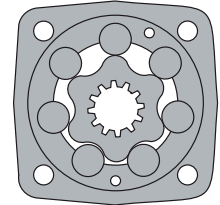
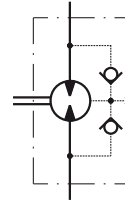


**Hydraulic Motors MS Series**



**APPLICATION**

- » Conveyors
- » Metal working machines
- » Agriculture 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

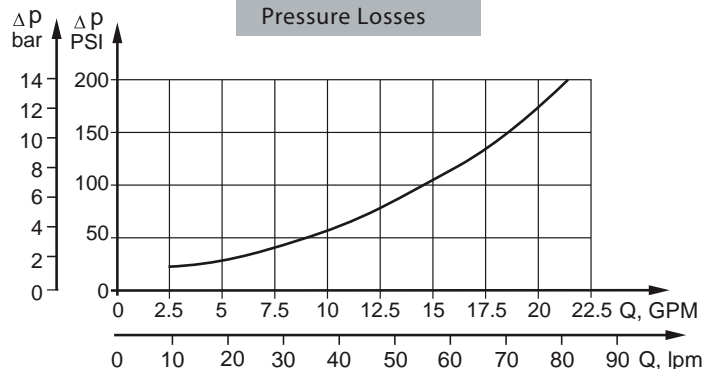
**GENERAL**

Max. Displacement, cm <sup>3</sup> /rev [in <sup>3</sup> /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 <sub>a</sub> =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 <sup>2</sup> /s [SUS]	20÷75 [98÷347]
Filtration	ISO code 20/16 (Min. recommended fluid filtration of 25 micron)

Oil flow in drain line

Pressure drop bar [PSI]	Viscosity mm <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



**MS Motors**

**SPECIFICATION DATA (continued)**

Type	MS 250	MS 315	MS 400	MS 475	MS 525	MS 565	
Displacement, cm. <sup>3</sup> /rev.[in. <sup>3</sup> /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]

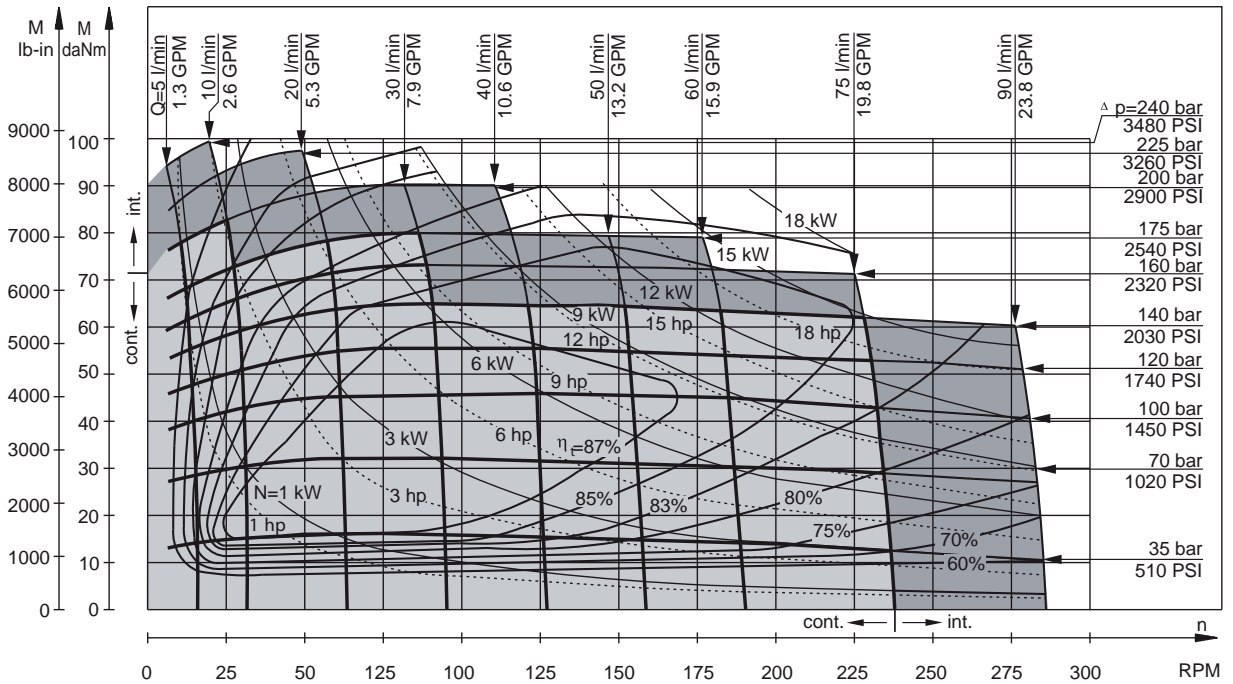
\* Intermittent operation: the permissible values may occur for max. 10% of every minute.  
 \*\* Peak load: the permissible values may occur for max. 1% of every minute.  
 \*\*\* For speeds lower than given, consult factory or your regional manager.

- 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 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.

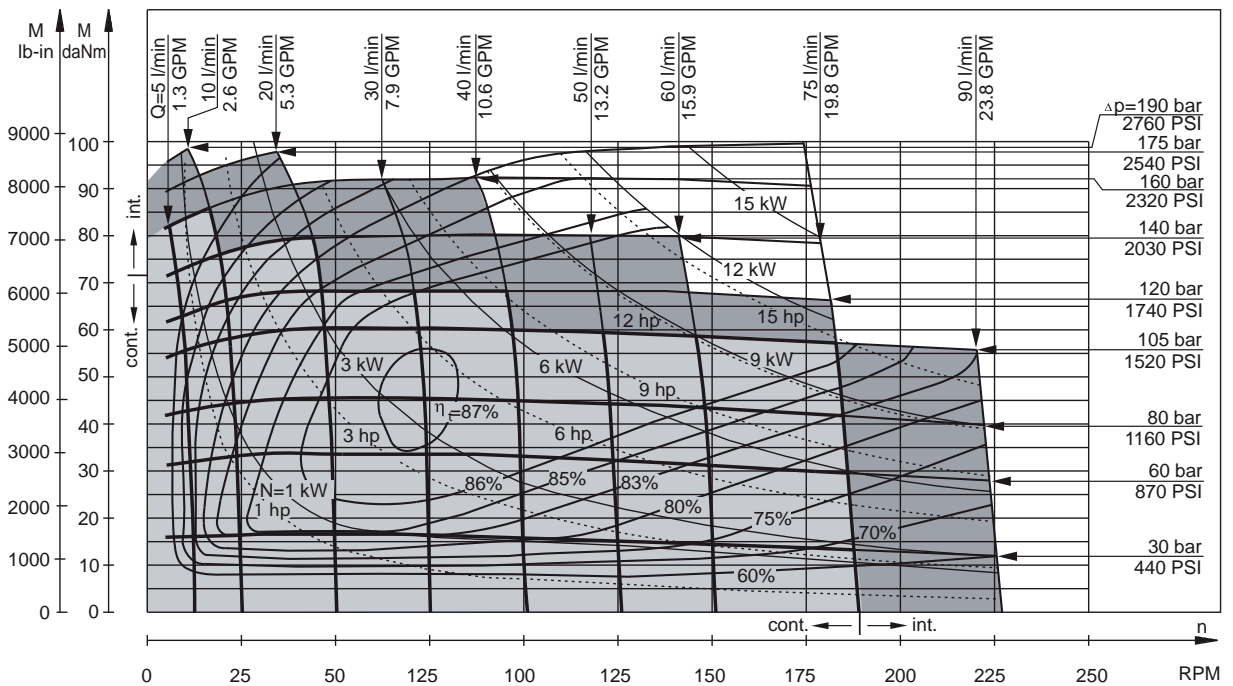
## MS Motors

### FUNCTION DIAGRAMS

#### MS 315



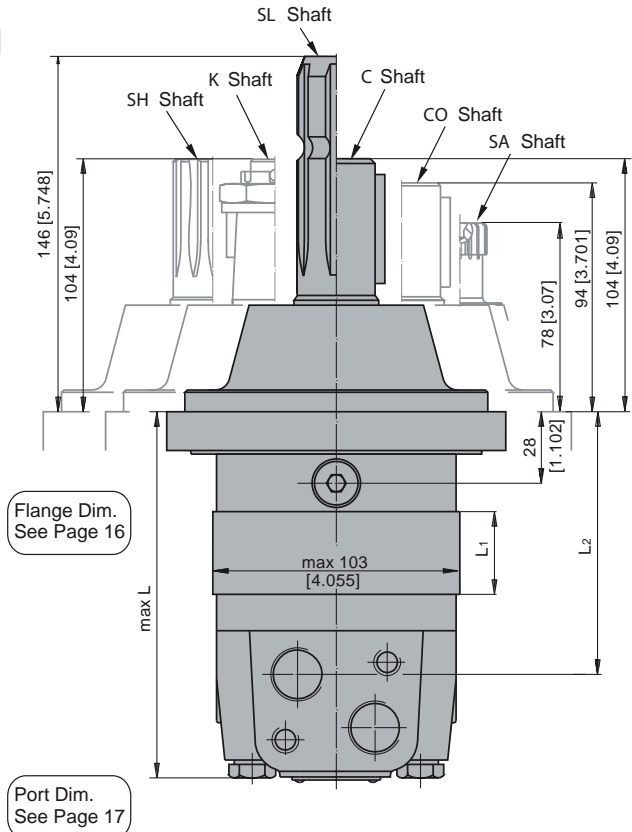
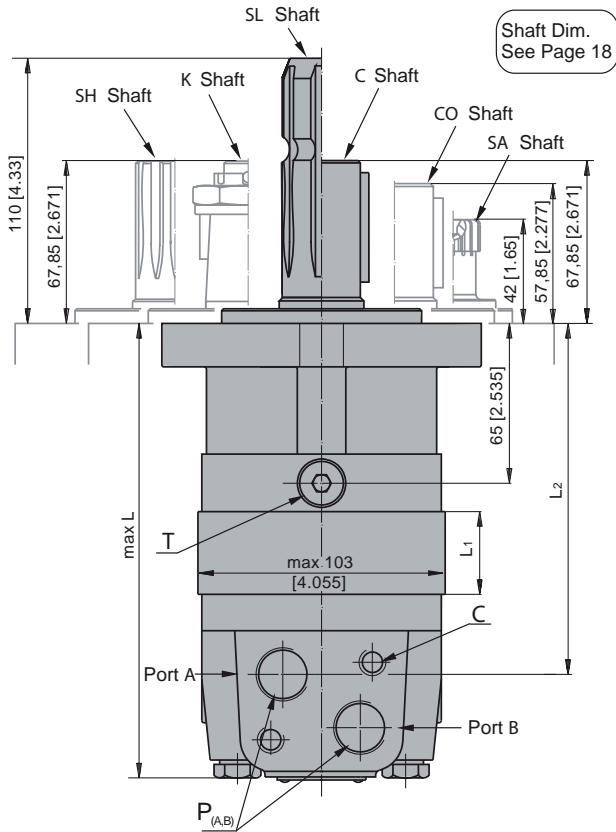
#### MS 400



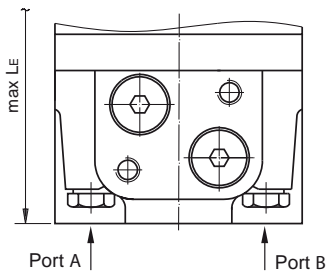
The function diagrams data is for average performance of randomly selected motors at back pressure 5±10 bar [72.5-145 PSI] and oil with viscosity of 32 mm<sup>2</sup>/s [150 SUS] at 50°C [122°F].

## MS Motors

### 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

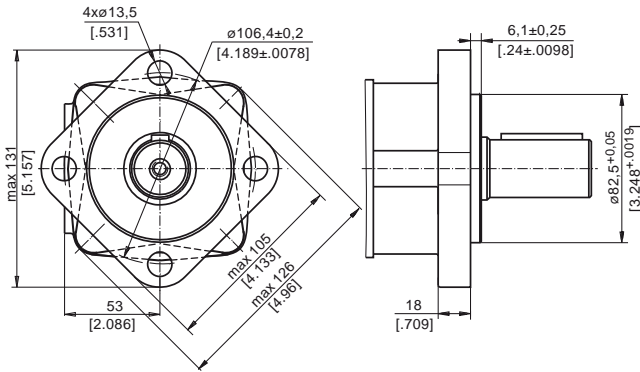
Type	L,mm[in.]	L <sub>2</sub> ,mm[in.]	*L <sub>E</sub> , mm[in.]	Type	L, mm[in.]	L <sub>2</sub> ,in.[mm]	*L <sub>E</sub> ,mm[in.]	L <sub>1</sub> ,mm[in.]
MS(F, A) 80	168 [6.61]	124 [4.88]	173 [6.81]	MSW 80	129 [5.08]	87 [3.43]	138 [5.43]	14,0 [.55]
MS(F, A) 100	171 [6.73]	128 [5.04]	177 [6.97]	MSW100	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]
<b>MS(F, A) 400</b>	<b>223 [8.78]</b>	<b>179 [7.05]</b>	<b>228 [8.98]</b>	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.

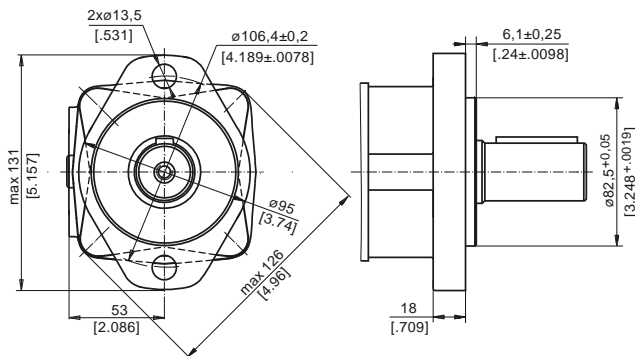
## MS Motors

### MOUNTING

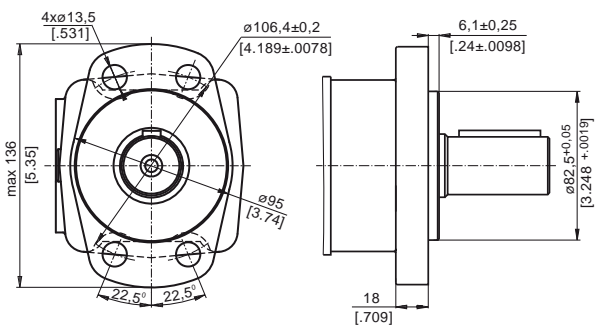
SAE A-4 Mount (4 Holes)



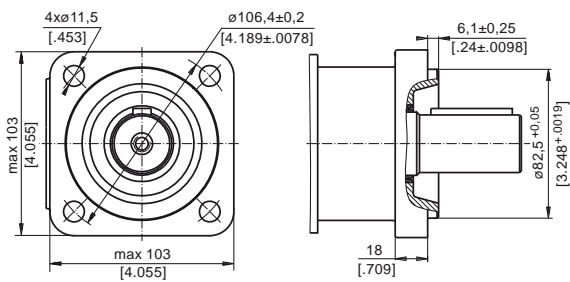
A SAE A-2 Mount (2 Holes)



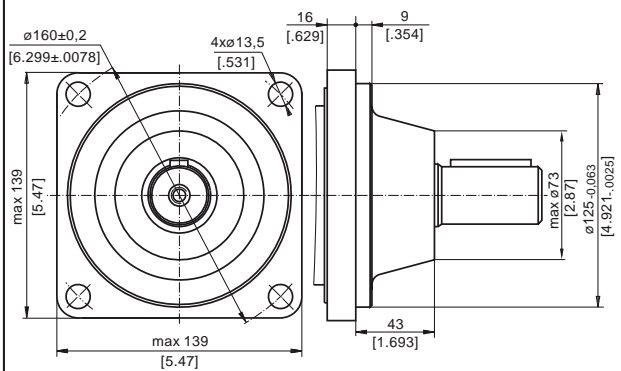
F Magneto Mount (4 Holes)



Q Square Mount (4 Holes)



W Wheel Mount

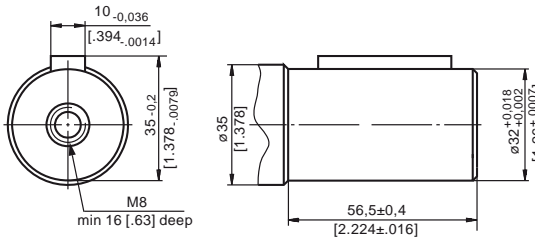




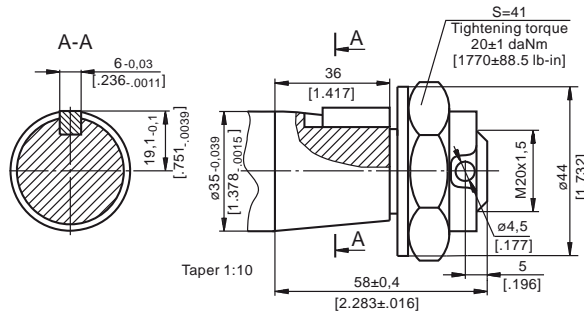
## MS Motors

### SHAFT EXTENSIONS

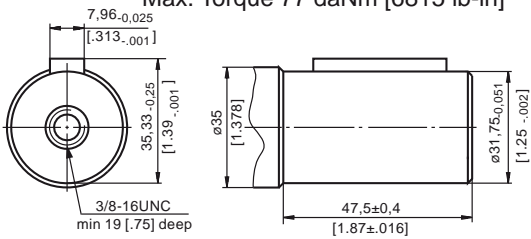
**C** -  $\varnothing 32$  straight, Parallel key A10x8x45 DIN 6885  
Max. Torque 77 daNm [6815 lb-in]



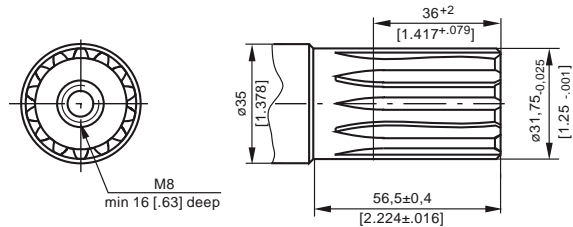
**K** - tapered 1:10, Parallel key B6x6x20 DIN 6885  
Max. Torque 95 daNm [8400 lb-in]



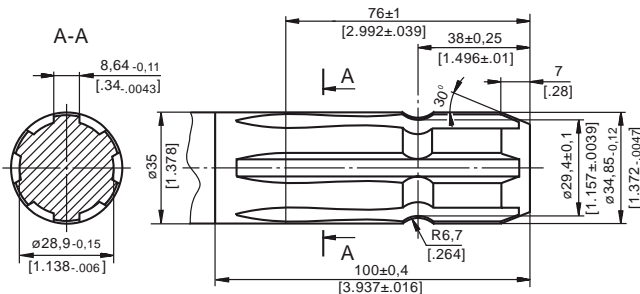
**CO** -  $\varnothing 1\frac{1}{4}$ " straight, Parallel key  $\frac{5}{16}$ "x  $\frac{5}{16}$ "x  $\frac{1}{4}$ " BS46  
Max. Torque 77 daNm [6815 lb-in]



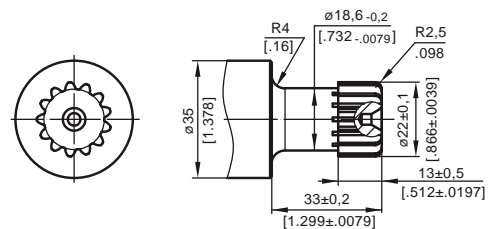
**SH** -  $\varnothing 1\frac{1}{4}$ " splined 14T, DP12/24 ANS B92.1-1970  
Max. Torque 95 daNm [8400 lb-in]



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

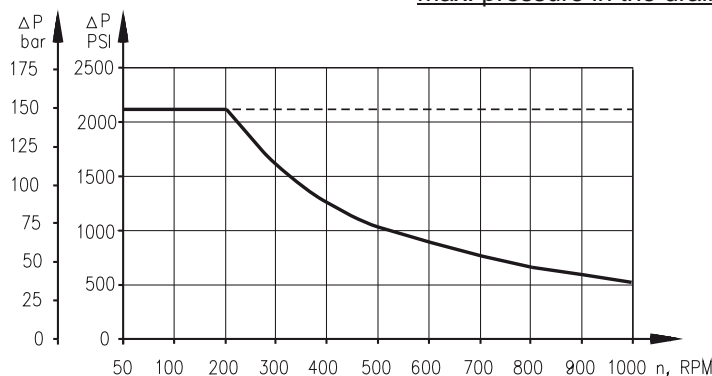


**SA** - 7/8"-13T splined DP16/32 ANS B92.1-1970  
Max. Torque 20 daNm [1770 lb-in]



### MAX. PERMISSIBLE SHAFT SEAL PRESSURE

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



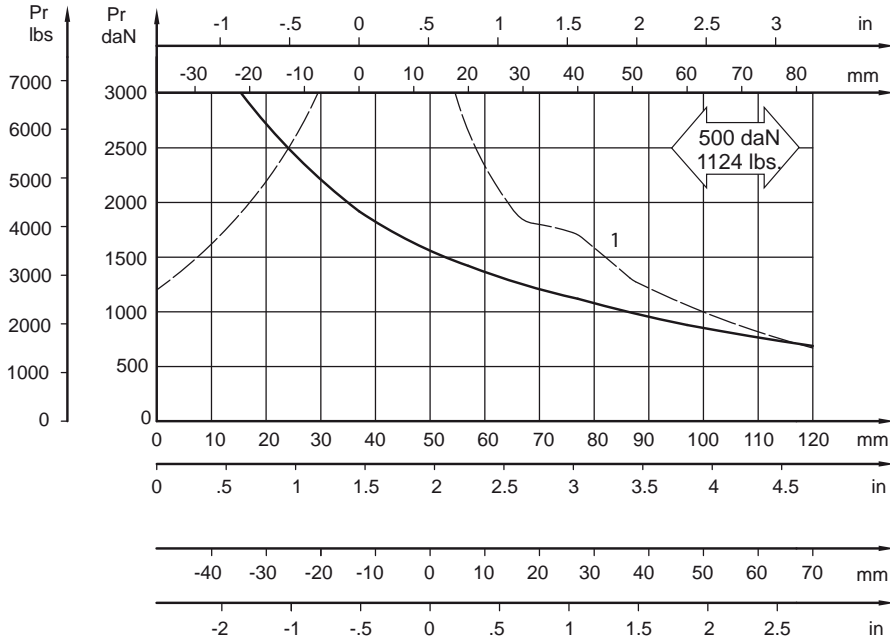


## MS Motors

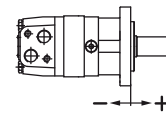
### PERMISSIBLE SHAFT LOADS

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.

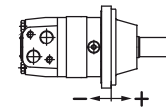
Curve "1" shows max. radial shaft load. Any shaft load exceeding the values quoted in the curve will seriously reduce motor life.



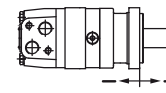
### Mounting Flange:



Standard A-2 Magneto



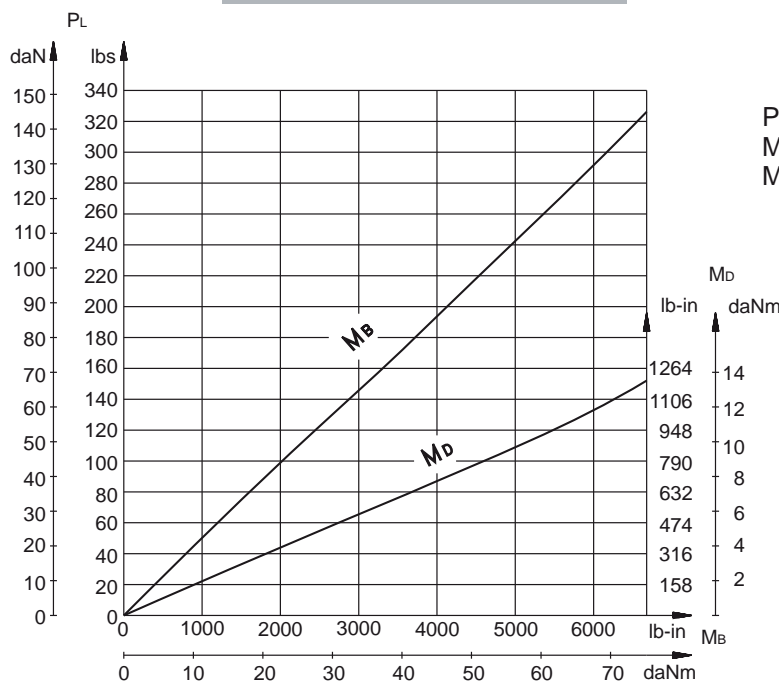
W - Wheel



Q - Square

Shaft: All type shafts except SA

### FUNCTION DIAGRAM MSB



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



## MS Motors

### ORDER CODE

	1	2	3	4	5	6	7	8
MS								

#### 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 shortmount
W	- Wheel mount

#### Pos.2- Port type

omit - Side ports

E	- Rear ports
---	--------------

#### Pos.3 - Displacement code

80	- 80,5 cm <sup>3</sup> /rev [4.91 in <sup>3</sup> /rev]
100	- 100,0 cm <sup>3</sup> /rev [6.10 in <sup>3</sup> /rev]
125	- 125,7 cm <sup>3</sup> /rev [7.67 in <sup>3</sup> /rev]
160	- 159,7 cm <sup>3</sup> /rev [9.74 in <sup>3</sup> /rev]
200	- 200,0 cm <sup>3</sup> /rev [12.20 in <sup>3</sup> /rev]
250	- 250,0 cm <sup>3</sup> /rev [15.30 in <sup>3</sup> /rev]
315	- 314,9 cm <sup>3</sup> /rev [19.20 in <sup>3</sup> /rev]
400	- 397,0 cm <sup>3</sup> /rev [24.20 in <sup>3</sup> /rev]
475	- 474,6 cm <sup>3</sup> /rev [28.96 in <sup>3</sup> /rev]
525	- 522,7 cm <sup>3</sup> /rev [31.88 in <sup>3</sup> /rev]
565	- 564,9 cm <sup>3</sup> /rev [34.47 in <sup>3</sup> /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 5/16"x5/16"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

#### 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 52)

#### Pos. 8 - Design Series

omit - Factory specified

#### NOTES:

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

\*\* Only for MSB

The hydraulic motors are mangano-phosphatized as standard.