

Technical Information

## Orbital Motors

GM / GP / GPH / GR / GRS / GH / GS / GT / GV

GFA / GGM / GKA / GKB / GKC / GWD / GBD



## Orbital Motors

<b>GM</b>	GM Series Orbital Motors	05-12
	Speed 	2450 RPM
	Torque 	88 Nm
<b>GP</b>	GP Series Orbital Motors	13-26
	Speed 	1815 RPM
	Torque 	640 Nm
<b>GPH</b>	GPH Series Orbital Motors	27-39
	Speed 	1815 RPM
	Torque 	640 Nm
<b>GR</b>	GR Series Orbital Motors	40-49
	Speed 	970 RPM
	Torque 	690 Nm
<b>GRS</b>	GRS Series Orbital Motors	50-60
	Speed 	970 RPM
	Torque 	690 Nm
<b>GH</b>	GH Series Orbital Motors	61-68
	Speed 	445 RPM
	Torque 	1040 Nm
<b>GS</b>	GS Series Orbital Motors	69-80
	Speed 	1000 RPM
	Torque 	990 Nm
<b>GT</b>	GT Series Orbital Motors	81-92
	Speed 	775 RPM
	Torque 	1470 Nm

## Orbital Motors

<b>GV</b>	GV Series Orbital Motors	93-101
	Speed	630 RPM
	Torque	2110 Nm
<b>GFA</b>	GFA Series Orbital Motors	102-112
	Speed	1141 RPM
	Torque	648 Nm
<b>GGM</b>	GGM Series Orbital Motors	113-120
	Speed	5000 RPM
	Torque	12.5 Nm
<b>GKA</b>	GKA Series Orbital Motors	121-128
	Speed	1215 RPM
	Torque	930 Nm
<b>GKB</b>	GKB Series Orbital Motors	129-137
	Speed	697 RPM
	Torque	1181 Nm
<b>GKC</b>	GKC Series Orbital Motors	138-143
	Speed	866 RPM
	Torque	1875 Nm
<b>GWD</b>	GWD Series Orbital Motors	144-150
	Speed	490 RPM
	Torque	1237 Nm
<b>GBD</b>	GBD Series Hydraulic Motor Brakes	151-153
	Speed	250 RPM
	Torque	1500 Nm

## GM Series Hydraulic Motors

### Options

- Flange connection
- Motor with needle roller bearing
- Side and rear ports
- Shaft seal for high and low pressure
- Straight, splined and tapered shafts
- Metric and BSPP ports
- Other special features

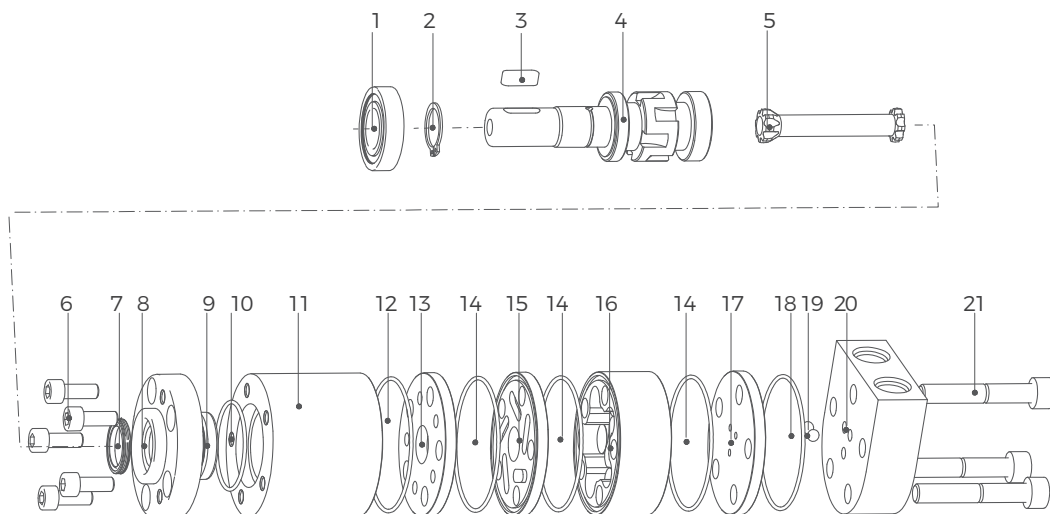
### Applications

- Conveyors
- Feeding mechanism of robots and manipulators
- Metal working machines
- Textile machines
- Agricultural machines
- Food industries
- Lawn mower



### General

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



1 Tapered roller bearing  
2 Shaft retainer  
3 Parallel Key  
4 Output shaft

5 Transmission shaft  
6 Screw  
7 Anti-dust free ring  
8 Front Cover

9 Skeleton oil seal  
10 O-ring  
11 Housing  
12 O-ring

13 Spacer 1  
14 O-ring  
15 Spacer 2  
16 Rotor and stator

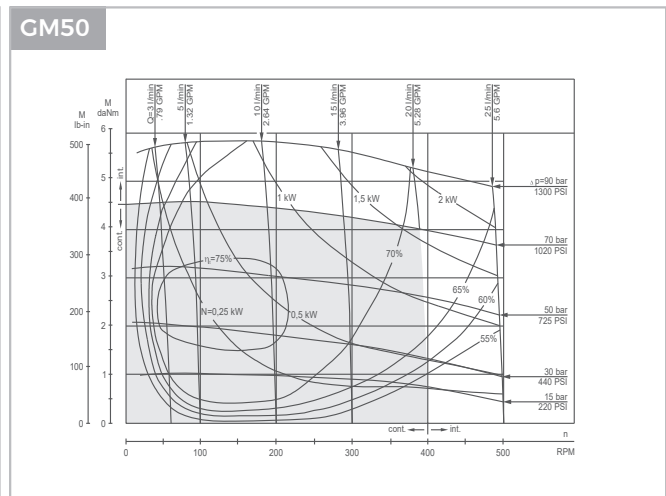
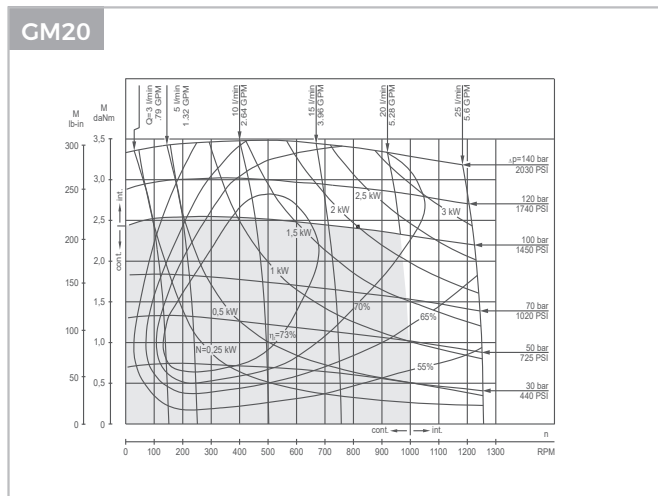
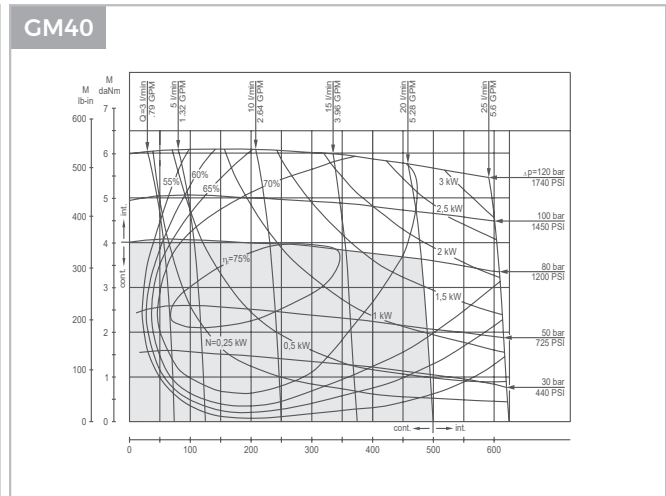
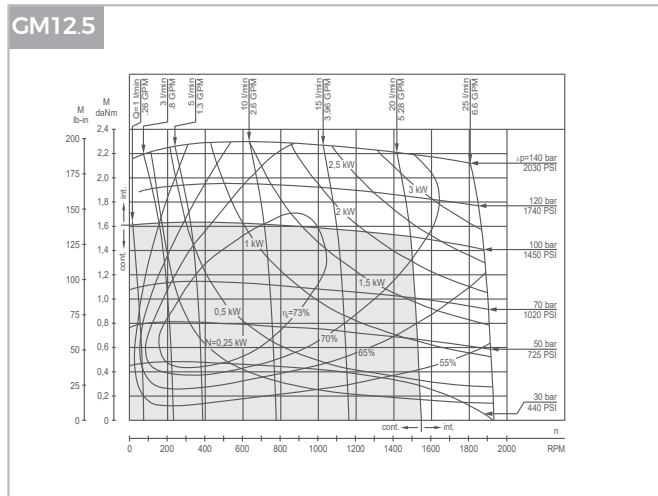
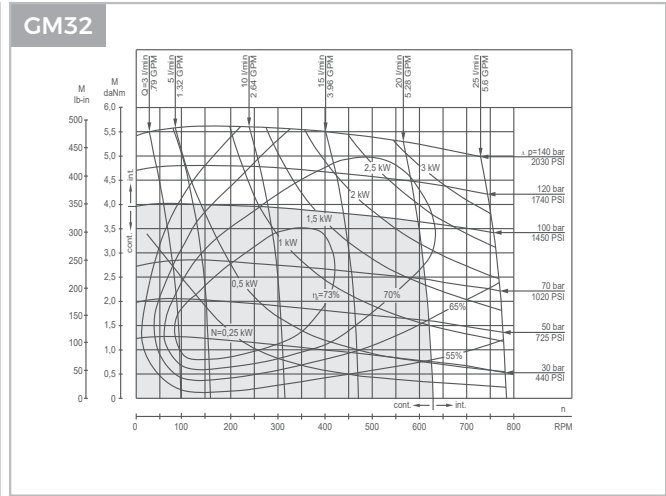
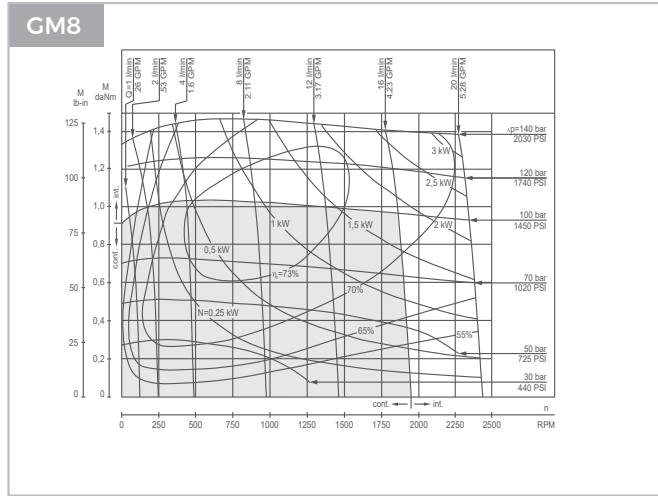
17 Balance plate  
18 O-ring seal  
19 Steel ball  
20 Rear cover  
21 Screw



## Specifications

Type		GM8	GM12.5	GM20	GM32	GM40	GM50
Displacement, cm <sup>3</sup> /rev [ in <sup>3</sup> /rev ]		8.2[.50]	12.5[.77]	19.9[1.22]	31.6[1.93]	39.8[2.43]	50[3.08]
Max. Speed	Cont.	1950	1550	1000	630	500	400
RPM	Int.*	2450	1940	1250	800	630	500
Max. Torque	Cont.	1.1[95]	1.6[140]	2.5[220]	4.03501	4.5[400]	4.6[410]
daNm [lb-in]	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	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]
kW [HP]	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	Cont.	100[1450]	100[1450]	100[1450]	100[1450]	90[1310]	70[1020]
bar [PSI]	Int.*	140[2030]	140[2030]	140[2030]	140[2030]	140[2030]	140[2030]
	Peak**	200[2900]	200[2900]	200[2900]	160[2900]	160[2900]	160[2900]
Max. Oil Flow	Cont.	16[4.2]	20[5.3]	20[5.3]	20[5.3]	20[5.3]	20[5.3]
lpm [GPM]	Int.*	20[5.3]	25[6.6]	25[6.6]	25[6.6]	25[6.6]	25[6.6]
Max. Inlet Pressure	Cont.	140[2030]	140[2030]	140[2030]	140[2030]	140[2030]	140[2030]
bar [PSI]	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	Cont. 0-100 RPM	140[2030]	140[2030]	140[2030]	140[2030]	140[2030]	140[2030]
without Drain Line	Cont.100-400 RPM	105[1500]	105[1500]	105[1500]	105[1500]	105[1500]	105[1500]
bar [PSI]	Cont. 400-800 RPM	50[725]	50[725]	50[725]	50[725]	50[725]	50[725]
Max. Pressure	Cont. >800 RPM	20[290]	20[290]	20[290]	-	-	-
in Drain Line, bar [PSI]	int.* 0-max. RPM	140[2030]	140[2030]	140[2030]	140[2030]	140[2030]	140[2030]
Max. Return Pressure	Cont.	140[2030]	140[2030]	140[2030]	140[2030]	140[2030]	140[2030]
with Drain Line	Int.*	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]
bar [PSI]	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	At max. press. drop Cont.	0.7[60]	1.2[105]	2.1[185]	3.4[300]	3.8[335]	4.1[365]
daNm [lb-in]	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]	GM	1.9[4.2]	2.0[4.41]	2.1[4.63]	2.2[4.85]	2.3[5.07]	2.5[5.51]

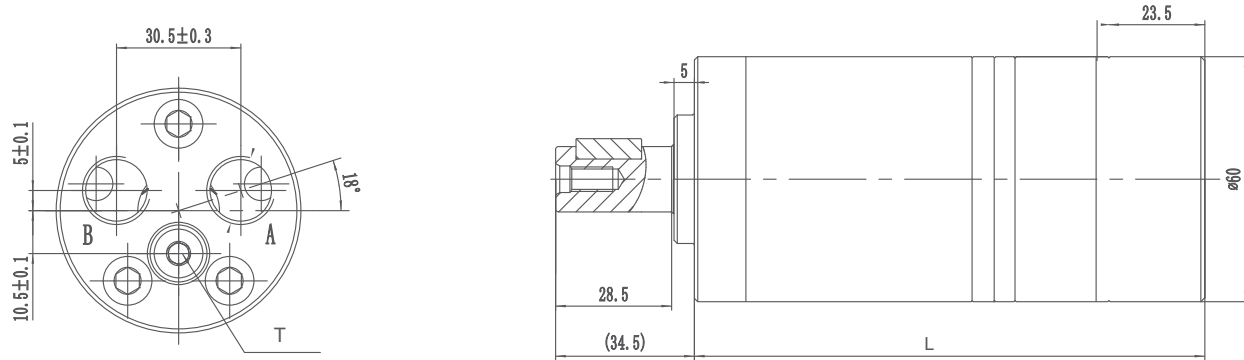
## Function Diagrams



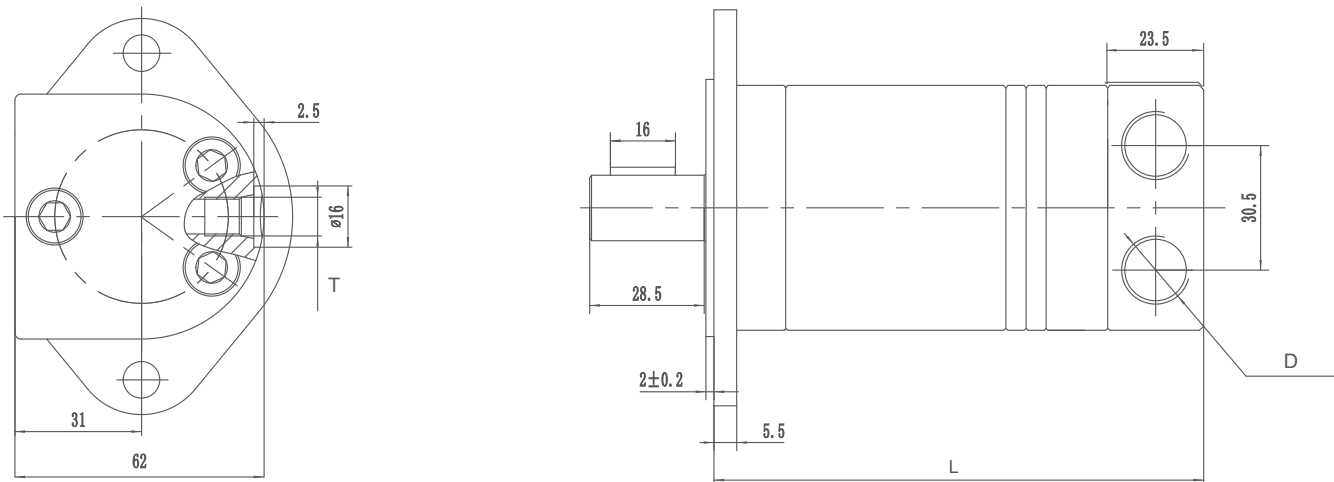
The function diagrams data is for average performance of randomly selected motors at backpressure. 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm<sup>2</sup>/s [150 SUS] at 50°C [122 F].

## GM Dimensions and Mountings

### Model A



### Model B

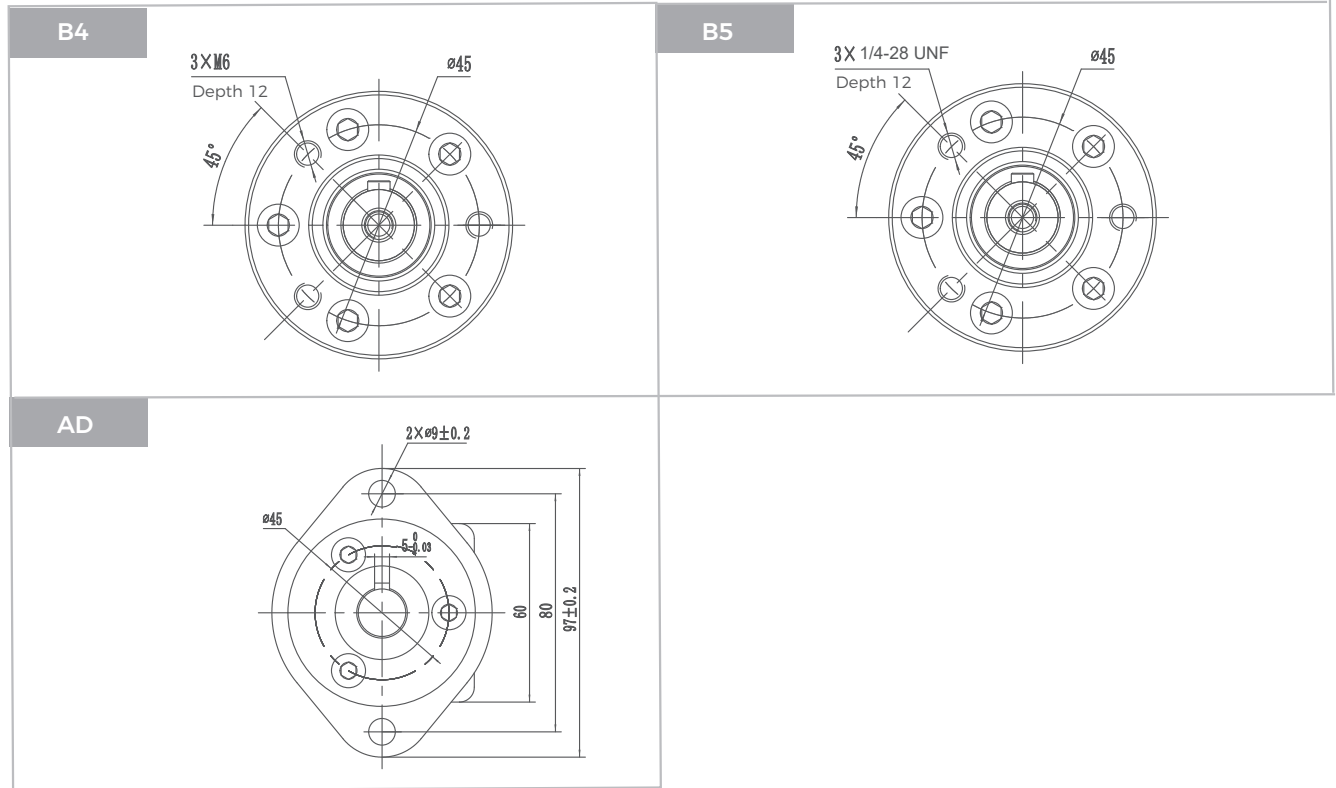


Model	Model A	Model B
	L	L
GM8	109	105
GM12.5	111	107
GM20	114	110
GM32	119	115
GM40	122	118
GM50	127	123

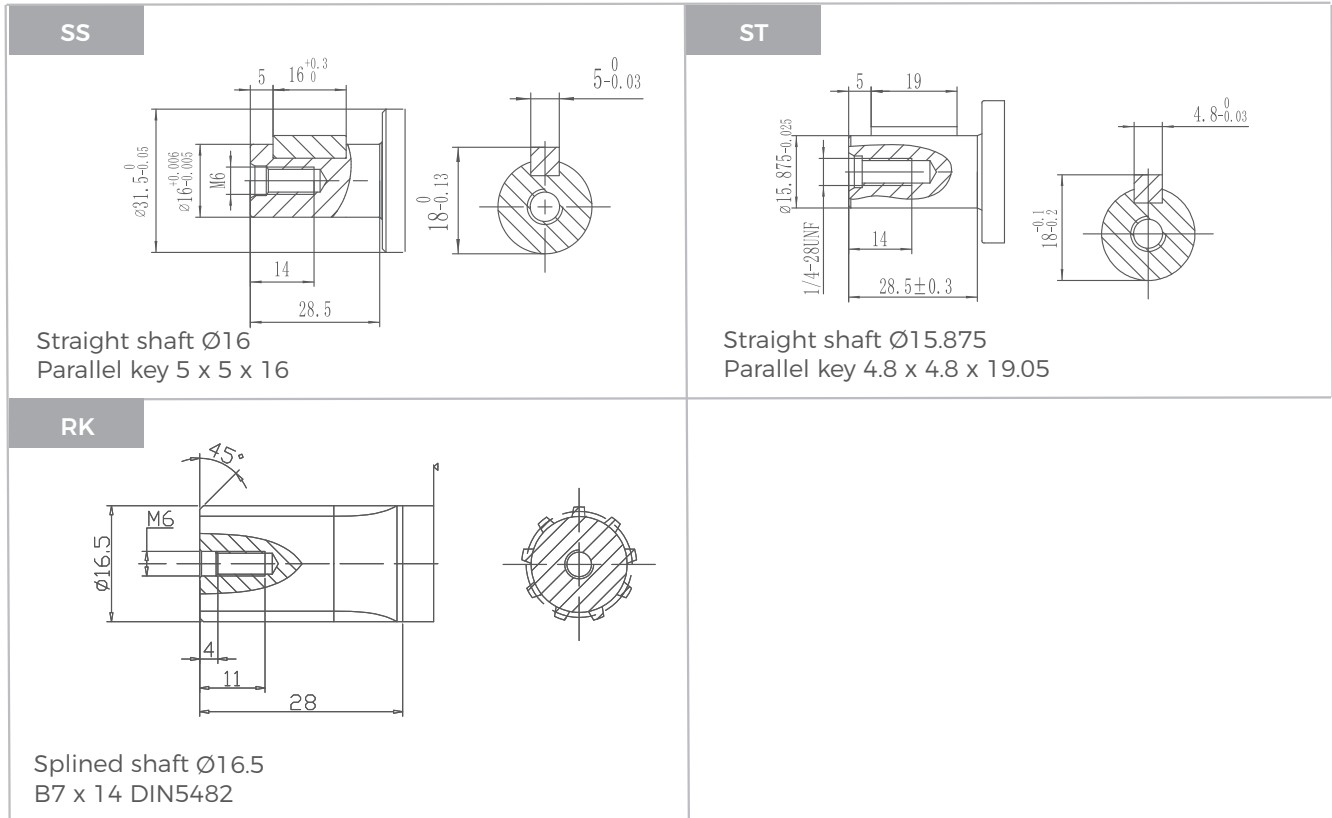
Mounting	GA	U8	GB	U9
	(depth)	(depth)	(depth)	(depth)
P(A, B)	G3/8 (12)	9/16-18UNF (12)	End port G3/8 (12)	End port 9/16-18UNF (12)
T	G1/8 (8)	3/8-24UNF (8)	G1/8 (8)	8-24UNF (8)



## GM Flange Covers Dimensions

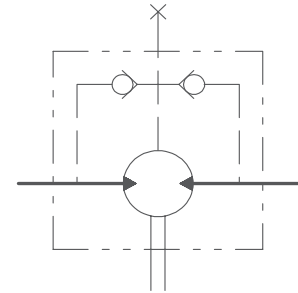
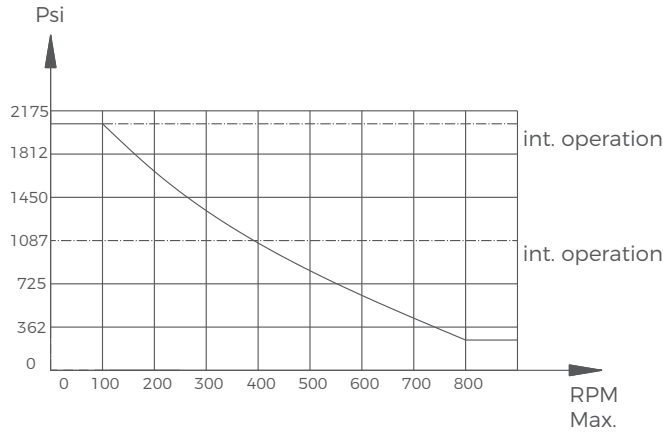


## GM Shafts Dimensions



## GM Series Hydraulic Motors

### Permissible shaft seal pressure



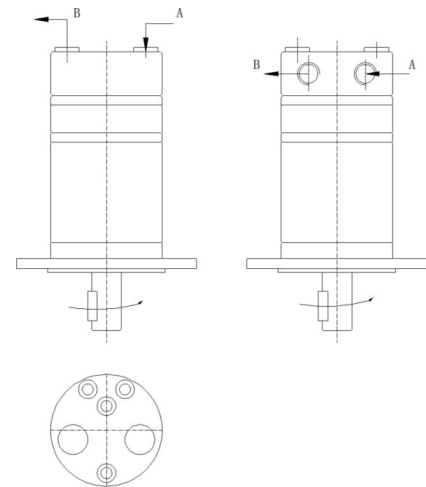
GM with standard shaft seal check valves and without use of drain connection: The pressure on the shaft seal never exceeds the pressure in the return line. GM with standard shaft seal, check valves and with drain connection: The shaft seal pressure equals the pressure on the drain line.

### Drain Port

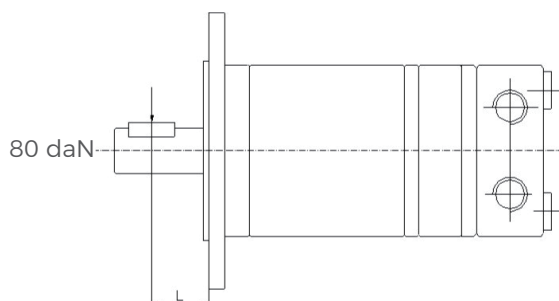
In applications without drain line, output shaft seal exceeds a bit of the pressure in the return line. In applications using the drain line, the pressure of output shaft seal equals the pressure in drain line.

### Standard direction of shaft rotation: Standard

When facing shaft end of motor, shaft to rotate:  
 Clockwise. When port "A" is pressurized.  
 Counter-clockwise port "B" is pressurized.



### Axial and Radial force



$$Fr = \frac{600}{n} * \frac{13040}{61.5 + L} \text{ (daN)}$$

Fr =Radial Force (daN)

L =Distance (mm)

n =Speed (rpm)

Rhomb flange L=15mm

Square flange L=20mm

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- Other special features

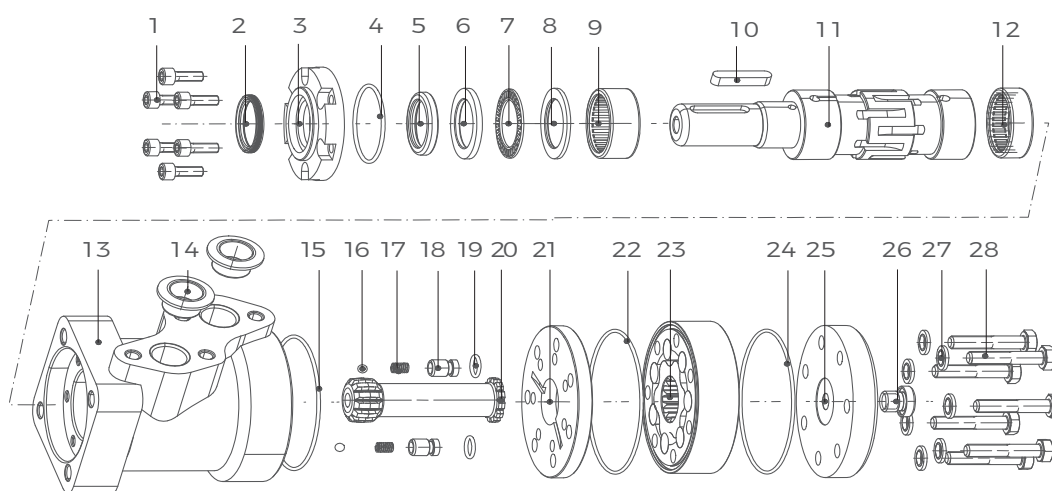
### Applications

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- Lawn mower



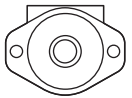

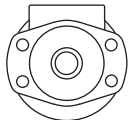

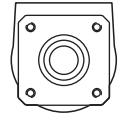

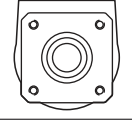







### General

Max. Displacement	cm <sup>3</sup> /rev [in <sup>3</sup> /rev]	623.6 [38.05]
Max. Speed	RPM	1815
Max. Torque	daNm [lb-in]	cont.: 50 [5144] 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 <sup>2</sup> /s [SUS]	20÷75 [98÷347]
Filtration		ISO code 20/16 [Min. recommended fluid filtration of 25 microns]



1 Bolt	6 Bearing retainer	11 Output shaft	16 Steel ball	21 Spacer	26 Plug
2 Anti-dust ring	7 Flat bearing	12 Needle roller bearing	17 Spring	22 O-ring seal	27 Washer
3 Front cover	8 Bearing retainer	13 Housing	18 Check valve	23 Rotor and stator	28 Screw
4 O-ring seal	9 Needle roller bearing	14 Rubber plug	19 O-ring seal	24 O-ring seal	
5 Shaft seal	10 Parallel key	15 O-ring seal	20 Transmission shaft	25 Rear cover	

## Ordering Code

GP SERIES		DISP	FLANGE		SHAFT	PORTS		ROTATION	PAINT	FUNCTION	
CODE	DISP	CODE	FLANGE	CODE	SHAFT	CODE	PORTS	CODE	PAINT	CODE	FUNCTION
025	25cm <sup>3</sup> /rev [1.52in <sup>3</sup> /rev]	A2	2-Hole SAE A, pilot Ø82.5×2.8 	S1	Shaft Ø25, parallel key 8×7×32 	G1	G1/2, G1/4 manifold 4×M8	A	No Paint	A	Standard
032	32cm <sup>3</sup> /rev [1.95in <sup>3</sup> /rev]	A4	4-Hole SAE A, pilot Ø82.5×2.8 	S2	Shaft Ø25.4, parallel key 6.35×6.35×31.75 	M1	M22×1.5M14×1.5, manifold 4×M8	B	Blue	N	Big radial force
040	40cm <sup>3</sup> /rev [2.44in <sup>3</sup> /rev]	H4	4-3/8-16UNC square, pilot Ø44.4×2.8 	R1	Shaft Ø25.4, splined tooth SAE6B 	U2	7/8-1UNF, 7/16-20UN manifold 4×5/16-18UNCF	C	Black	D	No case drain
050	49.5cm <sup>3</sup> /rev [3.02in <sup>3</sup> /rev]	H5	4-M10 square, pilot Ø44.4×2.8 	S3	Shaft Ø25.4, parallel key 6.35×6.35×31.75 	U1	7/8-14NPTF, 7/16 - 20UNF, manifold 4×5/16 - 18UNC	S	Silver grey	F	Free running
080	79.2cm <sup>3</sup> /rev [4.83in <sup>3</sup> /rev]			S4	Shaft Ø32, parallel key 10×8×45 	G2	PT (Rc) 1/2, PT (Rc) 1/4 manifold 4×M8	L	Low speed	V	High temp.
100	99cm <sup>3</sup> /rev [6.04in <sup>3</sup> /rev]			R2	Shaft Ø31.75, splined tooth 14 - DP 12/24 			S	Low temp.		
125	123.8cm <sup>3</sup> /rev [7.55in <sup>3</sup> /rev]			R3	Long shaft Ø31.75,splined tooth 14 - DP 12/24 						
160	158.4cm <sup>3</sup> /rev [9.66in <sup>3</sup> /rev]			S5	Shaft Ø31.75, parallel key 7.96×7.96×31.75 						
200	198cm <sup>3</sup> /rev [12.1in <sup>3</sup> /rev]			T1	Tapered shaft Ø28.56, parallel key B5×5×14 						
250	247.5cm <sup>3</sup> /rev [15.1in <sup>3</sup> /rev]			T2	Tapered shaft Ø31.75, paralle key 7.96×7.96×25.4 						
315	316.8cm <sup>3</sup> /rev [19.3in <sup>3</sup> /rev]										
400	396cm <sup>3</sup> /rev [24.16in <sup>3</sup> /rev]										
500	495cm <sup>3</sup> /rev [30.2in <sup>3</sup> /rev]										
630	623.6cm <sup>3</sup> /rev [38.05in <sup>3</sup> /rev]										

## Specifications

Technical data for GP with Ø25 and 1" straight and 1" splined and Ø28.56 tapered shaft

Type		GP25	GP32	GP40	GP50	GP80	GP100	GP125
Displacement, cm <sup>3</sup> /rev [in <sup>3</sup> /rev]		25[1.52]	32[1.95]	40[2.44]	49.5[3.02]	79.2[4.83]	99[6.04]	123.8[7.55]
Max. Speed,	Cont.	1600	1560	1500	1210	755	605	486
RPM	Int*	1815	1720	1750	1515	945	755	605
Max. Torque	Cont.	3.3[290]	4.3[380]	6.2[550]	9.4[835]	15.1[1340]	19.3[1710]	23.7[2100]
daNm [lb-in]	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	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]
kW [HP]	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	Cont.	100[1450]	100[1450]	120[1750]	140[2030]	140[2030]	140[2030]	140[2030]
bar [PSI]	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	Cont.	40[10.5]	50[13.2]	60[15.9]	60[15.9]	60[15.9]	60[15.9]	60[15.9]
lpm [GPM]	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	Cont.	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]
bar [PSI]	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	Cont.	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]
without Drain Line	Int*	200[2900]	200[2900]	200[2900]	200[2900]	200[2900]	200[2900]	200[2900]
bar [PSI]	Peak**	225[3260]	225[3260]	225[3260]	225[3260]	225[3260]	225[3260]	225[3260]
Max. Starting Pressure		10[145]	10[145]	10[145]	10[145]	10[145]	10[145]	9[131]
with Unloaded Shaft, bar [PSI]								
Min. Starting Torque	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]
daNm [lb-in]	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 Port + 0.450 [992]	GP	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]

## Specifications

Technical data for GP with Ø25 and 1" straight and 1" splined and Ø28.56 tapered shaft

Type		GP160	GP200	GP250	GP315	GP400	GP500	GP630
Displacement, cm <sup>3</sup> /rev [in <sup>3</sup> /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,	Cont	378	303	242	190	150	120	95
RPM	Int*	472	378	303	236	189	150	120
Max. Torque	Cont	31,3[2770]	36,6[3240]	38[3360]	38[3360]	36[3190]	39[3452]	44[3895]
daNm [lb-in]	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	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]
kW [HP]	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	Cont	140[2030]	140[2030]	110[1600]	90[1300]	70[1015]	60[870]	55[800]
bar [PSI]	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	Cont	60[15.9]	60[15.9]	60[15.9]	60[15.9]	60[15.9]	60[15.9]	60[15.9]
lpm [GPM]	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	Cont	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]	140[2030]	140[2030]
bar [PSI]	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	Cont	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]	140[2030]	140[2030]
without Drain Line	Int*	200[2900]	200[2900]	200[2900]	200[2900]	200[2900]	175[2540]	175 [2540]
bar [PSI]	Peak**	225[3260]	225[3260]	225[3260]	225[3260]	225[3260]	225[3260]	225[3260]
Max. Starting Pressure		8[116]	7[100]	6[87]	5[73]	5[73]	5[73]	5[73]
with Unloaded Shaft, bar [PSI]								
Min. Starting Torque	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]
daNm [lb-in]	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 Port + 0.450 [992]	GP	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]

## Specifications

Technical data for GP with  $\varnothing 31.75$  and  $\varnothing 32$  shaft

Type		GP25	GP32	GP40	GP50	GP80	GP100	GP125
Displacement, cm <sup>3</sup> /rev [in <sup>3</sup> /rev]		25[1.52]	32[1.95]	40[2.44]	49.5[3.02]	79.2[4.83]	99[6.04]	123.8[7.55]
Max. Speed,	Cont	1600	1560	1500	1210	755	605	486
RPM	Int*	1815	1720	1750	1515	945	755	605
Max. Torque	Cont	3.3[290]	4.3[380]	6.2[550]	9.4[835]	15.1[1340]	19.3[1710]	23.7[2100]
daNm [lb-in]	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	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]
kW [HP]	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	Cont	100[1450]	100[1450]	120[1750]	140[2030]	140[2030]	140[2030]	140[2030]
bar [PSI]	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	Cont	40[10.5]	60[13.2]	60[15.9]	60[15.9]	60[15.9]	60[15.9]	60[15.9]
lpm [GPM]	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	Cont	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]
bar [PSI]	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	Cont	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]
without Drain Line	Int*	200[2900]	200[2900]	200[2900]	200[2900]	200[2900]	200[2900]	200[2900]
bar [PSI]	Peak**	225[3260]	225[3260]	225[3260]	225[3260]	225[3260]	225[3260]	225[3260]
Max. Starting Pressure		10[145]	10[145]	10[145]	10[145]	10[145]	10[145]	9[131]
with Unloaded Shaft, bar [PSI]								
Min. Starting Torque		3.0[265]	4.0[355]	5.4[480]	7.8[690]	13.2[1170]	16.6[1470]	20.7[1830]
daNm [lb-in]	At max. press. drop Cont	4.2[370]	5.6[500]	6.8[600]	10[885]	16.8[1490]	21[1860]	26.6[2360]
Min. Speed***, RPM	At max. press. drop Int*	20	15	10	10	10	10	10
Weight, kg [lb] For								
Rear Port + 0.450 [992]	GP	5.6[12.3]	5.6[12.3]	5.7[12.6]	5.9[13]	6[13.2]	6.2[13.7]	6.3[13.9]

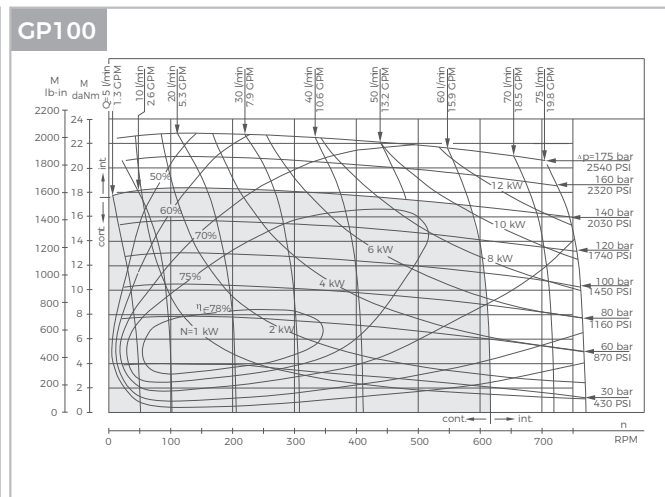
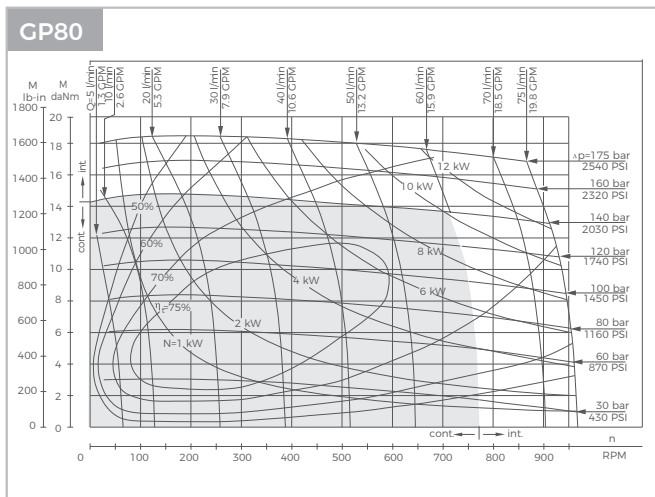
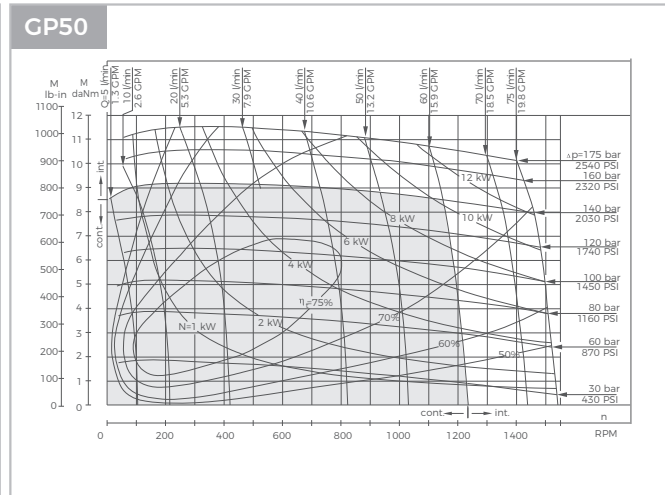
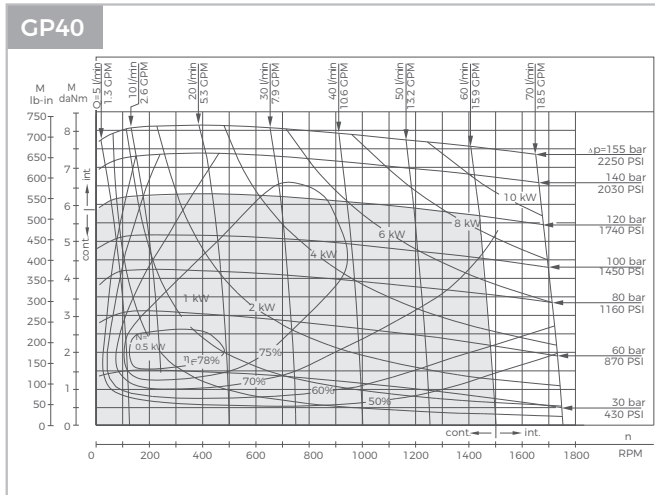
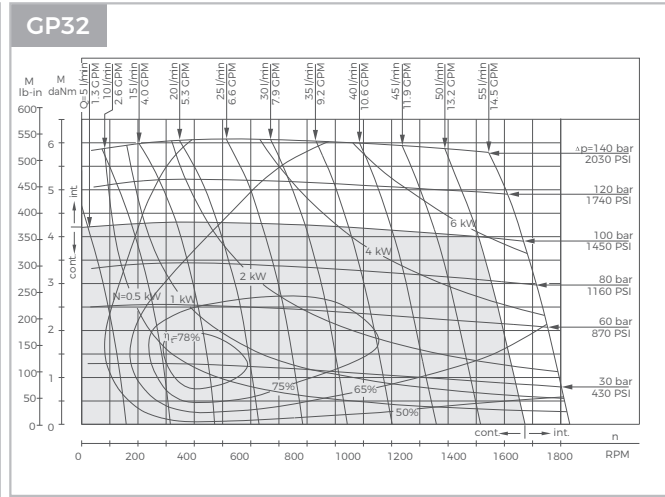
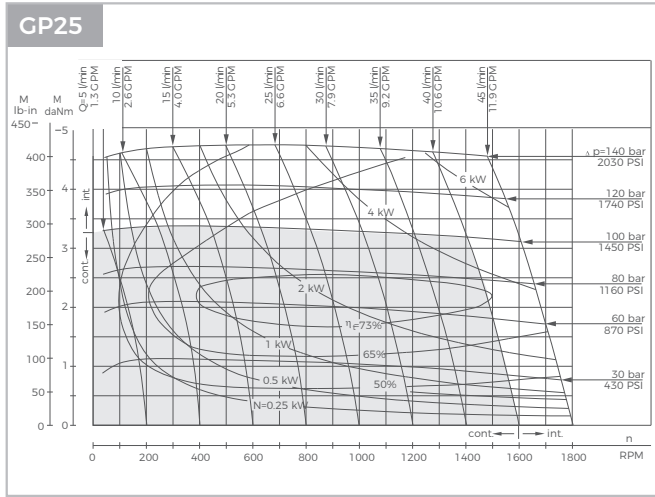


## Specifications

Technical data for GP with Ø31.75 and Ø32 shaft

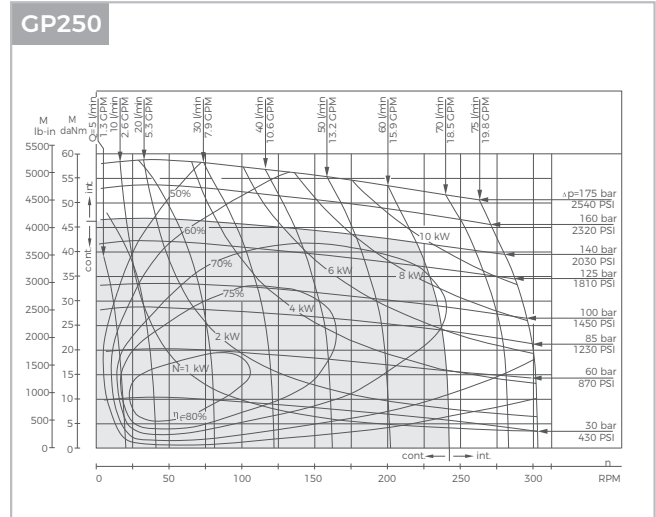
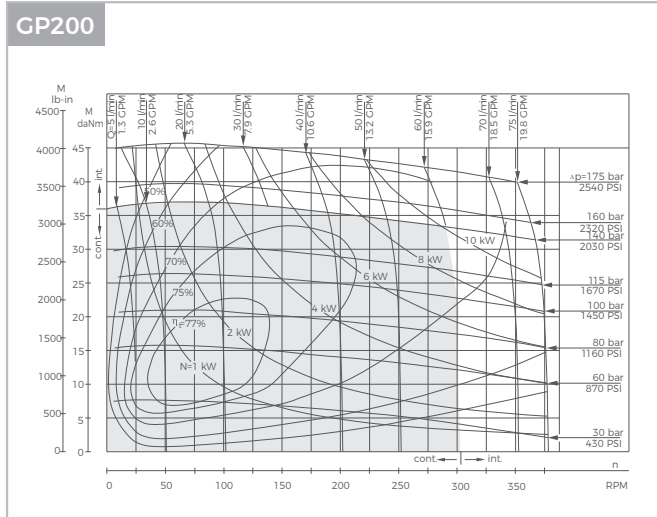
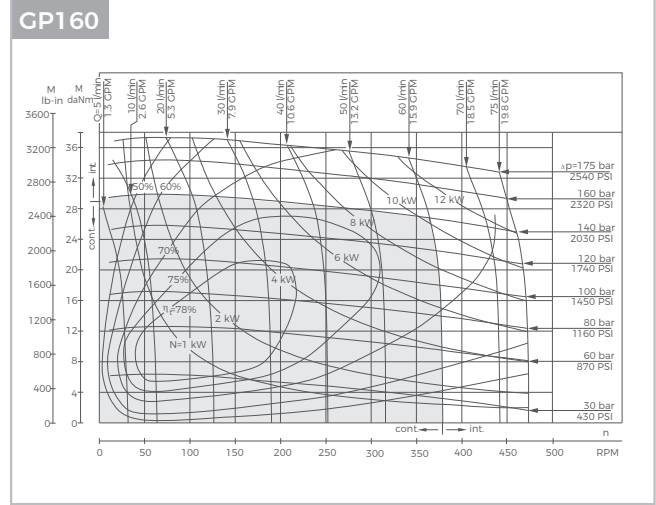
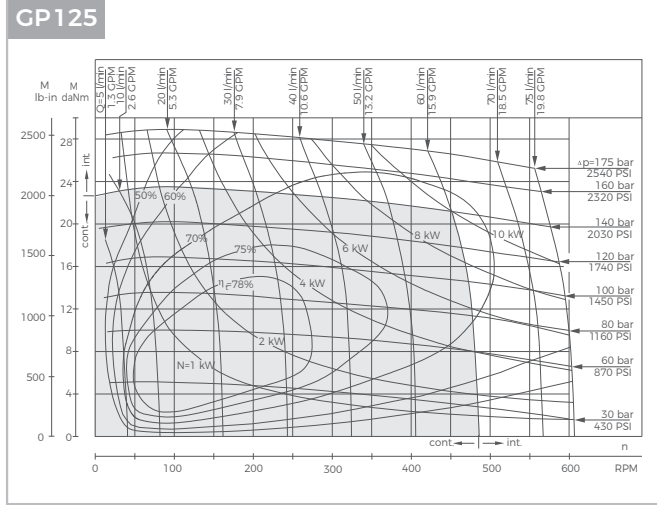
Type		GP160	GP200	GP250	GP315	GP400	GP500	GP630
Displacement, cm <sup>3</sup> /rev [in <sup>3</sup> /rev]		158,4[9.66]	198[12.1]	247,5[15.1]	316,8[19.3]	396[24.16]	495[30.2]	623,6[38.05]
Max. Speed,	Cont.	378	303	242	190	150	120	95
RPM	Int*	472	378	303	236	189	150	120
Max. Torque	Cont.	31,3[2770]	36,6[3240]	47[4160]	48[4360]	50[4415]	39[3452]	44[3895]
daNm [lb-in]	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	Cont.	10,1[13.5]	10[13.5]	9[12.1]	7,6[10.2]	6,2[8.3]	3,5[4.7]	3,3[4.4]
kW [HP]	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	Cont.	140[2030]	140[2030]	140[2030]	120[1740]	95[1400]	60[870]	55[800]
bar [PSI]	Int*	175[2540]	175[2540]	175[2540]	140[2030]	115[1670]	90[1305]	80[1160]
	Peak**	225[3260]	225[3260]	225[3260]	225[3260]	180[2610]	130[1885]	110[1740]
Max. Oil Flow	Cont.	60[15.9]	60[15.9]	60[15.9]	60[15.9]	60[15.9]	60[15.9]	60[15.9]
lpm [GPM]	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	Cont.	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]	140[2030]	140[2030]
bar [PSI]	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	Cont.	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]	140[2030]	140[2030]
without Drain Line	Int*	200[2900]	200[2900]	200[2900]	200[2900]	200[2900]	175[2540]	175[2540]
bar [PSI]	Peak**	225[3260]	225[3260]	225[3260]	225[3260]	225[3260]	225[3260]	225[3260]
Max. Starting Pressure		8[116]	7[100]	6[87]	5[73]	5[73]	5[73]	5[73]
with Unloaded Shaft, bar [PSI]								
Min. Starting Torque		28,2[2500]	33,5[2950]	42,8[3790]	40,50[45.8]	46,8[4140]	36[3180]	41,5[3670]
daNm [lb-in]	At max. press. drop Cont.	35,5[3140]	42,6[3770]	54,2[4795]	54,80[61.9]	60,8[5390]	54[4780]	62[5480]
Min. Speed***, RPM	At max. press. drop Int*	10	10	10	10	10	10	10
Weight, kg [lb] For Rear Port + 0,450 [992]	GP	6[14.3]	6[14.8]	6,9[15.2]	7,2[15.9]	7,7[17]	9[19.9]	9[21.2]

## Function Diagrams



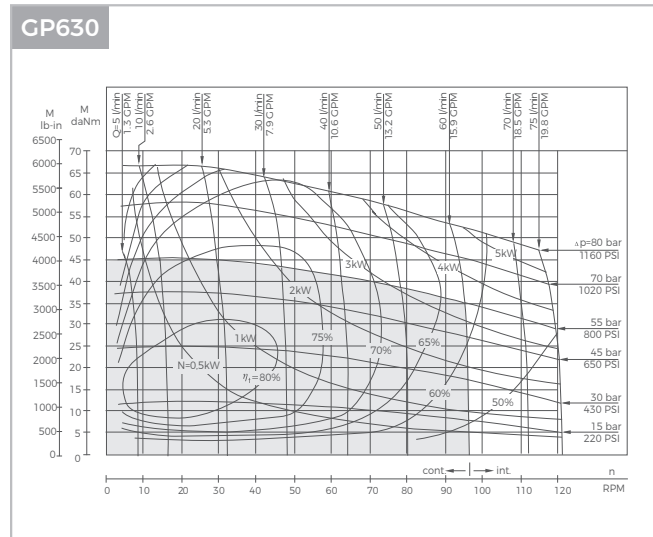
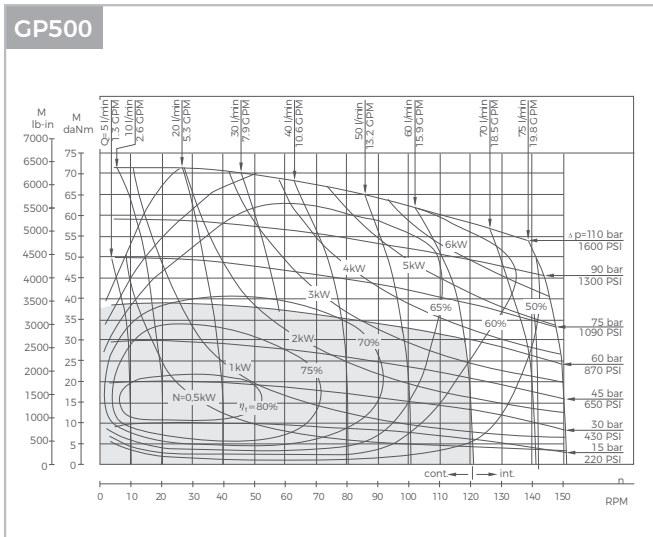
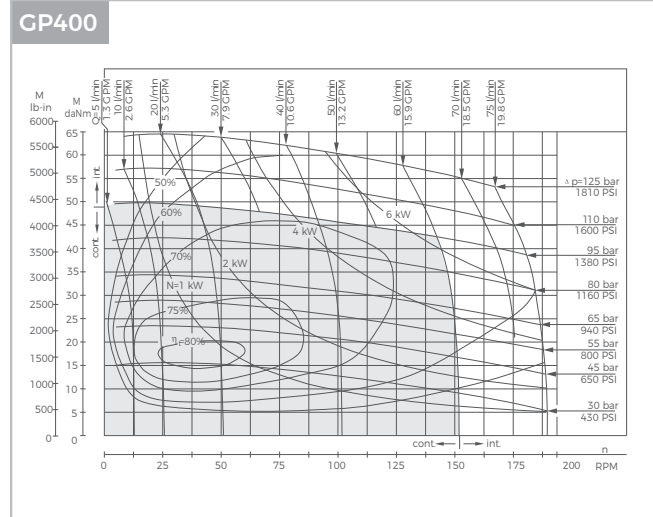
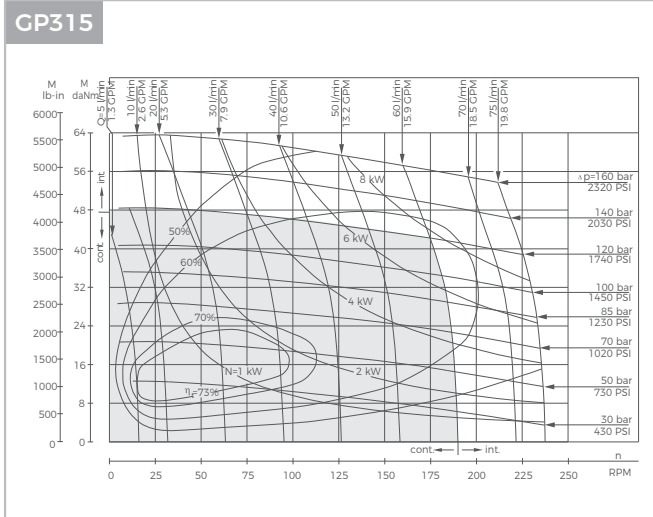
The function diagrams data is for average performance of randomly selected motors at backpressure. 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm<sup>2</sup>/s [150 SUS] at 50°C [122°F].

## Function Diagrams



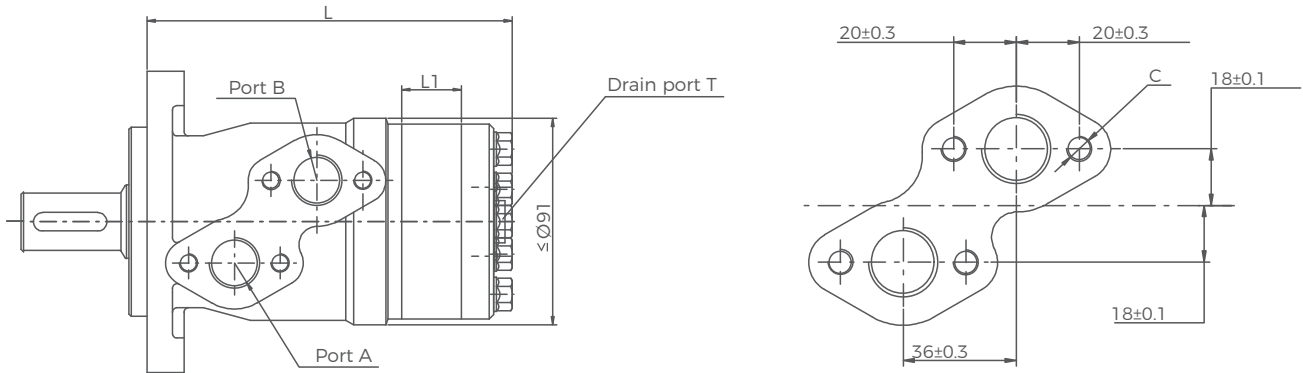
The function diagrams data is for average performance of randomly selected motors at backpressure.  $5 \pm 10$  bar [72.5  $\div$  145 PSI] and oil with viscosity of 32 mm<sup>2</sup>/s [150 SUS] at 50°C [122°F].

## Function Diagrams



The function diagrams data is for average performance of randomly selected motors at backpressure. 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].

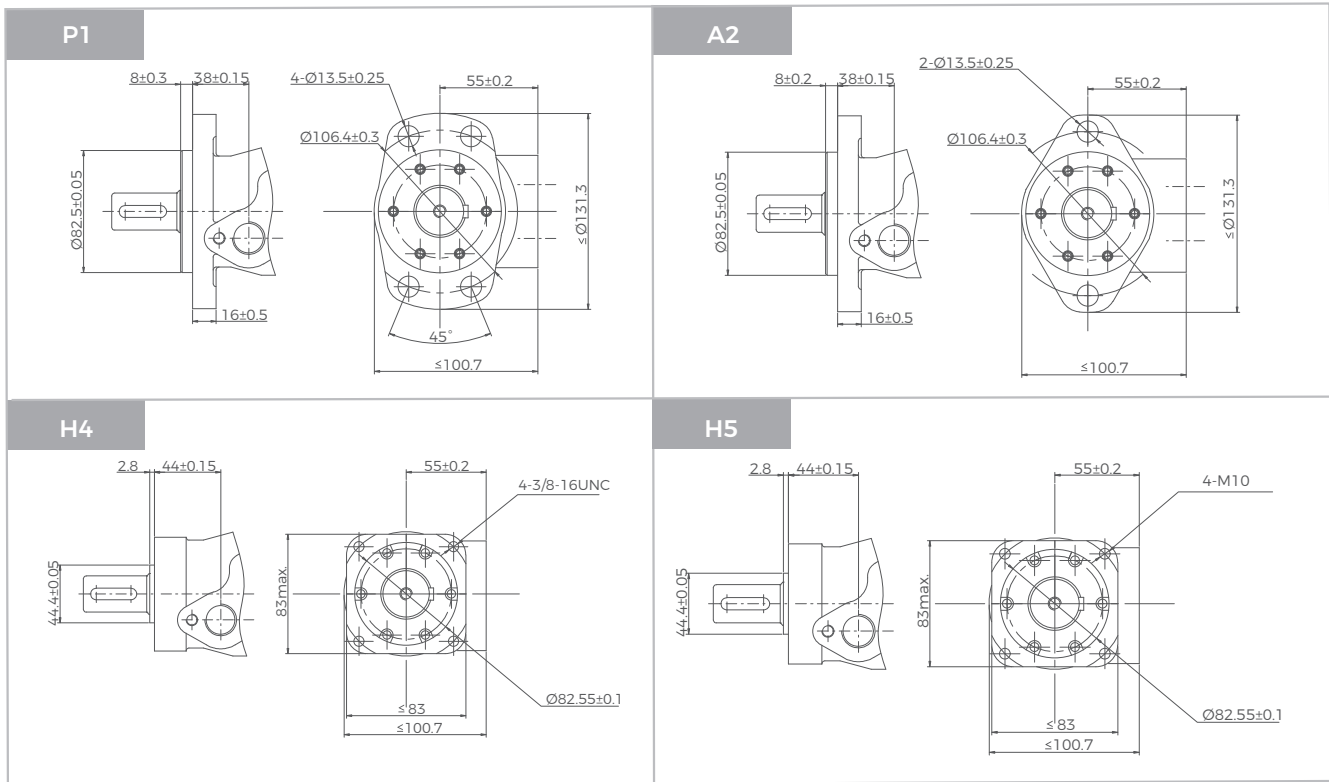
### GP Dimensions and Mountings



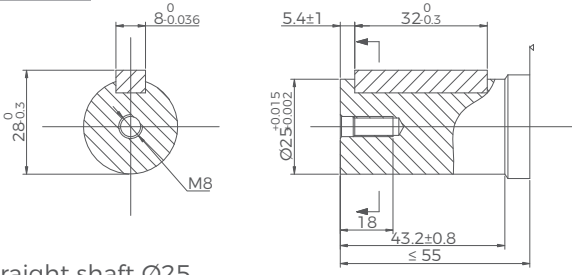
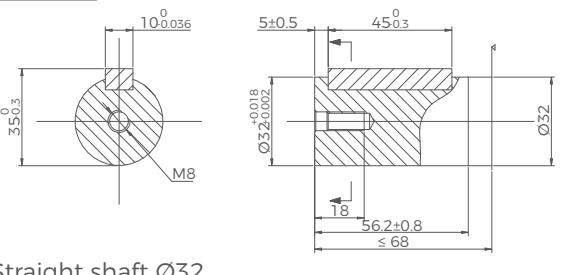
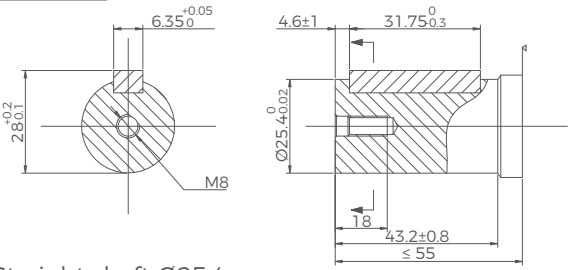
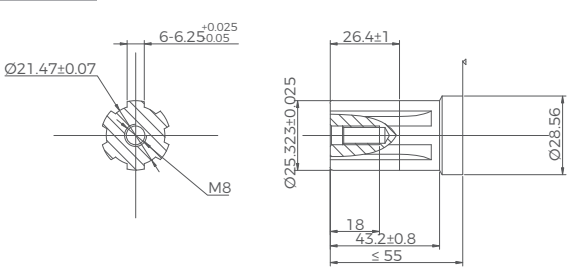
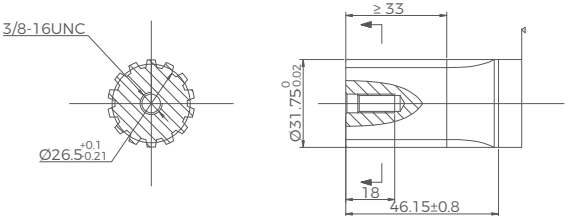
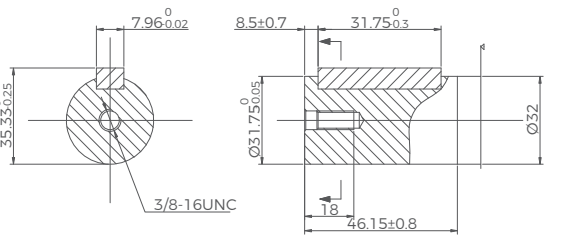
Model	L	L1
GP25	135	4.5
GP32	136	5.5
GP40	137	7
GP50	137	7
GP80	140.5	10.5
GP100	143	13
GP125	146	16
GP160	151	21
GP200	157	26
GP250	162	32
GP315	172	42
GP400	182	52
GP500	195	65
GP630	213	84

Mounting	G1 (depth)	M1 (depth)	U2 (depth)	U1 (depth)	G2 (depth)
P(A, B)	G1/2(15)	M22 x 1.5(15)	7/8-14 O-ring(17)	1/2-14NPTF(15)	PT(RC)1/2(15)
C	4-M8(13)	4-M8(13)	4-5/16-18UNC(13)	4-5/16-18UNC(13)	4-M8(13)
T	G1/4(12)	M14 x 1.5(12)	7/16-20UNF(12)	7/16-20UNF(12)	PT(RC)1/4(9.7)

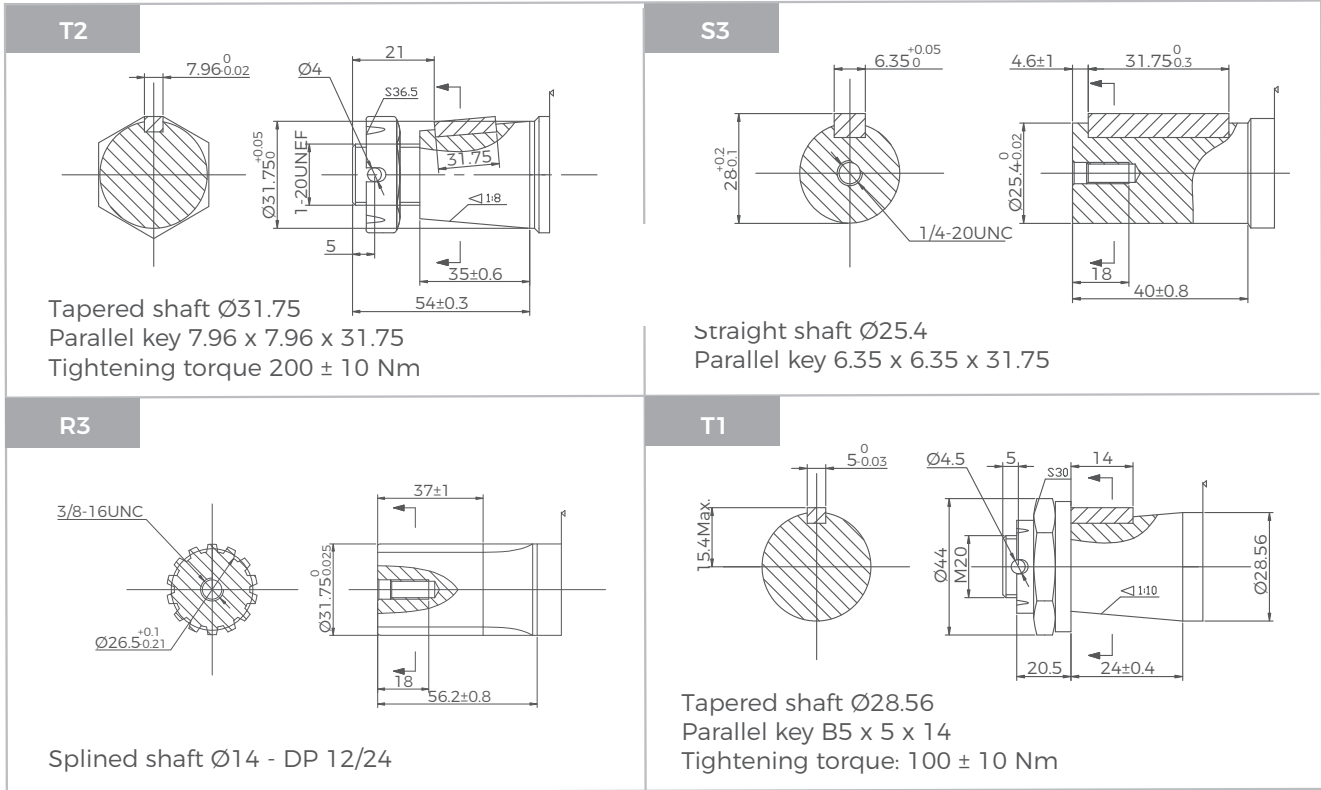
## GP Flange Covers Dimensions



### GP Shafts Dimensions

<p><b>S1</b></p>  <p>Straight shaft Ø25 Parallel key 8 x 7 x 32</p>	<p><b>S4</b></p>  <p>Straight shaft Ø32 Parallel key 10 x 8 x 45</p>
<p><b>S2</b></p>  <p>Straight shaft Ø25.4 Parallel key 6.35 x 6.35 x 31.75</p>	<p><b>R1</b></p>  <p>Splined shaft SAE 6B</p>
<p><b>R2</b></p>  <p>Splined shaft 14 - DP 12/ 24</p>	<p><b>S5</b></p>  <p>Straight shaft Ø31.75 Parallel key 7.96 x 7.96 x 31.75</p>

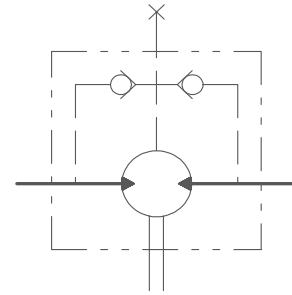
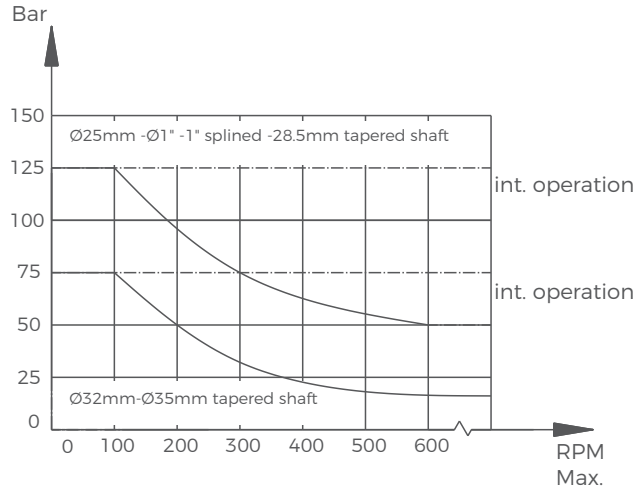
### GP Shafts Dimensions





## GP Series Hydraulic Motors

### Permissible shaft seal pressure



GP with standard shaft seal check valves and without use of drain connection: The pressure on the shaft seal never exceeds the pressure in the return line.

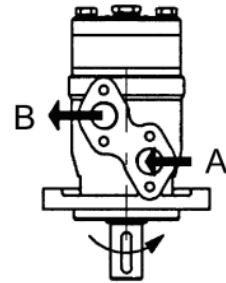
GP with standard shaft seal, check valves and with drain connection: The shaft seal pressure equals the pressure on the drain line.

### Drain Port

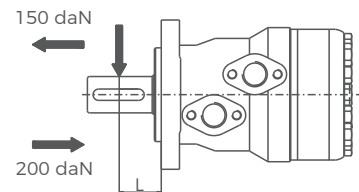
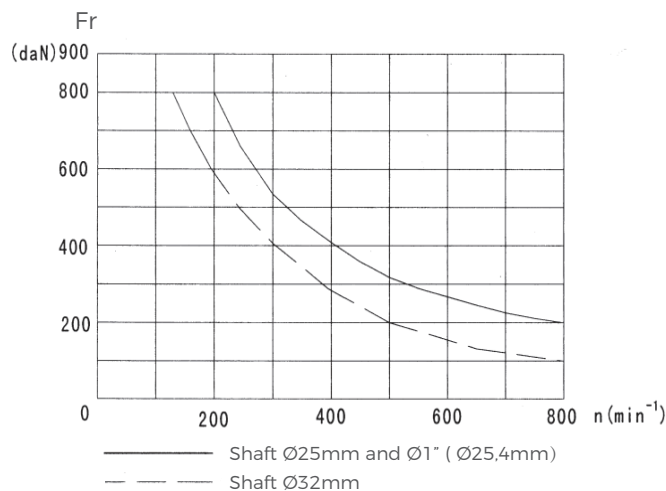
In applications without drain line, output shaft seal exceeds a bit of the pressure in the return line. In applications using the drain line, the pressure of output shaft seal equals the pressure in drain line.

### Standard direction of shaft rotation: Standard

When facing shaft end of motor, shaft to rotate:  
 Clockwise when port A is pressurized.  
 Counter-clockwise when port B is pressurized.



### Output shaft stand radial force



$$Fr = \frac{800}{n} * \frac{25000}{95 + L} \text{ (daN)}$$

Fr = Radial Force (daN)

L = Distance (mm)

n = Speed (rpm)

Rhomb flange L = 30mm

Square flange L = 24mm

## GPH Series Hydraulic Motors

### Options

- Flange connection
- Motor with needle roller bearing
- Speed sensing
- Side and bottom ports
- Shaft seal for high and low pressure
- Straight, splined and tapered shafts
- Metric and BSPP ports
- Other special features

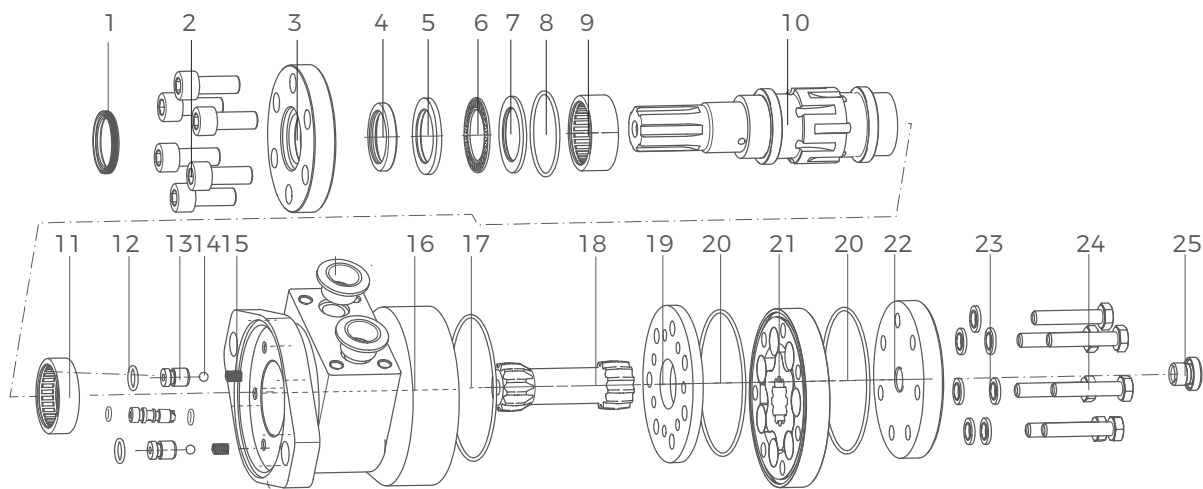
### Applications

- Conveyors
- Feeding mechanism of robots and manipulators
- Metal working machines
- Textile machines
- Agricultural machines
- Food industries
- Lawn mower




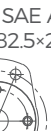
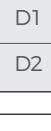
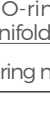


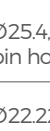








### General

Max. Displacement	cm <sup>3</sup> /rev [in <sup>3</sup> /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
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 microns)



1 Anti-dust ring	6 Flat bearing	11 Needle roller bearing	16 Rubber plug	21 Stator assembly
2 Bolt	7 Bearing retainer	12 O-ring seal	17 Housing	22 Rear cover
3 Front cover	8 O-ring seal	13 Check valve	18 O-ring seal	23 Combination washer
4 Shaft seal	9 Needle roller bearing	14 Steel ball	19 Transmission shaft	24 Screw
5 Bearing retainer	10 Output shaft	15 Spring	20 Spacer	25 External drain plug

## Ordering Code

GPH SERIES		DISP	FLANGE		SHAFT	PORTS	ROTATION	PAINT	FUNCTION
CODE		DISP	CODE	FLANGE		CODE		CODE	PAINT
025		25cm <sup>3</sup> /rev [1.52in <sup>3</sup> /rev]	A1	2-Hole SAE A, pilot Ø82.5×2.8 		G7		A	No Paint
032		32cm <sup>3</sup> /rev [1.95in <sup>3</sup> /rev]	A3	4-Hole SAE A, pilot Ø82.5×2.8 		U9		B	Blue
040		40cm <sup>3</sup> /rev [2.44in <sup>3</sup> /rev]				UA		C	Black
050		49.5cm <sup>3</sup> /rev [3.02in <sup>3</sup> /rev]	H4	4-3/8-16 UNC square pilot Ø44.4×2.8 		G8		S	Silver grey
080		79.2cm <sup>3</sup> /rev [4.83in <sup>3</sup> /rev]				D1			
100		99cm <sup>3</sup> /rev [6.04in <sup>3</sup> /rev]				D2			
125		123.8cm <sup>3</sup> /rev [7.55in <sup>3</sup> /rev]							
160		158.4cm <sup>3</sup> /rev [9.66in <sup>3</sup> /rev]	H5	4-M10 square, pilot Ø44.4×2.8 		D1			
200		198cm <sup>3</sup> /rev [12.1in <sup>3</sup> /rev]							
250		247.5cm <sup>3</sup> /rev [15.1in <sup>3</sup> /rev]							
315		316.8cm <sup>3</sup> /rev [19.3in <sup>3</sup> /rev]							
400		396cm <sup>3</sup> /rev [24.16in <sup>3</sup> /rev]							
500		495cm <sup>3</sup> /rev [30.2in <sup>3</sup> /rev]							
630		623.6cm <sup>3</sup> /rev [38.05in <sup>3</sup> /rev]							
					CODE	SHAFT		CODE	FUNCTION
					S6	Ø25.4, woodruff key Ø25.4×6.35 		A	Standard
					R4	Ø25.4, splined tooth SAE 6B 		N	Big radial force
					S7	Ø25, parallel key 8×7×32 		D	No case drain
					S8	Ø25.4, parallel key 6.35×6.35×31.75 		F	Free running
					S9	Ø25.4, pin hole Ø10.3 		L	Low speed
					SA	Ø25.4, pin hole Ø8 		V	High Temp.
					SB	Ø22.22, parallel key 6.35×6.35×25.4 		S	Low Temp.
					R5	Ø22.22, splined tooth 13-DP 16/32 			
					T3	Tapered Ø25.4, woodruff key Ø25.4×6.35 		CODE	ROTATION
					SC	Ø25, parallel key 8×7×28 		A	Standard
					SD	Ø25, parallel key 7×7×32 		R	Opposite

## Specifications

Type		GPH25	GPH32	GPH40	GPH50	GPH80
Displacement, cm <sup>3</sup> /rev [ in <sup>3</sup> /rev ]		25[1.52]	32[1.95]	40[2.44]	49.5[3.02]	79.2[4.83]
Max. Speed,	Cont.	1600	1560	1500	1210	755
RPM	Int*	1815	1720	1750	1515	945
Max. Torque	Cont.	3,3[290]	4,3[380]	6,2[550]	9,4[835]	15,1[1340]
daNm [lb-in]	Int*	4,7[415]	6,1[540]	8,2[730]	11,9[1050]	19,5[1725]
	Peak**	6,7[595]	8,6[760]	10,7[950]	14,3[1285]	22,4[1985]
Max. Output	Cont.	4,5[6.0]	5,8[7.8]	8,4[11.5]	10,1[13.5]	10,2[13.7]
kW [HP]	Int*	6,1[8.2]	7,8[10.5]	11,6[15.5]	12,2[16.1]	12,5[16.8]
Max. Pressure Drop	Cont.	100[1450]	100[1450]	120[1750]	140[2030]	140[2030]
bar [PSI]	Int*	140[2030]	140[2030]	155[2250]	175[2540]	175[2540]
	Peak**	225[3260]	225[3260]	225[3260]	225[3260]	225[3260]
Max. Oil Flow	Cont.	40[10.5]	50[13.2]	60[15.9]	60[15.9]	60[15.9]
lpm [GPM]	Int*	45[11.9]	55[14.5]	70[18.5]	75[19.8]	75[19.8]
Max. Inlet Pressure	Cont.	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]
bar [PSI]	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	Cont.	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]
without Drain Line	Int*	200[2900]	200[2900]	200[2900]	200[2900]	200[2900]
bar [PSI]	Peak**	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]
Min. Starting Torque	At max. press. drop Cont.	3,0[265]	4,0[355]	5,4[480]	7,8[690]	13,2[1170]
daNm [lb-in]	At max. press. drop Int*	4,2[370]	5,6[500]	6,8[600]	10[885]	16,8[1490]
Min. Speed***, RPM		20	15	10	10	10
Weight, kg [lb] For rear port + 0.450 [992]	GPH	5,6[12.3]	5,6[12.3]	5,7[12.6]	5,8[12.8]	5,9[13.2]

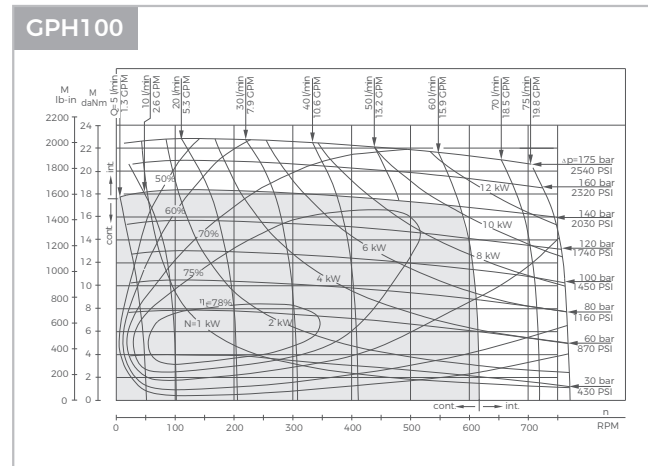
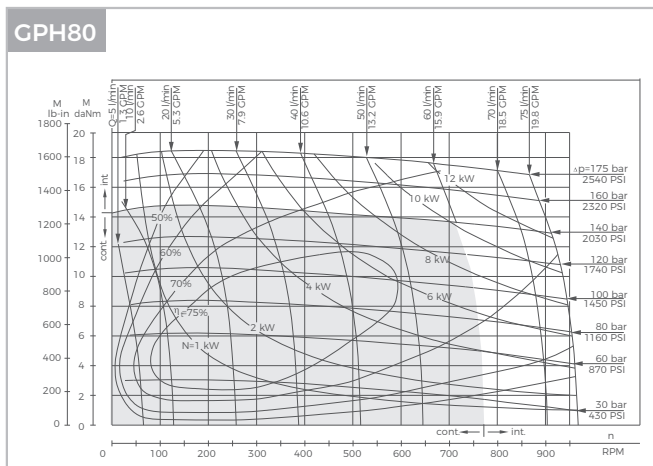
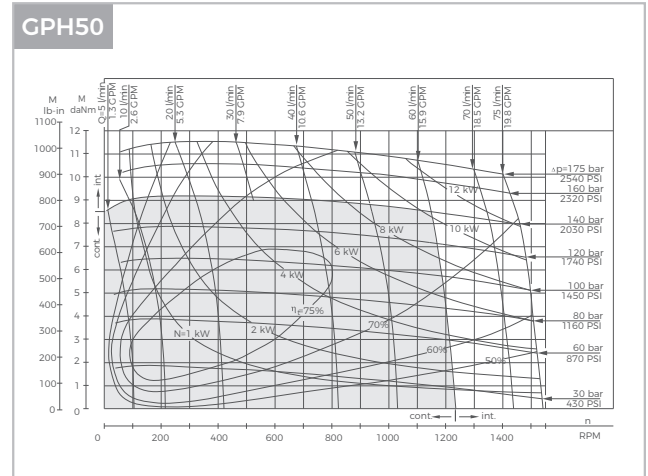
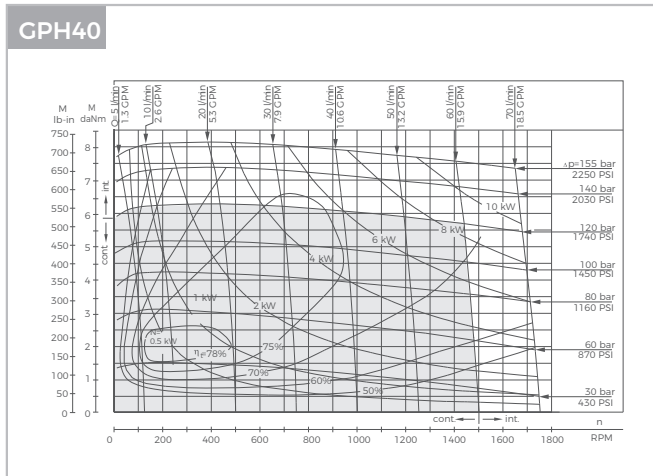
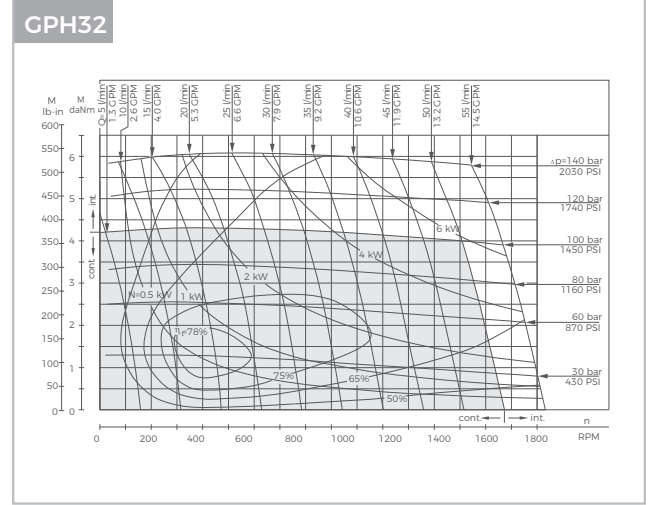
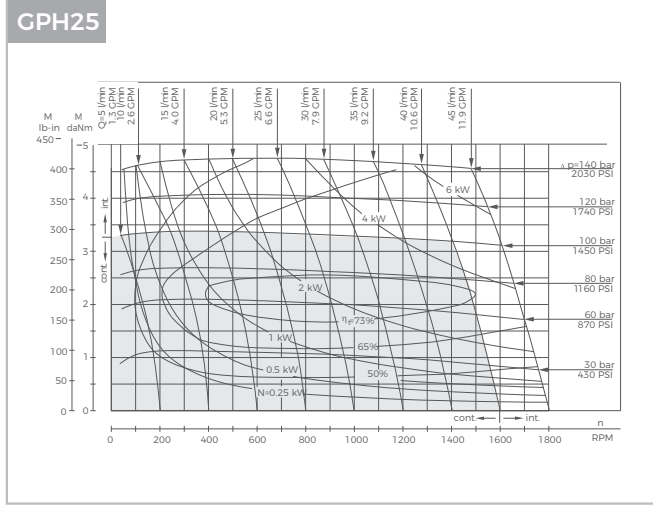
## Specifications

Type		GPH100	GPH125	GPH160	GPH200
Displacement, cm <sup>3</sup> /rev [ in <sup>3</sup> /rev ]		99[6.04]	123,8[7.55]	158,4[ 9.66]	198[12.1]
Max. Speed,	Cont.	605	486	378	303
RPM	Int*	755	605	472	378
Max. Torque	Cont.	19,3[1710]	23,7[2100]	31,3[2770]	36,6[3240]
daNm [lb-in]	Int*	23,7[2100]	29,8[2640]	37,8[3345]	45,6[4035]
	Peak**	27,5[2435]	36,5[3235]	43,8[3880]	55[4870]
Max. Output	Cont.	10,5[14.1]	10,2[13.7]	10,1[13.5]	10[13.5]
kW [HP]	Int*	12,8[17.1]	12[16.1]	12,1[16.2]	12[16.1]
Max. Pressure Drop	Cont.	140[2030]	140[2030]	140[2030]	140[2030]
bar [PSI]	Int*	175[2540]	175[2540]	175[2540]	175[2540]
	Peak**	225[3260]	225[3260]	225[3260]	225[3260]
Max. Oil Flow	Cont.	60[15.9]	60[15.9]	60[15.9]	60[15.9]
lpm [GPM]	Int*	75[19.8]	75[19.8]	75[19.8]	75[19.8]
Max. Inlet Pressure	Cont.	175[2540]	175[2540]	175[2540]	175[2540]
bar [PSI]	Int*	200[2900]	200[2900]	200[2900]	200[2900]
	Peak**	225[3260]	225[3260]	225[3260]	225[3260]
Max. Return Pressure	Cont.	175[2540]	175[2540]	175[2540]	175[2540]
without Drain Line	Int*	200[2900]	200[2900]	200[2900]	200[2900]
bar [PSI]	Peak**	225[3260]	225[3260]	225[3260]	225[3260]
Max. Starting Pressure		10[145]	9[131]	8[116]	7[100]
with Unloaded Shaft, bar [PSI]					
Min. Starting Torque	At max. press. drop Cont.	16,6[1470]	20,7[1830]	28,2[2500]	33,5[2950]
daNm [lb-in]	At max. press. drop Int*	21[1860]	26,6[2360]	35,5[3140]	42,6[3770]
Min. Speed***, RPM		10	10	10	10
Weight, kg [lb] For	GPH	6,1[13.5]	6,2[13.7]	6,4[14.1]	6,6[14.6]
rear port + 0,450 [992]					

## Specifications

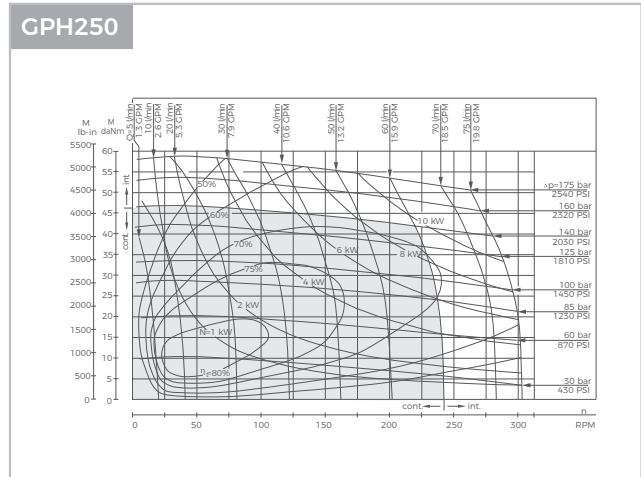
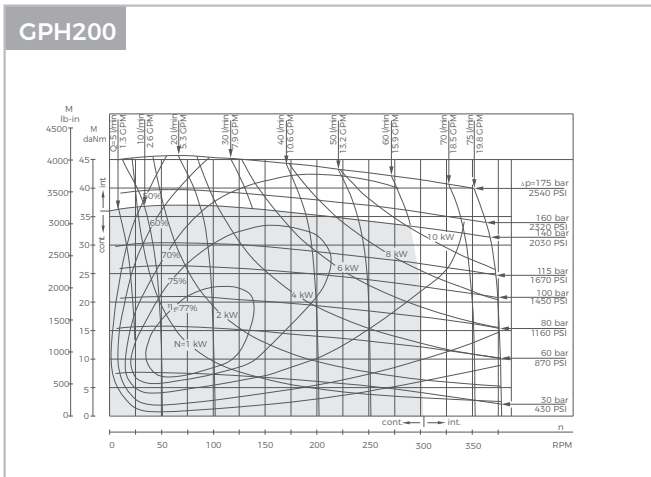
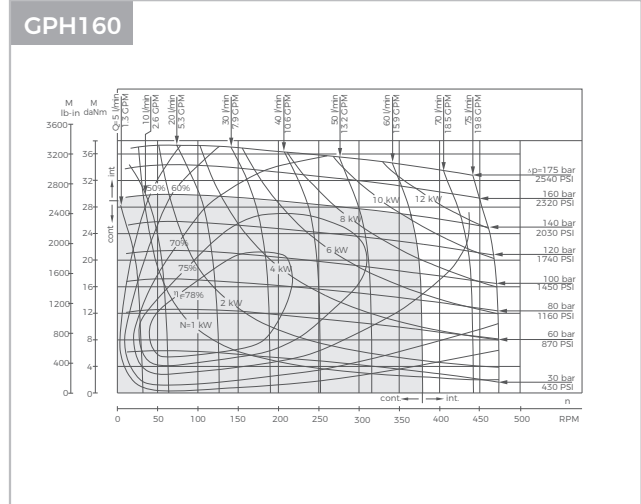
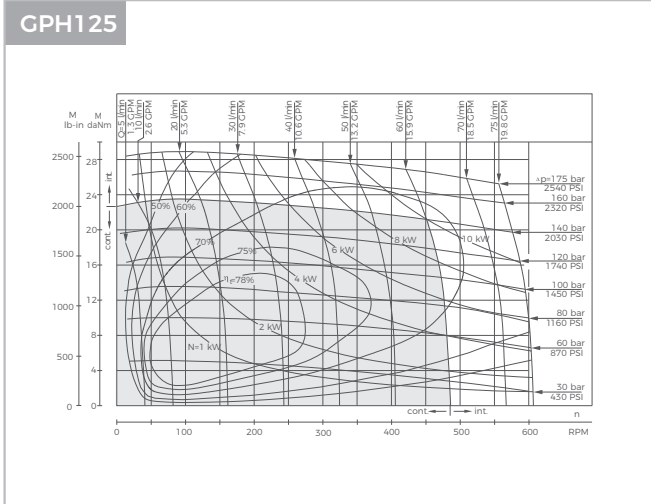
Type		GPH250	GPH315	GPH400	GPH500	GPH630
Displacement, cm <sup>3</sup> /rev [ in <sup>3</sup> /rev ]		247,5[15.1]	316,8[19.3]	396[24.16]	495[30.2]	623,6[38.05]
Max. Speed,	Cont.	242	190	150	120	95
RPM	Int*	303	236	189	150	120
Max. Torque	Cont.	38[3360]	38[3360]	36[3190]	39[3452]	44[3895]
daNm [lb-in]	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	Cont.	7,5[10]	5,8[7.9]	4,6[6.2]	3,5[4.7]	3,3[4.4]
kW [HP]	Int*	12[16.1]	9[12.1]	7,8[10.5]	7,2[9.7]	5,6[7.5]
Max. Pressure Drop	Cont.	110[1600]	90[1300]	70[1015]	60[870]	55[800]
bar [PSI]	Int*	175[2540]	140[2030]	115[1665]	90[1305]	80[1160]
	Peak**	225[3260]	225[3260]	180[2610]	130[1885]	110[1740]
Max. Oil Flow	Cont.	60[15.9]	60[15.9]	60[15.9]	60[15.9]	60[15.9]
lpm [GPM]	Int*	75[19.8]	75[19.8]	75[19.8]	75[19.8]	75[19.8]
Max. Inlet Pressure	Cont.	175[2540]	175[2540]	175[2540]	140[2030]	140[2030]
bar [PSI]	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	Cont.	175[2540]	175[2540]	175[2540]	140[2030]	140[2030]
without Drain Line	Int*	200[2900]	200[2900]	200[2900]	175[2540]	175[2540]
bar [PSI]	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	At max. press. drop Cont.	33,6[2970]	34,4[3045]	34,5[3050]	36[3180]	41,5[3670]
daNm [lb-in]	At max. press. drop Int*	54,2[4795]	61,9[5480]	60,8[5390]	54[4780]	62[5480]
Min. Speed***, RPM		10	10	10	10	10
Weight, kg [lb] For rear port + 0,450 [992]	GPH	6,8[15]	7,1[15.6]	7,6[16.8]	8,9[20]	9,5[21.4]

## Function Diagrams



The function diagrams data is for average performance of randomly selected motors at backpressure. 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].

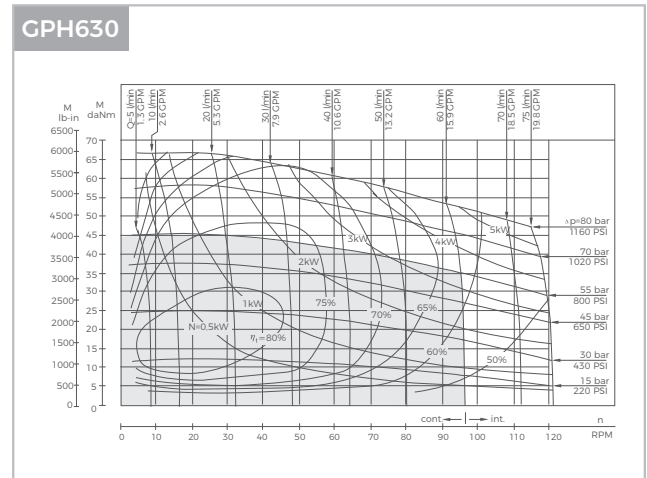
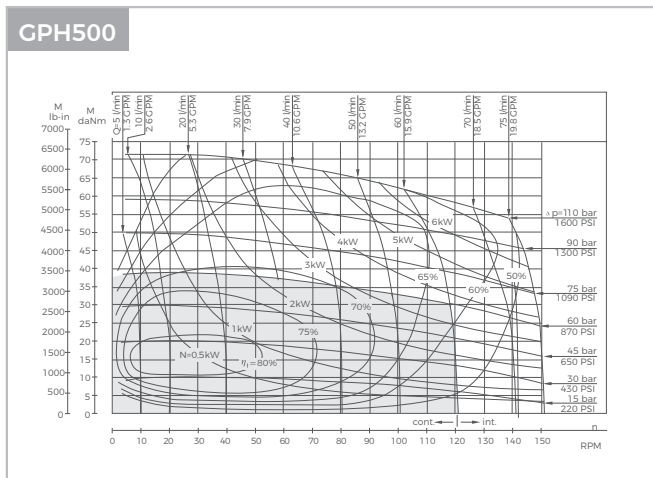
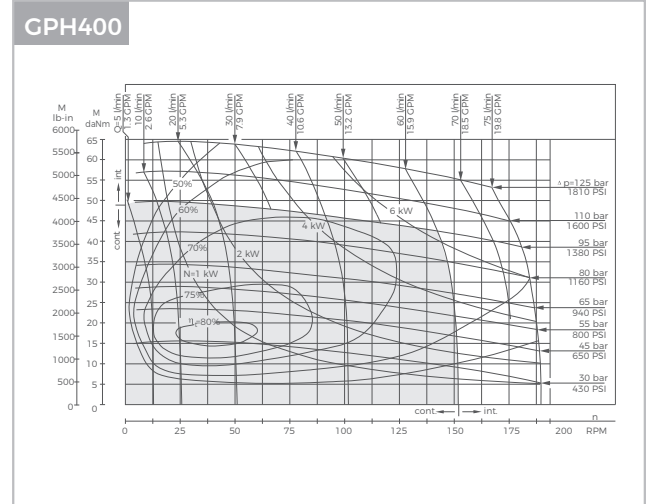
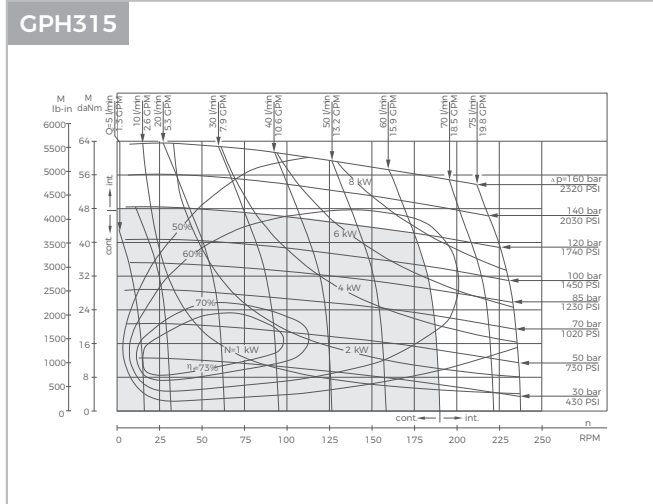
## Function Diagrams



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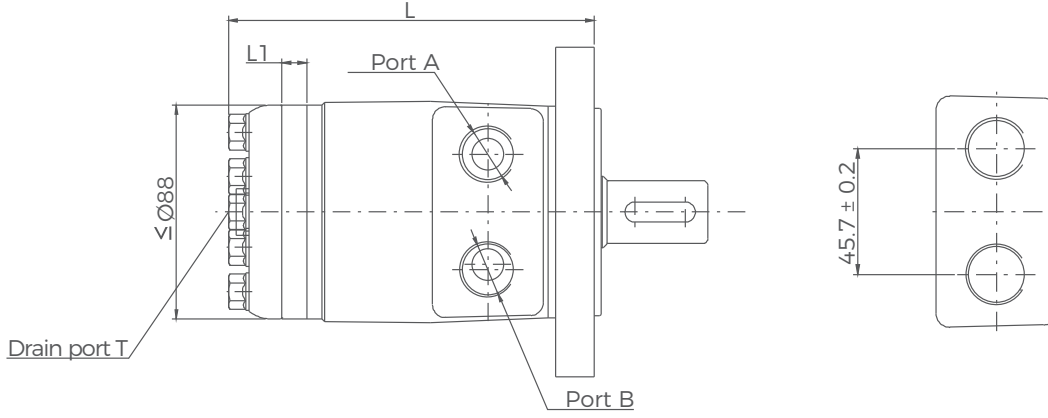


## Function Diagrams

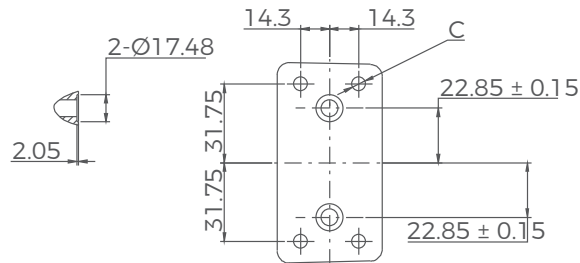


The function diagrams data is for average performance of randomly selected motors at backpressure. 5±10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm<sup>2</sup>/s [150 SUS] at 50°C [122°F].

## GPH Dimensions and Mountings

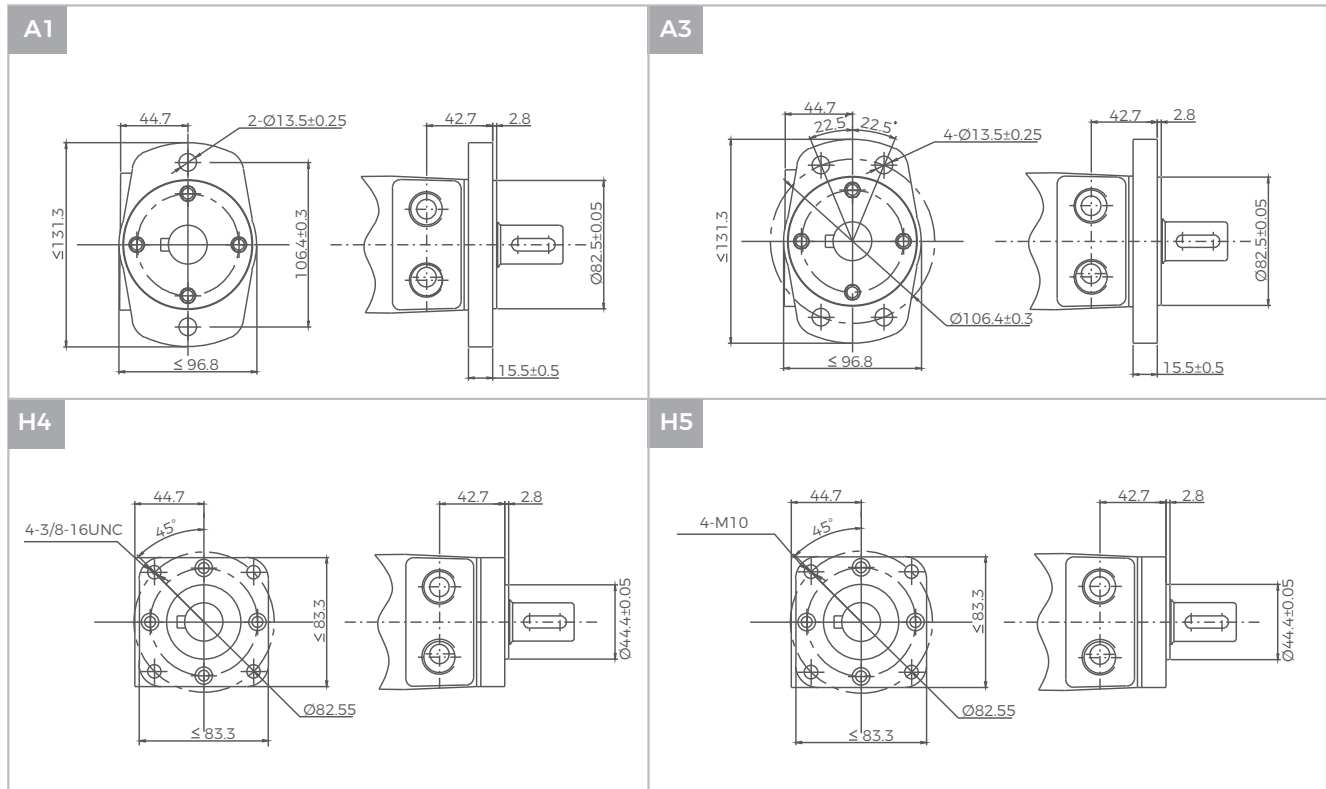


Model	L	L1
GPH40	136	5.5
GPH50	137	7
GPH80	144.5	10.5
GPH100	147	13
GPH125	150	16
GPH160	155	21
GPH200	160	26
GPH250	166	32
GPH315	176	42
GPH400	186	52
GPH500	199	65
GPH630	203	84



Mounting	G7 (depth)	U9 (depth)	UA (depth)	U3 (depth)	G8 (depth)	D1 (depth)	D2 (depth)
P(A, B)	G1/2(15)	7/8-14 O-ring(17)	1/2-14NPTF(15)	3/4-16 O-ring(15)	PT(RC)1/2(15)	Ø10	Ø10
T	G1/4(12)	7/16-20UNF(12)	7/16-20UNF(12)	7/16-20UNF(12)	PT(RC)1/4(9.7)	7/16-20UNF(12)	G1/4(12)
C	—	—	—	—	—	4-5/16-18UNC(13)	4-M8(13)

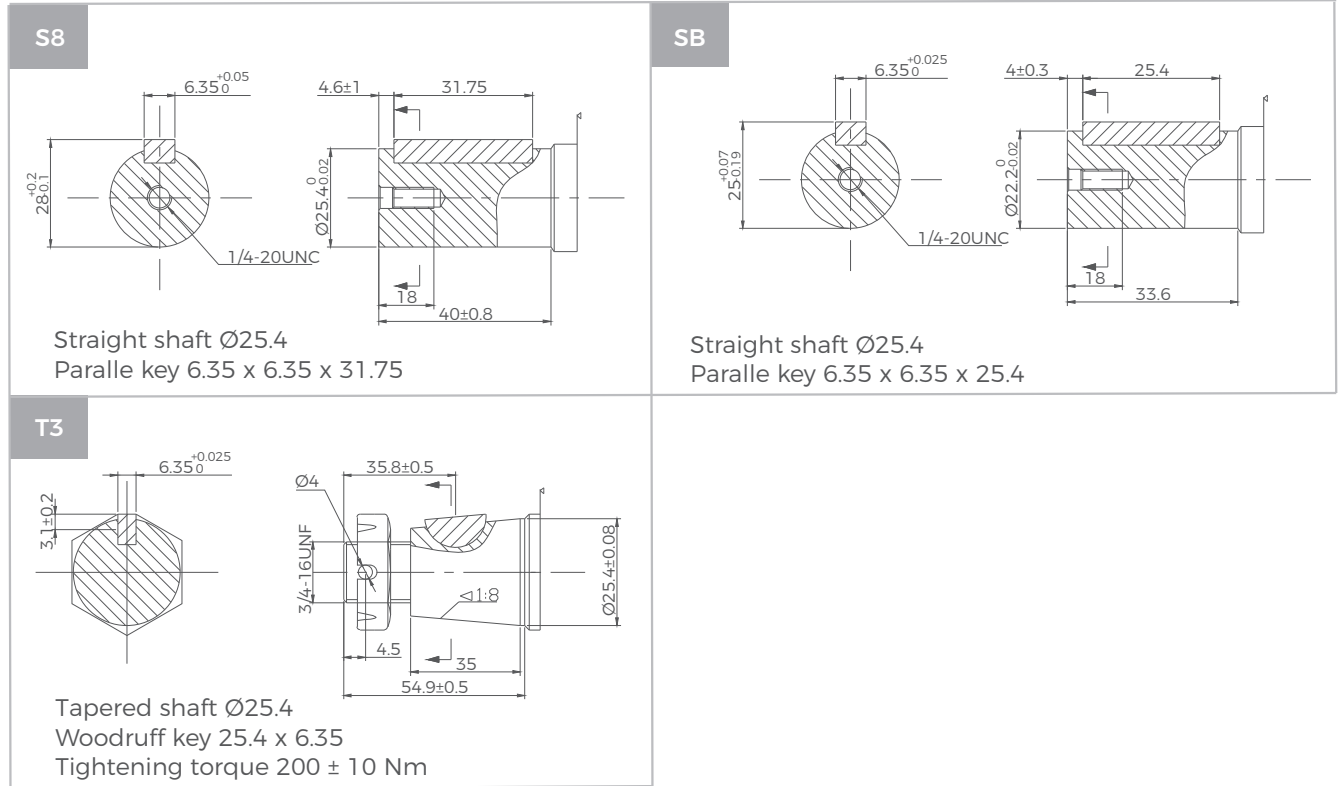
### GPH Flange Covers Dimensions



### GPH Shafts Dimensions

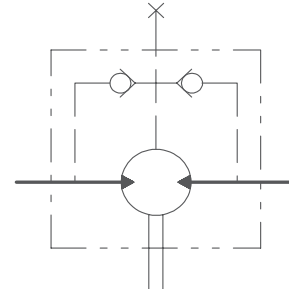
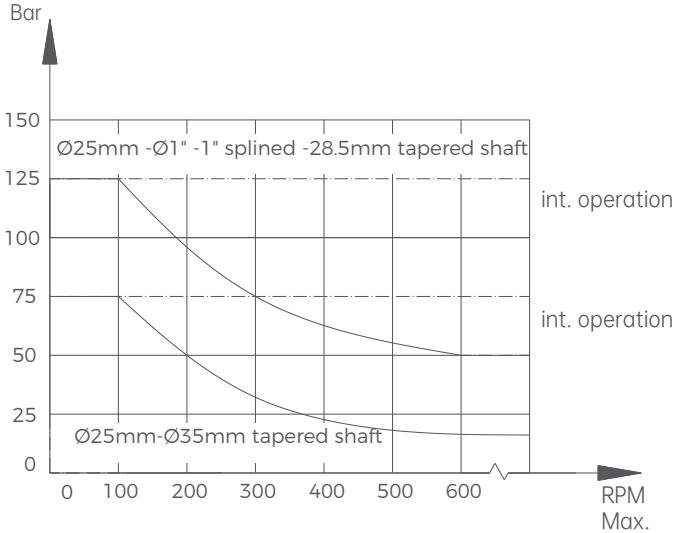
<p><b>S6</b></p> <p>Straight shaft <math>\varnothing 25.4</math> Woodruff key 25.4 x 6.35</p>	<p><b>S9</b></p> <p>Straight shaft <math>\varnothing 25.4</math> Pin hole <math>\varnothing 10.3</math></p>
<p><b>R4</b></p> <p>Splined shaft SAE 6B</p>	<p><b>SC</b></p> <p>Straight shaft <math>\varnothing 25</math> Parallel key 8 x 7 x 28</p>
<p><b>SD</b></p> <p>Straight shaft <math>\varnothing 25</math> Parallel key 7 x 7 x 32</p>	<p><b>R5</b></p> <p>Splined shaft 13-DP 16/32</p>
<p><b>S7</b></p> <p>Straight shaft <math>\varnothing 25</math> Parallel key 8 x 7 x 32</p>	<p><b>SA</b></p> <p>Straight shaft <math>\varnothing 25.4</math> Pin hole <math>\varnothing 8</math></p>

### GPH Shafts Dimensions



## GPH Series Hydraulic Motors

### Permissible shaft seal pressure



GPH with standard shaft seal check valves and without use of drain connection: The pressure on the shaft seal never exceeds the pressure in the return line.

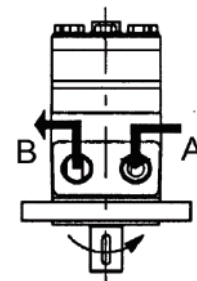
GPH with standard shaft seal, check valves and with drain connection: The shaft seal pressure equals the pressure on the drain line.

### Drain Port

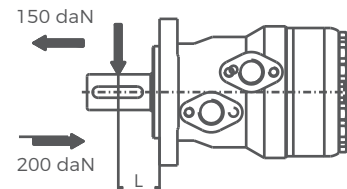
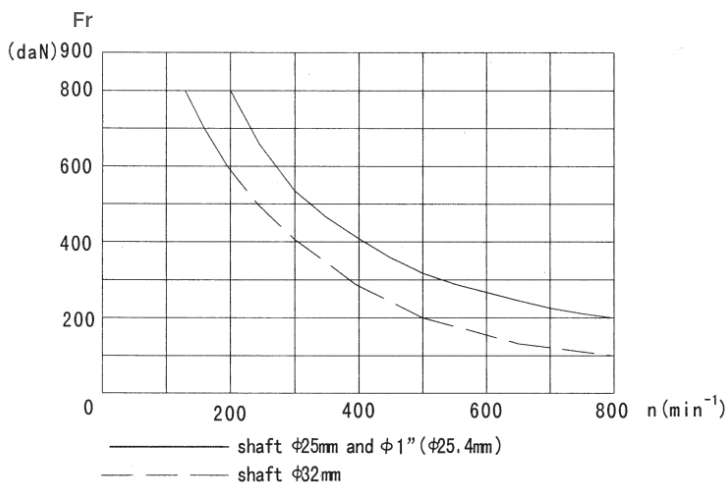
In applications without drain line, output shaft seal exceeds a bit of the pressure in the return line. In applications using the drain line, the pressure of output shaft seal equals the pressure in drain line.

### Standard direction of shaft rotation: Standard

When facing shaft end of motor, shaft to rotate:  
 Clockwise. When port A is pressurized.  
 Counter-clockwise. When port B is pressurized.



### Output shaft stand radial force



$$Fr = \frac{800}{n} * \frac{25000}{95 + L} \text{ (daN)}$$

Fr = Radial Force (daN)

L = Distance (mm)

n = Speed (rpm)

Rhomb-flange L = 30mm

Square-flange L = 24mm

## GR Series Hydraulic Motors

### Options

- Flange connection
- Motor with needle bearing
- Side and rear ports
- Straight, splined and tapered shafts
- Shaft seal for high and low pressure
- Metric and BSPP ports
- Speed sensing
- Other special features

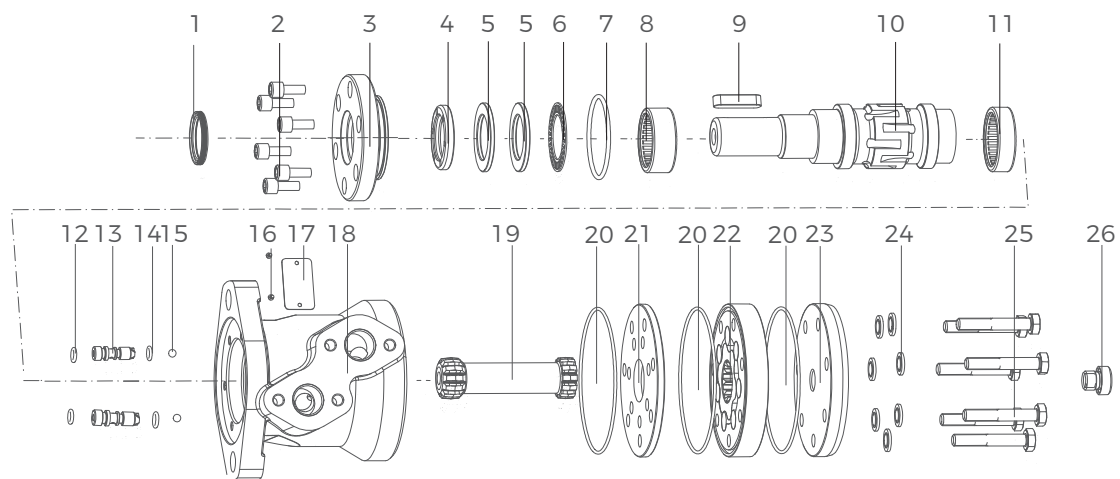
### Applications

- Conveyors
- Feeding mechanism of robots and manipulators
- Metal working machines
- Textile machines
- Agricultural machines
- Food industries
- Lawn mower



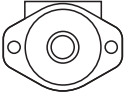
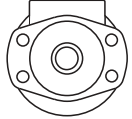
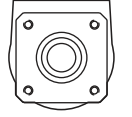
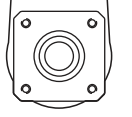
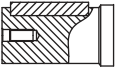





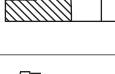

### General

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



- |                           |                         |                          |                       |                        |
|---------------------------|-------------------------|--------------------------|-----------------------|------------------------|
| 1 Anti-dust ring          | 6 Needle roller bearing | 11 Needle roller bearing | 16 Nameplate rivet    | 21 Spacer              |
| 2 Bolt                    | 7 O-ring seal           | 12 O-ring seal           | 17 Nameplate          | 22 Rotor and stator    |
| 3 Front cover             | 8 Needle roller bearing | 13 Check valve           | 18 Housing            | 23 Rear cover          |
| 4 Pressure resistant seal | 9 Parallel Key          | 14 O-ring seal           | 19 Transmission shaft | 24 Washer              |
| 5 Retainer                | 10 Output shaft         | 15 Steel ball            | 20 O-ring seal        | 25 Bolt                |
|                           |                         |                          |                       | 26 External drain plug |

## Ordering Code

GR SERIES		DISP	FLANGE		SHAFT	PORTS		ROTATION	PAINT	FUNCTION	
CODE		DISP	CODE	FLANGE		CODE	PORTS		CODE	PAINT	
50		51.5cm <sup>3</sup> /rev [3.14in <sup>3</sup> /rev]		2-Ø13.5 SAE A pilot Ø82.5×2.8		G1	G1/2, G1/4 manifold 4×M8		A	No Paint	
80		80.3cm <sup>3</sup> /rev [4.90in <sup>3</sup> /rev]	A2			M1	M22×1.5, M14×1.5 manifold 4×M8		B	Blue	
100		99.8cm <sup>3</sup> /rev [6.09in <sup>3</sup> /rev]		4-Ø13.5 SAE A pilot Ø82.5×2.8		U2	7/8-14UNF O-ring, 7/16-20UNF manifold 4×5/16-18UNC		C	Black	
125		125.7cm <sup>3</sup> /rev [7.67in <sup>3</sup> /rev]	A4			U1	1/2-14NPTF, 7/16-20UNF manifold 4×5/16-18UNC		S	Silver grey	
160		159.6cm <sup>3</sup> /rev [9.74in <sup>3</sup> /rev]		4-3/8-16 square, pilot Ø44.4×2.8		G2	PT(Rc)1/2, PT(Rc)1/4 manifold 4×M8				
200		199.8cm <sup>3</sup> /rev [12.19in <sup>3</sup> /rev]	H4								
250		250.1cm <sup>3</sup> /rev [15.26in <sup>3</sup> /rev]		4-M10 square, pilot Ø44.4×2.8							
315		315.7cm <sup>3</sup> /rev [19.26in <sup>3</sup> /rev]	H5			CODE	SHAFT				
400		397cm <sup>3</sup> /rev [24.4in <sup>3</sup> /rev]				S1	Ø25, parallel key 8×7×32 				
						S2	Ø25.4, parallel key 6.35×6.35×31.75 				
						R1	Ø25.4, splined tooth SAE 6B 				
						S3	Short: Ø25.4, parallel key 6.35×6.35×31.75 				
						S4	Ø32, parallel key 10×8×45 				
						R2	Ø31.75, splined tooth 14-DP 12/24 				
						S5	Ø31.75, parallel key 7.96×7.96×31.75 				
						T1	Tapered Ø28.56, parallel key B5×5×14 				



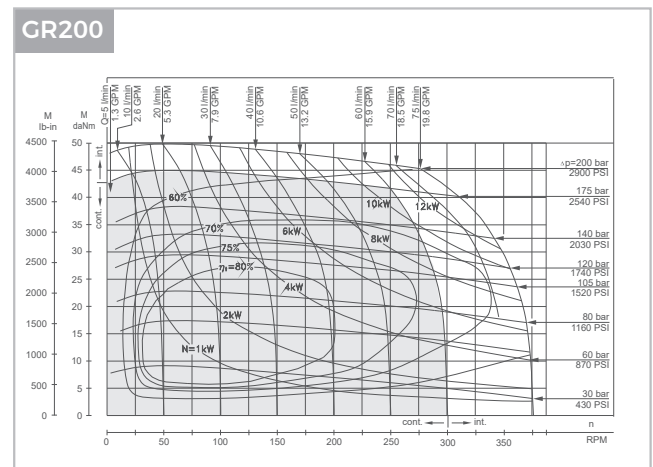
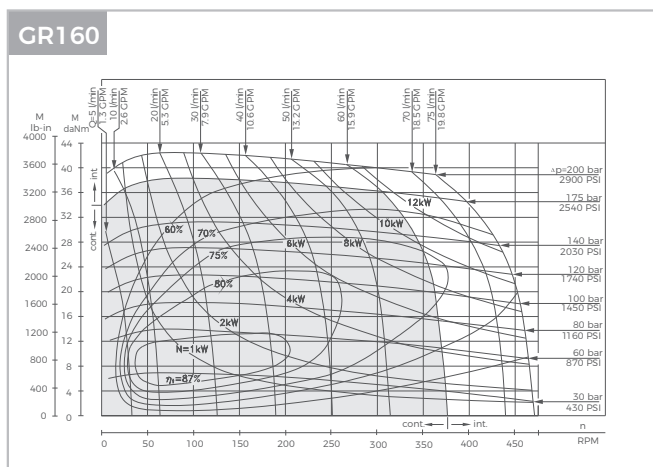
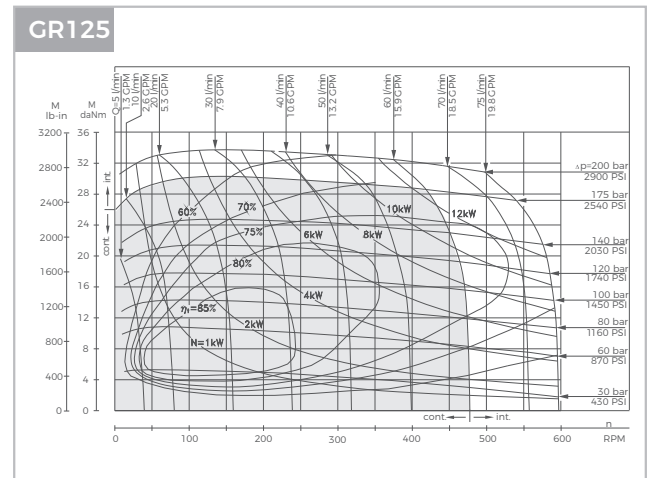
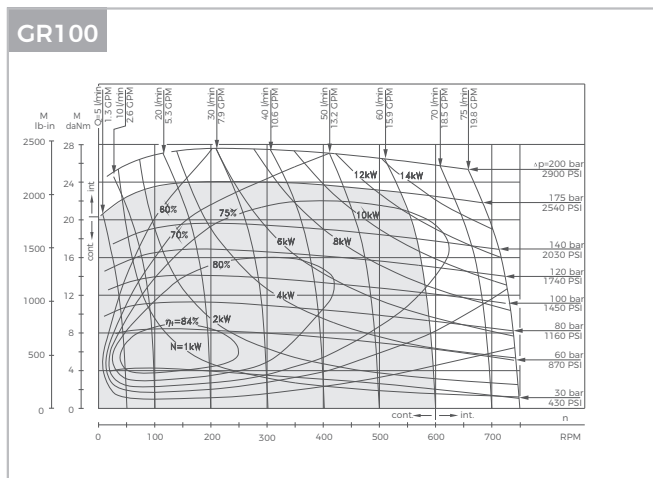
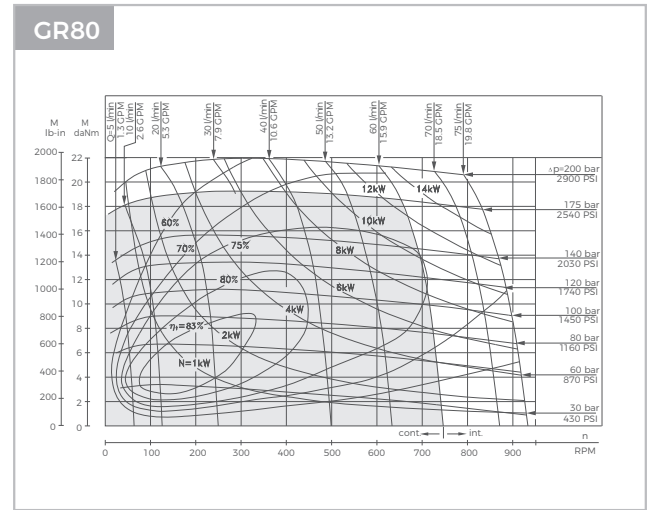
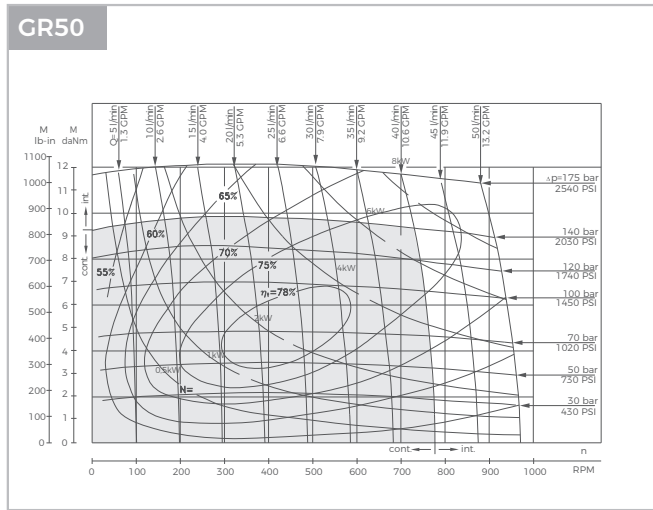
## Specifications

Type		GR50	GR80	GR100	GR125	GR160
Displacement, cm <sup>3</sup> /rev [ in <sup>3</sup> /rev ]		51,5[3.14]	80,3[4.90 ]	99,8[6.09]	125,7[7.67]	159,6[9.74]
Max. Speed,	Cont.	775	750	600	457	375
RPM	Int.*	970	940	750	600	470
Max. Torque	Cont.	10[900]	20[1770]	24[2125]	30[2655]	39[3450]
daNm [lb-in]	Int.*	13[1150]	22[1947]	28[2480]	34[3010]	43[3805]
	Peak**	17[1505]	27[2390]	32[2832]	37[3275]	46[4070]
Max. Output	Cont.	7[9.5]	12,5[17]	13[17.4]	12,5[16.8]	11,5[15.4]
kW [HP]	Int.*	8,5[11.9]	15[20.1]	15[20.1]	14,5[19.5]	14[18.8]
Max. Pressure Drop	Cont.	140[2030]	175[2540]	175[2540]	175[2540]	175[2540]
bar [PSI]	Int.*	175[2540]	200[2900]	200[2900]	200[2900]	200[2900]
	Peak**	225[3260]	225[3260]	225[3260]	225[3260]	225[3260]
Max. Oil Flow	Cont.	40[10.5]	60[15.8]	60[15.8]	60[15.8]	60[15.8]
lpm [GPM]	Int.*	50[13.2]	75[19.8]	75[19.8]	75[19.8]	75[19.8]
Max. Inlet Pressure	Cont.	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]
bar [PSI]	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	Cont.	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]
without Drain Line	Int.*	200[2900]	200[2900]	200[2900]	200[2900]	200[2900]
bar [PSI]	Peak**	225[3260]	225[3260]	225[3260]	225[3260]	225[3260]
Max. Starting Pressure		10[145]	10[145]	10[145]	9[130]	7[102]
with Unloaded Shaft, bar [PSI]						
Min. Starting Torque	At max. press. drop Cont.	8[710]	15[1330]	20[1770]	25[2215]	32[2832]
daNm [lb-in]	At max. press. drop Int.*	10[85]	17[1505]	23[2035]	28[2480]	37[3275]
Min. Speed***, RPM		10	10	10	10	10
Weight, kg [lb] For rear port + 0,650 [1.433]	GR	6,8[15]	6,9[15.2]	7,2[15.9]	7,3[16.1]	7,5[15.2]

## Specifications

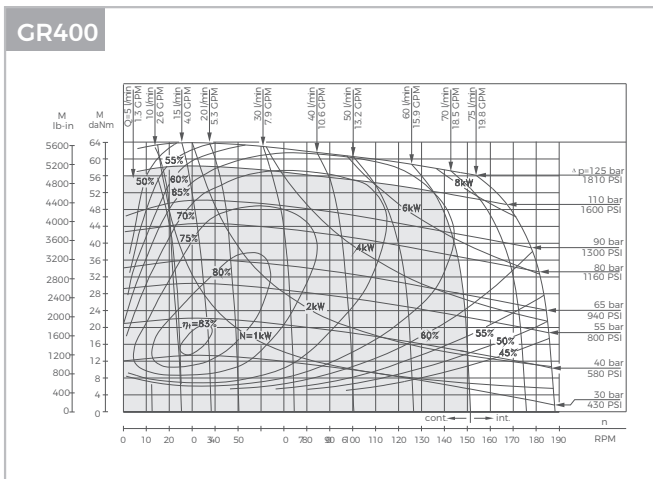
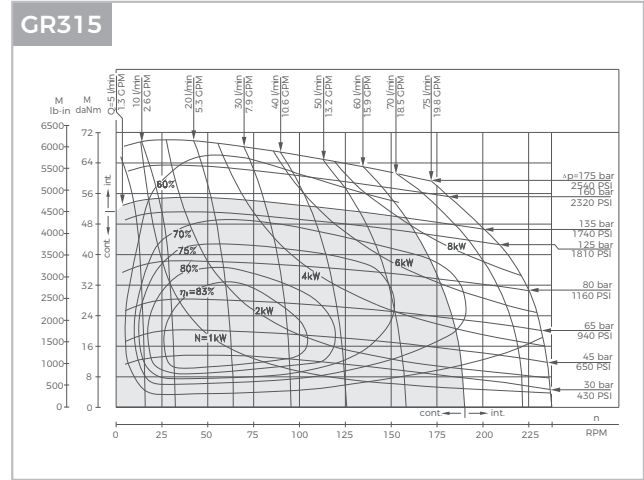
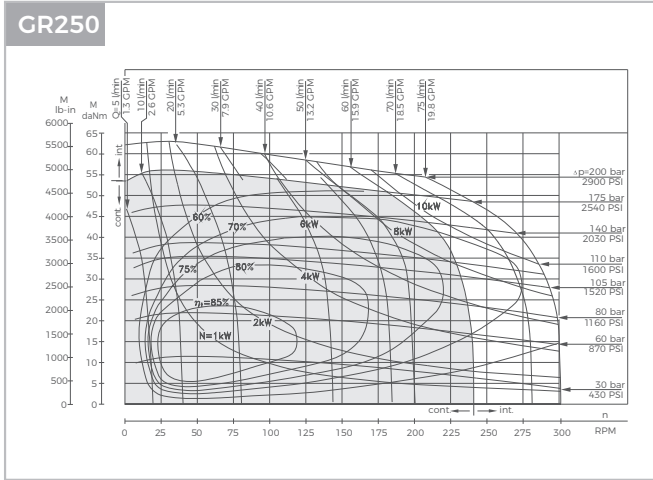
Type		GR200	GR250	GR315	GR400
Displacement, cm <sup>3</sup> /rev [ in <sup>3</sup> /rev ]		199,8[12.19]	250,13[15.26 ]	315,7[19.26]	397[24.4]
Max. Speed,	Cont.	300	240	194	150
RPM	Int.*	375	300	240	190
Max. Torque	Cont.	45[4000]	54[4780]	55[4870]	61[5400]
daNm [lb-in]	Int.*	50[4425]	61[5400]	69[6110]	69[6110]
	Peak**	56[4960]	71[6280]	84[7435]	87[7770]
Max. Output	Cont.	11[4.8]	10[20.13.4]	9[12]	7,8[10.5]
kW [HP]	Int.*	13[17.4]	12[16.1]	10[13.4]	10,6[14.2]
Max. Pressure Drop	Cont.	175[2540]	175[2540]	135[1960]	110[1600]
bar [PSI]	Int.*	200[2900]	200[2900]	200[2900]	200[2900]
	Peak**	225[3260]	225[3260]	225[3260]	225[3260]
Max. Oil Flow	Cont.	60[15.8]	60[15.8]	60[15.8]	60[15.8]
lpm [GPM]	Int.*	75[19.8]	75[19.8]	75[19.8]	75[19.8]
Max. Inlet Pressure	Cont.	175[2540]	175[2540]	175[2540]	175[2540]
bar [PSI]	Int.*	200[2900]	200[2900]	200[2900]	200[2900]
	Peak**	225[3260]	225[3260]	225[3260]	225[3260]
Max. Return Pressure	Cont.	175[2540]	175[2540]	175[2540]	175[2540]
without Drain Line	Int.*	200[2900]	200[2900]	200[2900]	200[2900]
bar [PSI]	Peak**	225[3260]	225[3260]	225[3260]	225[3260]
Max. Starting Pressure		5[73]	4[58]	3[44]	3[44]
with Unloaded Shaft, bar [PSI]					
Min. Starting Torque	At max. press. drop Cont.	41[3630]	50[4425]	50[4425]	50[4425]
daNm [lb-in]	At max. press. drop Int.*	46[4070]	55[4870]	66[5840]	61[5400]
Min. Speed***, RPM		10	10	10	10
Weight, kg [lb] For rear port + 0,650 [1.433]	GR	8,1[18.9]	8,5[18.7]	9,2[20.3]	9,9[21.8]

# Function Diagrams



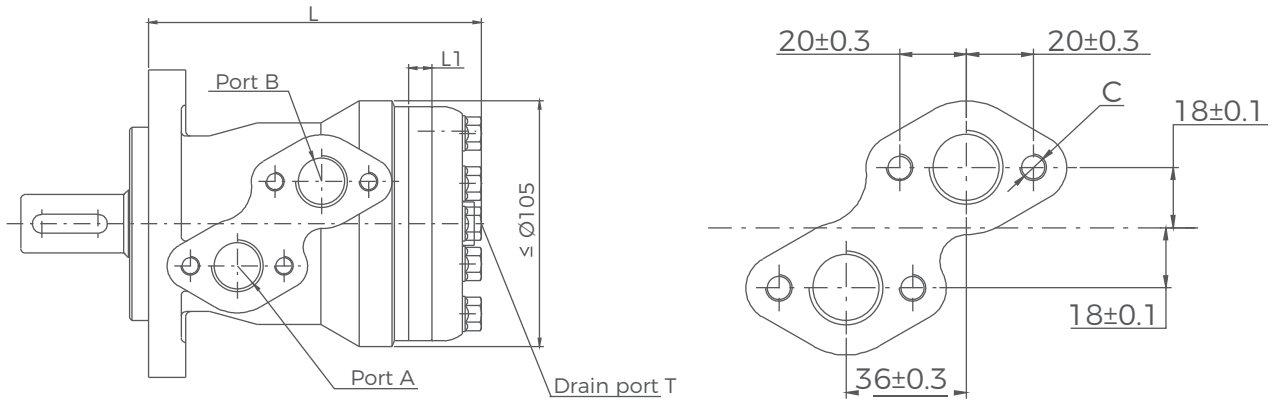
The function diagrams data is for average performance of randomly selected motors at backpressure. 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm<sup>2</sup>/s [150 SUS] at 50°C [122°F].

## Function Diagrams



The function diagrams data is for average performance of randomly selected motors at backpressure. 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].

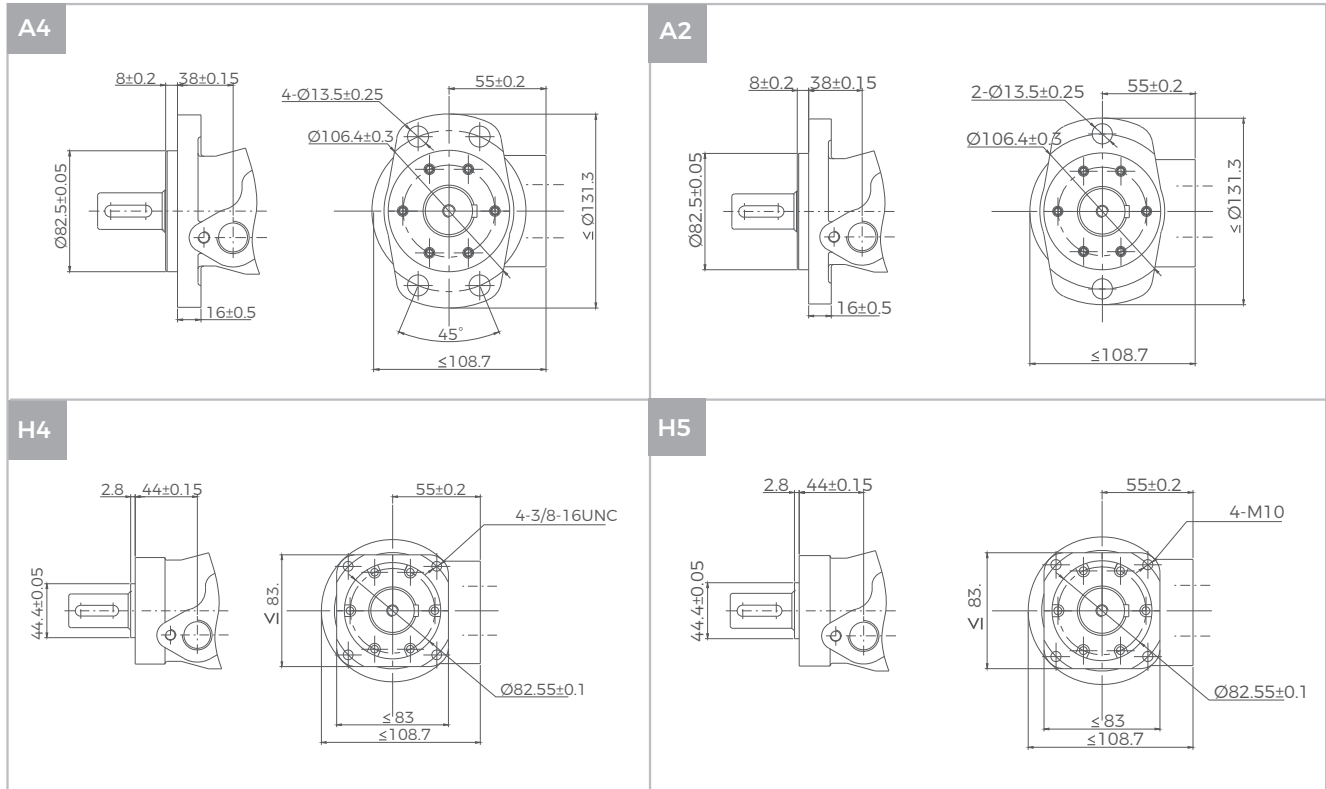
## GR Dimensions and Mountings



Model	L	L1
GR50	140	10
GR80	146	16
GR100	150	20
GR125	155	25
GR160	161.5	30.5
GR200	170	38.1
GR250	180	50
GR315	192	62
GR400	207	76

Mounting	G1 (depth)	M1 (depth)	U2 (depth)	U1 (depth)	G2 (depth)
P(A, B)	G1/2(15)	M22x1.5(15)	7/8-14 O-ring(17)	1/2-14NPTF(15)	PT(RC)1/2(15)
T	G1/4(12)	M14x1.5(12)	7/16-20UNF(12)	7/16-20UNF(12)	PT(RC)1/4(9.7)
C	4-M8(13)	4-M8(13)	4-5/16-18UNC(13)	4-5/16-18UNC(13)	4-M8(13)

## GR Flange Covers Dimensions

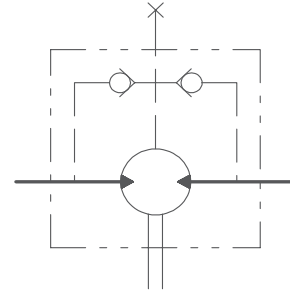
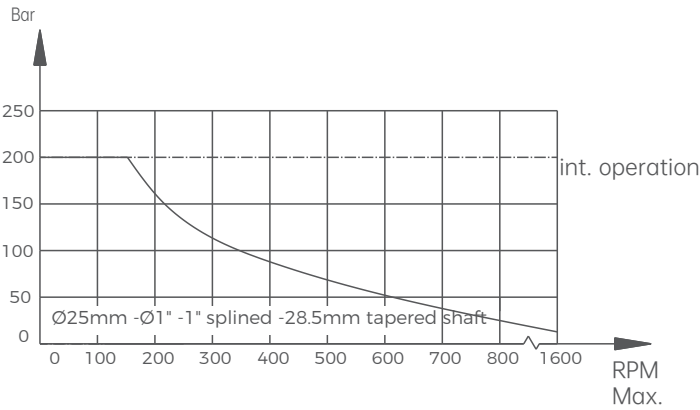


### GR Shafts Dimensions

<p><b>S1</b></p> <p>Straight shaft Ø25 Parallel key 8 x 7 x 32</p>	<p><b>S4</b></p> <p>Straight shaft Ø32 Parallel key 10 x 8 x 45</p>
<p><b>S2</b></p> <p>Straight shaft Ø25.4 Parallel key 6.35 x 6.35 x 31.75</p>	<p><b>R1</b></p> <p>Splined shaft SAE 6B</p>
<p><b>R2</b></p> <p>Splined shaft 14-DP 12/24</p>	<p><b>S5</b></p> <p>Straight shaft Ø31.75 Parallel key 7.96 x 7.96 x 31.75</p>
<p><b>T1</b></p> <p>Straight shaft Ø28.56 Parallel key B5 x 5 x 14 Tightening torque 100 ± 10Nm</p>	<p><b>S3</b></p> <p>Straight shaft Ø25.4 Parallel key 6.35 x 6.35 x 31.75</p>

## GR Series Hydraulic Motors

### Permissible shaft seal pressure



GR with standard shaft seal check valves and without use of drain connection: The pressure on the shaft seal never exceeds the pressure in the return line.

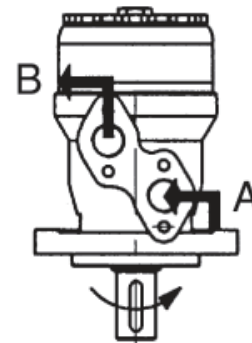
GR with standard shaft seal, check valves and with drain connection: The shaft seal pressure equals the pressure on the drain line.

### Drain Port

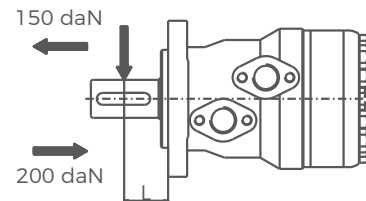
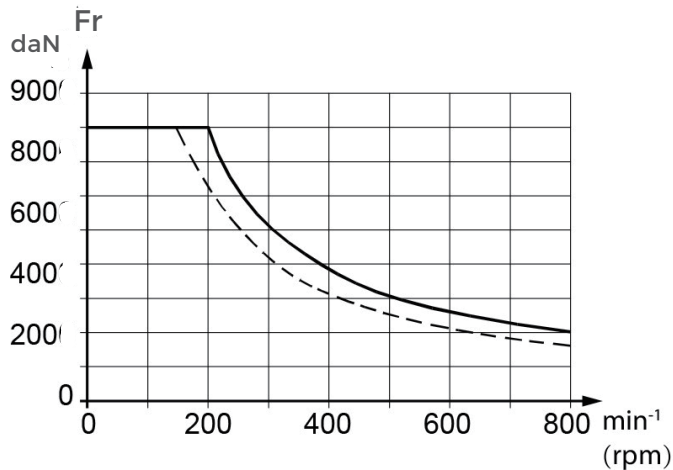
In applications without drain line, output shaft seal exceeds a bit of the pressure in the return line. In applications using the drain line, the pressure of output shaft seal equals the pressure in drain line.

### Standard direction of shaft rotation: Standard

When facing shaft end of motor, shaft to rotate:  
 Clockwise. When port "A" is pressurized.  
 Counter-clockwise port "B" is pressurized.



### Output shaft stand radial force



$$Fr = \frac{800}{n} * \frac{25000}{95 + L} \text{ (daN)}$$

Fr = Radial Force (daN)

L = Distance (mm)

n = Speed (rpm)

Rhomb-flange L = 30mm

Square-flange L = 24mm



## GRS Series Hydraulic Motors

### Options

- Flange connection
- Motor with needle bearing
- Side and rear ports
- Straight, splined and tapered shafts
- Shaft seal for high and low pressure
- Metric and BSPP ports
- Speed sensing
- Other special features

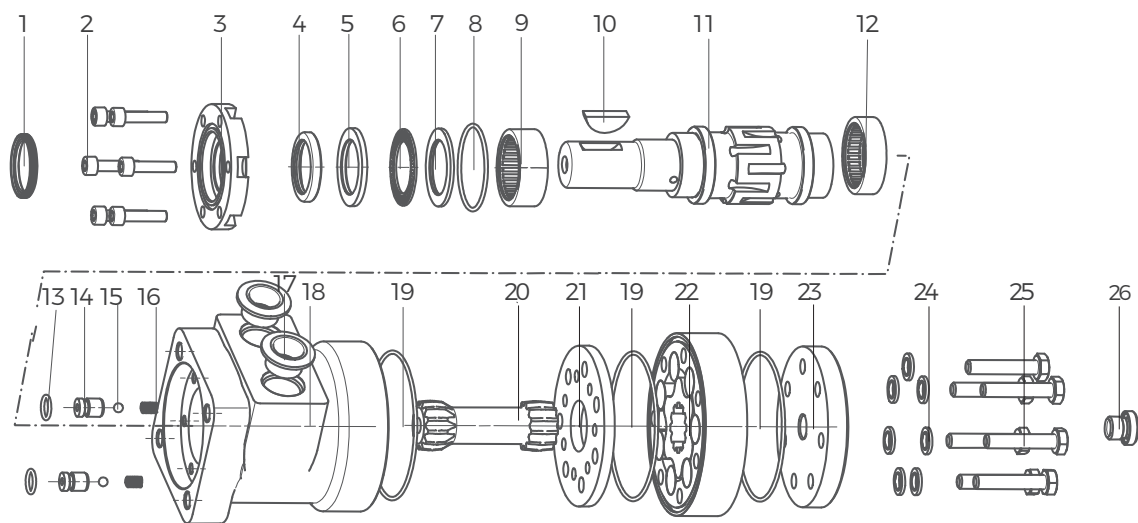
### Applications

- Conveyors
- Feeding mechanism of robots and manipulators
- Metal working machines
- Textile machines
- Agricultural machines
- Food industries
- Lawn mower





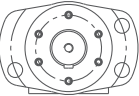












### General

Max. Displacement	cm <sup>3</sup> /rev [in <sup>3</sup> /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
Operating 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 microns)



- |                  |                         |                          |                              |                        |
|------------------|-------------------------|--------------------------|------------------------------|------------------------|
| 1 Anti-dust ring | 6 Bearing               | 11 Output shaft          | 16 Spring                    | 21 Spacer              |
| 2 Bolt           | 7 Retainer              | 12 Needle roller bearing | 17 Oil-resistant rubber plug | 22 Stator assembly     |
| 3 Front Cover    | 8 O-ring seal           | 13 O-ring seal           | 18 Housing                   | 23 Rear cover          |
| 4 Shaft seal     | 9 Needle roller bearing | 14 Check valve           | 19 O-ring seal               | 24 Washer              |
| 5 Retainer       | 10 woodruff key         | 15 Steel ball            | 20 Transmission shaft        | 25 Bolt                |
|                  |                         |                          |                              | 26 External drain plug |

## Ordering Code

GRS SERIES		DISP		FLANGE		SHAFT		PORTS		ROTATION		PAINT		FUNCTION	
CODE	DISP	CODE	FLANGE	CODE	PORTS	CODE	SHAFT	CODE	PAINT	CODE	FUNCTION	CODE	ROTATION		
50	51.5cm <sup>3</sup> /rev [3.14in <sup>3</sup> /rev]	A2	2-Hole SAE A, pilot Ø82.5×2.8 	G7	G1/2, G1/4	S6	Ø25.4, woodruff key Ø25.4 × 6.35 	A	No Paint	A	Standard				
80	80.3cm <sup>3</sup> /rev [4.90in <sup>3</sup> /rev]	A3	4-Hole SAE A, pilot Ø82.5×2.8 	U9	7/8-14UNF O-ring, 7/16-20UNF	R4	Ø25.4, splined tooth SAE 6B 	B	Blue	N	Big radial force				
100	99.8cm <sup>3</sup> /rev [6.09in <sup>3</sup> /rev]	H4	4-Hole square, pilot Ø44.4×2.8 	UA	1/2-14NPTF, 7/16-20UNF	S7	Ø25.4, parallel key 8×7 ×32 	C	Black	D	No case drain				
125	125.7cm <sup>3</sup> /rev [7.67in <sup>3</sup> /rev]	H5	4-Hole square, pilot Ø44.4×2.8 	G8	PT(Rc) 1/2, PT(Rc) 1/4	S8	Ø25.4, parallel key 6.35×6.35×31.75 	S	Silver grey	F	Free running				
160	159.6cm <sup>3</sup> /rev [9.74in <sup>3</sup> /rev]			D1	Ø10 O-ring, 7/16-20UNF manifold 4×5/16-18UNC	S9	Ø25.4, pin hole Ø10.3 			L	Low speed				
200	199.8cm <sup>3</sup> /rev [12.19in <sup>3</sup> /rev]			D2	Ø10 O-ring, G1/4 manifold 4×M8	SA	Ø25.4, pin hole Ø8 			V	High temp.				
250	250.1cm <sup>3</sup> /rev [15.26in <sup>3</sup> /rev]			M2	M18×1.5, M10×1	SB	Ø22.2, parallel key 6.35×6.35×25.4 			S	Low temp.				
315	315.7cm <sup>3</sup> /rev [19.26in <sup>3</sup> /rev]			M3	M20×1.5, M10×1	R5	Ø22.2, splined tooth 13-DP 16/32 								
400	397cm <sup>3</sup> /rev [24.4in <sup>3</sup> /rev]			M4	M22×1.5, M10×1	T3	Tapered shaft Ø25.4 woodruff key Ø25.4×6.35 								
						SC	Ø25, parallel key 8×7×32 								
						SD	Ø25, parallel key 7×7×32 								

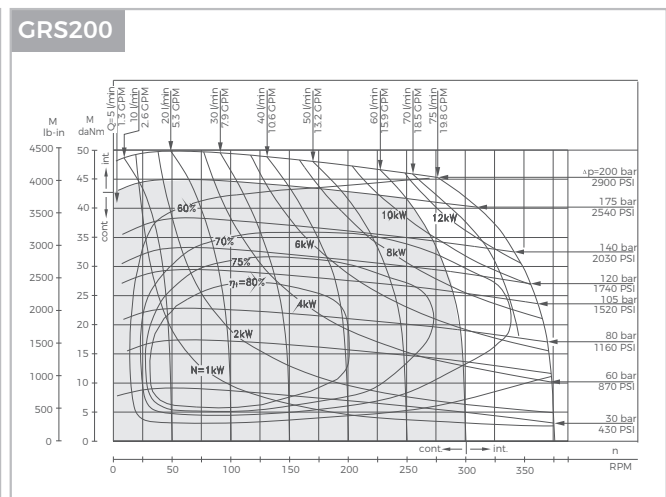
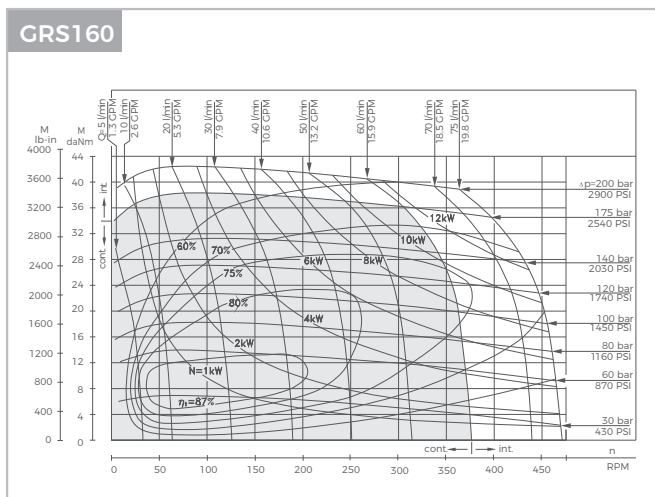
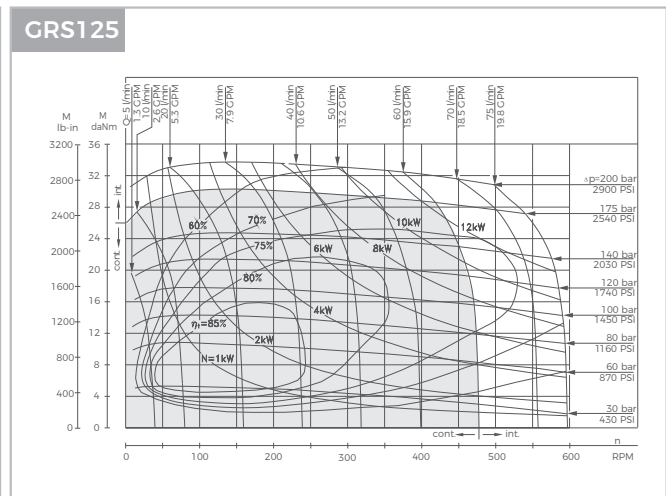
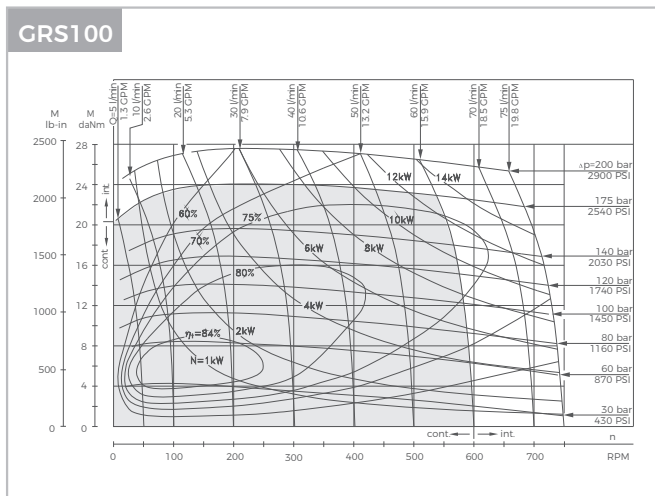
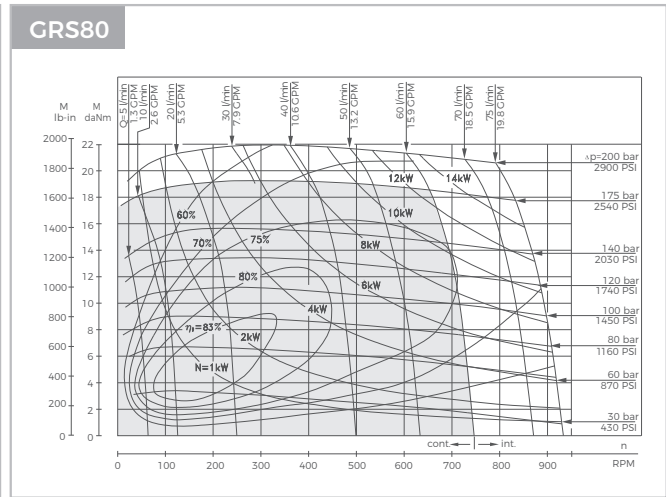
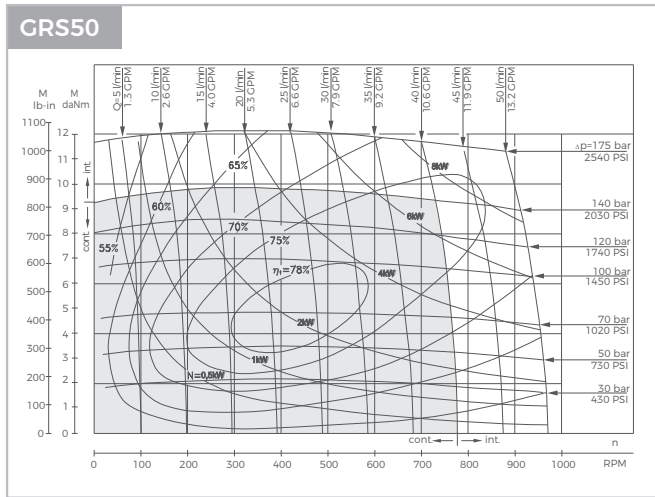
## Specifications

Type		GRS50	GRS80	GRS100	GRS125	GRS160
Displacement, cm <sup>3</sup> /rev [ in <sup>3</sup> /rev ]	Cont.	51,5[3.14]	80,3[4.90 ]	99,8[6.09]	125,7[7.67]	159,6[9.74]
Max. Speed,	Int.*	775	750	600	457	375
RPM	Cont.	970	940	750	600	470
Max. Torque	Int.*	10[900]	20[1770]	24[2125]	30[2655]	39[3450]
daNm [lb-in]	Peak**	13[1150]	22[1947]	28[2480]	34[3010]	43[3805]
	Cont.	17[1505]	27[2390]	32[2832]	37[3275]	46[4070]
Max. Output	Int.*	7[9.5]	125[17]	13[17.4]	125[16.8]	115[15.4]
kW [HP]	Cont.	85[11.9]	15[20.1]	15[20.1]	145[19.5]	14[18.8]
Max. Pressure Drop	Int.*	140[2030]	175[2540]	175[2540]	175[2540]	175[2540]
bar [PSI]	Peak**	175[2540]	200[2900]	200[2900]	200[2900]	200[2900]
	Cont.	225[3260]	225[3260]	225[3260]	225[3260]	225[3260]
Max. Oil Flow	Int.*	40[10.5]	60[15.8]	60[15.8]	60[15.8]	60[15.8]
lpm [GPM]	Cont.	50[13.2]	75[19.8]	75[19.8]	75[19.8]	75[19.8]
Max. Inlet Pressure	Int.*	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]
bar [PSI]	Peak**	200[2900]	200[2900]	200[2900]	200[2900]	200[2900]
	Cont.	225[3260]	225[3260]	225[3260]	225[3260]	225[3260]
Max. Return Pressure	Int.*	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]
without Drain Line	Peak**	200[2900]	200[2900]	200[2900]	200[2900]	200[2900]
bar [PSI]		225[3260]	225[3260]	225[3260]	225[3260]	225[3260]
Max. Starting Pressure		10[145]	10[145]	10[145]	9[130]	7[102]
with Unloaded Shaft, bar [PSI]						
Min. Starting Torque	At max. press. drop Cont.	8[710]	15[1330]	20[1770]	25[2215]	32[2832]
daNm [lb-in]	At max. press. drop Int.*	10[885]	17[1505]	23[2035]	28[2480]	37[3275]
Min. Speed***, RPM		10	10	10	10	10
Weight, kg [lb] For rear port + 0,650 [1.433]	GRS	6,9[15.2]	7[15.4]	7,3[16.1]	7,4[16.3]	7,6[15.4]

## Specifications

Type		GRS200	GRS250	GRS315	GRS400
Displacement, cm <sup>3</sup> /rev [ in <sup>3</sup> /rev ]	Cont.	199,8[12.19]	250,1[15.26]	315,7[19.26]	397[24.4]
Max. Speed,	Int.*	300	240	190	150
RPM	Cont.	375	300	240	190
Max. Torque	Int.*	45[4000]	54[4780]	55[4870]	61[5400]
daNm [lb-in]	Peak**	50[4425]	61[5400]	69[6110]	69[6110]
	Cont.	56[4960]	71[6280]	84[7435]	87[7700]
Max. Output	Int.*	11[14.8]	10[13.4]	9[12]	78[10.5]
kW [HP]	Cont.	13[17.4]	12[16.1]	10[13.4]	106[14.2]
Max. Pressure Drop	Int.*	175[2540]	175[2540]	135[1960]	110[1600]
bar [PSI]	Peak**	200[2900]	200[2900]	175[2540]	140[2030]
	Cont.	225[3260]	225[3260]	225[3260]	225[3260]
Max. Oil Flow	Int.*	60[15.8]	60[15.8]	60[15.8]	60[15.8]
lpm [GPM]	Cont.	75[19.8]	75[19.8]	75[19.8]	75[19.8]
Max. Inlet Pressure	Int.*	175[2540]	175[2540]	175[2540]	175[2540]
bar [PSI]	Peak**	200[2900]	200[2900]	200[2900]	200[2900]
	Cont.	225[3260]	225[3260]	225[3260]	225[3260]
Max. Return Pressure	Int.*	175[2540]	175[2540]	175[2540]	175[2540]
without Drain Line	Peak**	200[2900]	200[2900]	200[2900]	200[2900]
bar [PSI]		225[3260]	225[3260]	225[3260]	225[3260]
Max. Starting Pressure					
with Unloaded Shaft, bar [PSI]		5[73]	4[58]	3[44]	3[44]
Min. Starting Torque	At max. press. drop Cont.	41[3630]	50[4425]	50[4425]	50[4425]
daNm [lb-in]	At max. press. drop Int.*	46[4070]	55[4870]	66[5840]	61[5400]
Min. Speed***, RPM		10	10	10	10
Weight, kg [lb] For rear port + 0,650 [1.433]	GRS	8,1[18.9]	8,5[18.7]	9,2[20.3]	9,9[21.8]

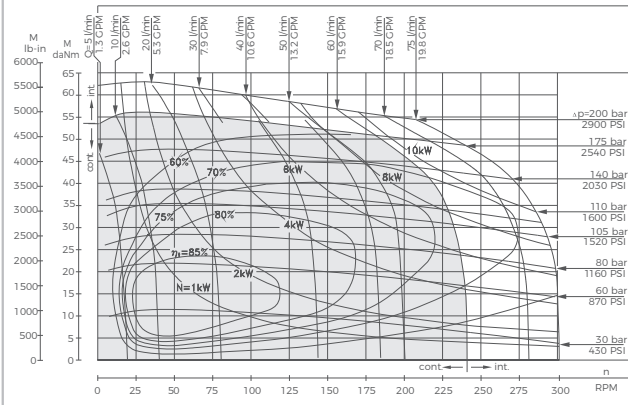
## Function Diagrams



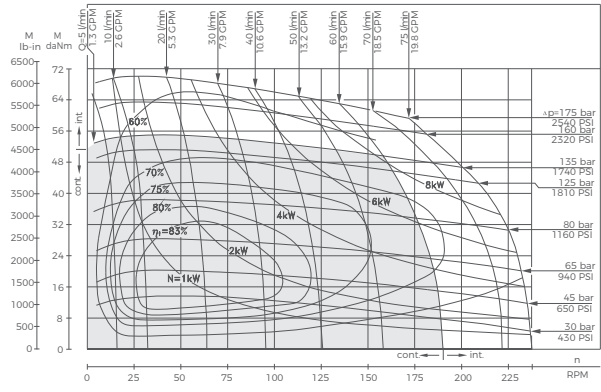
The function diagrams data is for average performance of randomly selected motors at backpressure. 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm<sup>2</sup>/s [150 SUS] at 50°C [122°F].

## Function Diagrams

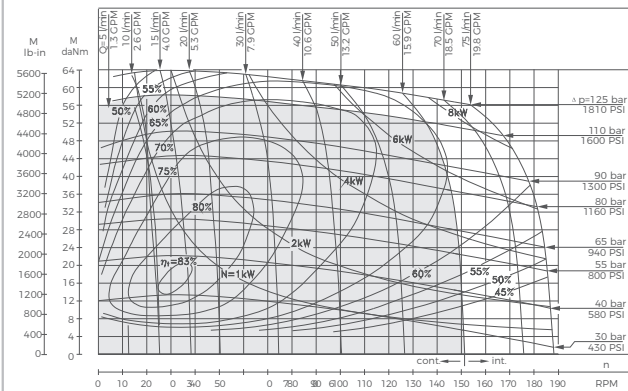
**GR250**



**GRS315**

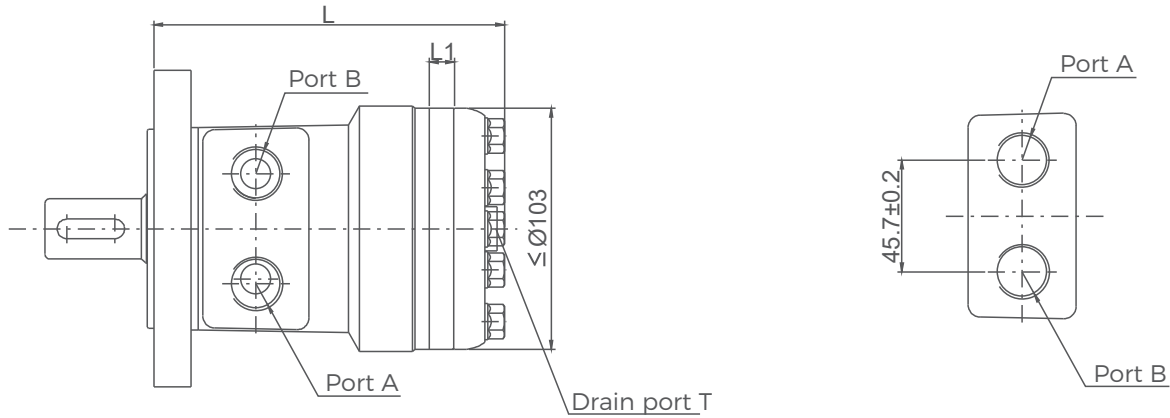


**GRS400**

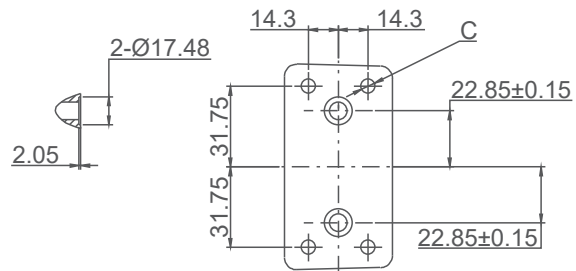


The function diagrams data is for average performance of randomly selected motors at backpressure. 5±10 bar [72.5±145 PSI] and oil with viscosity of 32 mm<sup>2</sup>/s [150 SUS] at 50°C [122°F].

## GRS Dimensions and Mountings

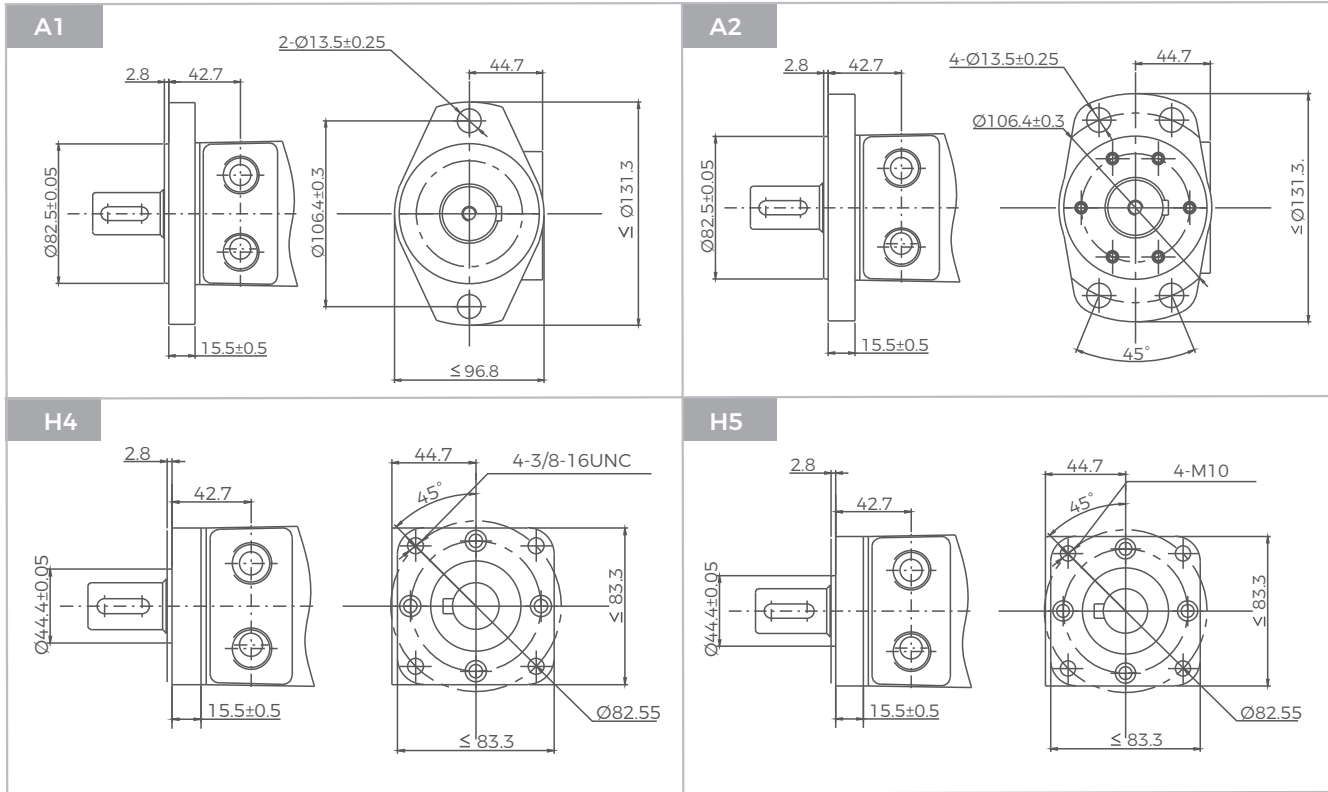


Model	L	L1
GRS50	146	10
GRS80	152	16
GRS100	156	20
GRS125	161	25
GRS160	166.5	30.5
GRS200	174	38.1
GRS250	186	50
GRS315	198	62
GRS400	213	76



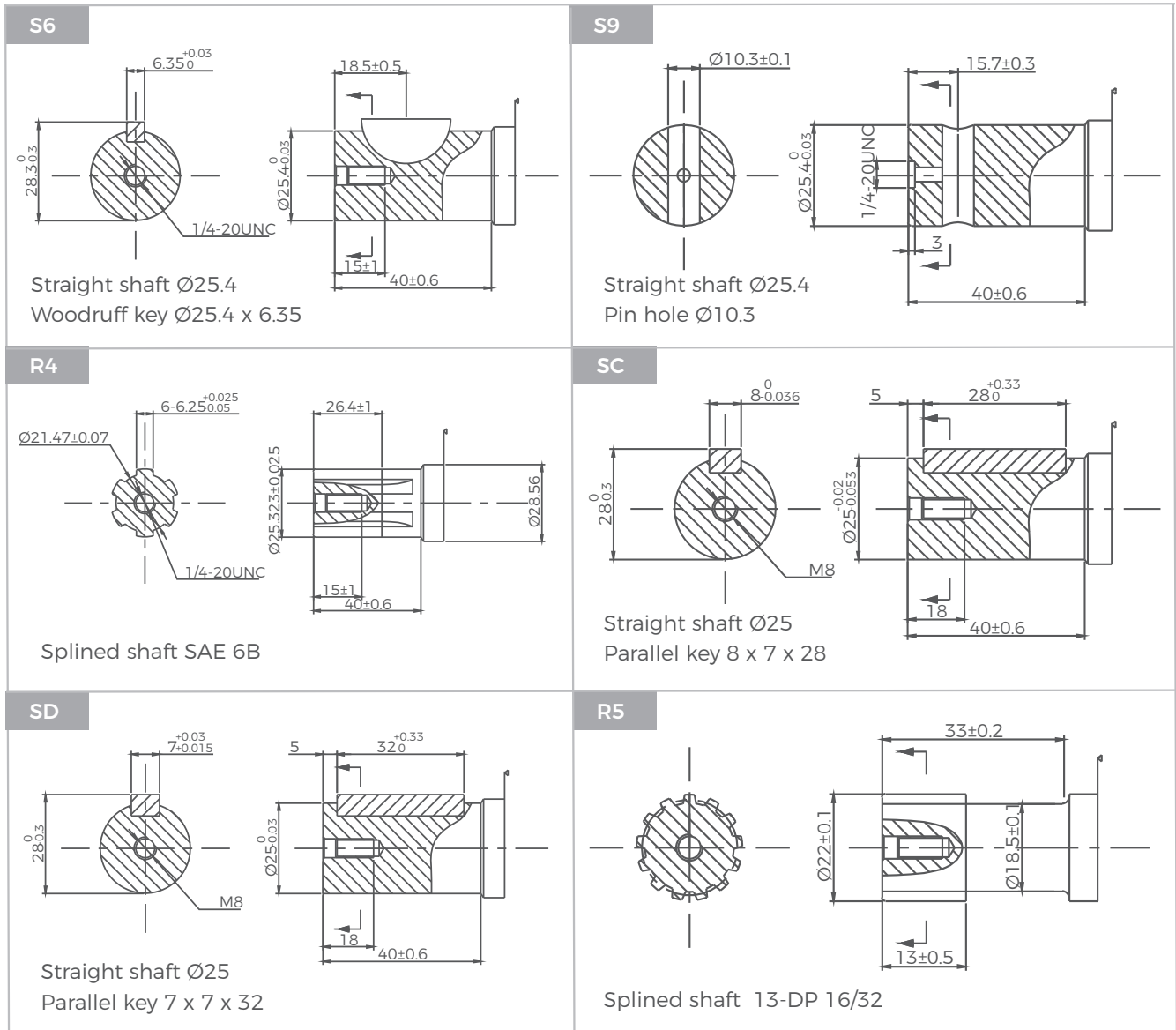
Mounting	G7 (depth)	U9 (depth)	UA (depth)	G8 (depth)	M2 (depth)	M3 (depth)	M4 (depth)	D1 (depth)	D2 (depth)
P(A, B)	G1/2(15)	7/8-14 O-ring(17)	1/2-14NPTF(15)	PT(RC)1/2(15)	M18 x 1.5(15)	M20 x 1.5(15)	M22 x 1.5(15)	10	10
T	G1/4(12)	7/16-20UNF(12)	7/16-20UNF(12)	PT(RC)1/4(9.7)	M10 x 1(12)	M10 x 1(12)	M10 x 1(12)	7/16-20UNF(12)	G1/4(12)
C	—	—	—	—	—	—	—	4-5/16-18UNC(13)	4-M8(13)

## GRS Flange Covers Dimensions

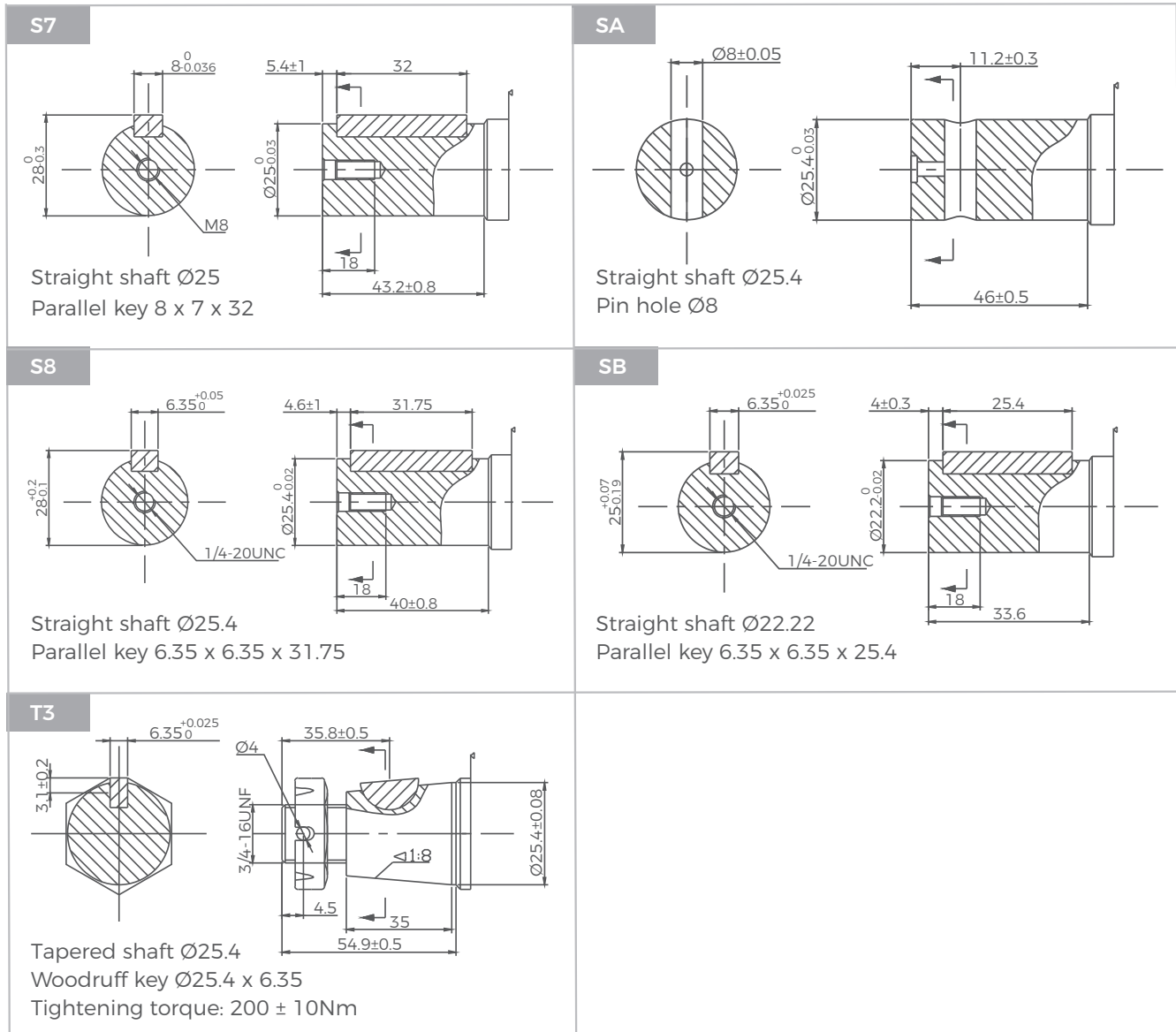




## GRS Shafts Dimensions

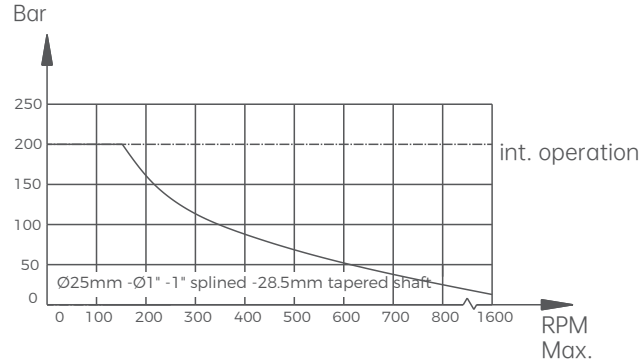


## GRS Shafts Dimensions



## GRS Series Hydraulic Motors

### Permissible shaft seal pressure

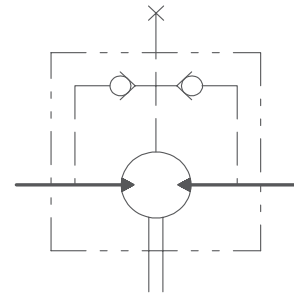


### Drain Port

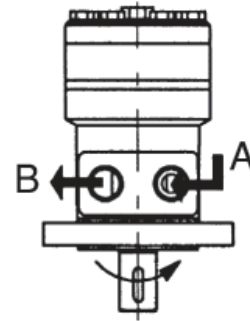
In applications without drain line, output shaft seal exceeds a bit of the pressure in the return line. When applications use the drain line, the pressure of output shaft seal equals the pressure in drain line.

### Standard direction of shaft rotation: Standard

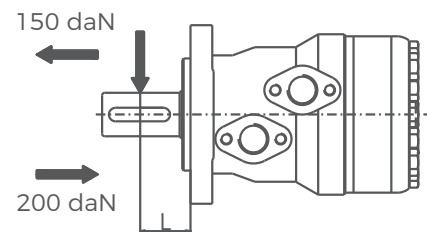
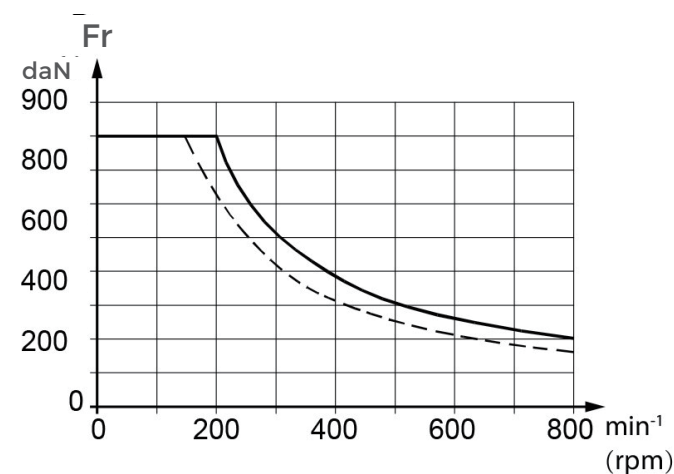
When facing shaft end of motor, shaft to rotate:  
Clockwise when port "A" is pressurized.  
Counter-clockwise port "B" is pressurized.



GRS with standard shaft seal, check valves and without use of drain connection: The pressure on the shaft seal never exceeds the pressure in the return line.  
GRS with standard shaft seal, check valves and with drain connection: The shaft seal pressure equals the pressure on the drain line.



### Output shaft stand radial force



$$Fr = \frac{800}{n} * \frac{25000}{95 + L} \quad (\text{daN})$$

Fr = Radial Force (daN)

L = Distance (mm)

n = Speed (rpm)

Rhomb-flange L = 30mm

Square-flange L = 24mm

## GH Series Hydraulic Motors

### Options

- Flange connection
- Straight, splined and tapered shafts
- Metric and BSPP ports
- Other special features

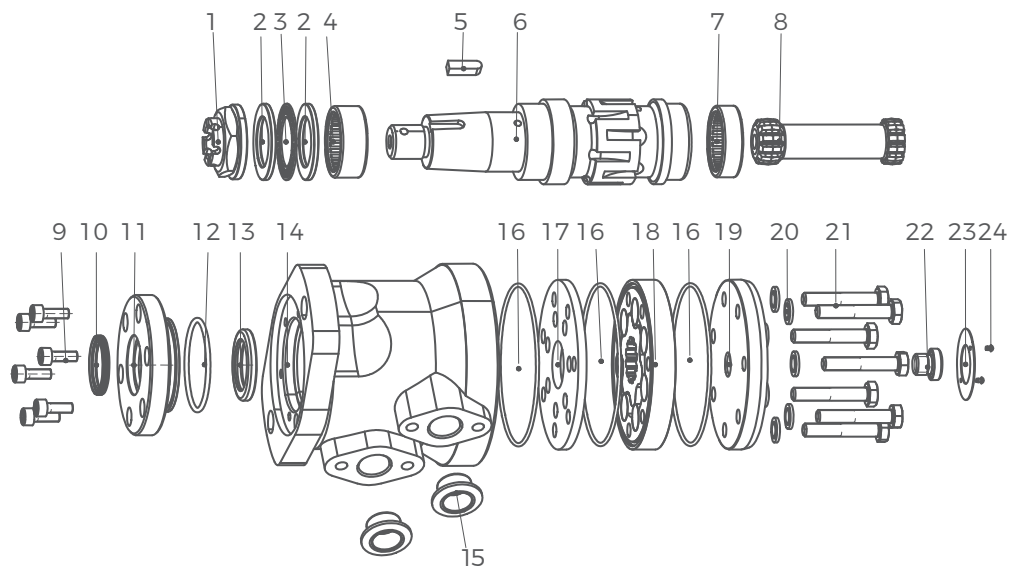
### Applications

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



### General

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



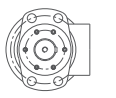
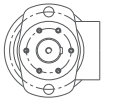
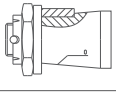
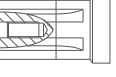
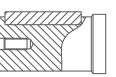
- 1 Slotted nuts
- 2 Bearing retainer
- 3 Thrust needle roller bearing
- 4 Needle roller bearings
- 5 Parallel Key
- 6 Output shaft

- 7 Thrust needle roller bearing
- 8 Transmission shaft
- 9 Screw
- 10 Skeleton anti-dust ring
- 11 Front cover
- 12 O-ring

- 13 Pressure Resistant Oil Seal
- 14 Housing
- 15 Oil port plug cap
- 16 O-ring
- 17 Spacer
- 18 Rotor and stator

- 19 Rear cover
- 20 Washer
- 21 Rear cover bolts
- 22 Plug
- 23 Nameplate
- 24 Rivets

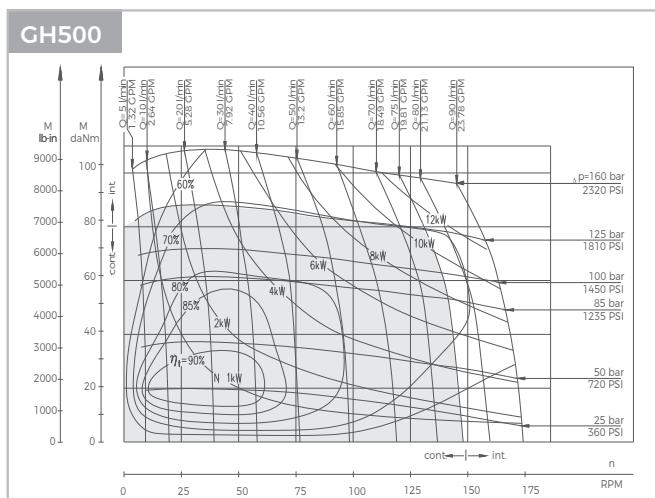
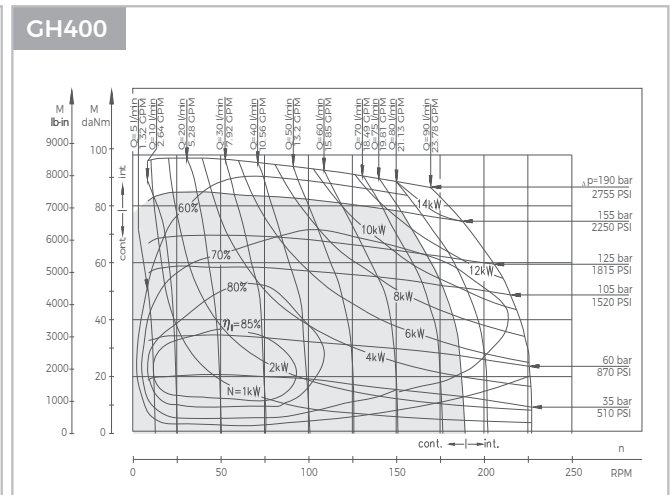
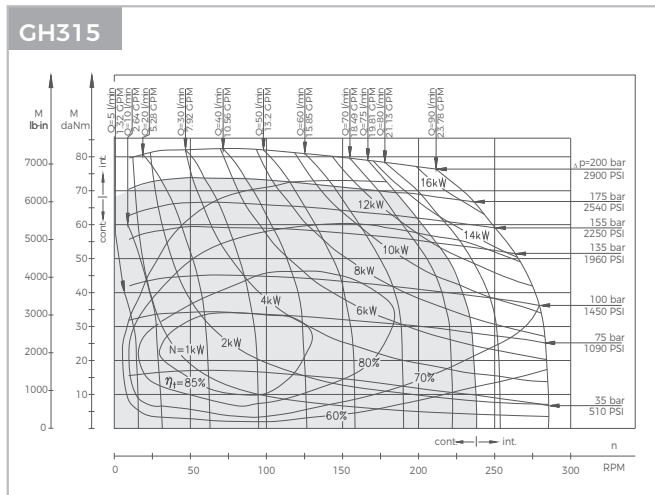
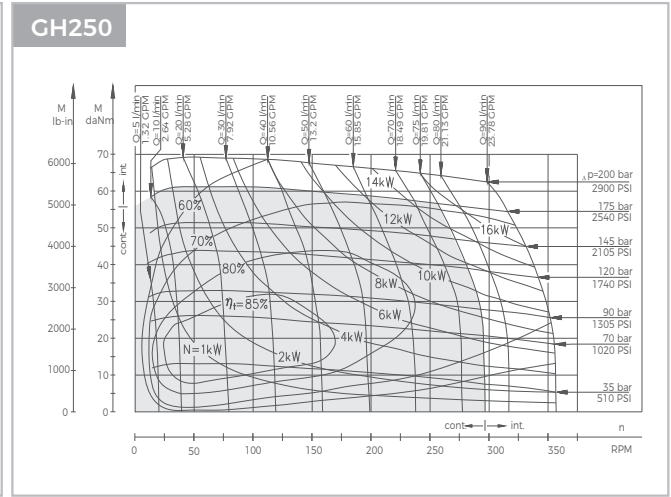
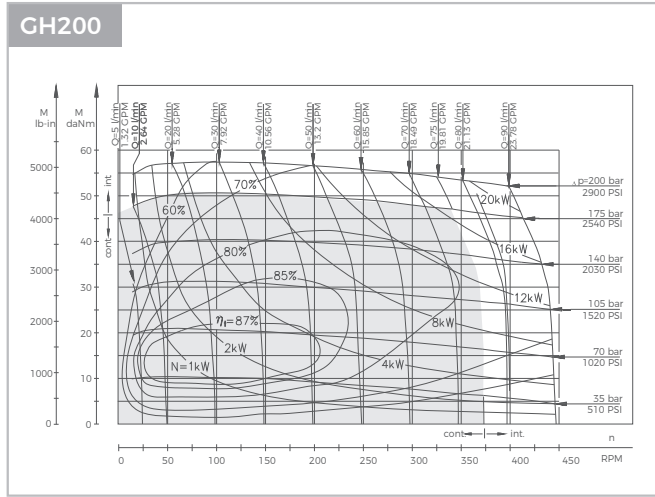
### Ordering Code

GH SERIES		DISP	FLANGE		SHAFT	PORTS		ROTATION	PAINT		FUNCTION		
CODE		DISP	CODE	FLANGE	CODE	PORTS		CODE	PAINT	CODE	ROTATION	CODE	FUNCTION
200		201.3cm <sup>3</sup> /rev [12.9in <sup>3</sup> /rev]	A5	2- Ø13.5 SAE A pilot Ø82.5×6 	S4	G1	G1/2, G1/4 Manifold 4×M8	A	No paint	A	Standard	A	Standard
250		252cm <sup>3</sup> /rev [15.4in <sup>3</sup> /rev]				M1	M22×1.5, M14×1.5 Manifold 4×M8	B	Blue	R	Opposite	N	Big radial force
315		314.9cm <sup>3</sup> /rev [19.2in <sup>3</sup> /rev]				A6	4- Ø13.5 SAE A pilot Ø82.5×6 	U2	7/8-14UNF O-ring, 7/16-20UNF Manifold 4×5/16-18UNC	C	Black	D	No drain
400		396.8cm <sup>3</sup> /rev [24.2in <sup>3</sup> /rev]	U1	1/2-14 NPTF, 7/16-20UNF Manifold 4×5/16-18UNC	F			Free running					
500		502.4cm <sup>3</sup> /rev [30.7in <sup>3</sup> /rev]	G2	PT (Rc) 1/2, PT (Rc) 1/4 Manifold 4×M8	L			Low speed					
					T4	Tapered Ø35 parallel key B6×6×20 	V	High temp.	S	Low temp.			
					R4	Ø25.4 SAE 6B 							
					SH	Ø35 parallel key 10×8×45 							

## Specifications

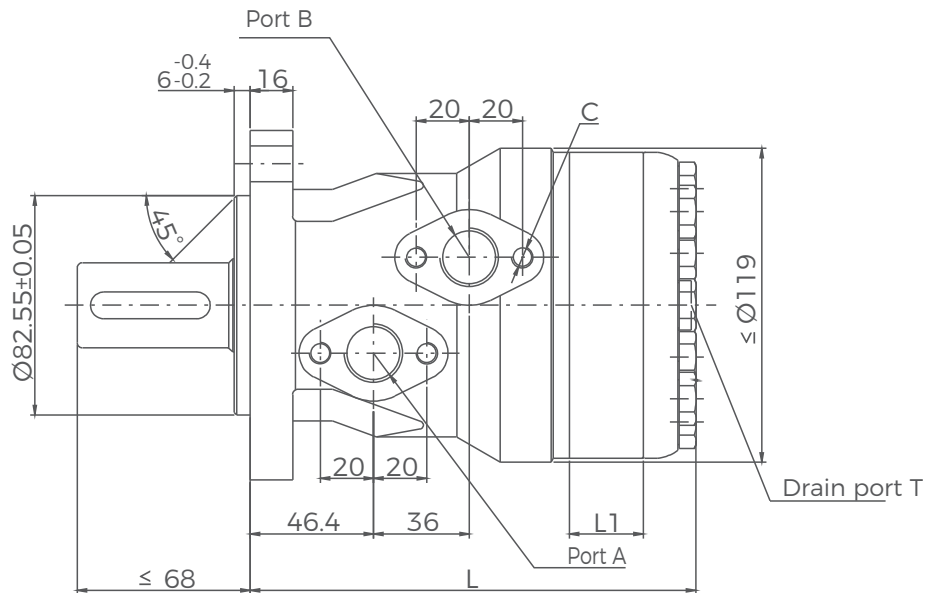
Type		GH200	GH250	GH315	GH400	GH500
Displacement, cm <sup>3</sup> /rev [ in <sup>3</sup> /rev ]		201.3[12.3]	252[15.4]	314.9[19.2]	396.8[24.2]	502.4[30.7]
Max. Speed,	Cont.	370	295	235	185	150
RPM	Int.*	445	350	285	225	180
Max. Torque	Cont.	51[4510]	61[5398]	74[6548]	84[7434]	82[7257]
daNm [lb-in]	Int.*	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 Drop	Cont.	175[2540]	175[2540]	175[2540]	155[2240]	125[1810]
bar [PSI]	Int.*	200[2900]	200[2900]	200[2900]	190[2750]	160[2320]
	Peak**	225[3260]	225[3260]	225[3260]	210[3045]	180[2610]
Max. Oil Flow	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. drop Cont.	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]	GH	10.5[23.2]	11[24.3]	11.5[25.4]	12.3[27.1]	13[28.7]

# Function Diagrams



The function diagrams data is for average performance of randomly selected motors at backpressure. 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].

## GH Dimensions and Mountings

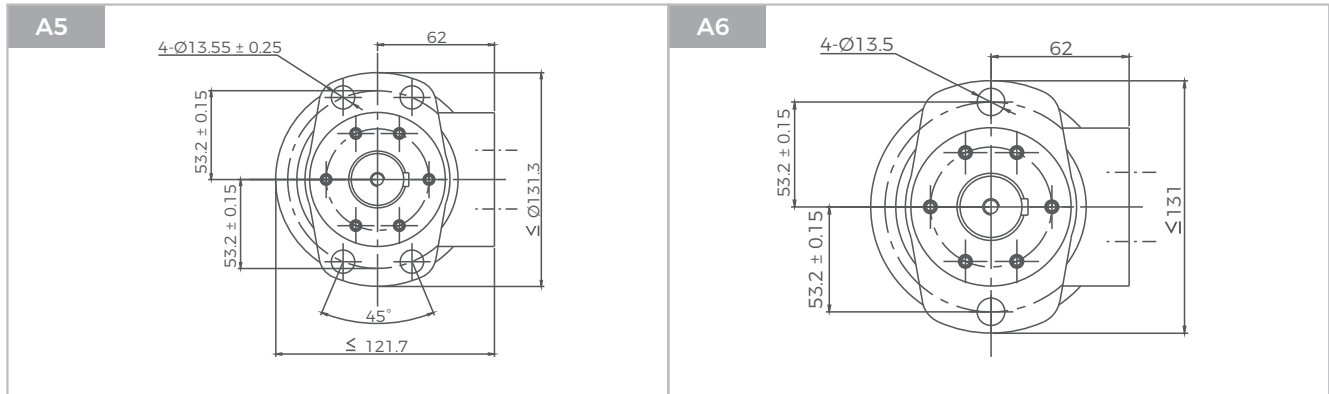


Model	L	L1
GH200	168	27
GH250	175	34
GH315	184	42
GH400	195	54
GH500	206	65

Mounting	G1 (depth)	M1 (depth)	U2 (depth)	U1 (depth)	G2 (depth)
P(A, B)	G1/2(15)	M22 x1.5(15)	7/8-14 O-ring(17)	1/2-14 NPTF(15)	PT(RC)1/2(15)
T	4-M8(13)	4-M8(13)	4-5/16-18 UNC(13)	4-5/16-18 UNC(13)	4-M8(13)
C	G1/4(12)	M14 x 1.5(12)	7/16-20 UNF(12)	7/16-20 UNF(12)	PT(RC)1/4(9.7)



## GH Flange Covers Dimensions

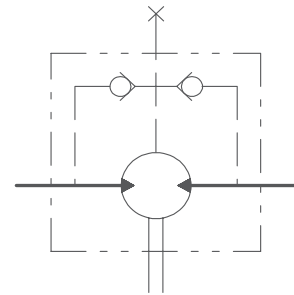
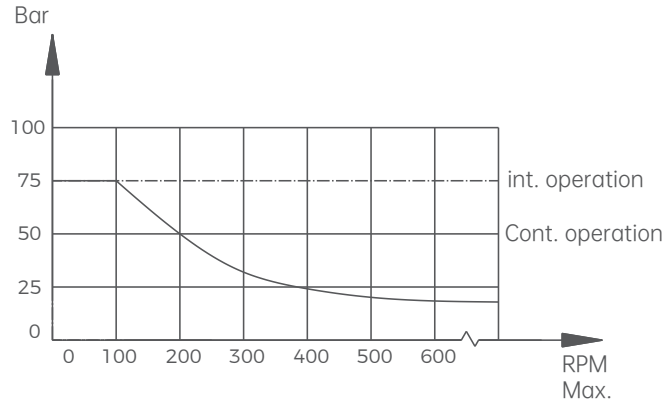


## GH Shafts Dimensions

<p><b>S4</b></p> <p>Straight shaft Ø32 Parallel key 10 x 8 x 45</p>	<p><b>SF</b></p> <p>Straight shaft Ø35 Parallel key 10 x 8 x 45</p>
<p><b>SC</b></p> <p>Straight shaft Ø31.75 Parallel key 7.96 x 7.96 x 31.75</p>	<p><b>R4</b></p> <p>Splined shaft SAE 6B</p>
<p><b>R3</b></p> <p>Splined shaft 14-DP 12/24</p>	<p><b>R6</b></p> <p>Splined shaft 14-DP 12/24</p>
<p><b>T4</b></p> <p>Tapered shaft Ø35 Parallel key B6 x 6 x 20 Tightening torque: 200 ± 10Nm</p>	<p><b>SH</b></p> <p>Straight shaft Ø35 Parallel key 10 x 8 x 45</p>

## GH Series Hydraulic Motors

### Permissible shaft seal pressure



GH with standard shaft seal check valves and without use of drain connection: The pressure on the shaft seal never exceeds the pressure in the return line.

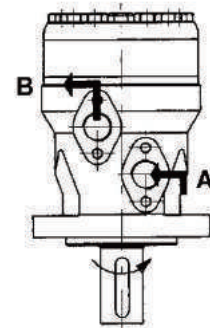
GH with standard shaft seal, check valves and with drain connection: The shaft seal pressure equals the pressure on the drain line.

### Drain Port

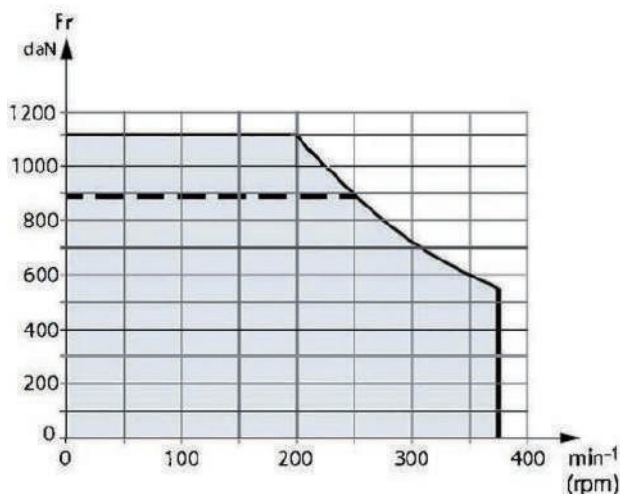
In applications without drain line, output shaft seal exceeds a bit of the pressure in the return line. In applications using the drain line, the pressure of output shaft seal equals the pressure in drain line.

### Standard direction of shaft rotation: Standard

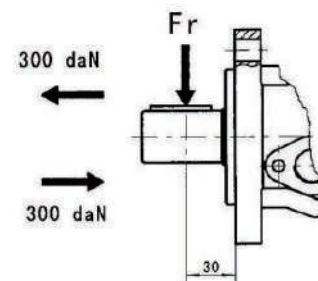
When facing shaft end of motor, shaft to rotate:  
 Clockwise. When port A is pressurized.  
 Counter-clockwise port B is pressurized.



### Axial and radial force



The drawing shows the permissible radial load when L = 30mm [1.18 in].



$$Fr = \frac{1100}{n} * \frac{25000}{103.5 + L} \text{ (daN)}$$

Fr = Radial Force (daN)

L = Distance (mm)

n = Speed (rpm)

## GS Series Hydraulic Motors

### Options

- Flange and wheel mount
- Bearingless motor
- Motor with brake
- Tachometer connection
- Speed sensing
- Side and rear ports
- Straight, splined and tapered shafts
- Shaft seal for high and low pressure
- Metric and BSPP ports
- Other special features

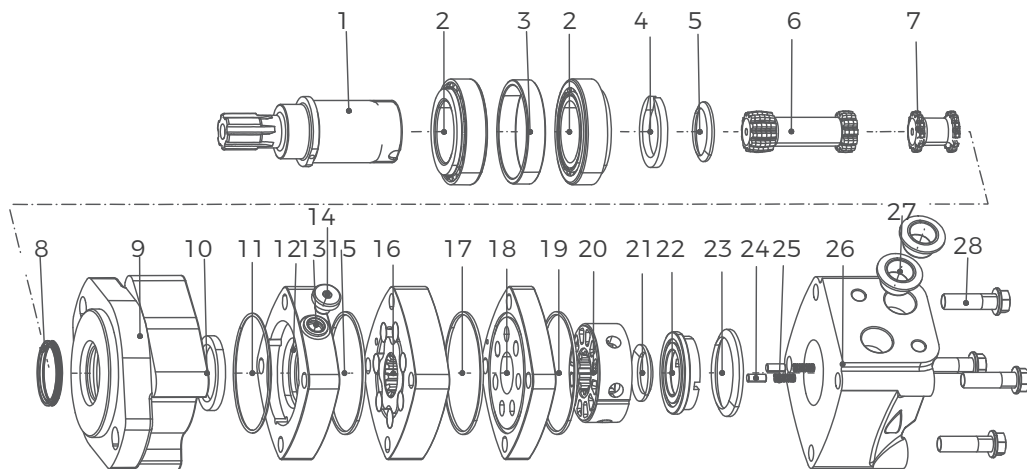
### Applications

- Conveyors
- Road building machines
- Metal working machines
- Special vehicles
- Agricultural machines
- Food industries
- Mining machines











### 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
Pmissible Shaft Loads	daNm [lbs]	Pa=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 microns)



- |                          |                    |                            |                        |
|--------------------------|--------------------|----------------------------|------------------------|
| 1 Output shaft           | 8 Anti-dust ring   | 15 O-ring                  | 22 Flow pressure plate |
| 2 Tapered roller bearing | 9 Front cover      | 16 Rotor and stator        | 23 Special shape ring  |
| 3 Bearing outer retainer | 10 Shaft seal      | 17 Special shape ring      | 24 Positioning pins    |
| 4 Washers                | 11 O-ring          | 18 Balance plate           | 25 Spring              |
| 5 Special shape ring     | 12 Connecting body | 19 Special shape ring      | 26 Rear housing        |
| 6 Transmission shaft     | 13 Sealing gasket  | 20 Flow distribution plate | 27 Oil port plug cap   |
| 7 Coupling shaft         | 14 Plug            | 21 Special shape ring      | 28 Screw               |

### Ordering Code

GS SERIES		DISP	FLANGE	SHAFT	PORTS	ROTATION	PAINT	FUNCTION	
CODE	TYPE	CODE	FLANGE	CODE	PORTS	CODE	PAINT	CODE	FUNCTION
GS	Orbital motor	80	A7 2-Ø13.5 rhomb Ø106.4, pilot Ø82.5×6.3 	C1	G1/2, G1/4 manifold 2×M10	A	No paint	A	Standard
GSS	Bearingless motor	100	H3 4-Ø13.5 square Ø106.4, pilot Ø82.5×6.3 	S4	M22×1.5, M14×1.5 manifold 2×M10	B	Blue	F	Free running
		125	A9 6-Ø13.5 rhomb Ø106.4, pilot Ø82.5×2.6 	S8	7/8-14UNF O-ring, 7/16-20UNC manifold 2×3/8-16UNC	C	Black	L	Low speed
		160	W1 4-Ø13.5 wheel Ø160, pilot Ø125×8 	SG	1/2-14 NPTF, 7/16-20UNF manifold 2×3/8-16UNC	S	Silver grey	V	High temp.
		200	AA 2-Ø14.3 rhomb Ø146.05, pilot Ø101.6×9.4 	R2				S	Low temp.
		250	H1 4-Ø11.5 square Ø106.4, pilot Ø82.5×6.3 	R3					
		315	B1 4-Ø11 circle Ø125, pilot Ø100×6 	R7					
		400	H2 4-Ø13.5 square Ø127, pilot Ø101.6×6.3 	T4					
		475		T5					
		525		R8					
		565		R5					
				S1					
				S6					
				T2					

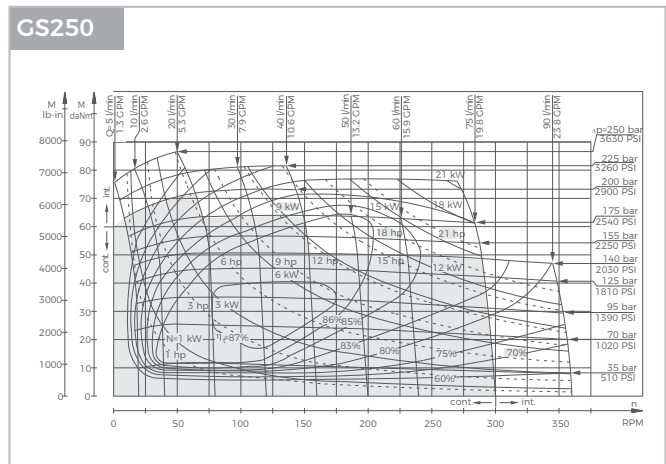
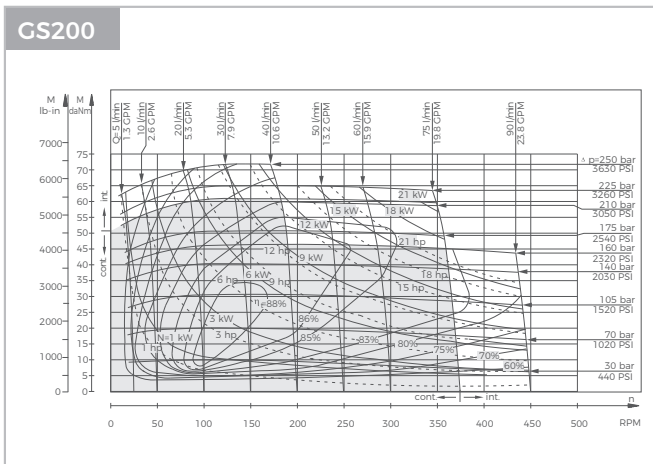
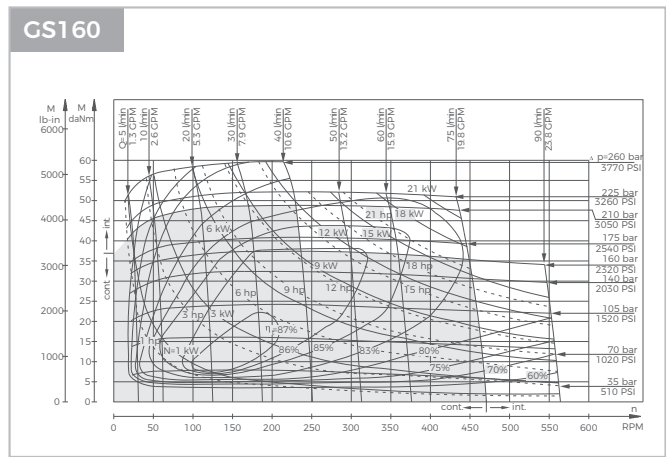
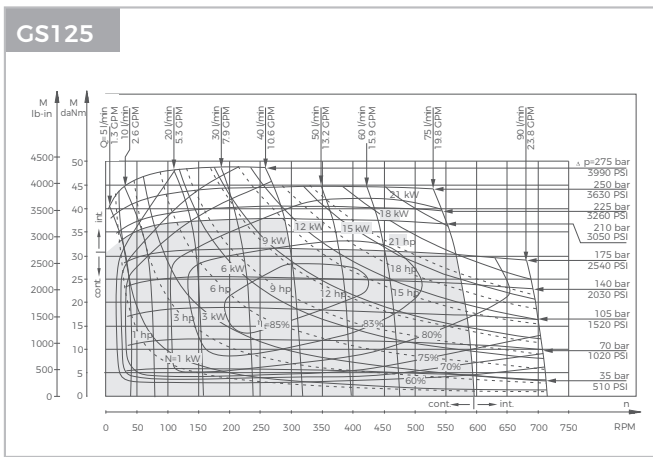
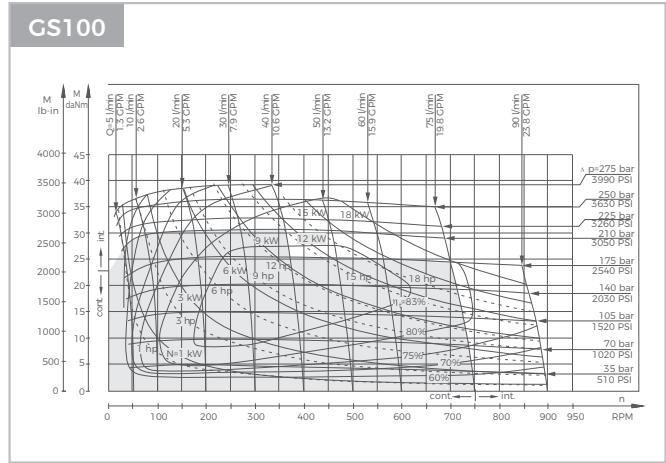
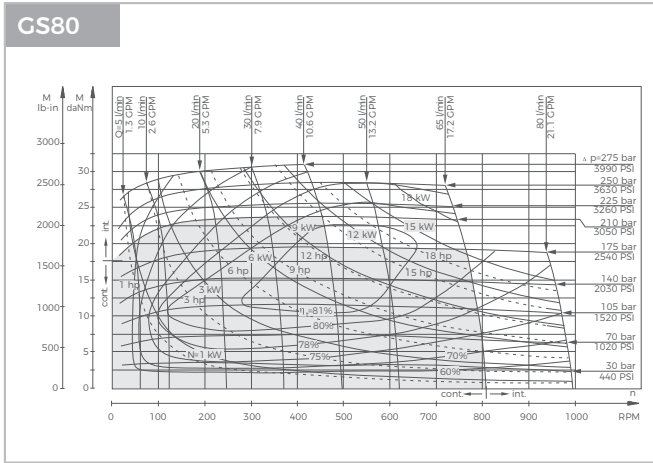
## Specifications

Type		GS80	GS100	GS125	GS160	GS200	GS250
Displacement, cm <sup>3</sup> /rev [in <sup>3</sup> /rev]		80,5[4.91]	100[6.1]	125,7[7.67]	159,7[9.74]	200[12.2]	250 [15.3]
Max. Speed	Cont	810	750	600	470	375	300
RPM	Int*	1000	900	720	560	450	360
Max. Torque	Cont	24[2120]	30,5[2700]	37,5[3320]	49[4340]	61[5400]	72[6370]
daNm [lb-in]	Int*	31[2740]	39[3450]	49[4340]	60[5310]	72[6370]	87[7700]
Max. Output	Cont	15,5[20.8]	18[24.1]	18[24.1]	16,5[22.1]	16,5[22.1]	14,5[19.4]
kW [HP]	Int*	19,5[26.2]	22,8[30.2]	22,5[30.2]	23[30.8]	22[29.52]	18[24.1]
Max. Pressure Drop	Cont	210[3050]	210[3050]	210[3050]	210[3050]	210[3050]	200[2900]
bar [PSI]	Int*	275[3990]	275[3990]	275[3990]	275[3990]	275[3990]	250[3630]
	Peak**	295[4280]	295[4280]	295[4280]	295[4280]	295[4280]	270[3920]
Max. Oil Flow	Cont	65[17]	75[20]	75[20]	75[20]	75[20]	75[20]
lpm [GPM]	Int*	80[21]	90[24]	90[24]	90[24]	90[24]	90[24]
Max. Inlet Pressure	Cont	230[3340]	230[3340]	230[3340]	230[3340]	230[3340]	230[3340]
bar [PSI]	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	Cont	140[2030]	140[2030]	140[2030]	140[2030]	140[2030]	140[2030]
with Drain Line	Int*	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]
bar [PSI]	Peak**	210[3050]	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]	8[115]
Min. Starting Torque	At max. press. drop Cont	18[1590]	23[2040]	29[2570]	37[3270]	47[4160]	56[4960]
daNm [lb-in]	At max. press. drop Int*	23,5[2080]	30[2660]	38[3360]	46[4070]	56[4960]	70[6200]
Min. Speed***, RPM		10	10	8	8	6	6
Weight, kg [lb] For	GS	9,9[21.8]	10,1[22.2]	10,4[22.9]	10,8[23.8]	11,2[24.7]	11,7[25.8]
rear port + 0,40 [.88]	GSS	7,9[17.4]	8,1[17.8]	8,4[18.5]	8,8[19.4]	9,2[20.2]	9,7[21.4]

## Specifications

Type		GS315	GS400	GS475	GS525	GS565
Displacement, cm <sup>3</sup> /rev [in <sup>3</sup> /rev]		314,9[19.2]	397[24.2]	474,6[28.96]	522,7[31.88]	564,9[34.47]
Max. Speed	Cont.	240	190	160	145	130
RPM	Int.*	290	230	190	175	160
Max. Torque	Cont.	82,5[7300]	86,5 [7660]	85[7520]	85[7520]	85[7520]
daNm [lb-in]	Int.*	100[8850]	99[8760]	99[8760]	99[8760]	99[8760]
Max. Output	Cont.	15[20.1]	11[14.8]	8,4[11]	7,6[10.2]	6,9[9]
kW [HP]	Int.*	17[22.8]	12,5[16.8]	11,3[15]	10,4[13.9]	9,6[13]
Max. Pressure Drop	Cont.	200[2900]	160[2320]	130[1880]	115[1670]	105[1520]
bar [PSI]	Int.*	240[3480]	190[2760]	150[2180]	135[1960]	125[1810]
	Peak**	260[3770]	210[3050]	170[2470]	155[2250]	145[2100]
Max. Oil Flow	Cont.	75[20]	75[20]	75[20]	75[20]	75[20]
lpm [GPM]	Int.*	90[24]	90[24]	90[24]	90[24]	90[24]
Max. Inlet Pressure	Cont.	230[3340]	230[3340]	230[3340]	230[3340]	230[3340]
bar [PSI]	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	Cont.	140[2030]	140[2030]	140[2030]	140[2030]	140[2030]
with Drain Line	Int.*	175[2540]	175[2540]	175[2540]	175[2540]	175[2540]
bar [PSI]	Peak**	210[3050]	210[3050]	210[3050]	210[3050]	210[3050]
Max. Starting Pressure		8[115]	8[115]	8[115]	8[115]	8[115]
with Unloaded Shaft, bar [PSI]						
Min. Starting Torque	At max. press. drop Cont.	71[6280]	71[6280]	71[6280]	71[6280]	71[6280]
daNm [lb-in]	At max. press. drop Int.*	85[7520]	84[7430]	84[7430]	84[7430]	84[7430]
Min. Speed**, RPM		5	5	5	5	5
Weight, kg [lb] For	GS	12,4[27.3]	13,1[29.3]	14,1[31]	14,6[32.2]	15[33.1]
rear port + 0,40 [.88]	GSS	10,4[22.9]	11,3[24.9]	12,1[26.7]	12,6[27.8]	13[28.6]

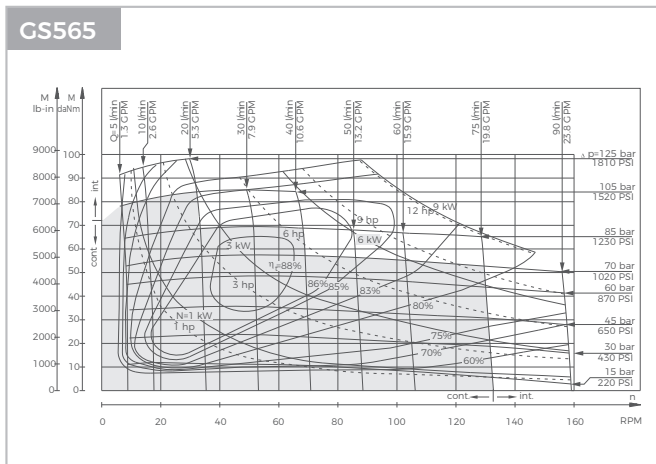
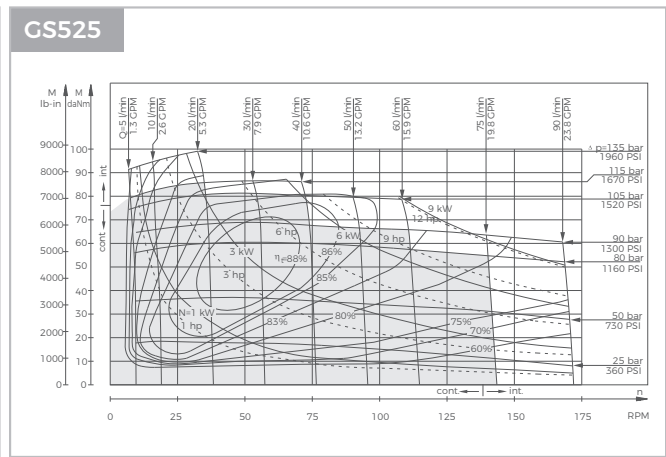
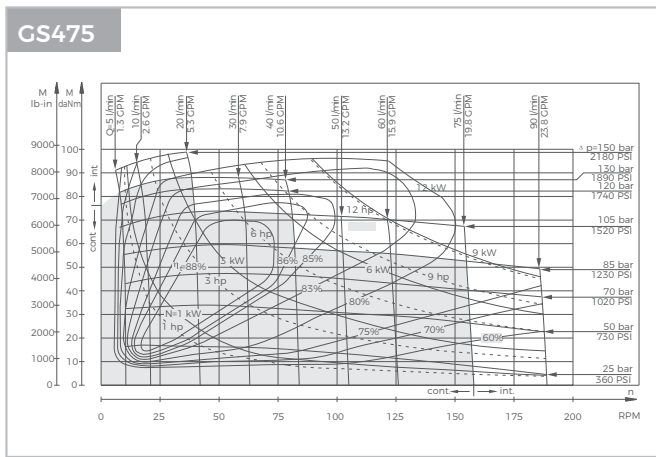
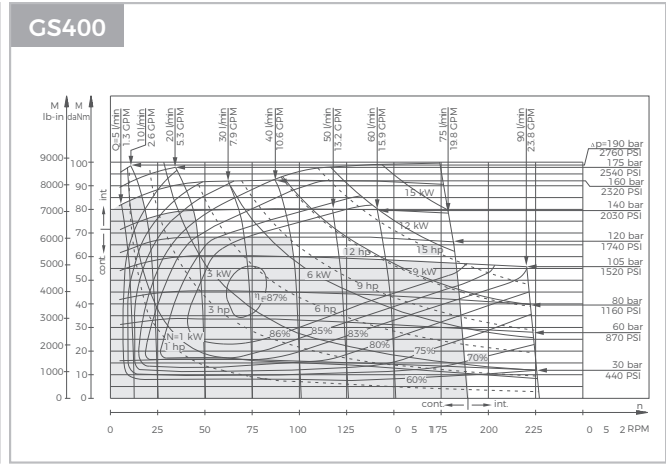
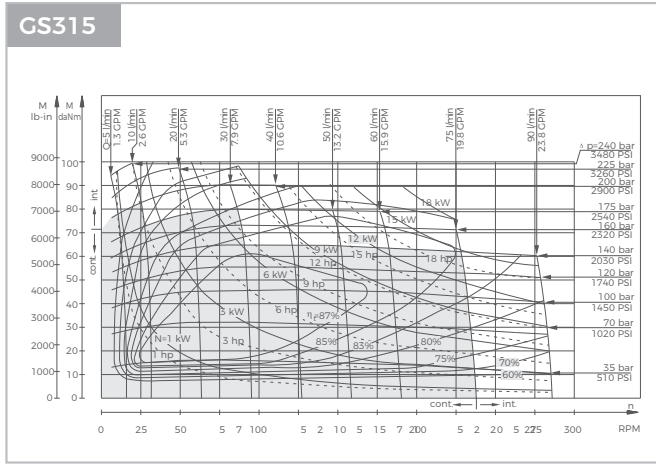
## Function Diagrams



The function diagrams data is for average performance of randomly selected motors at backpressure. 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].

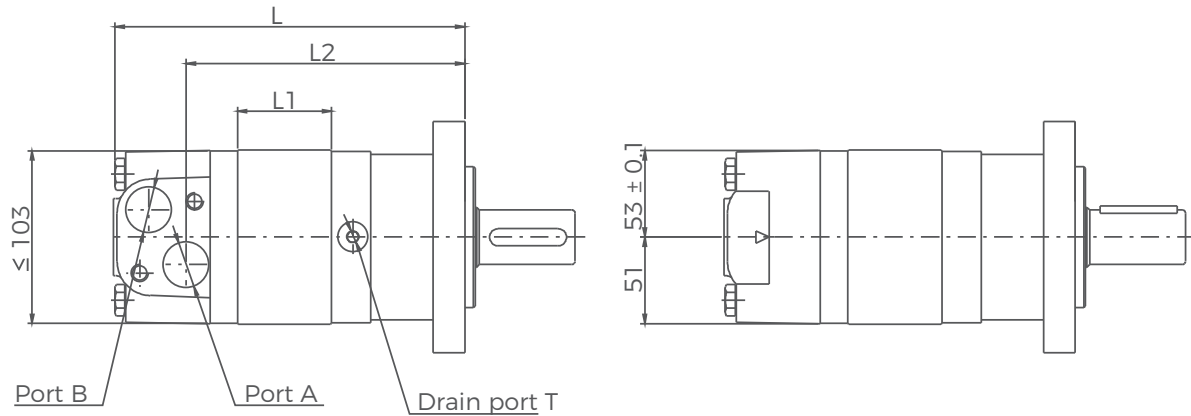


## Function Diagrams

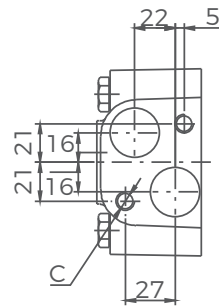


The function diagrams data is for average performance of randomly selected motors at backpressure. 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm<sup>2</sup>/s [150 SUS] at 50°C [122°F].

## GS Dimensions and Mountings

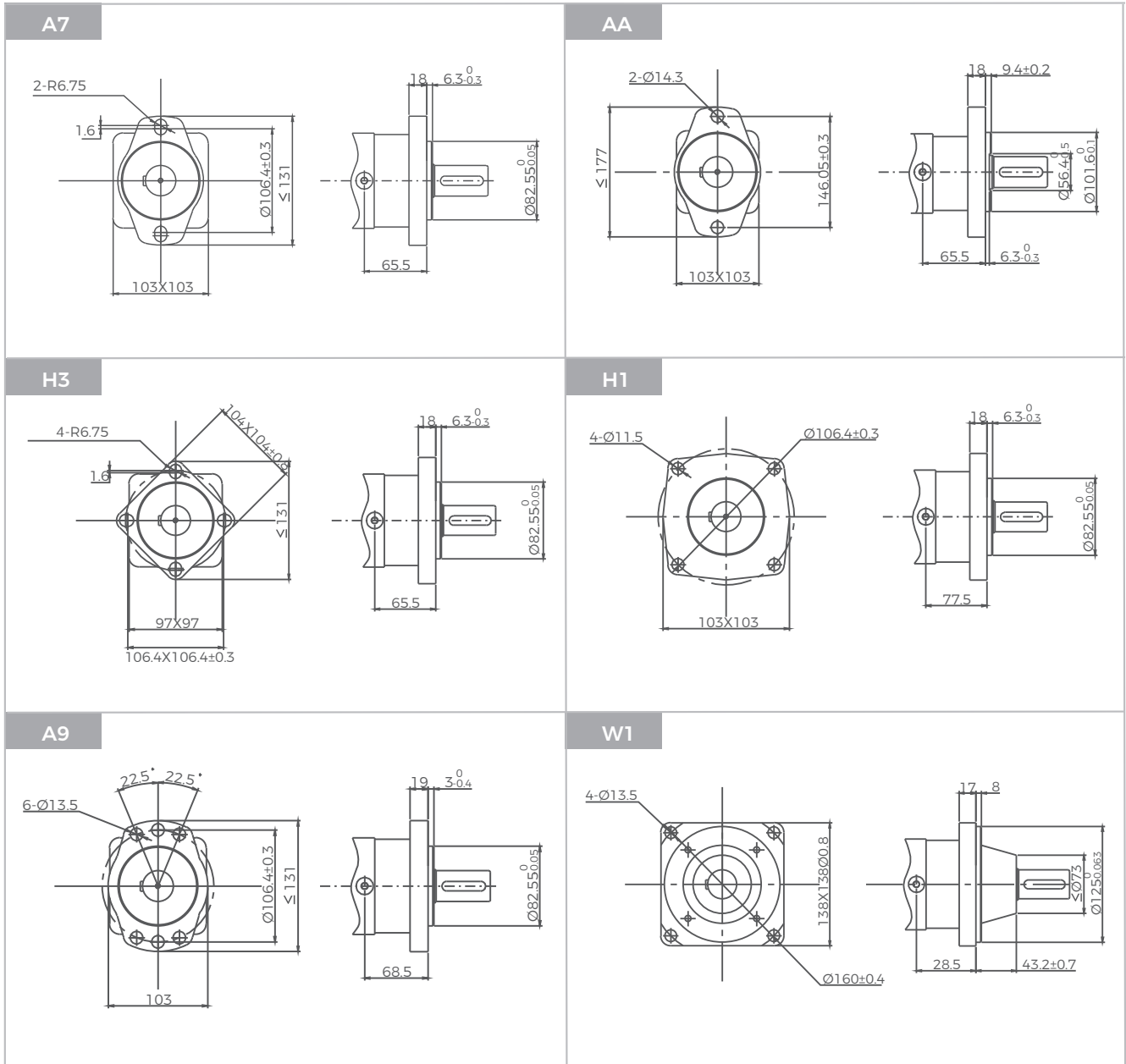


Model	L	L1	L2
GS80	170	16	126.5
GS100	174	20	130.5
GS125	179	25	135.5
GS160	181	27	137.5
GS200	188	34	144.5
GS250	196	42	152.5
GS315	208	54	164.5
GS400	223	69	179.5
GS475	237	83	193.5
GS525	229	75	185
GS565	235	80	191

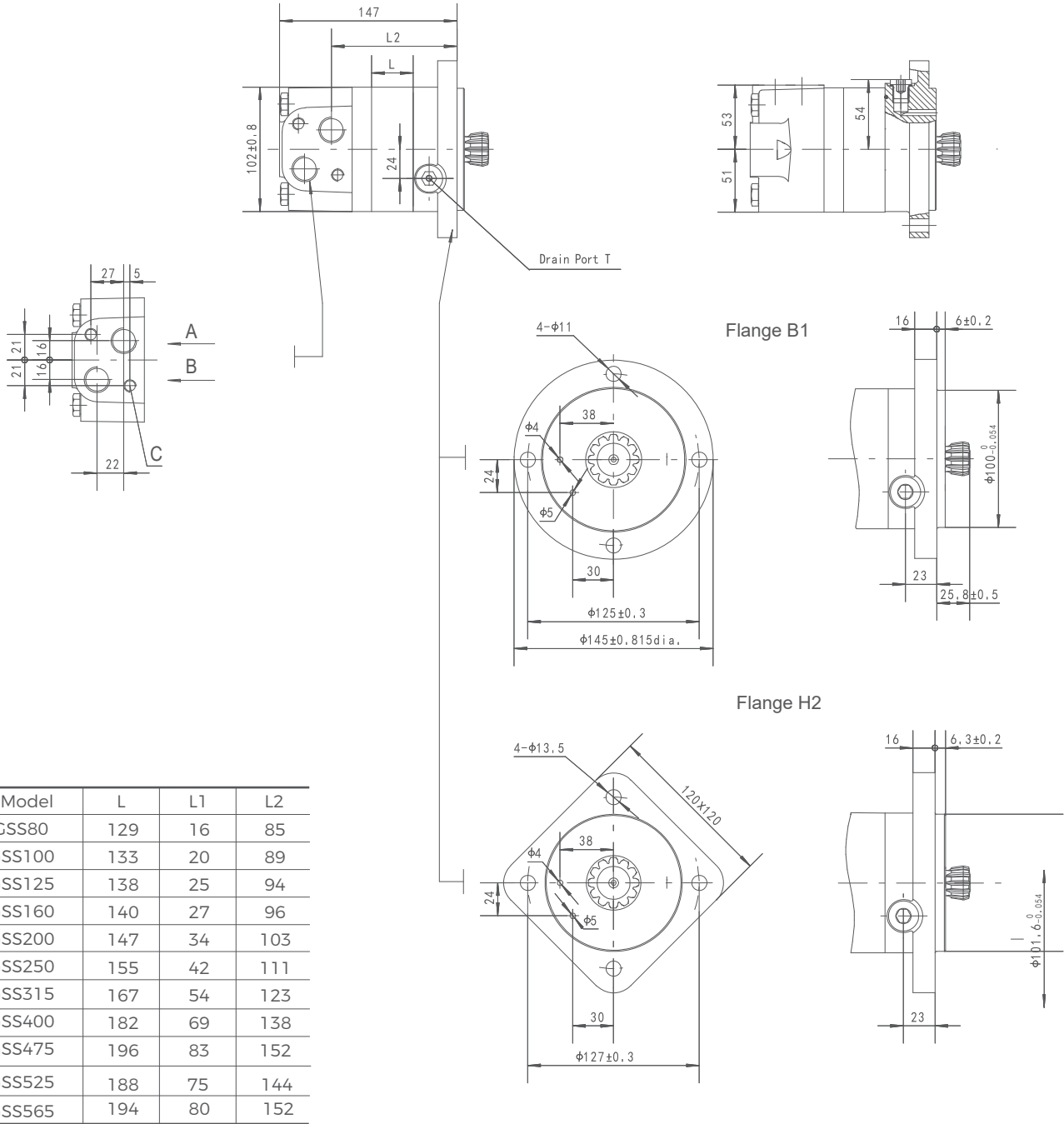


Mounting	C9 (depth)	M8 (depth)	UB (depth)	UC (depth)
P(A,B)	G1/2(15)	M22 x 1.5(15)	7/8-14 O-ring(17)	1/2-14 NPTF(15)
T	G1/4(12)	M14 x 1.5(12)	7/16-20 UNF(12)	7/16-20 UNF(12)
C	2-M10(13)	2-M10(13)	2-3/8-16 UNC(13)	2-3/8-16 UNC(13)

### CS Flange Covers Dimensions



### GSS Bearingless Motor Dimensions and Mounting



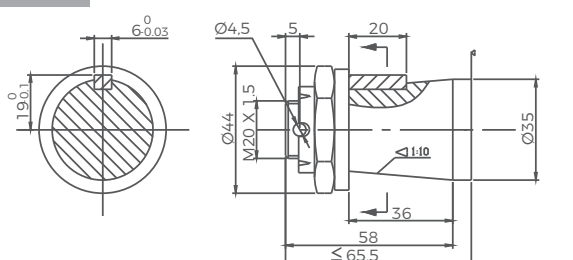
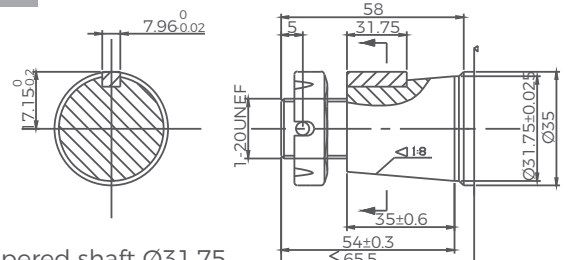
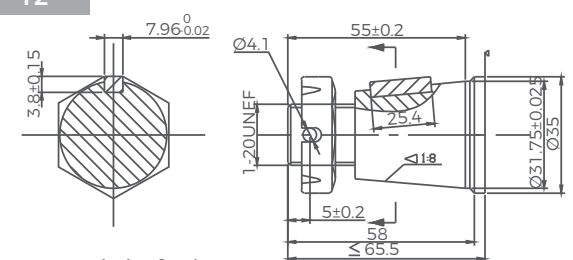
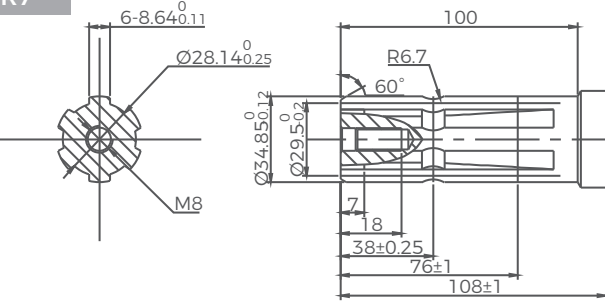
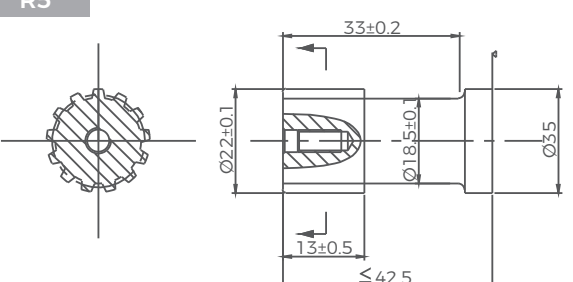
Model	L	L1	L2
GSS80	129	16	85
GSS100	133	20	89
GSS125	138	25	94
GSS160	140	27	96
GSS200	147	34	103
GSS250	155	42	111
GSS315	167	54	123
GSS400	182	69	138
GSS475	196	83	152
GSS525	188	75	144
GSS565	194	80	152

Mounting	C9 (depth)	M8 (depth)	UB (depth)	UC (depth)
P(A, B)	G1/2(15)	M22 x 1.5(15)	7/8-14 O-ring(17)	1/2-14 NPTF(15)
T	G1/4(12)	M14 x 1.5(12)	7/16-20 UNF(12)	7/16-20 UNF(12)
C	2-M10(13)	2-M10(13)	2-3/8-16 UNC(13)	2-3/8-16 UNC(13)

### GS Shafts Dimensions

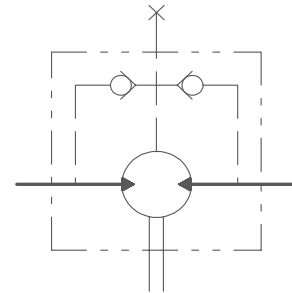
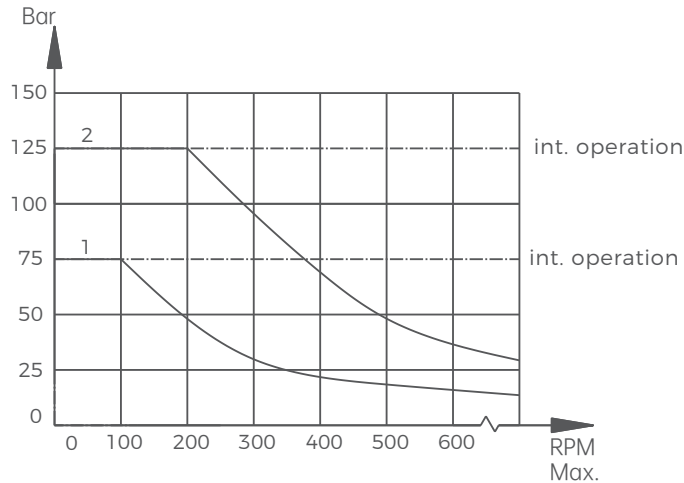
<p><b>S1</b></p> <p>Straight shaft Ø25 Parallel key 8 x 7 x 32</p>	<p><b>S4</b></p> <p>Straight shaft Ø32 Parallel key 10 x 8 x 45</p>
<p><b>S8</b></p> <p>Straight shaft Ø25.4 Parallel key 6.35 x 6.35 x 25.4</p>	<p><b>SG</b></p> <p>Straight shaft Ø31.75 Parallel key 7.96 x 7.96 x 31.75</p>
<p><b>R2</b></p> <p>Splined shaft 14-DP 12/24</p>	<p><b>R3</b></p> <p>Splined shaft 14-DP 12/24</p>
<p><b>S6</b></p> <p>Straight shaft Ø25.4 Woodruff key Ø25.4 x 6.35</p>	<p><b>R8</b></p> <p>Splined shaft SAE 6B</p>

## CS Shafts Dimensions

<p><b>T4</b></p>  <p>Tapered shaft Ø35 Parallel key B6 x 6 x 20</p>	<p><b>T5</b></p>  <p>Tapered shaft Ø31.75 Parallel key 7.96 x 7.96 x 31.75 Tightening torque: 200 ± 10Nm</p>
<p><b>T2</b></p>  <p>Tapered shaft Ø31.75 Parallel key 7.96 x 7.96 x 25.4 Tightening torque: 200 ± 10Nm</p>	<p><b>R7</b></p>  <p>Splined shaft 6-34.85 x 28.14 x 8.64</p>
<p><b>R5</b></p>  <p>Splined shaft 13-DP 16/32</p>	

## GS Series Hydraulic Motors

### Permissible shaft seal pressure



GS with standard shaft seal check valves and without use of drain connection: The pressure on the shaft seal never exceeds the pressure in the return line.

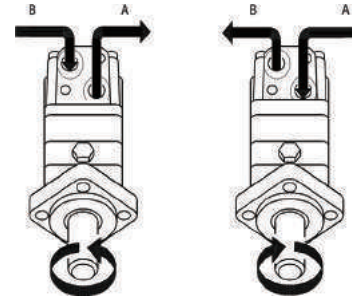
GS with standard shaft seal, check valves and with drain connection: The shaft seal pressure equals the pressure on the drain line.

### Drain Port

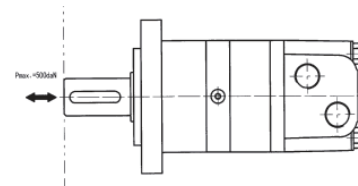
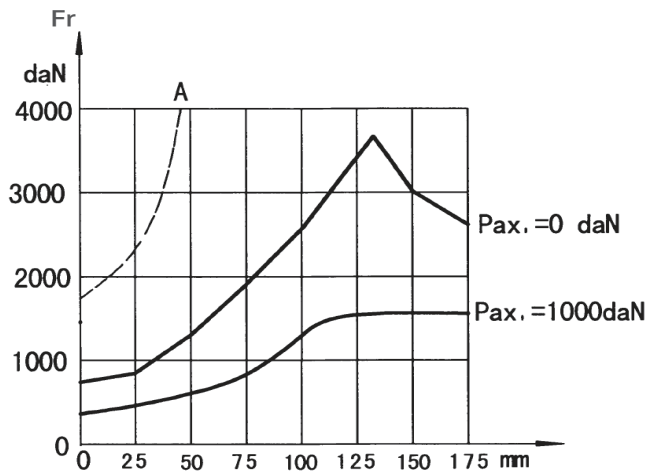
In applications without drain line, output shaft seal exceeds a bit of the pressure in the return line. In applications using the drain line, the pressure of output shaft seal equals the pressure in drain line.

### Standard direction of shaft rotation: Standard

When facing shaft end of motor, shaft to rotate:  
 Clockwise. When port A is pressurized.  
 Counter-clockwise port B is pressurized.



### Axial and radial force



The output shaft runs in tapered bearings that permit high axial and radial forces, Curve "A" shows max radial shaft load, Any shaft loads exceeding the values quoted in the curve will involve a risk of breakage, The two other curves apply to a B10 bearing life of 3000 hours at 200 RPM.