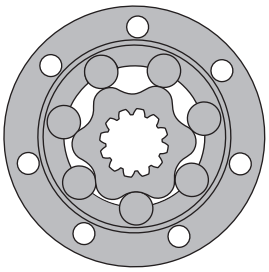
HYDRAULIC MOTORS HW

APPLICATION

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



CONTENTS

OPTIONS

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

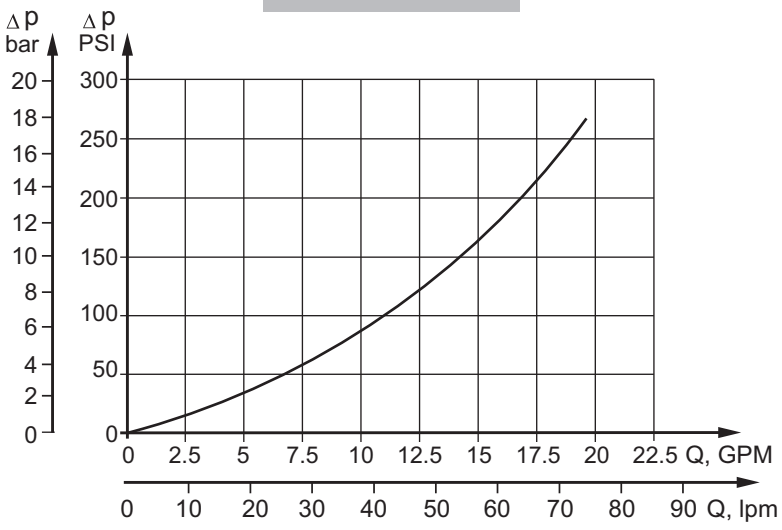
GENERAL

Max. Displacement, cm^3/rev [in^3/rev]	753,8 [45.99]
Max. Speed, [RPM]	750
Max. Torque, daNm [lb-in]	cont.: 96 [8500] int.: 106 [9382]
Max. Output, kW [HP]	23,1 [31]
Max. Pressure Drop, bar [PSI]	cont.: 205 [3000] int.: 225 [3260]
Max. Oil Flow, lpm [GPM]	115 [30.4]
Min. Speed, [RPM]	10
Pressure fluid	Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)
Temperature range, ^{O}C [^{O}F]	-40÷140 [-40÷284]
Optimal Viscosity range, mm^2/s [SUS]	20÷75 [98÷347]
Filtration	ISO code: 18/16/13 According to ISO 4406-1999

Oil flow in drain line

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

Pressure Losses



SPECIFICATION DATA

Type		HW 80	HW 100	HW 125	HW 160	HW 200	HW 235
Displacement, cm^3/rev [in^3/rev]		79,7 [4.86]	101,4 [6.19]	126 [7.69]	157,8 [9.63]	201,3 [12.28]	235,3 [14.36]
Max. Speed,	Cont.	565	445	357	380	373	319
[RPM]	Int.*	750	590	476	475	497	425
Max. Torque,	Cont.	18,8 [1664]	24 [2124]	35 [3098]	44 [3894]	55 [4868]	64,5 [5710]
daNm [lb-in]	Int.*	22,1 [1956]	28,2 [2496]	38,5 [3408]	48 [4248]	60 [5310]	70 [6196]
Max. Output,	Cont.	15,4 [20.7]	15,8 [21.2]	16,2 [21.7]	17,6 [23.6]	18,6 [24.9]	18,2 [24.4]
kW [HP]	Int.*	17,4 [23.3]	18,1 [24.3]	19,8 [26.6]	21,6 [29]	23,1 [31]	22,6 [30.3]
Max. Pressure	Cont.	175 [2540]	175 [2540]	205 [2970]	205 [2970]	205 [2970]	205 [2970]
Drop, bar [PSI]	Int.*	205 [2970]	205 [2970]	225 [3260]	225 [3260]	225 [3260]	225 [3260]
Max. Oil Flow,	Cont.	45 [12]	45 [12]	45 [12]	60 [16]	75 [20]	75 [20]
lpm [GPM]	Int.*	60 [16]	60 [16]	60 [16]	75 [20]	100 [26.4]	100 [26.4]
Max. Inlet	Cont.	200 [2900]	200 [2900]	210 [3050]	210 [3050]	210 [3050]	210 [3050]
Pressure, bar [PSI]	Int.*	225 [3260]	225 [3260]	250 [3625]	250 [3625]	250 [3625]	250 [3625]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		12 [174]	12 [174]	10 [145]	10 [145]	10 [145]	10 [145]
Min. Starting	At max. press. drop Cont.	15 [1328]	19,2 [1699]	28,7 [2540]	36 [3186]	45,1 [3991]	52,8 [4673]
Torque, daNm [lb-in]	At max. press. drop Int.*	17,6 [1558]	22,5 [1991]	31,5 [2788]	39,3 [3478]	49,2 [4355]	57,4 [5080]
Min. Speed***, [RPM]		12	12	10	10	10	10
Weight, kg [lb]	HW	14,1 [31.1]	14,2 [31.3]	14,3 [31.5]	14,6 [32.2]	15,1 [33.3]	15,5 [34.2]
	HWF	12,6 [27.8]	12,7 [28.0]	12,8 [28.2]	13,1 [28.9]	13,6 [30.0]	14,0 [30.9]
	HWFR	14,6 [32.2]	14,7 [32.4]	14,8 [32.6]	15,1 [33.3]	15,6 [34.4]	16,0 [35.3]
	HWFV	12,6 [27.8]	12,7 [28.0]	12,8 [28.2]	13,1 [28.9]	13,6 [30.0]	14,0 [30.9]
	HWS	13,8 [30.4]	13,9 [30.6]	14,0 [30.9]	14,3 [31.5]	14,8 [32.6]	15,2 [33.5]
	HWSW	13,5 [29.8]	13,6 [30.0]	13,7 [30.2]	14,0 [30.9]	14,5 [31.9]	14,9 [32.8]
	HWSR	15,8 [34.8]	15,9 [35.1]	16,0 [35.3]	16,3 [35.9]	16,8 [37.0]	17,2 [37.9]
	HWD	14,3 [31.5]	14,4 [31.8]	14,5 [31.9]	14,8 [32.6]	15,3 [33.7]	15,7 [34.6]
	HWV	13,8 [30.4]	13,9 [30.6]	14,0 [30.9]	14,3 [31.5]	14,8 [32.6]	15,2 [33.5]
	HWE	14,5 [31.9]	14,6 [32.2]	14,7 [32.4]	15,0 [33.1]	15,5 [34.2]	15,9 [35.1]
	HWSE	14,2 [31.3]	14,3 [31.5]	14,4 [31.8]	14,7 [32.4]	15,2 [33.5]	15,6 [34.4]
	HWFE	13,0 [28.7]	13,1 [28.9]	13,2 [29.1]	13,5 [29.8]	14,0 [30.9]	14,4 [31.8]
	HW(7,8,9,10)	16,0 [35.3]	16,1 [35.5]	16,2 [35.7]	16,5 [36.4]	17,0 [37.5]	17,4 [38.4]
	HWF(7,8,9,10)	14,5 [31.9]	14,6 [32.2]	14,7 [32.4]	15,0 [33.1]	15,5 [34.2]	15,9 [35.1]
	HWS(7,8,9,10)	15,7 [34.6]	15,8 [34.8]	15,9 [35.1]	16,2 [35.7]	16,7 [36.8]	17,1 [37.7]

* Intermittent operation: the permissible values may occur for max. 10% of every minute.
** For speeds lower than given, consult factory or your regional manager.
*** **For "E"-option and versions 7,8,9,10 it is not recommendable a flow bigger than 75% of the nominal flow rate.**

1. Intermittent speed and intermittent pressure must not occur simultaneously.
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4). If using synthetic fluids consult the factory for alternative seal materials.
4. Recommended minimum oil viscosity 13 mm^2/s [70 SUS] at 50°C [122°F].
5. Recommended maximum system operating temperature is 82°C [180°F].
6. To assure optimum motor life fill with fluid prior to loading and run at moderate load and speed for 10-15 minutes.

SPECIFICATION DATA

Type		HW 250	HW 300	HW 315	HW 350	HW 370	HW 400
Displacement, cm^3/rev [in^3/rev]		252 [15.38]	300 [18.31]	314,9 [19.22]	347,8 [21.22]	369,2 [22.53]	396,8 [24.21]
Max. Speed,	Cont.	298	250	238	216	203	189
[RPM]	Int.*	397	333	318	288	271	252
Max. Torque,	Cont.	69 [6107]	81 [7170]	85 [7523]	94 [8320]	96 [8497]	96 [8497]
daNm [lb-in]	Int.*	75 [6638]	89 [7877]	93 [8230]	102 [9028]	105 [9293]	98 [8674]
Max. Output,	Cont.	16,8 [22.5]	16,5 [22]	16,4 [21.9]	16,5 [22]	13,2 [17.7]	12,5 [16.8]
kW [HP]	Int.*	20,8 [27.9]	20,8 [27.9]	20,8 [27.9]	20,8 [27.9]	19,2 [25.7]	18,5 [24.8]
Max. Pressure	Cont.	205 [2970]	205 [2970]	205 [2970]	205 [2970]	200 [2900]	185 [2680]
Drop, bar [PSI]	Int.*	225 [3260]	225 [3260]	225 [3260]	225 [3260]	220 [3200]	190 [2760]
Max. Oil Flow,	Cont.	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]
lpm [GPM]	Int.*	100 [26.4]	100 [26.4]	100 [26.4]	100 [26.4]	100 [26.4]	100 [26.4]
Max. Inlet	Cont.	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]
Pressure, bar [PSI]	Int.*	250 [3625]	250 [3625]	250 [3625]	250 [3625]	250 [3625]	250 [3625]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		10 [145]	10 [145]	10 [145]	10 [145]	10 [145]	10 [145]
Min. Starting	At max. press. drop Cont.	56,5 [5000]	66,4 [5877]	69,7 [6169]	77 [6815]	79,5 [7036]	78,7 [6966]
Torque, daNm [lb-in]	At max. press. drop Int.*	61,5 [5443]	72,9 [6452]	76,2 [6744]	83,6 [7400]	86 [7612]	80,3 [7107]
Min. Speed*, [RPM]**		10	10	10	8	8	8
Weight, kg [lb]	HW	15,7 [34.6]	16,1 [35.5]	16,3 [35.9]	16,7 [36.8]	16,9 [37.3]	17,3 [38.1]
	HWF	14,2 [31.3]	14,6 [32.2]	14,8 [32.6]	15,2 [33.5]	15,4 [34.0]	15,8 [34.8]
	HWFR	16,2 [35.7]	16,6 [36.6]	16,8 [37.0]	17,2 [37.9]	17,4 [38.4]	17,8 [39.2]
	HWFV	14,2 [31.3]	14,6 [32.2]	14,8 [32.6]	15,2 [33.5]	15,4 [34.0]	15,8 [34.8]
	HWS	15,4 [34.0]	15,8 [34.8]	16,0 [35.3]	16,4 [36.2]	16,6 [36.6]	17,0 [37.5]
	HWSW	15,1 [33.3]	15,5 [34.2]	15,7 [34.6]	16,1 [35.5]	16,3 [35.9]	16,7 [36.8]
	HWSR	17,4 [38.4]	17,8 [39.2]	18,0 [39.7]	18,4 [40.6]	18,6 [41.0]	19,0 [41.9]
	HWD	15,9 [35.1]	16,3 [35.9]	16,5 [36.4]	16,8 [37.0]	17,1 [37.7]	17,5 [38.6]
	HWV	15,4 [34.0]	15,8 [34.8]	16,0 [35.3]	16,4 [36.2]	16,6 [36.6]	17,0 [37.5]
	HWE	16,1 [35.5]	16,5 [36.4]	16,7 [36.8]	17,1 [37.7]	17,3 [38.1]	17,7 [39.0]
	HWSE	15,8 [34.8]	16,2 [35.7]	16,4 [36.2]	16,8 [37.0]	17,0 [37.5]	17,4 [38.4]
	HWFE	14,6 [32.2]	15,0 [33.1]	15,2 [33.5]	15,6 [34.4]	15,8 [34.8]	16,2 [35.7]
	HW(7,8,9,10)	17,6 [38.8]	18,0 [39.7]	18,2 [40.1]	18,6 [41.0]	18,8 [41.4]	19,2 [42.3]
	HWF(7,8,9,10)	16,1 [35.5]	16,5 [36.4]	16,7 [36.8]	17,1 [37.7]	17,3 [38.1]	17,7 [39.0]
	HWS(7,8,9,10)	17,3 [38.1]	17,7 [39.0]	17,9 [39.5]	18,3 [40.3]	18,5 [40.8]	18,9 [41.7]

* Intermittent operation: the permissible values may occur for max. 10% of every minute.
** For speeds lower than given, consult factory or your regional manager.
*** **For "E"-option and versions 7,8,9,10 it is not recommendable a flow bigger than 75% of the nominal flow rate.**

1. Intermittent speed and intermittent pressure must not occur simultaneously.
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4). If using synthetic fluids consult the factory for alternative seal materials.
4. Recommended minimum oil viscosity 13 mm^2/s [70 SUS] at 50°C [122°F].
5. Recommended maximum system operating temperature is 82°C [180°F].
6. To assure optimum motor life fill with fluid prior to loading and run at moderate load and speed for 10-15 minutes.

SPECIFICATION DATA

Type		HW 470	HW 500	HW 535	HW 550	HW 600	HW 750
Displacement, cm^3/rev [in^3/rev]		470,6 [28.72]	502,4 [30.66]	535 [32.65]	550 [33.56]	598,9 [36.55]	753,8 [45.99]
Max. Speed,	Cont.	159	149	140	136	125	99
[RPM]	Int.*	244	229	215	209	192	152
Max. Torque,	Cont.	92 [8143]	91 [8054]	90 [7966]	89 [7877]	91 [8054]	92 [8143]
daNm [lb-in]	Int.*	101 [8939]	101 [8939]	104 [9205]	105 [9293]	106 [9382]	106 [9382]
Max. Output,	Cont.	10,6 [14.2]	10,8 [14.5]	9,4 [12.6]	9 [12]	8,7 [11.7]	7,3 [9.8]
kW [HP]	Int.*	17,4 [23.3]	17,8 [23.9]	16,4 [22]	15,8 [21.2]	15,1 [20.2]	12,5 [16.8]
Max. Pressure	Cont.	150 [2180]	140 [2030]	130 [1885]	125 [1815]	115 [1670]	95 [1380]
Drop, bar [PSI]	Int.*	165 [2390]	155 [2250]	150 [2180]	145 [2105]	135 [1960]	105 [1520]
Max. Oil Flow,	Cont.	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]
lpm [GPM]	Int.*	115 [30.4]	115 [30.4]	115 [30.4]	115 [30.4]	115 [30.4]	115 [30.4]
Max. Inlet	Cont.	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]
Pressure, bar [PSI]	Int.*	250 [3625]	250 [3625]	250 [3625]	250 [3625]	250 [3625]	250 [3625]
Max. Starting Pressure with Unloaded Shaft, bar [PSI]		10 [145]	10 [145]	10 [145]	10 [145]	10 [145]	10 [145]
Min. Starting	At max. press. drop Cont.	75,4 [6674]	74,6 [6603]	73,8 [6532]	72,9 [6452]	72,0 [6373]	73,6 [6515]
Torque, daNm [lb-in]	At max. press. drop Int.*	82,8 [7328]	82,8 [7328]	85,2 [7540]	84,4 [7470]	83,8 [7417]	84,8 [7505]
Min. Speed***, [RPM]		8	8	5	5	5	4
Weight, kg [lb]	HW	18,1 [39.9]	18,4 [40.6]	18,8 [41.5]	18,9 [41.7]	20,4 [44.9]	21,9 [48.3]
	HWF	16,6 [36.6]	16,9 [37.3]	17,3 [38.1]	17,4 [38.4]	18,8 [41.4]	20,3 [44.6]
	HWFR	18,6 [41.0]	18,9 [41.7]	19,3 [42.5]	19,4 [42.8]	21,0 [46.3]	22,5 [49.6]
	HWFV	16,6 [36.6]	16,9 [37.3]	17,3 [38.1]	17,4 [38.4]	18,8 [41.4]	20,3 [44.6]
	HWS	17,8 [39.2]	18,1 [39.9]	18,5 [40.8]	18,6 [41.0]	20,1 [44.3]	21,6 [47.6]
	HWSW	17,5 [38.6]	17,8 [39.2]	18,2 [40.1]	18,3 [40.3]	19,8 [43.7]	21,3 [46.9]
	HWSR	19,8 [43.7]	20,1 [44.3]	20,5 [45.2]	20,6 [45.4]	22,2 [48.9]	23,7 [52.2]
	HWD	18,3 [40.3]	18,6 [41.0]	19,0 [41.9]	19,1 [42.1]	20,6 [45.4]	22,1 [48.7]
	HWV	17,8 [39.2]	18,1 [39.9]	18,5 [40.8]	18,6 [41.0]	20,1 [44.3]	21,6 [47.6]
	HWE	18,5 [40.8]	18,9 [41.7]	19,2 [42.3]	19,3 [42.5]	20,8 [45.9]	22,3 [49.2]
	HWSE	18,2 [40.1]	18,5 [40.8]	18,9 [41.7]	19,0 [41.9]	20,5 [45.2]	22,0 [48.5]
	HWFE	17,0 [37.5]	17,3 [38.1]	17,7 [39.0]	17,8 [39.2]	19,2 [42.3]	20,7 [45.6]
	HW(7,8,9,10)	20,0 [44.1]	20,3 [44.6]	20,7 [45.6]	20,8 [45.9]	22,3 [49.2]	23,8 [52.5]
	HWF(7,8,9,10)	18,5 [40.8]	18,8 [41.4]	19,2 [42.3]	19,3 [42.5]	20,7 [45.6]	22,2 [48.9]
	HWS(7,8,9,10)	19,7 [43.4]	20,0 [44.1]	20,4 [44.9]	20,5 [45.2]	22,0 [48.5]	23,5 [51.8]

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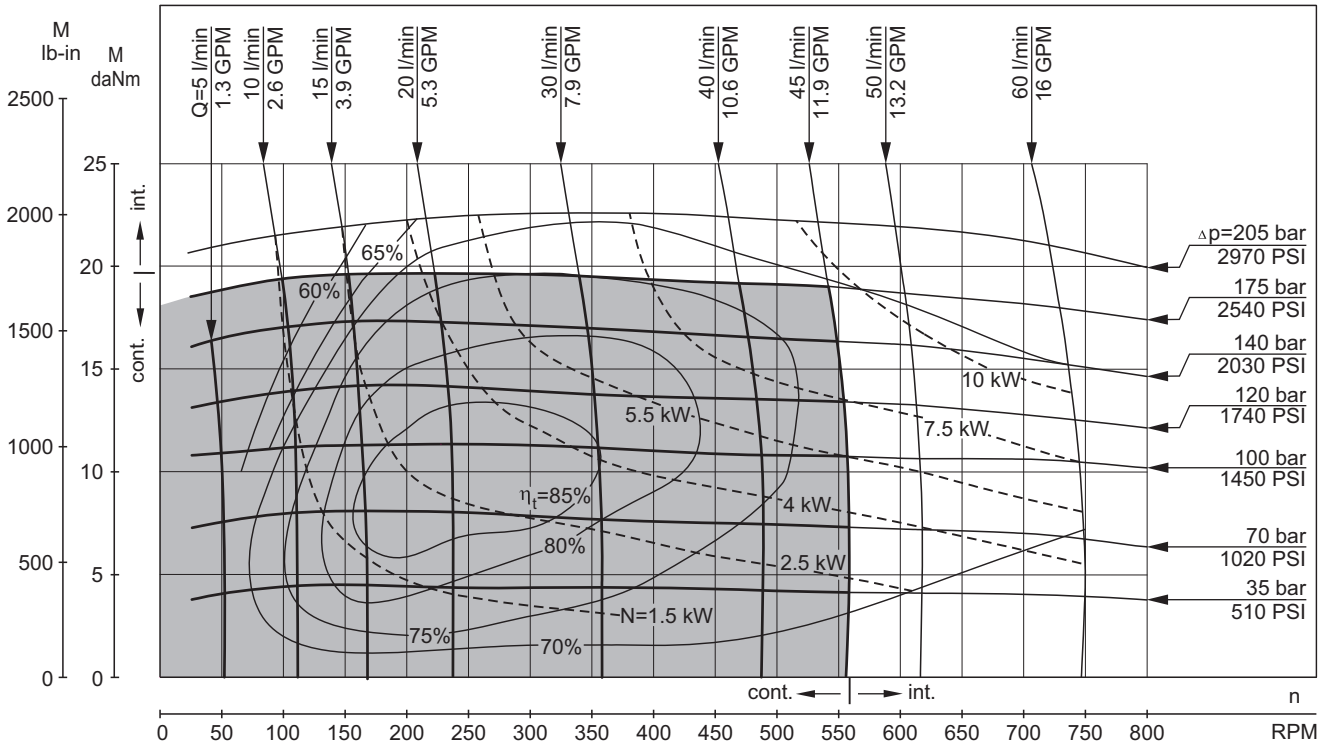
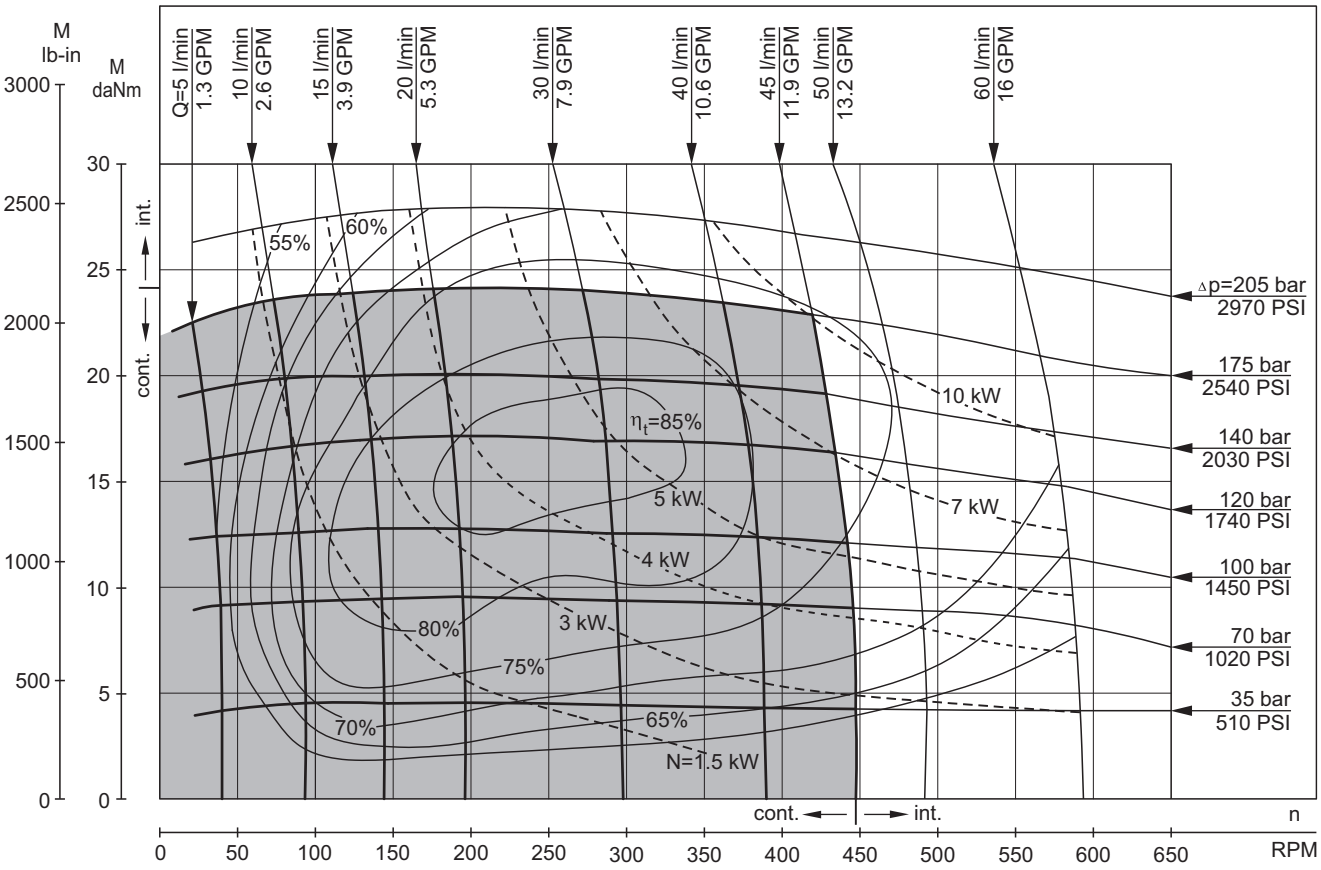
4. Recommended minimum oil viscosity 13 mm^2/s [70 SUS] at 50°C [122°F].
5. Recommended maximum system operating temperature is 82°C [180°F].
6. To assure optimum motor life fill with fluid prior to loading and run at moderate load and speed for 10-15 minutes.

FUNCTION DIAGRAMS

HW 80



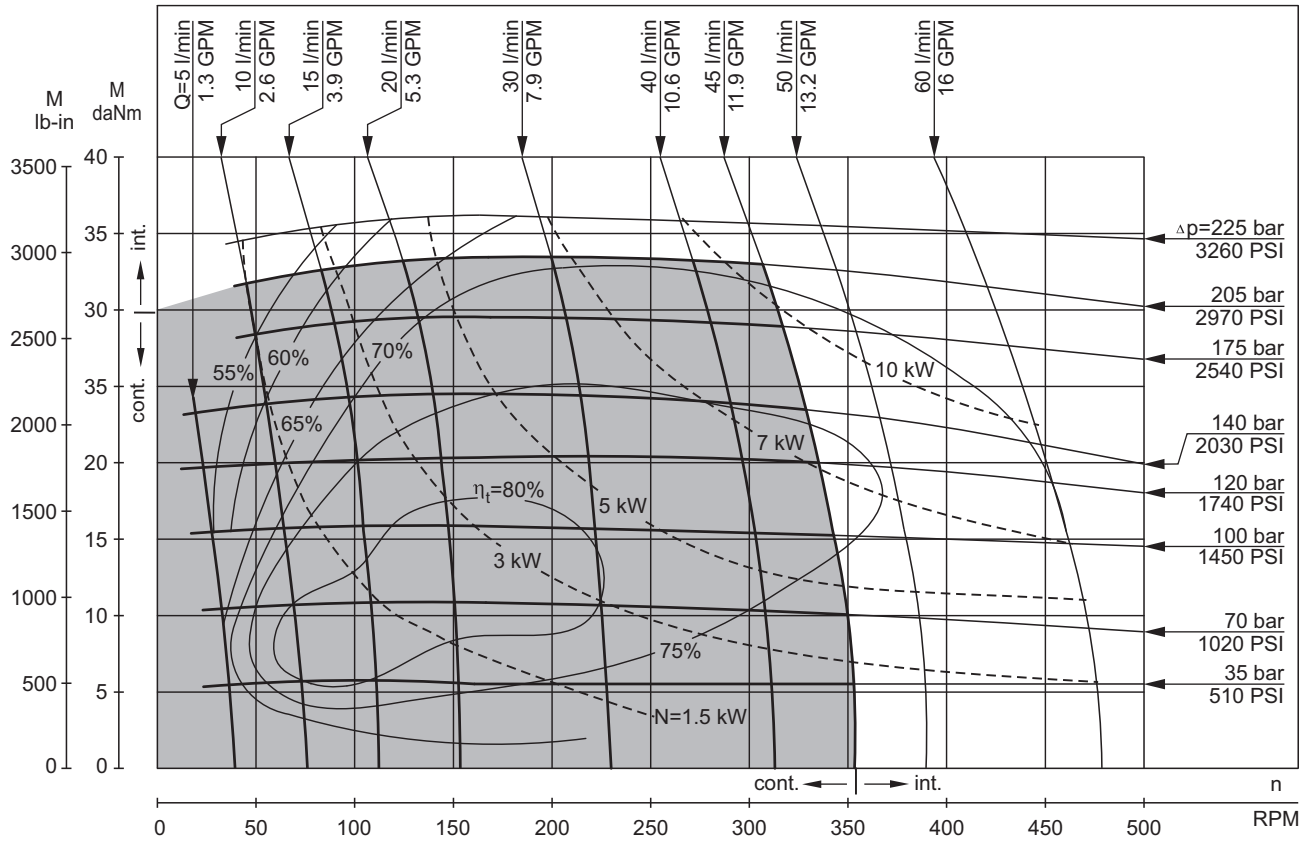
HW 100



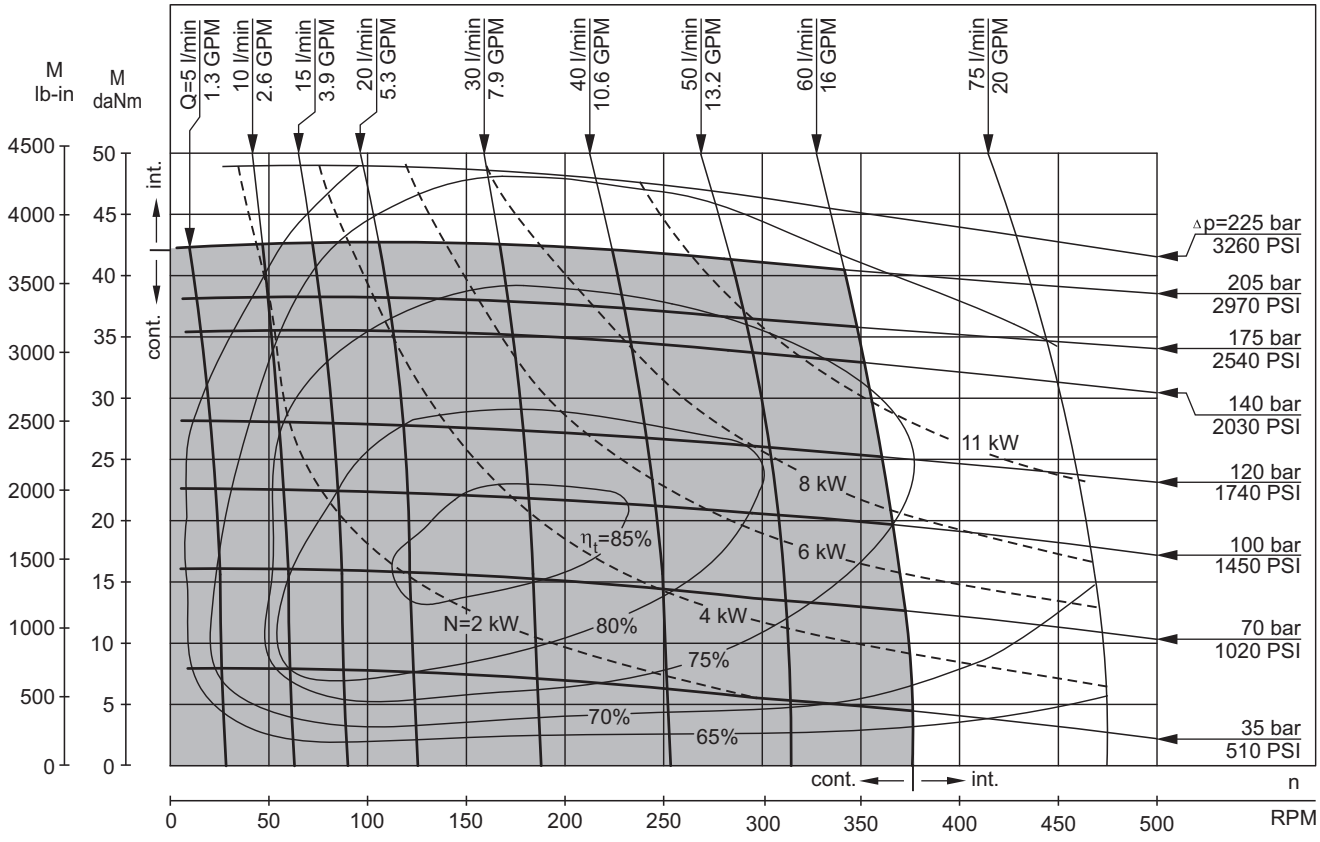
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5 PSI÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 125



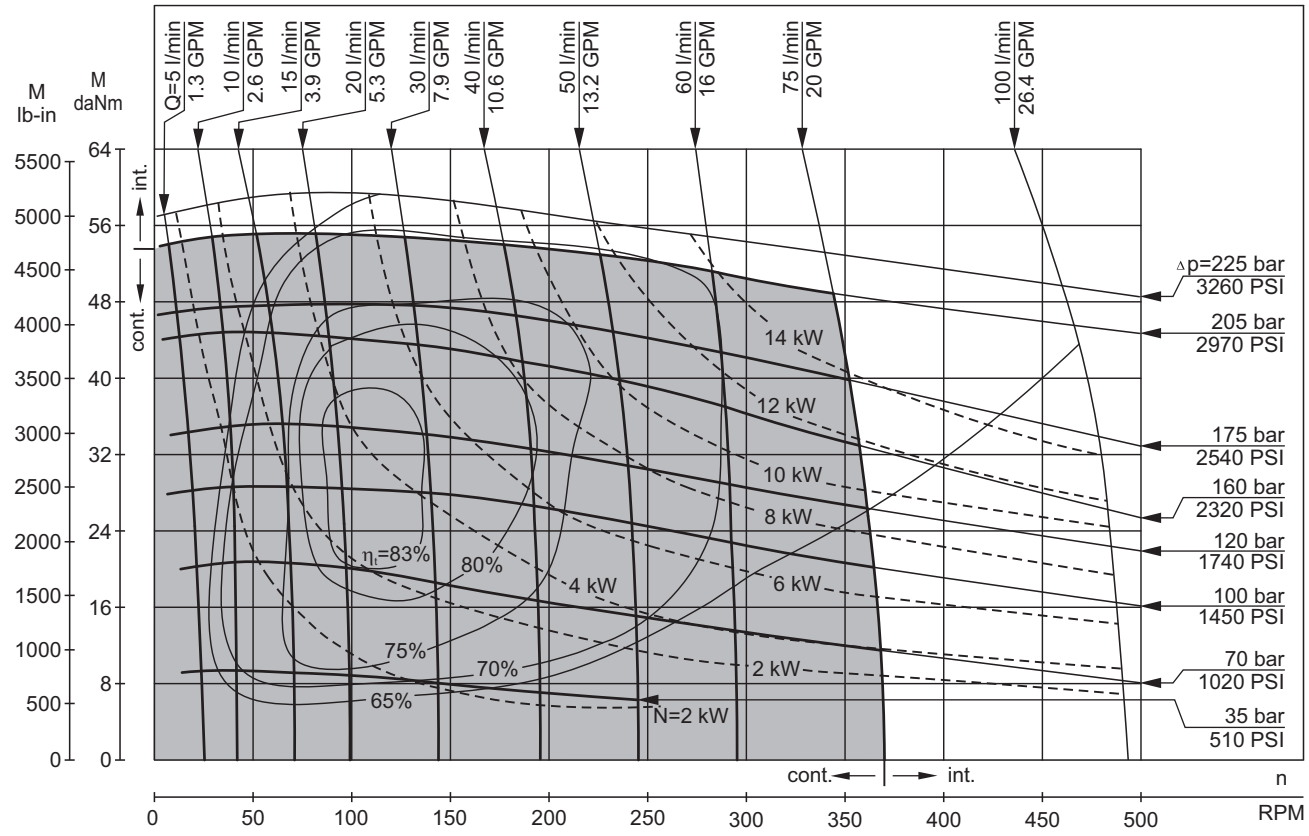
HW 160



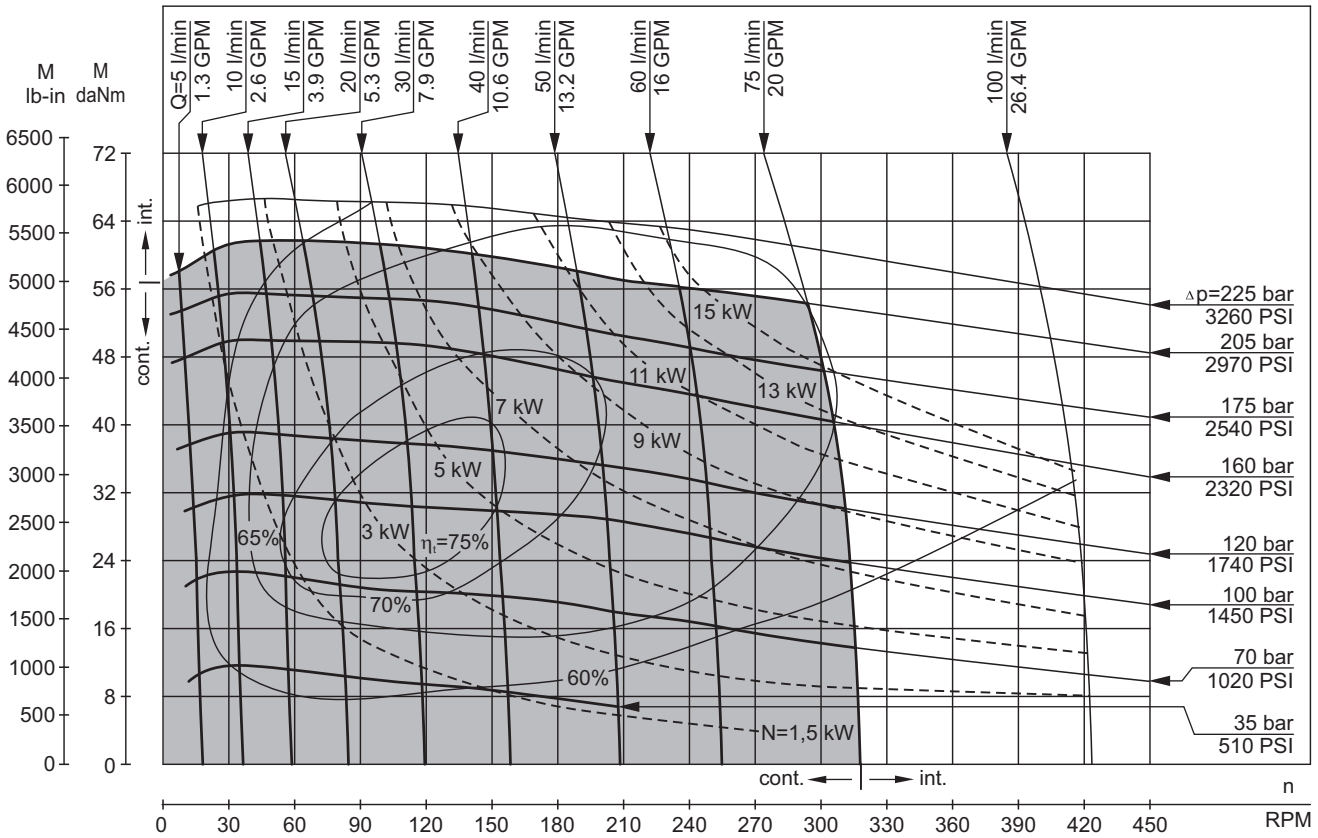
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5 PSI÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 200



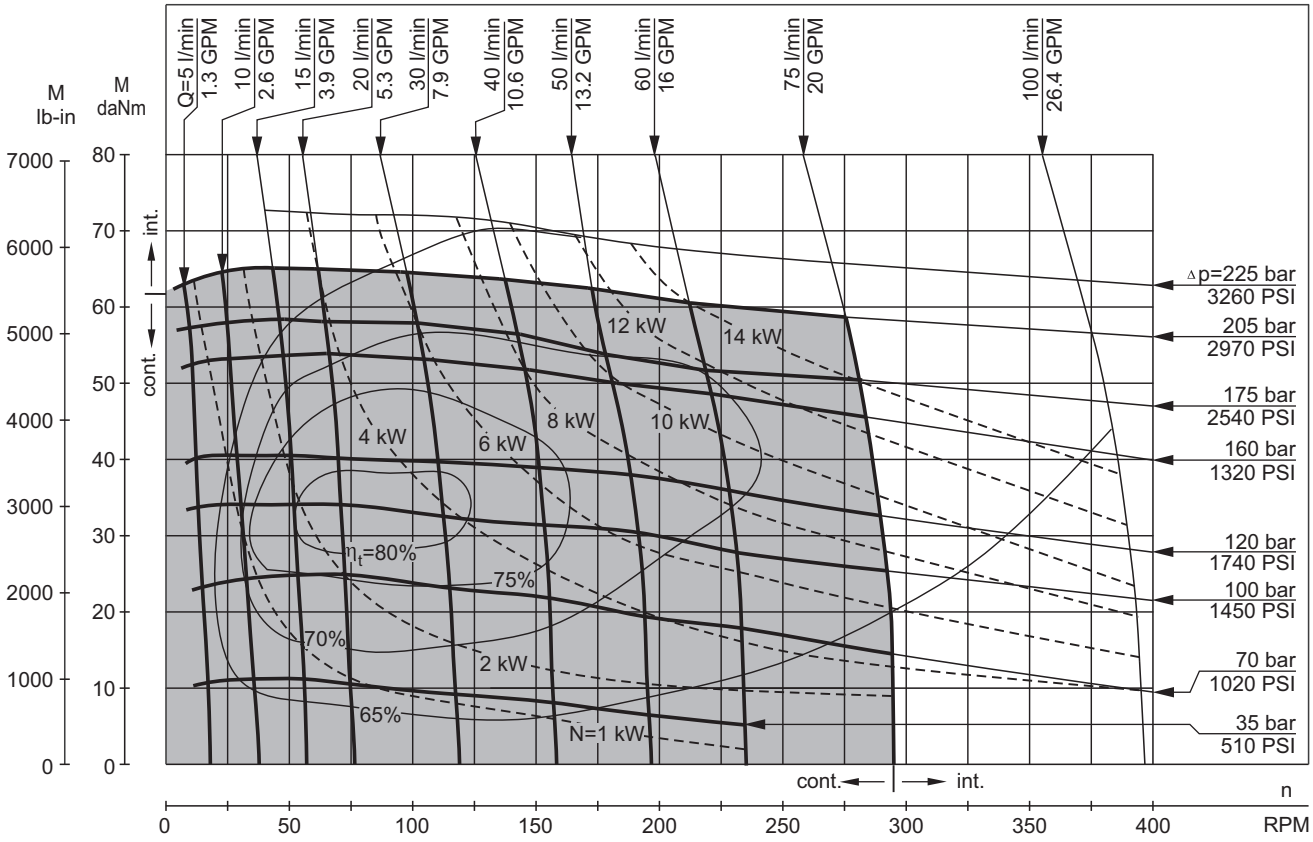
HW 235



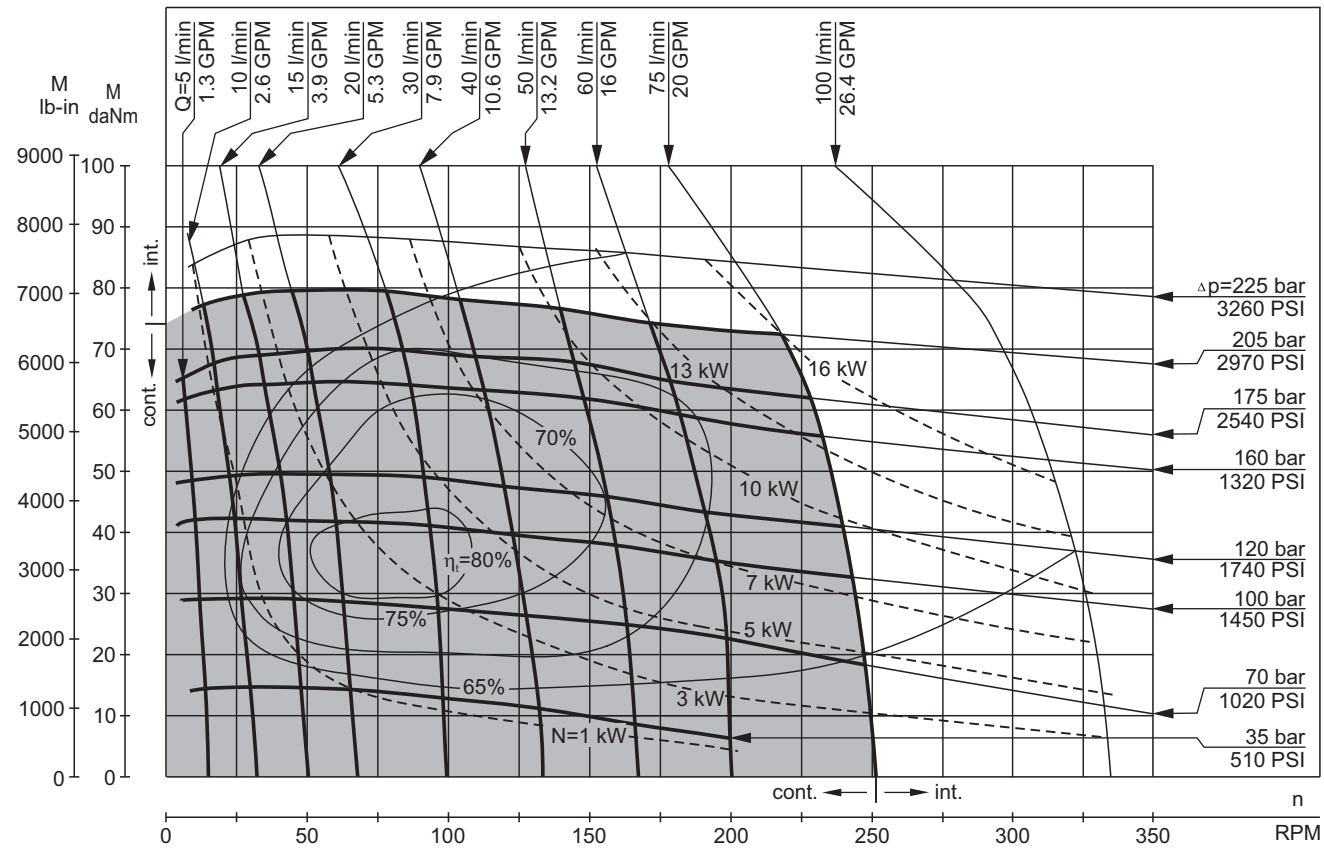
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5 PSI÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 250



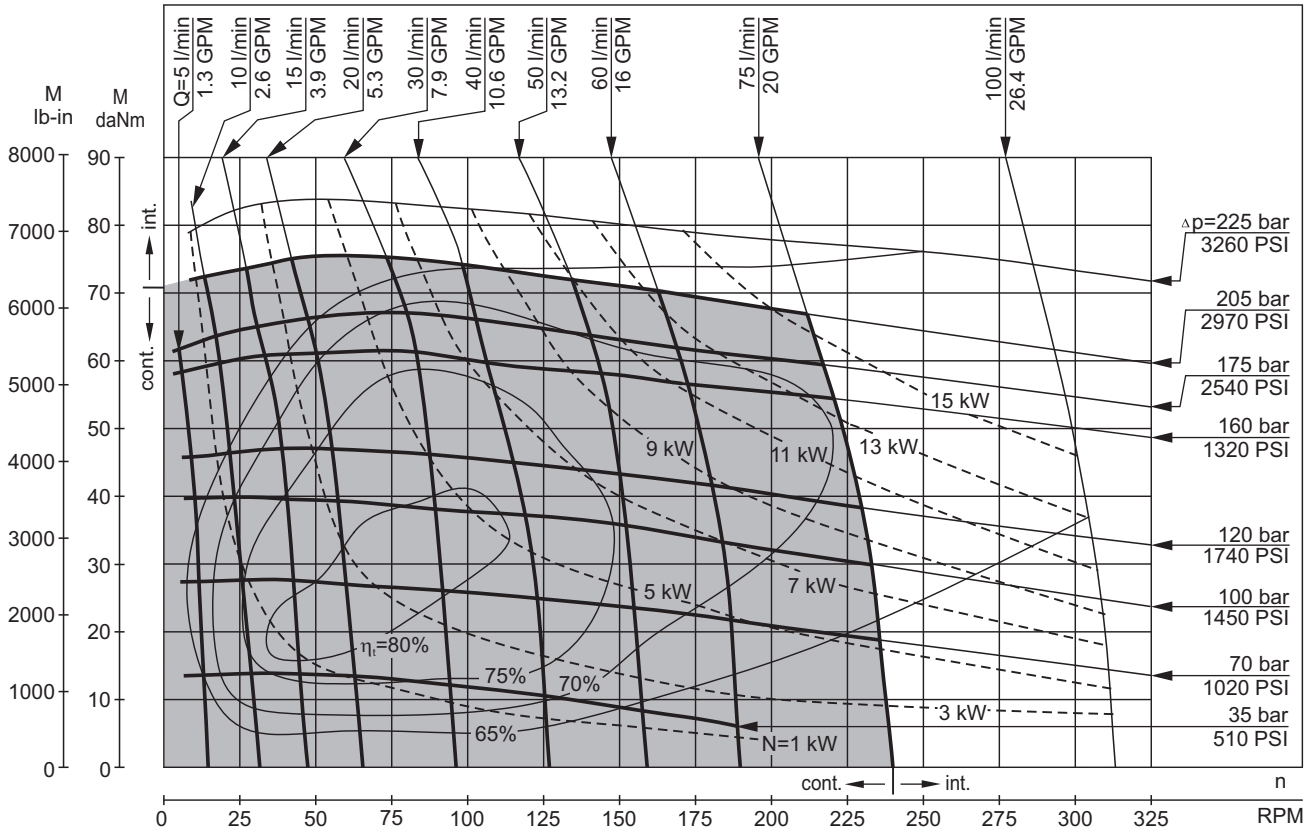
HW 300



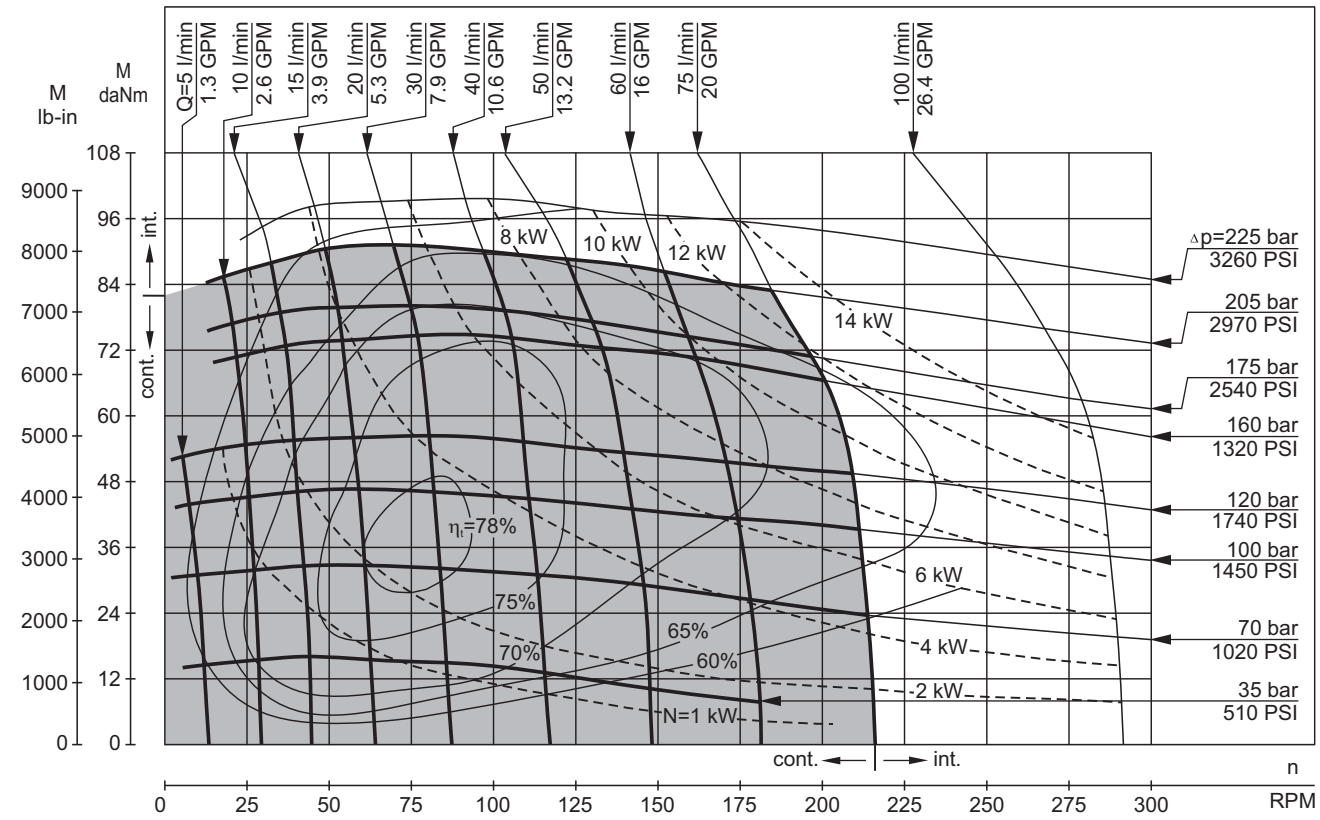
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5 PSI÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 315



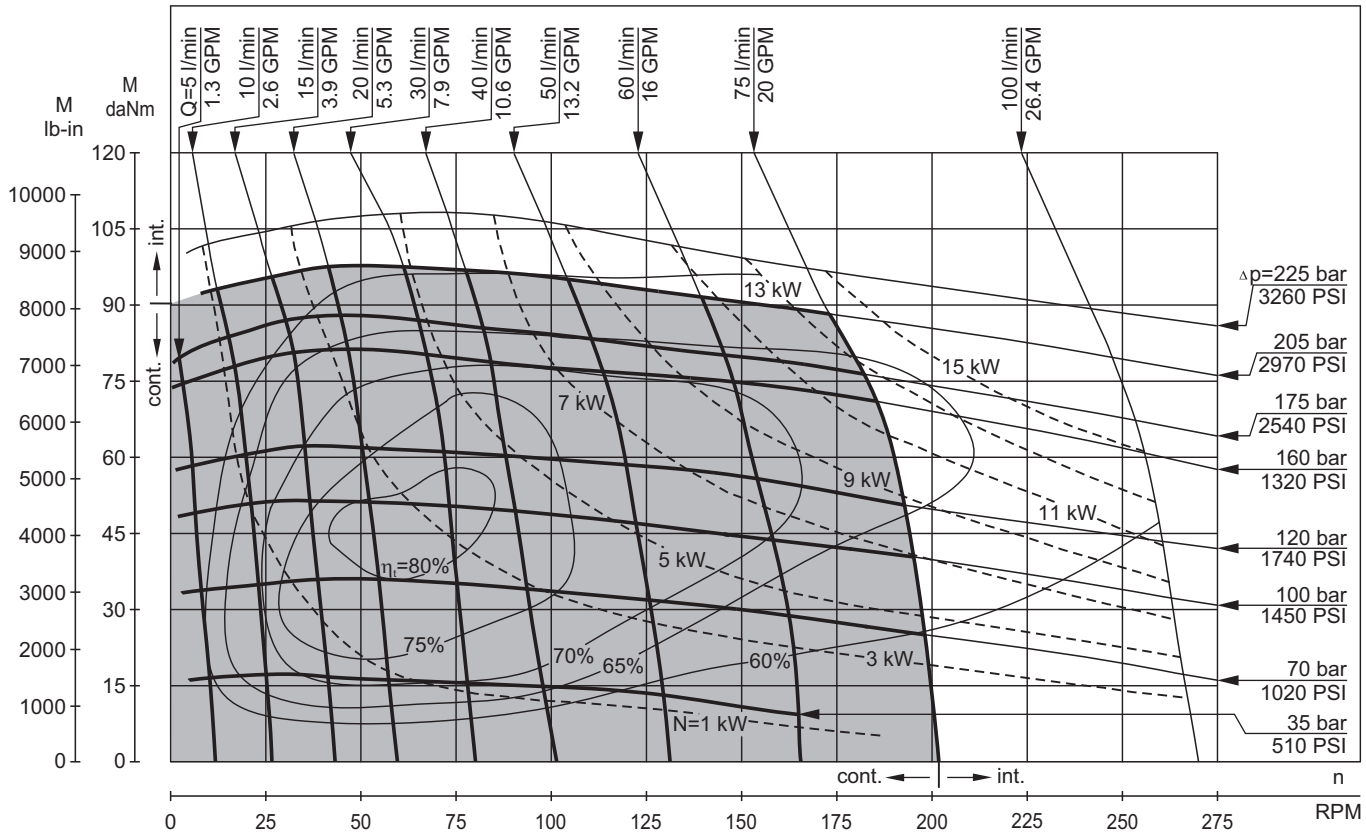
HW 350



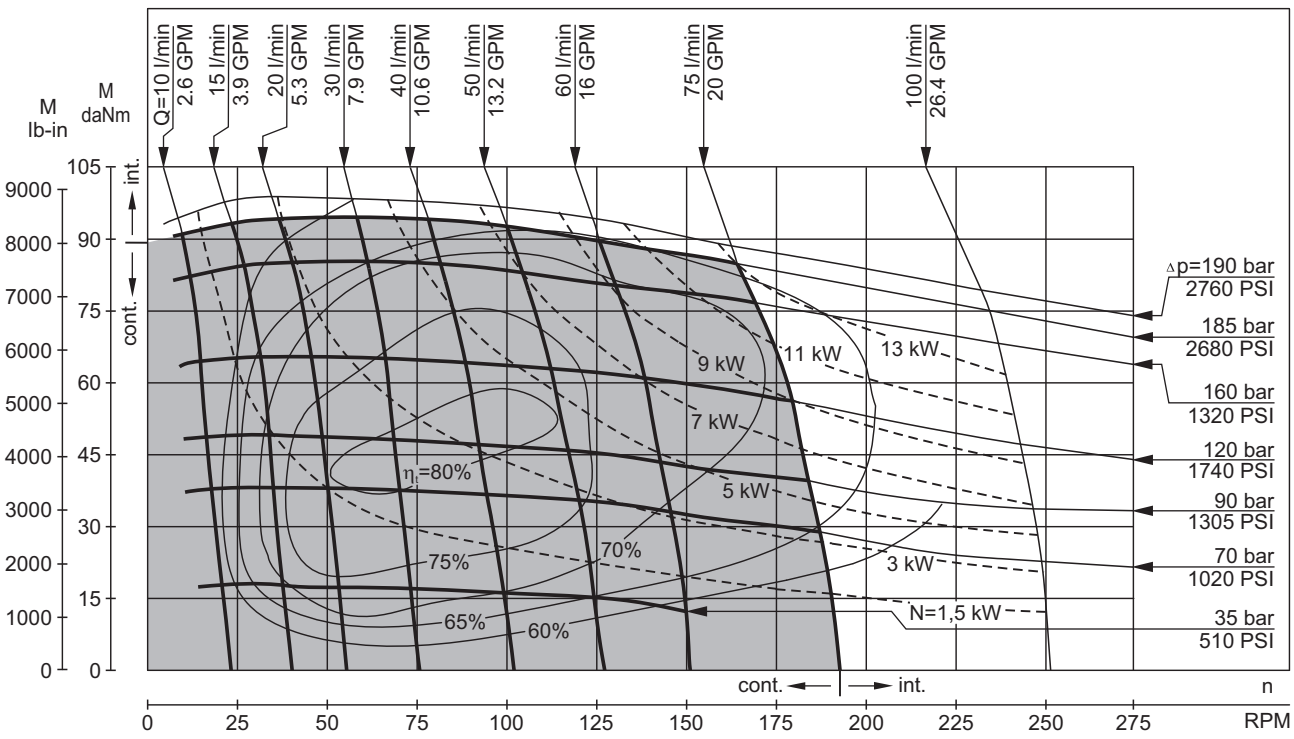
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5 PSI÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 370



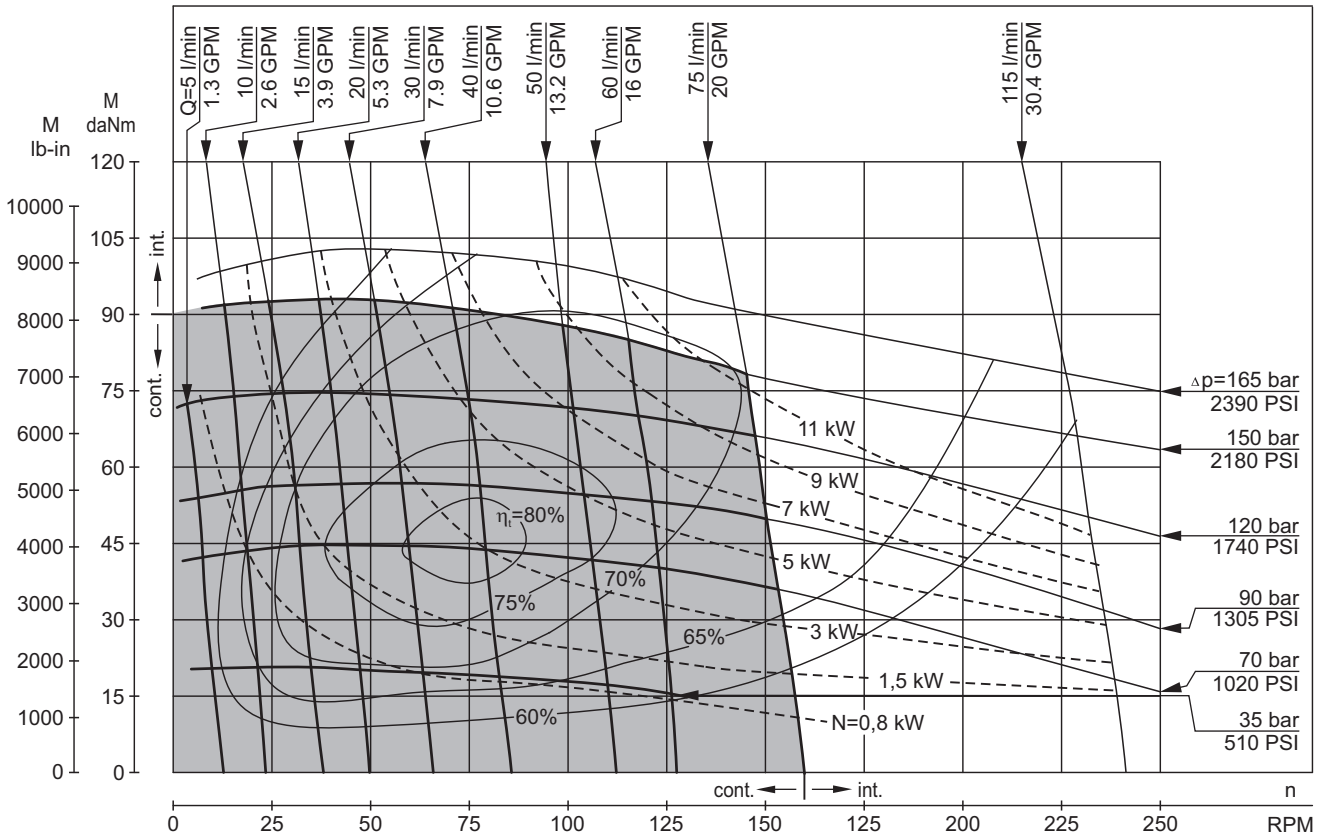
HW 400



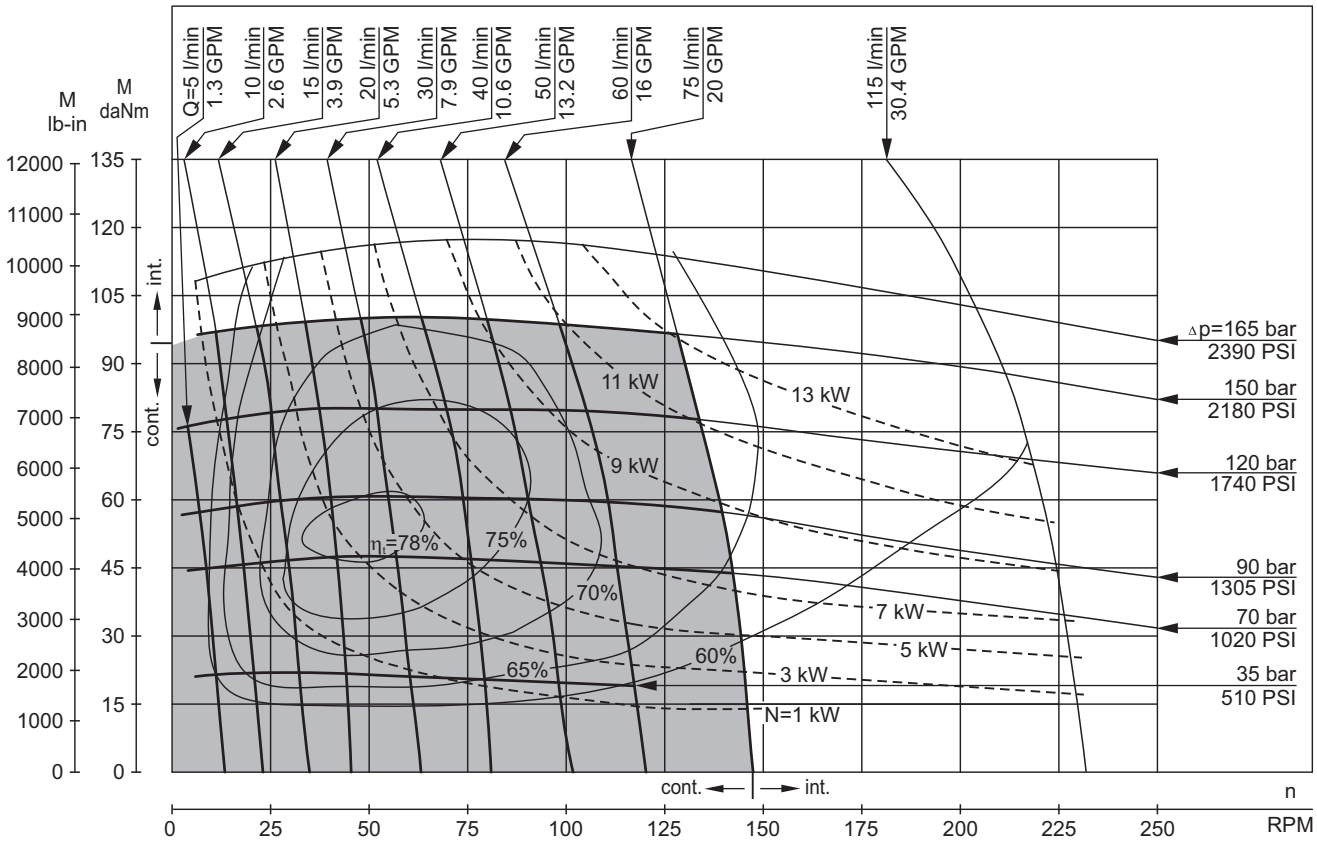
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5 PSI÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 470



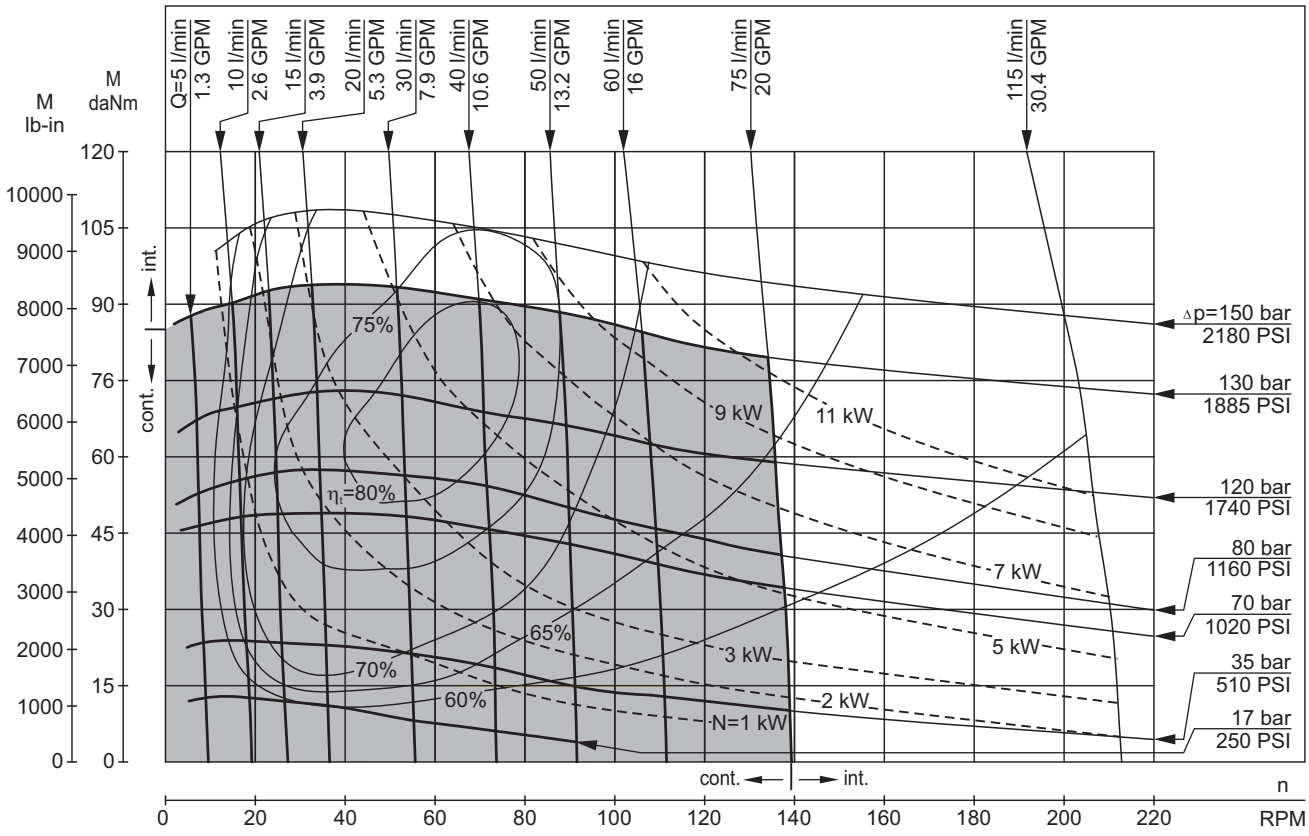
HW 500



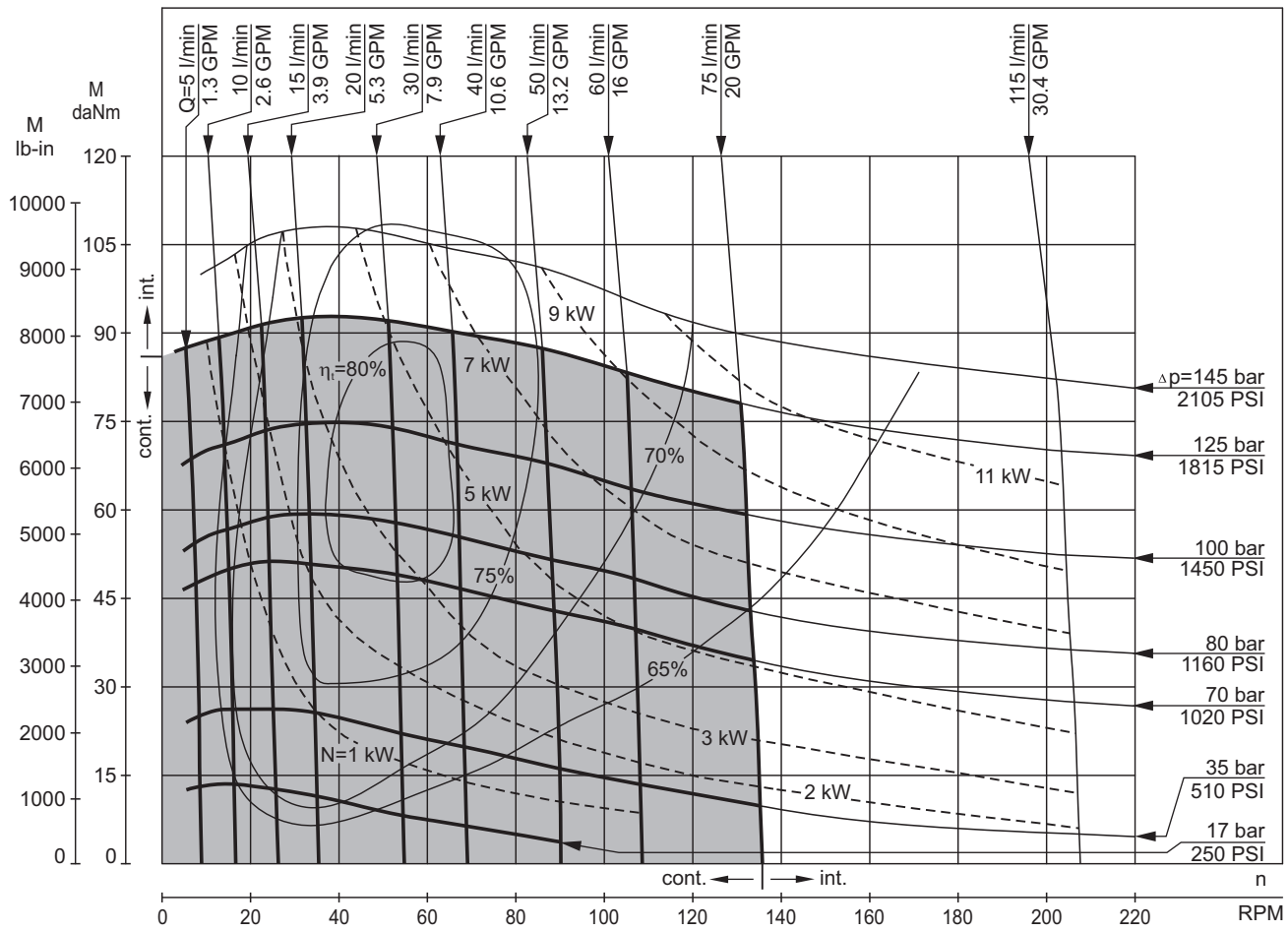
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5 PSI÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 535



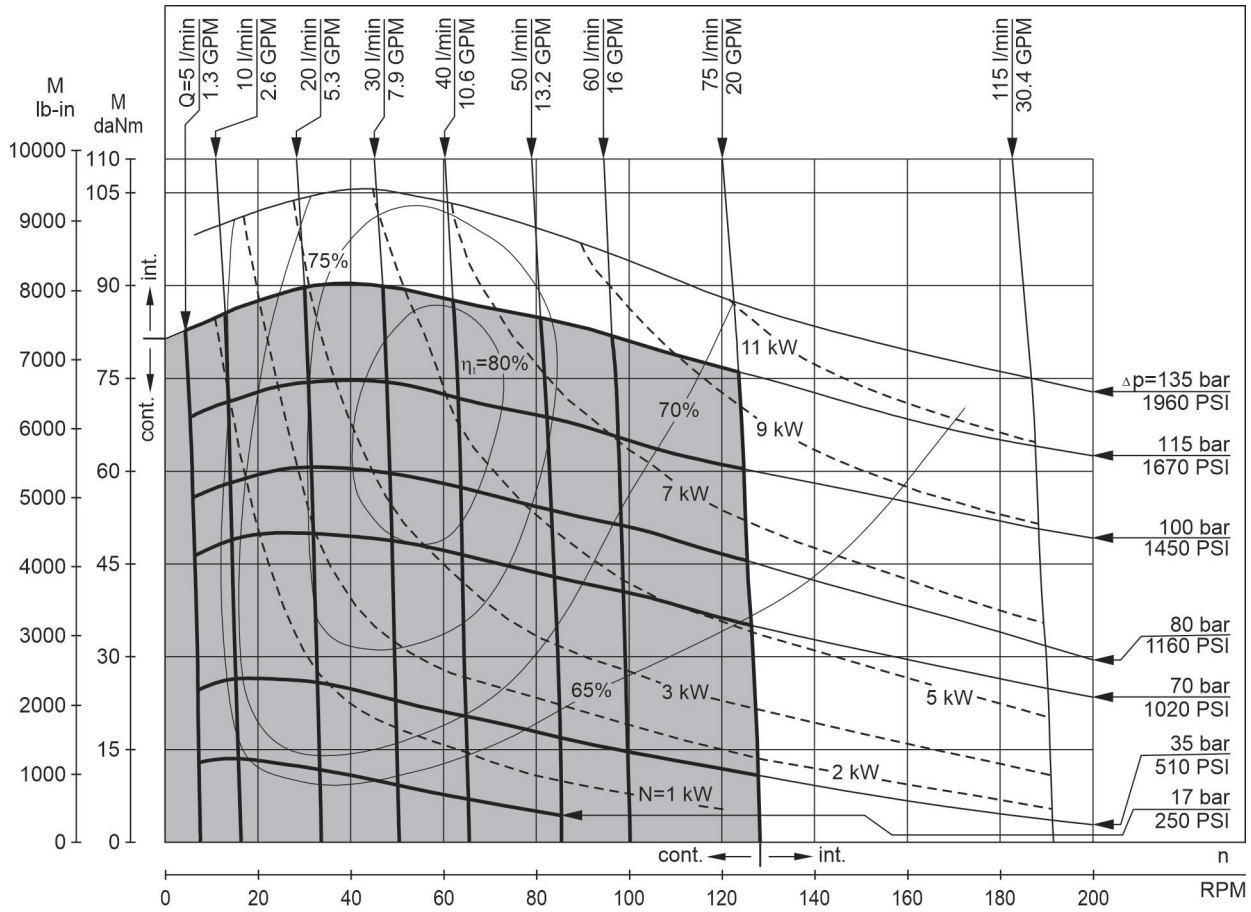
HW 550



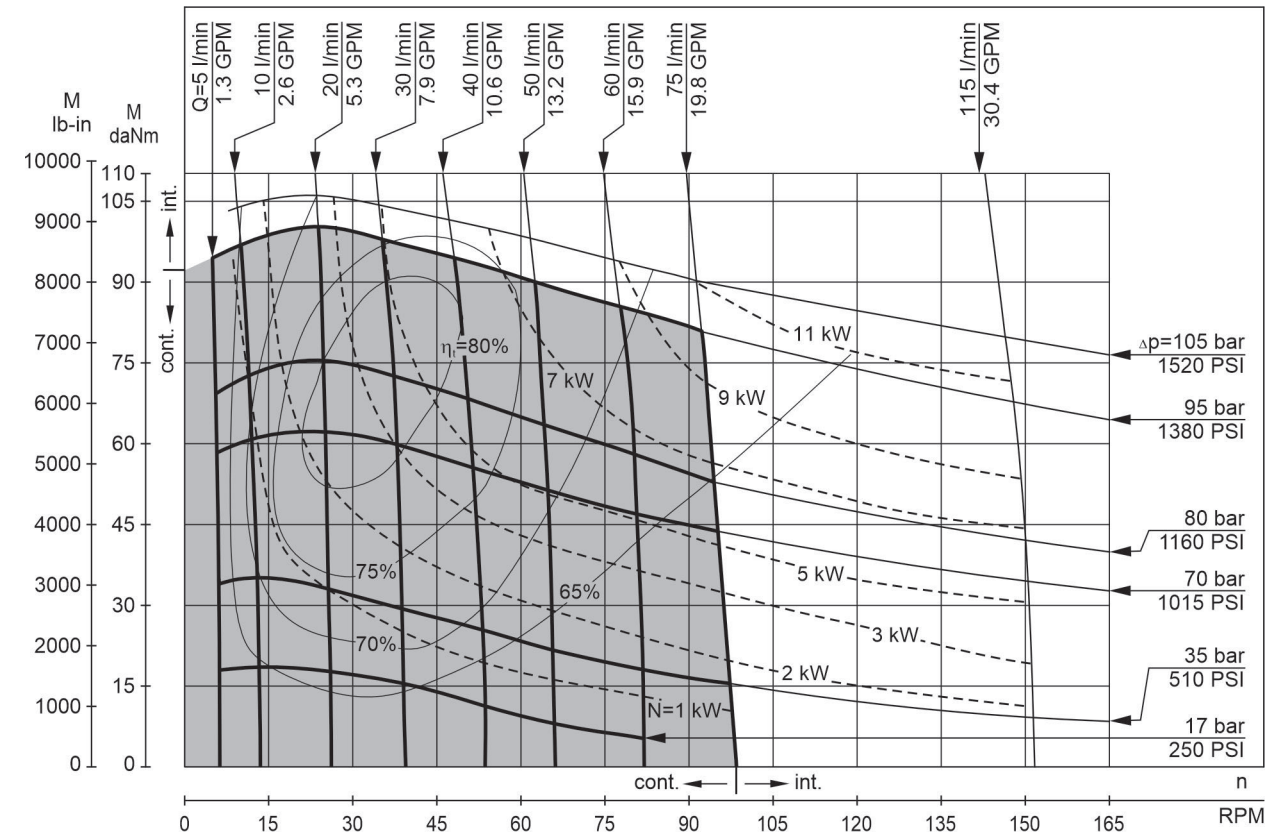
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5 PSI÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 600



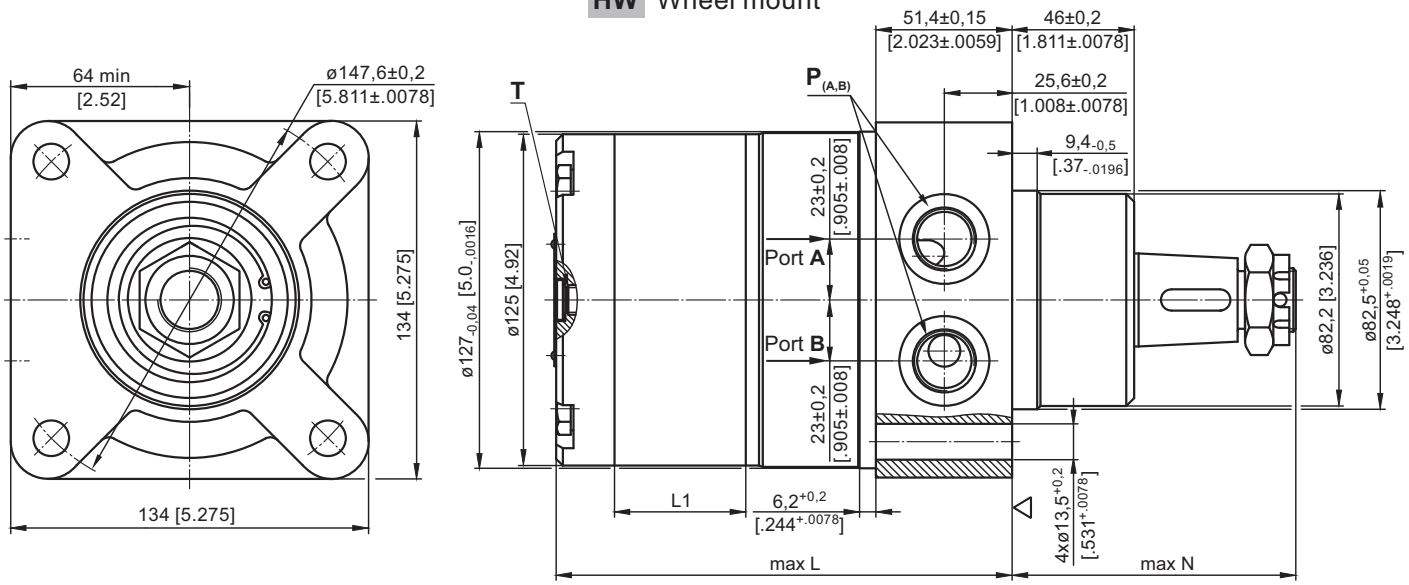
HW 750



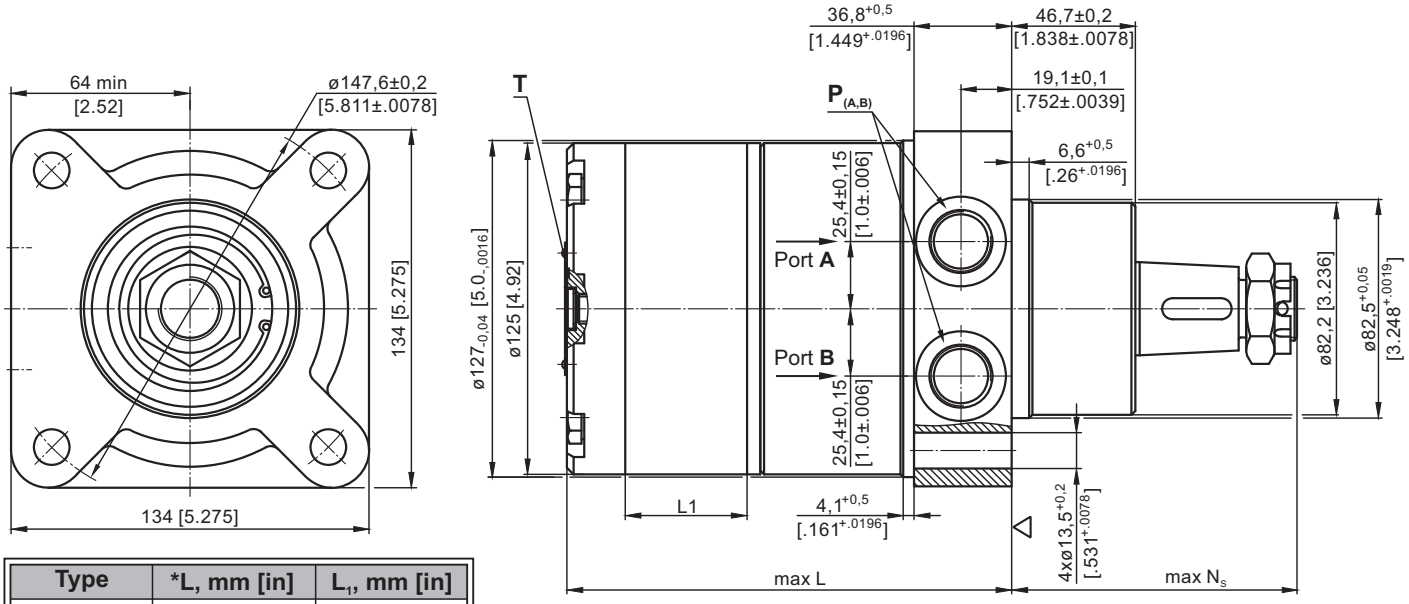
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5 PSI÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

DIMENSIONS and MOUNTING DATA

HW Wheel mount



HWS Wheel mount



Type	*L, mm [in]	L_1, mm [in]
HW(S) 80	134,0 [5.28]	11,0 [.43]
HW(S) 100	137,0 [5.39]	14,0 [.55]
HW(S) 125	140,5 [5.51]	17,4 [.68]
HW(S) 160	145,0 [5.71]	21,8 [.86]
HW(S) 200	151,0 [5.95]	27,8 [1.09]
HW(S) 235	155,5 [6.12]	32,5 [1.28]
HW(S) 250	158,0 [6.22]	34,8 [1.37]
HW(S) 300	164,5 [6.48]	41,4 [1.63]
HW(S) 315	166,5 [6.56]	43,5 [1.71]
HW(S) 350	171,0 [6.73]	48,0 [1.89]
HW(S) 370	174,0 [6.85]	51,0 [2.01]
HW(S) 400	178,0 [7.01]	54,8 [2.16]
HW(S) 470	188,0 [7.40]	65,0 [2.56]
HW(S) 500	192,5 [7.58]	69,4 [2.73]
HW(S) 535	197,0 [7.76]	74,1 [2.92]
HW(S) 550	199,0 [7.84]	76,0 [2.99]
HW(S) 600	206,0 [8.11]	82,6 [3.25]
HW(S) 750	227,5 [8.96]	104,0 [4.09]

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

▽ - Motor Mounting Surface

Note: For N see pages 120,121 and 122.

	Versions	
	2	4
$P_{(A,B)}$	2xG½	2x⅞-14UNF, O-ring
T	G¼	7/16-20UNF, O-ring

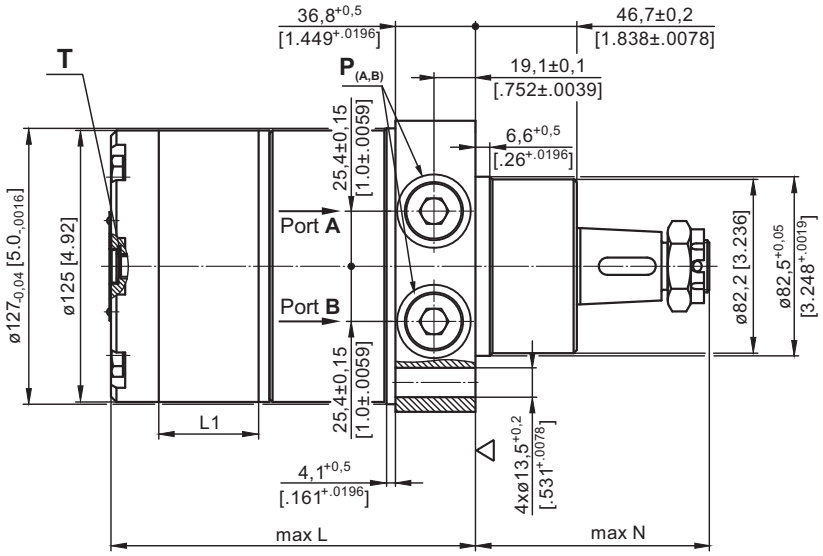
Standard Rotation
Viewed from Shaft End
Port **A** Pressurized - **CW**
Port **B** Pressurized - **CCW**

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

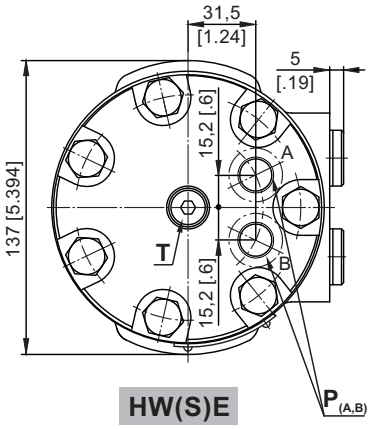
mm [in]

DIMENSIONS and MOUNTING DATA

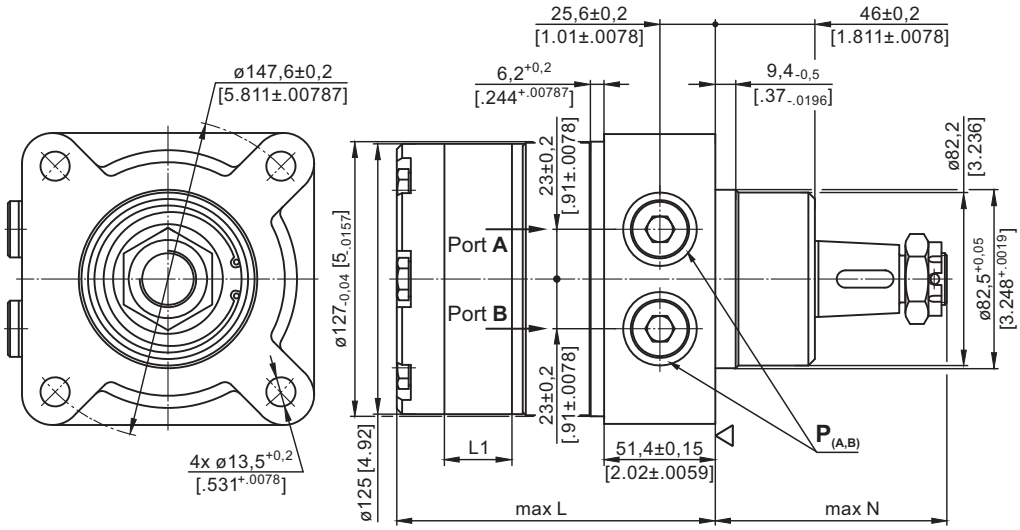
HWSE Wheel mount, rear ports



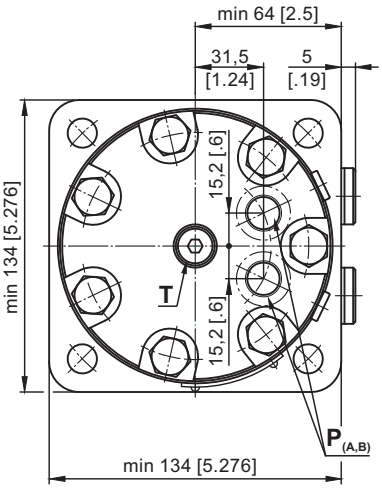
HWFE Magneto mount



HWE Wheel mount, rear ports



HW(S)E



Type	*L, mm [in]		L_1, mm [in]
	HWE, HWSE	HWFE	
HW... 80	139,0 [5.47]	182,5 [7.19]	11,0 [.43]
HW... 100	142,0 [5.59]	185,5 [7.30]	14,0 [.55]
HW... 125	145,5 [5.73]	189,0 [7.44]	17,4 [.68]
HW... 160	150,0 [5.91]	193,5 [7.62]	21,8 [.86]
HW... 200	156,0 [6.14]	199,5 [7.85]	27,8 [1.09]
HW... 235	160,5 [6.32]	204,0 [8.03]	32,5 [1.28]
HW... 250	163,0 [6.42]	206,5 [8.13]	34,8 [1.37]
HW... 300	169,5 [6.67]	213,0 [8.39]	41,4 [1.63]
HW... 315	171,5 [6.75]	215,0 [8.46]	43,5 [1.71]
HW... 350	176,0 [6.93]	219,5 [8.64]	48,0 [1.89]
HW... 370	179,0 [7.05]	222,5 [8.76]	51,0 [2.01]
HW... 400	183,0 [7.20]	226,5 [8.92]	54,8 [2.16]
HW... 470	193,0 [7.60]	236,5 [9.31]	65,0 [2.56]
HW... 500	197,5 [7.78]	241,0 [9.49]	69,4 [2.73]
HW... 535	202,0 [7.95]	245,5 [9.67]	74,1 [2.92]
HW... 550	204,0 [8.03]	247,5 [9.74]	76,0 [2.99]
HW... 600	210,6 [8.29]	254,1 [10.00]	82,6 [3.25]
HW... 750	232,5 [9.15]	275,5 [10.85]	104,0 [4.09]

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

▽ - Motor mounting surface

Note: For N see pages 120,121 and 122.

	Versions	
	5	6
$P_{(A,B)}$	2xG⅜	2x9/16-18UNF, O-ring
T	G¼	7/16-20UNF, O-ring

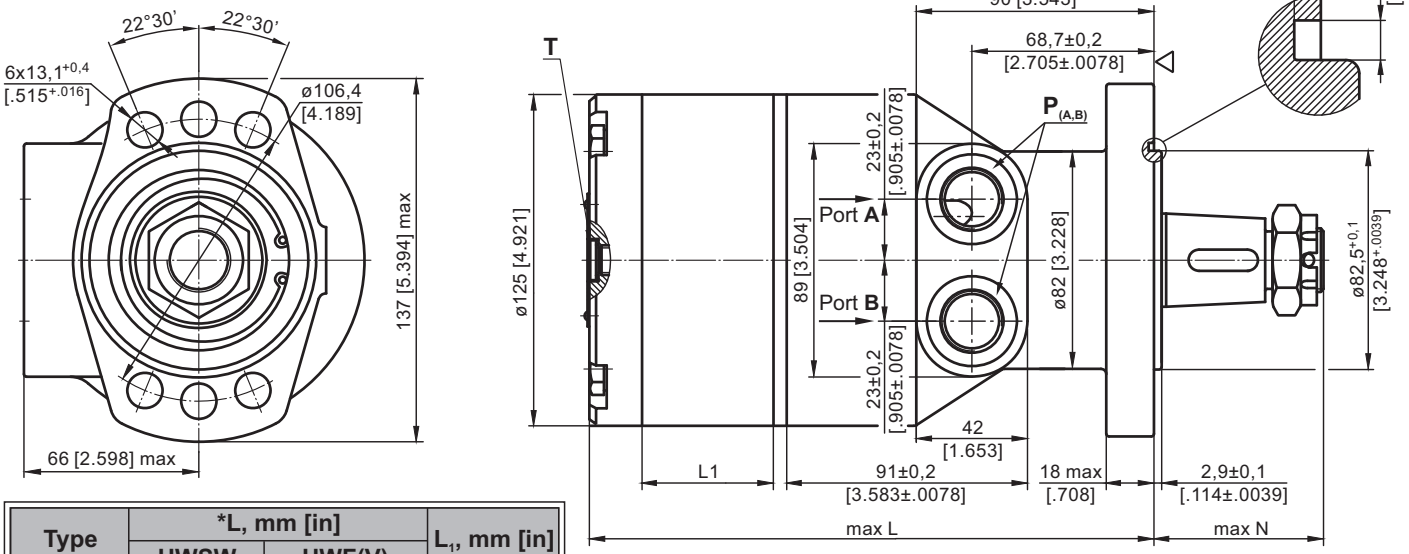
Standard Rotation
Viewed from Shaft End
Port **A** Pressurized - **CW**
Port **B** Pressurized - **CCW**

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

mm [in]

DIMENSIONS and MOUNTING DATA

F Magneto mount, six holes

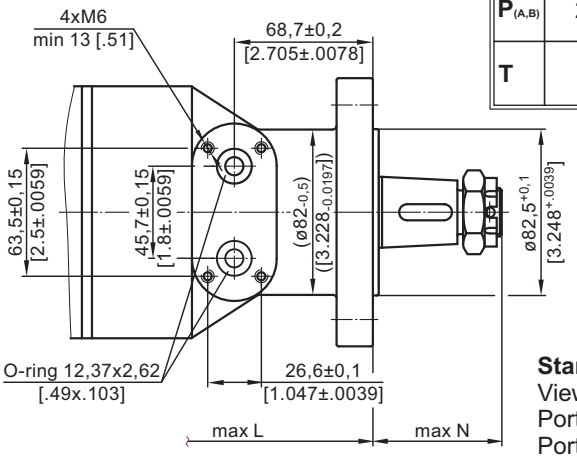


Type	*L, mm [in]		L_1, mm [in]
	HWSW	HWF(V)	
HW... 80	110,5 [4.35]	178,0 [7.01]	11,0 [.43]
HW... 100	113,5 [4.47]	180,5 [7.11]	14,0 [.55]
HW... 125	117,0 [4.61]	184,0 [7.24]	17,4 [.68]
HW... 160	121,5 [4.78]	188,5 [7.42]	21,8 [.86]
HW... 200	127,0 [5.00]	194,5 [7.66]	27,8 [1.09]
HW... 235	132,0 [5.20]	199,0 [7.84]	32,5 [1.28]
HW... 250	134,5 [5.30]	201,5 [7.93]	34,8 [1.37]
HW... 300	141,0 [5.55]	208,0 [8.20]	41,4 [1.63]
HW... 315	143,0 [5.63]	210,0 [8.27]	43,5 [1.71]
HW... 350	147,5 [5.81]	214,5 [8.45]	48,0 [1.89]
HW... 370	151,0 [5.94]	217,5 [8.56]	51,0 [2.01]
HW... 400	154,5 [6.08]	221,5 [8.72]	54,8 [2.16]
HW... 470	164,5 [6.48]	231,5 [9.11]	65,0 [2.56]
HW... 500	169,0 [6.65]	236,0 [9.29]	69,4 [2.73]
HW... 535	174,0 [6.85]	240,5 [9.47]	74,1 [2.92]
HW... 550	175,5 [6.91]	242,5 [9.55]	76,0 [2.99]
HW... 600	182,1 [7.16]	249,1 [9.81]	82,6 [3.25]
HW... 750	203,5 [8.01]	270,5 [10.65]	104,0 [4.09]

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

HWFV Magneto mount, six holes, relief valves

	Versions	
	2	4
$P_{(A,B)}$	2xG½	2x⅞-14UNF, O-ring
T	G¼	7/16-20UNF, O-ring

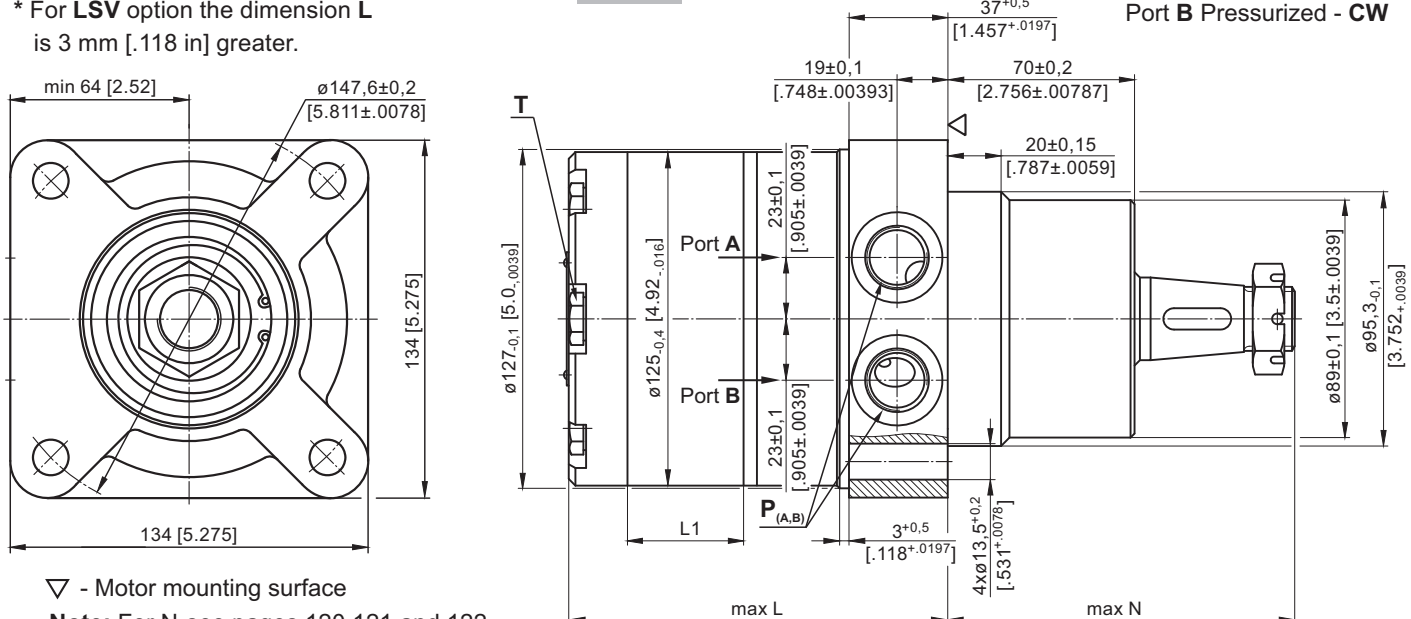


mm [in]

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

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

HWSW Wheel mount

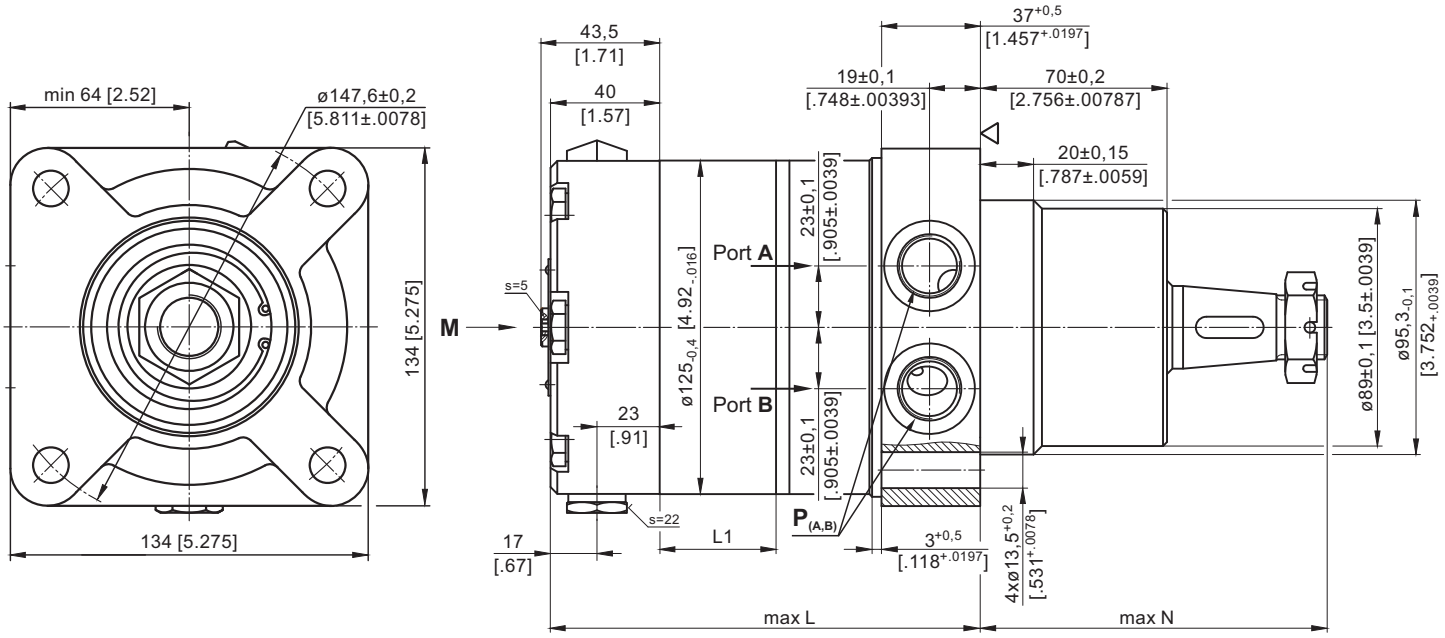


▽ - Motor mounting surface

Note: For N see pages 120,121 and 122.

DIMENSIONS and MOUNTING DATA

HWSWR Wheel mount, relief valves

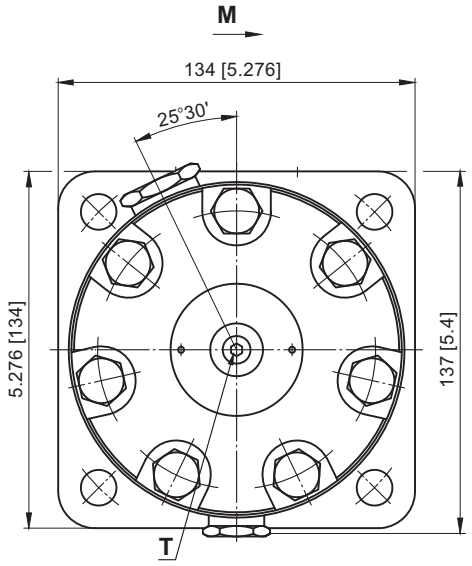


Note: For N see pages 120,121 and 122.

Type	*L, mm [in]	L_1, mm [in]
HWSWR 80	128,5 [5.28]	11,0 [.43]
HWSWR 100	131,5 [5.39]	14,0 [.55]
HWSWR 125	135 [5.51]	17,4 [.68]
HWSWR 160	139,5 [5.71]	21,8 [.86]
HWSWR 200	145,0 [5.95]	27,8 [1.09]
HWSWR 235	150,0 [6.12]	32,5 [1.28]
HWSWR 250	152,5 [6.22]	34,8 [1.37]
HWSWR 300	159,0 [6.48]	41,4 [1.63]
HWSWR 315	161,0 [6.56]	43,5 [1.71]
HWSWR 350	165,5 [6.73]	48,0 [1.89]
HWSWR 370	169,0 [6.85]	51,0 [2.01]
HWSWR 400	172,5 [7.01]	54,8 [2.16]
HWSWR 470	182,5 [7.40]	65,0 [2.56]
HWSWR 500	187,0 [7.58]	69,4 [2.73]
HWSWR 535	192,0 [7.76]	74,1 [2.92]
HWSWR 550	193,5 [7.84]	76,0 [2.99]
HWSWR 600	200,0 [8.09]	82,6 [3.25]
HWSWR 750	221,0 [8.70]	104,0 [4.09]

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

mm [in]

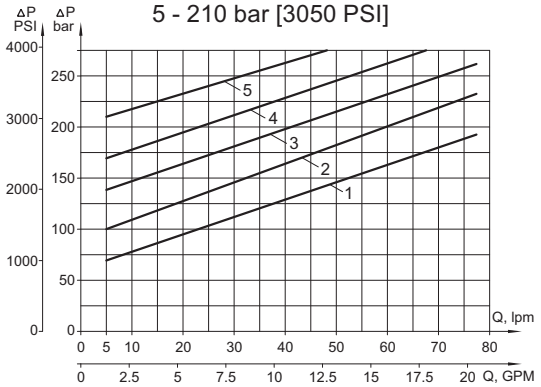


▽ - Motor mounting surface

	Versions	
	2	4
$P_{(A,B)}$	2xG½	2x⅞-14UNF, O-ring
T	G⅛	G⅛

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

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

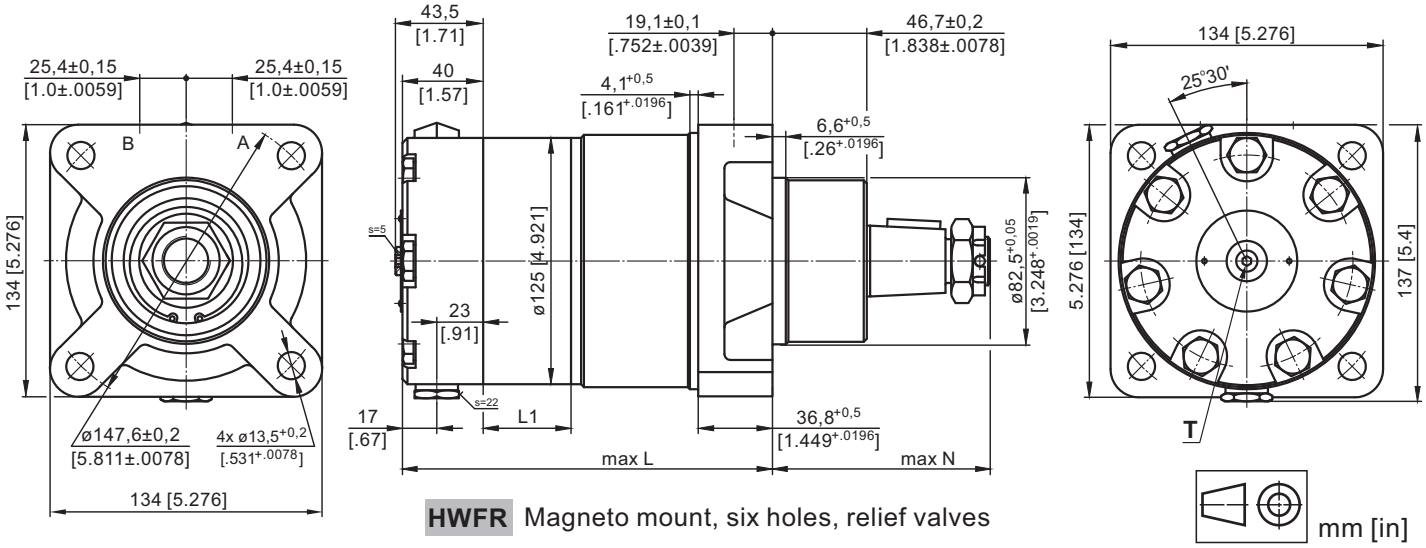


Standard Rotation
Viewed from Shaft End
Port **A** Pressurized - **CW**
Port **B** Pressurized - **CCW**

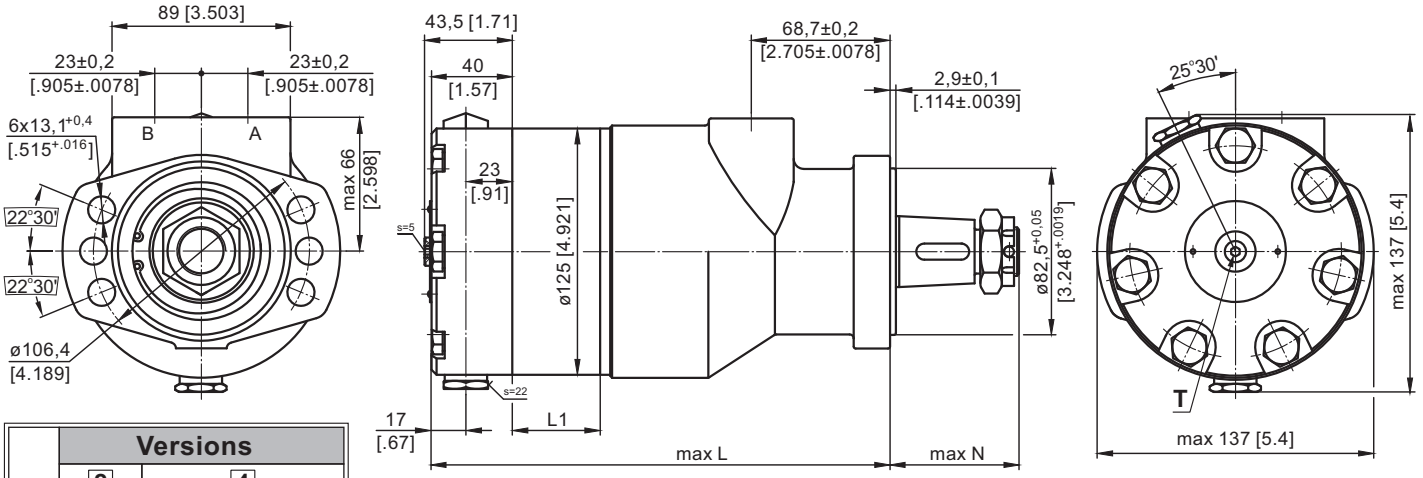
Reverse Rotation
Viewed from Shaft End
Port **A** Pressurized - **CCW**
Port **B** Pressurized - **CW**

DIMENSIONS and MOUNTING DATA

HWSR Wheel mount, relief valves



HWFR Magneto mount, six holes, relief valves



	Versions	
	2	4
P(A,B)	2xG½	2x7/8-14UNF, O-ring
T	G⅛	G⅛

▽ - Motor mounting surface

Note: For N see pages 120,121 and 122.

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

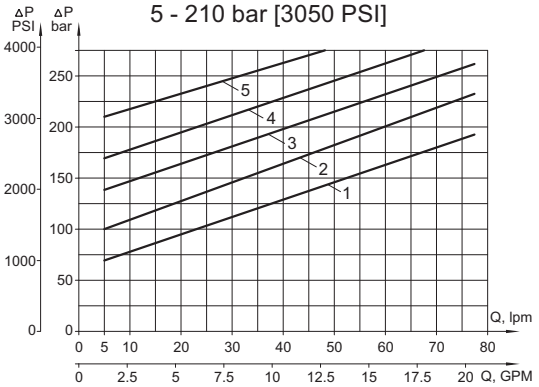
Reverse Rotation
Viewed from Shaft End
Port **A** Pressurized - **CCW**
Port **B** Pressurized - **CW**

Type	*L, mm [in]		L_1, mm [in]
	HWSR	HWFR	
HW... 80	152,0 [5.98]	195,5 [7.69]	11,0 [.43]
HW... 100	155,0 [6.10]	198,5 [7.81]	14,0 [.55]
HW... 125	158,5 [6.24]	202,0 [7.95]	17,4 [.68]
HW... 160	163,0 [6.42]	206,5 [8.13]	21,8 [.86]
HW... 200	169,0 [6.65]	212,5 [8.37]	27,8 [1.09]
HW... 235	173,5 [6.83]	217,0 [8.54]	32,5 [1.28]
HW... 250	176,0 [6.93]	219,5 [8.64]	34,8 [1.37]
HW... 300	182,5 [7.19]	226,0 [8.89]	41,4 [1.63]
HW... 315	184,5 [7.26]	228,0 [8.98]	43,5 [1.71]
HW... 350	189,0 [7.44]	232,5 [9.15]	48,0 [1.89]
HW... 370	192,0 [7.56]	235,5 [9.27]	51,0 [2.01]
HW... 400	196,0 [7.72]	239,5 [9.43]	54,8 [2.16]
HW... 470	206,0 [8.11]	249,5 [9.82]	65,0 [2.56]
HW... 500	210,5 [8.29]	254,0 [10.00]	69,4 [2.73]
HW... 535	215,0 [8.46]	258,8 [10.19]	74,1 [2.92]
HW... 550	217,0 [8.54]	260,5 [10.26]	76,0 [2.99]
HW... 600	226,6 [8.92]	267,1 [10.52]	82,6 [3.25]
HW... 750	244,5 [9.63]	288,0 [11.34]	104,0 [4.09]

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

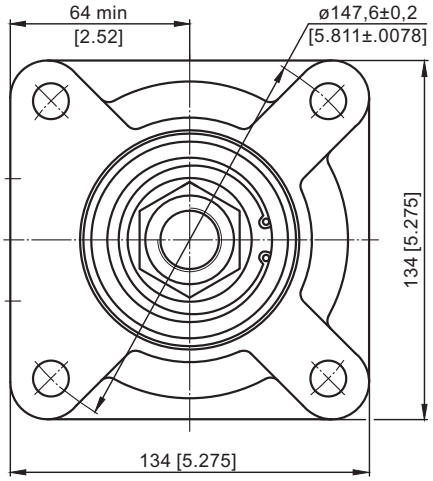
Pressure Settings at Flow Q=5 lpm [1.32 GPM] 32 mm²/s [150 SUS]; 50°C [122°F]

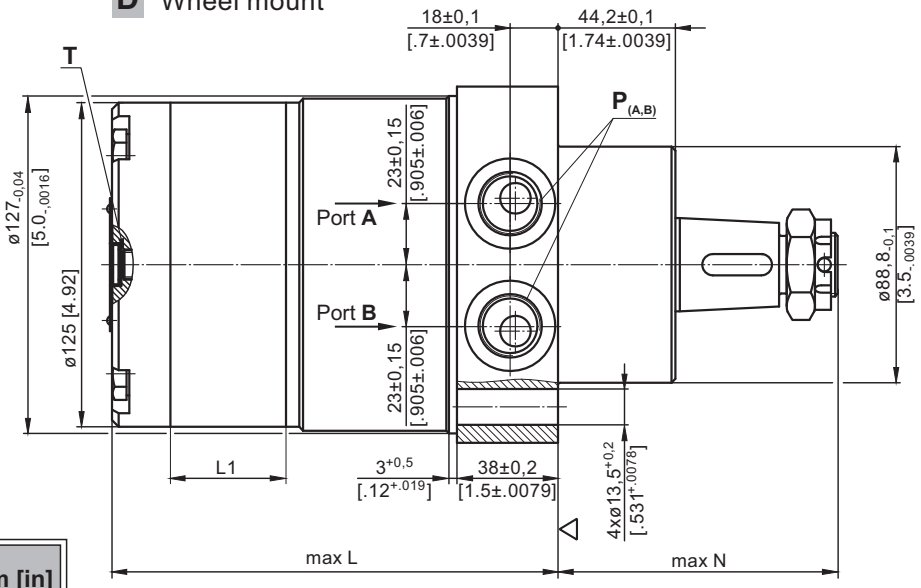
1 - 70 bar [1015 PSI]
2 - 100 bar [1450 PSI]
3 - 140 bar [2030 PSI]
4 - 170 bar [2470 PSI]
5 - 210 bar [3050 PSI]



DIMENSIONS and MOUNTING DATA

D Wheel mount





Type	*L, mm [in]		L_1, mm [in]
	HWD	HWV	
HW... 80	136,0 [5.35]	134,0 [5.28]	11,0 [.43]
HW... 100	139,0 [5.47]	137,0 [5.39]	14,0 [.55]
HW... 125	142,5 [5.61]	140,5 [5.53]	17,4 [.68]
HW... 160	147,0 [5.79]	145,0 [5.71]	21,8 [.86]
HW... 200	153,0 [6.02]	151,0 [5.94]	27,8 [1.09]
HW... 235	158,0 [6.22]	155,5 [6.12]	32,5 [1.28]
HW... 250	160,0 [6.30]	158,0 [6.22]	34,8 [1.37]
HW... 300	166,5 [6.56]	164,5 [6.46]	41,4 [1.63]
HW... 315	169,0 [6.65]	166,5 [6.56]	43,5 [1.71]
HW... 350	173,5 [6.83]	171,0 [6.73]	48,0 [1.89]
HW... 370	176,5 [6.95]	174,0 [6.85]	51,0 [2.01]
HW... 400	180,0 [7.09]	178,0 [7.01]	54,8 [2.16]
HW... 470	190,5 [7.50]	188,0 [7.40]	65,0 [2.56]
HW... 500	194,5 [7.66]	192,5 [7.58]	69,4 [2.73]
HW... 535	199,5 [7.85]	197,0 [7.76]	74,1 [2.92]
HW... 550	201,5 [7.93]	199,0 [7.83]	76,0 [2.99]
HW... 600	207,1 [8.15]	206,0 [8.11]	82,6 [3.25]
HW... 750	229,0 [9.02]	227,5 [8.96]	104,0 [4.09]

	Versions	
	2	4
$P_{(A,B)}$	2xG½	2x⅞-14UNF, O-ring
T	G¼	7/16-20UNF, O-ring

Note: For N see pages 120,121 and 122.

▽ - Motor mounting surface

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

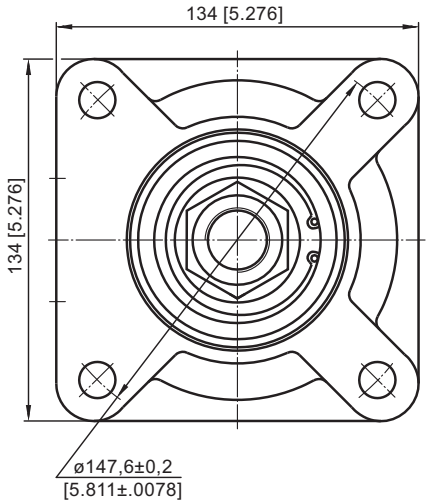
Reverse Rotation
Viewed from Shaft End
Port **A** Pressurized - **CCW**
Port **B** Pressurized - **CW**

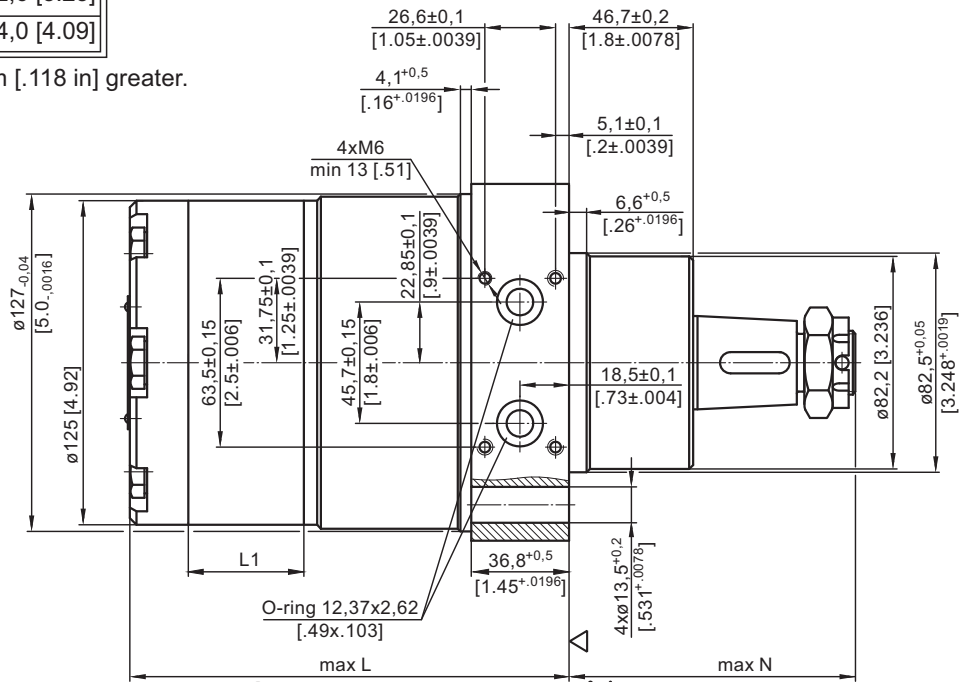
mm [in]

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

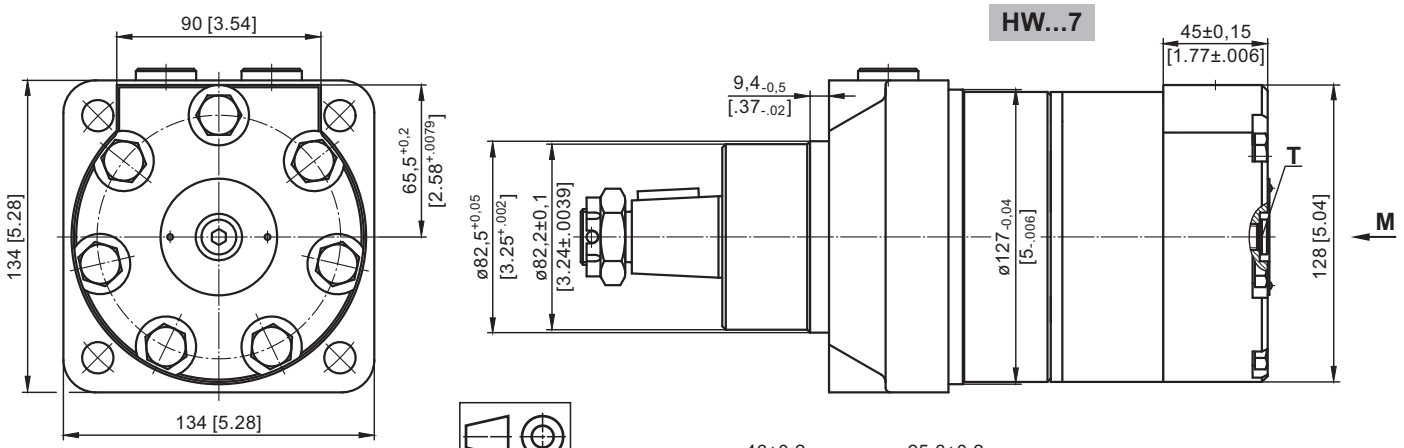
V Wheel mount, four holes, manifold 4xM6

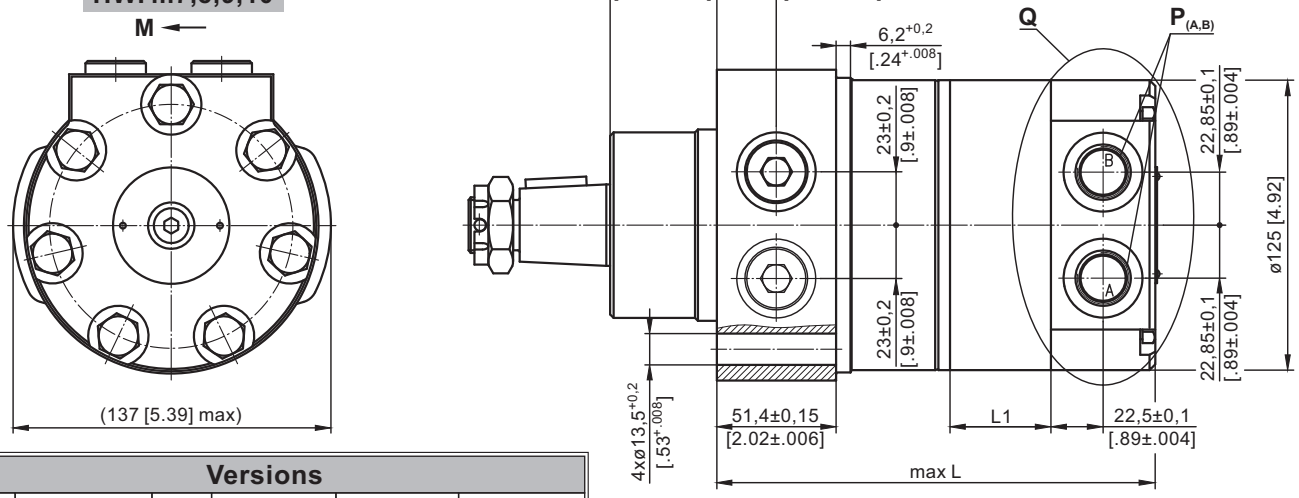
	Versions	
	2	4
T	G¼	7/16-20UNF, O-ring





DIMENSIONS and MOUNTING DATA

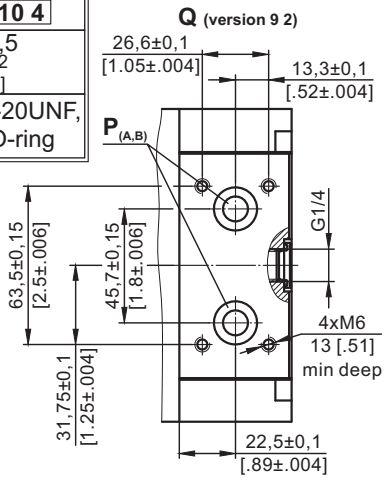


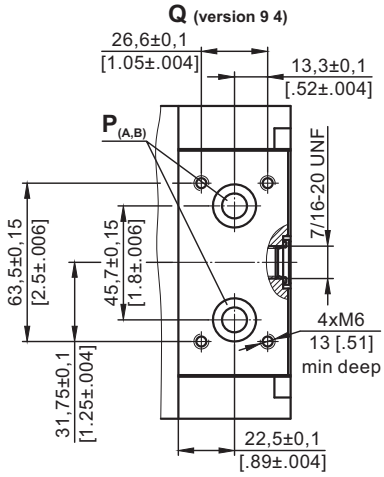


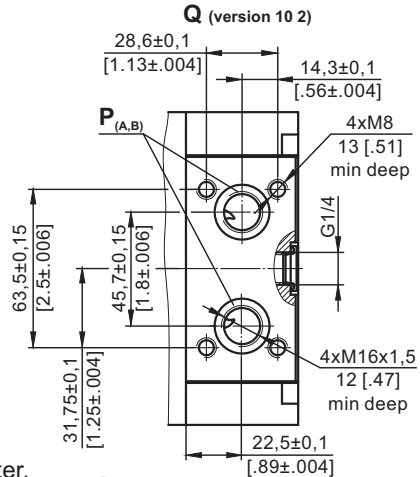
	Versions					
	7	8	9 2	9 4	10 2	10 4
P(A,B)	2xG½	2x⅞-14UNF, O-ring	2xø9 O-ring 12,37x2,62 [.49x.103]		2xM16x1,5 O-ring 18x2 [.709x.787]	
T	G¼	7/16-20UNF, O-ring	G¼	7/16-20UNF, O-ring	G¼	7/16-20UNF, O-ring

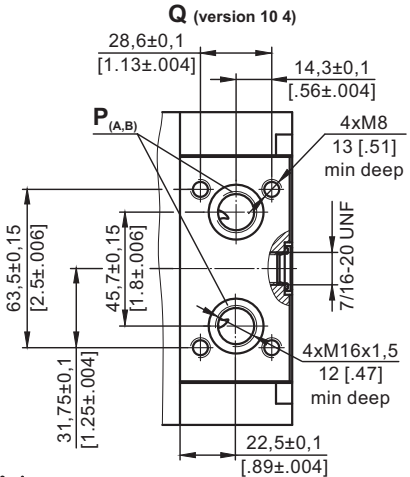
Type	*L, mm [in]		L1,mm [in]
	HW(S)...7,8,9,10	HWF...7,8,9,10	
HW... 80	157,5 [6.20]	200,5 [7.89]	11,0 [.43]
HW...100	160,5 [6.32]	203,5 [8.01]	14,0 [.55]
HW...125	164,0 [6.46]	207,0 [8.15]	17,4 [.68]
HW...160	168,0 [6.61]	211,0 [8.31]	21,8 [.86]
HW...200	174,0 [6.85]	217,0 [8.54]	27,8 [1.09]
HW...235	179,0 [7.05]	222,0 [8.74]	32,5 [1.28]
HW...250	181,0 [7.13]	224,0 [8.82]	34,8 [1.37]
HW...300	187,5 [7.38]	230,5 [9.07]	41,4 [1.63]
HW...315	190,0 [7.48]	233,0 [9.17]	43,5 [1.71]
HW...350	194,5 [7.66]	237,5 [9.35]	48,0 [1.89]
HW...370	197,5 [7.78]	240,5 [9.47]	51,0 [2.01]
HW...400	201,0 [7.91]	244,0 [9.61]	54,8 [2.16]
HW...470	211,5 [8.33]	254,5 [10.02]	65,0 [2.56]
HW...500	216,0 [8.50]	259,0 [10.20]	69,4 [2.73]
HW...535	220,5 [8.68]	263,5 [10.37]	74,1 [2.92]
HW...550	222,5 [8.76]	265,5 [10.45]	76,0 [2.99]
HW...600	229,0 [9.02]	272,0 [10.71]	82,6 [3.25]
HW...750	250,5 [9.86]	293,5 [11.56]	104 [4.09]

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



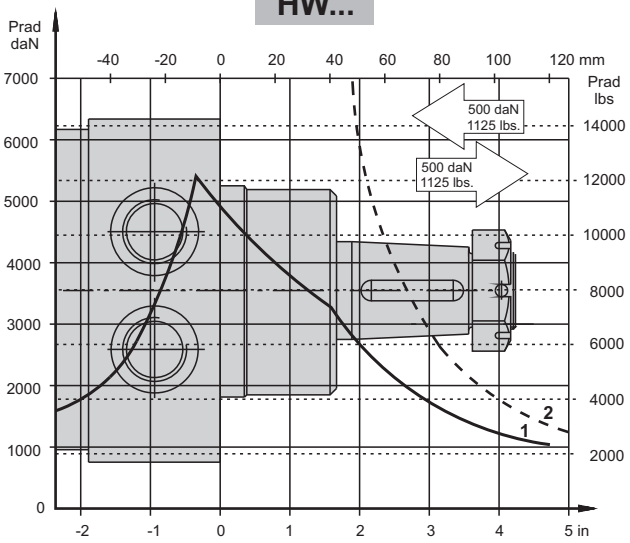




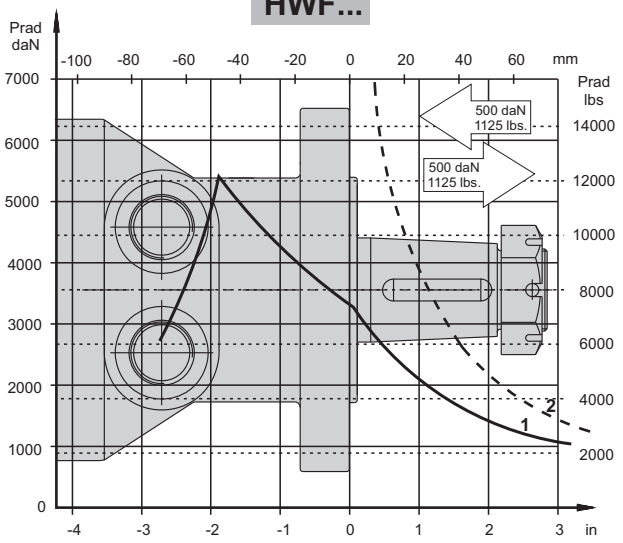


PERMISSIBLE SHAFT LOADS

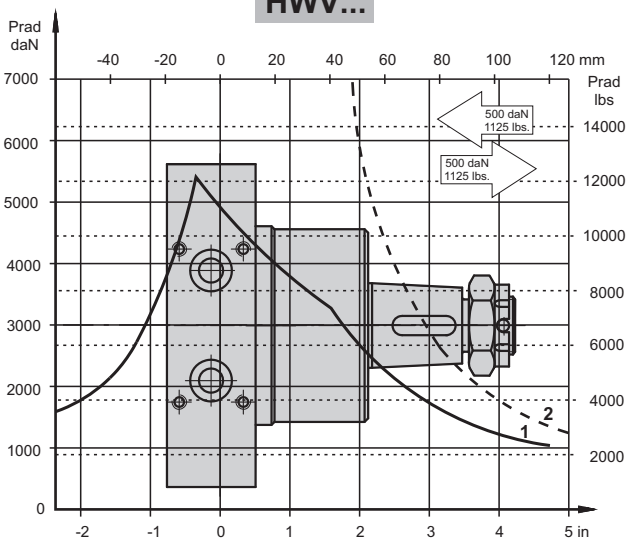
HW...



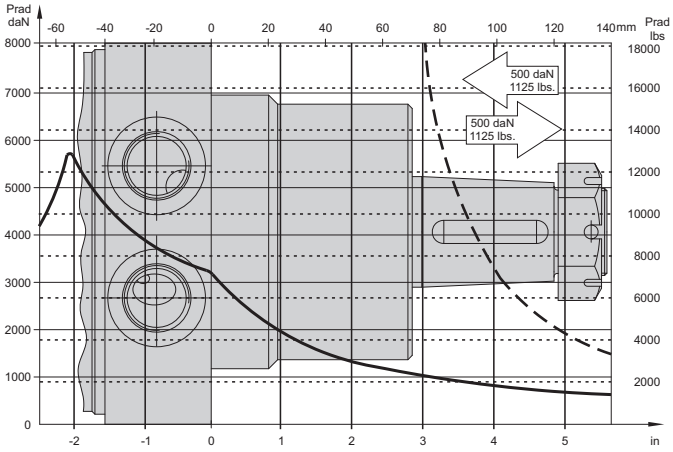
HWF...



HWV...



HWSW...

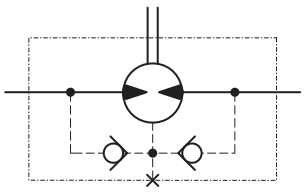


1 - Bearing curve: The curve applies to a B10 bearing life of 2000 hours at 100 RPM.

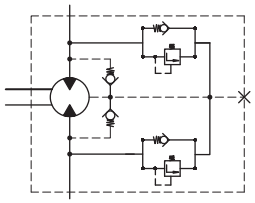
2 - Shaft curve: The curve represents Max. permissible radial shaft load with safety factor 3:1.

MAX. PERMISSIBLE SHAFT SEAL PRESSURE

HW, HWF, HWS, HWD,
HWV, HWSW,
HW(S)(F)...7,8,9,10



HWFR, HWSR, HWSWR

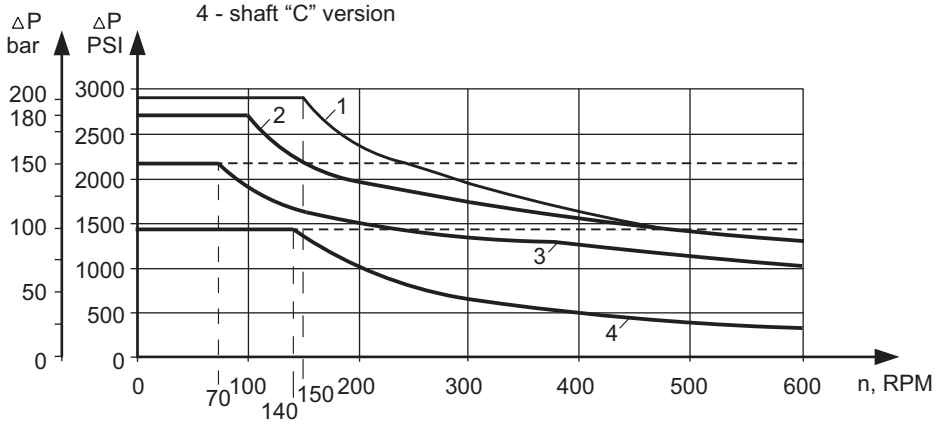


HW...U(Q) motors with drain connection:

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

1 - extreme high pressure “Q” version
2 - high pressure “U” version
3 - standard version
4 - shaft “C” version

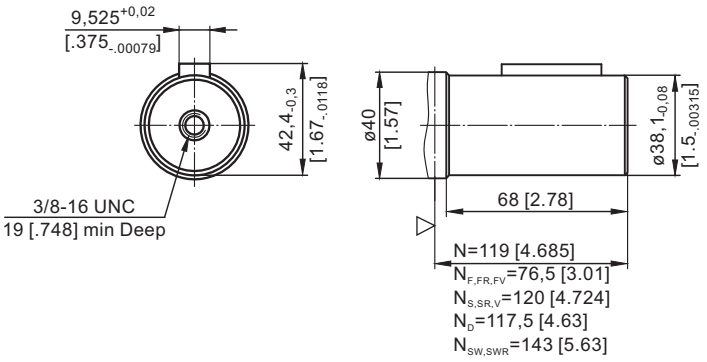
——— - continuous operations
– – – – – - intermittent operations



SHAFT EXTENSIONS

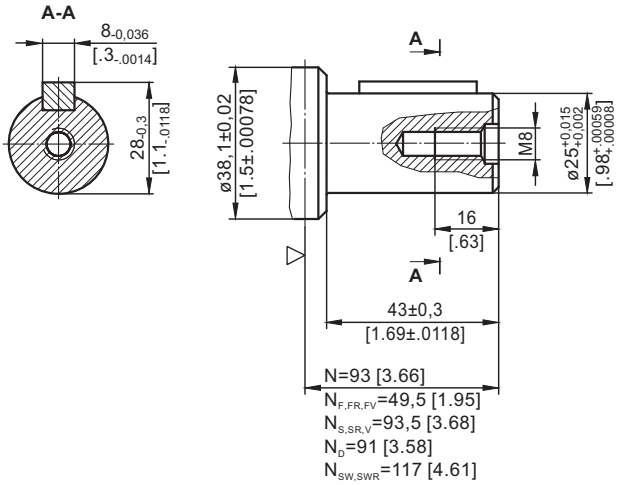
C - 1½" [38,1] straight, Parallel key ⅜"x ⅜"x1½" BS46

Max. Torque 120 daNm [10630 lb-in]



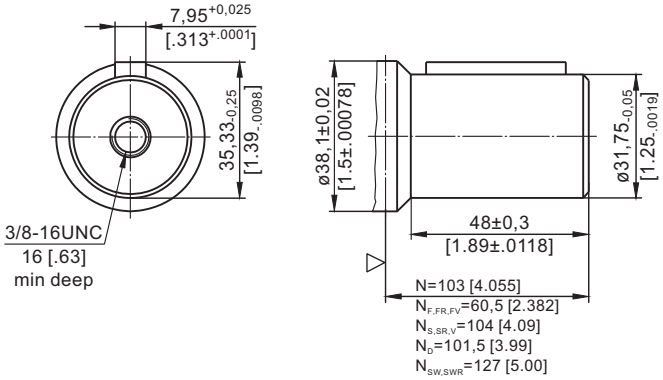
CO - ø25, straight, Parallel key A8x7x32 DIN 6885

Max. Torque 40 daNm [3540 lb-in]



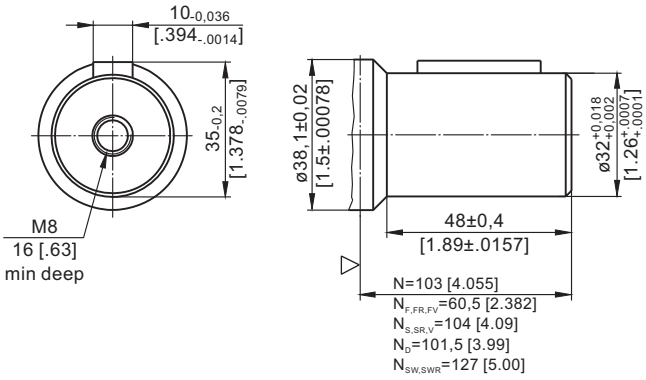
K - 1¼" [31,75] straight, Parallel key 5⁄16"x5⁄16"x1½" BS46

Max. Torque 77 daNm [6815 lb-in]



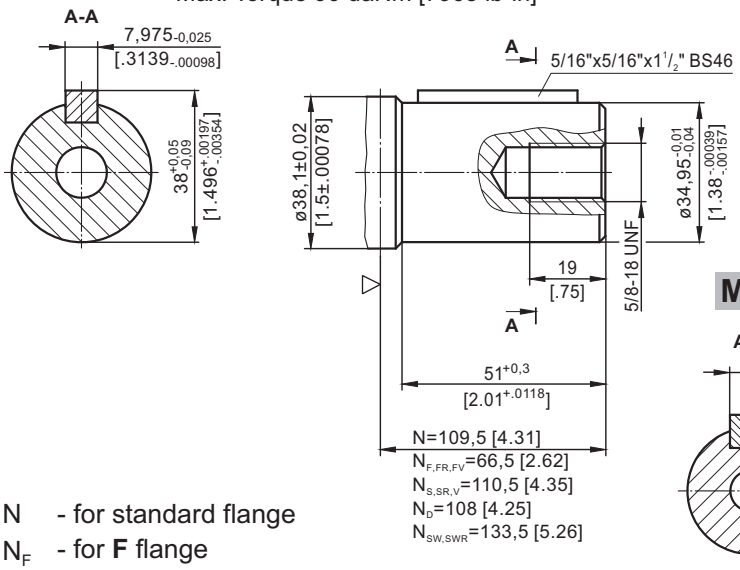
M - ø32 straight, Parallel key A10x8x32 DIN 6885

Max. Torque 77 daNm [6815 lb-in]



H - 1 3⁄8" [35] straight, Parallel key 5⁄16"x5⁄16"x1½" BS46

Max. Torque 90 daNm [7965 lb-in]

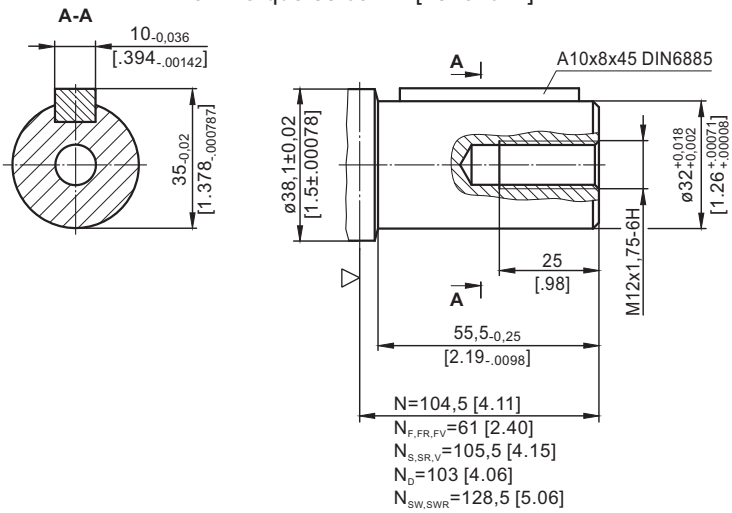


mm [in]

▽ - Motor Mounting Surface

MP - ø32 straight, Parallel key A10x8x45 DIN 6885

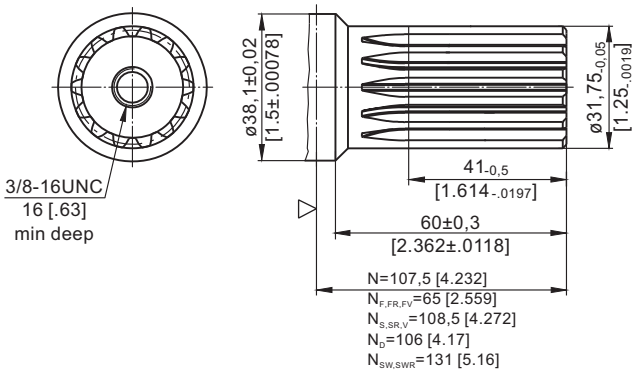
Max. Torque 85 daNm [7520 lb-in]



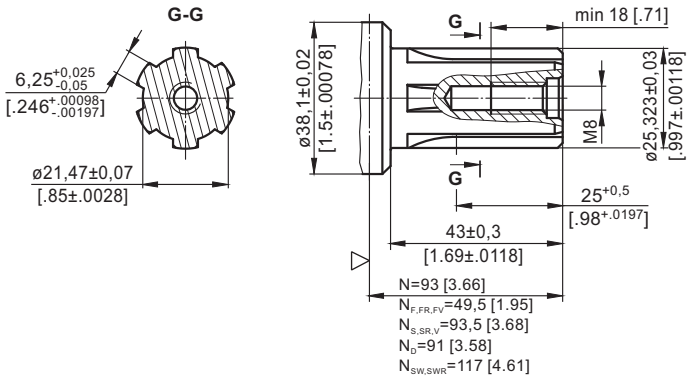
N - for standard flange
N_F - for **F** flange
N_{FR} - for **FR** flange
N_{FV} - for **FV** flange
N_S - for **S** flange
N_{SR} - for **SR** flange
N_D - for **D** flange
N_V - for **V** flange
N_{SW} - for **SW** flange
N_{SWR} - for **SWR** flange

SHAFT EXTENSIONS [continued]

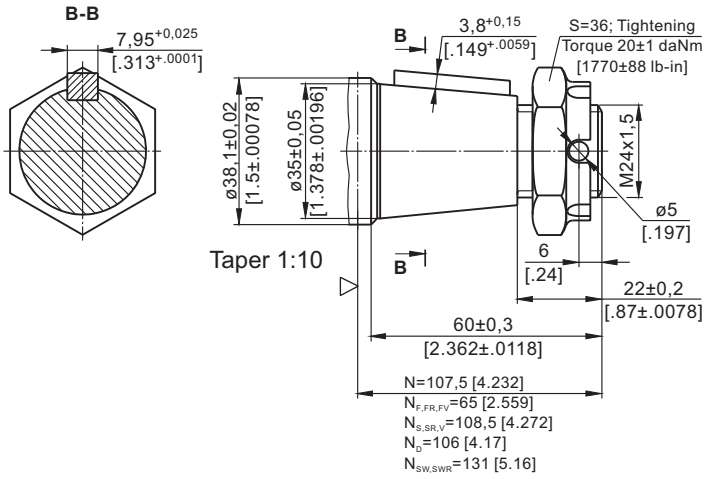
L - ø1¼" [31,75] splined 14T, DP12/24 ANSI B92.1-1976
Max. Torque 95 daNm [8410 lb-in]



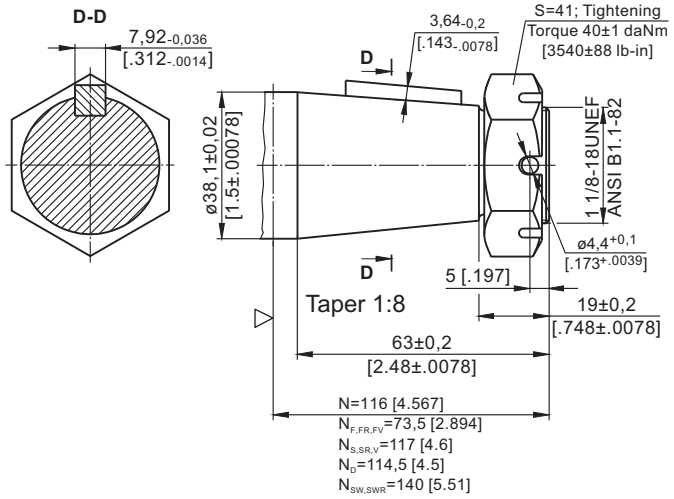
SH - ø1" splined BS 2059, SAE 6B
Max. Torque 40 daNm [3540 lb-in]



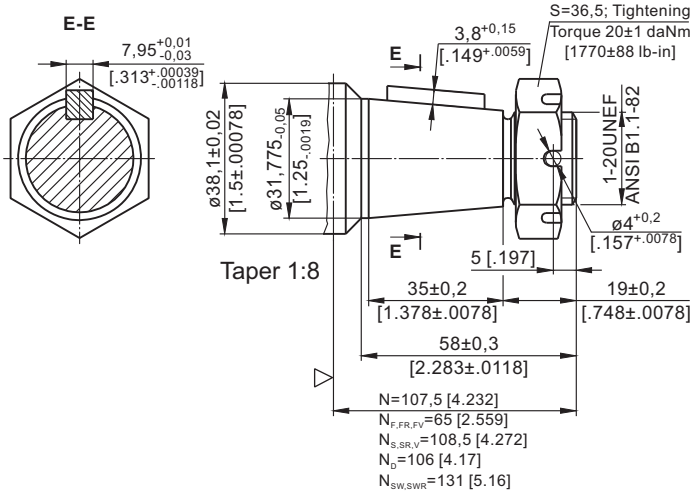
KB - ø35 tapered 1:10, Parallel key 5/16"x5/16"x1¼" BS46
Max. Torque 95 daNm [8410 lb-in]



T - 1½" [38,1] tapered 1:8, Parallel key 5/16"x5/16"x1¼" BS46
Max. Torque 120 daNm [10620 lb-in]



R - 1¼" [31,75] tapered 1:8, Parallel key 5/16"x5/16"x1" BS46
Max. Torque 95 daNm [8410 lb-in]



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

mm [in]

▽ - Motor Mounting Surface

ORDER CODE

	1	2	3	4	5	6	7	8	9
HW								/	

Pos.1 - Mounting Flange

omit	- Wheel mount, four holes
E	- Wheel mount, four holes, rear ports
F	- Magneto mount, six holes
FR	- Magneto mount, six holes, relief valves
FV[1)*]	- Magneto mount, six holes, manifold 4xM6
FE	- Magneto mount, six holes, rear ports
S	- Wheel mount, four holes
SR	- Wheel mount, four holes, relief valves
SW	- Wheel mount, four holes; mounting on ø95,3 [3.75]
SWR	- Wheel mount, four holes; mounting on ø95,3 [3.75], relief valves
SE	- Wheel mount, four holes, rear ports
D	- Wheel mount, four holes; mounting on ø88,8 [3.5]
V[1)*]	- Wheel mount, four holes, manifold 4xM6

Pos.2 - Displacement code

80	- 79,7 cm^3/rev [4.86 in^3/rev]
100	- 101,4 cm^3/rev [6.19 in^3/rev]
125	- 126,0 cm^3/rev [7.69 in^3/rev]
160	- 157,8 cm^3/rev [9.63 in^3/rev]
200	- 201,3 cm^3/rev [12.28 in^3/rev]
235	- 235,3 cm^3/rev [14.36 in^3/rev]
250	- 252,0 cm^3/rev [15.38 in^3/rev]
300	- 300,0 cm^3/rev [18.31 in^3/rev]
315	- 314,9 cm^3/rev [19.22 in^3/rev]
350	- 347,8 cm^3/rev [21.22 in^3/rev]
370	- 369,0 cm^3/rev [22.52 in^3/rev]
400	- 396,8 cm^3/rev [24.21 in^3/rev]
470	- 470,6 cm^3/rev [28.72 in^3/rev]
500	- 502,4 cm^3/rev [30.66 in^3/rev]
535	- 535,0 cm^3/rev [32.65 in^3/rev]
550	- 550,0 cm^3/rev [33.56 in^3/rev]
600	- 598,9 cm^3/rev [36.55 in^3/rev]
750	- 753,8 cm^3/rev [45.99 in^3/rev]

Pos.3 - Shaft Extensions[2)*]

K	- 1¼" [ø31,75] straight, Parallel key $^5/_{16}$"x$^5/_{16}$"x1$^1/_2$" BS46
KB	- ø35 tapered 1:10, Parallel key $^5/_{16}$"x$^5/_{16}$"x1$^1/_4$" BS46
L	- 1$^1/_4$" [ø31,75] splined 14T, DP12/24 ANSI B92.1-1976
M	- ø32 straight, Parallel key A10x8x32 DIN 6885
MP	- ø32 straight, Parallel key A10x8x45 DIN 6885
R	- 1$^1/_4$" [ø31,75] tapered 1:8, Parallel key $^5/_{16}$"x$^5/_{16}$"x1" BS46
T	- 1$^1/_2$" [ø38,1] tapered 1:8, Parallel key $^5/_{16}$"x$^5/_{16}$"x1$^1/_4$" BS46
C	- 1$^1/_2$" [ø38,1] straight, Parallel key $^3/_8$"x$^3/_8$"x1$^1/_2$" BS46
CO	- ø25, straight, Parallel key A8x7x32 DIN 6885
H	- 1$^3/_8$" [ø35] straight, Parallel key $^5/_{16}$"x$^5/_{16}$"x1$^1/_2$" BS46
SH	- 1" [ø25,32] splined BS 2059, SAE 6B

Pos.4 - Ports

2	- side ports, 2xG1/2, G1/4, BSP thread, ISO 228
4	- side ports, 2x7/8-14 UNF, O-ring, 7/16-20 UNF
5[3)*]	- rear ports, 2xG3/8, G1/4, BSP thread, ISO 228
6[3)*]	- rear ports, 2x9/16-18 UNF, O-ring, 7/16-20 UNF
7[8)*]	- side ports, 2xG1/2 thread in the cover
8[8)*]	- side ports, 2x7/8-14 UNF, O-ring thread in the cover
9[8)*]	- side ports, for valve mounting in the cover
10[8)*]	- side ports, for valve mounting and 2xM16 in the cover

Pos.5 - Drain line

omit	- For versions 2,4,5,6,7 and 8
2	- G1/4, BSP thread, ISO 228
4	- 7/16-20 UNF

Pos.6 - Shaft Seal Version

omit	- Standard shaft seal up to 150 bar [2175 PSI]
U	- High pressure shaft seal up to 180 bar [2610 PSI]
Q	- Extreme high pressure shaft seal up to 200 bar [2900 PSI]

Pos.7 - Additional Options[4)*,5)*,6)*] [see page 125]

Pos.8 - Valves Pressure Range, bar[7)*]

/	- 70, 100, 140, 170, 210

Pos.9 - Design Series

omit	- Factory specified

NOTES:

[1)]* Flanges **V** and **FV** are for versions 2 and 4 - drainage only!
[2)]* The permissible output torque for shafts must not be exceeded!
[3)]* For **E**-version only!
[4)]* If the code on pos.7 is not specified in the order, it will be considered as LL-option.
[5)]* Colour at customer's request.
[6)]* Non painted feeding surfaces, colour at customer's request.
[7)]* For **SR** and **FR** only!
[8)]* Port versions 7,8,9 and 10 are available with HW(S)(F) flanges only!

E-version and 7,8,9 and 10 are not available with **SR**, **SWR** and **FR!!!**
HW...R-version is not available with **"RS"!**

The hydraulic motors are mangano-phosphatized as standard.

MOTOR ADDITIONAL OPTIONS

Additional Options Description	Order Code	Motor type														
		MM	MP	MPW	MP(W)N	MR	MRN	MRB	SP, SR	PL	RL	PK(Q)	RK	RW	MH	HW
Speed Sensor*	RS	O	O	–	–	O	–	–	–	–	–	–	–	–	O	O*****
Tacho connection	T	–	–	–	–	O	O	–	–	–	–	–	–	–	O	–
Low Leakage	LL	O	–	–	–	O	O	–	–	–	O	–	O	O	O	O
Low Speed Valving	LSV	–	–	–	–	O	–	–	–	–	–	–	–	–	O	O
Free Running	FR	O	O	O	O	O	O	–	–	O	O	O	O	O	O	O
Reverse Rotation	R	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Paint**	P	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Corrosion Protected Paint**	PC	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Special Paint***	PS PCS	O	O	O	O	O	O	O	–	O	O	O	O	O	O	O
Check Valves		S	S****	S****	S	S****	S	S	S	S	S	S	S	S****	S****	S

O	Optional
–	Not applicable
S	Standard

* For sensor ordering see pages 126÷127.
** Colour at customer's request.
*** Non painted feeding surfaces, colour at customer's request.
**** Without check valves for "**U**" shaft seal versions.
***** RS option is not available at HW...R (with relief valves).