTES:

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

** For MSB only!

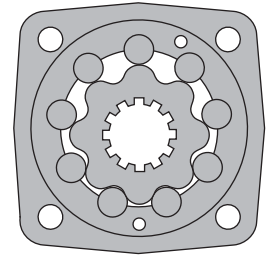
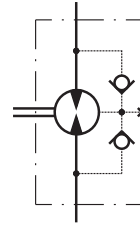
The hydraulic motors are mangano-phosphatized as standard.

HYDRAULIC MOTORS MT



APPLICATION

- » Conveyors
- » Metal working machines
- » Agricultural machines
- » Road building machines
- » Mining machinery
- » Food industries
- » Special vehicles
- » Plastic and rubber machinery etc.



CONTENTS

Specification data	26÷27
Function diagrams	28÷31
Dimensions and mounting	32÷33
Shaft extensions	34
Permissible Shaft Seal pressure	34
Dimensions and mounting- MTS, V	35÷36
Internal Spline data	37
Permissible shaft loads	37
Tacho connection	38
Order code	38

OPTIONS

- » Model - Disc valve, roll-gerotor
- » Flange with wheel mount
- » Short motor
- » Tacho connection
- » Speed sensing
- » Side and rear ports
- » Shafts - straight, splined and tapered
- » Metric and BSPP ports
- » Other special features

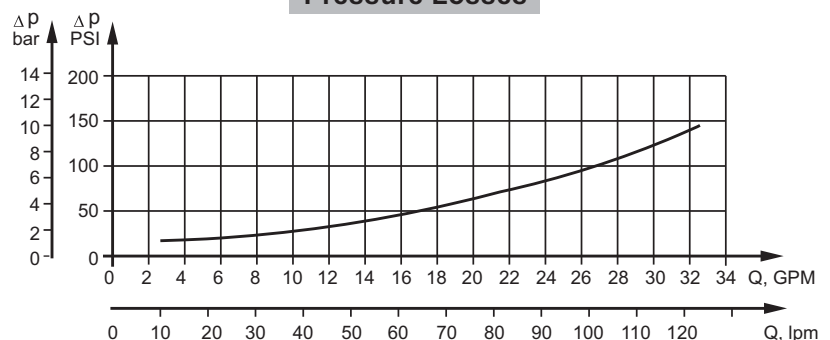
GENERAL

Max. Displacement, cm ³ /rev [in ³ /rev]	724,3 [44.2]
Max. Speed, [RPM]	775
Max. Torque, daNm [lb-in]	cont.: 130 [11500] int.: 148 [13100]
Max. Output, kW [HP]	40 [54]
Max. Pressure Drop, bar [PSI]	cont.: 200 [2900] int. 240 [3480]
Max. Oil Flow, lpm [GPM]	150 [39.6]
Min. Speed, [RPM]	5
Permissible Shaft Loads daN [lbs]	P _a =1000 [2250]
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]
140 [2030]	20 [98]	2,5 [.660]
	35 [164]	1,5 [.396]
210 [3045]	20 [98]	5 [1.321]
	35 [164]	3 [.793]

Pressure Losses



SPECIFICATION DATA

Type		MT 160	MT 200	MT 250	MT 315
Displacement, cm³/rev [in³/rev]		161,1 [9.83]	201,4 [12.29]	251,8 [15.36]	326,3 [19.90]
Max. Speed, [RPM]	Cont.	622	620	496	382
	Int.*	775	752	601	461
Max. Torque daNm [lb-in]	Cont.	47 [4160]	59 [5220]	73 [6460]	95 [8410]
	Int.*	56 [4960]	71 [6285]	88 [7790]	114 [10090]
	Peak**	66 [5840]	82 [7260]	102 [9030]	133 [11770]
Max. Output kW [HP]	Cont.	26,5 [36]	33,5 [45]	33,5 [45]	33,5 [45]
	Int.*	32 [43]	40 [54]	40 [54]	40 [54]
Max. Pressure Drop bar [PSI]	Cont.	200 [2900]	200 [2900]	200 [2900]	200 [2900]
	Int.*	240 [3480]	240 [3480]	240 [3480]	240 [3480]
	Peak**	280 [4050]	280 [4050]	280 [4050]	280 [4050]
Max. Oil Flow lpm [GPM]	Cont.	100 [26]	125 [33]	125 [33]	125 [33]
	Int.*	125 [33]	150 [39.6]	150 [39.6]	150 [39.6]
Max. Inlet Pressure bar [PSI]	Cont.	210 [3050]	210 [3050]	210 [3050]	210 [3050]
	Int.*	250 [3600]	250 [3600]	250 [3600]	250 [3600]
	Peak**	300 [4350]	300 [4350]	300 [4350]	300 [4350]
Max. Return Pressure with Drain Line bar [PSI]	Cont.	140 [2030]	140 [2030]	140 [2030]	140 [2000]
	Int.*	175 [2540]	175 [2540]	175 [2540]	175 [2500]
	Peak**	210 [3050]	210 [3050]	210 [3050]	210 [3000]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		10 [150]	10 [150]	10 [150]	10 [150]
Min. Starting Torque daNm [lb-in]	At max. press. drop Cont.	34 [3010]	43 [3800]	53 [4690]	74 [6550]
	At max. press. drop Int.*	41 [3630]	52 [4600]	63 [5580]	89 [7880]
Min. Speed***, [RPM]		10	9	8	7
Weight, kg [lb] For Rear Ports +0,450[.992]	MT	20 [44.1]	21,5 [47.4]	21 [46.3]	22 [48.5]
	MTW	22 [48.5]	22,5 [49.6]	23 [50.7]	24 [52.9]
	MTS	15 [33.1]	15,5 [34.2]	16 [35.3]	17 [37.5]
	MTV	11 [24.3]	11,5 [25.4]	12 [26.5]	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.

SPECIFICATION DATA (continued)

Type		MT 400	MT 500	MT 630	MT 725
Displacement, cm ³ /rev [in ³ /rev]		410,9 [25.06]	523,6 [31.95]	631,2 [38.52]	724,3 [44.2]
Max. Speed, [RPM]	Cont.	304	238	197	172
	Int.*	368	289	234	209
Max. Torque daNm [lb-in]	Cont.	108 [9560]	122 [10800]	130 [11500]	127 [11240]
	Int.*	126 [11150]	137 [12125]	148 [13100]	147 [13010]
	Peak**	144 [12745]	160 [14160]	176 [15580]	175 [15490]
Max. Output kW [HP]	Cont.	30 [40]	26,5 [36]	24,3 [33]	20,2 [27]
	Int.*	35 [47]	30 [40]	27,5 [37]	26,8 [36]
Max. Pressure Drop bar [PSI]	Cont.	180 [2610]	160 [2320]	140 [2010]	120 [1740]
	Int.*	210 [3050]	180 [2610]	160 [2320]	140 [2010]
	Peak**	240 [3480]	210 [3050]	190 [2760]	165 [2395]
Max. Oil Flow lpm [GPM]	Cont.	125 [33]	125 [33]	125 [33]	125 [33]
	Int.*	150 [39.6]	150 [39.6]	150 [39.6]	150 [39.6]
Max. Inlet Pressure bar [PSI]	Cont.	210 [3050]	210 [3050]	210 [3600]	210 [3050]
	Int.*	250 [3600]	250 [3600]	250 [4350]	250 [3600]
	Peak**	300 [4350]	300 [4350]	300 [2000]	300 [4350]
Max. Return Pressure with Drain Line bar [PSI]	Cont.	140 [2000]	140 [2000]	140 [2500]	140 [2000]
	Int.*	175 [2500]	175 [2500]	175 [2500]	175 [2500]
	Peak**	210 [3000]	210 [3000]	210 [3000]	210 [3000]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		10 [150]	10 [150]	10 [150]	10 [150]
Min. Starting Torque daNm [lb-in]	At max. press. drop Cont.	84 [7435]	95 [8410]	95 [8410]	95 [8410]
	At max. press. drop Int.*	97 [8585]	106 [9380]	110 [9740]	115 [10180]
Min. Speed***, [RPM]		6	5	5	5
Weight, kg [lb]	MT	23 [50.7]	24 [52.9]	23,5 [51.8]	24,5 [54.0]
For Rear Ports	MTW	25 [55.1]	26 [57.3]	25,5 [56.2]	26,5 [58.4]
+0,450[.992]	MTS	18 [39.7]	19 [41.9]	18,5 [40.8]	19,5 [43.0]
	MTV	14 [30.9]	15 [33.1]	14,5 [32.0]	15,5 [34.2]

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

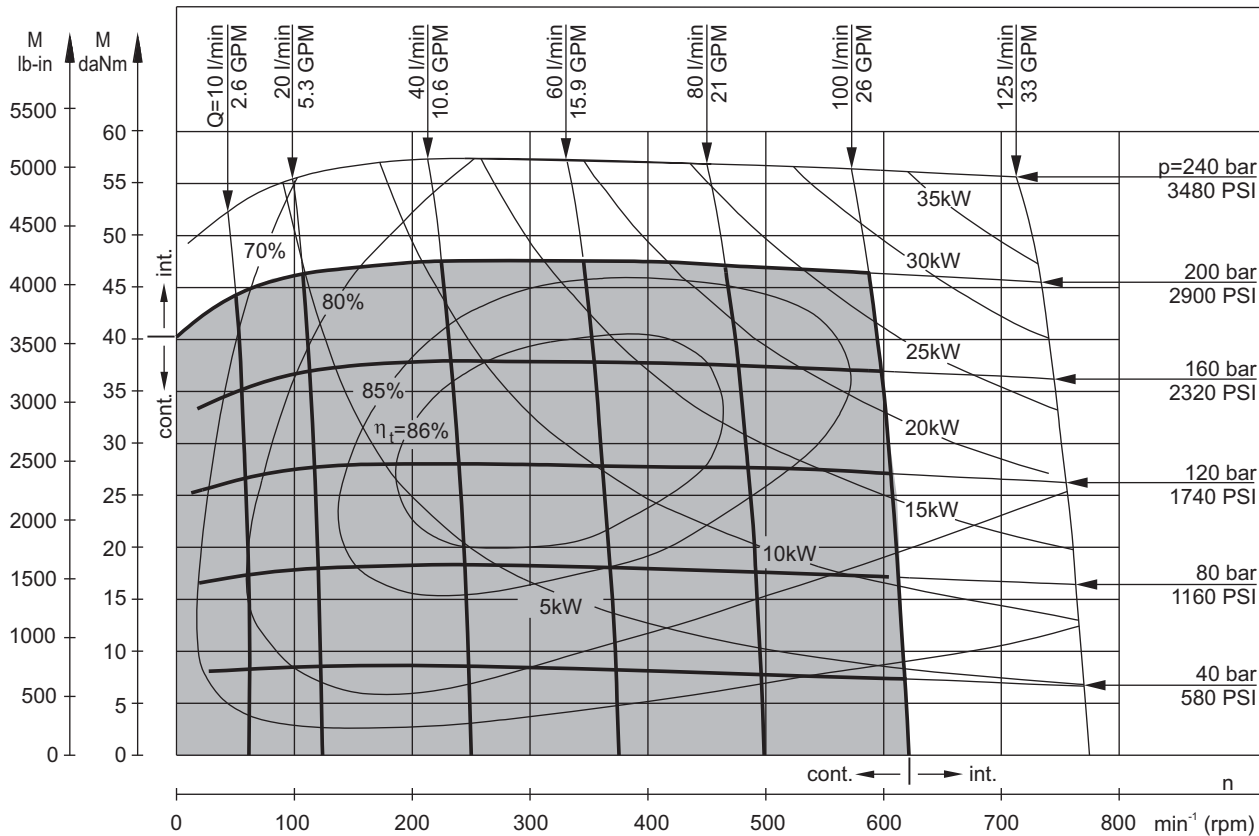
** Peak load: the permissible values may occur for max. 1% of every minute.

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

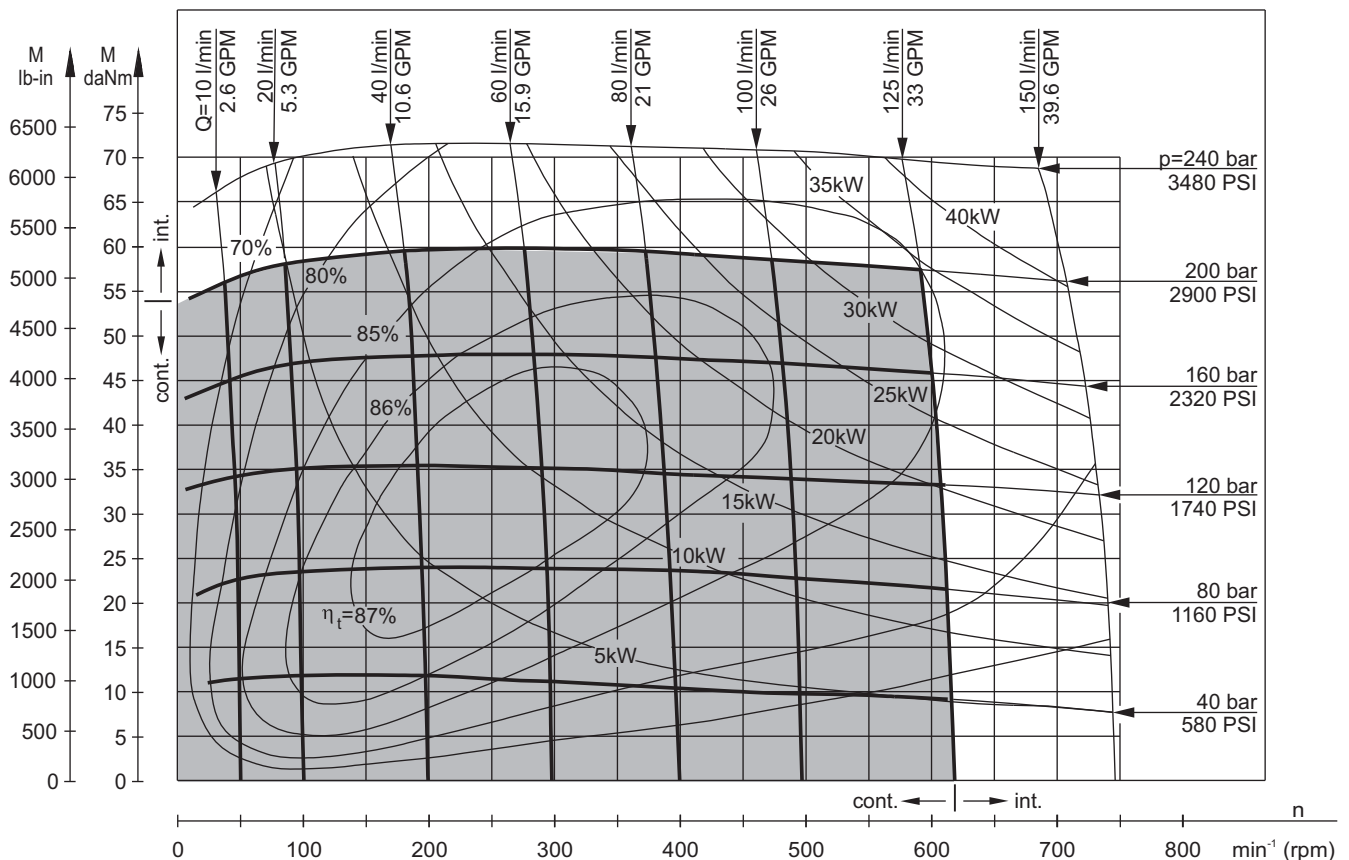
- Intermittent speed and intermittent pressure must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).
If using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

MT 160



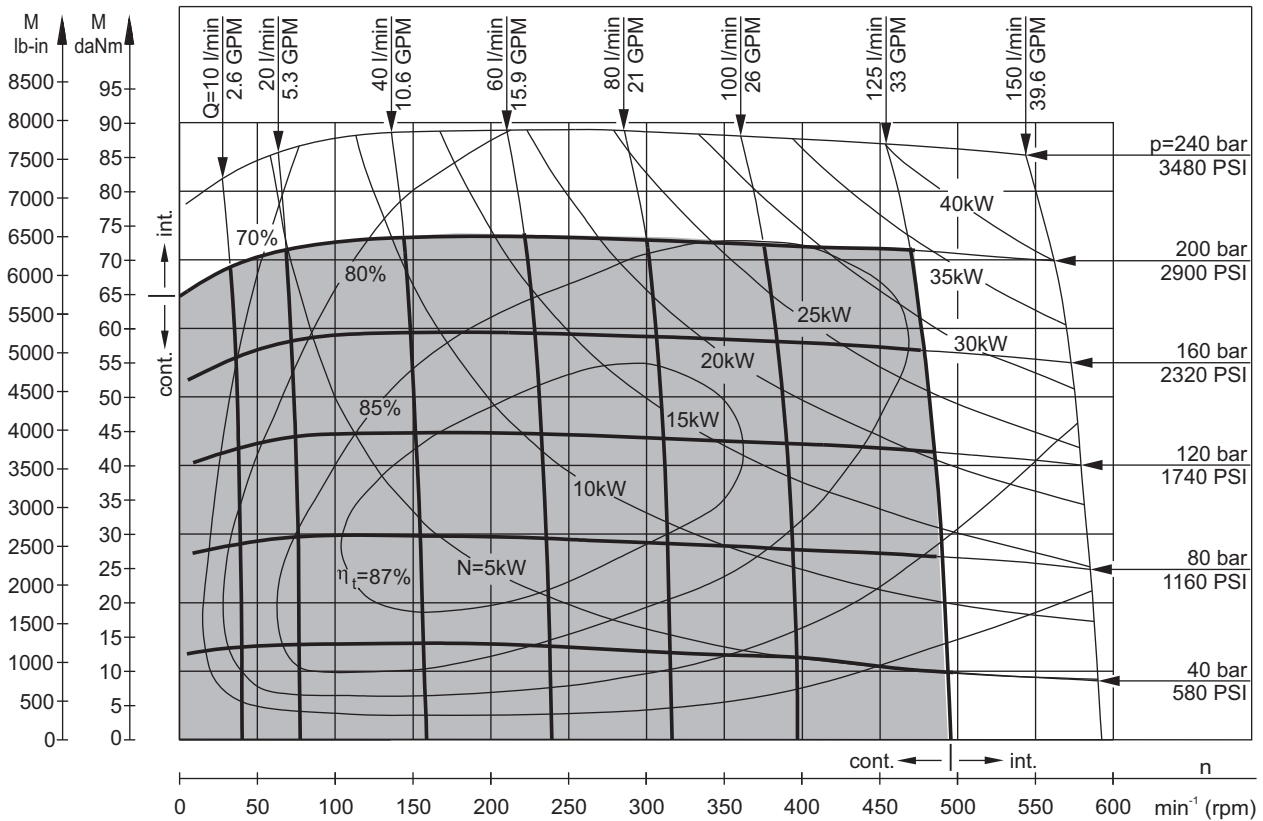
MT 200



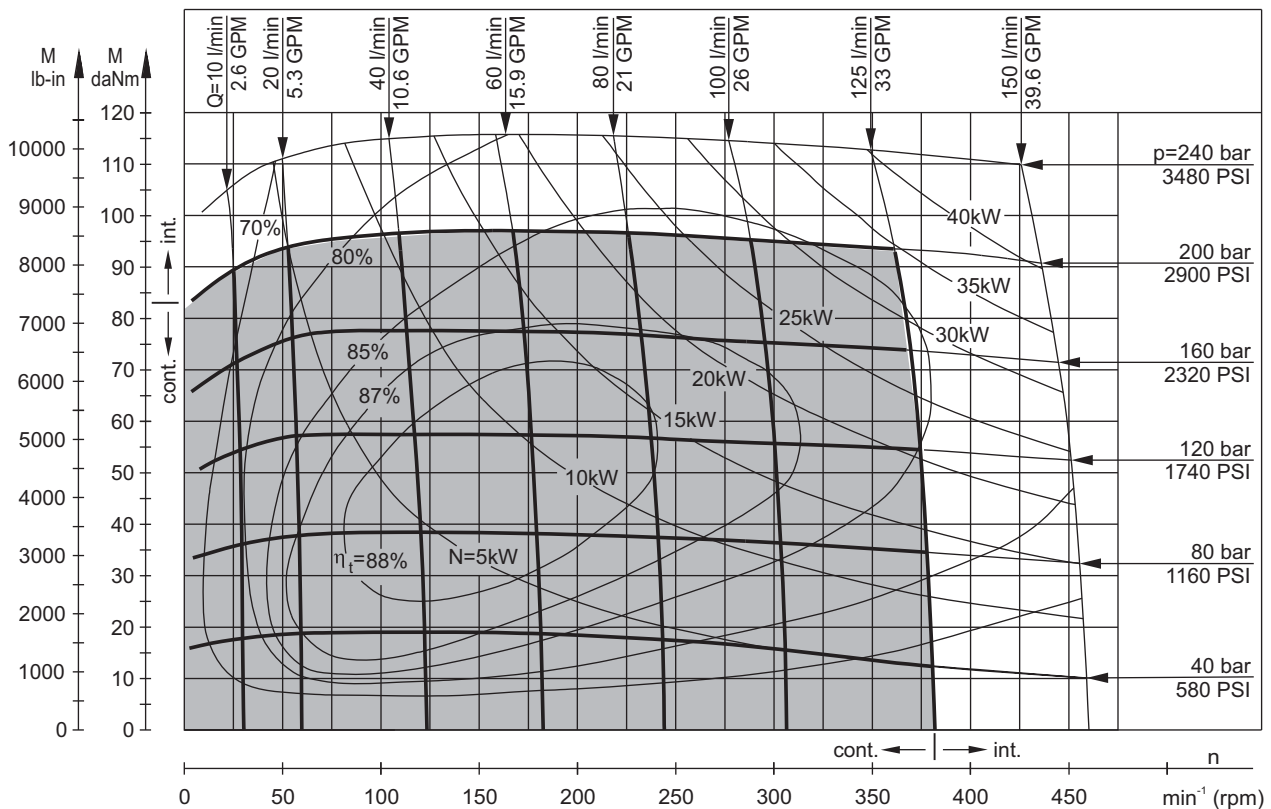
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MT 250



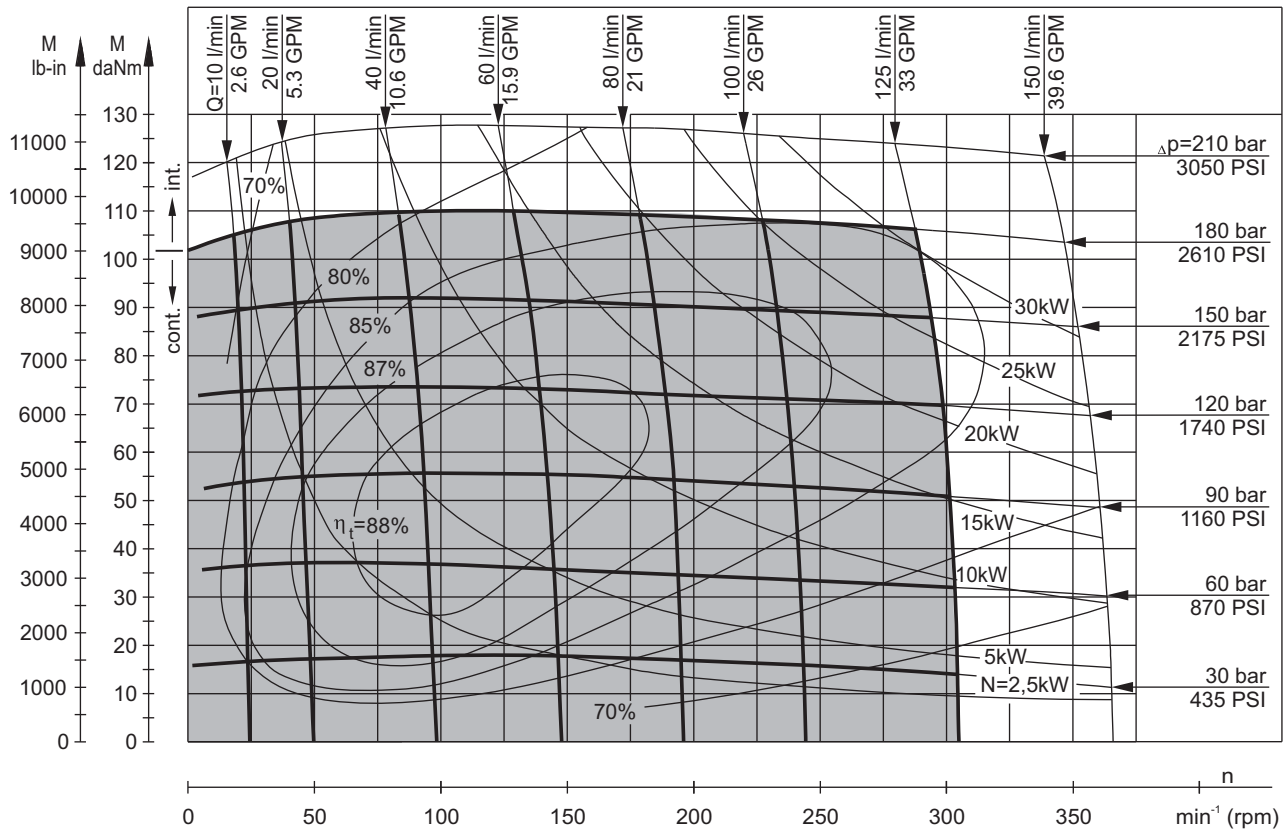
MT 315



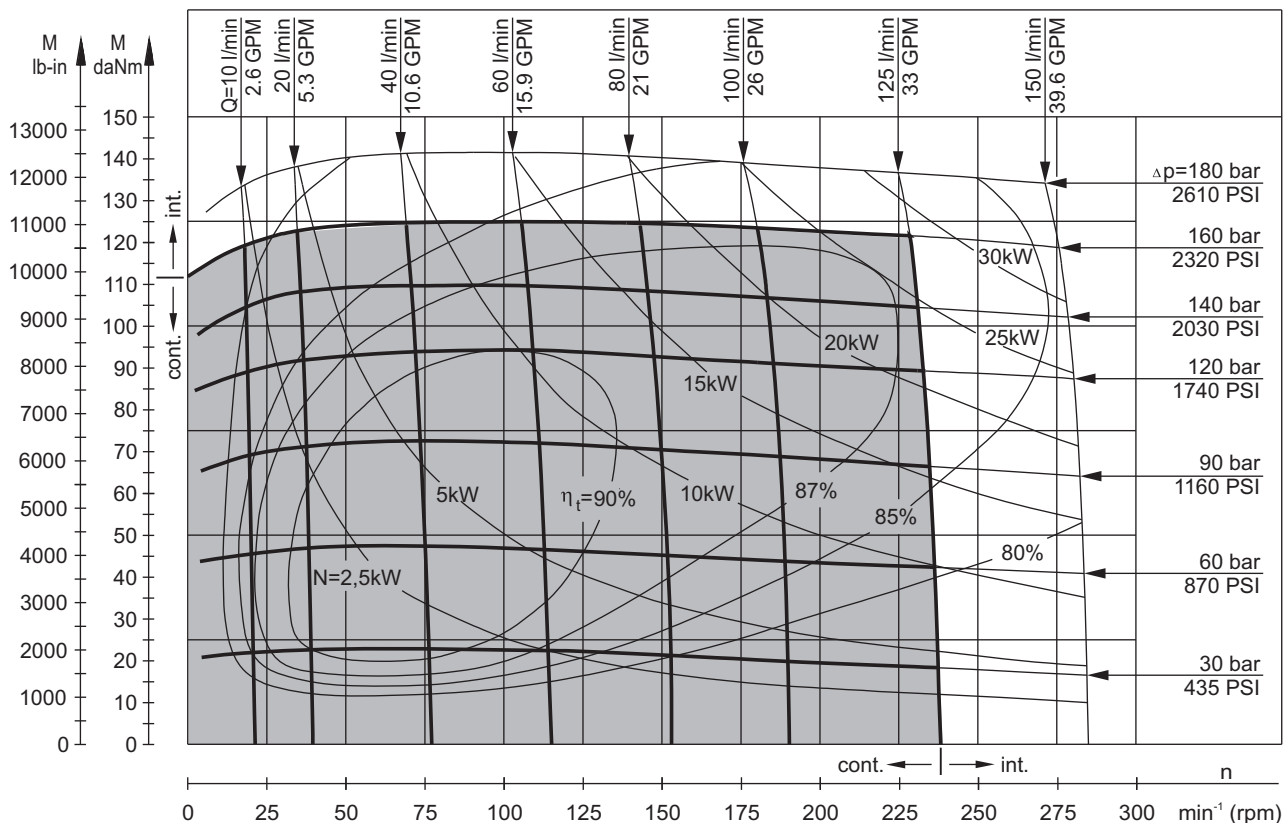
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MT 400



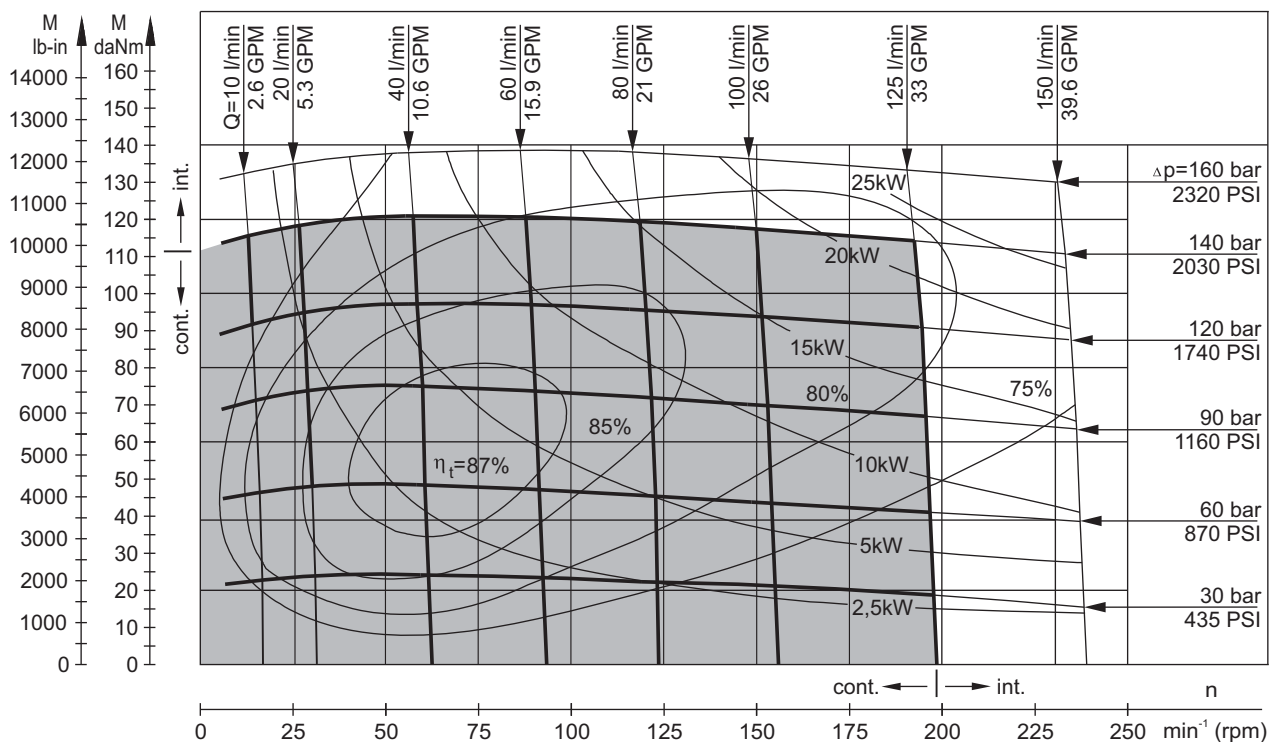
MT 500



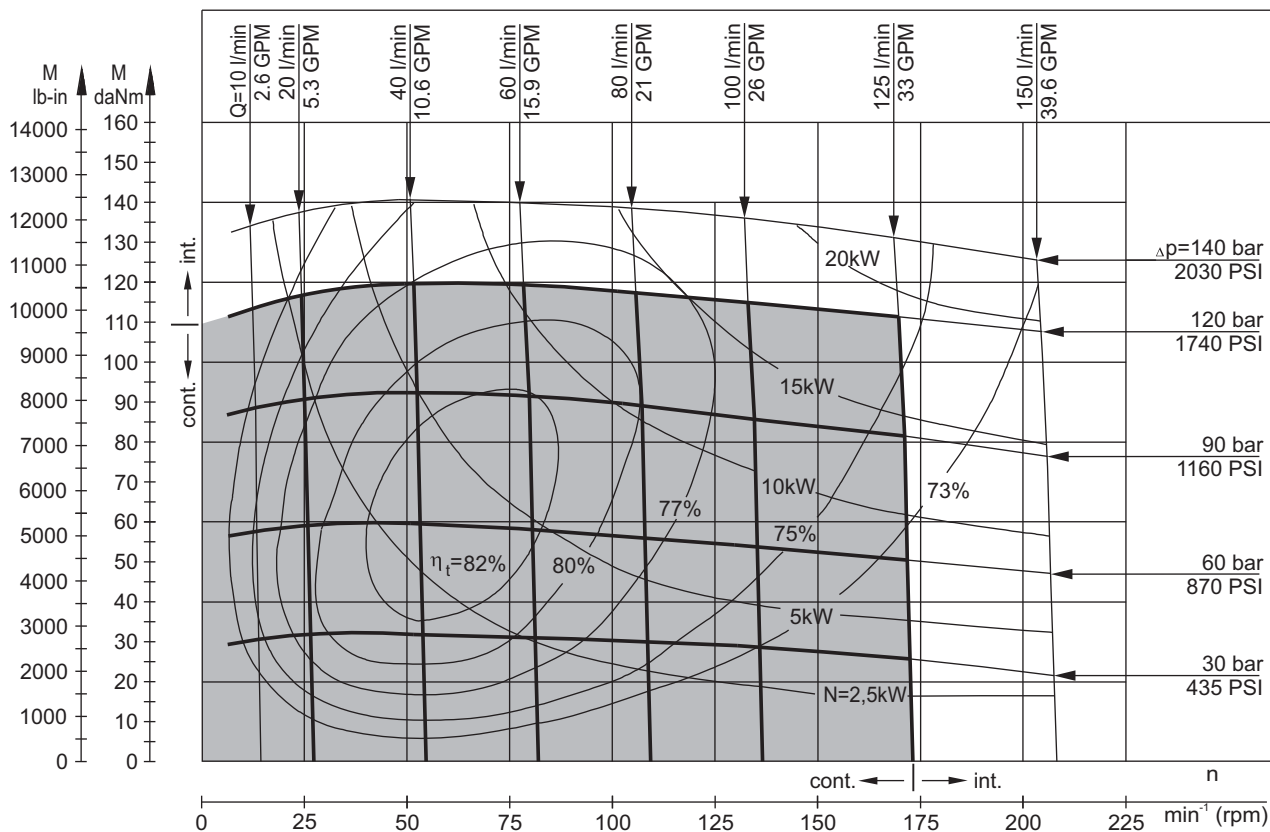
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MT 630

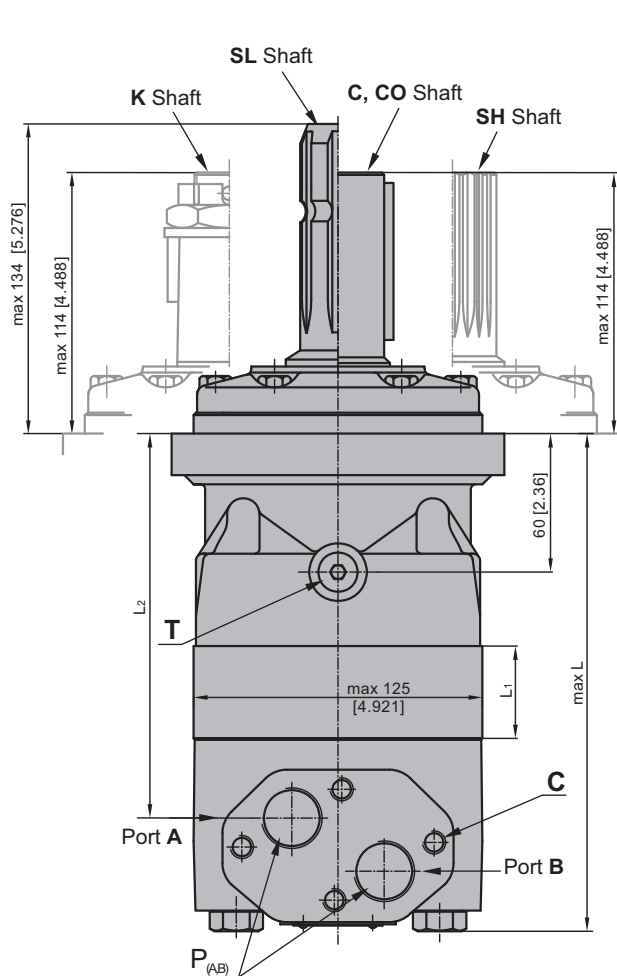


MT 725

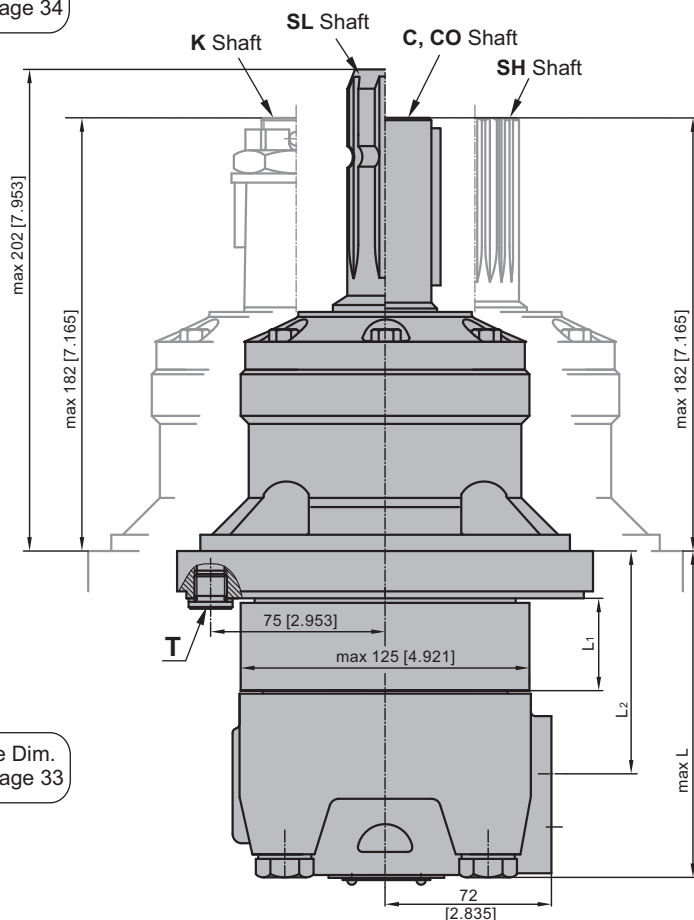


The function diagrams data is for average performance of randomly selected motors at back pressure 5 ± 10 bar [72.5 $\pm$ 145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

DIMENSIONS AND MOUNTING DATA



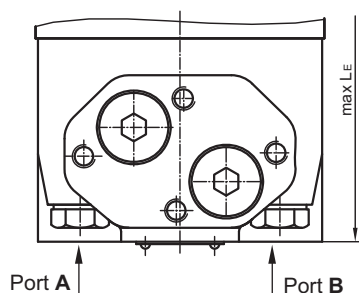
Shaft Dim.
See Page 34



Flange Dim.
See Page 33

Port Dim.
See Page 33

E Rear ports



- C** : 4xM10-10 mm [.39 in] depth
P_(A,B) : 2xG3/4 or 2xM27x2-17 mm [.67 in] depth
T : G 1/4 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**

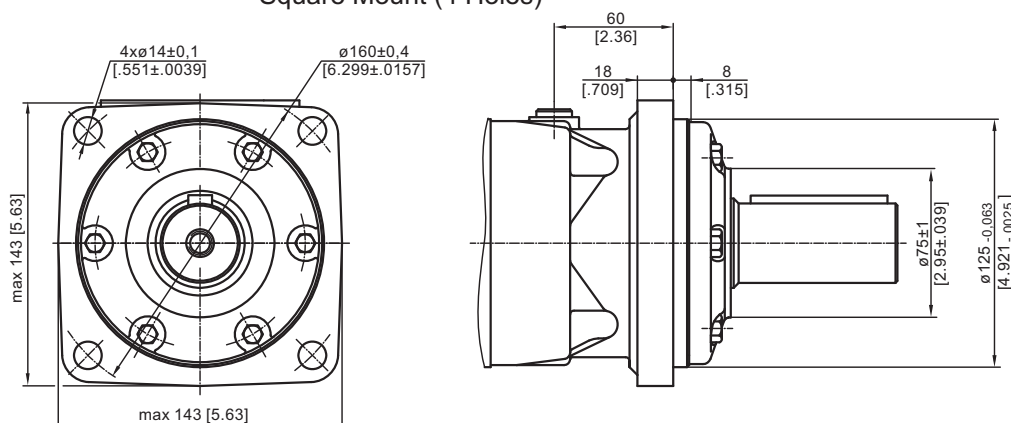
Type	L, mm [in]	L ₂ , mm [in]	**L _E , mm [in]	Type	L, mm [in]	L ₂ , mm [in]	**L _E , mm [in]	*L ₁ , mm [in]
MT 160	193,1 [7.60]	143,5 [5.65]	203,1 [8.00]	MTW 160	124,1 [4.89]	74,3 [2.93]	134,1 [5.28]	16,5 [.65]
MT 200	198,1 [7.80]	148,5 [5.85]	208,1 [8.19]	MTW 200	129,1 [5.08]	79,3 [3.12]	139,1 [5.48]	21,5 [.85]
MT 250	204,4 [8.05]	154,8 [6.09]	214,4 [8.44]	MTW 250	135,4 [5.33]	85,6 [3.37]	145,4 [5.72]	27,8 [1.09]
MT 315	213,6 [8.41]	164,0 [6.46]	223,6 [8.80]	MTW 315	144,6 [5.69]	94,8 [3.73]	154,6 [6.09]	37,0 [1.46]
MT 400	224,1 [8.82]	174,5 [6.87]	234,1 [9.22]	MTW 400	155,1 [6.11]	105,3 [4.15]	165,1 [6.50]	47,5 [1.87]
MT 500	238,1 [9.37]	188,5 [7.42]	248,1 [9.77]	MTW 500	169,1 [6.66]	119,3 [4.70]	179,1 [7.05]	61,5 [2.42]
MT 630	234,1 [9.22]	184,5 [7.26]	244,1 [9.61]	MTW 630	165,1 [6.50]	115,3 [4.54]	175,1 [6.89]	57,5 [2.26]
MT 725	243,1 [9.57]	193,5 [7.62]	253,1 [9.96]	MTW 725	174,1 [6.85]	124,3 [4.89]	184,1 [7.25]	66,5 [2.62]

* - The width of the roll-gerotor is 3,5 mm [.138 in] greater than L₁.

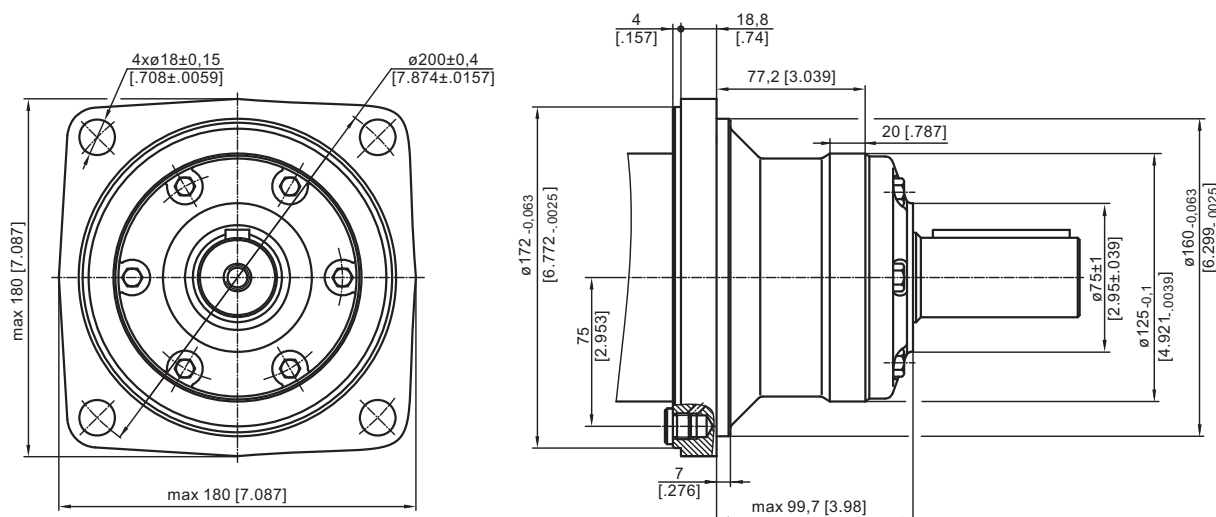
** - For Rear Ported Motors.

MOUNTING

Square Mount (4 Holes)

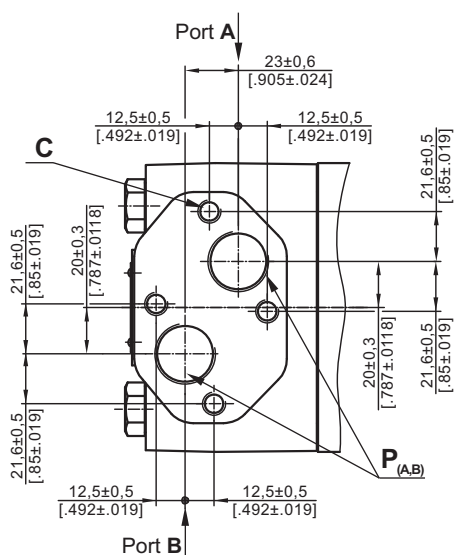


W Wheel Mount

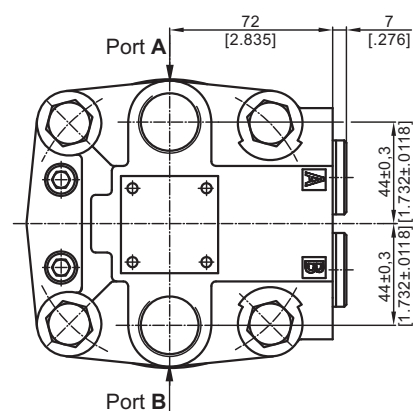


PORTS

Side Ports



E Rear Ports



Standard Rotation

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

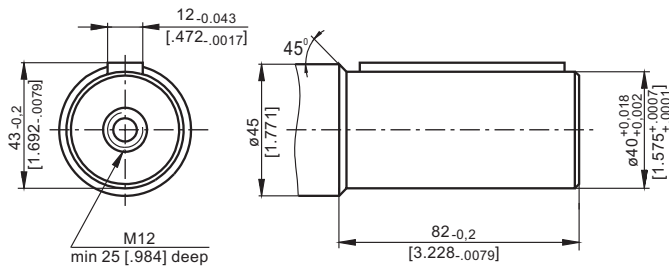
Reverse Rotation

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

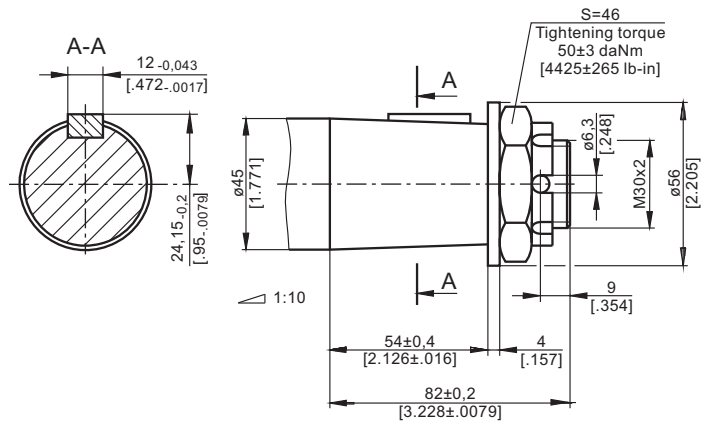
C : 4xM10-10 mm [.39 in] depth
P_(A,B) : 2xG3/4 or 2xM27x2-17 mm [.67 in] depth
T : G 1/4 or M14x1,5 - 12 mm [.47 in] depth (plugged)

SHAFT EXTENSIONS

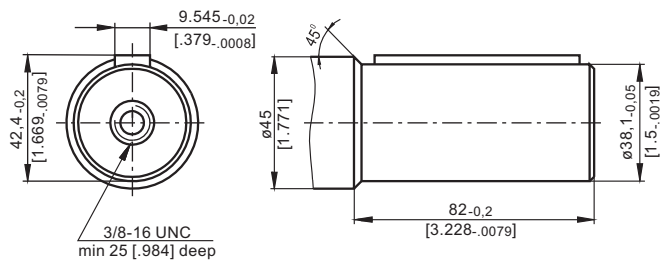
C - $\varnothing 40$ straight, Parallel key A12x8x70 DIN 6885
Max. Torque 132,8 daNm [11755 lb-in]



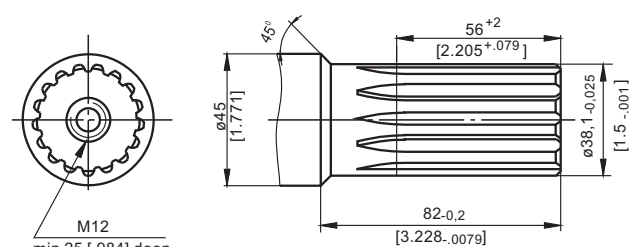
K -tapered 1:10, Parallel key B12x8x28 DIN 6885
Max. Torque 210,7 daNm [18650 lb-in]



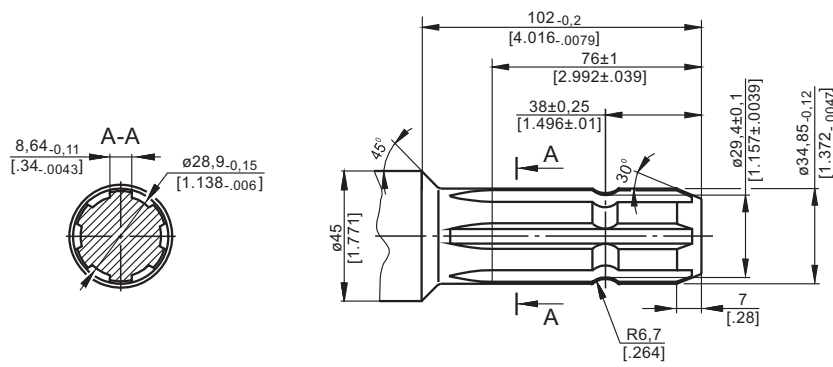
CO - $\varnothing 1\frac{1}{2}$ " straight, Parallel key $\frac{3}{8}$ " x $\frac{3}{8}$ " x $2\frac{1}{4}$ " BS46
Max. Torque 132,8 daNm [11755 lb-in]



SH - $\varnothing 1\frac{1}{2}$ " splined 17T, DP 12/24 ANSI B92.1-1976
Max. Torque 132,8 daNm [11755 lb-in]

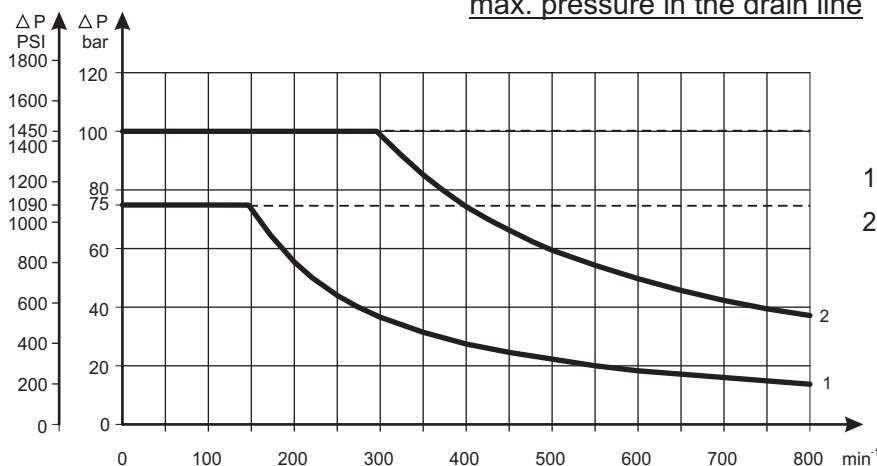


SL - $\varnothing 34,85$ p.t.o. DIN 9611 Form 1
Max. Torque 77 daNm [6815 lb-in]



MAX. PERMISSIBLE SHAFT SEAL PRESSURE for MT motors

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



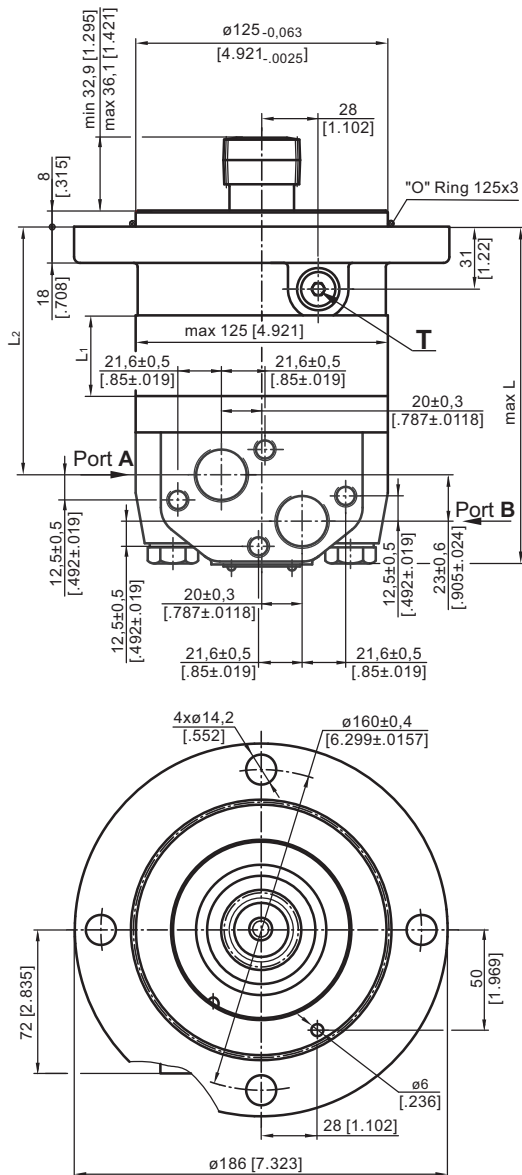
1: Drawing for Standard Shaft Seal

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

— - continuous operations
- - - - intermittent operations

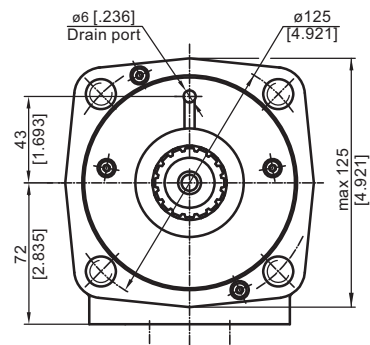
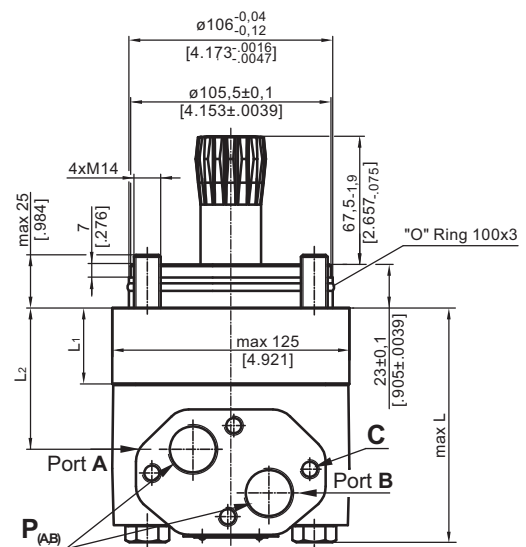
DIMENSIONS AND MOUNTING DATA - MTS and MTV

S Short Mount



Port Dim.
See Page 33

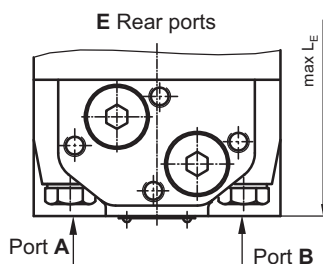
V Very Short Mount



- C:** 4xM10-10 mm [.39 in] depth
P_(A,B): 2xG3/4 or 2xM27x2-17 mm [.67 in] depth
T: G 1/4 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**



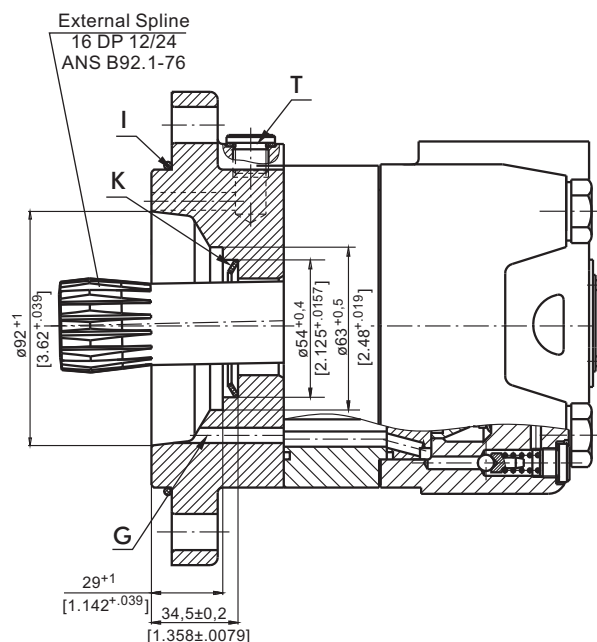
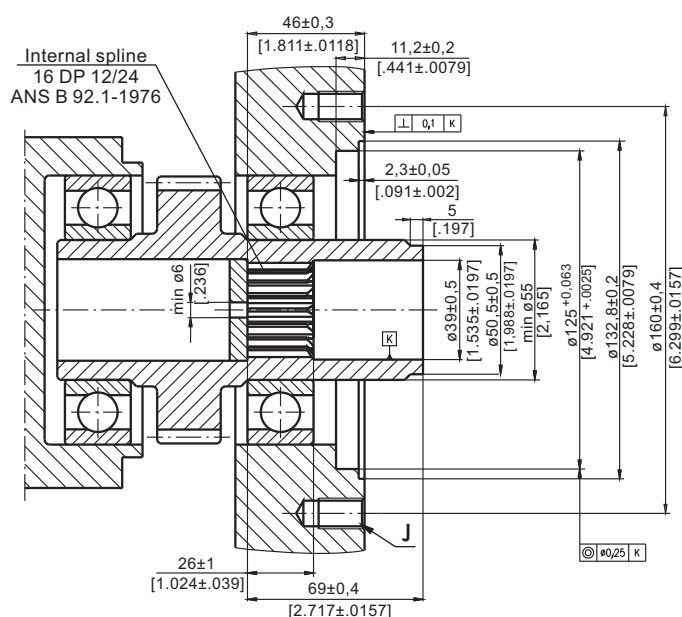
Type	L, mm [in]	L ₂ , mm [in]	**L _E , mm [in]	*L ₁ , mm [in]	Type	L, mm [in]	L ₂ , mm [in]	**L _E , mm [in]	*L ₁ , mm [in]
MTS 160	150 [5.90]	103,5 [4.07]	155 [6.10]	20,0 [.79]	MTV 160	100,8 [3.97]	51,5 [2.02]	110,8 [4.36]	16,5 [.65]
MTS 200	155 [6.10]	108,5 [4.27]	160 [6.30]	25,0 [.98]	MTV 200	105,8 [4.17]	56,5 [2.22]	115,8 [4.56]	21,5 [.85]
MTS 250	161 [6.34]	114,8 [4.52]	167 [6.57]	31,3 [1.23]	MTV 250	112,1 [4.41]	62,8 [2.47]	122,1 [4.81]	27,8 [1.09]
MTS 315	170 [6.69]	124,0 [4.88]	176 [6.93]	40,5 [1.59]	MTV 315	121,3 [4.76]	72,0 [2.83]	131,3 [5.17]	37,0 [1.46]
MTS 400	181 [7.13]	134,5 [5.30]	186 [7.32]	51,0 [2.01]	MTV 400	131,8 [5.19]	82,5 [3.25]	141,8 [5.58]	47,5 [1.87]
MTS 500	195 [7.68]	148,5 [5.85]	200 [7.87]	65,0 [2.56]	MTV 500	145,8 [5.74]	96,5 [3.80]	155,8 [6.13]	61,5 [2.42]
MTS 630	191 [7.52]	144,5 [5.69]	196 [7.72]	61,0 [2.40]	MTV 630	141,8 [5.58]	92,5 [3.64]	151,8 [5.98]	57,5 [2.26]
MTS 725	200 [7.87]	153,5 [6.04]	205 [8.07]	70,0 [2.76]	MTV 725	150,8 [5.94]	101,5 [4.00]	160,8 [6.33]	66,5 [2.62]

* - The width of the roll-gerotor is 3,5 mm [.138 in] greater than L₁.

** - For Rear Ported Motors.

DIMENSIONS OF THE ATTACHED COMPONENT

MTS

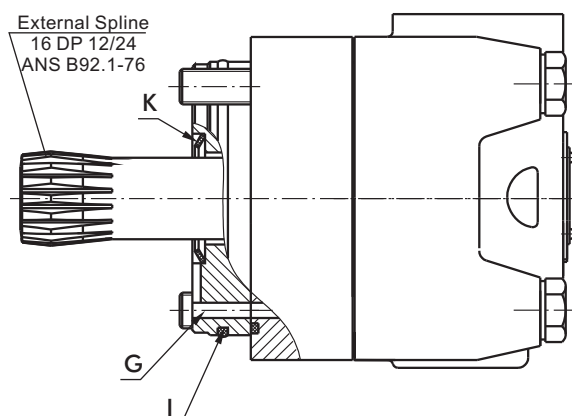
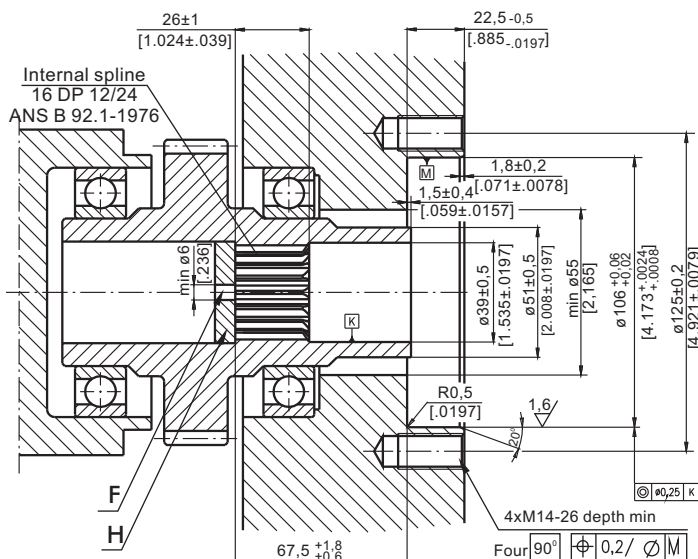


F: Oil circulation hole
G: Internal drain channel
H: Hardened stop plate

I: O- Ring 125x3 mm [4.921x.118 in]
J: 4xM12-18 mm [.71 in] depth, 90°
K: Conical seal ring
T: Drain connection G1/4 or M14x1,5



MTV



F: Oil circulation hole
G: Internal drain channel

H: Hardened stop plate
I: O- Ring 100x3 mm [3.94x.12 in]
K: Conical seal ring

DRAIN CONNECTION

The drain line has to be used when pressure in the return line can exceed the permissible pressure. It can be connected:

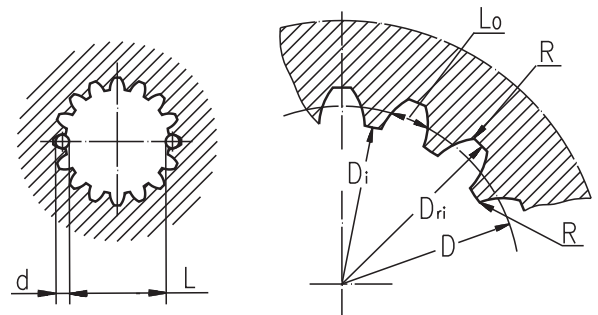
- For MTS at the drain port of the motor;
- For MTV at the drain connection of the attached component. The maximum pressure in the drain line is limited by the attached component and its shaft seal.

The drain line must be possible for oil to flow freely between motor and attached component and must be led to the tank. The maximum pressure in the drain line is limited by the attached component and its seal.

INTERNAL SPLINE DATA FOR THE ATTACHED COMPONENT

Standard ANS B92.1-1976, class 5
[$m=2.1166$; corrected $x.m=1$]

Flat Root Side Fit		mm	inch
Number of Teeth	z	16	16
Diametral Pitch	DP	12/24	12/24
Pressure Angle		30°	30°
Pitch Dia.	D	33,8656	1.3333
Major Dia.	D _{ri}	38,4 ^{+0,4}	1.5118±1.5275
Minor Dia.	D _i	32,15 ^{+0,04}	1.2657±1.2673
Space Width [Circular]	L _o	4,516±0,037	.1763±.1791
Fillet Radius	R	0,5	.02
Max. Measurement between Pins	L	26,9 ^{+0,10}	1.063±1.059
Pin Dia.	d	4,835±0,001	.19026±.19034



Hardening Specification:

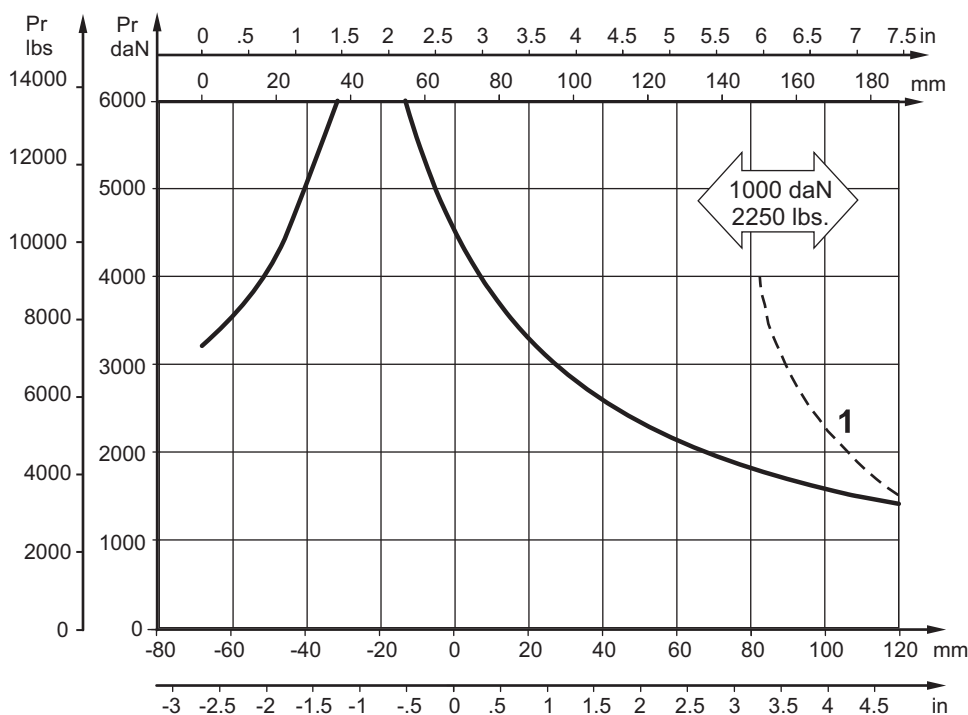
HV=750±50 on the surface.

HV=560 at 0,7±0,2 mm [.035±.019in] case depth
Material: 20 MoCr4 EN 10084 or SAE8620.

PERMISSIBLE SHAFT LOADS

The output shaft runs in tapered bearings that permit high axial and radial forces. The permissible radial load on the shaft is shown for an axial load of 0 N as function of the distance from the mounting flange to the point of load application. The curves apply to a B10 bearing life of 2000 hours at 100 RPM.

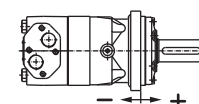
Curve "1" shows max. radial shaft load. Any shaft load exceeding the values shown by the curve will seriously reduce motor life.



Mounting Flange:



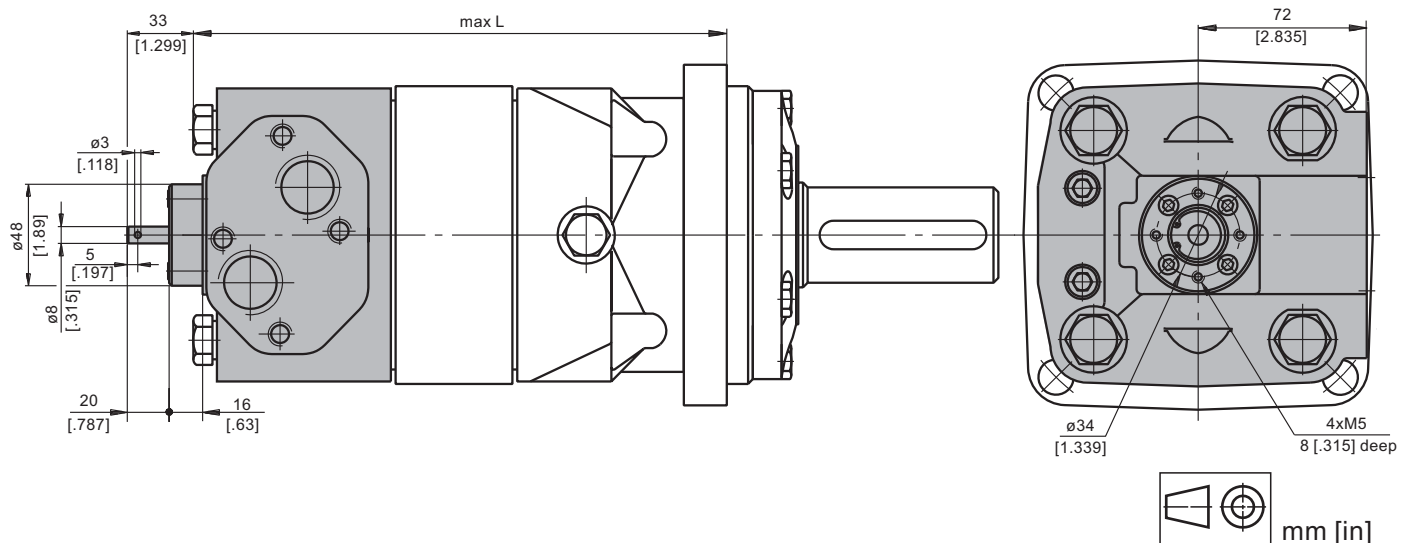
W - Wheel



Standard



MOTORS WITH TACHO CONNECTION



ORDER CODE

1	2	3	4	5	6	7	8
MT							

Pos.1 - Mounting Flange

omit - Square mount, four holes

S - Short mount

V - Very short mount

W - Wheel mount

Pos.2 - Port type

omit - Side ports

E - Rear ports

Pos.3 - Displacement code

160	- 61,6 cm ³ /rev [9.83 in ³ /rev]
200	- 201,4 cm ³ /rev [12.29 in ³ /rev]
250	- 251,8 cm ³ /rev [15.36 in ³ /rev]
315	- 326,3 cm ³ /rev [19.90 in ³ /rev]
400	- 410,9 cm ³ /rev [25.06 in ³ /rev]
500	- 523,6 cm ³ /rev [31.95 in ³ /rev]
630	- 631,2 cm ³ /rev [38.52 in ³ /rev]
725	- 724,3 cm ³ /rev [44.20 in ³ /rev]

Pos.4 - Shaft Extensions*

omit - for **S** and **V** mounting flange

C - $\varnothing 40$ straight, Parallel key A12x8x70 DIN6885

CO - $\varnothing 1\frac{1}{2}$ " straight, Parallel key $\frac{3}{8}$ "x $\frac{3}{8}$ "x2 $\frac{1}{4}$ " BS46

K - $\varnothing 45$ tapered 1:10, Parallel key B12x8x28 DIN6885

SL - $\varnothing 34,85$ p.t.o. DIN 9611 Form 1

SH - $\varnothing 1\frac{1}{2}$ " splined 17T ANS B92.1-1976

Pos.5 - Shaft Seal Version (see page 34)

omit - Low pressure seal

U - High pressure seal

Pos.6 - Ports

omit - BSPP (ISO 228)

M - Metric (ISO 262)

Pos.7 - Special Features (see page 51)

Pos.8 - Design Series

omit - Factory specified

NOTES:

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

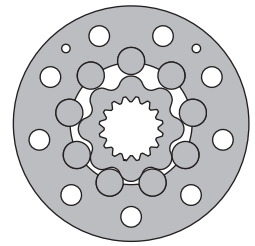
The hydraulic motors are mangano-phosphatized as standard.

HYDRAULIC MOTOR-BRAKE MTM/B



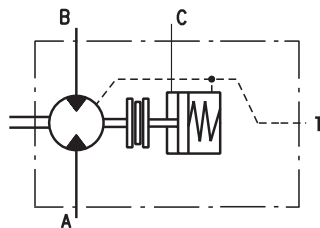
APPLICATION

- » Skid Steer Loaders
- » Metal working machines
- » Trenchers
- » Augers
- » Agricultural machines
- » Road building machines
- » Special vehicles
- » Mine machines
- » Woodworking and sawmill machinery
- » Conveyors etc.



CONTENTS

Specification data	36
Dimensions and mounting ..	37-38
Shaft extensions	39
Permissible shaft loads	40
Order code	40



OPTIONS

- » Model - Disc valve, roll-gerotor;
- » Fully integrated friction disk brake;
- » Side ports;
- » Shafts - straight, splined and tapered;
- » BSPP ports
- » Other special features

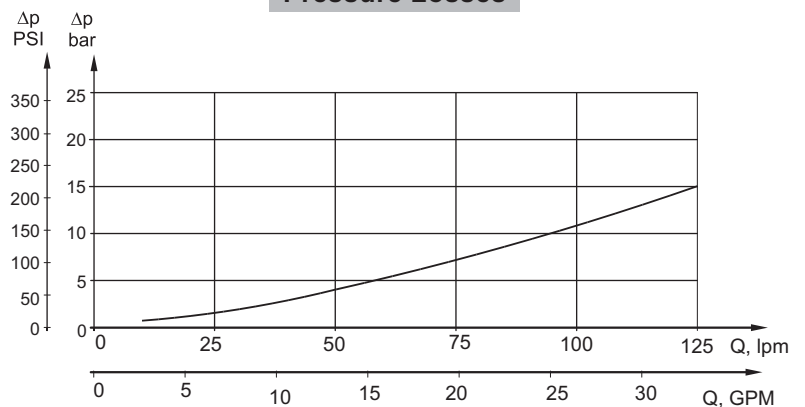
GENERAL

Max. Displacement, cm ³ /rev [in ³ /rev]	724,3 [44.2]
Max. Speed, [RPM]	750
Max. Torque, daNm [in-lb]	cont.: 175 [15490] int.: 215 [16030]
Max. Output, kW [HP]	70 [94]
Max. Pressure Drop, bar [PSI]	cont.: 250 [3600] int.: 350 [5080]
Max. Oil Flow, lpm [GPM]	150 [40]
Permissible Shaft Loads daN [lbs]	P _a =1000 [2250]
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]
200 [2900]	20 [98]	2,5 [.660]
	35 [164]	1,5 [.400]
275 [3990]	20 [98]	4 [1.057]
	35 [164]	2,5 [.660]

Pressure Losses



SPECIFICATION DATA

Type		MTM/B 200	MTM/B 250	MTM/B 315	MTM/B 400	MTM/B 470	MTM/B 500	MTM/B 630	MTM/B 725
Displacement, cm ³ /rev [in ³ /rev]		201,4 [12.29]	251,8 [15.36]	326,3 [19.9]	410,9 [25.06]	475 [28.97]	494,9 [30.17]	631,2 [38.5]	724 [44.2]
Max. Speed, [RPM]	Cont.	625	500	380	305	260	250	196	170
	Int.*	750	600	460	365	315	300	235	215
Max. Torque, daNm [lb-in]	Cont.	72 [6375]	90 [7965]	116 [10265]	147 [13010]	171 [15135]	172 [15225]	175 [15490]	160 [14160]
	Int.*	102 [9030]	128 [11330]	163 [14425]	206 [18232]	215 [16030]	215 [16030]	215 [16030]	192 [17000]
	Peak**	115 [10180]	144 [12745]	186 [16460]	235 [20800]	240 [21240]	240 [21240]	255 [22570]	240 [21240]
Max. Output, kW [HP]	Cont.	41 [55]	41 [55]	41 [55]	41 [55]	41 [55]	37,5 [50]	29 [39]	26 [35]
	Int.*	65 [87]	70 [94]	70 [94]	70 [94]	55 [74]	51 [68]	45 [60]	40 [54]
Max. Pressure Drop, bar [PSI]	Cont.	250 [3600]	250 [3600]	250 [3600]	250 [3600]	250 [3600]	230 [3340]	185 [2680]	160 [2320]
	Int.*	350 [5080]	350 [5080]	350 [5080]	350 [5080]	315 [4570]	280 [4060]	225 [3260]	210 [3045]
	Peak**	400 [5800]	400 [5800]	400 [5800]	400 [5800]	350 [5080]	320 [4640]	270 [3985]	260 [3770]
Max. Oil Flow, lpm [GPM]	Cont.	125 [33]	125 [33]	125 [33]	125 [33]	125 [33]	125 [33]	125 [33]	125 [33]
	Int.*	150 [40]	150 [40]	150 [40]	150 [40]	150 [40]	150 [40]	150 [40]	150 [40]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		6 [87]	6 [87]	6 [87]	6 [87]	6 [87]	6 [87]	6 [87]	6 [87]
Min. Starting Torque, daNm [lb-in]		60 [5310]	75 [6640]	97 [8585]	122 [10800]	142 [12570]	143 [12655]	144 [12745]	148 [13100]
Static Torque of Brake, daNm [lb-in]		200 [17700]							
Min. Brake Release Pressure***, bar [PSI]		14 [203]							
Full Opening Pressure, bar [PSI]		40 [580]							
Max. Pressure in Release Port C, bar [PSI]		120 [1740]							
Weight, kg [lb]		37,5 [82.7]	37,9 [83.6]	39,1 [86.2]	41,3 [91.1]	44,1 [97.2]	46,0 [101.4]	49,1 [108.2]	52,0 [114.6]

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

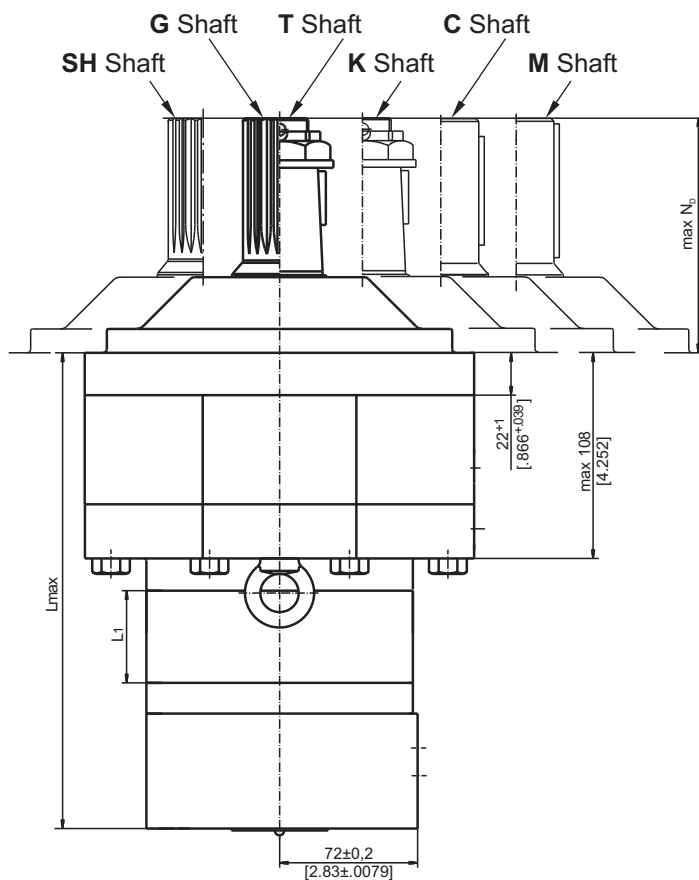
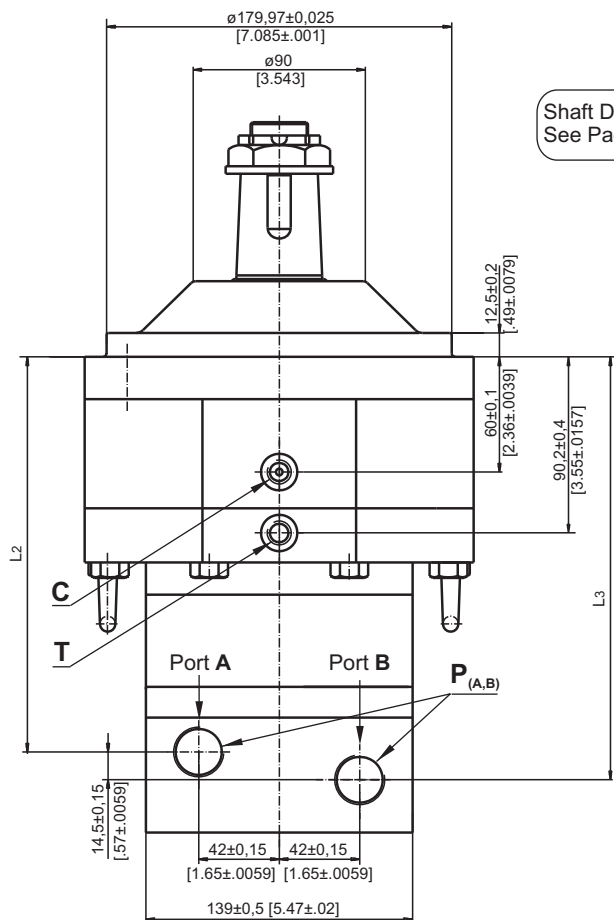
** Peak load: the permissible values may occur for max. 1% of every minute.

*** Motor-brakes must always have a drain line. The brake release pressure is the difference between the pressure in the brake release line and the pressure in the drain line.

- Intermittent speed and intermittent pressure drop 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.

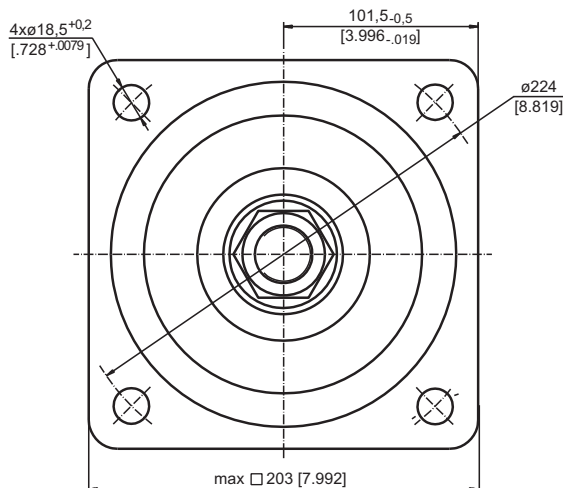
DIMENSIONS AND MOUNTING DATA - MTM/B D

D - Bolt flange 4x $\varnothing$ 18.5 mm
spigot diameter 7.086 in [$\varnothing$ 180 mm]



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	L, mm [in]	L2, mm [in]	L3, mm [in]	L1, mm [in]
MTM/B D 200	226 [8.90]	184 [7.24]	198,5 [7.86]	25 [.98]
MTM/B D 250	232,5 [9.15]	190 [7.48]	204,5 [8.05]	31,3 [1.23]
MTM/B D 315	241,5 [9.51]	199,5 [7.85]	214 [8.43]	40,5 [1.59]
MTM/B D 400	252 [9.92]	210 [8.27]	224,5 [8.84]	51 [2.01]
MTM/B D 470	260 [10.24]	218 [8.58]	232,5 [9.15]	59 [2.32]
MTM/B D 500	249 [9.80]	207 [8.15]	221,5 [8.72]	48 [1.89]
MTM/B D 630	262 [10.32]	220 [8.66]	234,5 [9.23]	61 [2.40]
MTM/B D 725	271 [10.67]	229 [9.02]	243,5 [9.59]	70 [2.76]

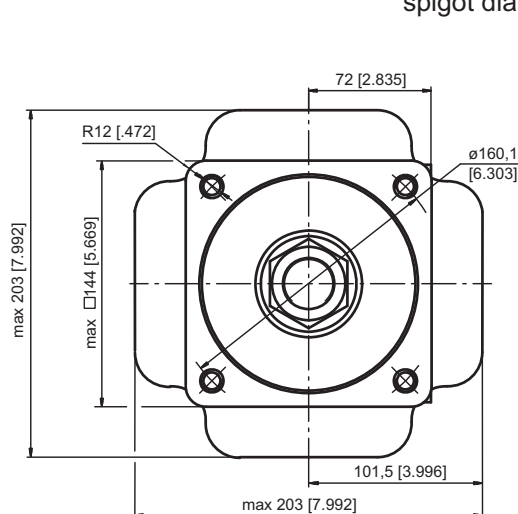
Note: For N_b see page 39

C : Brake release port
T : Drainage tap

	Versions	
	2	4
P (A,B)	2xG $\frac{3}{4}$	2x1 $\frac{1}{16}$ -12UN
T	G $\frac{1}{4}$	$\frac{9}{16}$ -18UNF
C	G $\frac{1}{4}$	$\frac{7}{16}$ -20 UNF

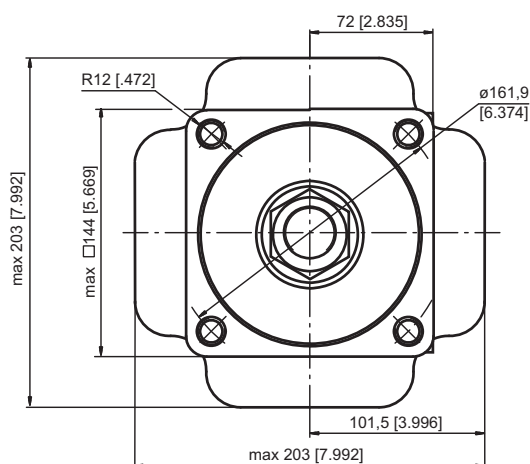
DIMENSIONS AND MOUNTING DATA MTM/B C and MTM/B AC

C - Thread hole flange 4xM16
spigot diameter 125 mm [4.921 in]

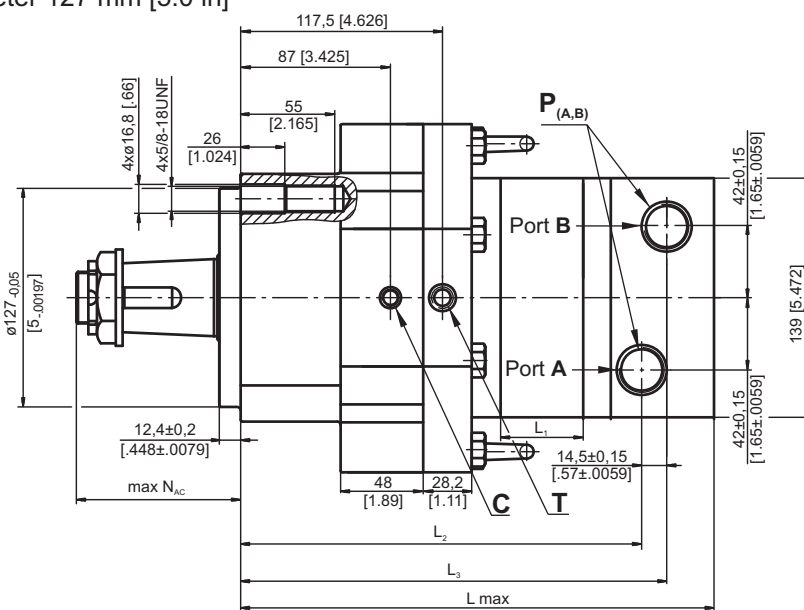
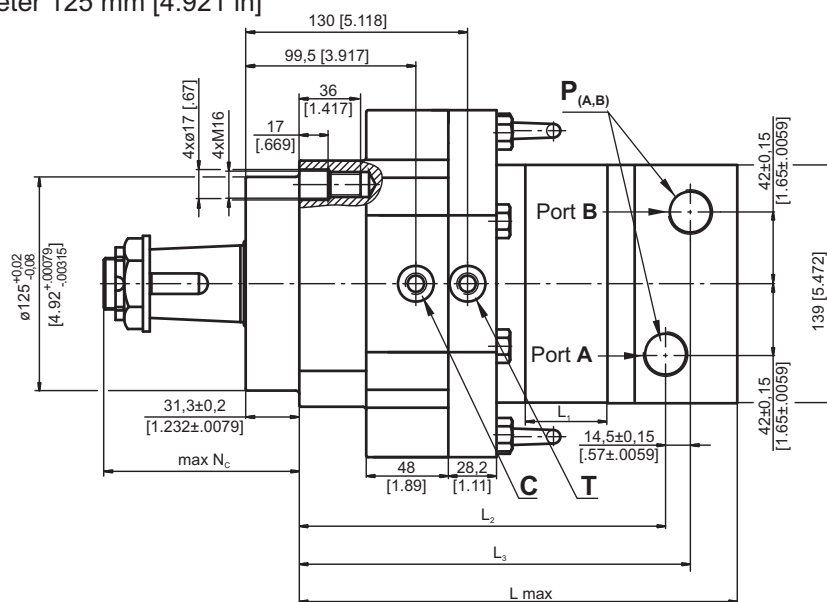


Shaft Dim.
See Page 39

AC - Thread hole flange 4x5/8-18 UNF
spigot diameter 127 mm [5.0 in]



C : Brake release port
T : Drainage tap



Note: For N_c and N_{AC} see page 39

	Versions	
	2	4
P (A,B)	2xG $\frac{3}{4}$	2x1 $\frac{1}{16}$ -12UN
T	G $\frac{1}{4}$	$\frac{9}{16}$ -18UNF
C	G $\frac{1}{4}$	$\frac{7}{16}$ -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**



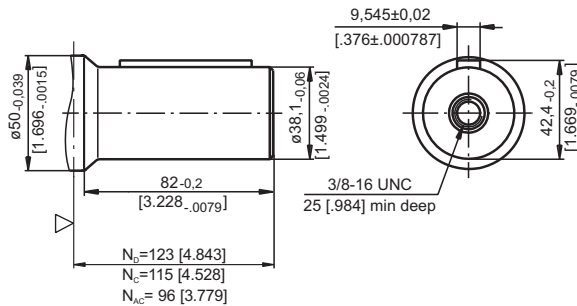
mm [in]

Type	L, mm [in]	L2, mm [in]	L3, mm [in]	Type	L, mm [in]	L2, mm [in]	L3, mm [in]	L1, mm [in]
MTM/B C 200	233 [9.17]	191 [7.92]	205,5 [8.09]	MTM/B AC 200	252 [9.92]	210 [8.27]	224,5 [8.84]	25 [.98]
MTM/B C 250	239,3 [9.42]	197,3 [7.77]	211,8 [8.34]	MTM/B AC 250	258,5 [10.18]	216,5 [8.25]	231 [9.09]	31,3 [1.23]
MTM/B C 315	248,5 [9.48]	206,5 [8.13]	221 [8.70]	MTM/B AC 315	267,5 [10.53]	225,5 [8.88]	240 [9.45]	40,5 [1.59]
MTM/B C 400	259 [10.19]	217 [8.54]	231,5 [9.11]	MTM/B AC 400	278 [10.94]	236 [9.29]	250,5 [9.186]	51 [2.01]
MTM/B C 470	267 [10.51]	225 [8.86]	239,5 [9.43]	MTM/B AC 470	286 [11.26]	244 [9.61]	258,5 [10.18]	59 [2.32]
MTM/B C 500	256 [10.08]	214 [8.43]	228,5 [8.99]	MTM/B AC 500	275 [10.83]	233 [9.17]	247,5 [9.74]	48 [1.89]
MTM/B C 630	269 [10.59]	227 [8.94]	241,5 [9.51]	MTM/B AC 630	288 [11.34]	246 [9.68]	260,5 [10.26]	61 [2.40]
MTM/B C 725	278 [10.94]	236 [9.29]	250,5 [9.86]	MTM/B AC 725	297 [11.69]	255 [10.04]	269,5 [10.61]	70 [2.76]

SHAFT EXTENSIONS

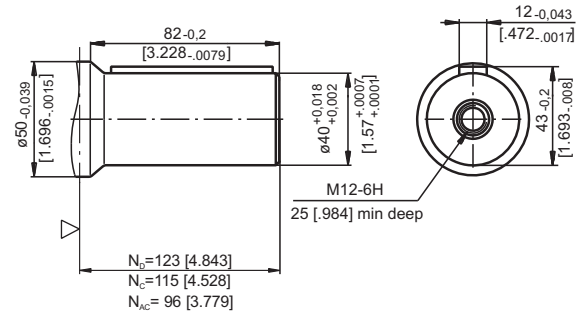
C

1½" [38,1] srtaight, Parallel key ¾"x ¾"x 2¼" BS46
Max. Torque 133 daNm [11770 lb-in]



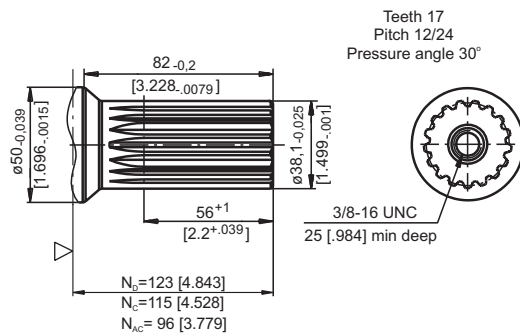
M

ø40 srtaight, Parallel key A12x8x70
Max. Torque 133 daNm [11770 lb-in]



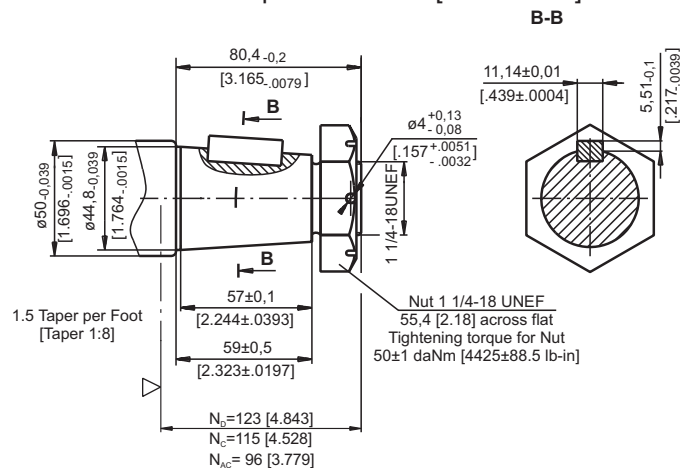
G

17T Splined, 1½" [38,1] ANS B92.1-1976
Max. Torque 210 daNm [18580 lb-in]



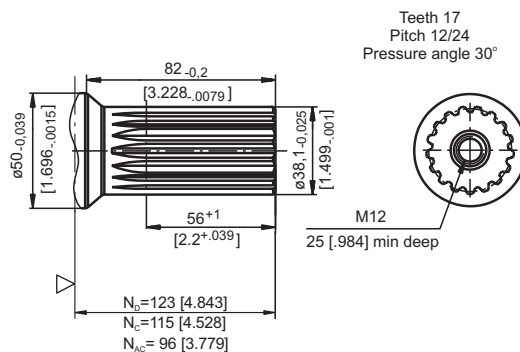
T

1¾" [44,5] SAE J501 Tapered 1:8
Parallel key 7/16"x 1¼" BS46
Max. Torque 210 daNm [18580 lb-in]



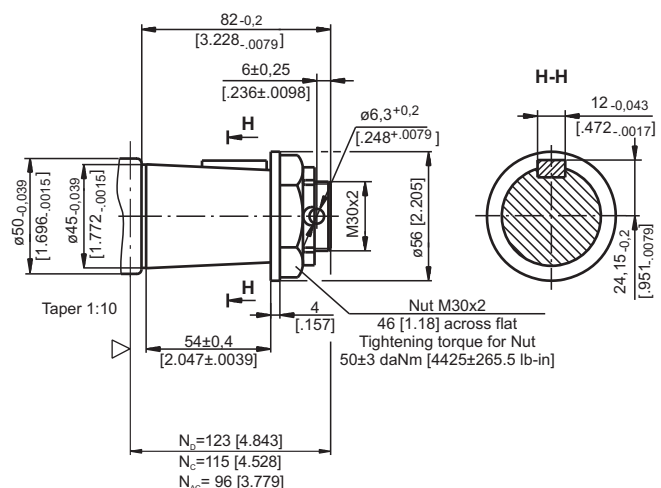
SH

17T Splined, 1½" [38,1] ANS B92.1-1976
Max. Torque 210 daNm [18580 lb-in]



K

ø45 Tapered 1:10
Parallel key 12x8x28 DIN 6885
Max. Torque 210 daNm [18580 lb-in]

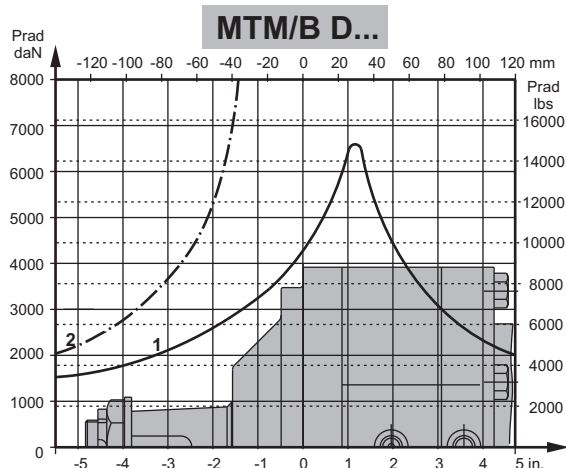


▽ - Motor Mounting Surface

N_D - for D flange
N_C - for C flange
N_{AC} - for AC flange

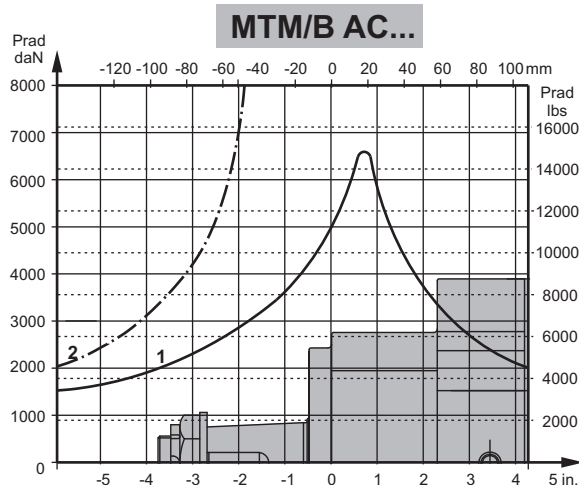
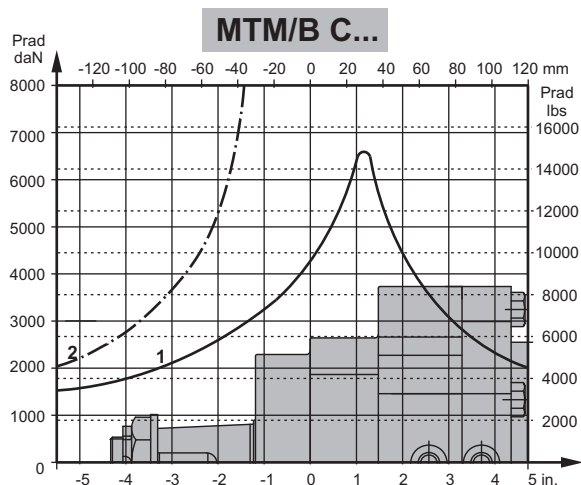
mm [in]

PERMISSIBLE RADIAL SHAFT LOADS



1 - Bearing curve: The curve applies to a B10 bearing life of 2000 hours at 100 RPM.

2 - Shaft curve: The curve represents Max. permissible radial shaft load with safety factor 2:1.



ORDER CODE

	1	2	3	4	5	6
MTM/B						

Pos.1 - Mounting Flange

- AC** - Flange 4x5/8-18UNC, spigot dia. $\varnothing 127$ mm [5 in]
C - Flange 4xM16, spigot dia. $\varnothing 125$ mm [4.92 in]
D - Flange 4x $\varnothing 18,5$ [.73], spigot dia. $\varnothing 180$ mm [7.09 in]

Pos.2 - Displacement code

- 200** - 201,4 cm³/rev [12.29 in³/rev]
250 - 251,8 cm³/rev [15.36 in³/rev]
315 - 326,3 cm³/rev [19.90 in³/rev]
400 - 410,9 cm³/rev [25.06 in³/rev]
470 - 475,0 cm³/rev [28.97 in³/rev]
500 - 523,6 cm³/rev [31.95 in³/rev]
630 - 631,2 cm³/rev [38.52 in³/rev]
725 - 724,3 cm³/rev [44.20 in³/rev]

Pos.3 - Shaft Extensions*

- C** - 1½" [38,1] straight, Parallel key 3/8x3/8x2 1/4"
G - 1½" [38,1] 17T Splined (3/8-16 UNC)
M - 40 mm straight, Parallel key 12x8x70
T - 1:8 Tapered, Parallel key 7/16x7/16x1 1/4"
SH - 1½" [38,1] 17T Splined (M12)
K - 1:10 Tapered, Parallel key 12x8x28

Pos.4 - Port Size/Type

- 2** - side ports, 2xG 3/4, G1/4, BSP thread, ISO 228
4 - side ports, 2x1½/16-12 UN, O-ring, 9/16-18 UNF, 7/16-20UNF

Pos.5 - Special Features

- omit - Reinforced motor **HD**** (always)
 For Other **Special Features** see page 68

Pos.6 - Design Series

- omit - Factory specified

Notes:

- * The permissible output torque for shafts must not be exceeded!
 ** The drain line must always be opened!

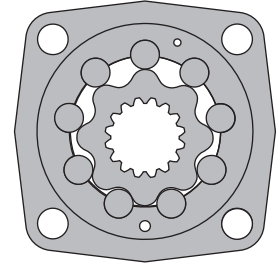
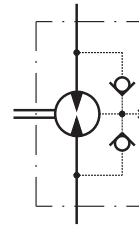
The motor-brakes are manganophosphatized as standard.

HYDRAULIC MOTORS MV



APPLICATION

- » Conveyors
- » Metal working machines
- » Agricultural machines
- » Road building machines
- » Mining machinery
- » Food industries
- » Special vehicles
- » Plastic and rubber machinery etc.



CONTENTS

Specification data	39
Function diagrams	41÷43
Permissible shaft loads	43
Dimensions and mounting	44÷46
Dimensions and mounting - MVS	47
Dimensions and mounting - MVV	48
Internal Spline data	49
Tacho connection.....	49
Shaft extensions	50
Order code	50

OPTIONS

- » Model - Disc valve, roll-gerotor
- » Flange and wheel mount
- » Short motor
- » Tacho connection
- » Speed sensing
- » Side ports
- » Shafts - straight, splined and tapered
- » BSPP ports
- » Other special features

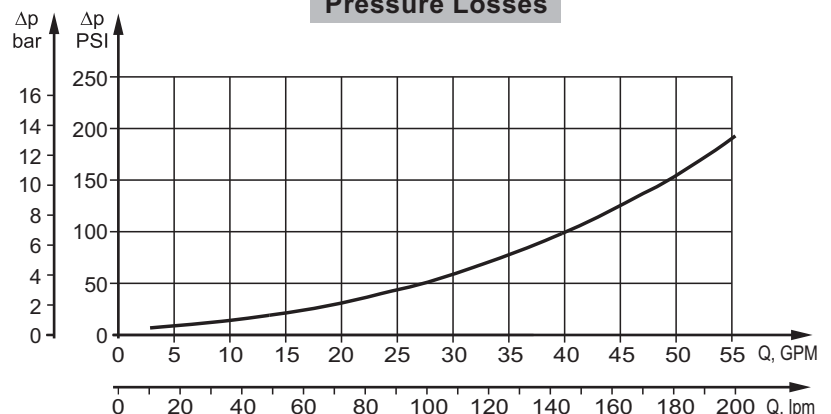
GENERAL

Max. Displacement, cm ³ /rev [in ³ /rev]	801,8 [48.91]
Max. Speed, [RPM]	630
Max. Torque, daNm [lb-in]	cont.: 188 [16650] int.: 211 [18650]
Max. Output, kW [HP]	64 [85,8]
Max. Pressure Drop, bar [PSI]	cont.: 200 [2900] int.: 240 [3480]
Max. Oil Flow, lpm [GPM]	240 [63.4]
Min. Speed, [RPM]	5
Permissible Shaft Loads daN [lbs]	P _a =1500 [3300]
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]
140 [2030]	20 [98]	3 [.793]
	35 [164]	2 [.528]
210 [3045]	20 [98]	6 [1.585]
	35 [164]	4 [1.057]

Pressure Losses



SPECIFICATION DATA

Type		MV 315	MV 400	MV 500	MV 630	MV 800
Displacement, cm ³ /rev [In ³ /rev]		314,5 [19.18]	400,9 [24.45]	499,6 [30.48]	629,1 [38.38]	801,8 [48.91]
Max. Speed, [RPM]	Cont.	510	500	400	320	250
	Int.*	630	600	480	380	300
Max. Torque daNm [lb-in]	Cont.	92 [8150]	118 [10450]	146 [12950]	166 [14700]	188 [16650]
	Int.*	111 [9800]	141 [12500]	176 [15550]	194 [17150]	211 [18650]
	Peak**	129 [11400]	164 [14500]	205 [18150]	221 [19550]	247 [21850]
Max. Output kW [HP]	Cont.	42,5 [57]	53,5 [71.7]	53,5 [71.7]	48 [64.4]	42,5 [57]
	Int.*	51 [68.4]	64 [85.8]	64 [85.8]	56 [75]	48 [64.4]
Max. Pressure Drop bar [PSI]	Cont.	200 [2900]	200 [2900]	200 [2900]	180 [2610]	160 [2320]
	Int.*	240 [3480]	240 [3480]	240 [3480]	210 [3050]	180 [2610]
	Peak**	280 [4060]	280 [4060]	280 [4060]	240 [3480]	210 [3050]
Max. Oil Flow lpm [GPM]	Cont.	160 [42.3]	200 [52.8]	200 [52.8]	200 [52.8]	200 [52.8]
	Int.*	200 [52.8]	240 [63.4]	240 [63.4]	240 [63.4]	240 [63.4]
Max. Inlet Pressure bar [PSI]	Cont.	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]
	Int.*	250 [3620]	250 [3620]	250 [3620]	250 [3620]	250 [3620]
	Peak**	300 [4350]	300 [4350]	300 [4350]	300 [4350]	300 [4350]
Max. Return Pressure with Drain Line bar [PSI]	Cont.	140 [2040]	140 [2040]	140 [2040]	140 [2040]	140 [2040]
	Int.*	175 [2540]	175 [2540]	175 [2540]	175 [2540]	175 [2540]
	Peak**	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		8 [120]	8 [120]	8 [120]	8 [120]	8 [120]
Min. Starting Torque daNm [lb-in]	At max. press. drop Cont.	71 [6300]	91 [8100]	113 [10000]	133 [11800]	151 [13400]
	At max. press. drop Int.*	85 [7500]	109 [9600]	136 [12000]	155 [13700]	170 [15000]
Min. Speed***, [RPM]		10	9	8	6	5
Weight, kg [lb]	MV	31,8 [70.1]	32,6 [71.9]	33,5 [73.8]	34,9 [76.9]	36,5 [80.5]
	MVW	32,4 [71.4]	33,2 [73.2]	34,1 [75.2]	35,5 [78.3]	37,1 [81.8]
	MVS	22,7 [50]	23,5 [51.8]	24,4 [53.8]	25,6 [56.4]	27,7 [61.1]

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

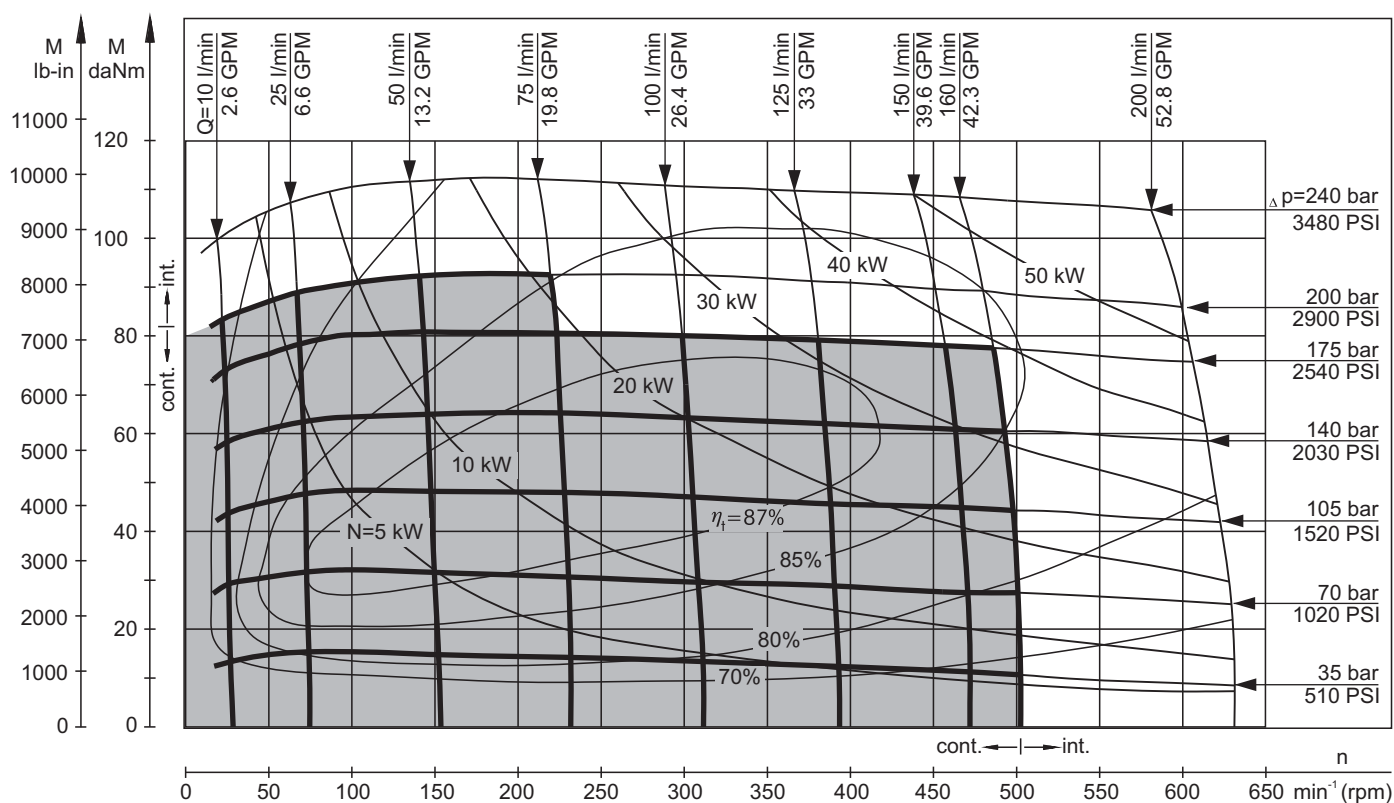
** Peak load: the permissible values may occur for max. 1% of every minute.

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

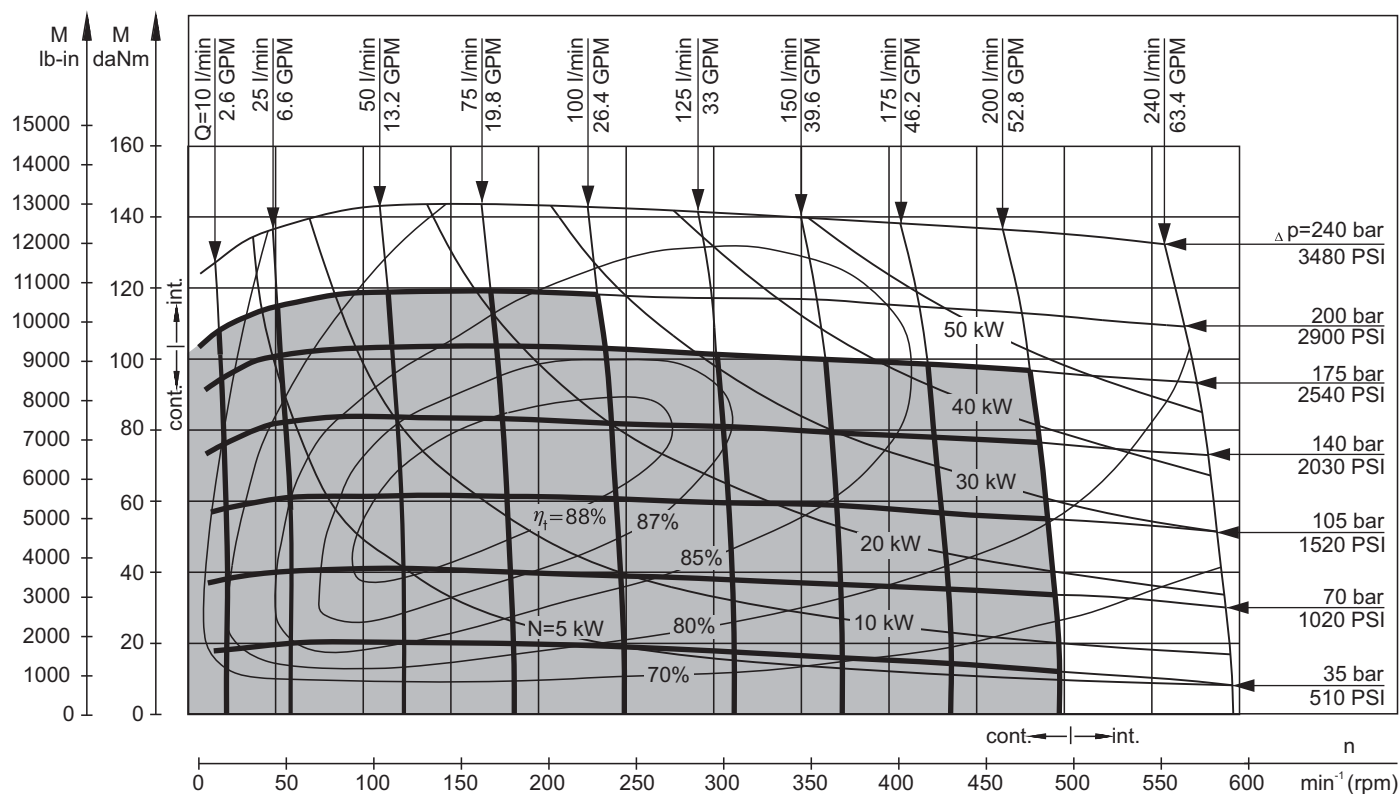
- Intermittent speed and intermittent pressure must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).
If using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

MV 315



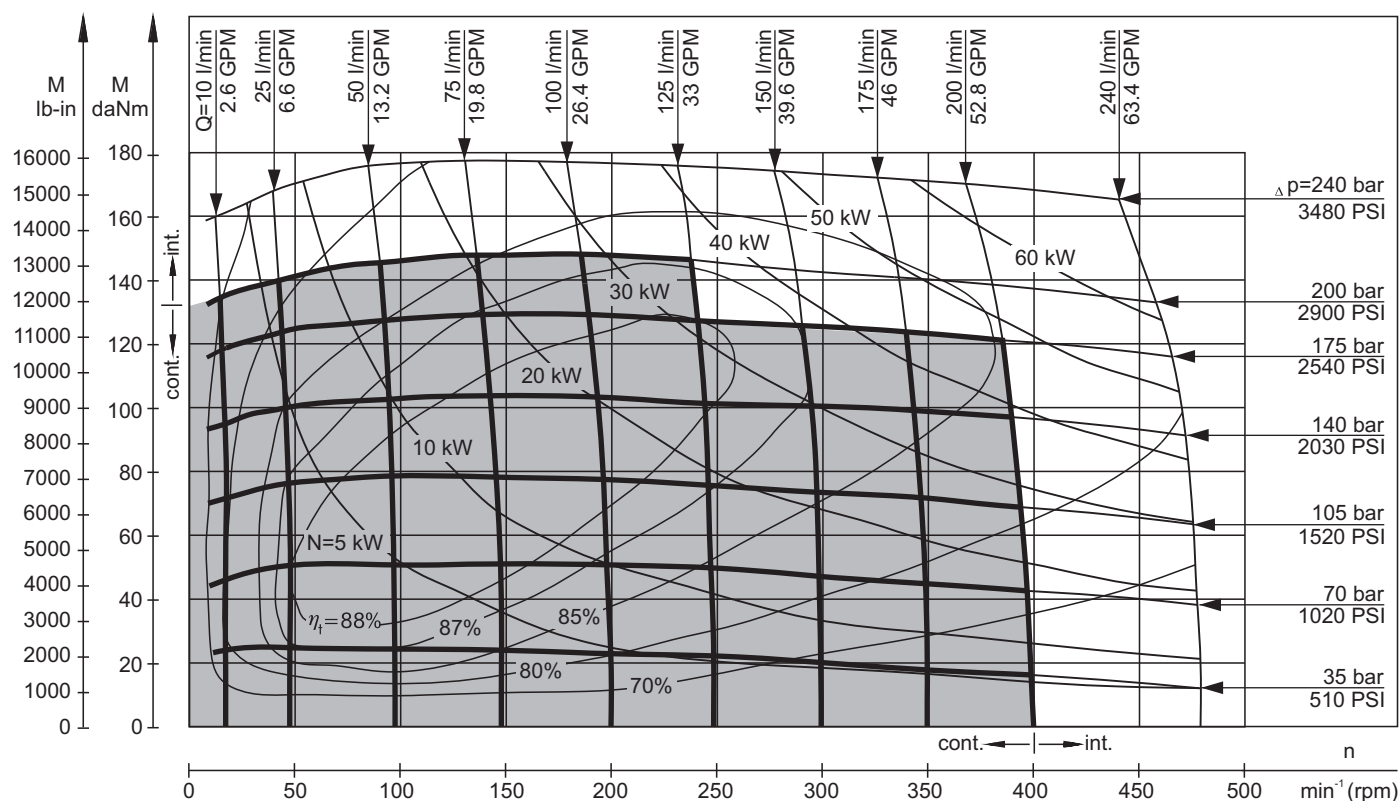
MV 400



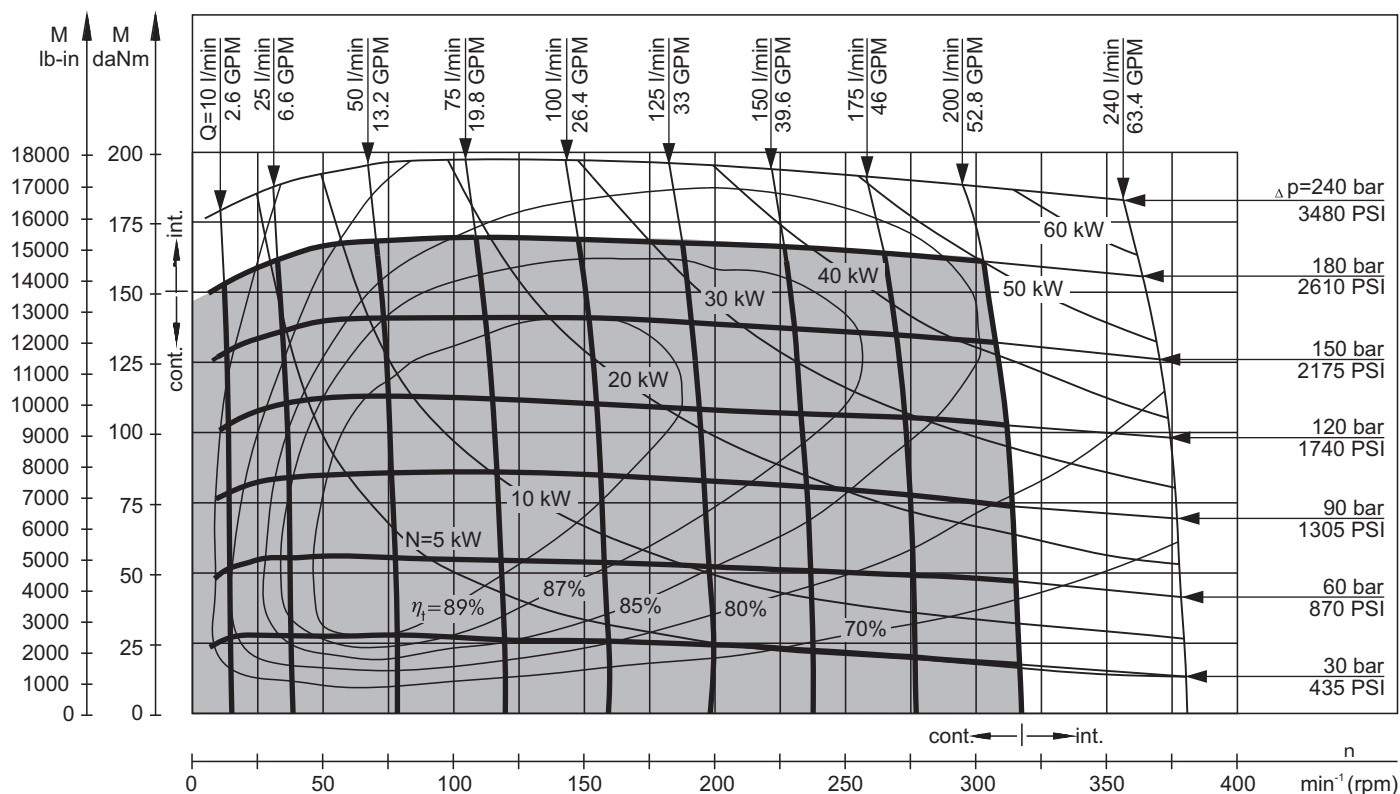
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MV 500



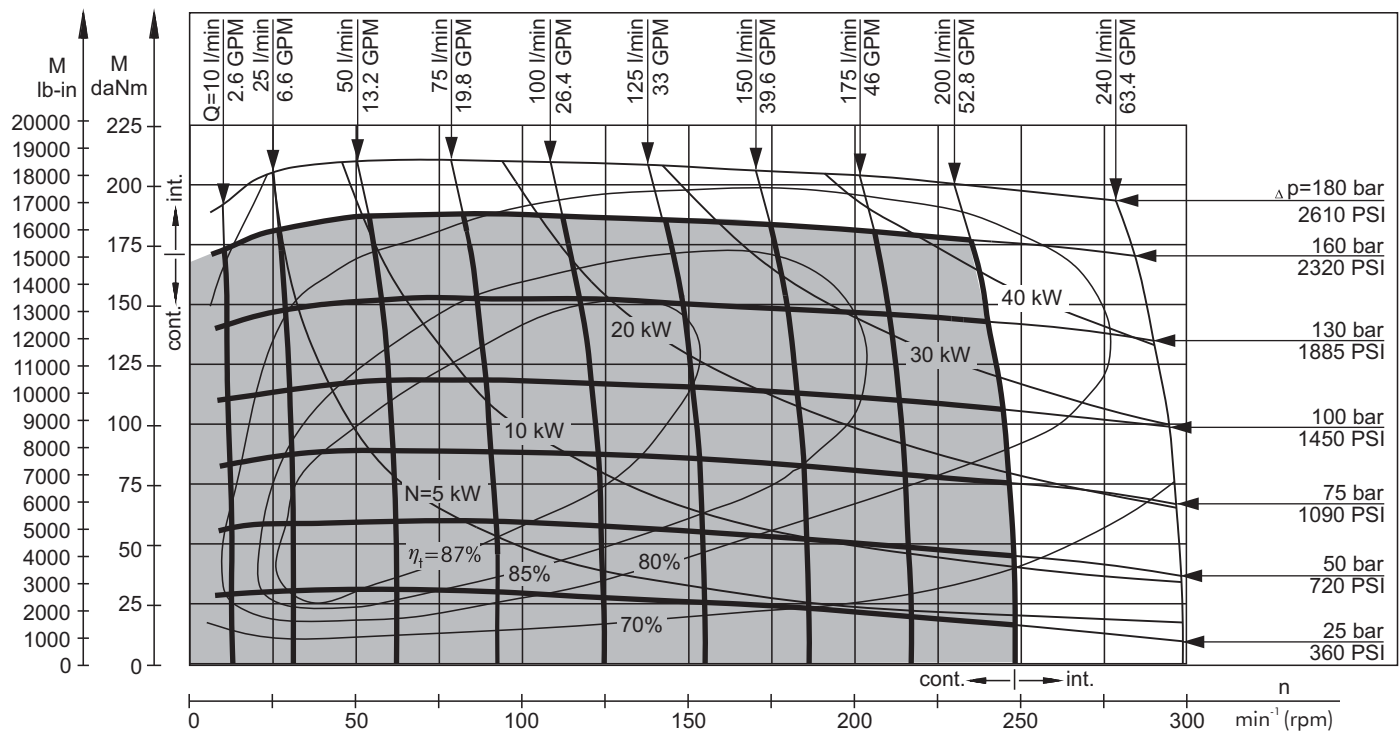
MV 630



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

MV 800



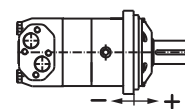
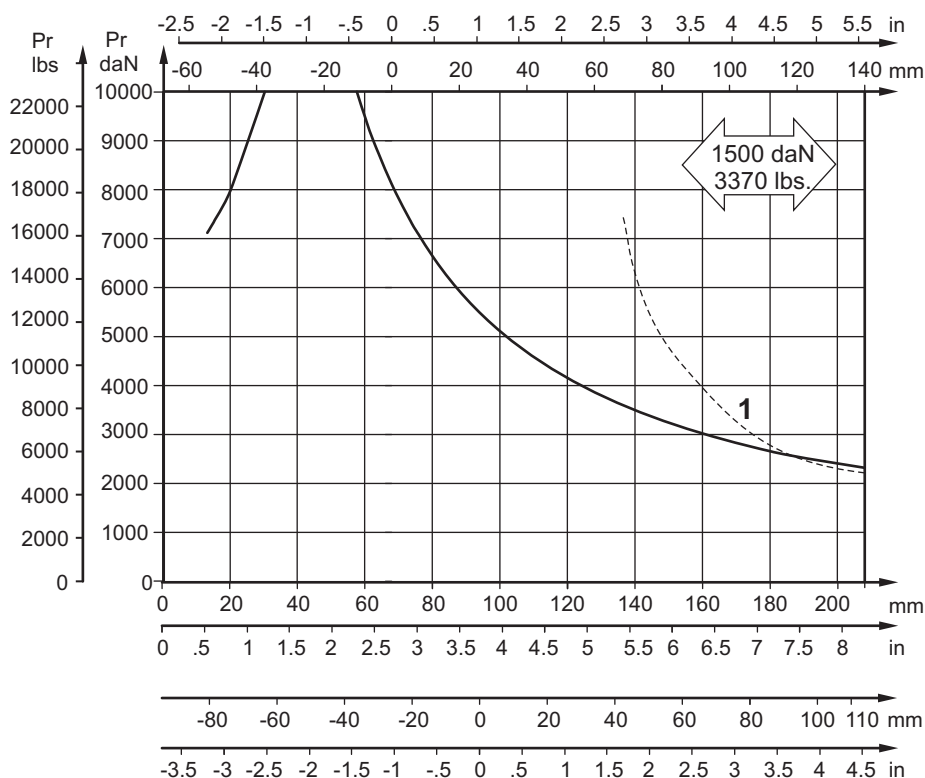
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

PERMISSIBLE SHAFT LOADS

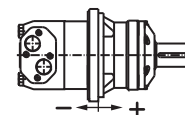
The output shaft runs in tapered bearings that permit high axial and radial forces. The permissible radial load on the shaft is shown for an axial load of 0 N as function of the distance from the mounting flange to the point of load application. The curves apply to a B10 bearing life of 2000 hours at 100 RPM.

Curve "1" shows max. radial shaft load. Any shaft load exceeding the values shown by the curve will seriously reduce motor life.

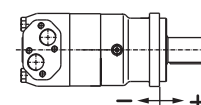
Mounting Flange:



Standard

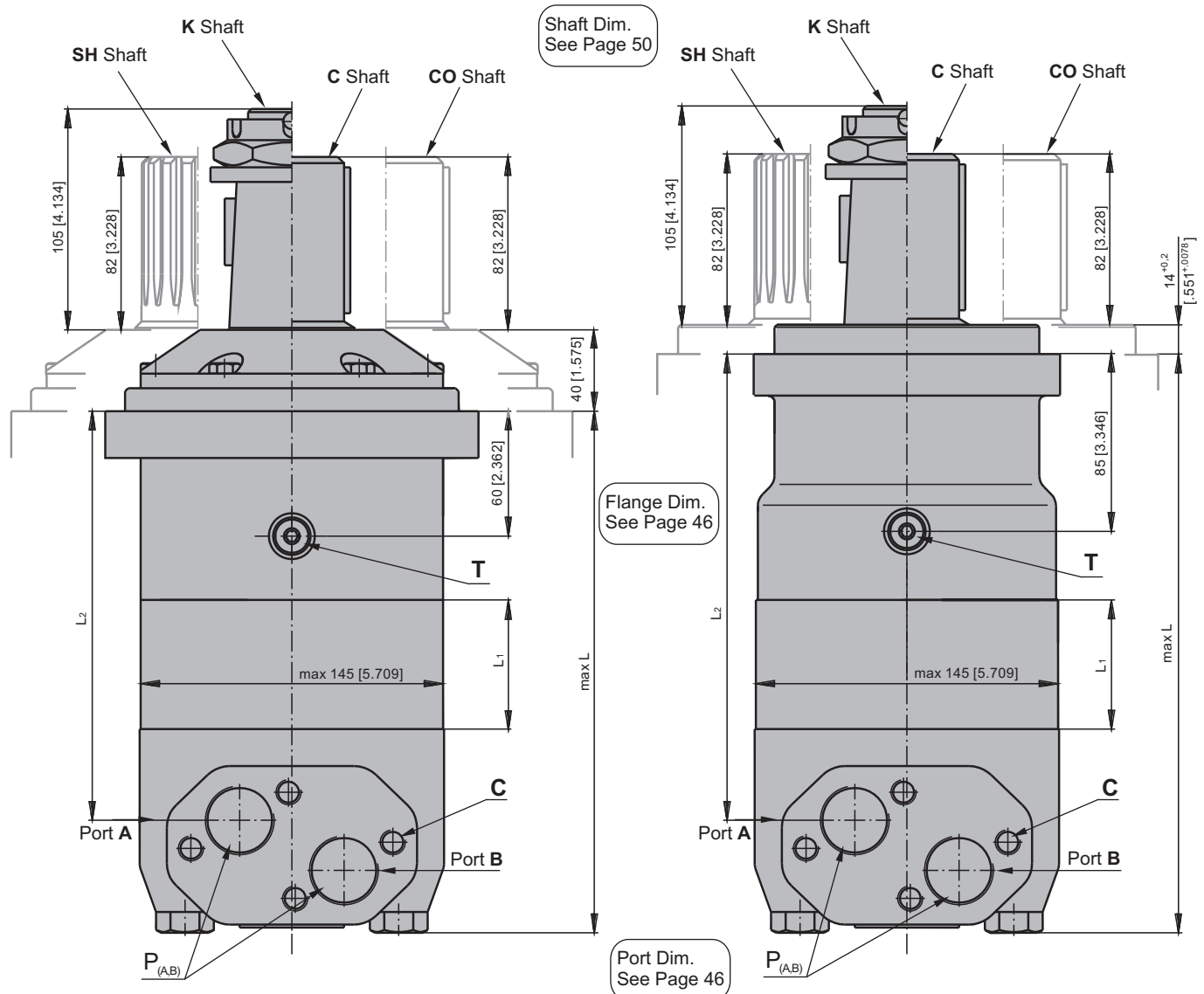


W - Wheel



SAE C

DIMENSIONS AND MOUNTING DATA - MV and MVC



C: 4xM12 - 12 mm [.47 in] depth
P_(A,B): 2xG1 - 20 mm [.79 in] depth
T: G 1/4 - 12 mm [.47 in] depth

Standard Rotation

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

Reverse Rotation

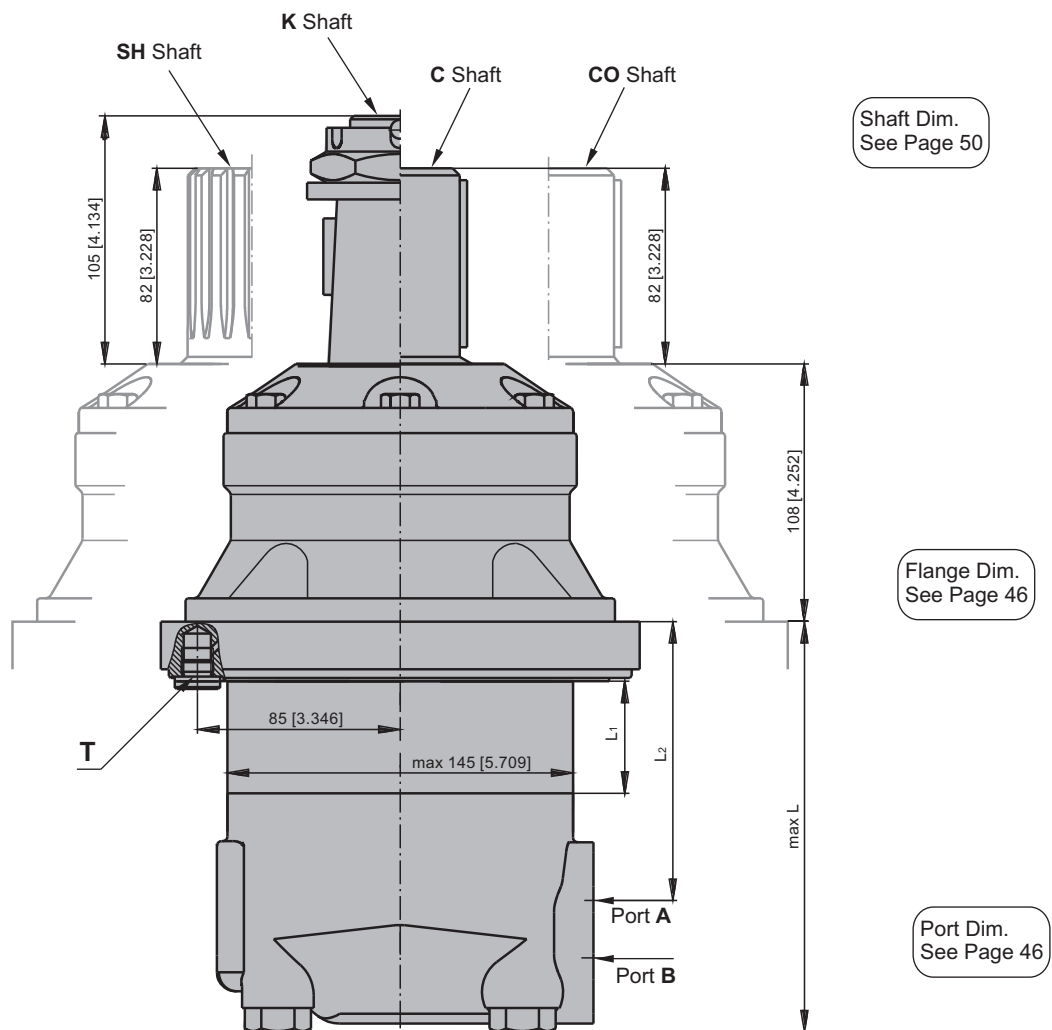
Viewed from Shaft End
 Port A Pressurized - **CCW**
 Port B Pressurized - **CW**



Type	L, mm [in]	L2, mm [in]	Type	L, mm [in]	L2, mm [in]	*L1, mm [in]
MV 315	214,5 [8.45]	160 [6.30]	MVC 315	239,0 [9.41]	185,5 [7.30]	22,0 [.87]
MV 400	221,5 [8.72]	167 [6.58]	MVC 400	246,0 [9.68]	192,5 [7.58]	29,0 [1.14]
MV 500	229,5 [9.04]	175 [6.89]	MVC 500	254,0 [10.0]	200,5 [7.89]	37,0 [1.46]
MV 630	240,0 [9.45]	186 [7.32]	MVC 630	264,5 [10.41]	211,0 [8.31]	47,5 [1.87]
MV 800	254,0 [10.0]	200 [7.87]	MVC 800	278,5 [10.96]	225,0 [8.86]	61,5 [2.42]

* The width of the roll-gerotor is 4 mm [.157 in.] greater than L1.

DIMENSIONS AND MOUNTING DATA - MVW



C: 4xM12 - 12 mm [.47 in] depth
P_(A,B): 2xG1 - 20 mm [.79 in] depth
T: G 1/4 - 12 mm [.47 in] depth

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**

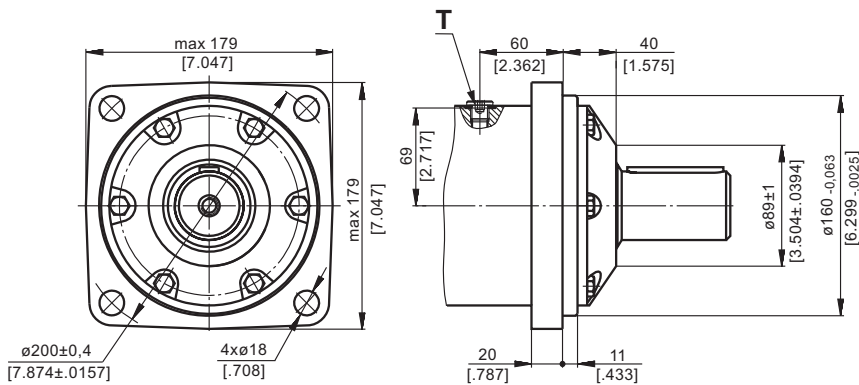


Type	L, mm [in]	L2, mm [in]	*L1, mm [in]
MVW 315	146 [5.75]	92 [3.62]	22,0 [.87]
MVW 400	153 [6.02]	99 [3.90]	29,0 [1.14]
MVW 500	161 [6.34]	107 [4.21]	37,0 [1.46]
MVW 630	172 [6.77]	118 [4.65]	47,5 [1.87]
MVW 800	185 [7.28]	132 [5.20]	61,5 [2.42]

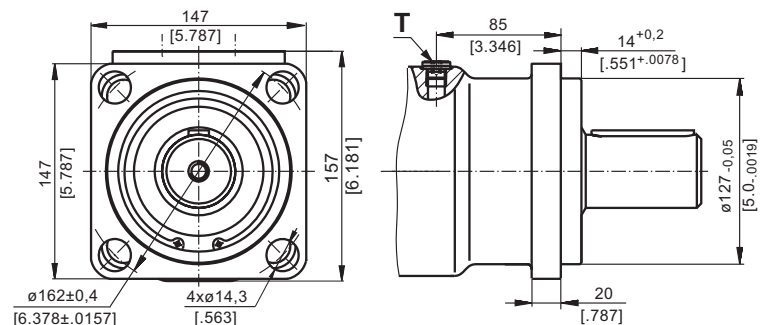
* The width of the roll-gerotor is 4 mm [.157 in.] greater than L1.

MOUNTING

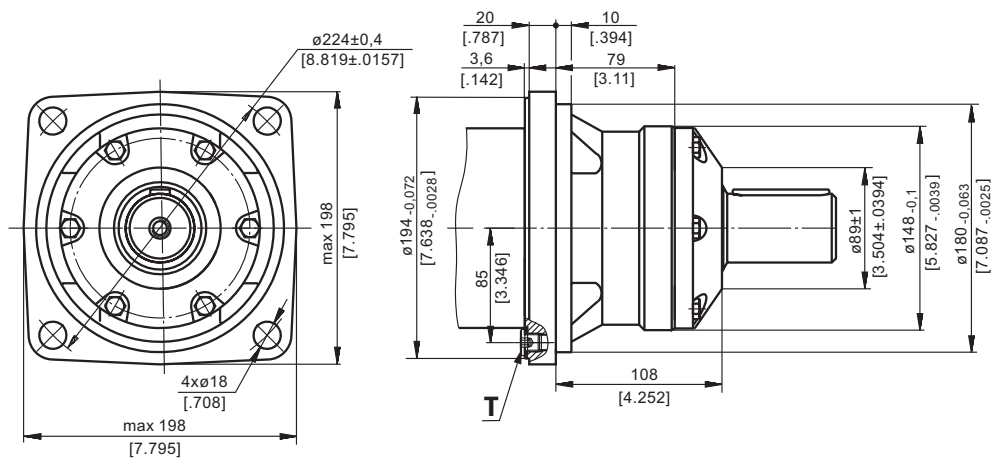
Square Mount (4 Holes)



C SAE C Mount

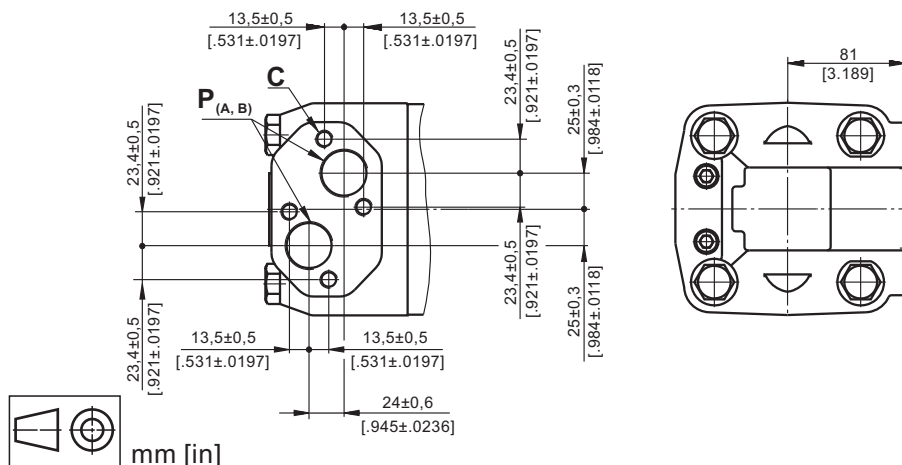


W Wheel Mount



PORTS

Side Ports



C: 4xM12 - 12 mm [0.47 in] depth
P_(A,B): 2xG1 - 20 mm [0.79 in] depth
T: G 1/4 - 12 mm [0.47 in] depth

Standard Rotation

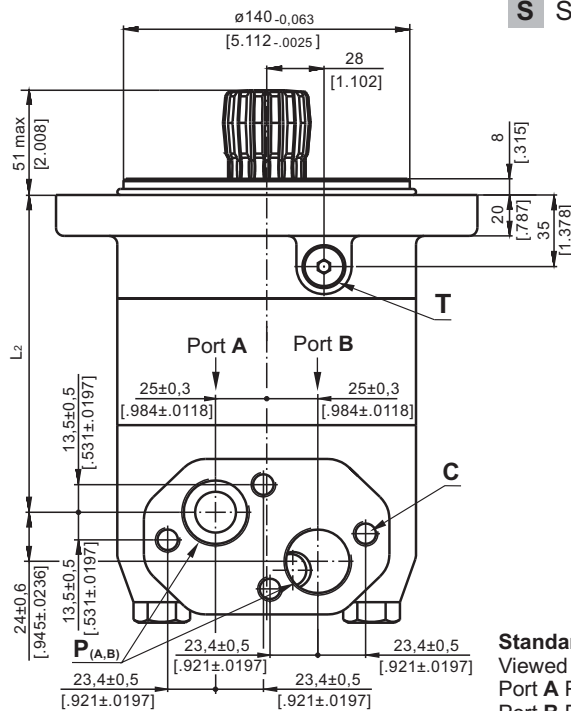
Viewed from Shaft End
 Port **A** Pressurized - **CW**
 Port **B** Pressurized - **CCW**

Reverse Rotation

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

DIMENSIONS AND MOUNTING

S Short Mount



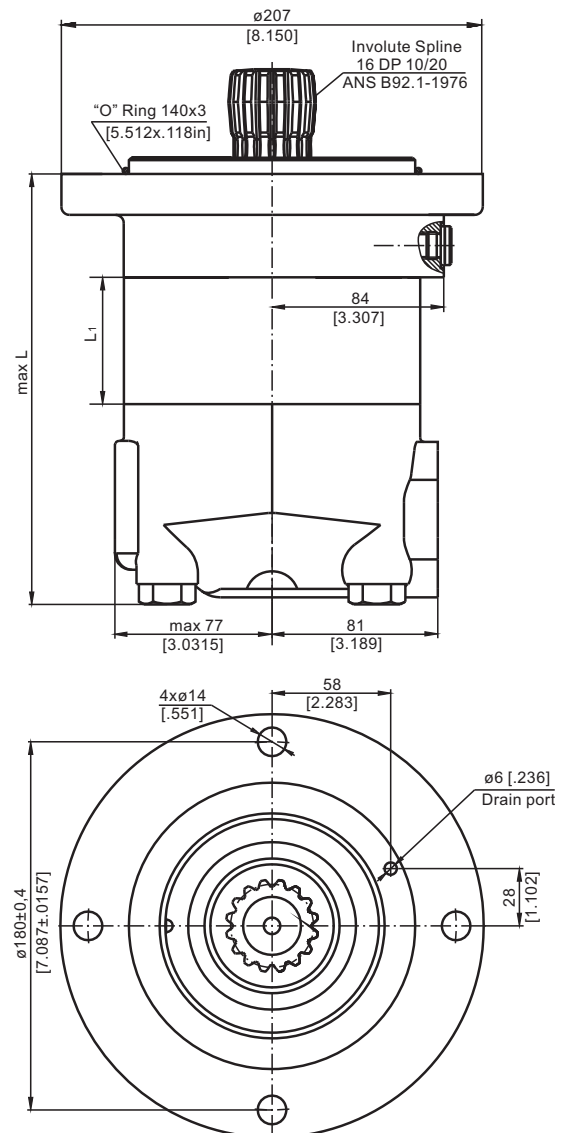
C: 4xM12 - 12 mm [.47 in] depth
P_{(A,B):} 2xG1 - 20 mm [.79 in] depth
T: G 1/4 - 12 mm [.47 in] depth

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**

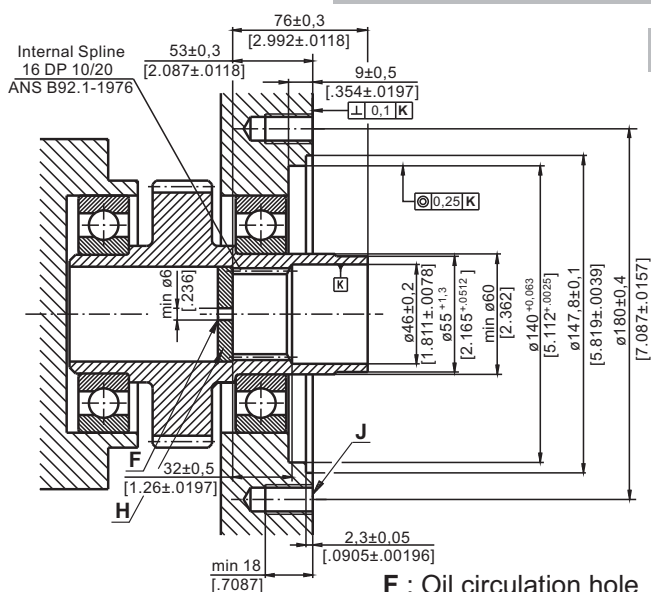
Type	L, mm [in]	L ₂ , mm [in]	*L ₁ , mm [in]
MVS 315	171[6.73]	117[4.61]	22,0 [.87]
MVS 400	179[7.05]	124[4.88]	29,0 [1.14]
MVS 500	186[7.32]	132[5.20]	37,0 [1.46]
MVS 630	197[7.76]	143[5.63]	47,5 [1.87]
MVS 800	211[8.31]	157[6.18]	61,5 [2.42]

* The width of the roll-gerotor is 4 mm [.157 in] greater than L1.

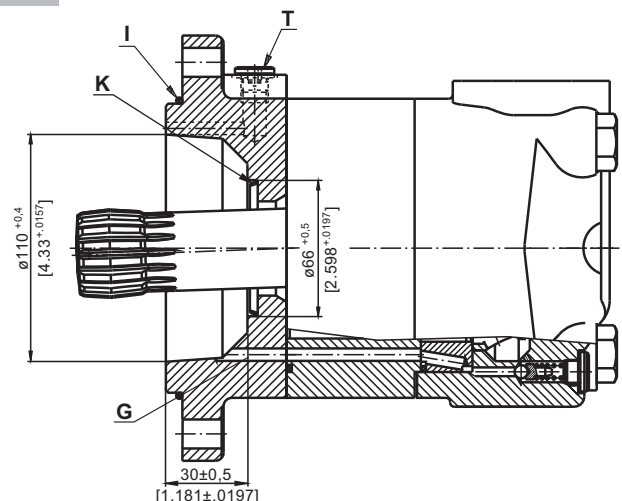


DIMENSIONS OF THE ATTACHED COMPONENT

MVS



F : Oil circulation hole
G: Internal drain channel
H: Hardened stop plate
I : O-Ring 140x3mm [5.512x.118in]

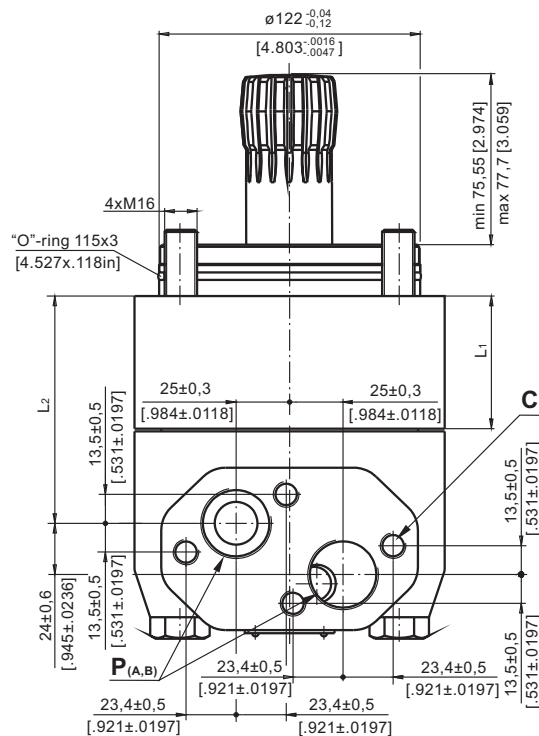


J: 4xM12-18 mm [.709 in] depth, 90°
K: Conical seal ring
T: Drain connection G1/4 - 12 mm [.47 in] depth



DIMENSIONS AND MOUNTING

V Very Short Mount



C: 4xM12 - 12 mm [0.47 in] depth

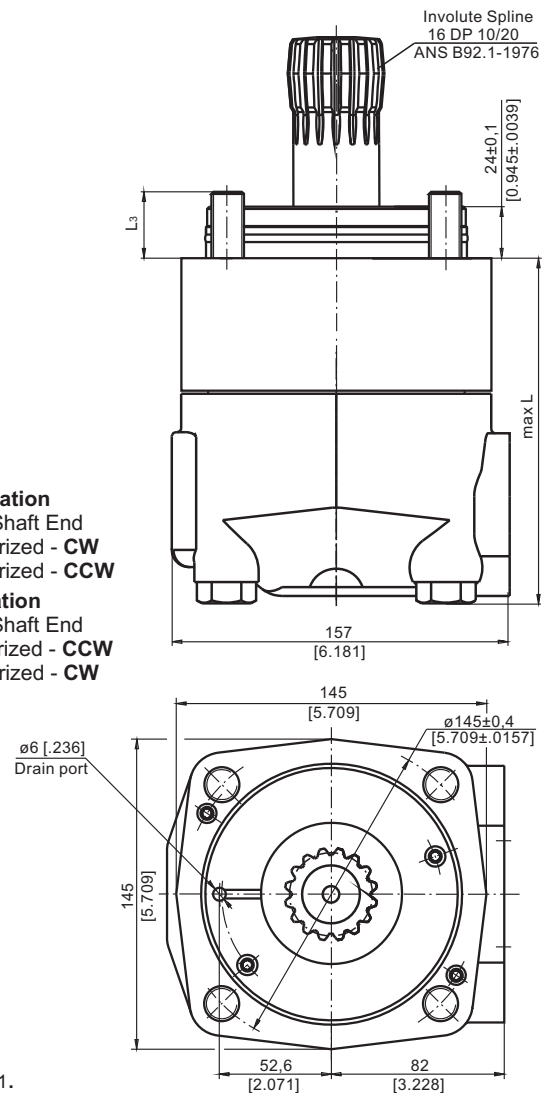
P_(A,B): 2xG1 - 20 mm [0.79 in] depth

Type	L, mm[in.]	L2, mm [in.]	L3, mm [in.]	*L1, mm [in.]
MVV 315	121,5[4.78]	68[2.68]	29,5[1.16]	22,0 [0.87]
MVV 400	128,5[5.06]	75[2.95]	32,5[1.28]	29,0 [1.14]
MVV 500	136,5[5.37]	83[3.27]	34,5[1.36]	37,0 [1.46]
MVV 630	147,0[5.79]	93[3.66]	34,0[1.34]	47,5 [1.87]
MVV 800	161,0[6.34]	107,5[4.23]	30,0[1.18]	61,5 [2.42]

* The width of the roll-gerotor is 4 mm [0.157 in] greater than L1.

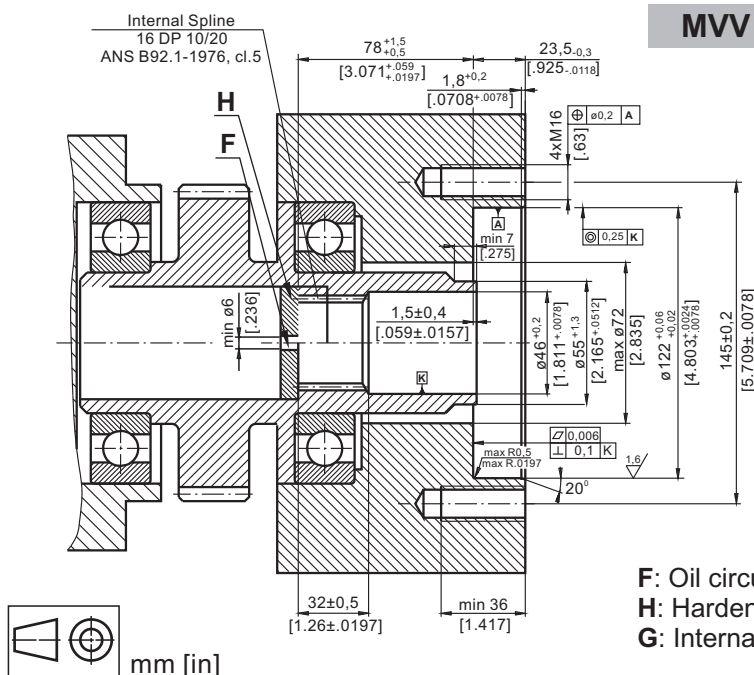
Standard Rotation
Viewed from Shaft End
Port A Pressurized - CW
Port B Pressurized - CCW

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

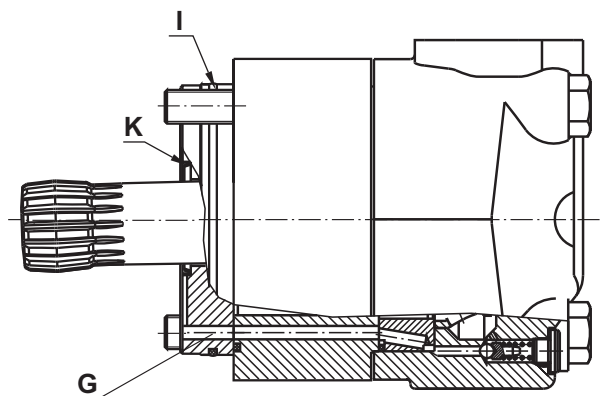


DIMENSIONS OF THE ATTACHED COMPONENT

MVV



F: Oil circulation hole
H: Hardened stop plate
G: Internal drain channel



I: O- Ring 115x3mm [4.527x.118in]
K: Conical seal ring

DRAIN CONNECTION

A drain line has to be used when pressure in the return line can exceed the permissible pressure. It can be connected:

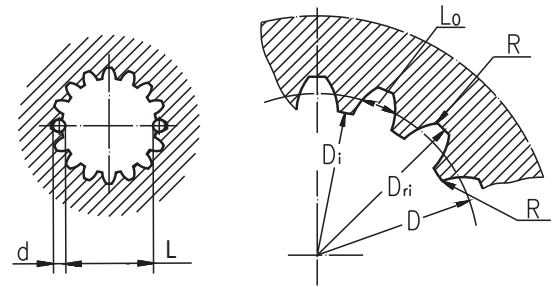
- For MVS to the drain port of the motor;
- For MVV to the drain connection of the attached component. The maximum pressure in the drain line is limited by the attached component and its shaft seal.

The drain line must be possible for oil to flow freely between motor and attached component and must be led to the tank. The maximum pressure in the drain line is limited by the attached component and its seal.

INTERNAL SPLINE DATA FOR THE ATTACHED COMPONENT

Standard *ANS B92.1-1976, class 5*
[$m=2.54$; corrected $x.m=+1,0$]

Flat Root Side Fit		mm	inch
Number of Teeth	z	16	16
Diametral Pitch	DP	10/20	10/20
Pressure Angle		30°	30°
Pitch Dia.	D	40,640	1.6
Major Dia.	D _{ri}	45,2 ^{+0,4}	1.796÷1.780
Minor Dia.	D _i	38,5 ^{+0,039}	1.5175÷1.516
Space Width [Circular]	L _o	5,18±0,037	.2055÷.2025
Fillet Radius	R	0,4	.015
Max. Measurement between Pins	L	32,47 ^{+0,15}	1.284÷1.278
Pin Dia.	d	5,6±0,001	.22051÷.22043



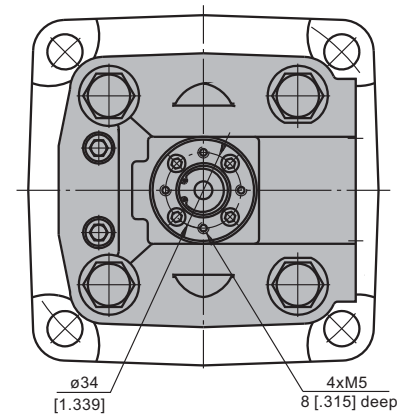
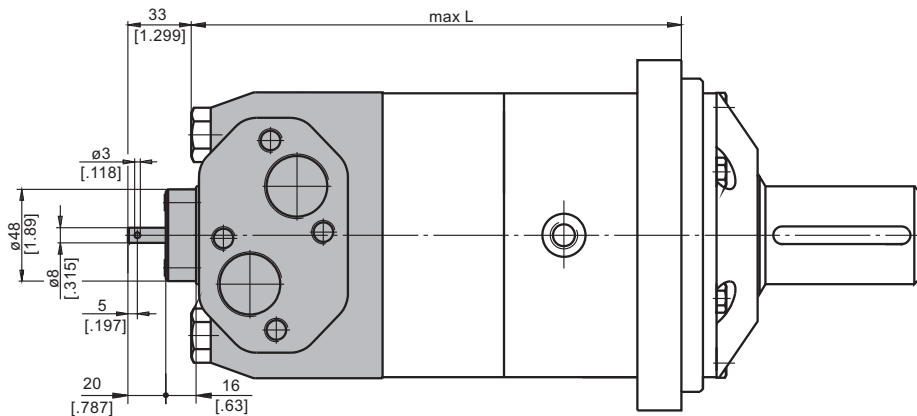
Hardening Specification:

HV=750±50 on the surface.

HV=560 at 0,7±0,2 mm [.035±.019in] case depth

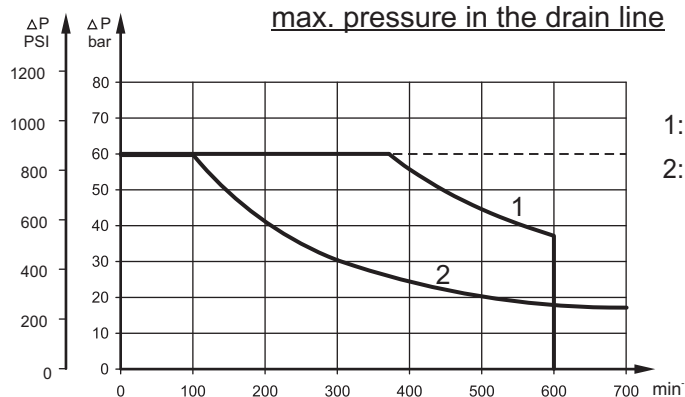
Material: 20 MoCr4 EN 10084 or better.

MOTOR WITH TACHO CONNECTION



MAX. PERMISSIBLE SHAFT SEAL PRESSURE for MV motors

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



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

2: Drawing for Standard Shaft Seal

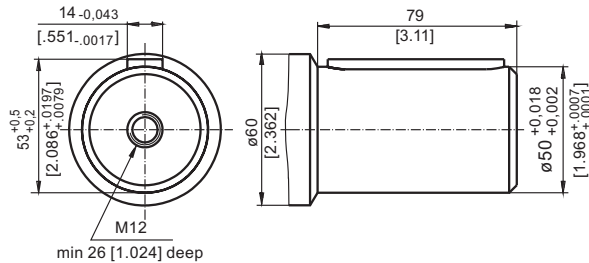
— - continuous operations

- - - - intermittent operations

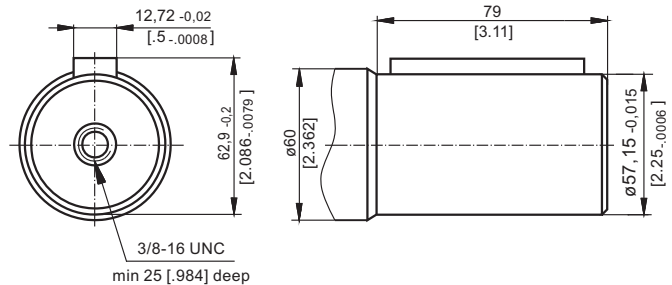


SHAFT EXTENSIONS

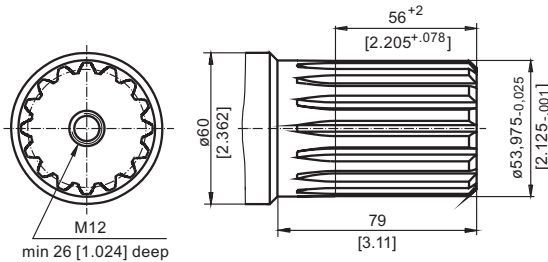
C - $\varnothing 50$ straight, Parallel key A14x9x70 DIN 6885



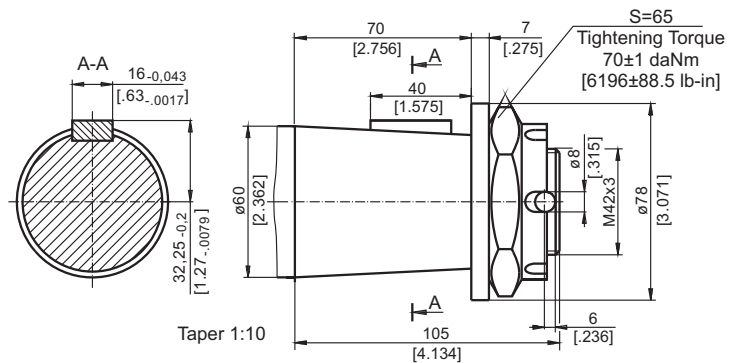
CO - $\varnothing 2\frac{1}{4}$ " [57, 15] straight, Parallel key $\frac{1}{2}$ " x $\frac{1}{2}$ " x $2\frac{1}{4}$ " BS46



SH - $\varnothing 2\frac{1}{8}$ " splined, 16 DP 8/16 ANS B92.1-1976



K - tapered 1:10, Parallel key B16x10x32 DIN 6885



mm [in]

ORDER CODE

	1	2	3	4	5	6
M V						

Pos.1 - Mounting Flange

omit - Square mount, four holes

C	- SAE C mount
W	- Wheel mount
S	- Short mount
V	- Very short mount

Pos.2 - Displacement code

315	- 314,5 cm ³ /rev [19.18 in ³ /rev]
400	- 400,9 cm ³ /rev [24.45 in ³ /rev]
500	- 499,6 cm ³ /rev [30.48 in ³ /rev]
630	- 629,1 cm ³ /rev [38.38 in ³ /rev]
800	- 801,8 cm ³ /rev [48.91 in ³ /rev]

Pos. 3 - Shaft extensions*

omit - for **S** and **V** mounting flange

C	- $\varnothing 50$ straight, Parallel key A14x9x70 DIN6885
CO	- $\varnothing 2\frac{1}{4}$ " straight, Parallel key $\frac{1}{2}$ " x $\frac{1}{2}$ " x $2\frac{1}{4}$ " BS46
SH	- $\varnothing 2\frac{1}{8}$ " splined, ANS B92.1-1976
K	- $\varnothing 60$ tapered 1:10, Parallel key B16x10x32 DIN6885

Pos. 4 - Shaft Seal Version (see page 49)

omit - Low pressure shaft seal
U - High pressure shaft seal

Pos. 5 - Special Features (see page 51)

Pos. 6 - Design Series

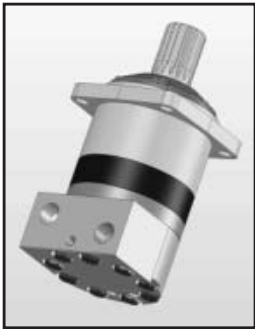
omit - Factory specified

NOTES:

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

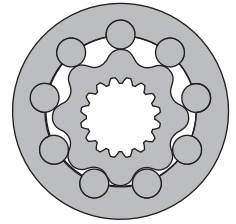
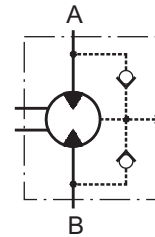
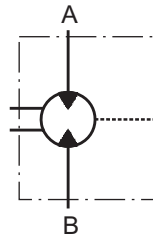
The hydraulic motors are mangano- phosphatized as standard.

HYDRAULIC MOTORS MVM



APPLICATION

- » Conveyors
- » Metal working machines
- » Agricultural machines
- » Road building machines
- » Mining machinery
- » Food industries
- » Special vehicles
- » Plastic and rubber machinery etc.



CONTENTS

Specification data	44
Function diagrams	45-47
Dimensions and mounting MVM	48
Mounting Flanges	49
Port Types	49
Shaft extensions	50
Permissible shaft Seal Pressure	51
Order code	51

OPTIONS

- » Model - Disc valve, roll-gerotor
- » Flange with wheel mount
- » Short motor
- » Side ports
- » Shafts - straight, splined and tapered
- » BSPP ports Metric, SAE and BSPP ports;
- » Other special features.

EXCELLENCE

- » High torque and pressure drop
- » High inlet pressure
- » High starting torque
- » Improved efficiency at high pressure drop and frequent reversing
- » Smooth operation at low speed
- » High radial and axial bearing capacity

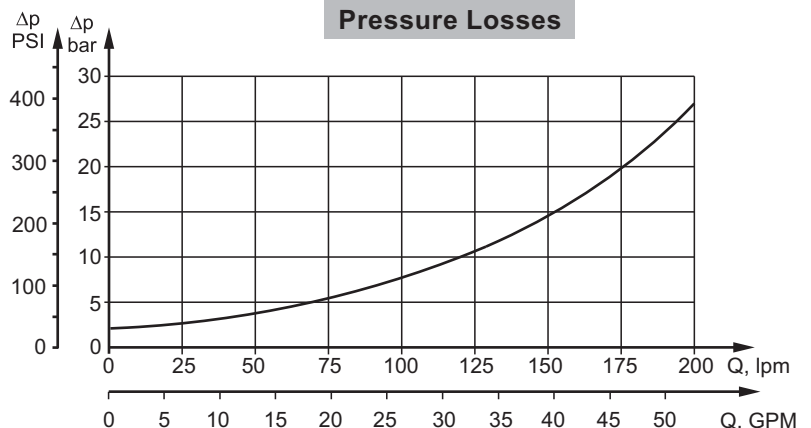
GENERAL

Max. Displacement, cm ³ /rev [in ³ /rev]	801,8 [48.91]
Max. Speed, [RPM]	763
Max. Torque, daNm [lb-in]	cont.: 259 [22920] int.: 340 [30090]
Max. Output, kW [HP]	112 [150]
Max. Pressure Drop, bar [PSI]	cont.: 250 [3630] int.: 350 [5080]
Max. Oil Flow, lpm [GPM]	240 [63.4]
Min. Speed, [RPM]	5
Permissible Shaft Loads, daN [lbs]	Pa=1500 [3370]
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]
140 [2030]	20 [98]	3 [.793]
	35 [164]	2 [.528]
210 [3045]	20 [98]	6 [1.585]
	35 [164]	4 [1.057]

Pressure Losses



SPECIFICATION DATA

Type		MVM 315	MVM 400	MVM 500	MVM 630	MVM 800
Displacement, cm ³ /rev [in ³ /rev]		314,5 [19.19]	400,9 [24.5]	499,6 [30.5]	629,1 [38.38]	801,8 [48.91]
Max. Speed, [RPM]	cont.	636	500	400	315	250
	Int.*	763	600	480	380	300
Max. Torque daNm [lb-in]	cont.	115 [10180]	144 [12745]	180 [15930]	227 [20090]	259 [22920]
	Int.*	160 [14160]	200 [17700]	260 [23010]	310 [27440]	340 [30090]
	peak**	180 [15930]	230 [20355]	286 [25315]	360 [31860]	402 [35580]
Max. Output kW [HP]	cont.	67 [90]	67 [90]	67 [90]	67 [90]	67 [90]
	int.*	112 [150]	112 [150]	112 [150]	112 [150]	112 [150]
Max. Pressure Drop bar [PSI]	cont.	250 [3630]	250 [3630]	250 [3630]	250 [3630]	225 [3263]
	Int.*	350 [5080]	350 [5080]	350 [5080]	350 [5080]	300 [4350]
	peak**	400 [5800]	400 [5800]	400 [5800]	400 [5800]	350 [5080]
Max. Oil Flow lpm [GPM]	cont.	200 [52.8]	200 [52.8]	200 [52.8]	200 [52.8]	200 [52.8]
	Int.*	240 [63.4]	240 [63.4]	240 [63.4]	240 [63.4]	240 [63.4]
Max. Inlet Pressure bar [PSI]	cont.	270 [3915]	270 [3915]	270 [3915]	270 [3915]	270 [3915]
	Int.*	370 [5365]	370 [5365]	370 [5365]	370 [5365]	370 [5365]
	peak**	420 [6090]	420 [6090]	420 [6090]	420 [6090]	420 [6090]
Max. Return Pressure with Drain Line bar [PSI]	cont.	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]
	Int.*	175 [2540]	175 [2540]	175 [2540]	175 [2540]	175 [2540]
	peak**	210 [3045]	210 [3045]	210 [3045]	210 [3045]	210 [3045]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		5 [70]	5 [70]	5 [70]	5 [70]	5 [70]
Min. Starting Torque daNm [lb-in]		92 [8140]	115 [10180]	144 [12745]	180 [15930]	205 [18145]
Min. Speed***, [RPM]		10	6	8	6	5
Weight, kg [lb]	MVM	41,3 [91]	42,1 [93]	43 [95]	44,5 [98]	46 [101.4]
	MVMC	43,8 [96.6]	44,9 [99]	45,8 [101]	48,3 [106.5]	50,4 [111.1]

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

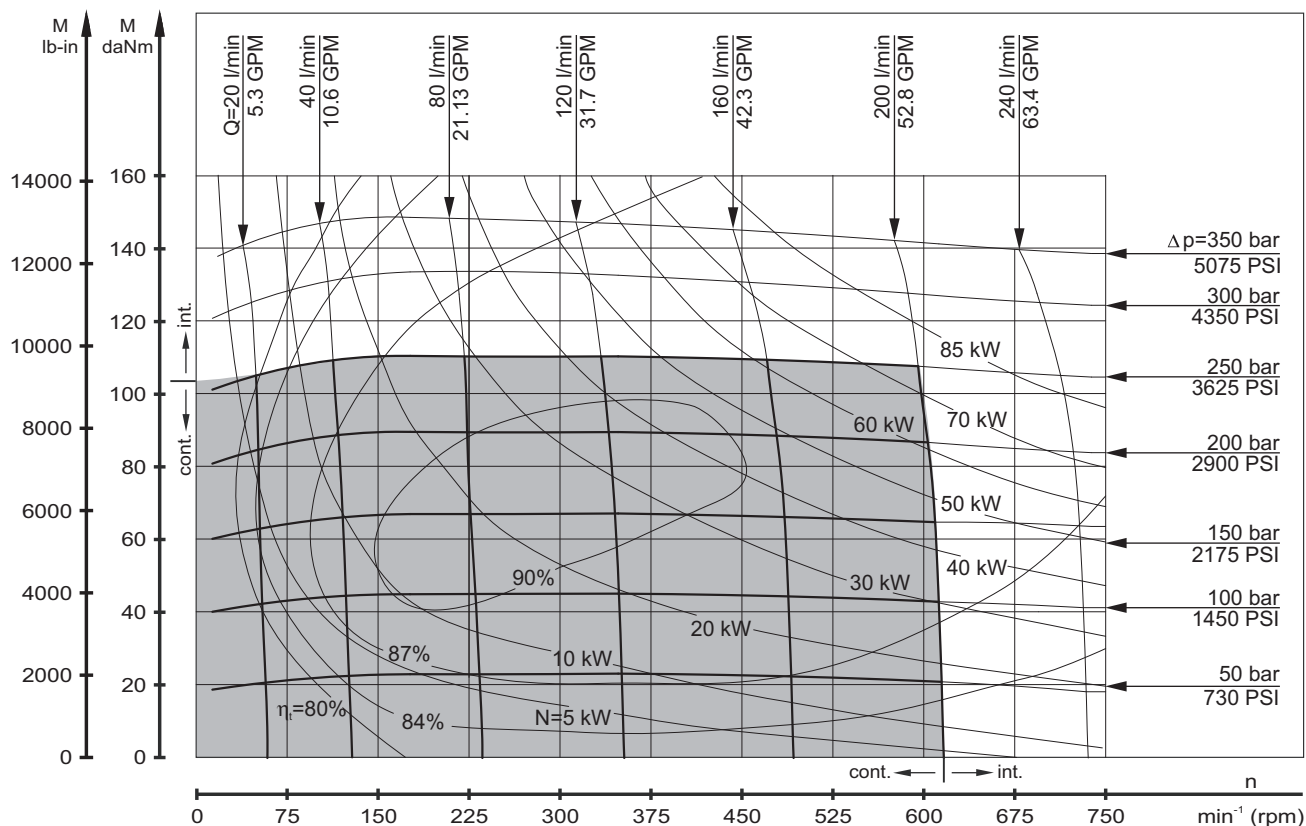
** Peak load: the permissible values may occur for max. 1% of every minute.

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

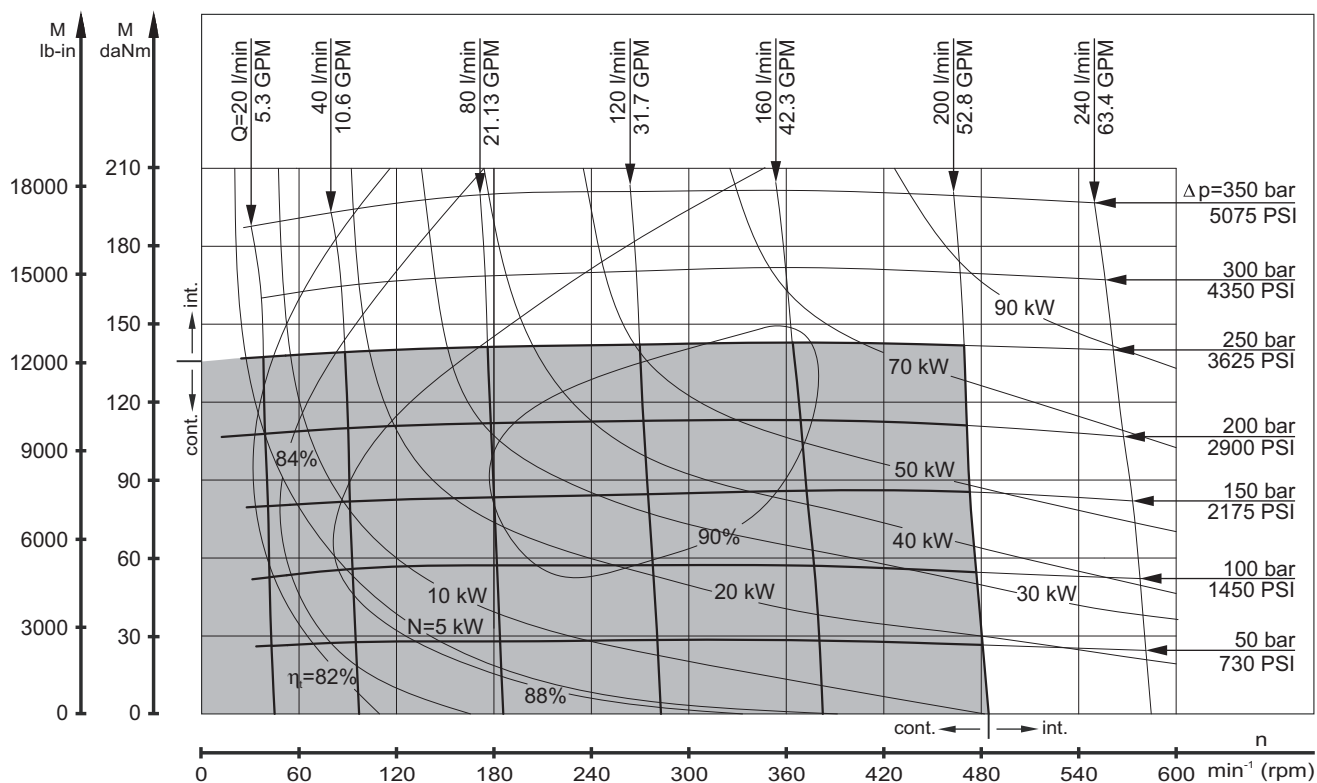
- Intermittent speed and intermittent pressure must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP (DIN51524) or HM (ISO 6743/4). If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

MVM 315



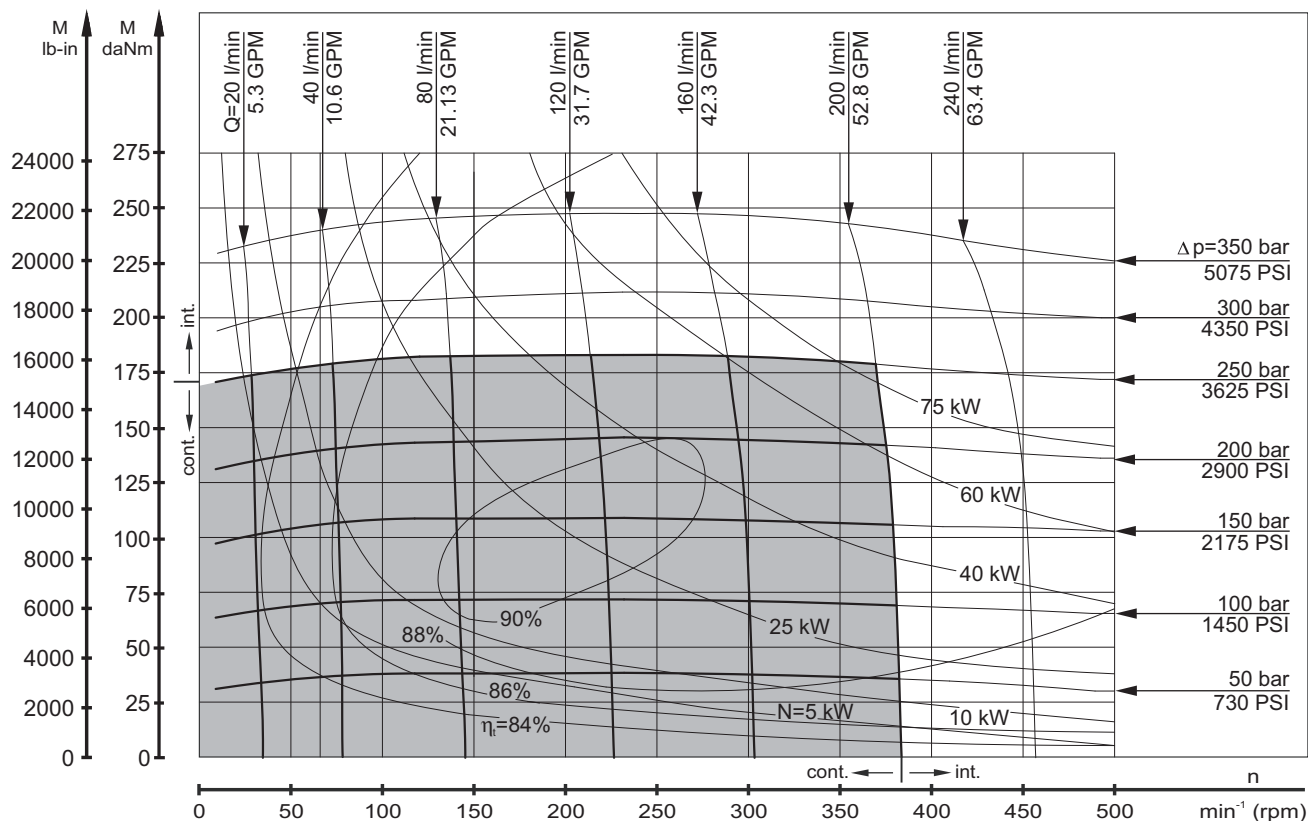
MVM 400



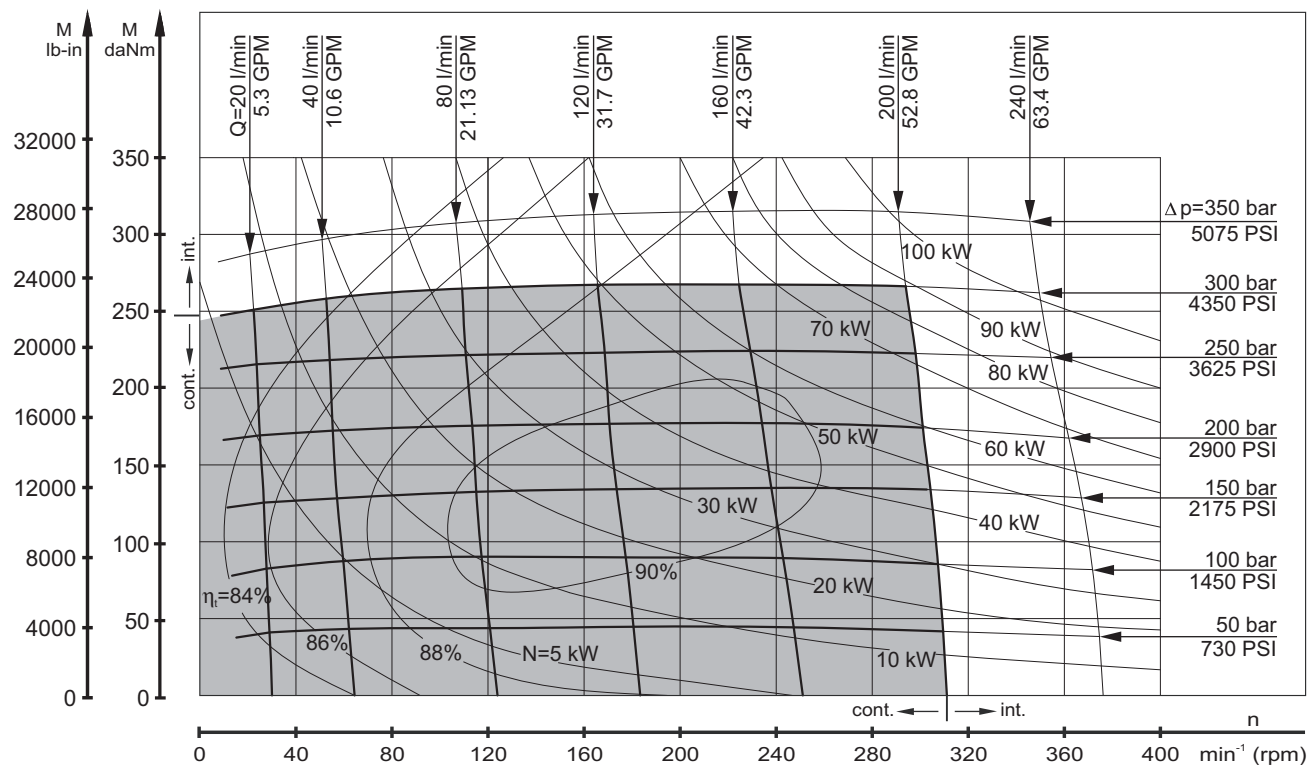
The function diagrams data was collected at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50° C [122°F].

FUNCTION DIAGRAMS

MVM 500



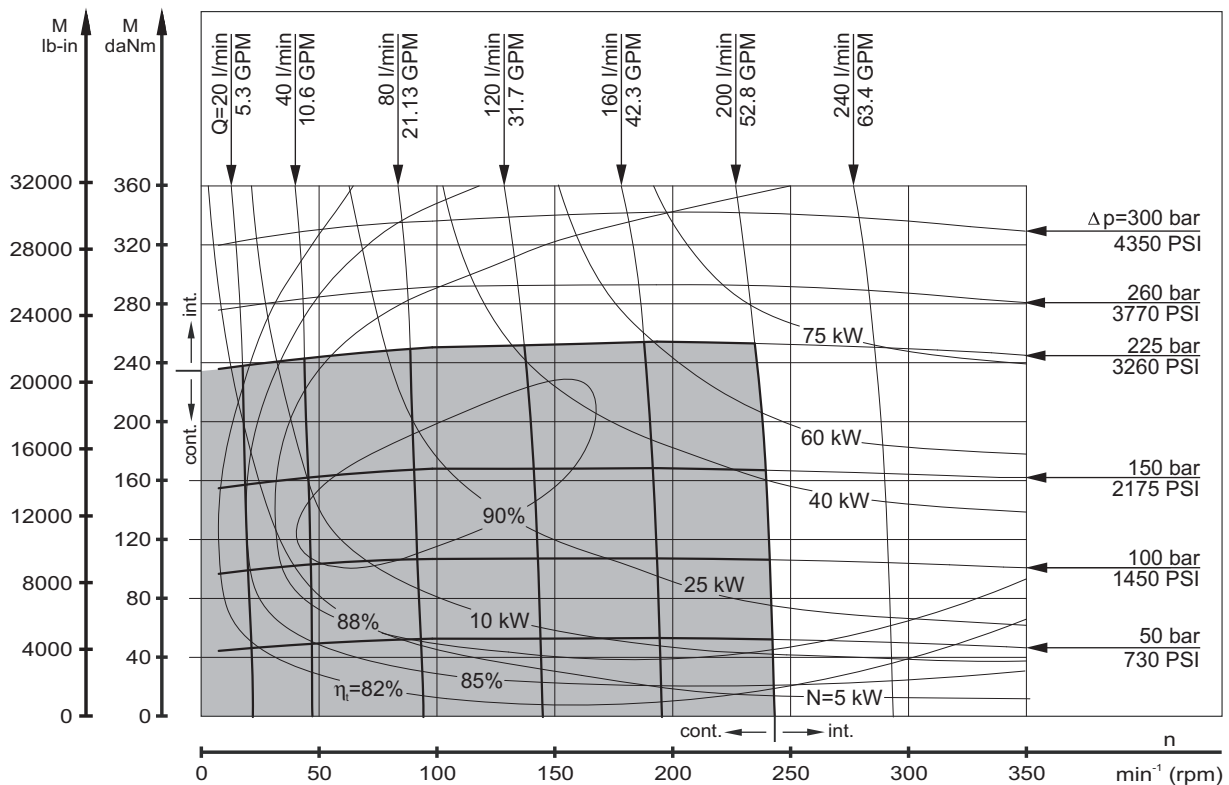
MVM 630



The function diagrams data was collected 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

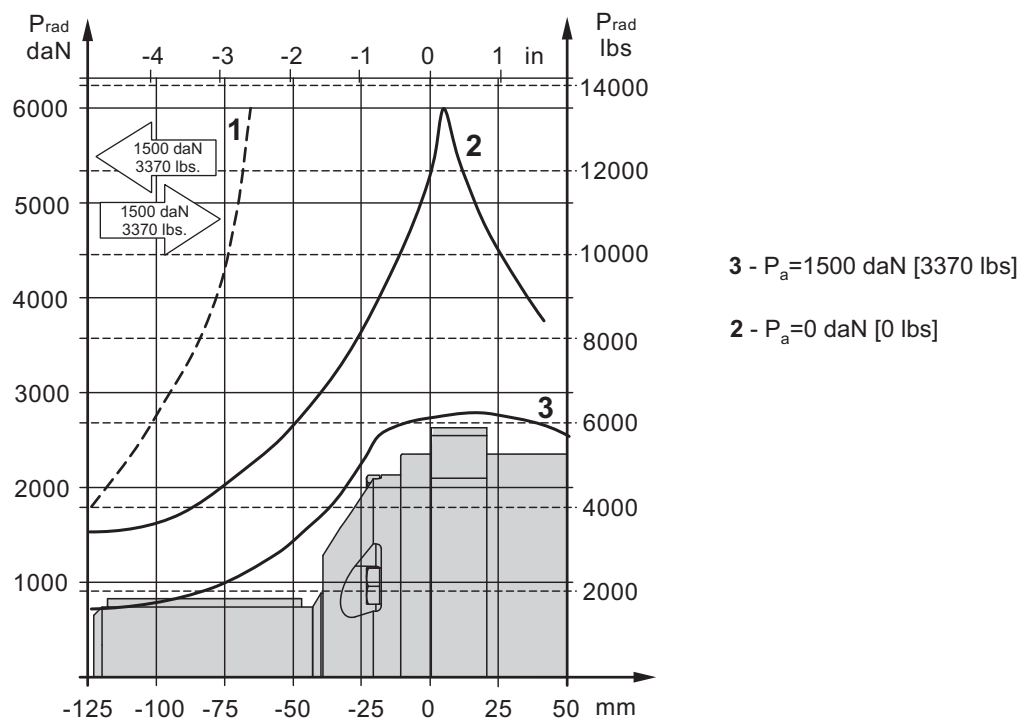
MVM 800



The function diagrams data was collected 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].

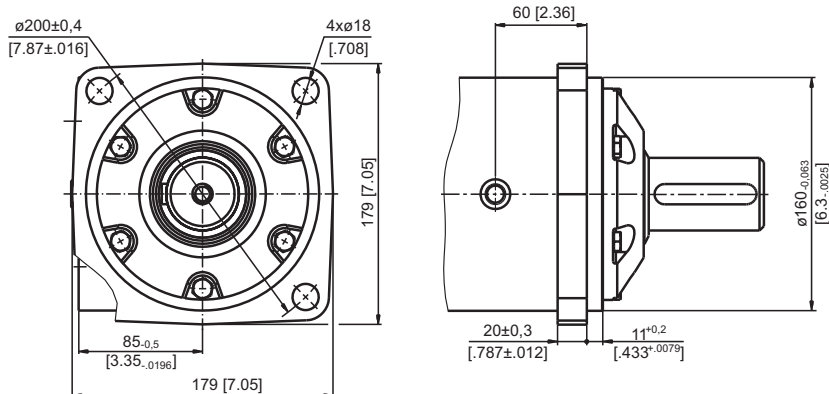
PERMISSIBLE SHAFT LOADS

The output shaft runs in tapered bearings that permit high axial and radial forces. Curve "1" shows max. radial shaft load. Any shaft load exceeding the values shown by the curve will seriously reduce motor life. The two other curves apply to a B10 bearing life of 3000 hours at 200 RPM.

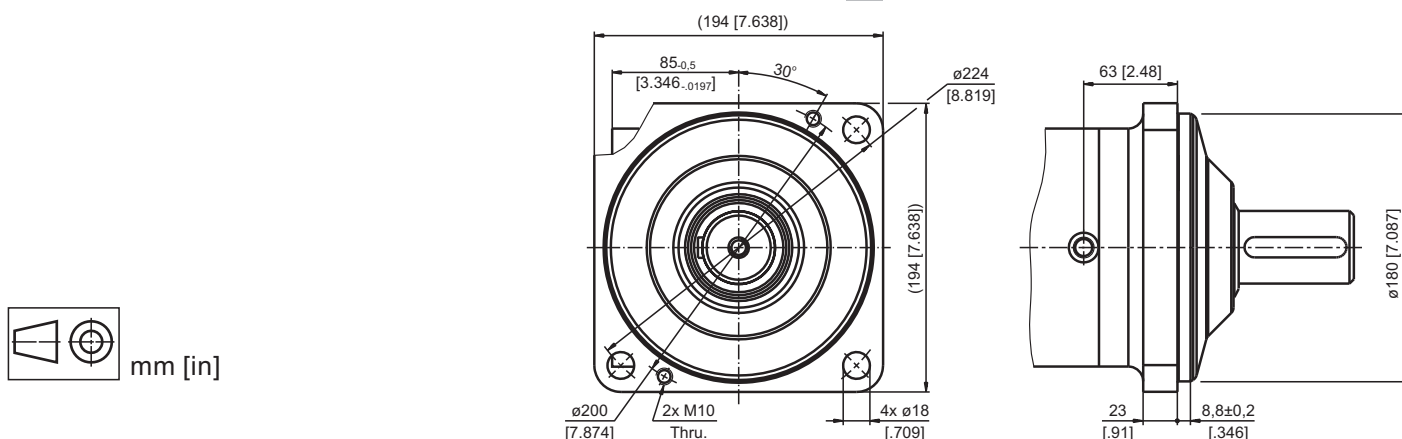


MOUNTING

Square Mount (4 Holes)



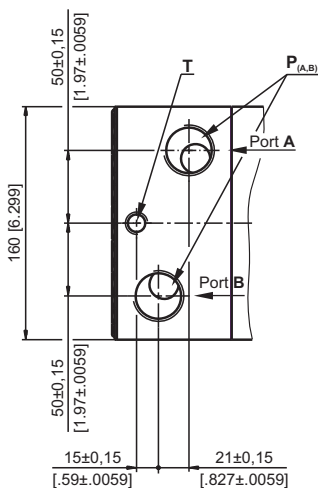
C Square Mount (four holes)



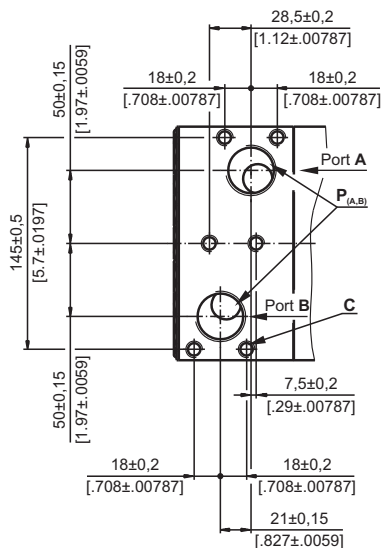
PORTS

Side Ports

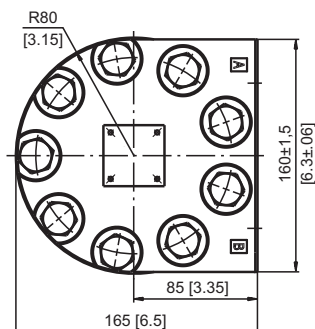
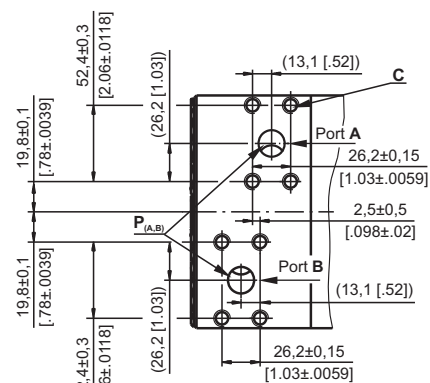
Versions **2** **4**



Versions **3**



Versions **5**



Standard Rotation

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

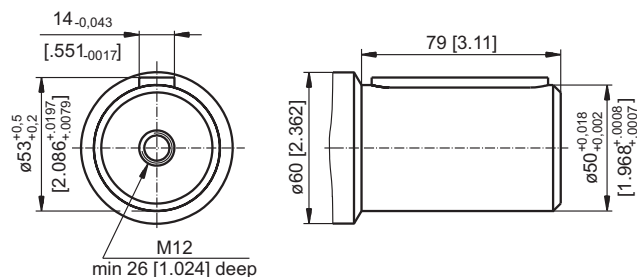
Reverse Rotation

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

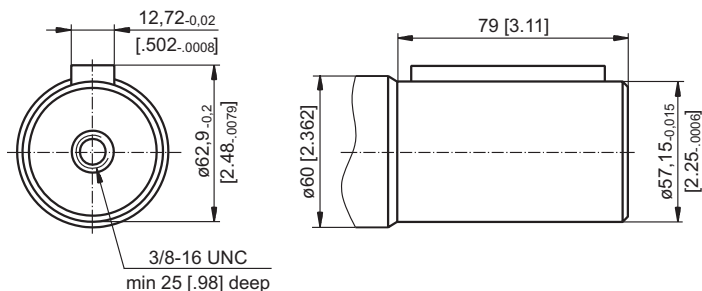
	Versions			
	2	3	4	5
P(A,B)	2xG1	2xG1	2x1 ⁵ / ₁₆ -12UN	2x1" (SAE PSI3000)
T	G ¹ / ₄	G ¹ / ₄	9 ¹⁶ / ₁₆ -18UNF	G ¹ / ₄
C	-	6xM10	-	8xM10

SHAFT EXTENSIONS

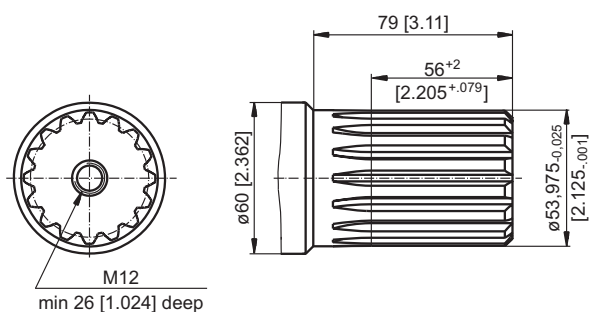
C - $\varnothing 50$ straight, Parallel key A14x9x70 DIN 6885



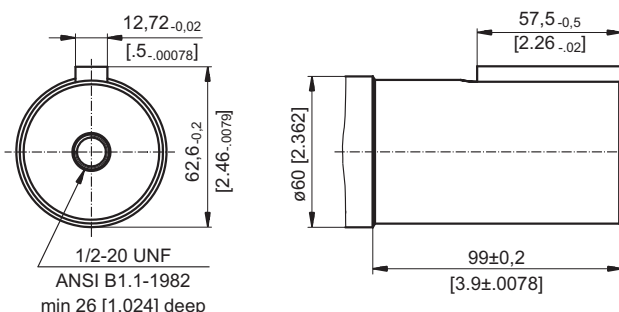
CO - $\varnothing 2\frac{1}{4}$ [57,15] straight
Parallel key $\frac{1}{2}$ "x $\frac{1}{2}$ "x $\frac{1}{4}$ " BS46



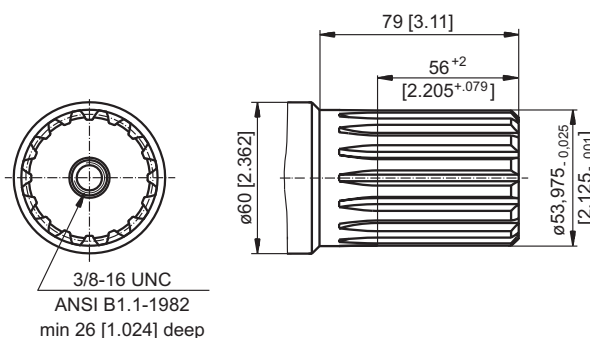
SH - $\varnothing 2\frac{1}{8}$ (53,975) splined
16 DP 8/16 ANS B92.1-1976



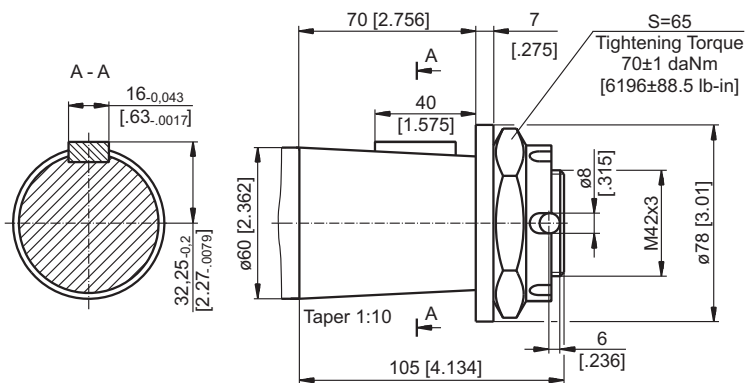
B - $\varnothing 2\frac{1}{4}$ [57,15] straight
Parallel key $\frac{1}{2}$ "x $\frac{1}{2}$ "x $\frac{1}{4}$ " BS46



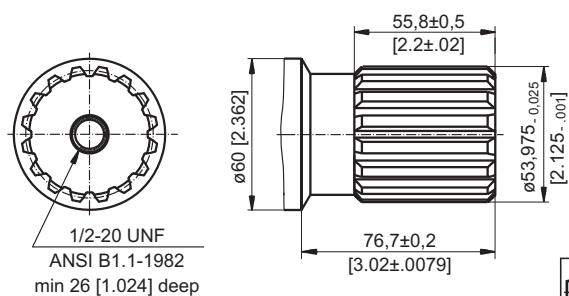
G - $\varnothing 2\frac{1}{8}$ [53,975] splined
16 DP 8/16 ANS B92.1-1976



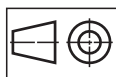
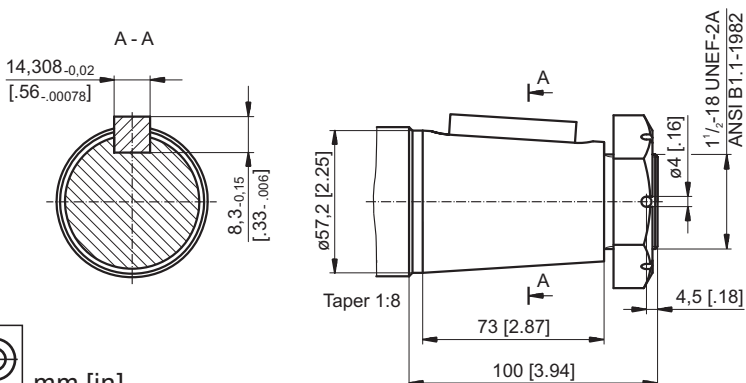
K - $\varnothing 60$, tapered 1:10
Parallel key B16x10x32 DIN 6885



S - $\varnothing 2\frac{1}{8}$ [53,975] splined
16 DP 8/16 ANS B92.1-1976



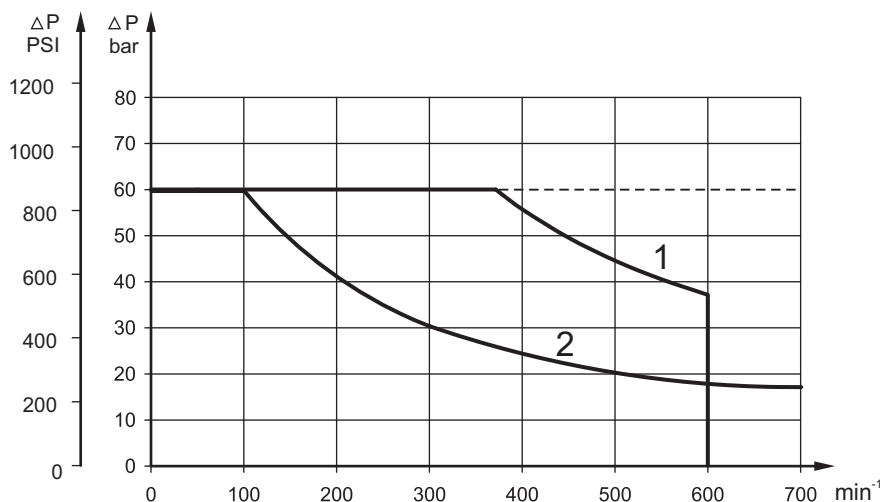
T - $\varnothing 2\frac{1}{4}$ [57,15] SAE J501, tapered 1:8
key $\frac{9}{16}$ "x $\frac{9}{16}$ "x2" BS46



mm [in]

MAX. PERMISSIBLE SHAFT SEAL PRESSURE

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



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

2: Drawing for Standard Shaft Seal

— - continuous operations

- - - - - intermittent operations

ORDER CODE

	1	2	3	4	5	6	7	8
M V M							HD	

Pos.1 - Mounting Flange

omit - Standard square mount, four holes

C - Square mount, four holes

Pos.2 - Displacement code

315 - 314,5 cm³/rev [19.80 in³/rev]

400 - 400,9 cm³/rev [24.45 in³/rev]

500 - 499,6 cm³/rev [30.48 in³/rev]

630 - 629,1 cm³/rev [38.38 in³/rev]

800 - 801,8 cm³/rev [48.91 in³/rev]

Pos.3 - Shaft Extensions*

C - ø50 straight, Parallel key A14x9x70 DIN6885

CO - ø2¼" [57,15] straight, Parallel key ½"x½"x2¼" BS46

B - ø2¼" [57,15] straight, Parallel key ½"x½"x2¼" BS46

SH - ø2⅞" [53,975] splined, 16DP 8/16 ANS B92.1-1976

G - ø2⅞" [53,975] splined, 16DP 8/16 ANS B92.1-1976

S - ø2⅞" [53,975] splined, 16DP 8/16 ANS B92.1-1976

K - ø60 tapered 1:10, Parallel key B16x10x32 DIN6885

T - ø2¼" [57,15] SAE J501, tapered 1:8,

key ⅜"x⅜"x2" BS46

Pos.4 - Ports

2 - side ports 2xG1, G1/4, BSP thread, ISO 228

3 - side ports 2xG1, G1/4, BSP thread, ISO 228, 6xM10

4 - side ports 2x1 5/16-12 UN, O-ring, 9/16-18 UNF

5 - side ports 2x1" (SAE PSI3000), G1/4, BSP thread, ISO 228, 8xM10

Pos.5 - Check Valves

omit - without check valves

1 - with check valves

Pos.6 - Shaft Seal Version (see page 50)

omit - Low pressure shaft seal

U - High pressure shaft seal

Pos.7 - Special Features

HD - Reinforced motor HD**

For Other **Special Features** see page 58

Pos.8 - Design Series

omit - Factory specified

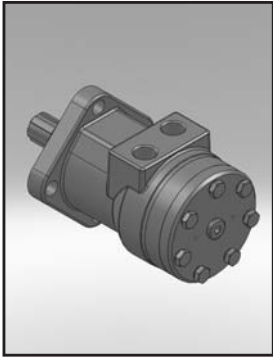
NOTES:

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

** Drain line should always be used (if no check valves).

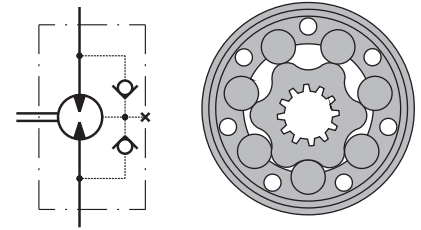
The hydraulic motors are manganophosphatized as standard.

HYDRAULIC MOTORS RL



APPLICATION

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



CONTENTS

Specification data	71
Dimensions and mounting	72
Shaft extensions	73
Permissible shaft loads	74
Order code	74

OPTIONS

- » Model - Spool valve, roll-gerotor
- » Antifriction conical bearings
- » Flange mount
- » Shafts - straight, splined and tapered
- » Metric and BSPP ports
- » Other special features

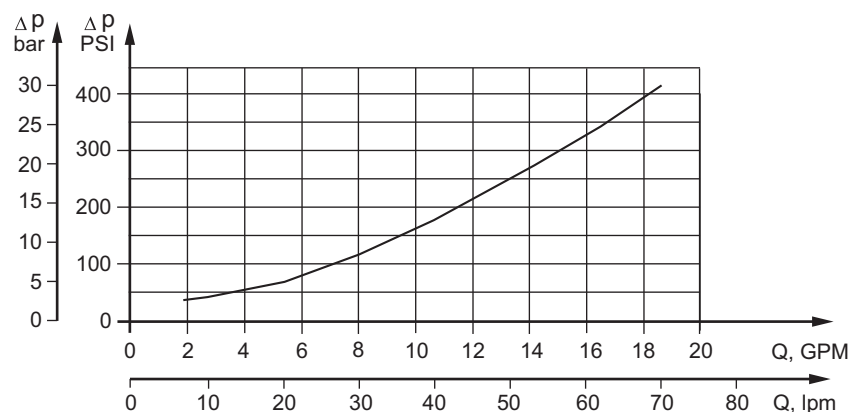
GENERAL

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]	16 [21.5]
Max. Pressure Drop, bar [PSI]	cont.: 175 [2540] int.: 200 [2900]
Max. Oil Flow, lpm [GPM]	75 [20]
Min. Speed, [RPM]	10
Permissible Shaft Loads, daN [lbs]	P _a =500 [1124]
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

Type		RL 50	RL 80	RL 100	RL 125	RL 160	RL 200	RL 250	RL 315	RL 400
Displacement, cm³/rev [in³/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 [lb-in]	Cont.	10 [885]	19,5 [1725]	24 [2125]	30 [2655]	38 [3360]	45 [4000]	54 [4780]	55 [4870]	61 [5400]
	Int.*	13 [1150]	22 [1947]	28 [2480]	34 [3010]	43 [3805]	50 [4425]	61 [5400]	69 [6100]	69 [6100]
	Peak**	17 [1505]	27 [2390]	32 [2832]	37 [3275]	46 [4070]	56 [4960]	71 [6280]	84 [77430]	87 [7700]
Max. Output kW [HP]	Cont.	7 [9.5]	12,5 [17]	13 [17.4]	12,5 [16.8]	12,5 [16.8]	11 [14.8]	10 [13.4]	9 [12]	7,5 [10]
	Int.*	8,5 [11.9]	15 [20.1]	15 [20.1]	14,5 [19]	14 [18.8]	13 [17.4]	12 [16.1]	10 [13.4]	9 [12]
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 [11]	60 [16]	60 [16]	60 [16]	60 [16]	60 [16]	60 [16]	60 [16]	60 [16]
	Int.*	50 [13]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]
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 without Drain Line or Max. Pres- sure in Drain Line, bar [PSI]	Cont. 0-100 RPM	100 [1450]	100 [1450]	100 [1450]	100 [1450]	100 [1450]	100 [1450]	100 [1450]	100 [1450]	100 [1450]
	Cont. 100-300 RPM	50 [725]	50 [725]	50 [725]	50 [725]	50 [725]	50 [725]	50 [725]	50 [725]	50 [725]
	Cont. 300-600 RPM	25 [365]	25 [365]	25 [365]	25 [365]	25 [365]	25 [365]	25 [365]	25 [365]	25 [365]
	Cont. >600 RPM	15 [220]	15 [220]	15 [220]	15 [220]	15 [220]	15 [220]	15 [220]	15 [220]	15 [220]
	Int.* 0-max. RPM	100 [1450]	100 [1450]	100 [1450]	100 [1450]	100 [1450]	100 [1450]	100 [1450]	100 [1450]	100 [1450]
Max. Return Pres- sure with Drain Line bar [PSI]	Cont.	140 [2030]	175 [2540]	175 [2540]	175 [2540]	175 [2540]	175 [2540]	175 [2540]	175 [2540]	175 [2540]
	Int.*	175 [2540]	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]	5 [73]	5 [73]	5 [73]
Min. Starting Torque daNm [lb-in]		8 [710]	15 [1330]	20 [1770]	25 [2215]	32 [2835]	37 [3275]	45 [3983]	45 [3983]	49 [4335]
Min. Speed***, [RPM]		10	10	10	10	10	10	10	10	10
Weight, kg [lb]		7,7 [17]	7,8 [17.2]	8,1 [17.8]	8,2 [18]	8,4 [18.5]	8,9 [19.6]	9,3 [20.5]	10,0 [22]	10,7 [23.6]

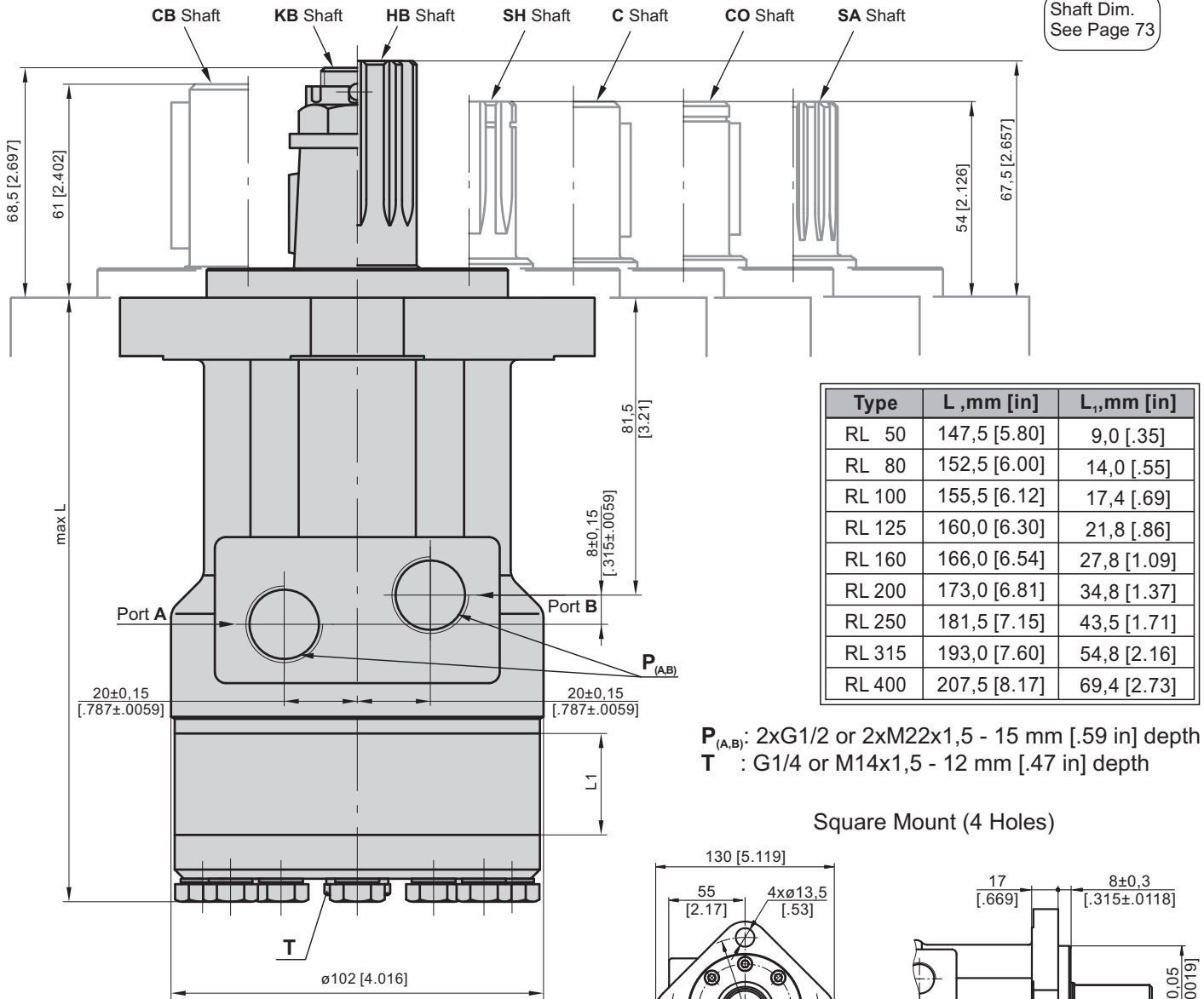
* Intermittent operation: the permissible values may occur for max. 10% of every minute.

** 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.

DIMENSIONS AND MOUNTING DATA

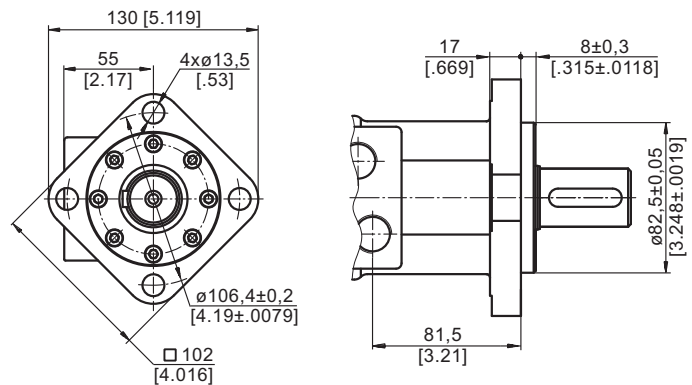


Standard Rotation
Viewed from Shaft End
Port A Pressurized - CW
Port B Pressurized - CCW

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

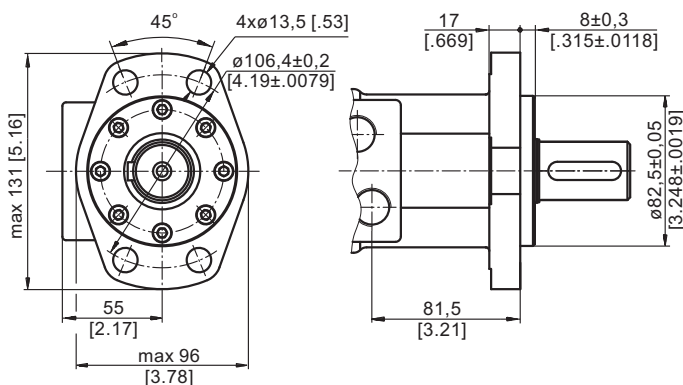


Square Mount (4 Holes)

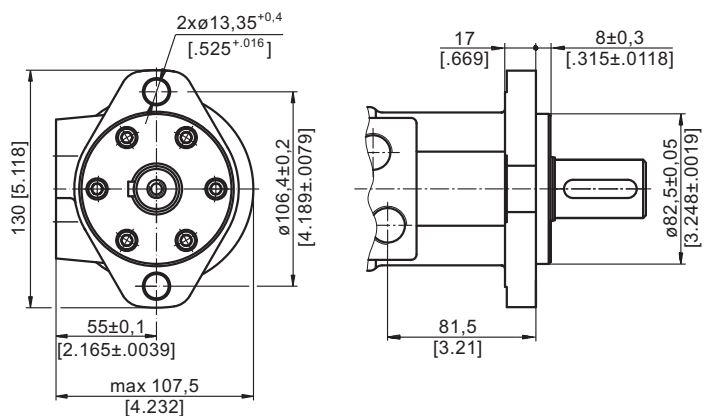


MOUNTING

F Oval Mount (4 Holes)

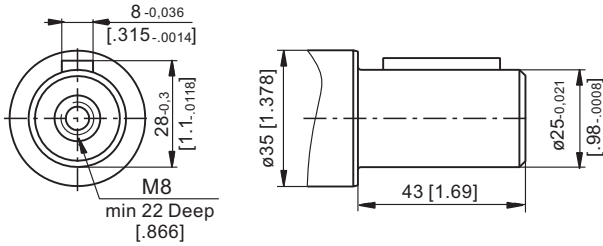


A Oval Mount (2 Holes)

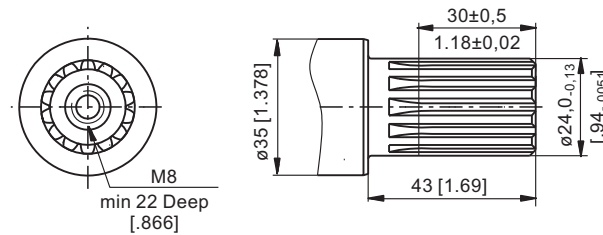


SHAFT EXTENSIONS

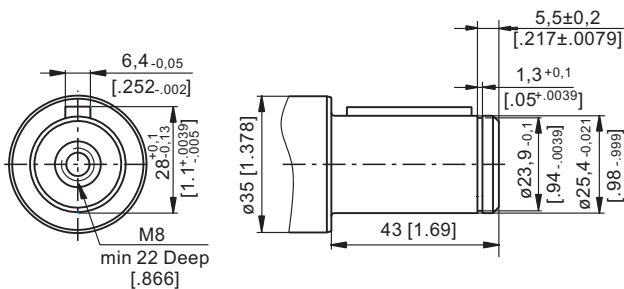
C - $\varnothing 25$ straight, Parallel key A8x7x30 DIN 6885
Max. Torque 34 daNm [3010 lb-in]



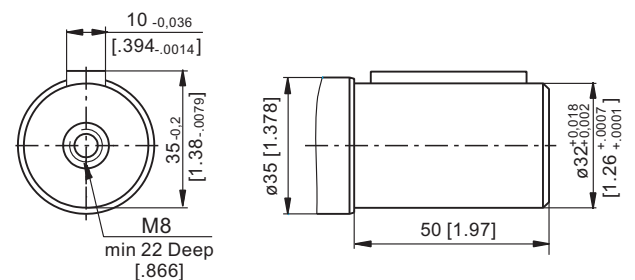
SA - splined B25x22 DIN 5482
Max. Torque 40 daNm [3540 lb-in]



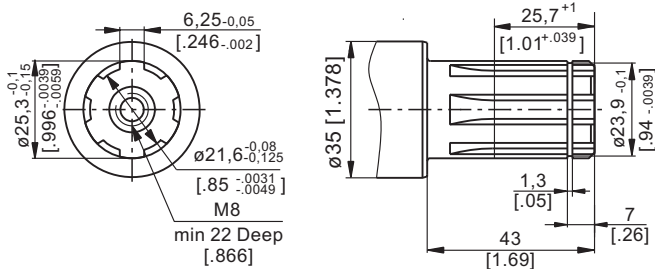
CO - $\varnothing 1$ " straight, Parallel key $\frac{1}{4}$ "x $\frac{1}{4}$ "x $\frac{1}{4}$ " BS46
Max. Torque 34 daNm [3010 lb-in]



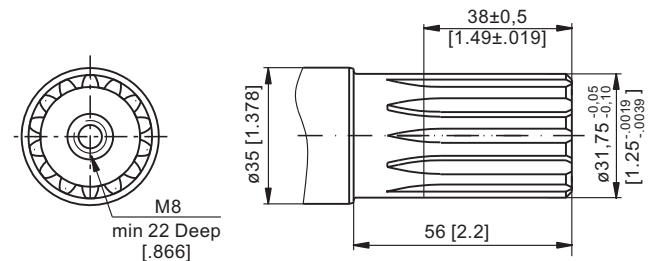
CB - $\varnothing 32$ straight, Parallel key A10x8x40 DIN 6885
Max. Torque 77 daNm [6815 lb-in]



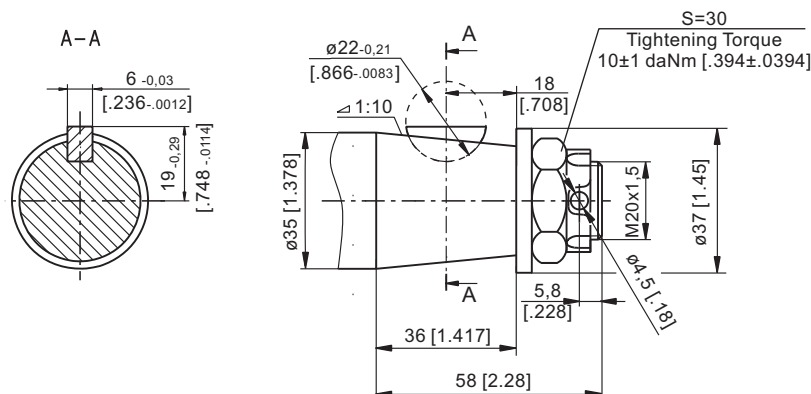
SH - splined, BS 2059 (SAE 6B)
Max. Torque 40 daNm [3540 lb-in]



HB - $\varnothing 1\frac{1}{4}$ " splined 14T, DP12/24 ANSI B92.1-1976
Max. Torque 95 daNm [8410 lb-in]

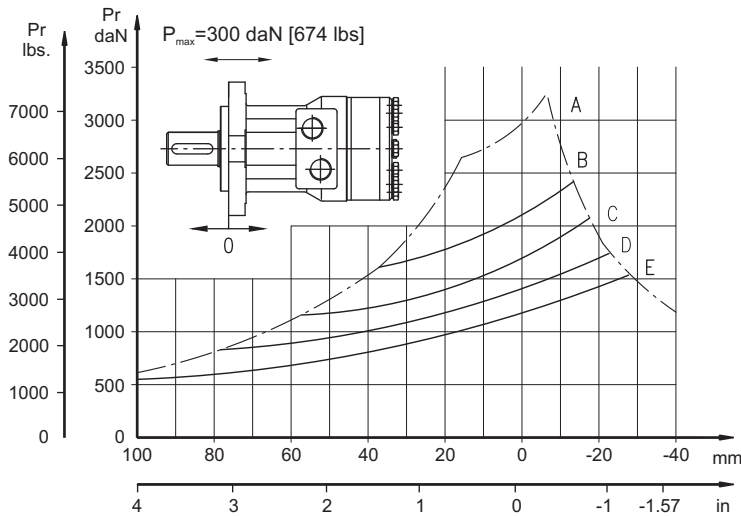


KB - tapered 1:10, Woodruff key 6x9 DIN6888
Max. Torque 95 daNm [8410 lb-in]



Permissible Shaft Loads PL and RL

The curves apply to a B10 bearings life of 2000 hrs



A - Max. radial shaft load.

B - $n=50 \text{ min}^{-1}$

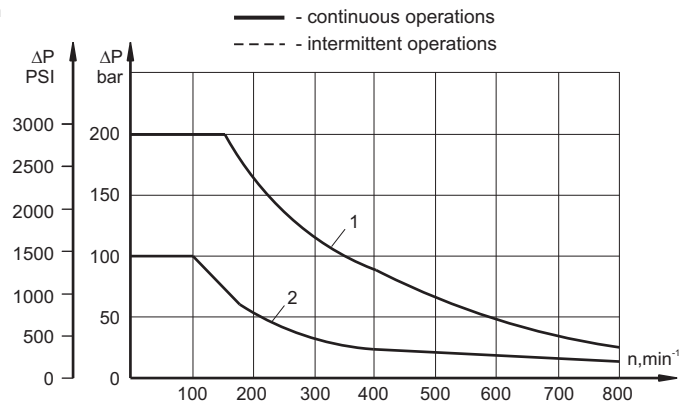
C - $n=100 \text{ min}^{-1}$

D - $n=200 \text{ min}^{-1}$

E - $n=400 \text{ min}^{-1}$

MAX. PERMISSIBLE SHAFT SEAL PRESSURE

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



ORDER CODE

1	2	3	4	5	6
RL					

Pos.1 - Mounting Flange

- omit - Square mount, four holes
- F** - Oval mount, four holes
- A** - Oval mount, two holes

Pos.2 - 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.3 - Shaft Extensions**

- C** - ø25 straight, Parallel key A8x7x35 DIN6885
- CO** - ø1" straight, Parallel key 1/4"x1/4"x1 1/4" BS46
- SH** - ø25,3 splined, BS 2059 (SAE 6B)
- SA** - ø24 splined, B 25x22 DIN 5482
- CB** - ø32 straight, Parallel key A10x8x40 DIN6885
- HB** - ø1 1/4" splined 14T ANSI B92.1-1976
- KB** - ø35 tapered 1:10, Woodruff key 6x9 DIN6888

Pos.4 - Shaft Seal Version

- omit - Standard shaft seal
- U** - High pressure shaft seal

Pos.4 - Ports

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

Pos.5 - Special Features (see page 120)

Pos.6 - Design Series

- omit - Factory specified

NOTES:

* For the Function Diagrams data please look at "M+S Hydraulic" Catalogue for MR motors, pages 35+39.

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

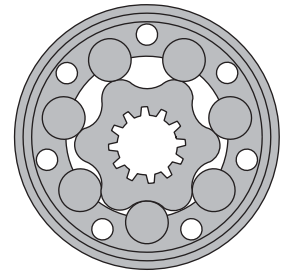
The hydraulic motors are manganophosphatized as standard.

HYDRAULIC MOTORS RW



APPLICATION

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



CONTENTS

Specification data	84
Function diagrams	85÷89
Dimensions and mounting	90
Permissible shaft Seal Pressure ...	91
Permissible shaft loads	91
Shaft extensions	92
Order code	92

OPTIONS

- » Model - Spool valve, roll-gerotor
- » Wheel mount
- » Shafts - straight and tapered
- » Shaft seal for high and low pressure
- » Metric and BSPP ports
- » Other special features

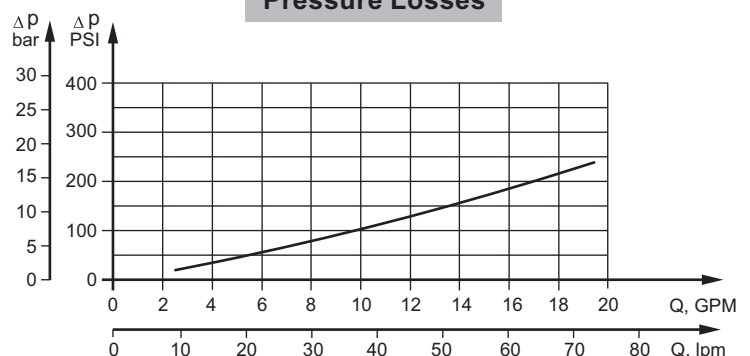
GENERAL

Max. Displacement, cm ³ /rev [in ³ /rev]	397 [24.4]
Max. Speed, [RPM]	1029
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]	90 [23.8]
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

Type		RW 50	RW 80	RW 100	RW 125	RW 160	RW 200	RW 250	RW 315	RW 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	300	240	190
	Int.*	1029	940	750	600	470	375	360	285	226
Max. Torque daNm [lb-in]	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 [6100]	69 [6100]
	Peak**	17 [1505]	27 [2390]	32 [2832]	37 [3275]	46 [4070]	56 [4960]	71 [6280]	84 [7430]	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 [10,6]	60 [15,9]	60 [15,9]	60 [15,9]	60 [15,9]	60 [15,9]	75 [19,8]	75 [19,8]	75 [19,8]
	Int.*	50 [13,2]	75 [19,8]	75 [19,8]	75 [19,8]	75 [19,8]	75 [19,8]	90 [23,8]	90 [23,8]	90 [23,8]
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]	5 [73]	5 [73]	5 [73]
Min. Starting Torque daNm [lb-in]	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]		9,6 [21.2]	9,7 [21.4]	9,8 [21.7]	10,0 [22.1]	10,3 [22.7]	10,8 [23.8]	11,3 [24.9]	11,8 [26]	12,5 [27.63]

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

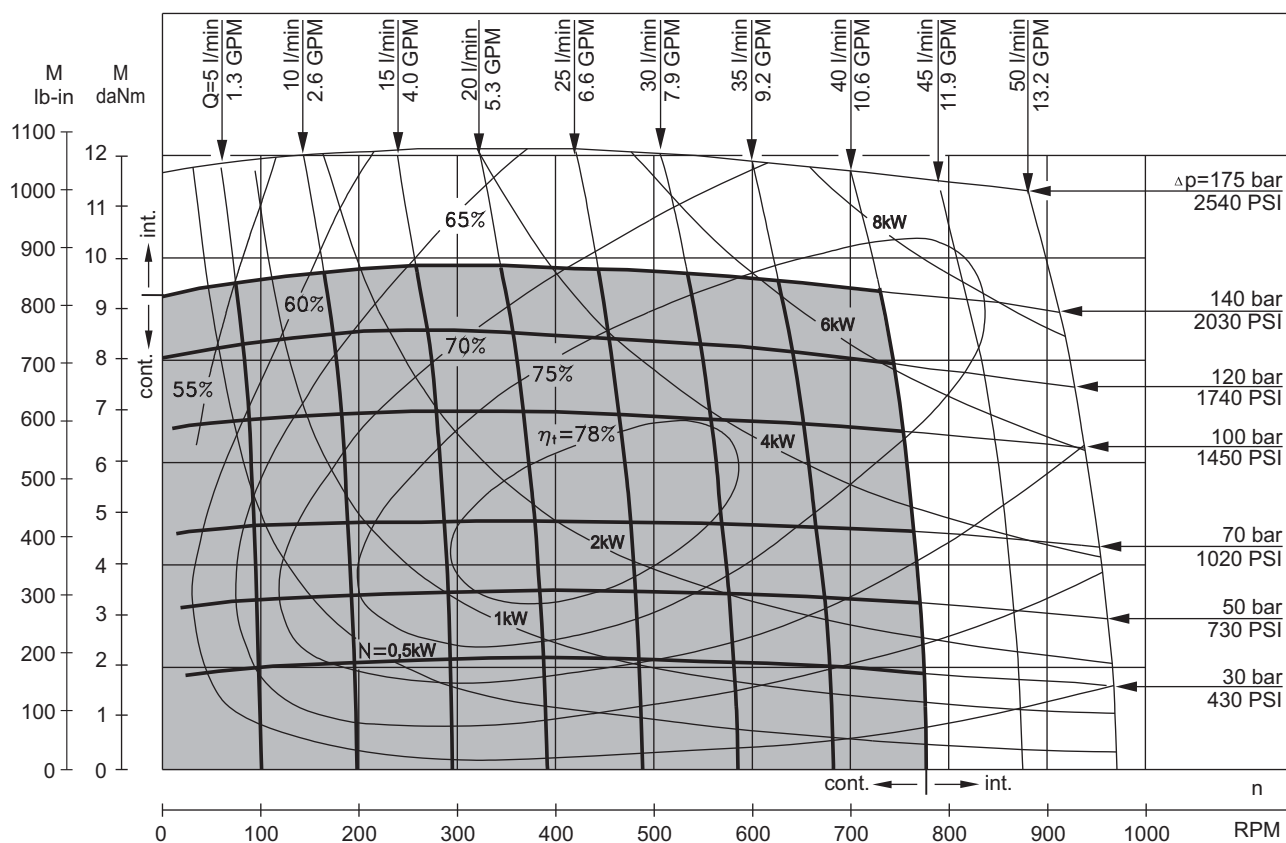
** Peak load: the permissible values may occur for max. 1% of every minute.

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

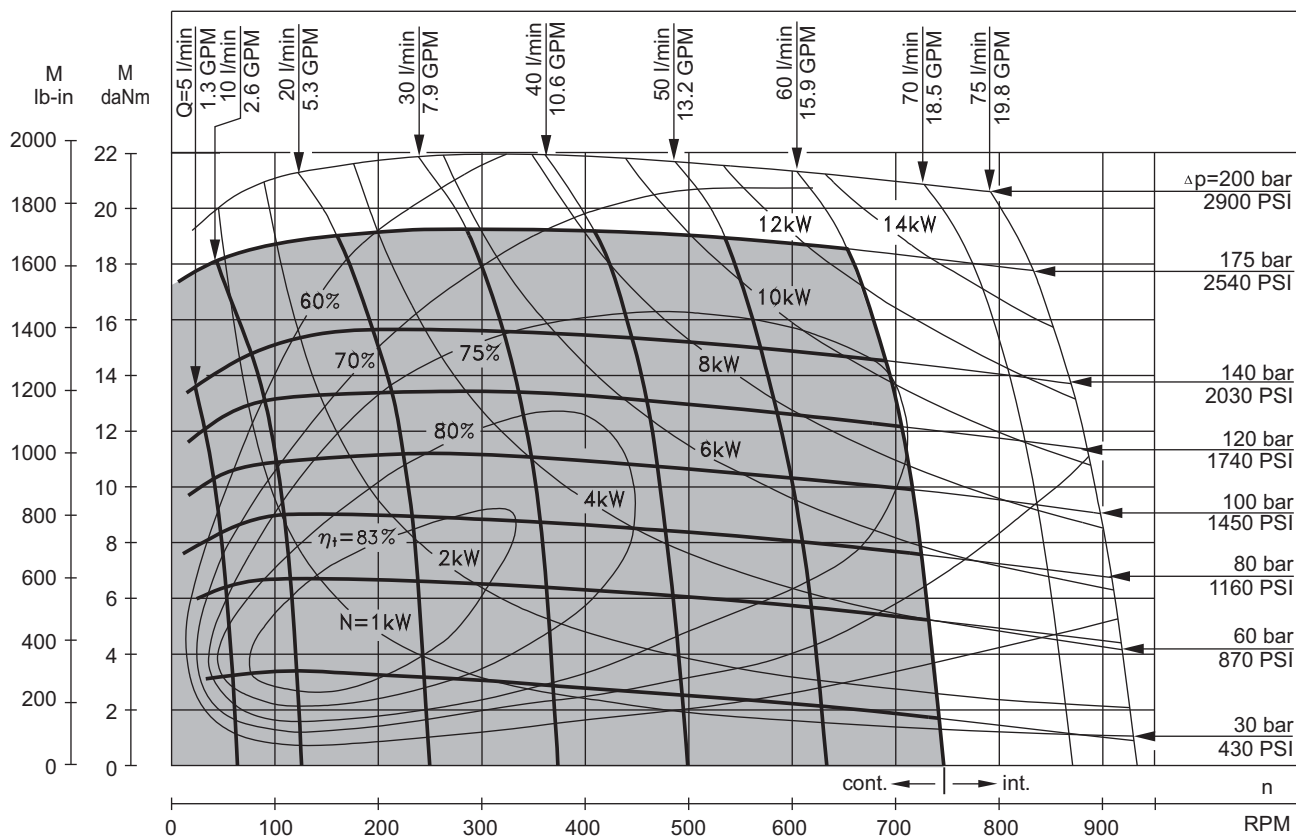
- Intermittent speed and intermittent pressure must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).
If using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

RW 50



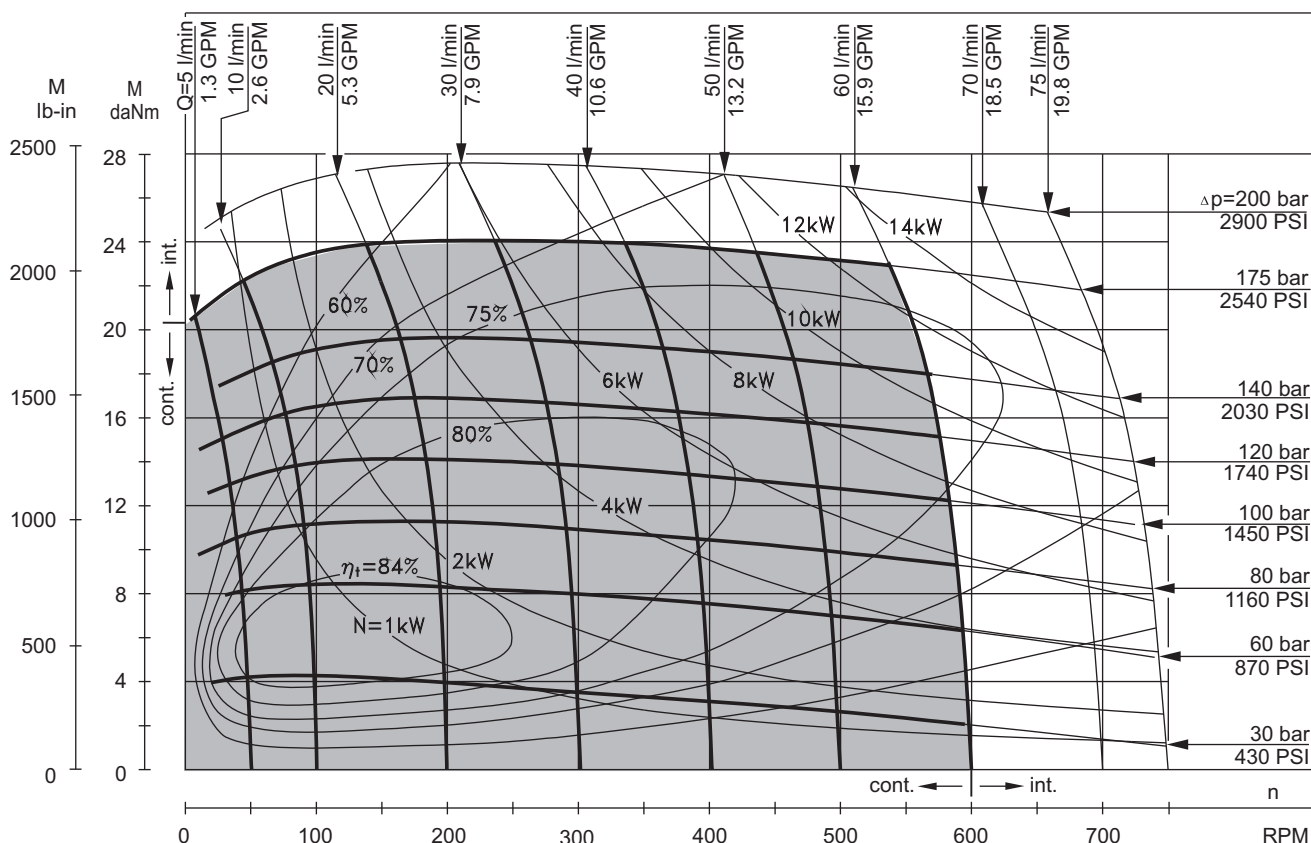
RW 80



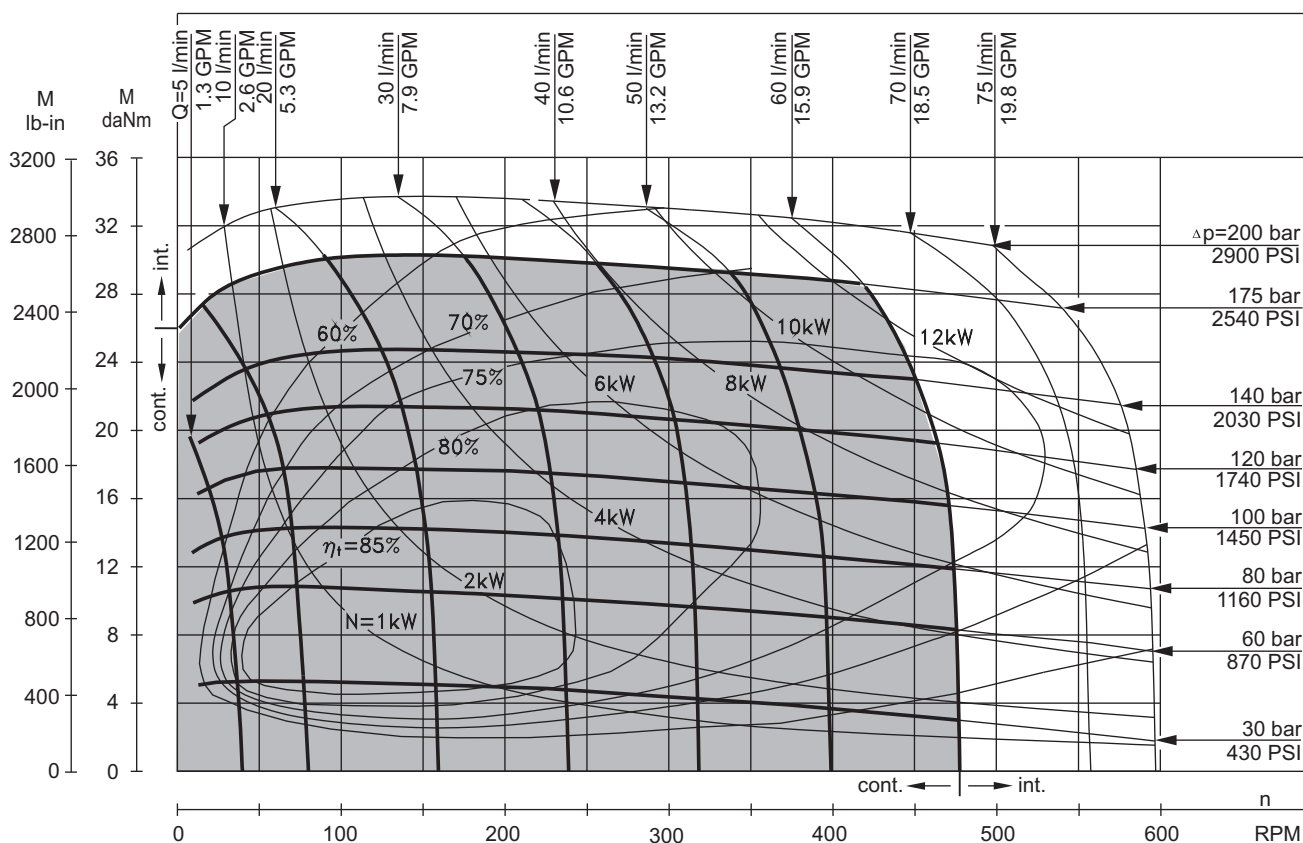
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

RW 100



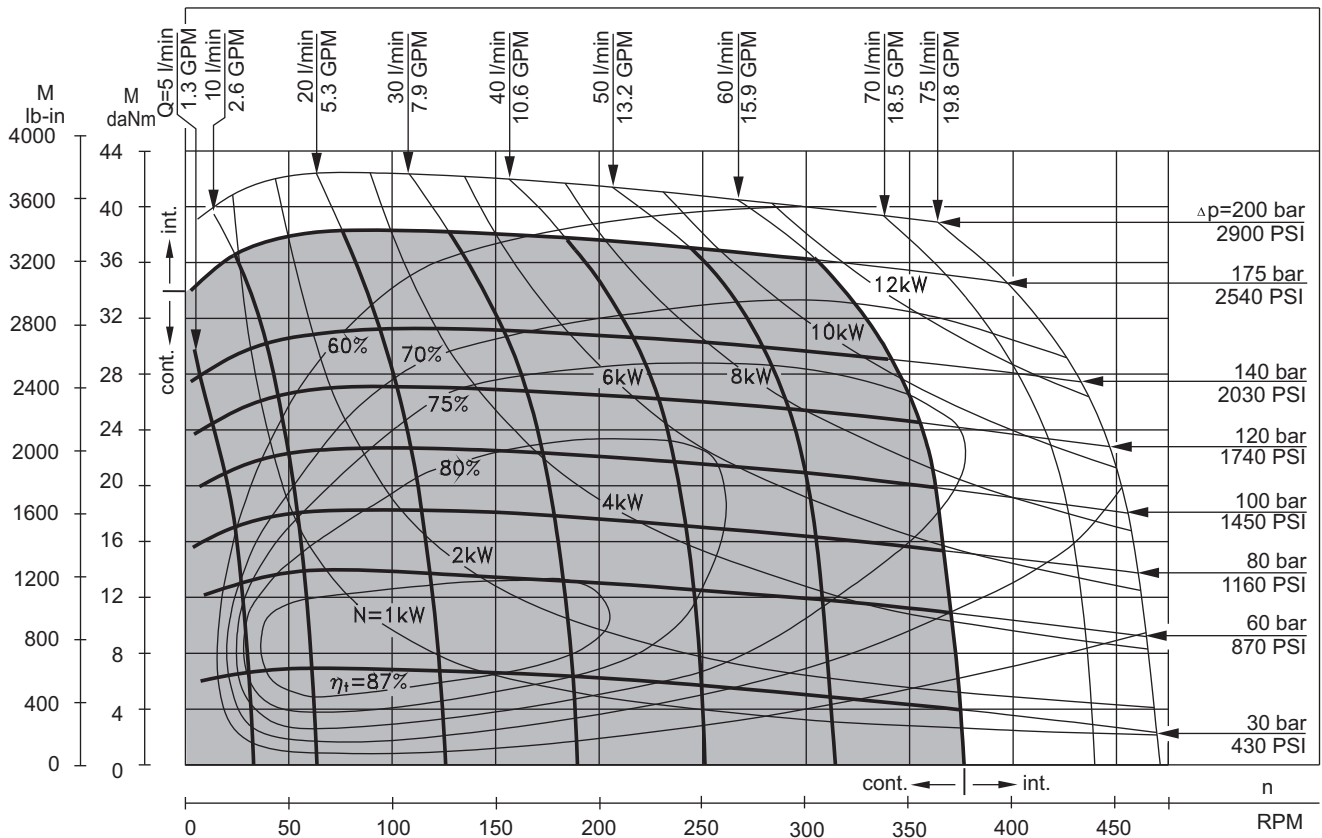
RW 125



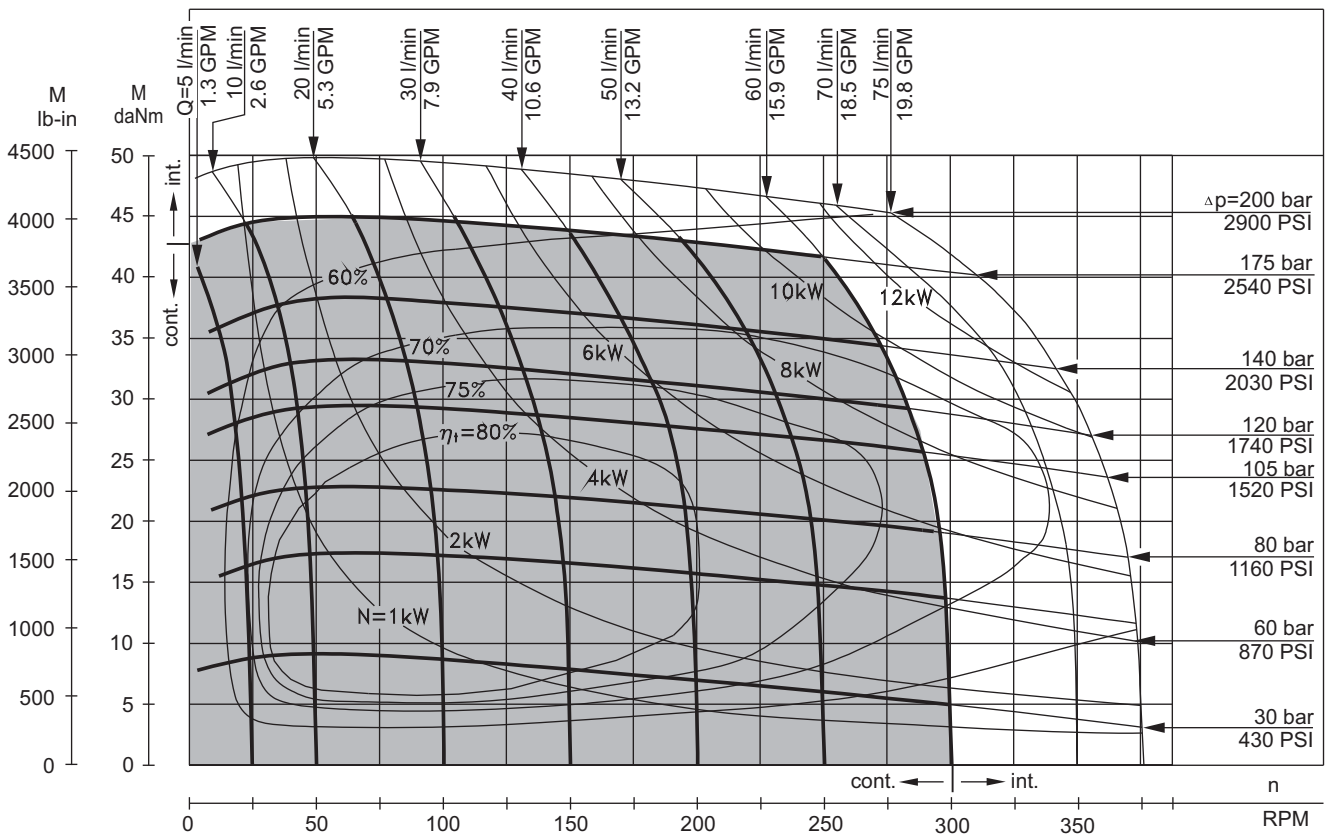
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

RW 160



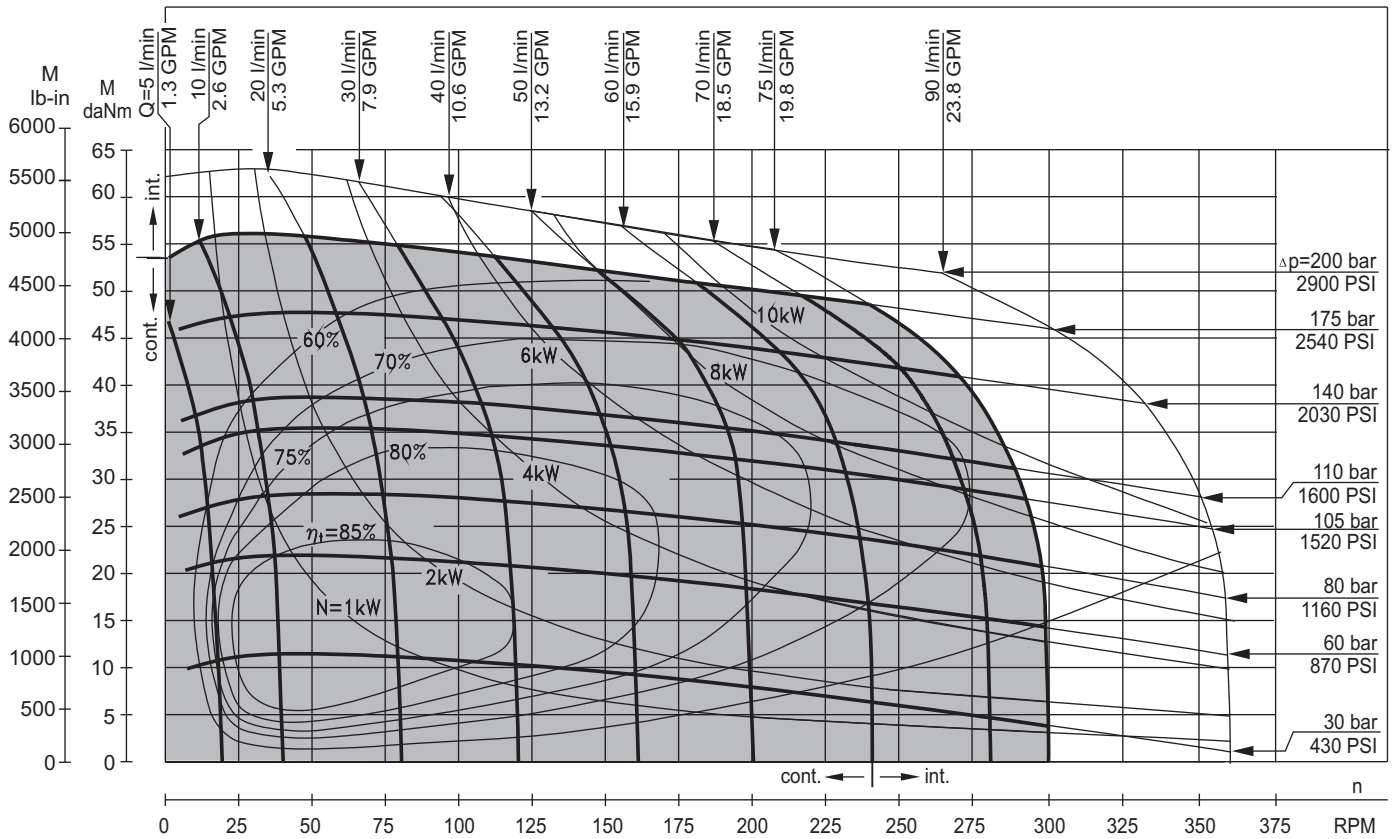
RW 200



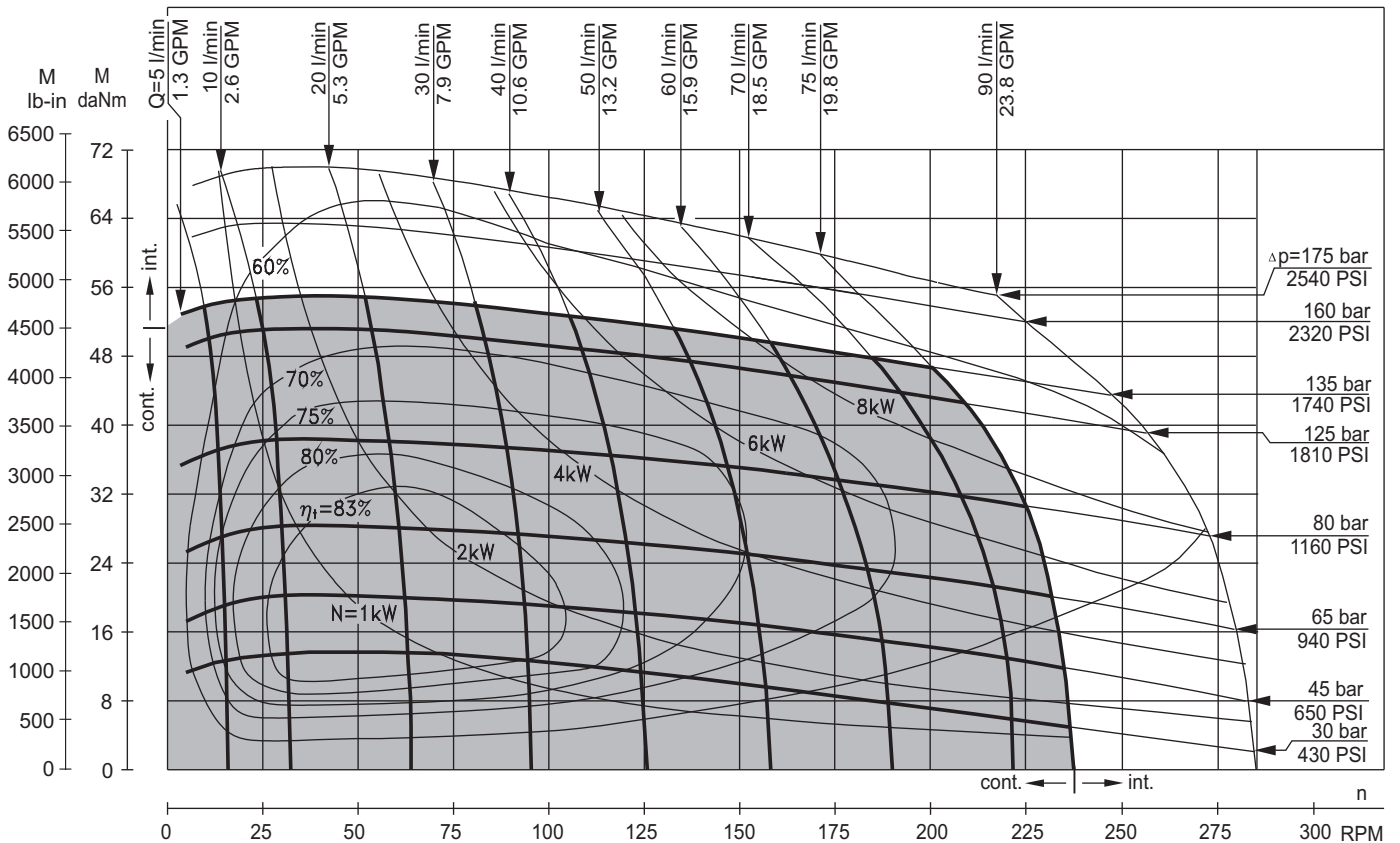
The function diagrams data is for average performance of randomly selected motors at back pressure 5 ± 10 bar [72.5±145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

RW 250



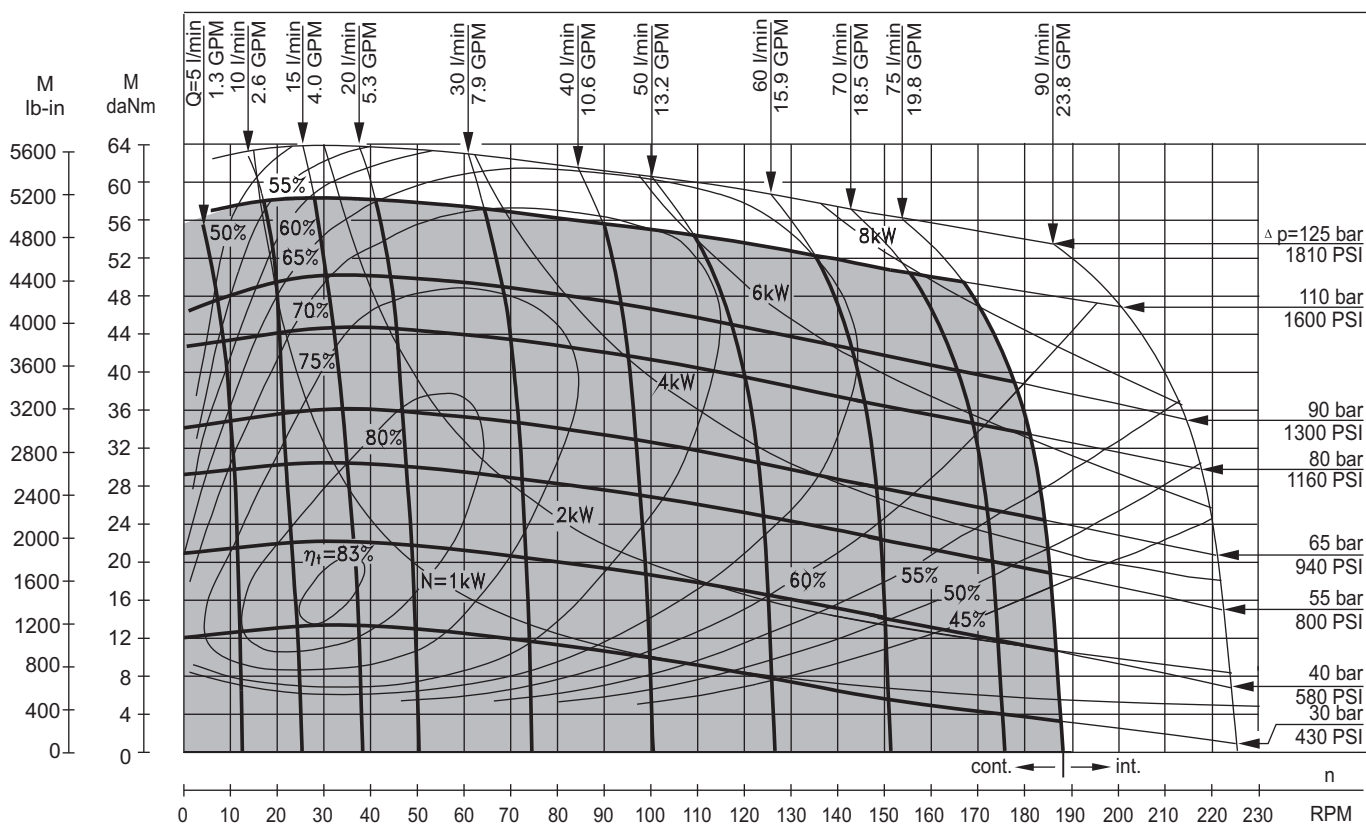
RW 315



The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [7.25÷14.5 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

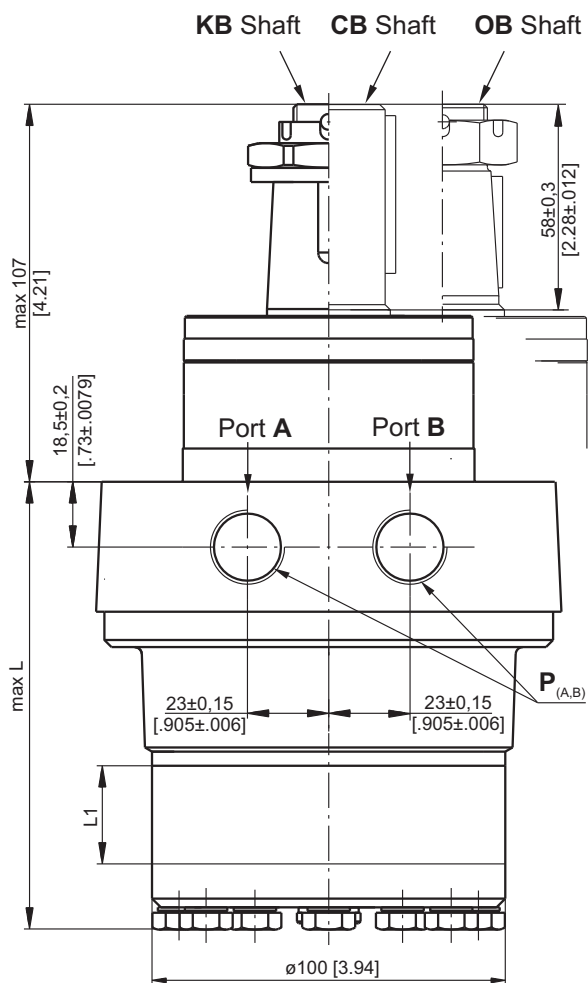
FUNCTION DIAGRAMS

RW 400

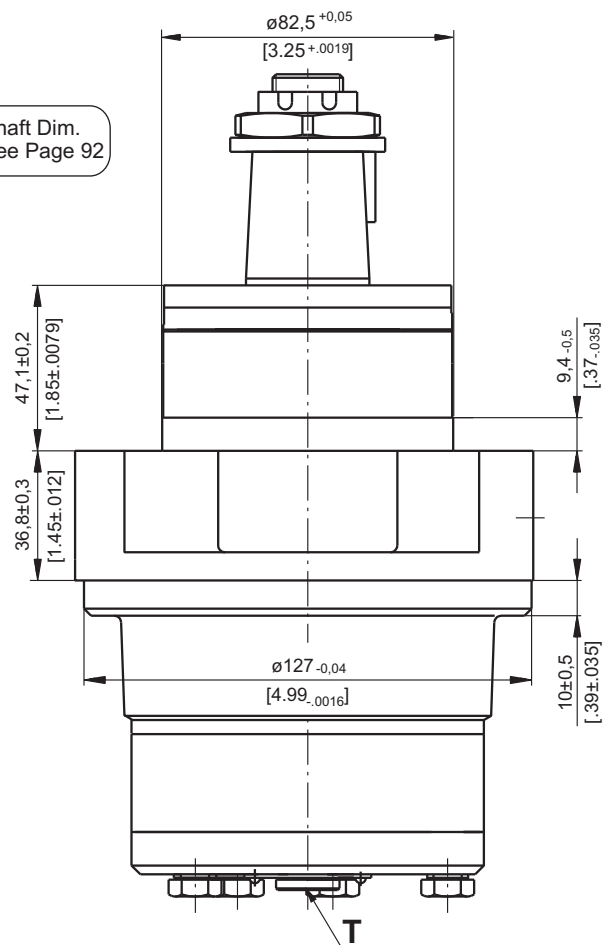


The function diagrams data is for average performance of randomly selected motors at back pressure 5 ± 10 bar [72.5 $\pm$ 145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

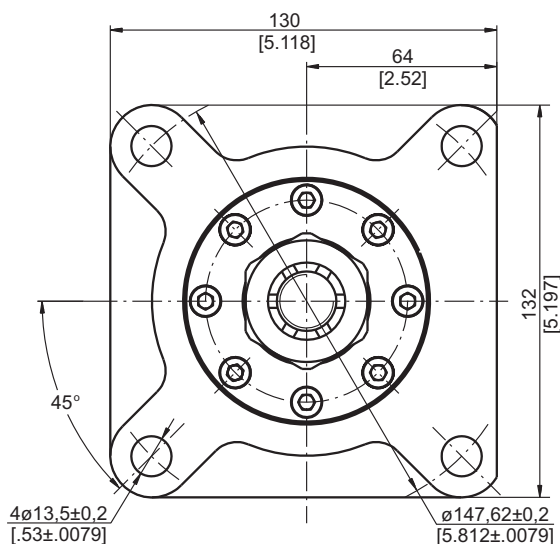
DIMENSIONS AND MOUNTING DATA



Shaft Dim.
See Page 92



Type	L, mm [in]	L1, mm [in]
RW 50	108,0 [4.25]	9,0 [.35]
RW 80	113,0 [4.45]	14,0 [.55]
RW 100	116,5 [4.59]	17,4 [.69]
RW 125	120,5 [4.74]	21,8 [.86]
RW 160	126,5 [4.98]	27,8 [1.09]
RW 200	133,5 [5.26]	34,8 [1.37]
RW 250	142,5 [5.61]	43,5 [1.71]
RW 315	153,5 [6.04]	54,8 [2.16]
RW 400	168,5 [6.63]	69,4 [2.73]



P_(A,B): 2xG1/2 or 2xM22x1,5 - 17 mm [.67 in.] depth

T : G1/4 or M14x1,5 - 12 mm [.47 in.] depth (plugged)

Standard Rotation

Viewed from Shaft End

Port A Pressurized - **CW**

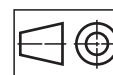
Port B Pressurized - **CCW**

Reverse Rotation

Viewed from Shaft End

Port A Pressurized - **CCW**

Port B Pressurized - **CW**

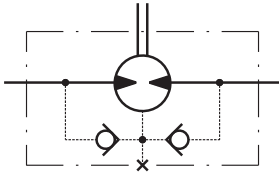


mm [in]

MAX. PERMISSIBLE SHAFT SEAL PRESSURE

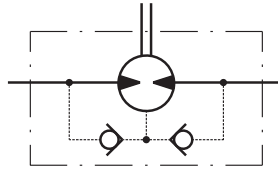
RW...; RW...UK motors with drain connection:

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



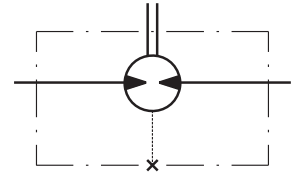
RW...1 motors without drain connection:

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

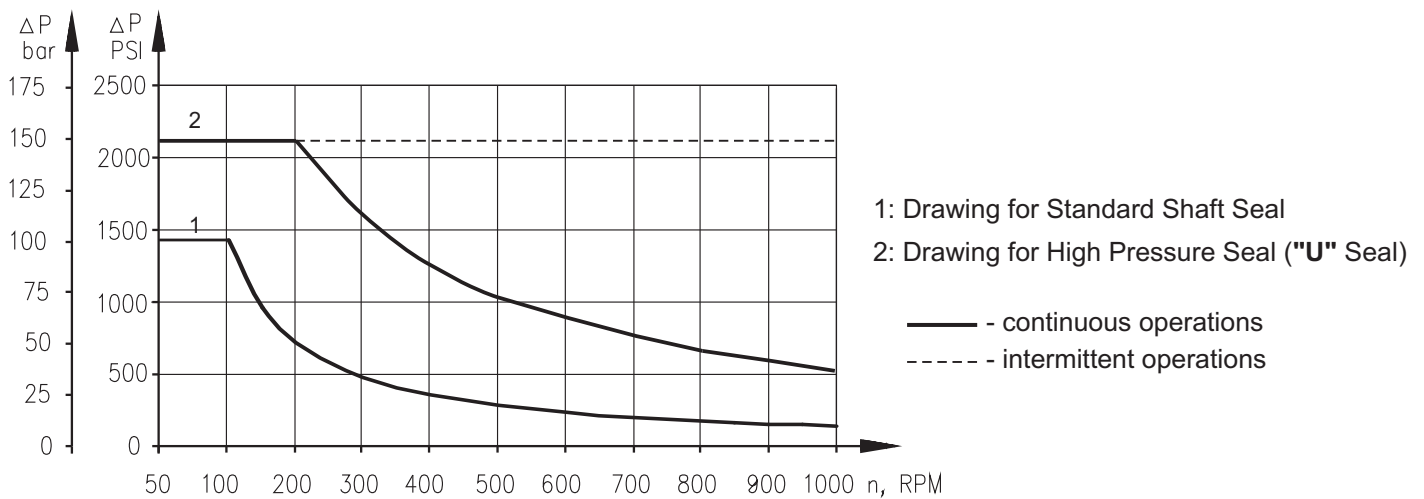


RW...U motors with high pressure seal and drain connection:

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

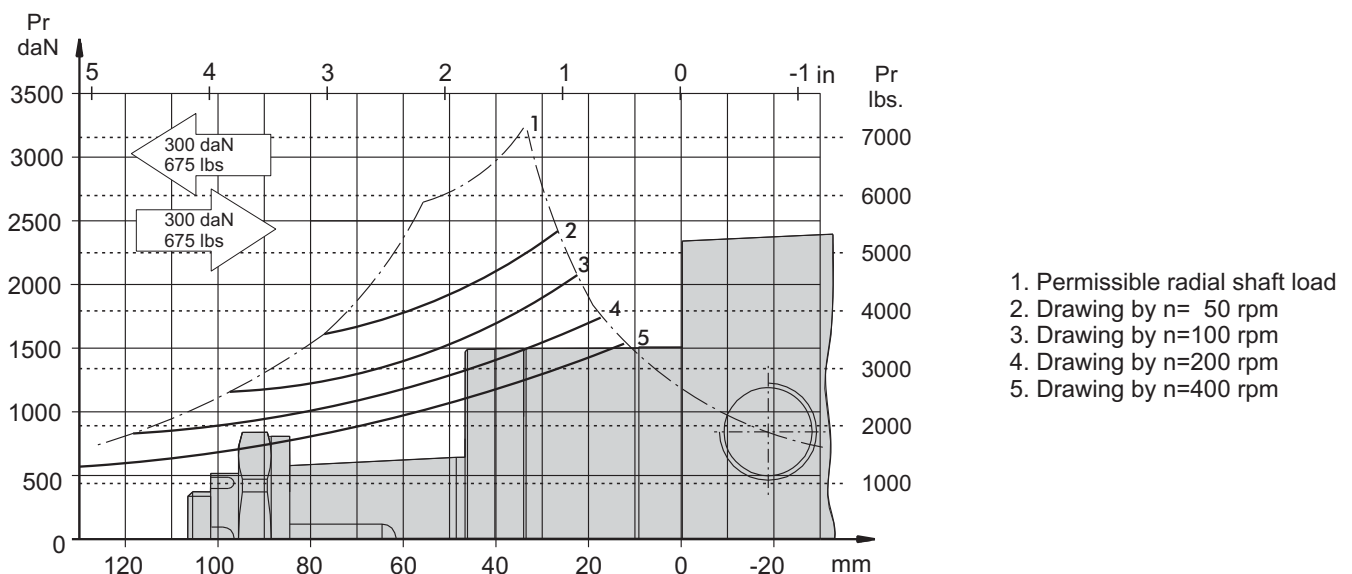


Max. return pressure without drain line or max. pressure in the drain line



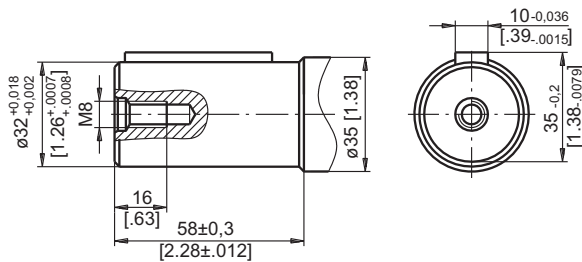
PERMISSIBLE SHAFT LOADS

The curve applies to a B10 bearing life of 2000 hours.

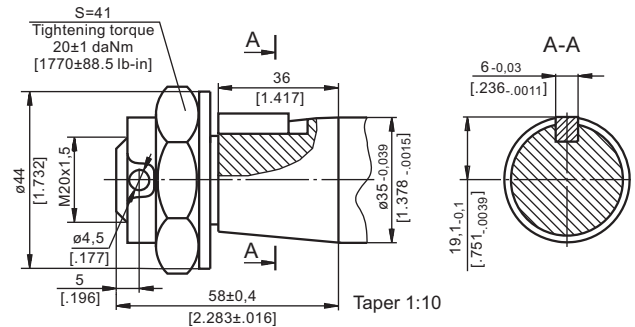


SHAFT EXTENSIONS

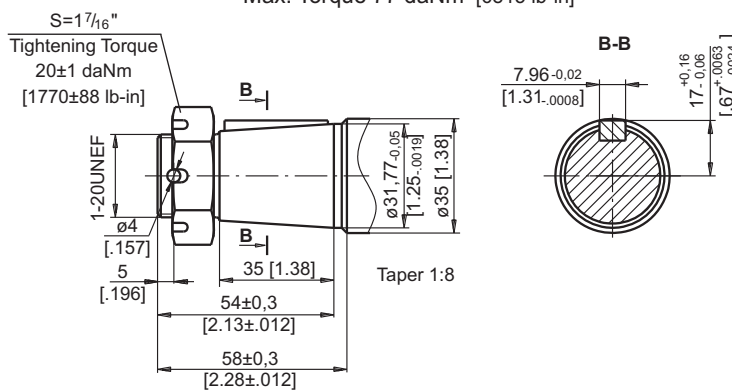
CB - $\varnothing 32$ straight, Parallel key A10x8x45 DIN 6885
Max. Torque 77 daNm [6815 lb-in]



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



ORDER CODE

	1	2	3	4	5	6	7
RW							

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 - Shaft Extensions*

CB	- $\varnothing 32$ straight, Parallel key A10x8x45 DIN6885
KB	- $\varnothing 35$ tapered 1:10, Parallel key B6x6x20 DIN6888
OB	- $\varnothing 1\frac{1}{4}$ tapered 1:8, Parallel key $\frac{5}{16} \times \frac{5}{16} \times 1\frac{1}{4}$ BS46

Pos.3 - Shaft Seal Pressure

omit	- Standard shaft seal
U	- High pressure shaft seal without check valves
UK	- High pressure shaft seal with check valve

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 120)

Pos.7 - Design Series

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

NOTE:

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

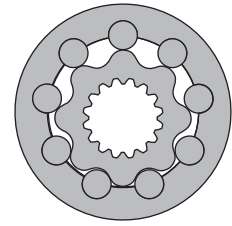
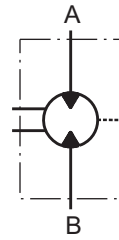
The hydraulic motors are mangano-phosphatized as standard.

HYDRAULIC MOTORS VMF



APPLICATION

- » Marine equipment
- » Forestry equipment
- » Metal working machines
- » Agricultural machines
- » Road building machines
- » Mining machinery
- » Special vehicles etc.



CONTENTS

Specification data	53
Function diagrams	54-56
Permissible shaft loads	56
Dimensions and mounting	57
Permissible shaft seal pressure	57
Order code	57

OPTIONS

- » Model - Disc valve, roll-gerotor
- » Wheel mounting flange
- » Side ports
- » Shaft - thread hole flange
- » SAE and BSPP ports
- » Other special features

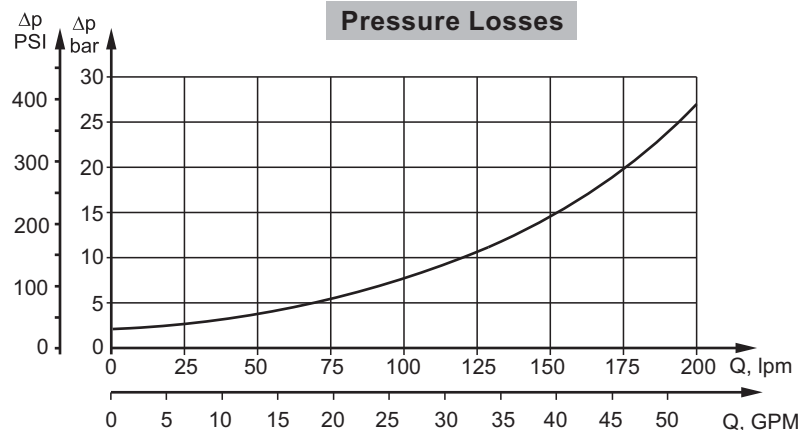
GENERAL

Max. Displacement,	cm ³ /rev [in ³ /rev]	801,8 [48.91]
Max. Speed,	[RPM]	736
Max. Torque,	daNm [lb-in]	cont.: 259 [22920] int.: 340 [30090]
Max. Output,	kW [HP]	112 [150]
Max. Pressure Drop,	bar [PSI]	cont.: 250 [3630] int.: 350 [5080]
Max. Oil Flow,	lpm [GPM]	240 [63.4]
Min. Speed,	[RPM]	5
Permissible Shaft Loads,	daN [lbs]	Pa=1500 [3370]
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]
140 [2030]	20 [98]	3 [.793]
	35 [164]	2 [.528]
210 [3045]	20 [98]	6 [1.585]
	35 [164]	4 [1.057]

Pressure Losses



SPECIFICATION DATA

Type		VMF 315	VMF 400	VMF 500	VMF 630	VMF 800
Displacement, cm³/rev [in³/rev]		314,5 [19.18]	400,9 [24.5]	499,6 [30.5]	629,1 [38.38]	801,8 [48.91]
Max. Speed, [RPM]	cont.	636	500	400	315	250
	Int.*	736	600	480	380	300
Max. Torque daNm [lb-in]	cont.	115 [10180]	144 [12745]	180 [15930]	227 [20090]	259 [22920]
	Int.*	160 [14160]	200 [17700]	260 [23010]	310 [27440]	340 [30090]
	peak**	180 [15930]	230 [20355]	286 [25315]	360 [31860]	402 [35580]
Max. Output kW [HP]	cont.	67 [90]	67 [90]	67 [90]	67 [90]	67 [90]
	int.*	112 [150]	112 [150]	112 [150]	112 [150]	112 [150]
Max. Pressure Drop bar [PSI]	cont.	250 [3630]	250 [3630]	250 [3630]	250 [3630]	225 [3263]
	Int.*	350 [5080]	350 [5080]	350 [5080]	350 [5080]	300 [4350]
	peak**	400 [5800]	400 [5800]	400 [5800]	400 [5800]	350 [5080]
Max. Oil Flow lpm [GPM]	cont.	200 [52.8]	200 [52.8]	200 [52.8]	200 [52.8]	200 [52.8]
	Int.*	240 [63.4]	240 [63.4]	240 [63.4]	240 [63.4]	240 [63.4]
Max. Inlet Pressure bar [PSI]	cont.	270 [3915]	270 [3915]	270 [3915]	270 [3915]	270 [3915]
	Int.*	370 [5365]	370 [5365]	370 [5365]	370 [5365]	370 [5365]
	peak**	420 [6090]	420 [6090]	420 [6090]	420 [6090]	420 [6090]
Max. Return Pressure with Drain Line bar [PSI]	cont.	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]
	Int.*	175 [2540]	175 [2540]	175 [2540]	175 [2540]	175 [2540]
	peak**	210 [3045]	210 [3045]	210 [3045]	210 [3045]	210 [3045]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		5 [70]	5 [70]	5 [70]	5 [70]	5 [70]
Min. Starting Torque daNm [lb-in]		92 [8140]	115 [10180]	144 [12745]	180 [15930]	205 [18145]
Min. Speed***, [RPM]		10	6	8	6	5
Weight, kg [lb]		46 [101.4]	47,2 [104,1]	48,5 [106.9]	50 [110.2]	51,5 [113.5]

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

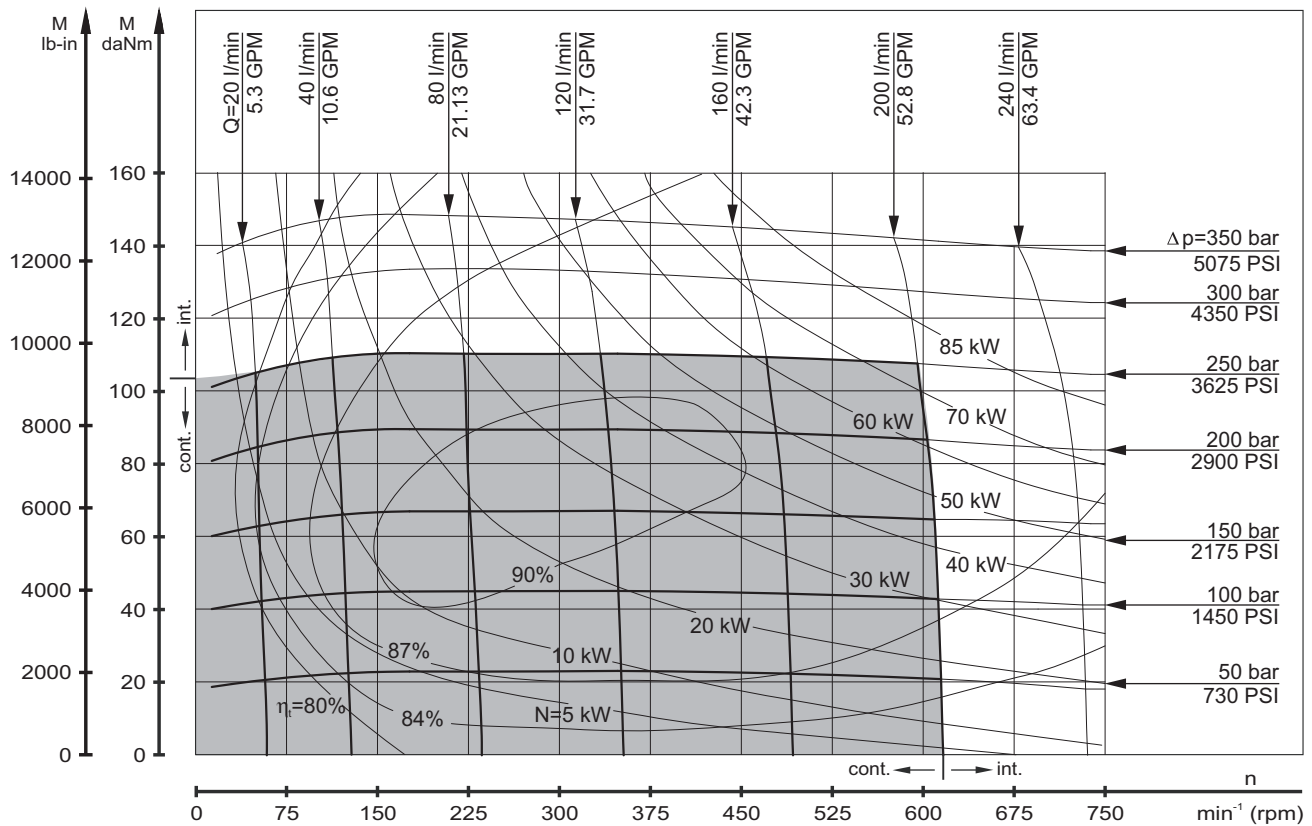
** Peak load: the permissible values may occur for max. 1% of every minute.

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

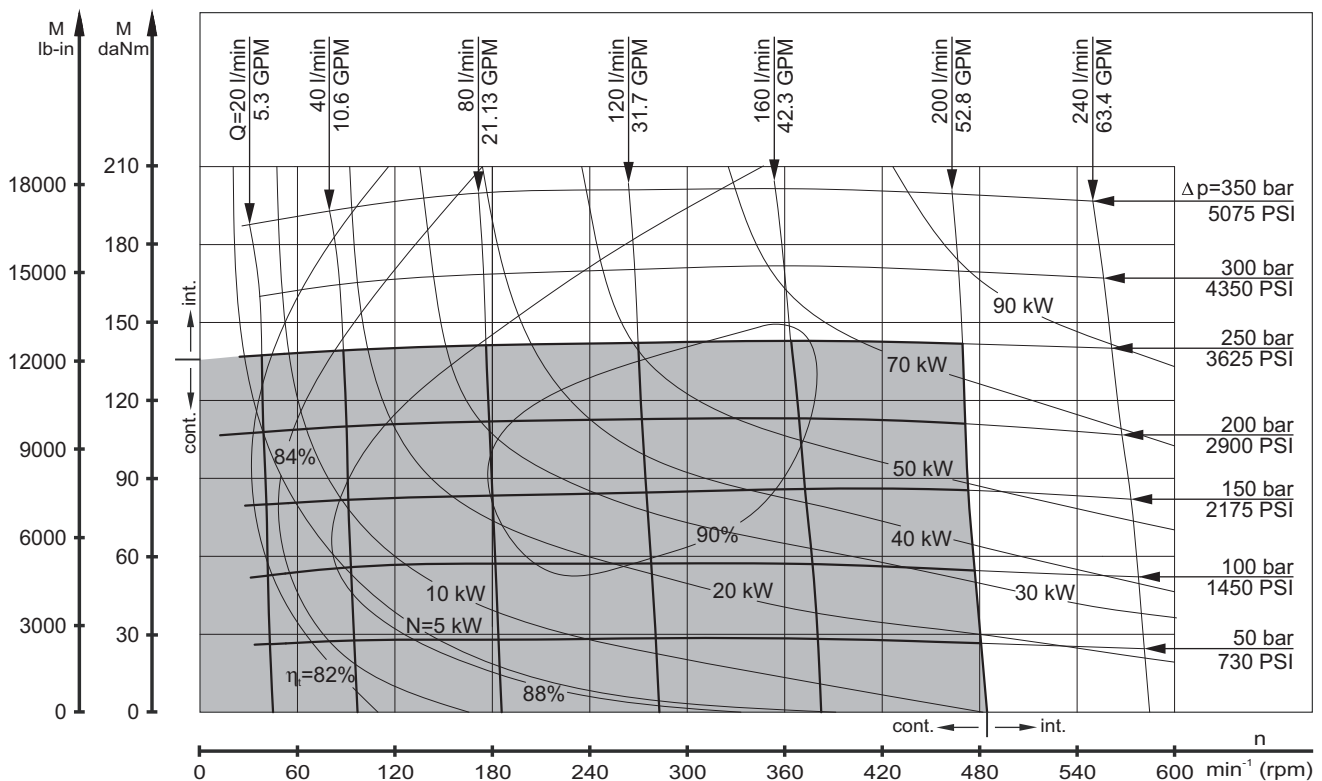
- Intermittent speed and intermittent pressure must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).
If using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

FUNCTION DIAGRAMS

VMF 315



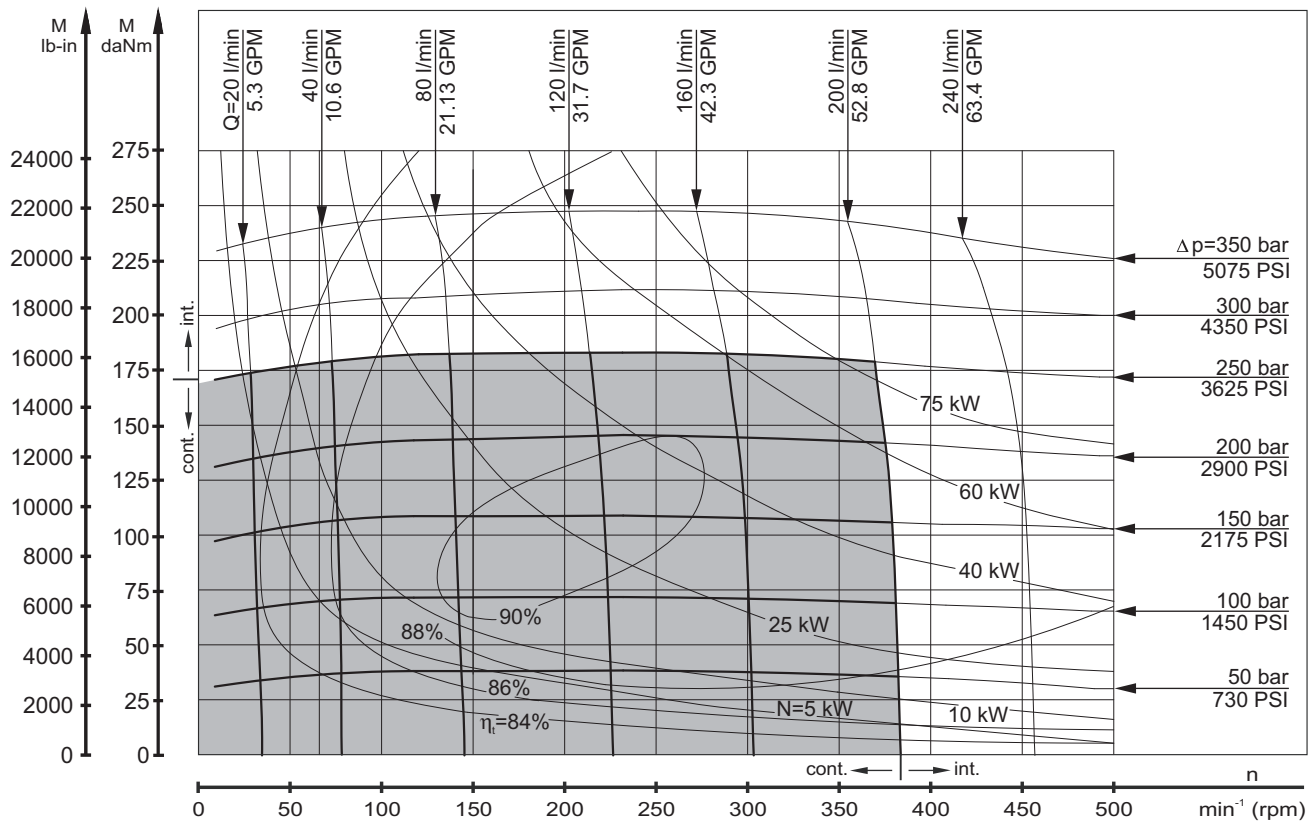
VMF 400



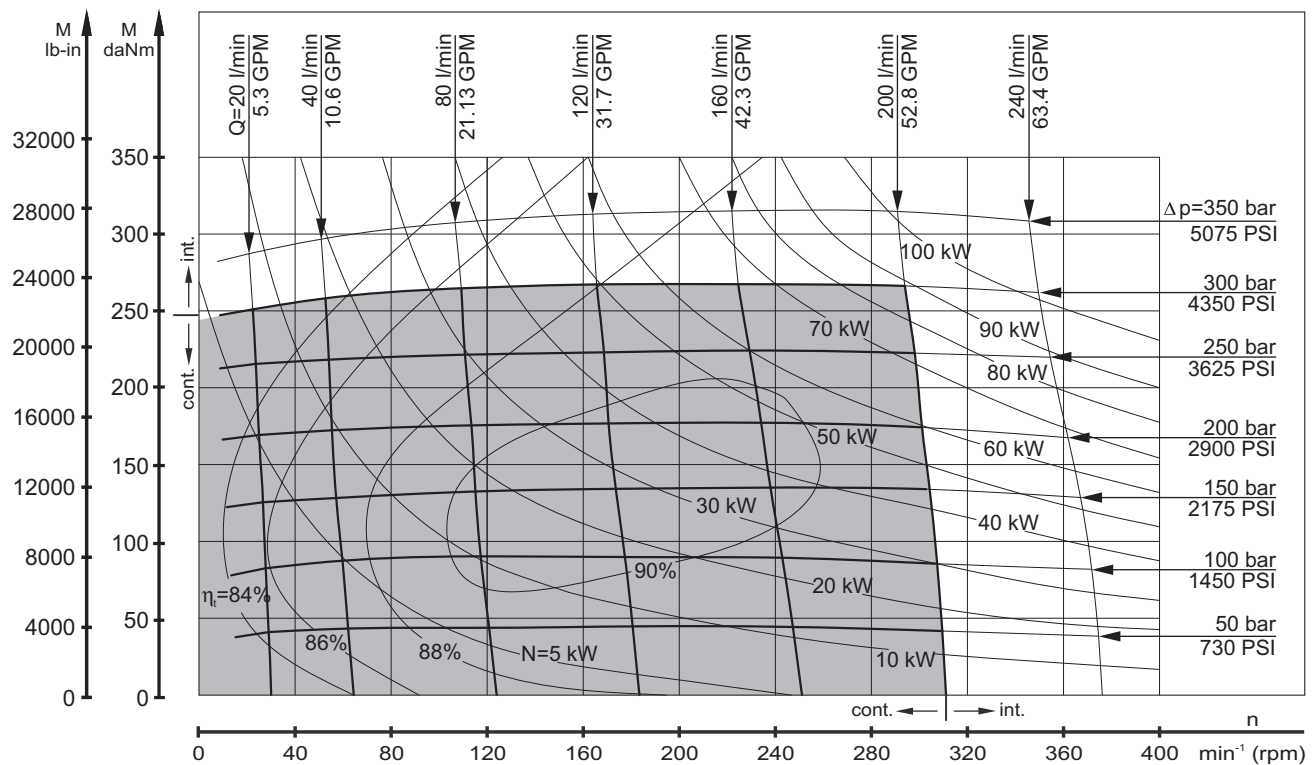
The function diagrams data was collected at back pressure 5÷10 bar (72.5PSI÷145PSI) and oil with viscosity of 32 mm²/s [150SUS] at 50° C [122°F].

FUNCTION DIAGRAMS

VMF 500



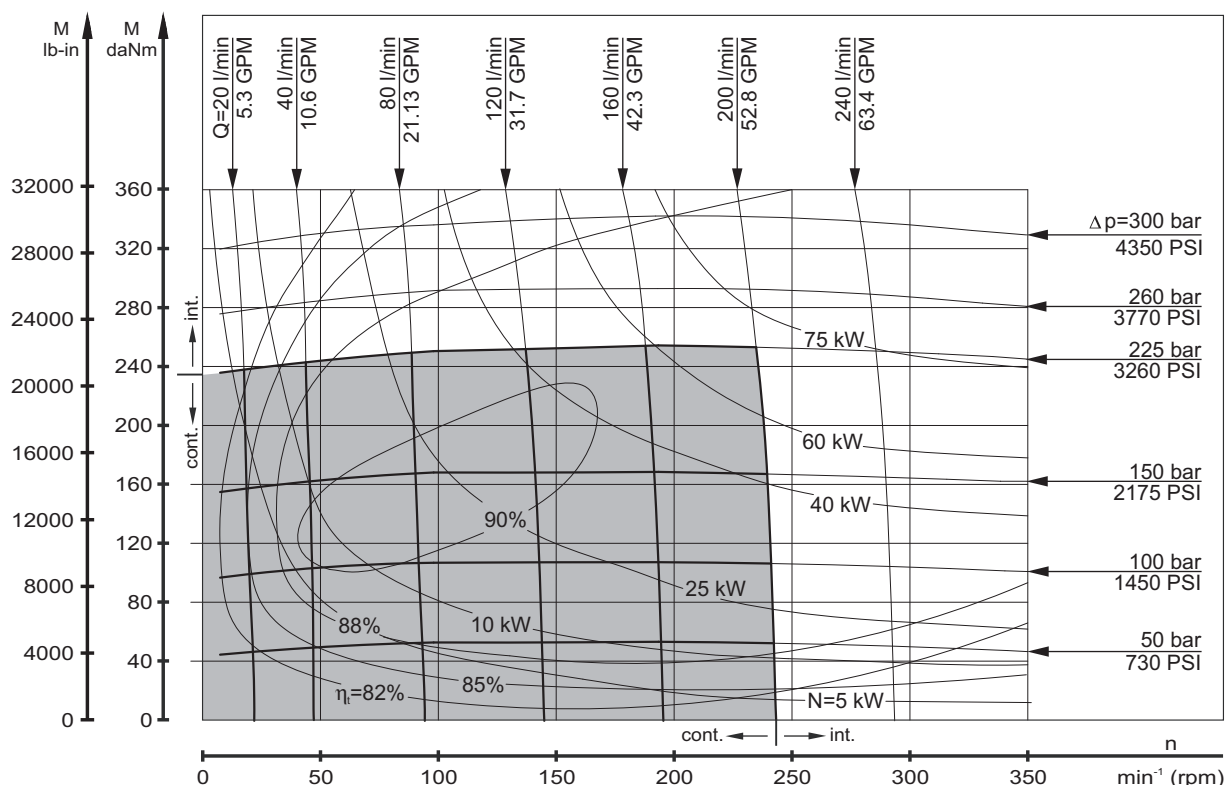
VMF 630



The function diagrams data was collected at back pressure 5÷10 bar (72.5PSI÷145PSI) and oil with viscosity of 32 mm²/s [150SUS] at 50° C [122°F].

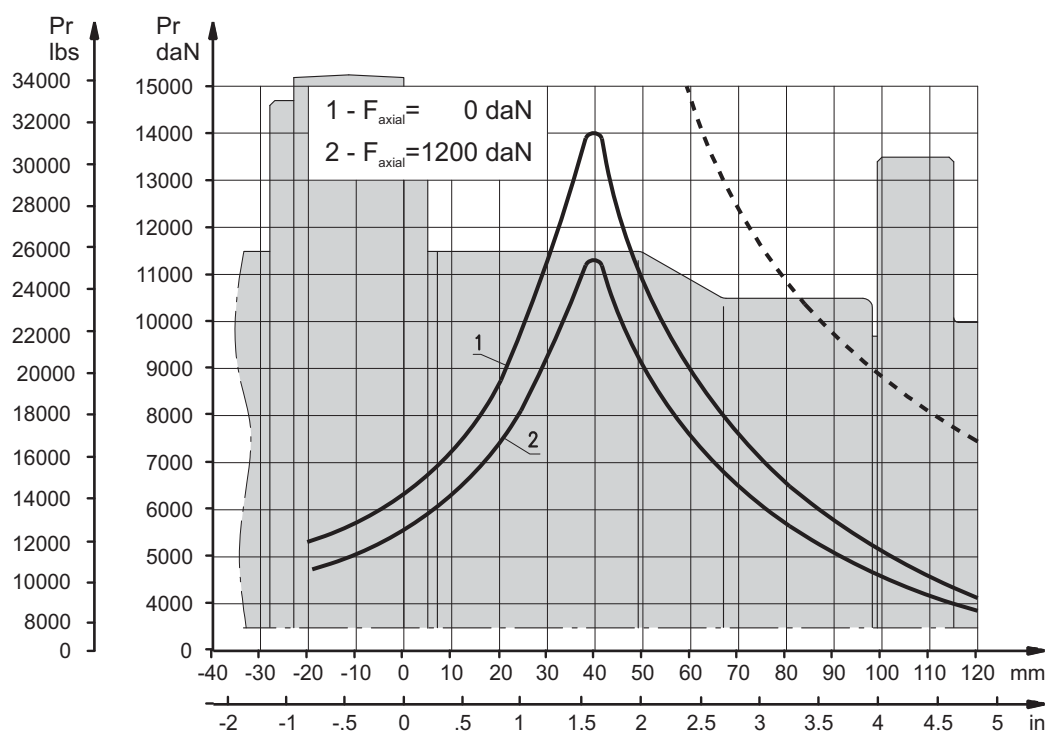
FUNCTION DIAGRAMS

VMF 800



The function diagrams data was collected at back pressure 5÷10 bar (72.5PSI÷145PSI) and oil with viscosity of 32 mm²/s [150SUS] at 50° C [122°F].

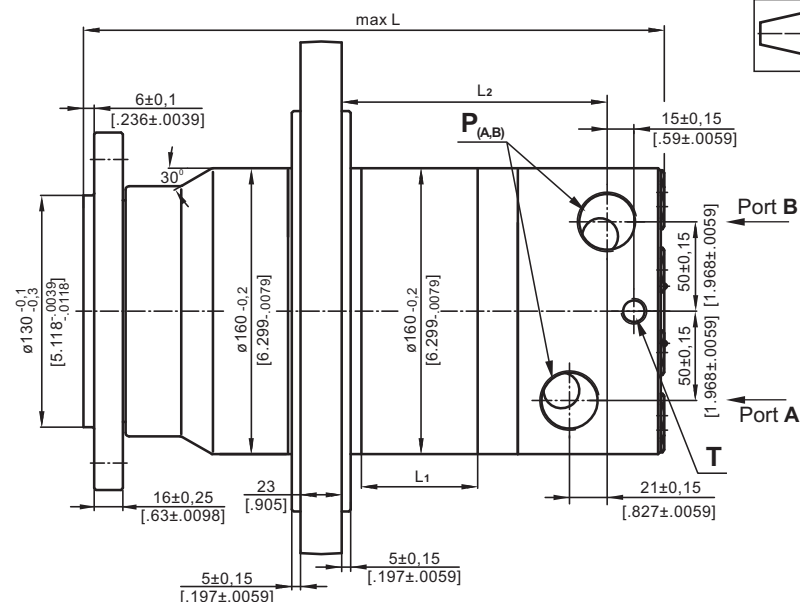
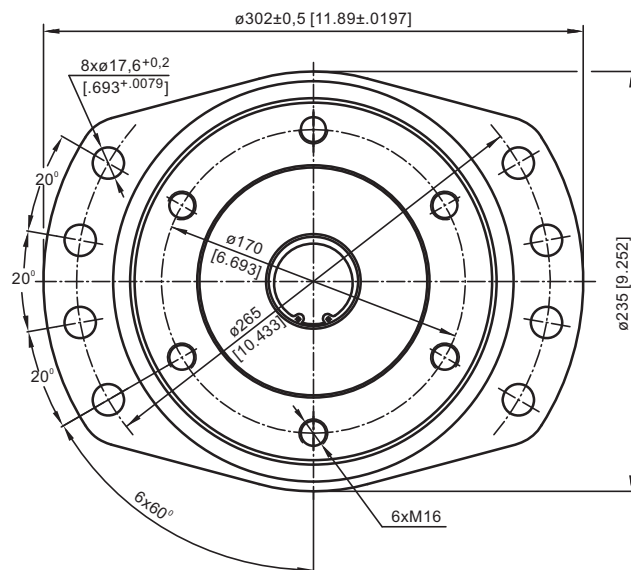
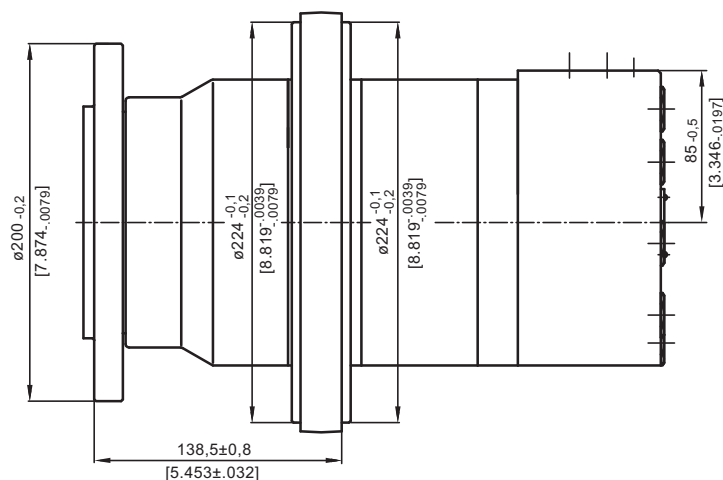
PERMISSIBLE SHAFT LOADS



1 - Bearing curve: The curve applies to a B10 bearing life of 2000 hours at 100 RPM.

2 - Shaft curve: The curve represents Max. permissible radial shaft load with safety factor 2:1.

DIMENSIONS AND MOUNTING DATA



	Versions	
	2	4
P_(A,B)	2xG1	2x1 ⁵ / ₁₆ -12UN
T	G1 ₄	⁹ / ₁₆ -18UNF

Type	L, mm [in]	L1, mm [in]	L2, mm [in]
VMF 315	286,5 [11.28]	25,5 [1.00]	109,5 [4.31]
VMF 400	293,5 [11.56]	32,5 [1.28]	116,5 [4.59]
VMF 500	301,5 [11.87]	40,5 [1.59]	124,5 [4.90]
VMF 630	312,0 [12.28]	51,0 [2.01]	135,0 [5.31]
VMF 800	326,0 [12.83]	65,0 [2.56]	149,0 [5.87]

ORDER CODE

	1	2	3	4
VMF			HD	

Pos.1 - Displacement code

315	- 314,5 cm³/rev [19.18 in³/rev]
400	- 400,9 cm³/rev [24.45 in³/rev]
500	- 499,6 cm³/rev [30.48 in³/rev]
630	- 629,1 cm³/rev [38.38 in³/rev]
800	- 801,8 cm³/rev [48.91 in³/rev]

Pos.2 - Ports

2	- side ports, 2xG1, G $\frac{1}{4}$, BSP thread, ISO 228
4	- side ports, 2x1 $\frac{5}{16}$ -12 UN, O-ring, $\frac{9}{16}$ -18 UNF

Pos.3 - Special Features

HD - Reinforced motor **HD***

For Other **Special Features** see page 58

Pos.4 - Design Series

omit - Factory specified

* Drain line should always be used.

The hydraulic motors are mangano-phosphatized as standard.

Warning: Drain line should always be used.

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

