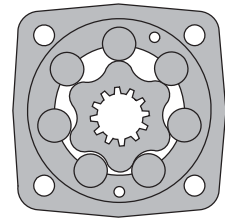
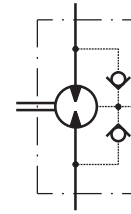


# HYDRAULIC MOTORS MS



## APPLICATION

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



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## 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

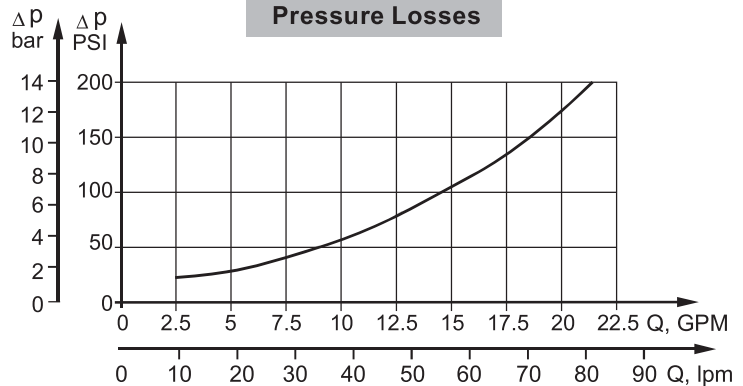
## GENERAL

<b>Max. Displacement,</b> cm <sup>3</sup> /rev [in <sup>3</sup> /rev]	564,9 [34.47]
<b>Max. Speed,</b> [RPM]	1000
<b>Max. Torque,</b> daNm [lb-in]	cont.: 85 [7520] int.: 99 [8760]
<b>Max. Output,</b> kW [HP]	23 [30.8]
<b>Max. Pressure Drop,</b> bar [PSI]	cont.: 210 [3050] int.: 275 [3990]
<b>Max. Oil Flow,</b> lpm [GPM]	90 [24]
<b>Min. Speed,</b> [RPM]	5
<b>Permissible Shaft Loads</b> daN [lbs]	P <sub>a</sub> =500 [1125]
<b>Pressure fluid</b>	Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)
<b>Temperature range,</b> °C [°F]	-40÷140 [-40÷284]
<b>Optimal Viscosity range,</b> mm <sup>2</sup> /s [SUS]	20÷75 [98÷347]
<b>Filtration</b>	ISO code 20/16 (Min. recommended fluid filtration of 25 microns)

### Oil flow in drain line

Pressure drop bar [PSI]	Viscosity mm <sup>2</sup> /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
<b>Displacement, cm<sup>3</sup>/rev [in<sup>3</sup>/rev]</b>		80,5 [4.91]	100 [6.1]	125,7 [7.67]	159,7 [9.74]	200 [12.2]
<b>Max. Speed, [RPM]</b>	cont.	810	750	600	470	375
	Int.*	1000	900	720	560	450
<b>Max. Torque daNm [lb-in]</b>	cont.	24 [2120]	30,5 [2700]	37,5 [3320]	49 [4340]	61 [5400]
	Int.*	31 [2740]	39 [3450]	49 [4340]	60 [5310]	72 [6370]
<b>Max. Output kW [HP]</b>	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]
<b>Max. Pressure Drop bar [PSI]</b>	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]
<b>Max. Oil Flow lpm [GPM]</b>	cont.	65 [17]	75 [20]	75 [20]	75 [20]	75 [20]
	Int.*	80 [21]	90 [24]	90 [24]	90 [24]	90 [24]
<b>Max. Inlet Pressure bar [PSI]</b>	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]
<b>Max. Return Pressure with Drain Line bar [PSI]</b>	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]
<b>Max. Starting Pressure with Unloaded Shaft, bar [PSI]</b>		12 [175]	10 [145]	10 [145]	8 [115]	8 [115]
<b>Min. Starting Torque daNm [lb-in]</b>	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]
<b>Min. Speed***, [RPM]</b>		10	10	8	8	6
<b>Weight, kg [lb] For Rear Ports + 0,40 [.88]</b>	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 mm<sup>2</sup>/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
<b>Displacement, cm<sup>3</sup>/rev [in<sup>3</sup>/rev]</b>		250 [15.3]	314,9 [19.2]	397 [24.2]	474,6[28.96]	522,7 [31.88]	564,9[34.47]
<b>Max. Speed, [RPM]</b>	cont.	300	240	190	160	145	130
	Int.*	360	290	230	190	175	160
<b>Max. Torque daNm [lb-in]</b>	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]
<b>Max. Output kW [HP]</b>	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]
<b>Max. Pressure Drop bar [PSI]</b>	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]
<b>Max. Oil Flow lpm [GPM]</b>	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]
<b>Max. Inlet Pressure bar [PSI]</b>	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]
<b>Max. Return Pressure with Drain Line bar [PSI]</b>	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]
<b>Max. Starting Pressure with Unloaded Shaft, bar [PSI]</b>		8 [115]	8 [115]	8 [115]	8 [115]	8 [115]	8 [115]
<b>Min. Starting Torque daNm [lb-in]</b>	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]
<b>Min. Speed***, [RPM]</b>		6	5	5	5	5	5
<b>Weight, kg [lb] For Rear Ports + 0,40 [.88]</b>	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.

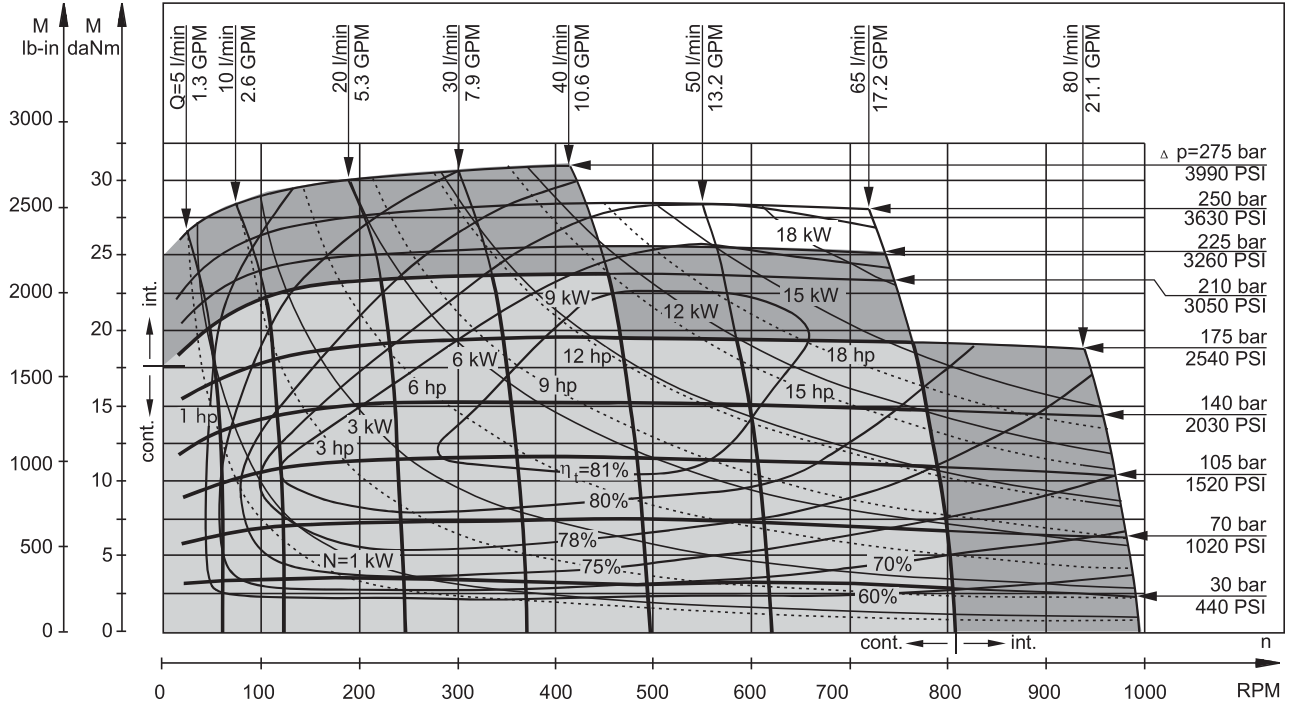
\*\* Peak load: the permissible values may occur for max. 1% of every minute.

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

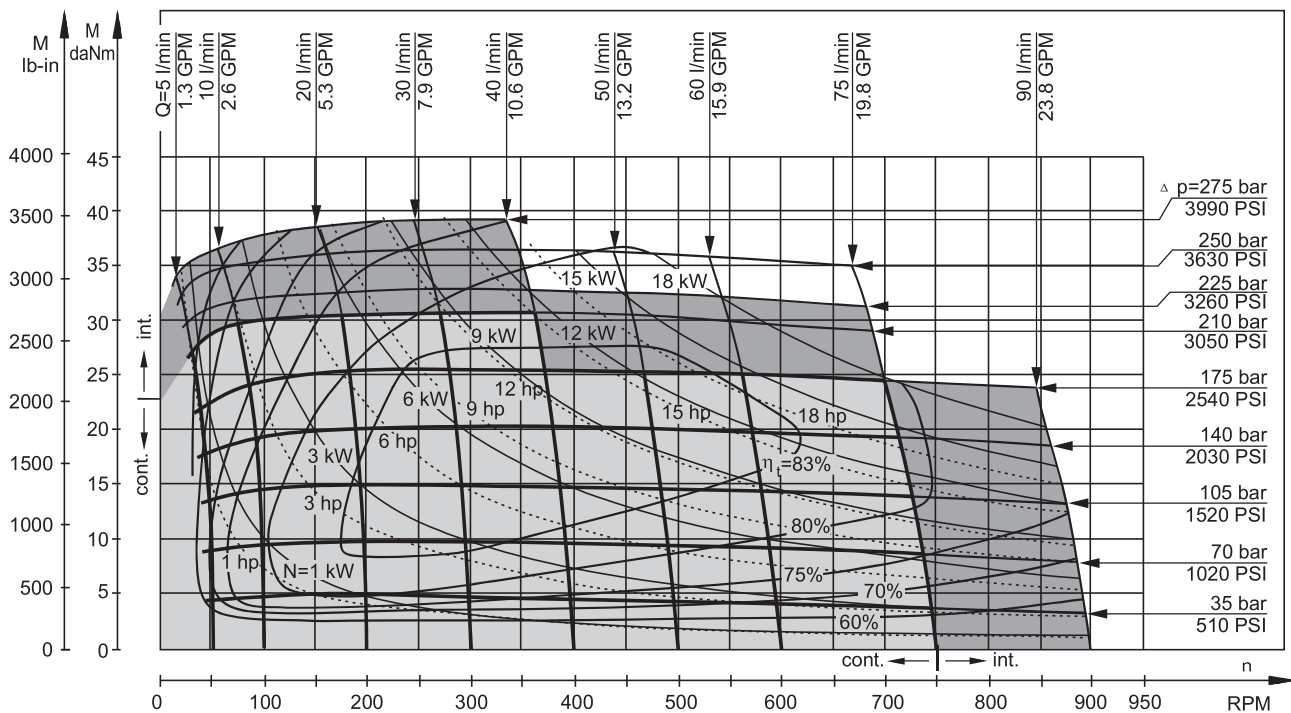
- Intermittent speed and intermittent pressure must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM ( ISO 6743/4).  
If using synthetic fluids consult the factory for alternative seal materials.
- Recommended minimum oil viscosity 13 mm<sup>2</sup>/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**



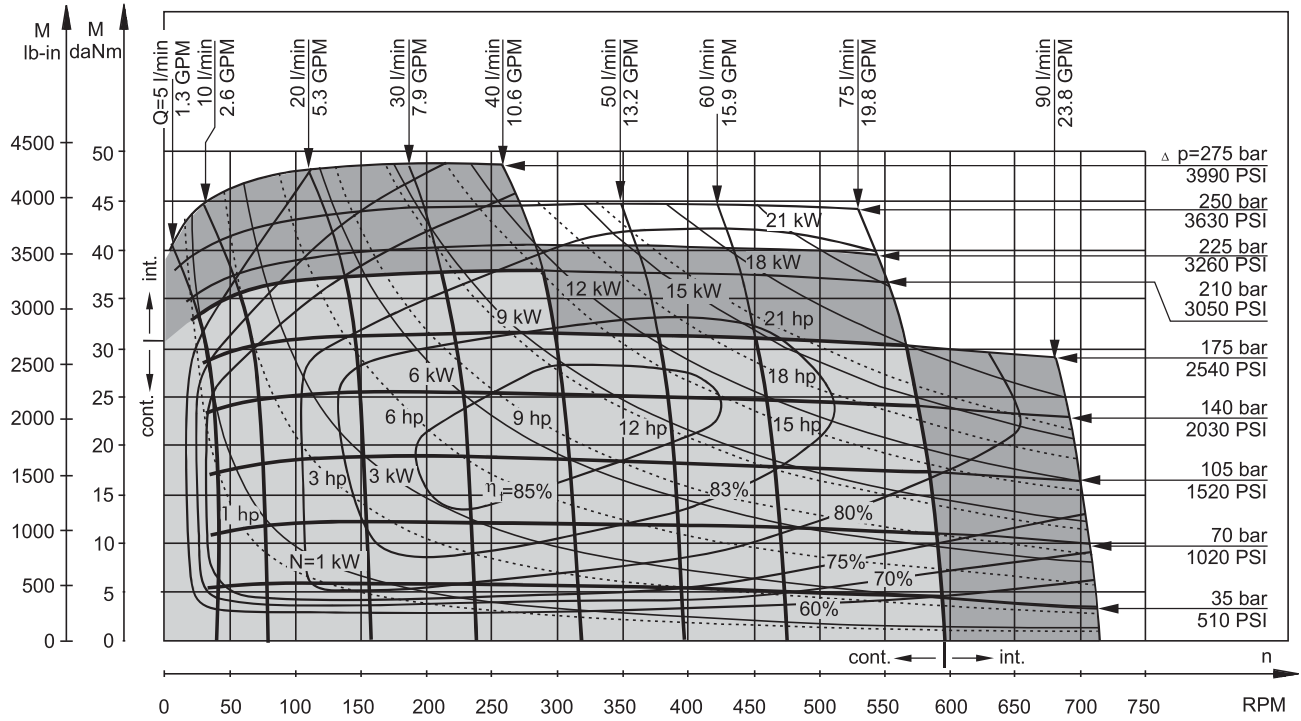
**MS 100**



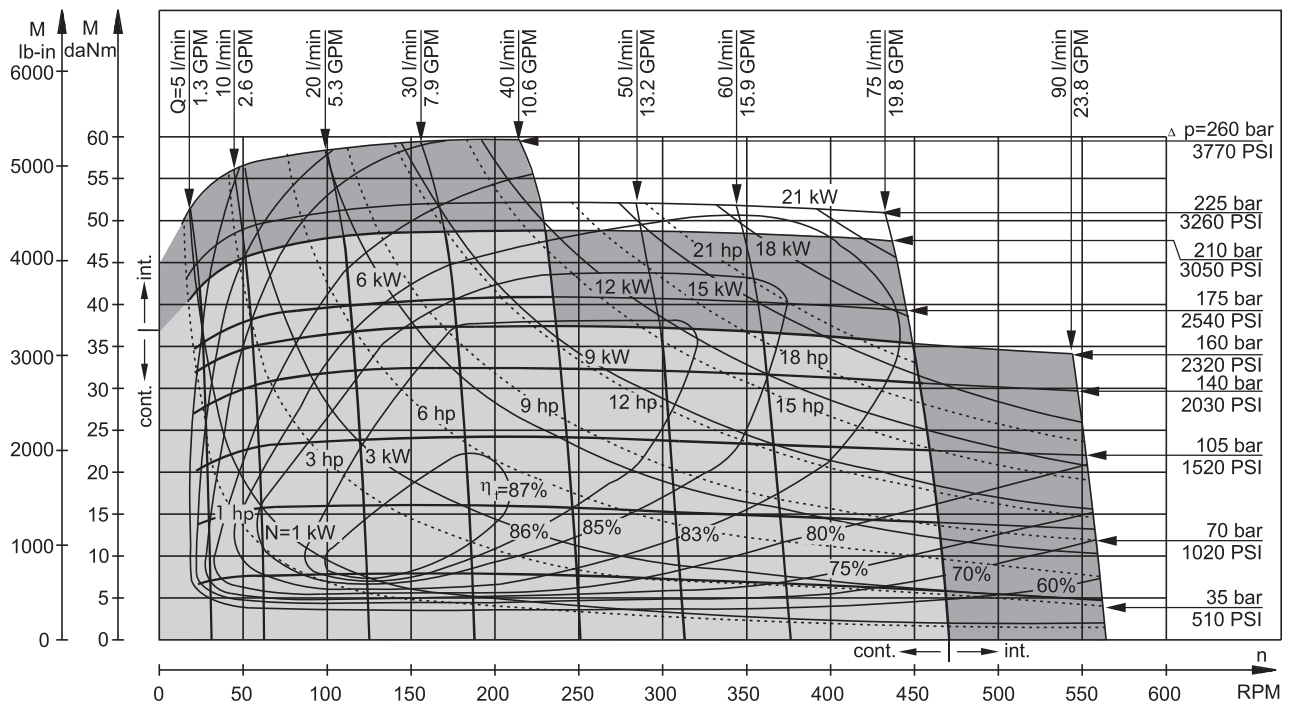
The function diagrams data is for average performance of randomly selected motors at back pressure 5±10 bar [72.5±145 PSI] and oil with viscosity of 32 mm<sup>2</sup>/s [150 SUS] at 50°C [122°F].

**FUNCTION DIAGRAMS**

**MS 125**



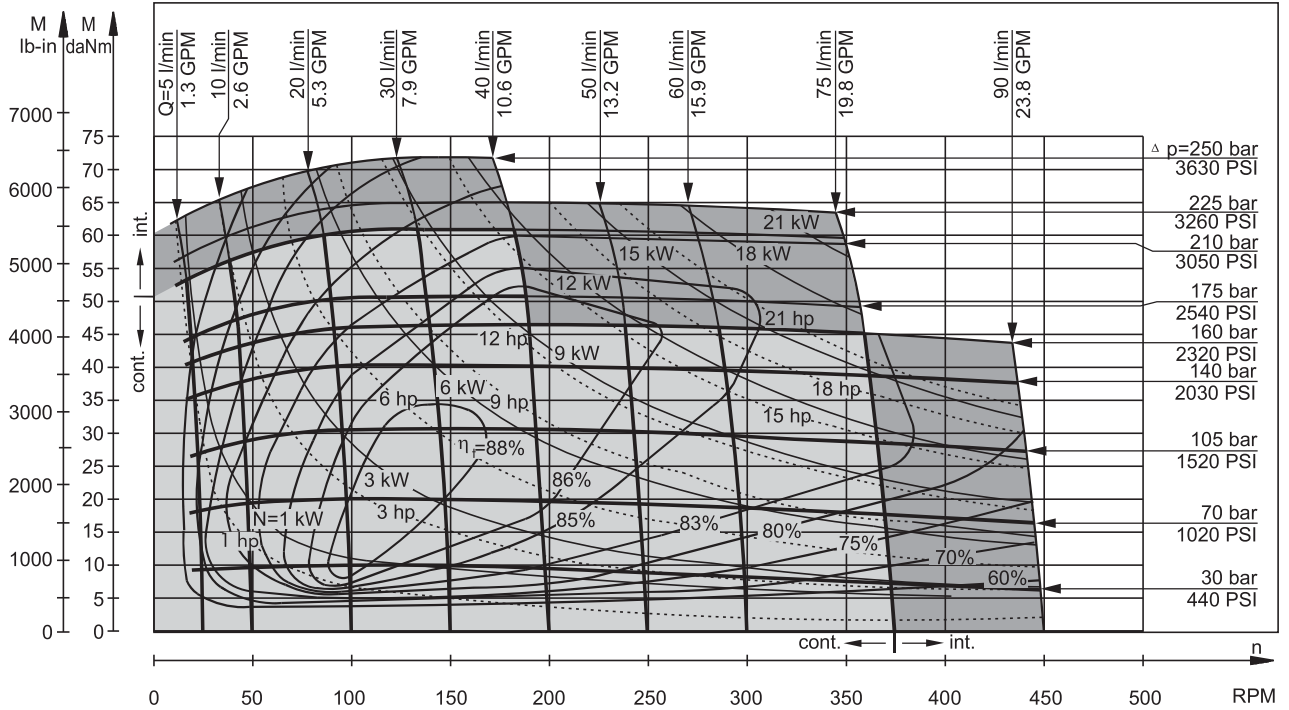
**MS 160**



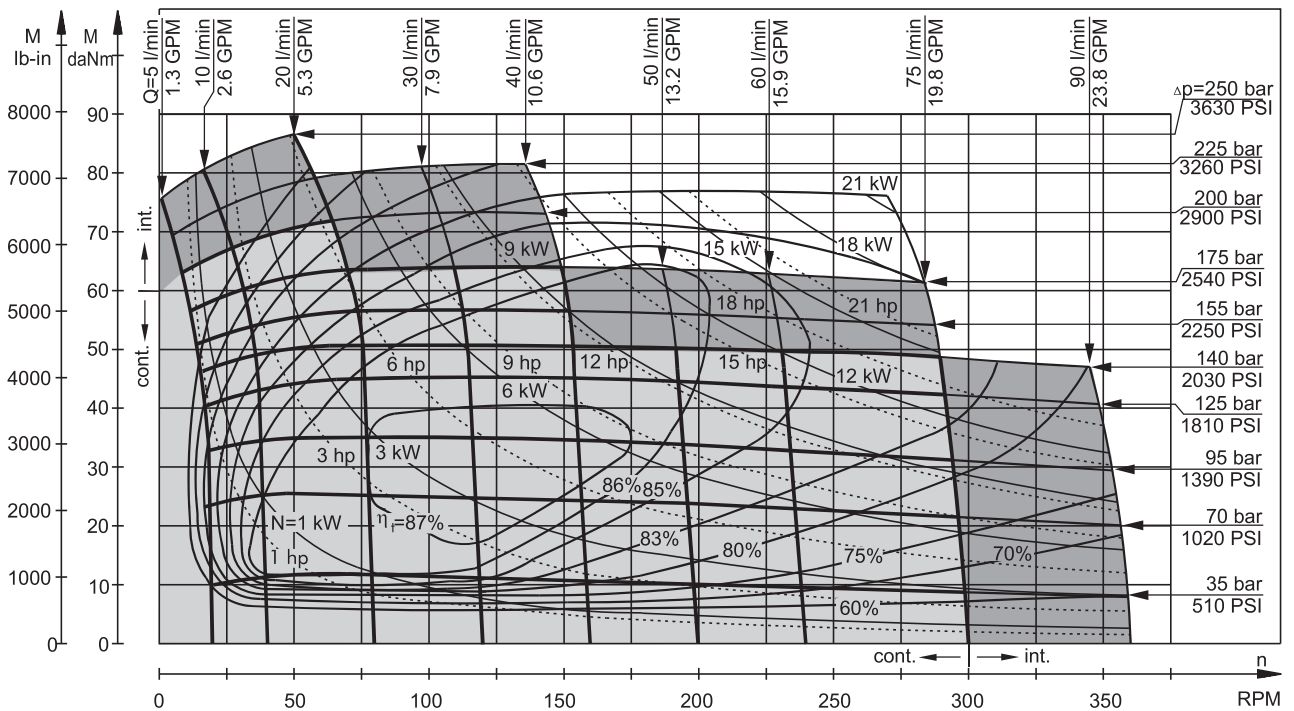
The function diagrams data is for average performance of randomly selected motors at back pressure 5±10 bar [72.5±145 PSI] and oil with viscosity of 32 mm<sup>2</sup>/s [150 SUS] at 50°C [122°F].

**FUNCTION DIAGRAMS**

**MS 200**



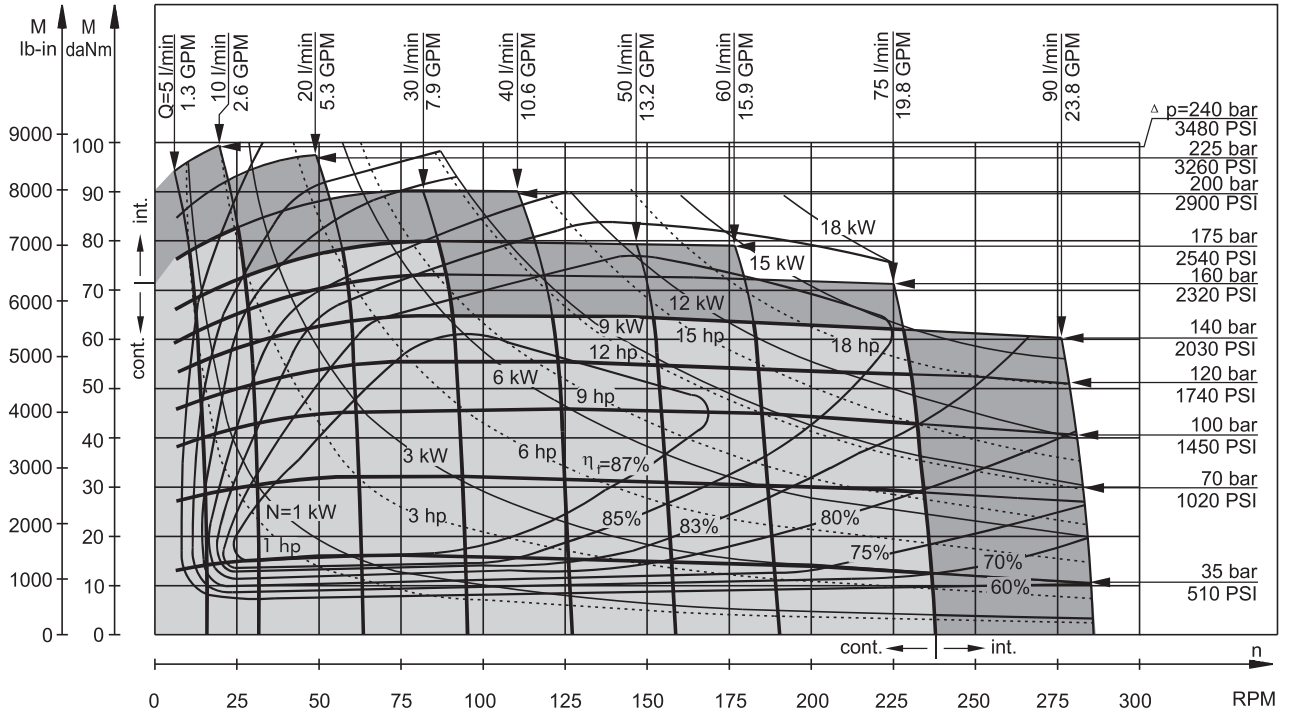
**MS 250**



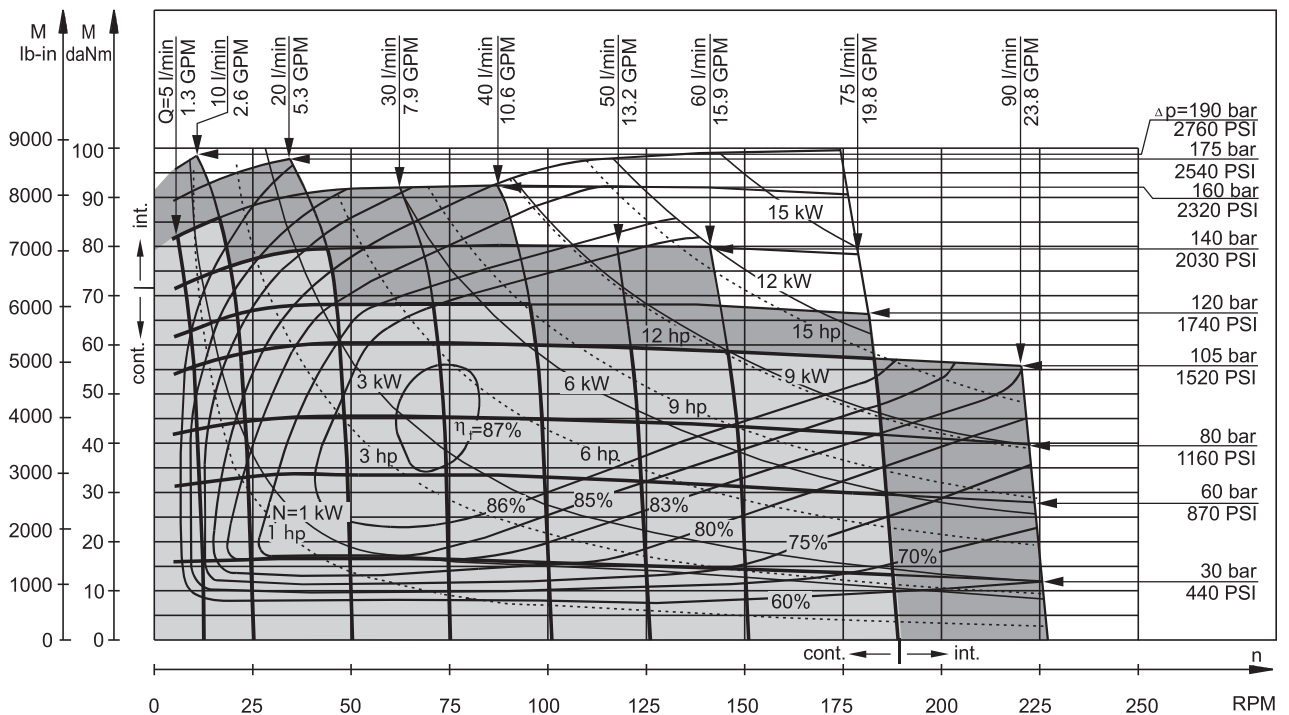
The function diagrams data is for average performance of randomly selected motors at back pressure 5±10 bar [72.5±145 PSI] and oil with viscosity of 32 mm<sup>2</sup>/s [150 SUS] at 50°C [122°F].

**FUNCTION DIAGRAMS**

**MS 315**



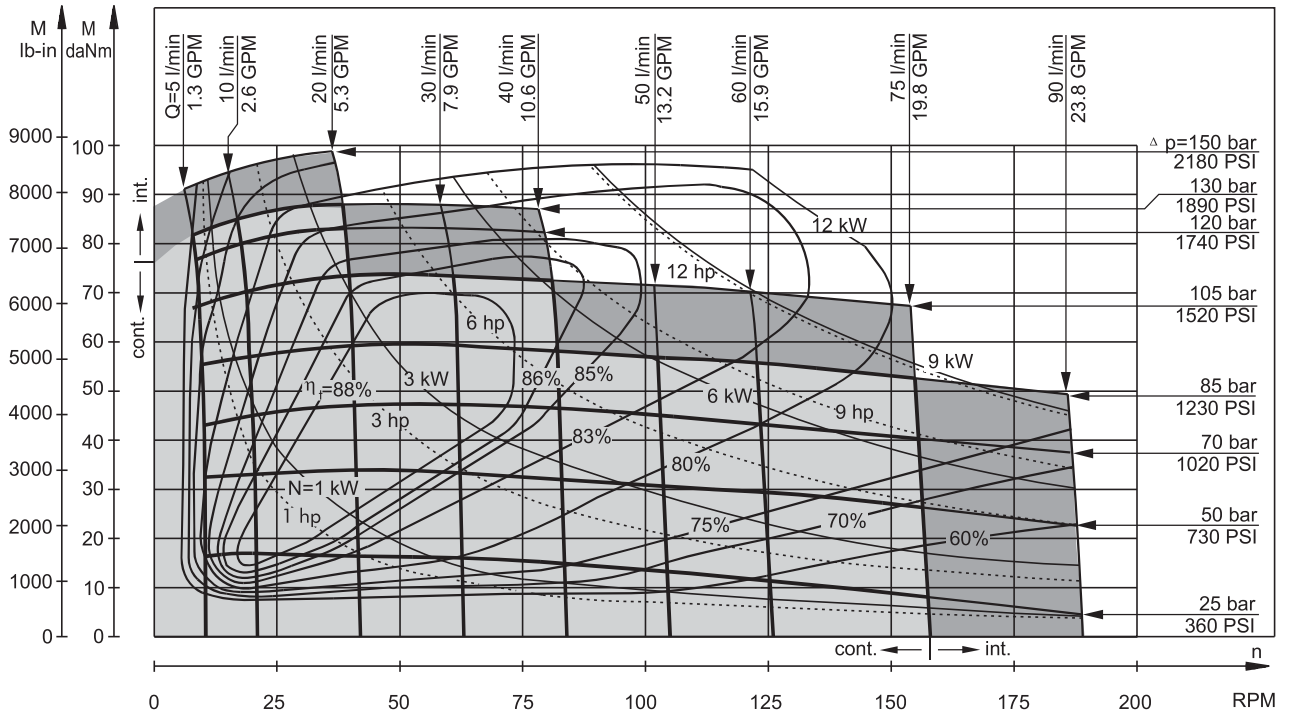
**MS 400**



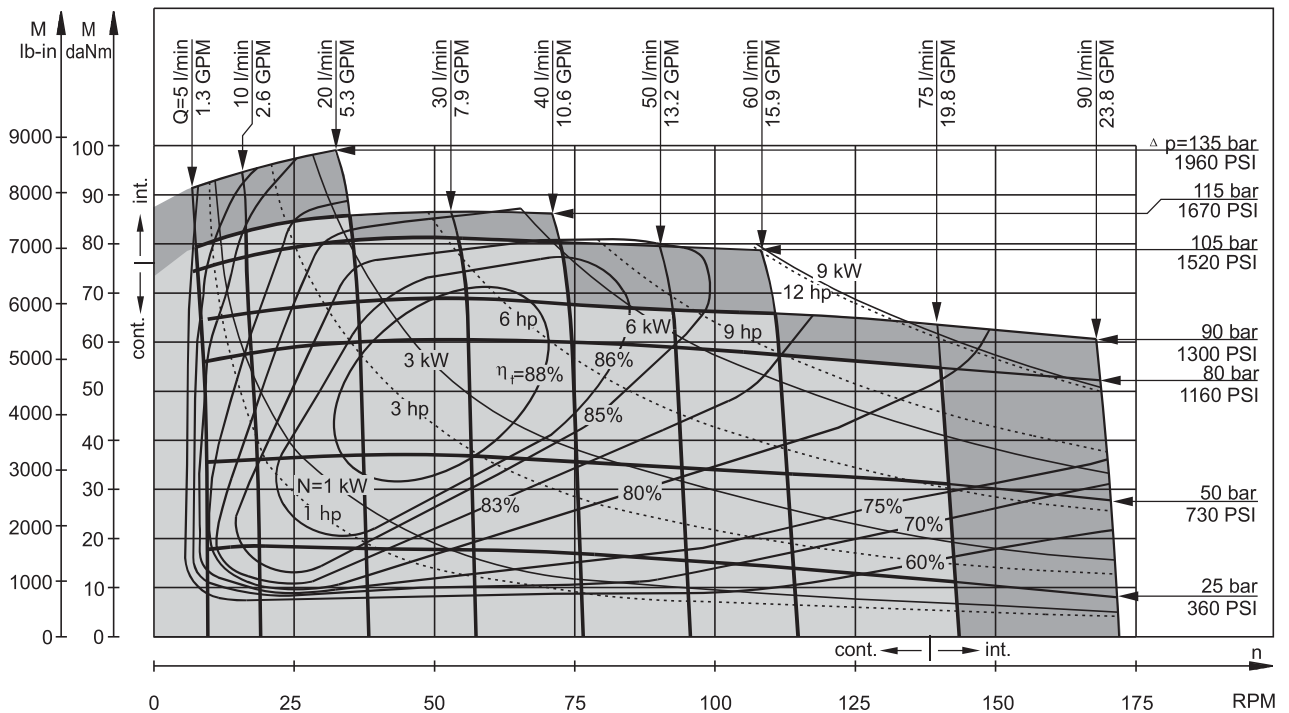
The function diagrams data is for average performance of randomly selected motors at back pressure 5±10 bar [72.5±145 PSI] and oil with viscosity of 32 mm<sup>2</sup>/s [150 SUS] at 50°C [122°F].

**FUNCTION DIAGRAMS**

**MS 475**



**MS 525**

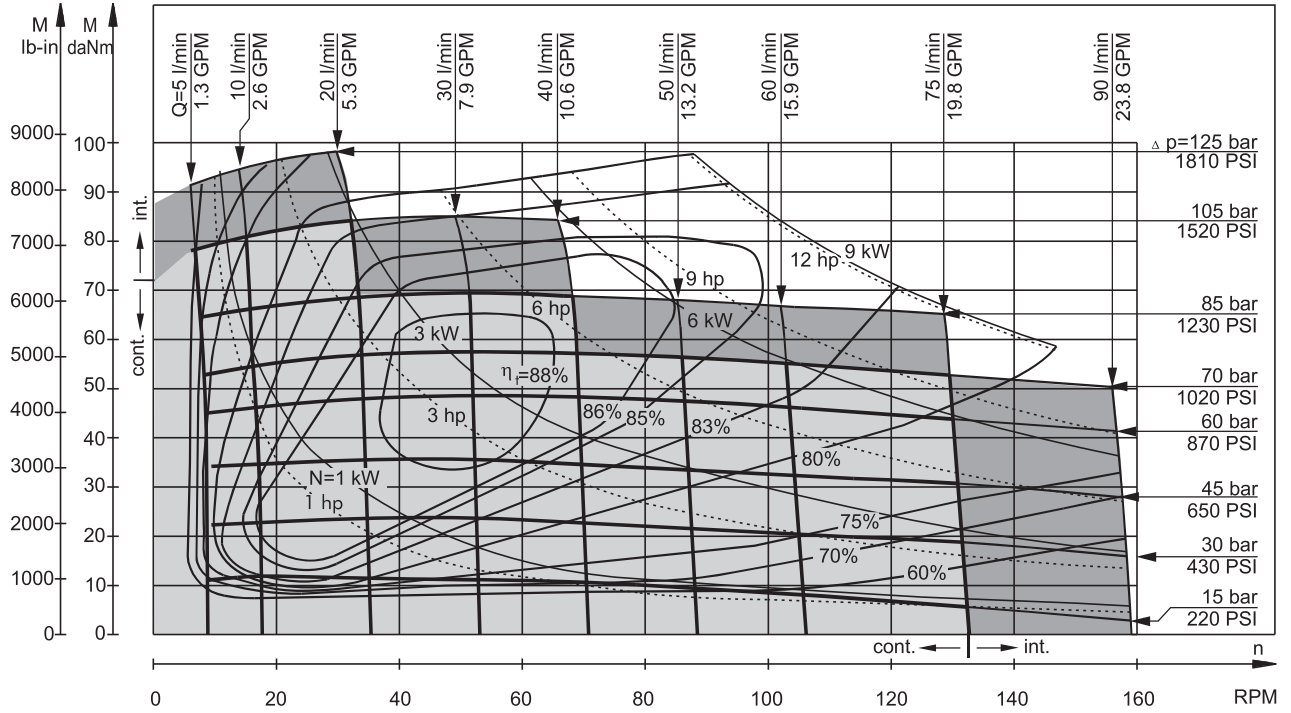


The function diagrams data is for average performance of randomly selected motors at back pressure 5±10 bar [72.5±145 PSI] and oil with viscosity of 32 mm<sup>2</sup>/s [150 SUS] at 50°C [122°F].



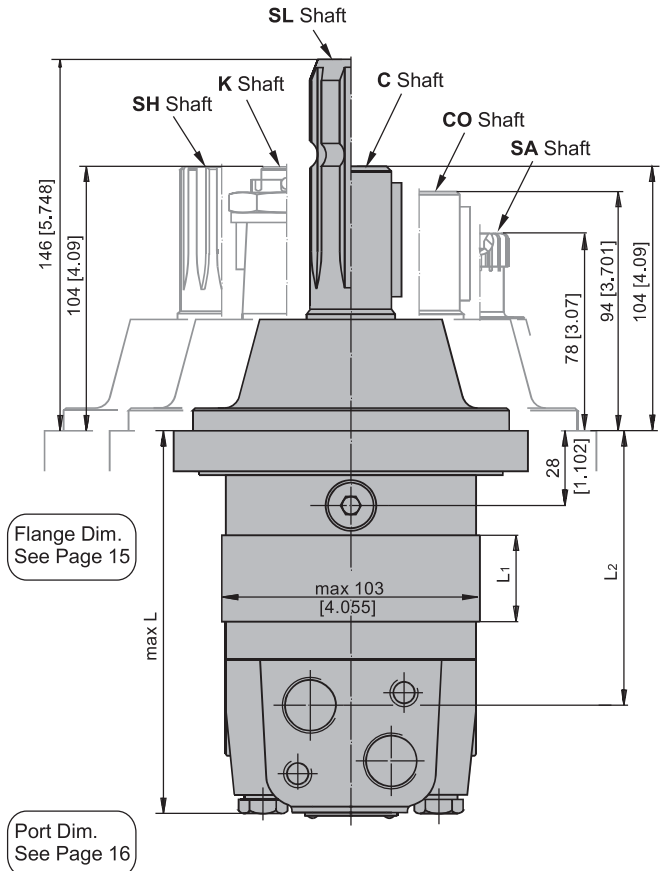
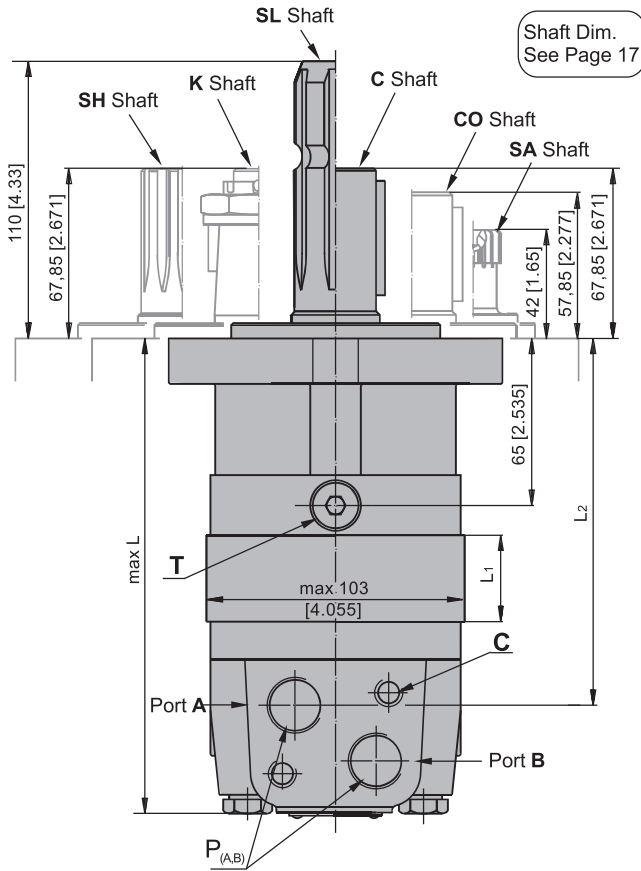
**FUNCTION DIAGRAMS**

**MS 565**

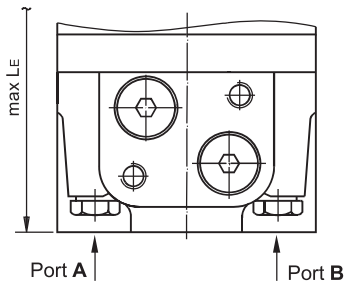


The function diagrams data is for average performance of randomly selected motors at back pressure 5±10 bar [72.5±145 PSI] and oil with viscosity of 32 mm<sup>2</sup>/s [150 SUS] at 50°C [122°F].

**DIMENSIONS AND MOUNTING DATA  
MS, MSF, MSA, MSW**



E Rear ports



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

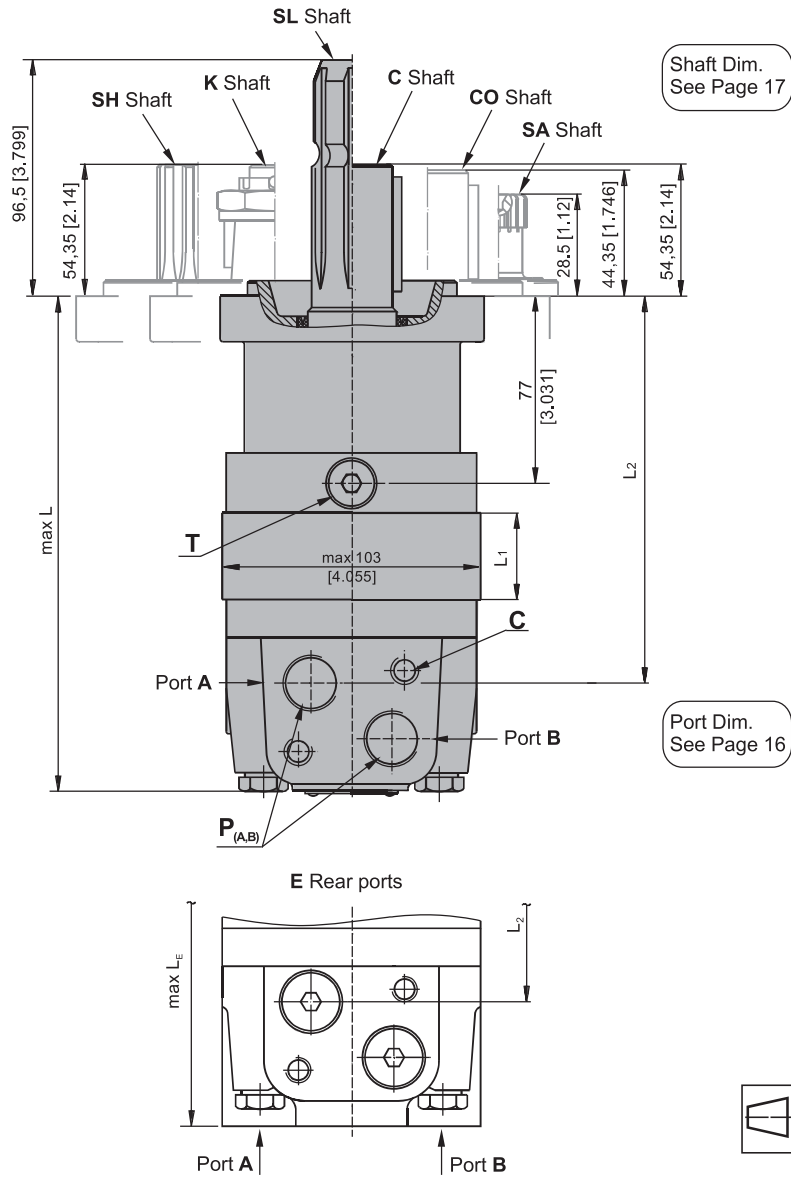
**Standard Rotation**  
 Viewed from Shaft End  
 Port A Pressurized - **CW**  
 Port B Pressurized - **CCW**

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

Type	L,mm[in.]	L <sub>2</sub> ,mm[in.]	*L <sub>E</sub> ,mm[in.]	Type	L, mm[in.]	L <sub>2</sub> ,in.[mm]	*L <sub>E</sub> ,mm[in.]	L <sub>1</sub> ,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**



Shaft Dim.  
See Page 17

Port Dim.  
See Page 16



**C:** 2xM10-12 mm [.47 in] depth  
**P<sub>(A,B)</sub>:** 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**

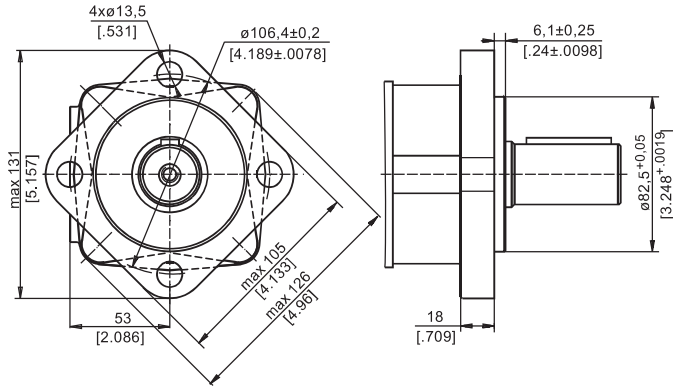
**Reverse Rotation**  
 Viewed from Shaft End  
 Port A Pressurized - **CCW**  
 Port B Pressurized - **CW**

Type	L, mm [in.]	L <sub>2</sub> , mm [in.]	*L <sub>E</sub> , mm [in.]	L <sub>1</sub> , mm [in.]
MSQ 80	179 [7.05]	136 [5.35]	185 [7.28]	.55 [14,0]
MSQ 100	183 [7.21]	140 [5.51]	189 [7.44]	.69 [17,4]
MSQ 125	187 [7.36]	144 [5.67]	193 [7.60]	.86 [21,8]
MSQ 160	193 [7.60]	150 [5.91]	199 [7.83]	1.09 [27,8]
MSQ 200	200 [7.87]	157 [6.18]	206 [8.11]	1.37 [34,8]
MSQ 250	209 [8.23]	166 [6.54]	215 [8.46]	1.71 [43,5]
MSQ 315	220 [8.66]	177 [6.97]	226 [8.90]	2.16 [54,8]
MSQ 400	235 [9.25]	192 [7.56]	241 [9.49]	2.73 [69,4]
MSQ 475	247 [9.72]	205 [8.07]	254 [10.0]	3.25 [82,6]
MSQ 525	240 [9.45]	197 [7.76]	246 [9.69]	2.93 [74,5]
MSQ 565	246 [9.69]	203 [7.99]	252 [9.92]	3.16 [80,2]

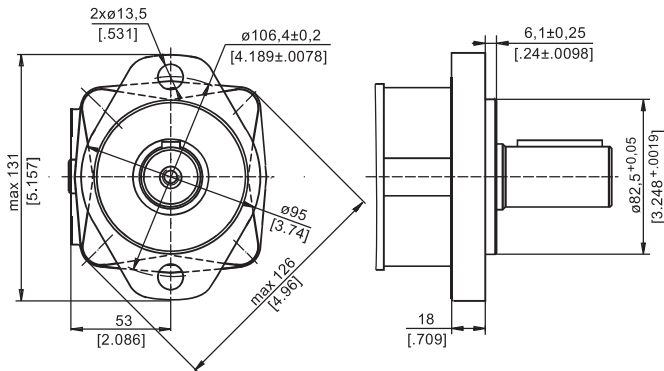
\* -For Rear Ported Motors.

**MOUNTING**

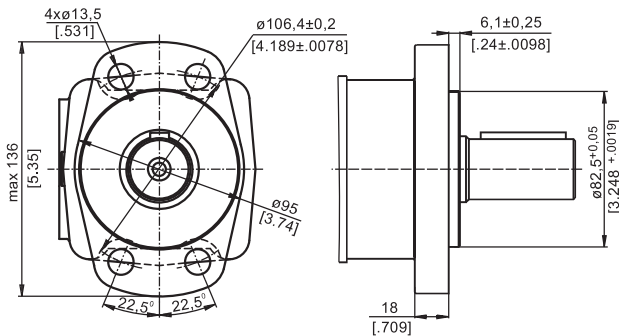
**SAE A-4 Mount (4 Holes)**



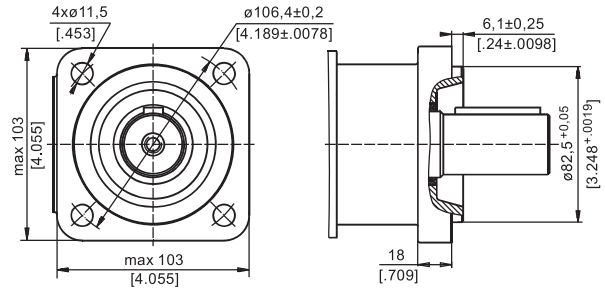
**A SAE A-2 Mount (2 Holes)**



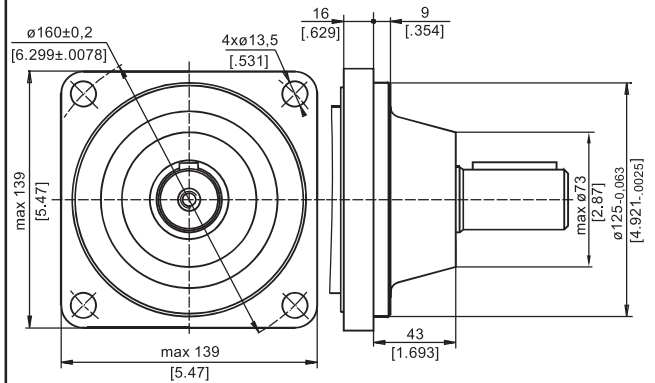
**F Magneto Mount (4 Holes)**



**Q Square Mount (4 Holes)**

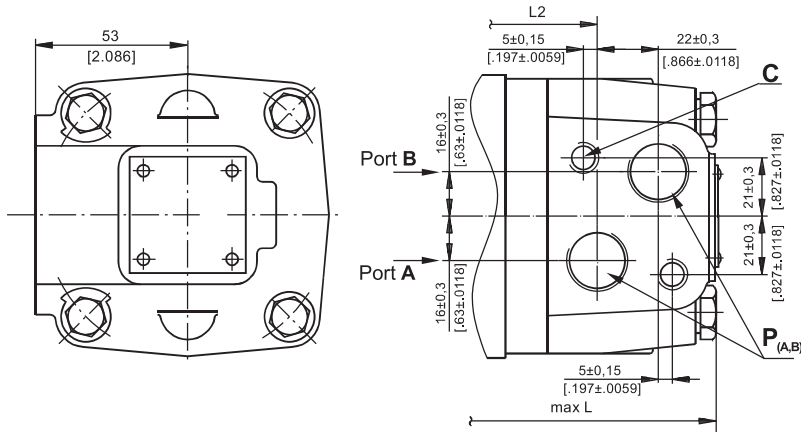


**W Wheel Mount**

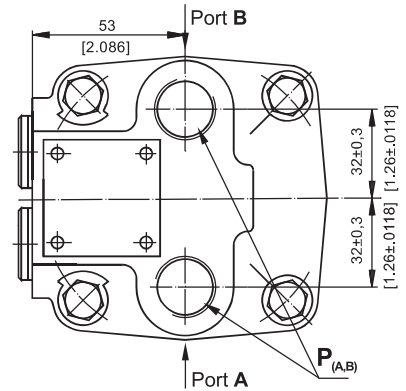


**PORTS**

Side Ports



**E** Rear Ports



**Standard Rotation**

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

**Reverse Rotation**

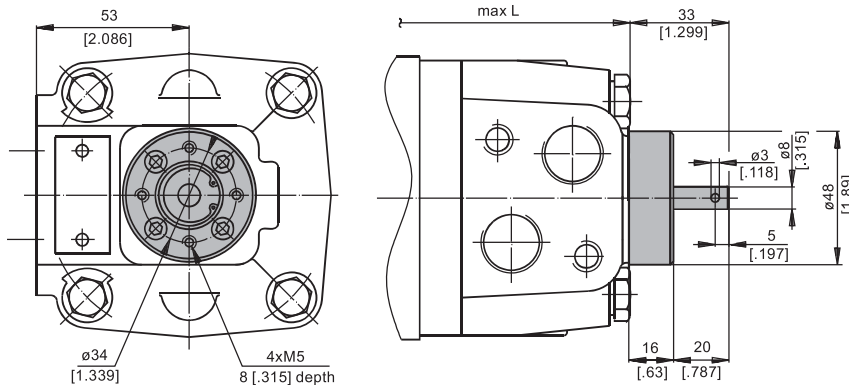
Viewed from Shaft End  
Port **A** Pressurized - **CCW**  
Port **B** Pressurized - **CW**

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

**P<sub>(A,B)</sub>**: 2xG1/2 or 2xM22x1,5-15 mm [.59 in] depth

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

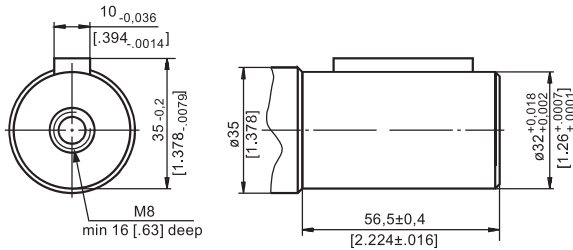
**MOTORS WITH TACHO CONNECTION**



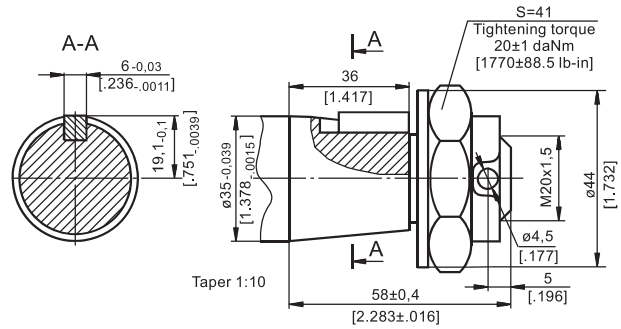
mm [in]

**SHAFT EXTENSIONS**

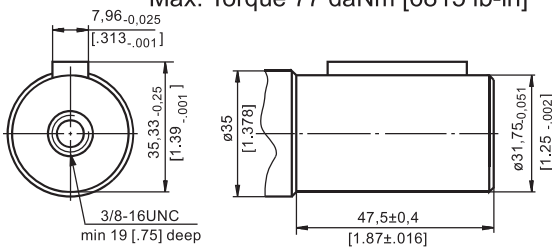
**C** -  $\phi 32$  straight, Parallel key A10x8x45 DIN 6885  
Max. Torque 77 daNm [6815 lb-in]



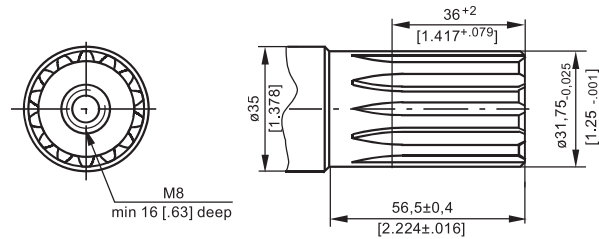
**K** - tapered 1:10, Parallel key B6x6x20 DIN 6885  
Max. Torque 95 daNm [8400 lb-in]



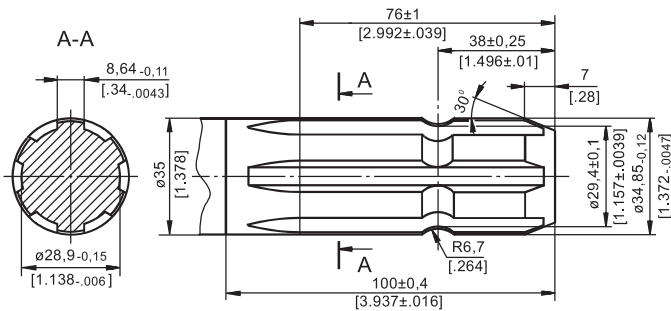
**CO** -  $\phi 1\frac{1}{4}$ " straight, Parallel key  $\frac{5}{16}$ "x $\frac{5}{16}$ "x $\frac{1}{4}$ "BS46  
Max. Torque 77 daNm [6815 lb-in]



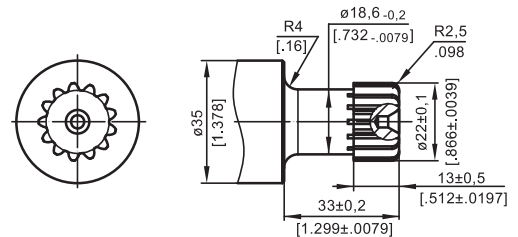
**SH** -  $\phi 1\frac{1}{4}$ " splined 14T, DP12/24 ANS B92.1-1970  
Max. Torque 95 daNm [8400 lb-in]



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

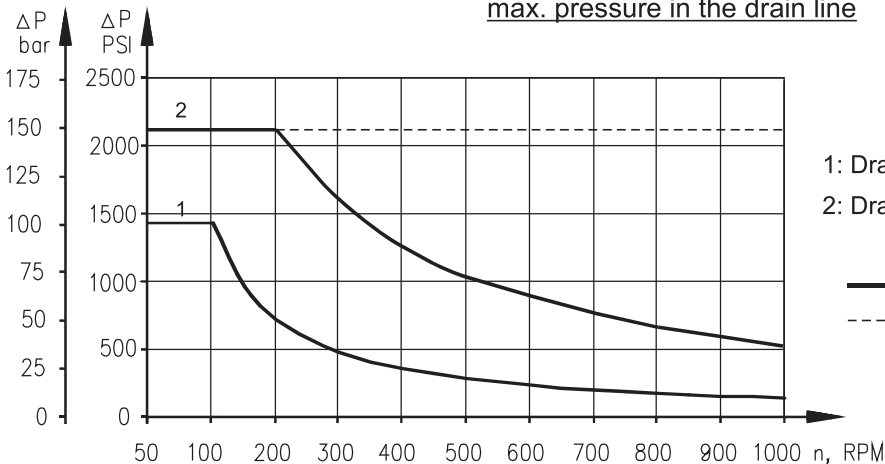


**SA** - 7/8"-13T splined DP16/32 ANS B92.1-1970  
Max. Torque 20 daNm [1770 lb-in]



**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