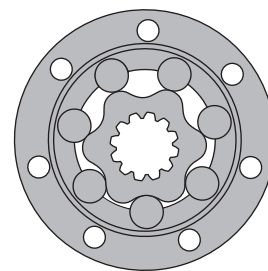


HYDRAULIC MOTORS HW



APPLICATION

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



CONTENTS

Specification data86÷87
Function diagrams 88÷94
Dimensions and mounting 95÷96
Permissible shaft Seal Pressure ... 96
Shaft extensions 97
Permissible shaft loads 98
Order code 98

OPTIONS

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

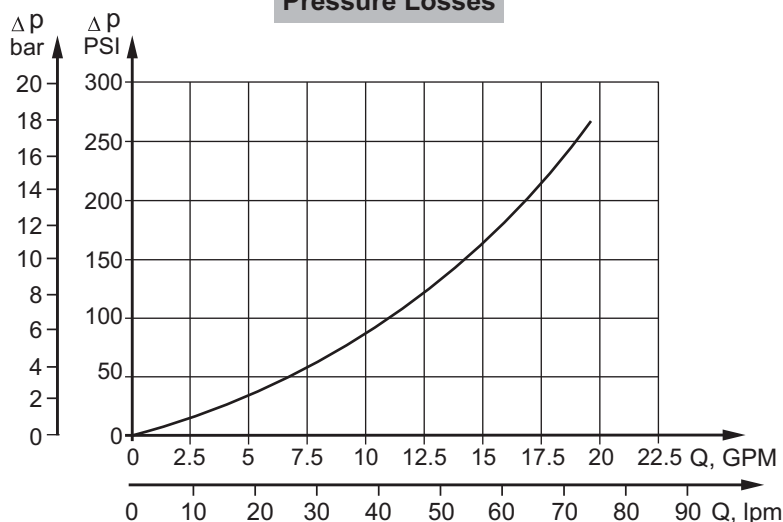
GENERAL

| | |
|---|--|
| Max. Displacement, cm ³ /rev [in ³ /rev] | 550 [33.55] |
| Max. Speed, [RPM] | 497 |
| Max. Torque, daNm [in-lb] | cont.: 96 [8500] int.: 105 [9293] |
| Max. Output, kW [HP] | 23,1 [31] |
| Max. Pressure Drop, bar [PSI] | cont.: 205 [3000] int.: 225 [3260] |
| Max. Oil Flow, lpm [GPM] | 115 [30.4] |
| Min. Speed, [RPM] | 10 |
| Pressure fluid | Mineral based- HLP(DIN 51524) or HM(ISO 6743/4) |
| Temperature range, °C [°F] | -40÷140 [-40÷284] |
| Optimal Viscosity range, mm ² /s [SUS] | 20÷75 [98÷347] |
| Filtration | ISO code 20/16 (Min. recommended fluid filtration of 25 microns) |

Oil flow in drain line

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

Pressure Losses



SPECIFICATION DATA

| Type | | HW 125 | HW 160 | HW 200 | HW 235 | HW 250 | HW 300 | HW 315 |
|--|---------------------------|-------------|--------------|---------------|---------------|-------------|-------------|---------------|
| Displacement, cm³/rev [in³/rev] | | 126 [7.69] | 157,8 [9.64] | 201,3 [12.28] | 235,3 [14.33] | 252 [15.37] | 300 [18.3] | 314,9 [19.21] |
| Max. Speed, [RPM] | cont. | 357 | 380 | 373 | 319 | 298 | 250 | 238 |
| | int.* | 476 | 475 | 497 | 425 | 397 | 333 | 318 |
| Max. Torque daNm [in-lb] | cont. | 35 [3098] | 44 [3894] | 55 [4868] | 64,5 [5710] | 69 [6107] | 81 [7170] | 85 [7523] |
| | int.* | 38,5 [3408] | 48 [4248] | 60 [5310] | 70 [6196] | 75 [6638] | 89 [7877] | 93 [8230] |
| Max. Output, kW [HP] | cont. | 16,2 [21.7] | 17,6 [23.6] | 18,6 [24.9] | 18,2 [24.4] | 16,8 [22.5] | 16,5 [22] | 16,4 [21.9] |
| | int.* | 19,8 [26.6] | 21,6 [29] | 23,1 [31] | 22,6 [30.3] | 20,8 [27.9] | 20,8 [27.9] | 20,8 [27.9] |
| Max. Pressure Drop, bar [PSI] | cont. | 205 [2970] | 205 [2970] | 205 [2970] | 205 [2970] | 205 [2970] | 205 [2970] | 205 [2970] |
| | int.* | 225 [3260] | 225 [3260] | 225 [3260] | 225 [3260] | 225 [3260] | 225 [3260] | 225 [3260] |
| Max. Oil Flow lpm [GPM] | cont. | 45 [12] | 60 [16] | 75 [20] | 75 [20] | 75 [20] | 75 [20] | 75 [20] |
| | int.* | 60 [16] | 75 [20] | 100 [26.4] | 100 [26.4] | 100 [26.4] | 100 [26.4] | 100 [26.4] |
| Max. Inlet Pressure, bar [PSI] | cont. | 210 [3050] | 210 [3050] | 210 [3050] | 210 [3050] | 210 [3050] | 210 [3050] | 210 [3050] |
| | int.* | 250 [3625] | 250 [3625] | 250 [3625] | 250 [3625] | 250 [3625] | 250 [3625] | 250 [3625] |
| Max. Starting Pressure with Unloaded Shaft, bar [PSI] | | 10 [145] | 10 [145] | 10 [145] | 10 [145] | 10 [145] | 10 [145] | 10 [145] |
| Min. Starting Torque daNm [in-lb] | at max. press. drop cont. | 28,7 [2540] | 36 [3186] | 45,1 [3991] | 52,8 [4673] | 56,5 [5000] | 66,4 [5877] | 69,7 [6169] |
| | at max. press. drop int.* | 31,5 [2788] | 39,3 [3478] | 49,2 [4355] | 57,4 [5080] | 61,5 [5443] | 72,9 [6452] | 76,2 [6744] |
| Min. Speed**, [RPM] | | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Weight, avg. kg [lb] | HW | 14,3 [31.5] | 14,6 [32.2] | 15,1 [33.3] | 15,5 [34.2] | 15,7 [34.6] | 16,1 [35.5] | 16,3 [35.9] |
| | HWF | 12,8 [28.2] | 13,1 [28.9] | 13,6 [30] | 14,0 [30.9] | 14,2 [31.3] | 14,6 [32.2] | 14,8 [32.6] |
| | HWS | 14 [30.9] | 14,3 [31.5] | 14,8 [32.6] | 15,2 [33.5] | 15,4 [34] | 15,8 [34.8] | 16 [35.3] |

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

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

- Intermittent speed and intermittent pressure drop must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4). If using synthetic fluids consult the factory for alternative seal materials.
- Recommended minimum oil viscosity 13 mm²/s [70 SUS] at 50°C [122°F].
- Recommended maximum system operating temperature is 82°C [180°F].
- To assure optimum motor life fill with fluid prior to loading and run at moderate load and speed for 10-15 minutes.

SPECIFICATION DATA

| Type | | HW 350 | HW 370 | HW 400 | HW 470 | HW 500 | HW 535 | HW 550 |
|--|---------------------------|---------------|---------------|--------------|---------------|---------------|-------------|-------------|
| Displacement, cm³/rev [in³/rev] | | 347,8 [21.21] | 369,2 [22.51] | 396,8 [24.2] | 470,6 [28.71] | 502,4 [30.65] | 535 [32.7] | 550 [33.55] |
| Max. Speed, [RPM] | cont. | 216 | 203 | 189 | 159 | 149 | 140 | 136 |
| | int.* | 288 | 271 | 252 | 244 | 229 | 215 | 209 |
| Max. Torque daNm [in-lb] | cont. | 94 [8320] | 96 [8497] | 96 [8497] | 92 [8143] | 91 [8054] | 90 [7966] | 89 [7877] |
| | int.* | 102 [9028] | 105 [9293] | 98 [8674] | 101 [8939] | 101 [8939] | 104 [9205] | 105 [9293] |
| Max. Output, kW [HP] | cont. | 16,5 [22] | 13,2 [17.7] | 12,5 [16.8] | 10,6 [14.2] | 10,8 [14.5] | 9,4 [12.6] | 9 [12] |
| | int.* | 20,8 [27.9] | 19,2 [25.7] | 18,5 [24.8] | 17,4 [23.3] | 17,8 [23.9] | 16,4 [22] | 15,8 [21.2] |
| Max. Pressure Drop, bar [PSI] | cont. | 205 [2970] | 205 [2970] | 185 [2680] | 150 [2180] | 140 [2030] | 130 [1885] | 125 [1815] |
| | int.* | 225 [3260] | 225 [3260] | 190 [2760] | 165 [2390] | 155 [2250] | 150 [2180] | 145 [2105] |
| Max. Oil Flow lpm [GPM] | cont. | 75 [20] | 75 [20] | 75 [20] | 75 [20] | 75 [20] | 75 [20] | 75 [20] |
| | int.* | 100 [26.4] | 100 [26.4] | 100 [26.4] | 115 [30.4] | 115 [30.4] | 115 [30.4] | 115 [30.4] |
| Max. Inlet Pressure, bar [PSI] | cont. | 210 [3050] | 210 [3050] | 210 [3050] | 210 [3050] | 210 [3050] | 210 [3050] | 210 [3050] |
| | int.* | 250 [3625] | 250 [3625] | 250 [3625] | 250 [3625] | 250 [3625] | 250 [3625] | 250 [3625] |
| Max. Starting Pressure with Unloaded Shaft, bar [PSI] | | 10 [145] | 10 [145] | 10 [145] | 10 [145] | 10 [145] | 10 [145] | 10 [145] |
| Min. Starting Torque daNm [in-lb] | at max. press. drop cont. | 77 [6815] | 79,5 [7036] | 78,7 [6966] | 75,4 [6674] | 74,6 [6603] | 73,8 [6532] | 72,9 [6452] |
| | at max. press. drop int.* | 83,6 [7400] | 86 [7612] | 80,3 [7107] | 82,8 [7328] | 82,8 [7328] | 85,2 [7540] | 84,4 [7470] |
| Min. Speed**, [RPM] | | 8 | 8 | 8 | 8 | 8 | 5 | 5 |
| Weight, avg. kg [lb] | HW | 16,7 [36.8] | 16,9 [37.3] | 17,3 [38.1] | 18,1 [39.9] | 18,4 [40.6] | 18,8 [41.5] | 18,9 [41.7] |
| | HWF | 15,2 [33.5] | 15,4 [34] | 15,8 [34.8] | 16,6 [36.6] | 16,9 [37.3] | 17,3 [38.1] | 17,4 [38.3] |
| | HWS | 16,4 [36.2] | 16,6 [36.6] | 17 [37.5] | 17,8 [39.2] | 18,1 [39.9] | 18,5 [40.8] | 18,6 [41] |

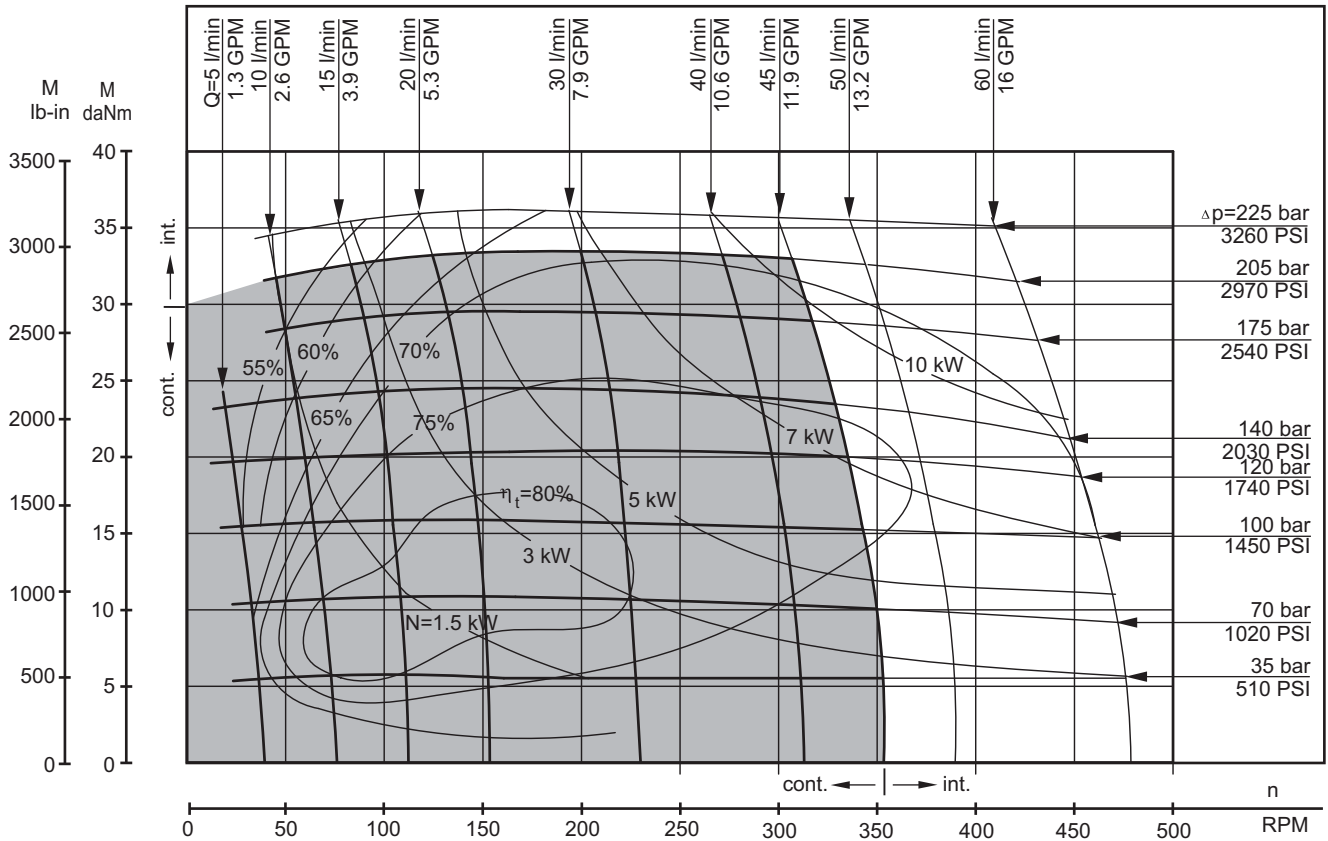
* Intermittent operation: the permissible values may occur for max. 10% of every minute.

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

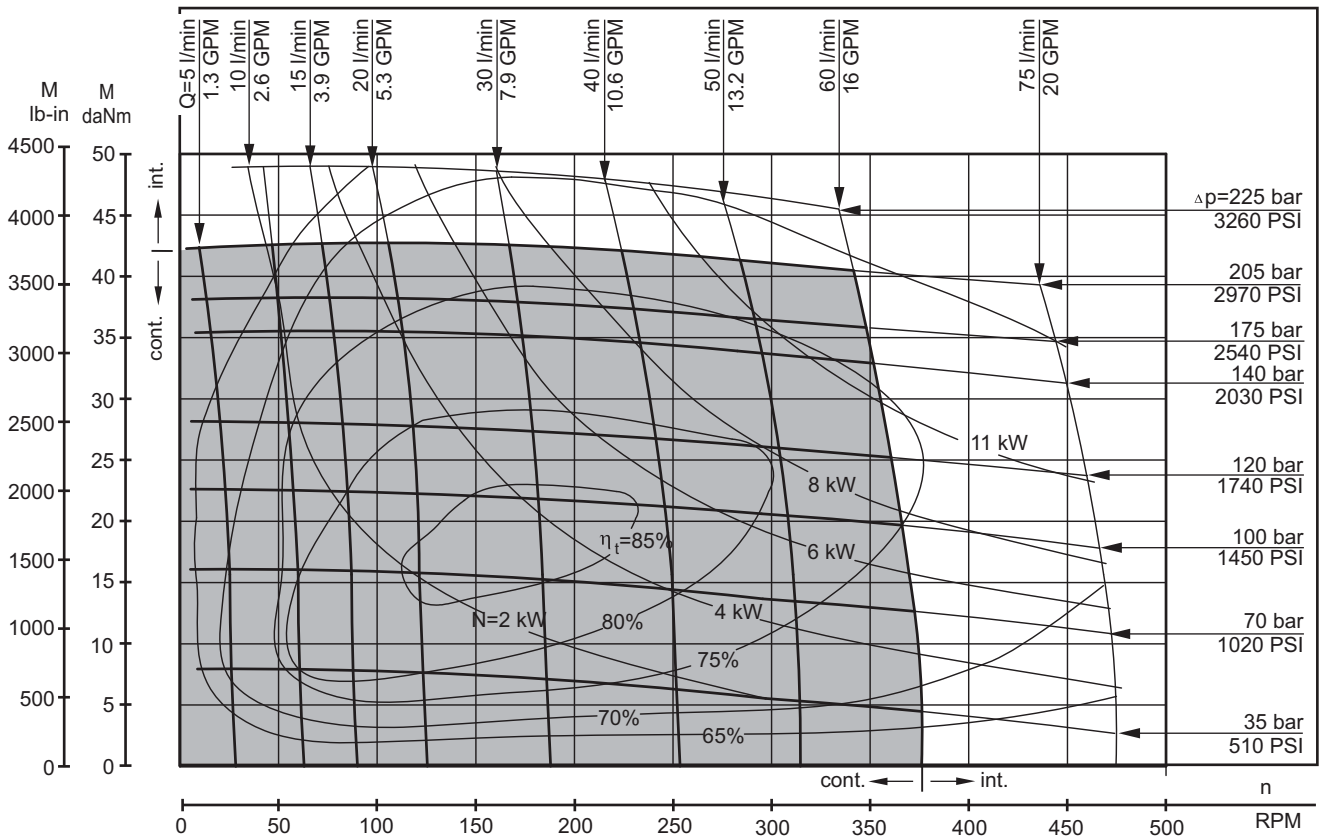
- Intermittent speed and intermittent pressure drop must not occur simultaneously.
- Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
- Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4). If using synthetic fluids consult the factory for alternative seal materials.
- Recommended minimum oil viscosity 13 mm²/s [70 SUS] at 50°C [122°F].
- Recommended maximum system operating temperature is 82°C [180°F].
- To assure optimum motor life fill with fluid prior to loading and run at moderate load and speed for 10-15 minutes.

FUNCTION DIAGRAMS

HW 125



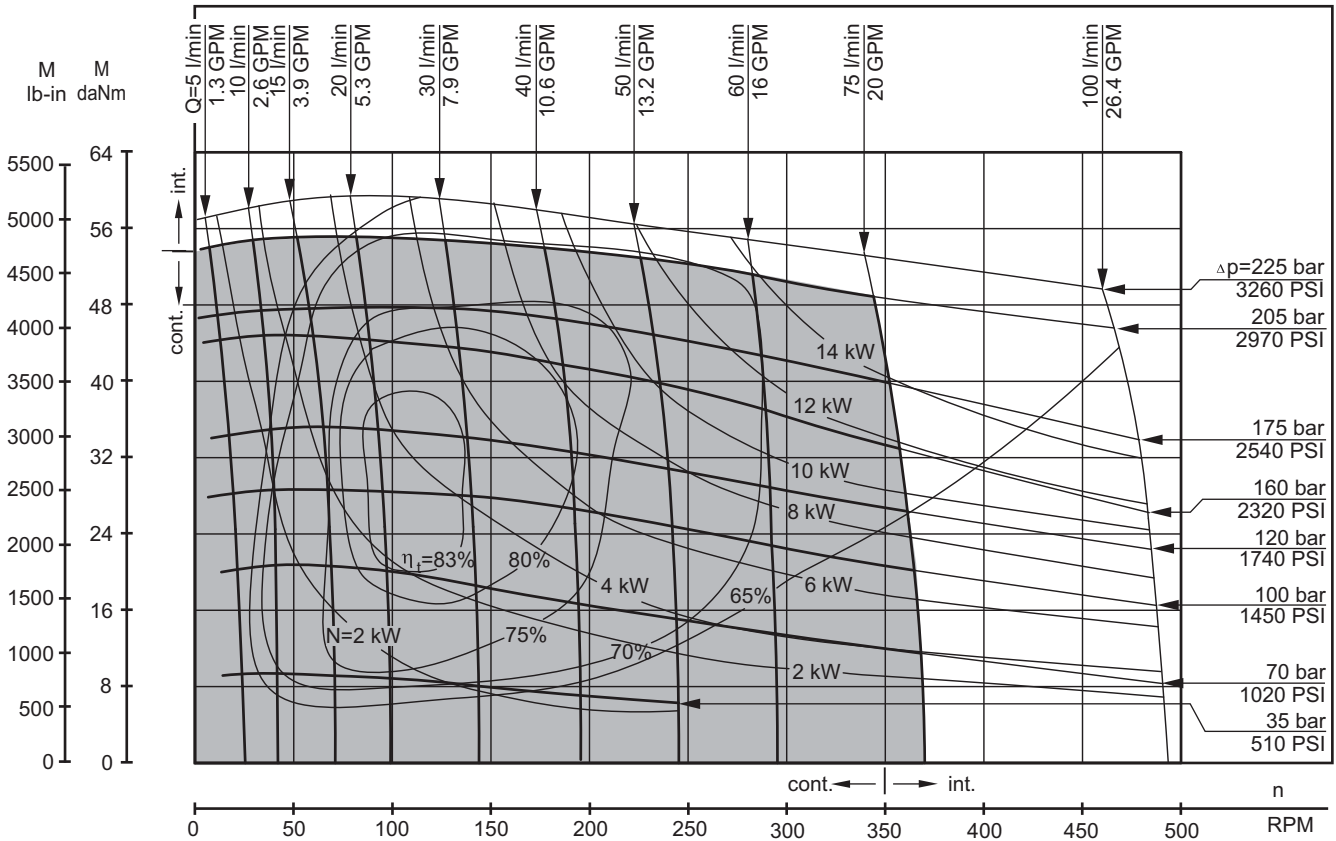
HW 160



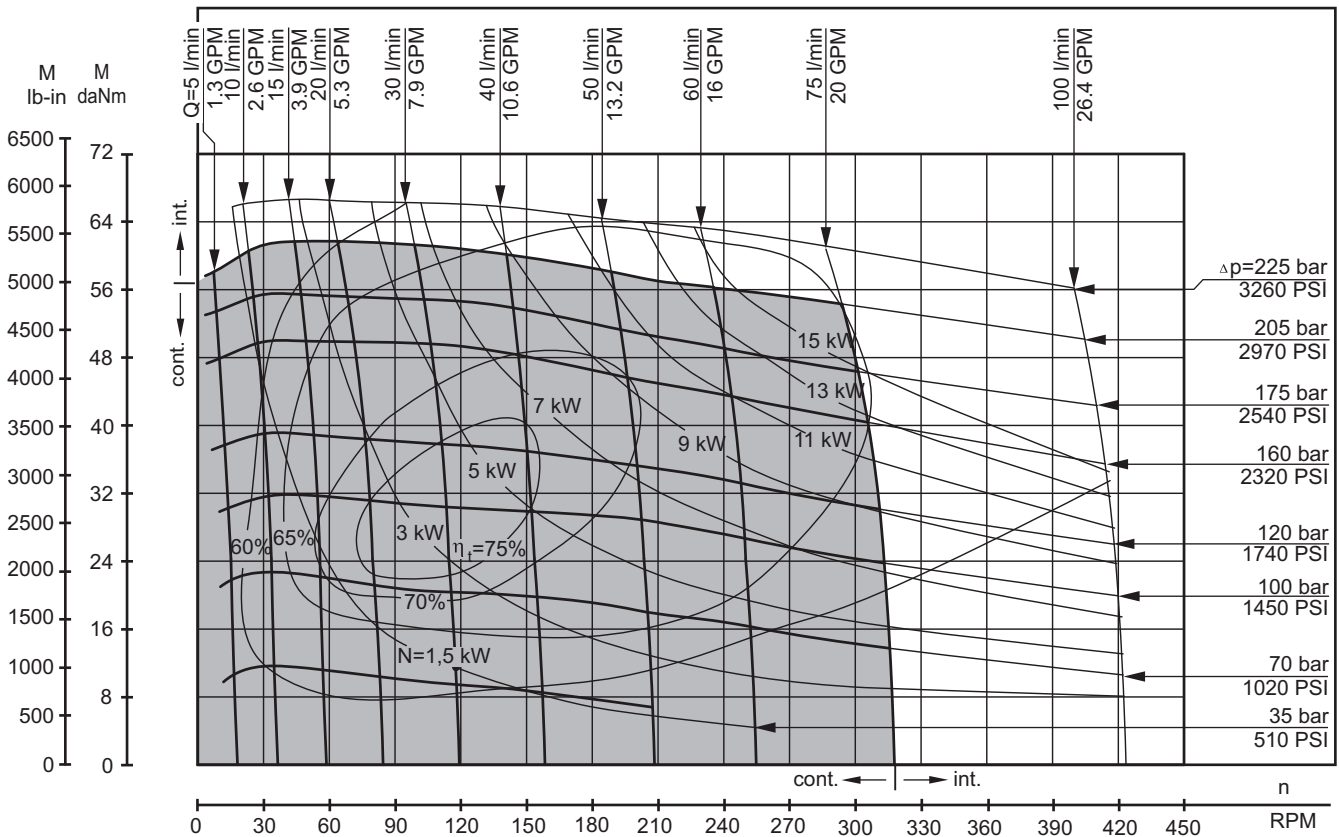
The function diagrams data is for average performance of randomly selected motors at back pressure 5±10 bar [72.5±145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 200



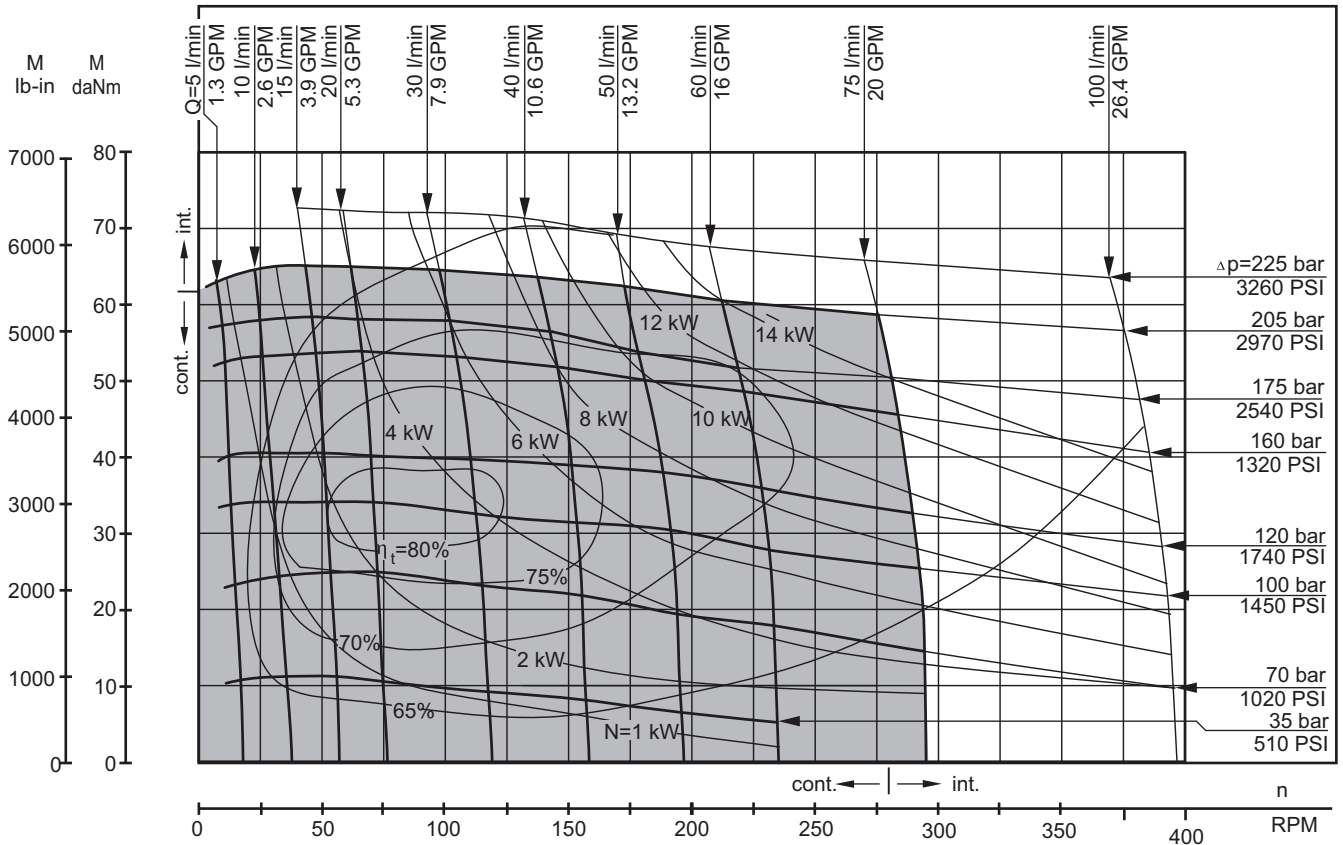
HW 235



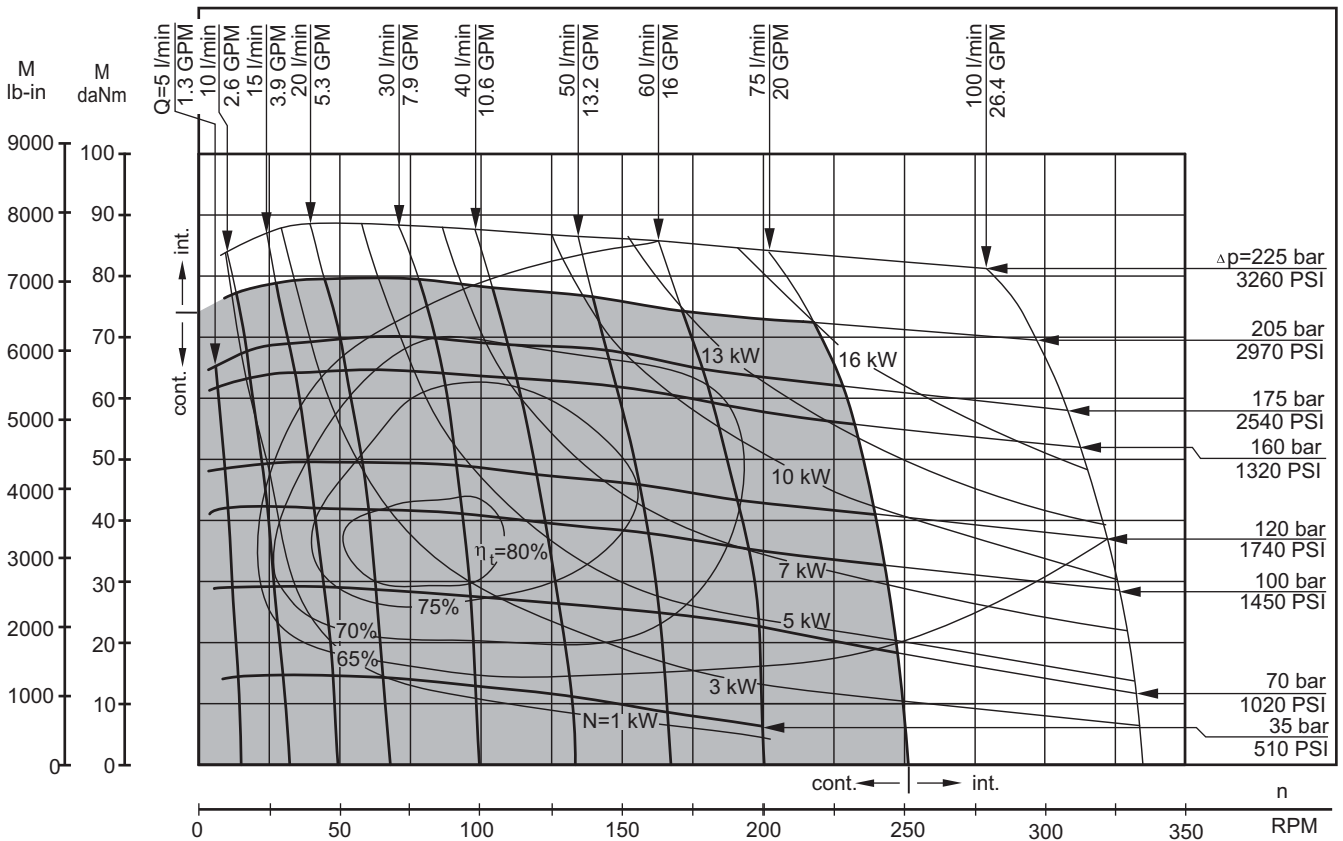
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 250



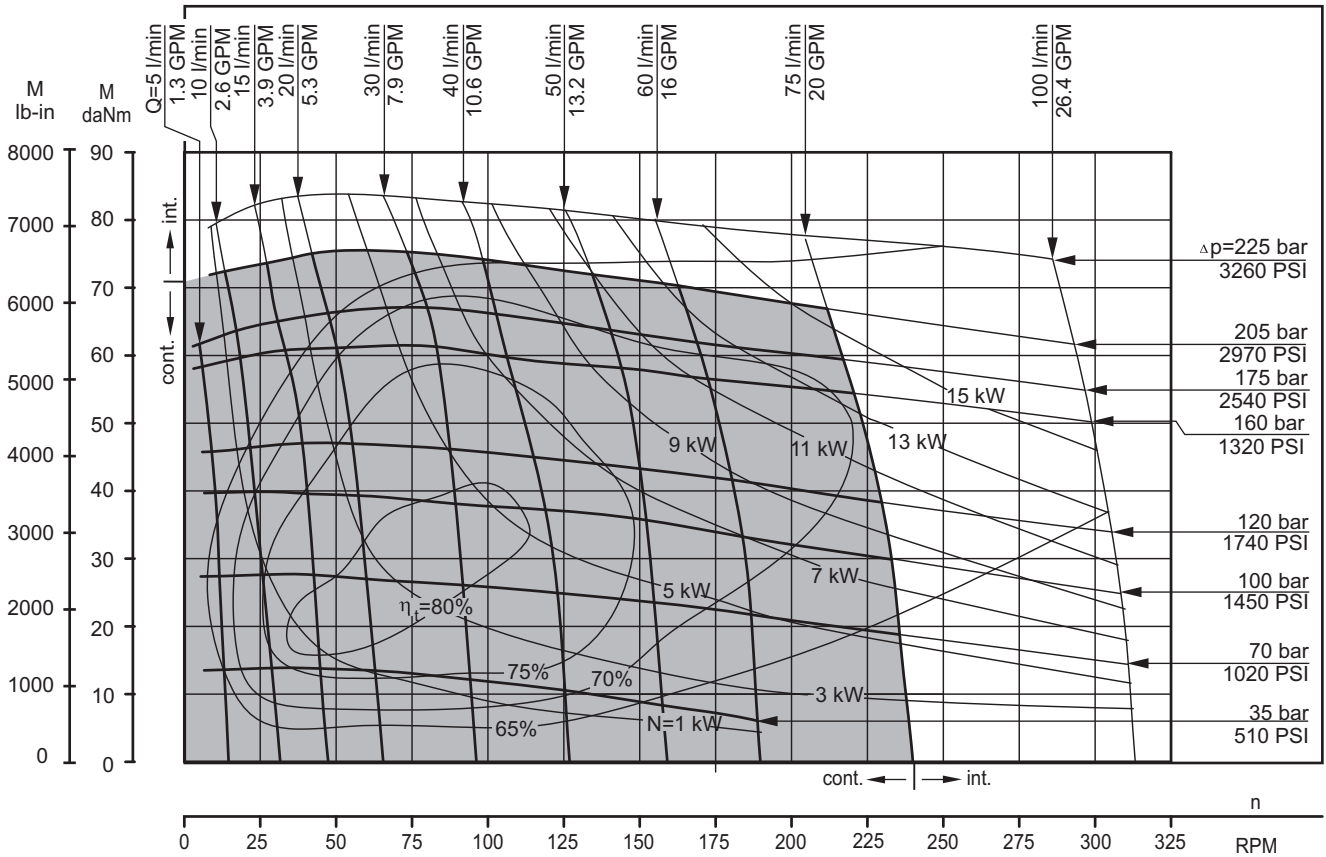
HW 300



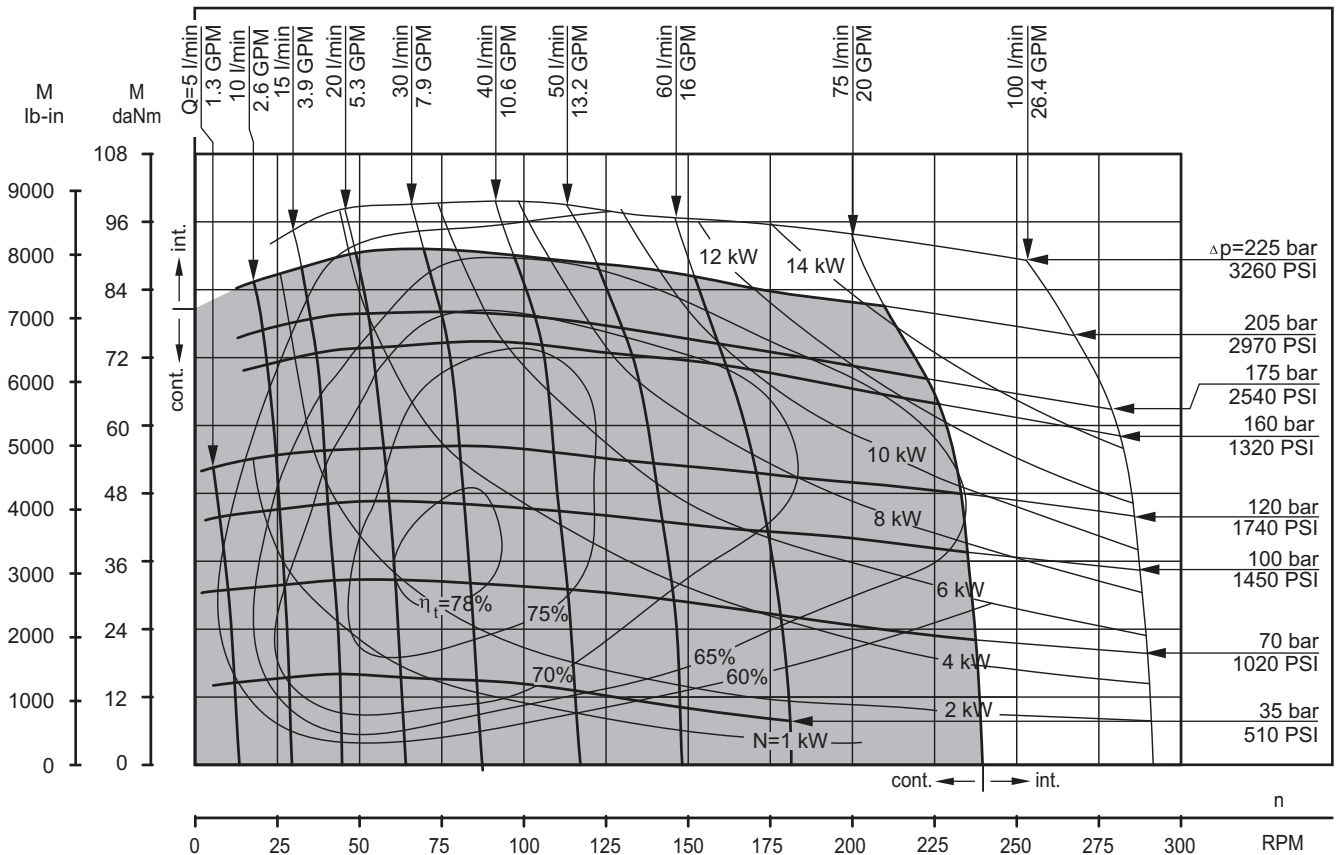
The function diagrams data is for average performance of randomly selected motors at back pressure 5÷10 bar [72.5÷145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 315



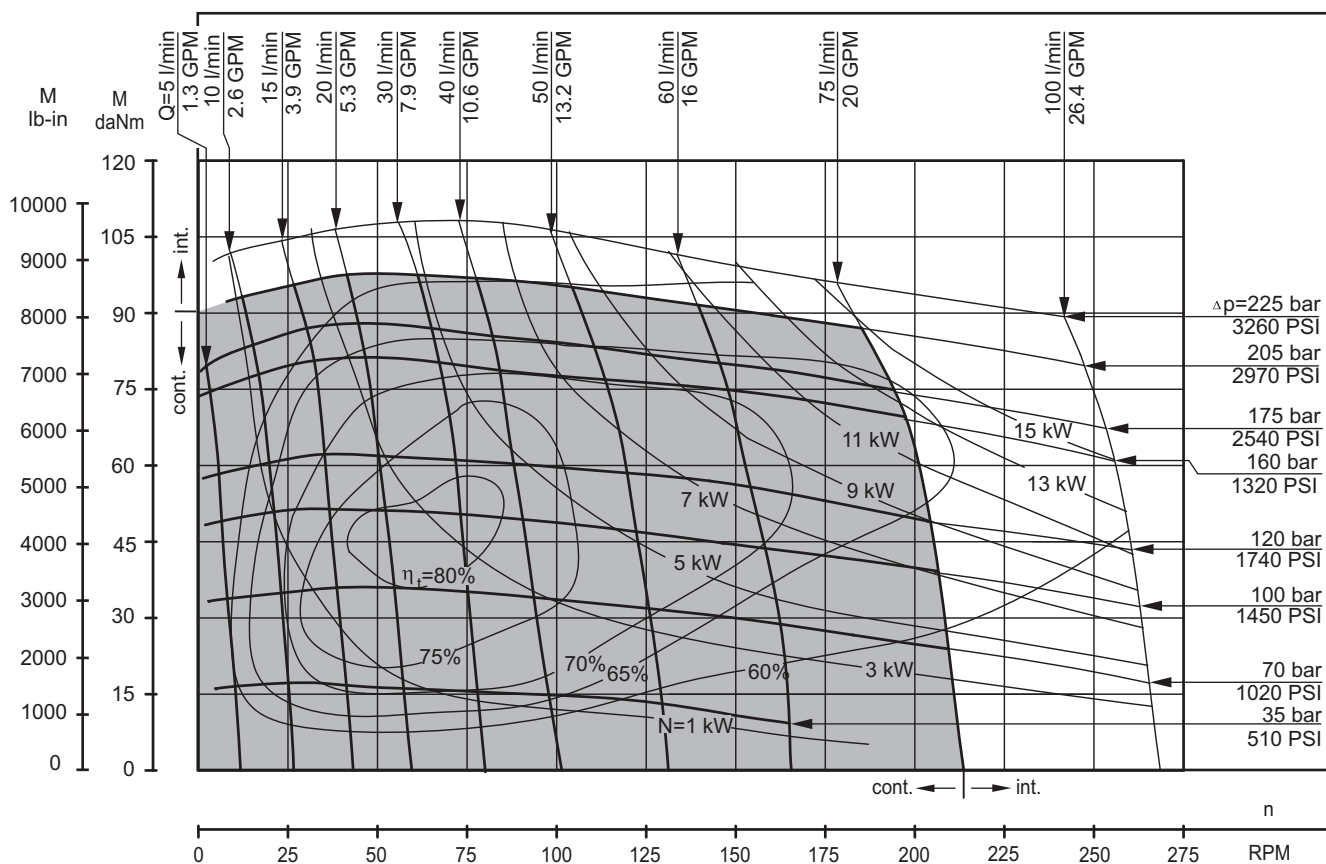
HW 350



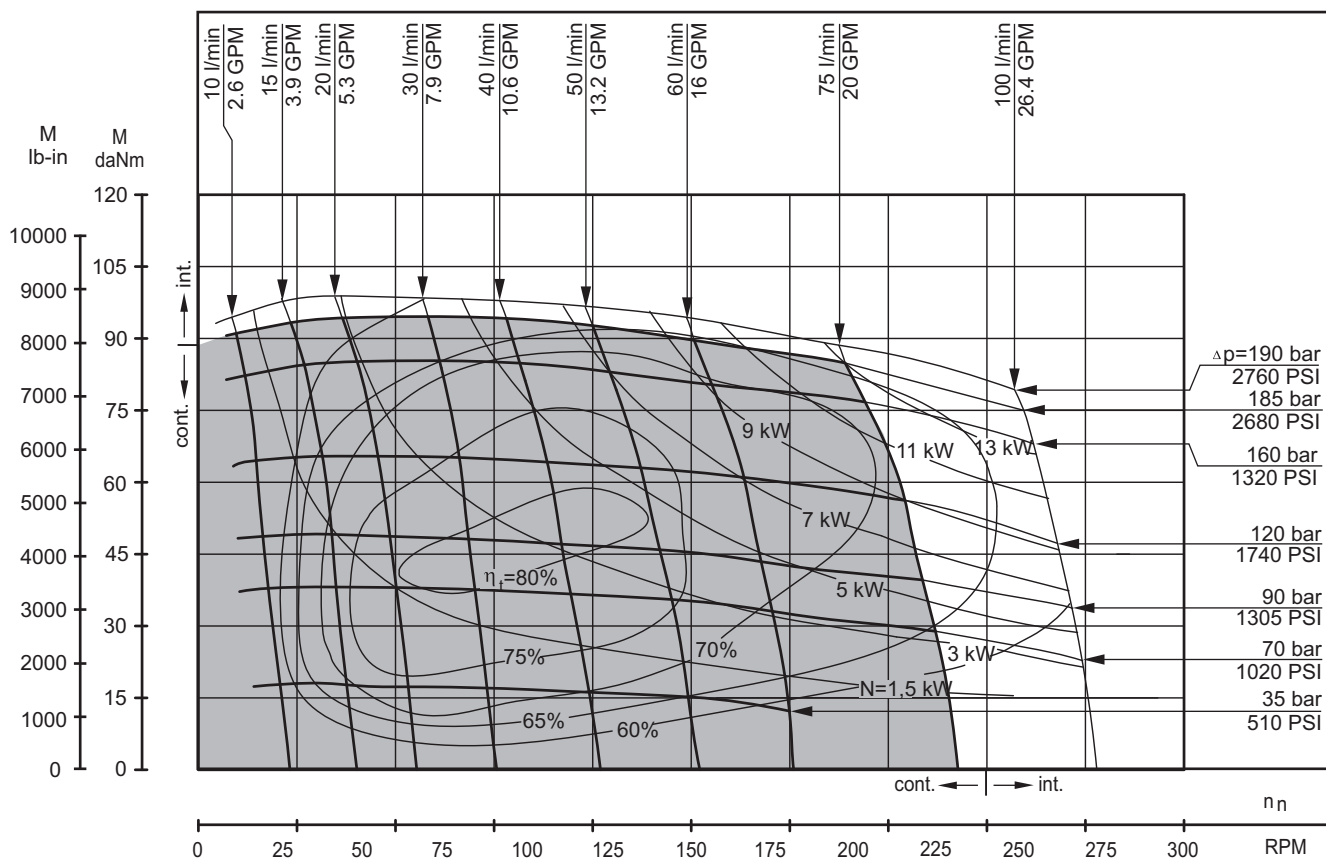
The function diagrams data is for average performance of randomly selected motors at back pressure 5±10 bar [72.5±145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 370



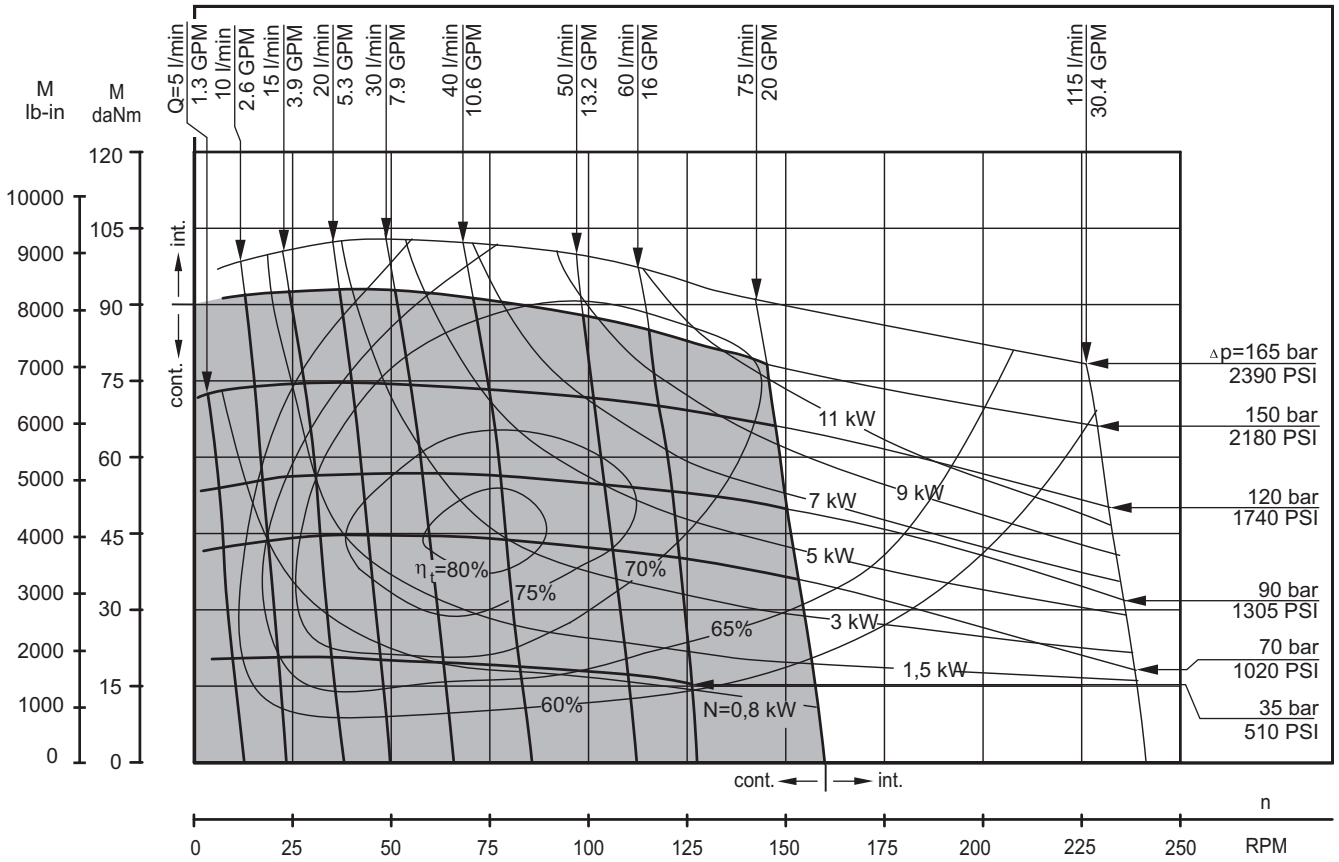
HW 400



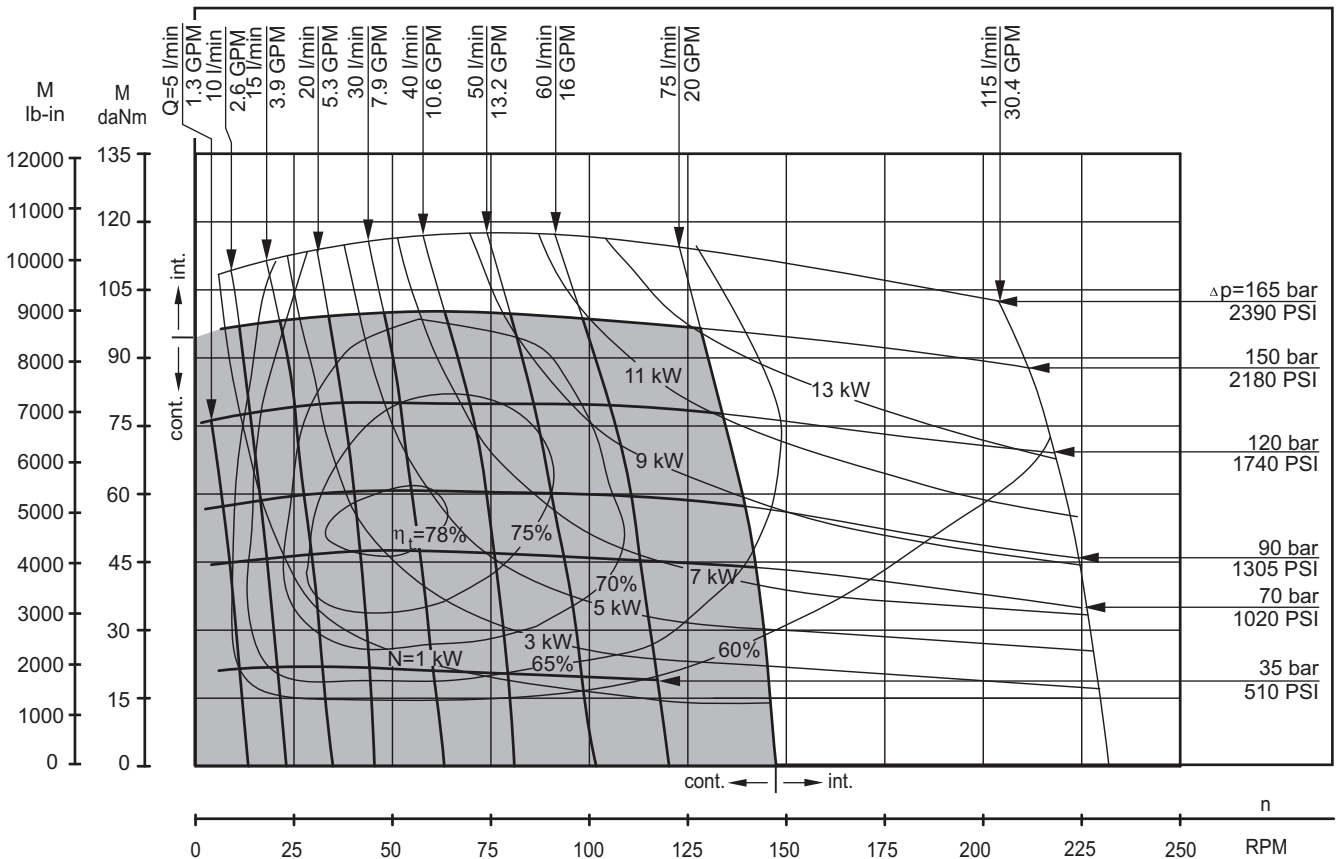
The function diagrams data is for average performance of randomly selected motors at back pressure 5 ± 10 bar [72.5 \pm 145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 470



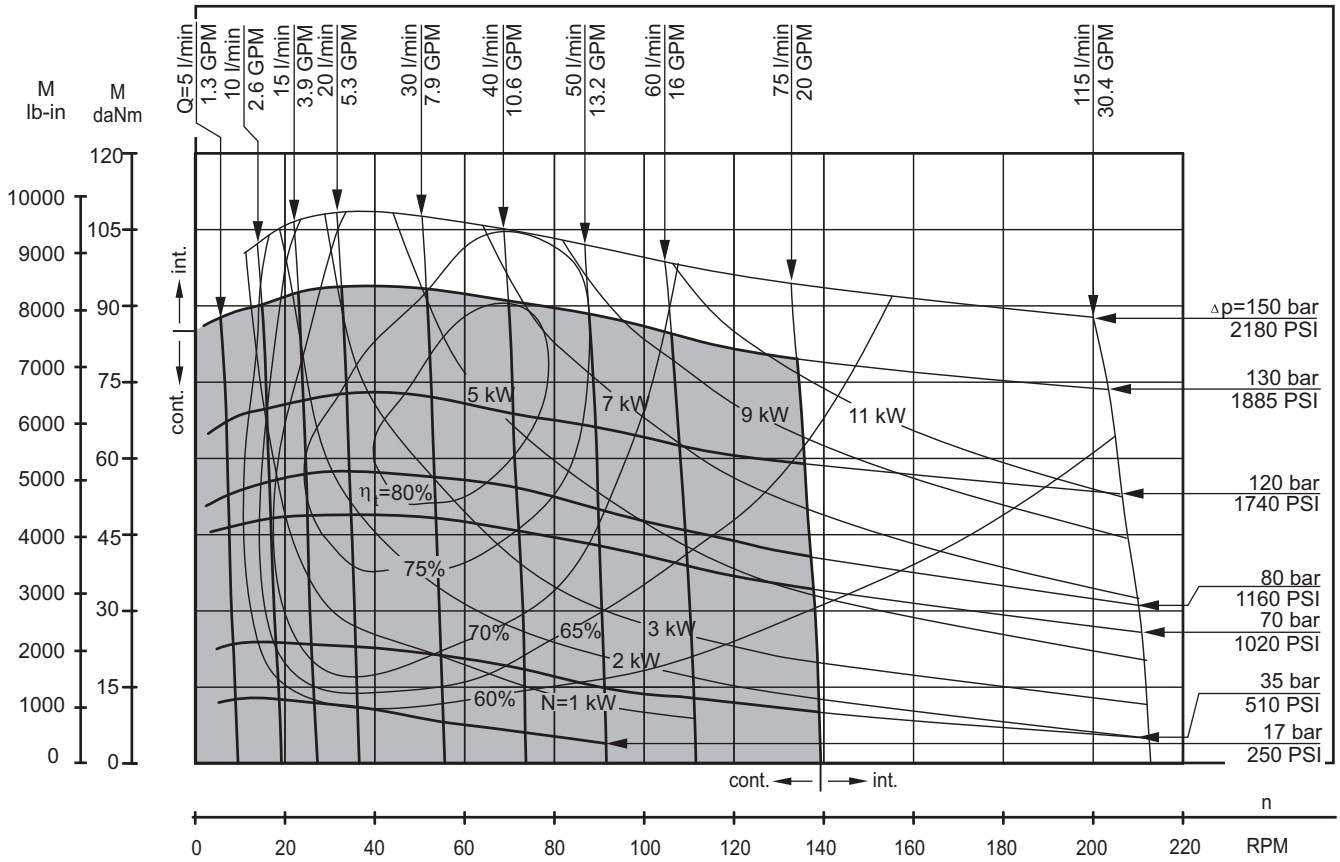
HW 500



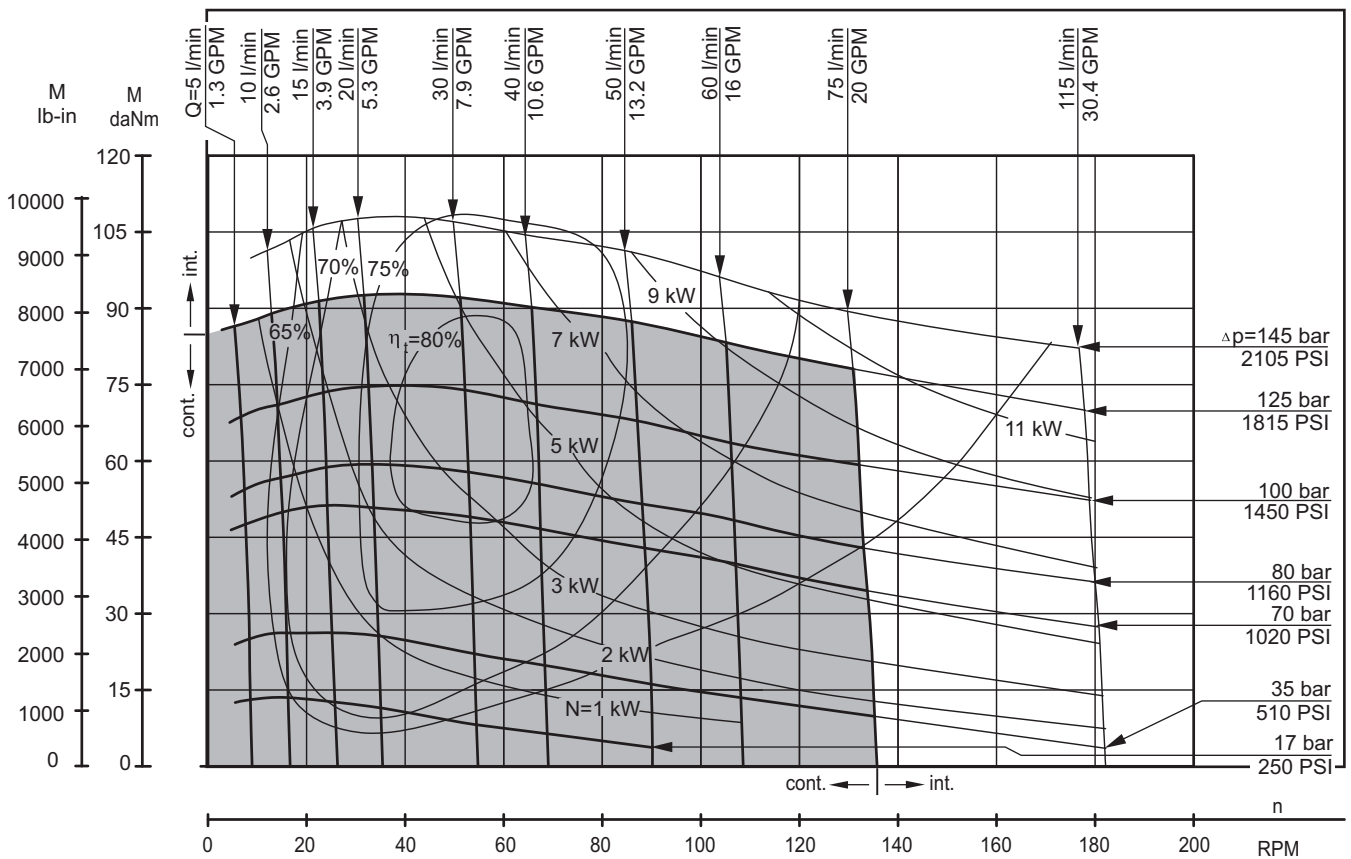
The function diagrams data is for average performance of randomly selected motors at back pressure 5 ± 10 bar [72.5 \pm 145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

HW 535



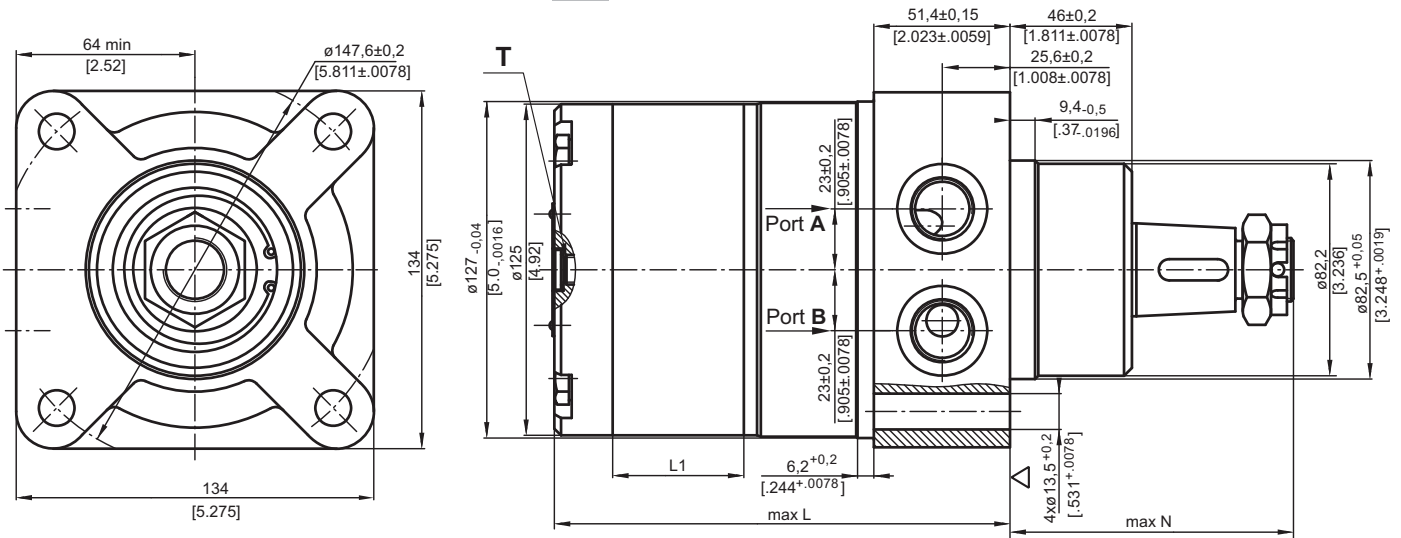
HW 550



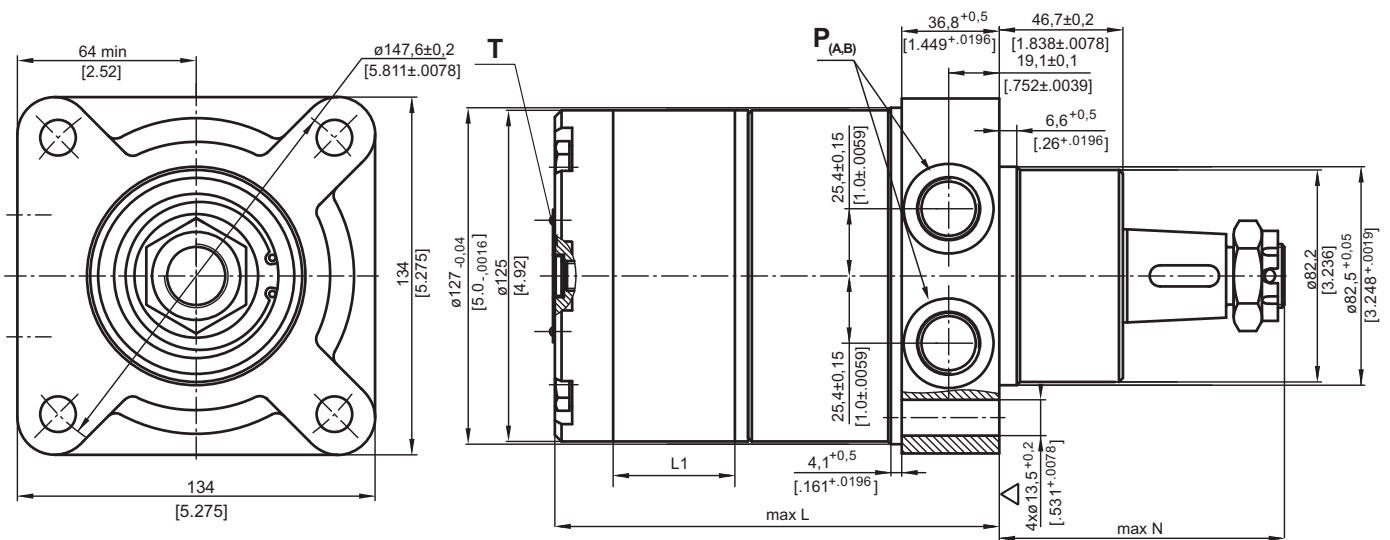
The function diagrams data is for average performance of randomly selected motors at back pressure 5 ± 10 bar [72.5 \pm 145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

DIMENSIONS AND MOUNTING DATA

HW - Wheel Mount



HWS - Wheel Mount



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

Note: For N see page 96.

▽ - Motor Mounting Surface

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

Standard Rotation

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

Reverse Rotation

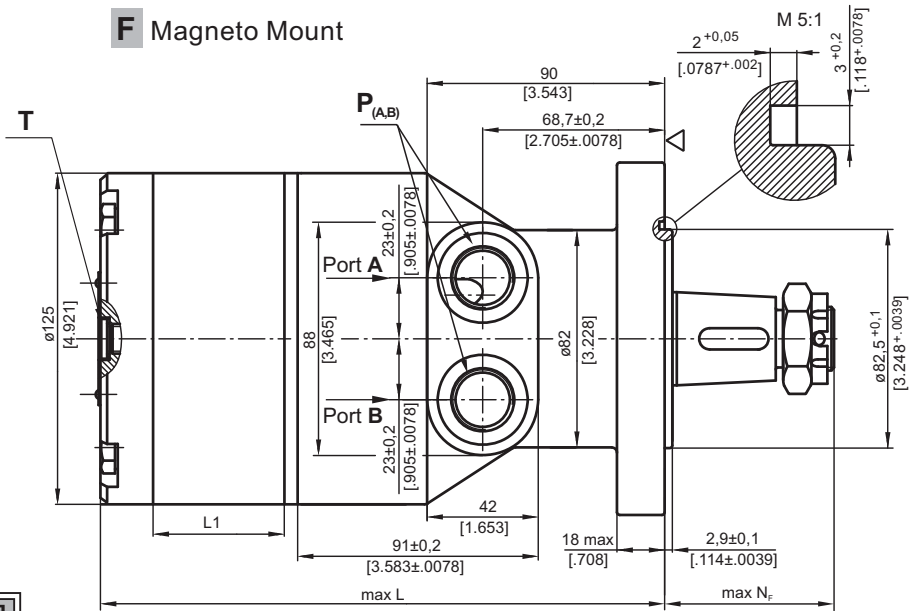
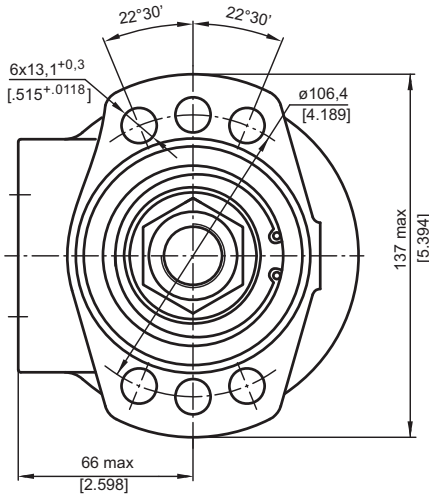
Viewed from Shaft End
Port A Pressurized - CCW
Port B Pressurized - CW



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

DIMENSIONS AND MOUNTING DATA - HWF

F Magneto Mount



Note: For N_F see page 96.

▽ - Motor Mounting Surface

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

| | Versions | |
|--------------------|----------|----------------------|
| | 2 | 4 |
| P _(A,B) | 2xG½ | 2x½-14UNF, O-ring |
| T | G ¼ | ¼-20UNF, 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

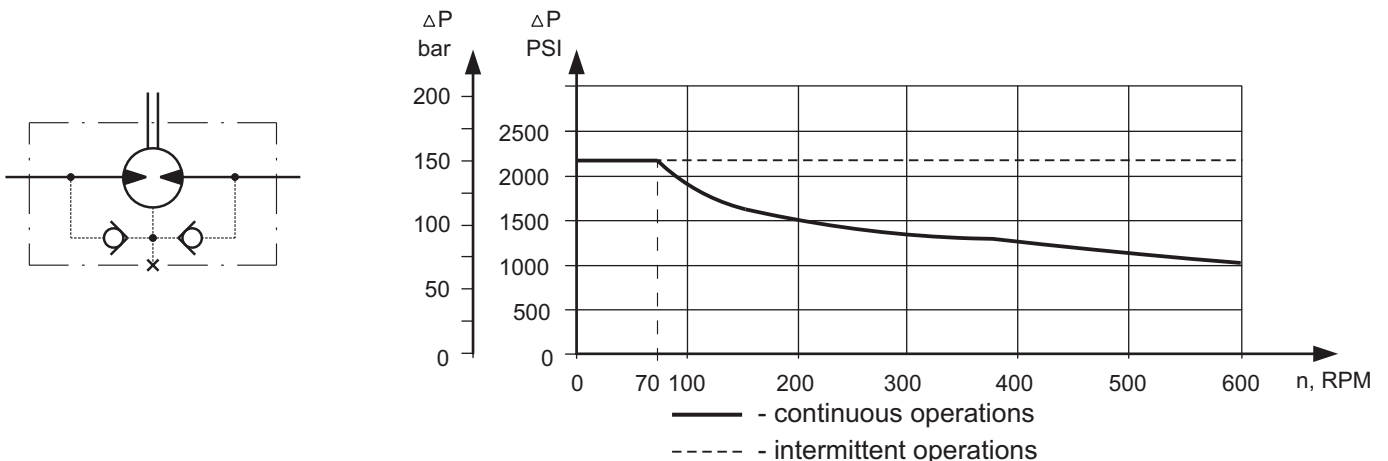


* For LSV option the dimension L is 3 mm [.118 in] greater.

MAX. PERMISSIBLE SHAFT SEAL PRESSURE

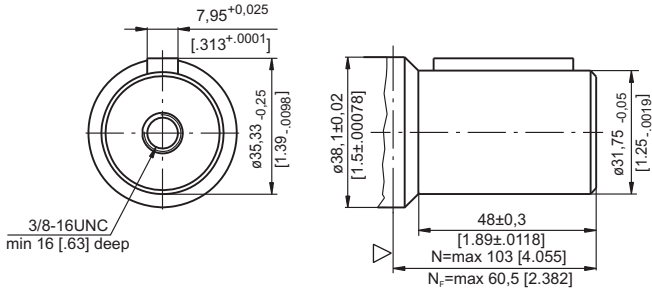
HW... motors with drain connection:

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

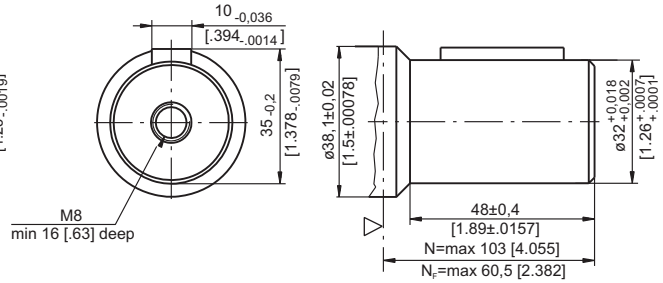


SHAFT EXTENSIONS

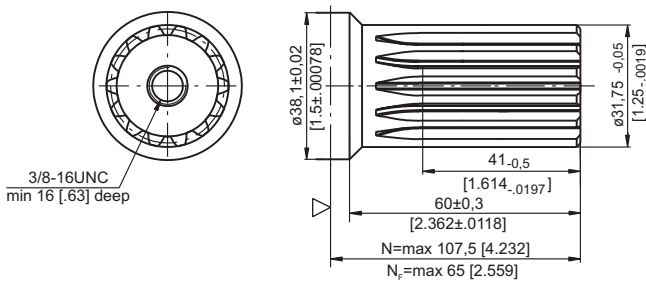
K - 1 1/4" straight, Parallel key 5/16"x5/16"x1 1/2" BS46
Max. Torque 77 daNm [6815 lb-in]



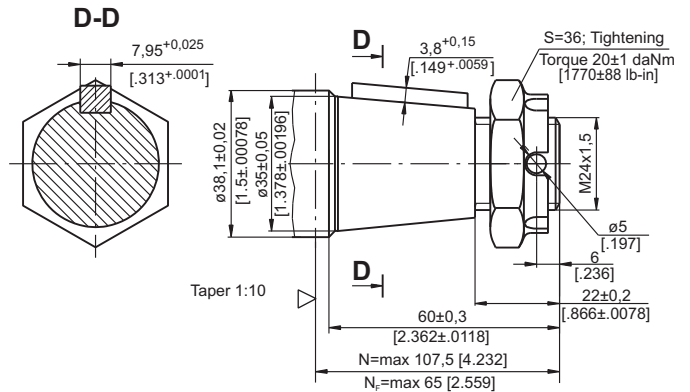
M - ø32 straight, Parallel key A10x8x32 DIN 6885
Max. Torque 77 daNm [6815 lb-in]



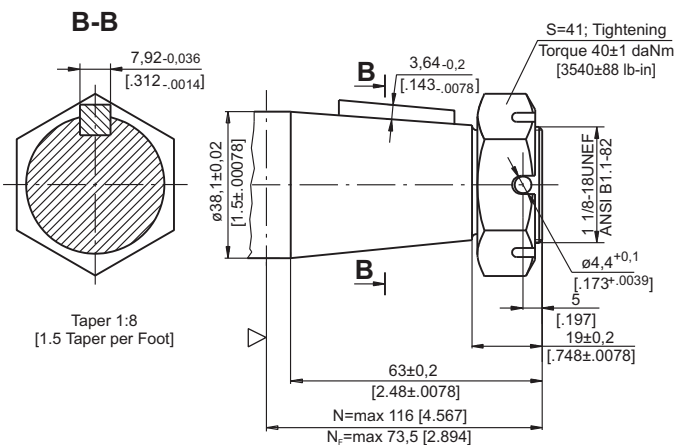
L - ø1 1/4" splined 14T, DP12/24 ANSI B92.1-1976 Norm
Max. Torque 77 daNm [6815 lb-in]



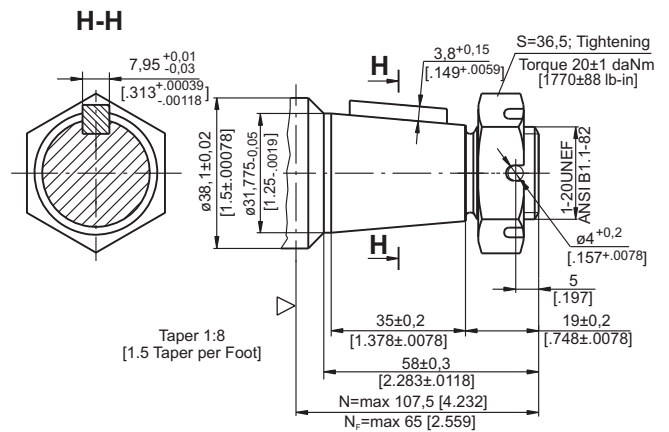
KB - ø35 tapered 1:10, Parallel key 5/16"x5/16"x1 1/4" BS46
Max. Torque 95 daNm [8410 lb-in]



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



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



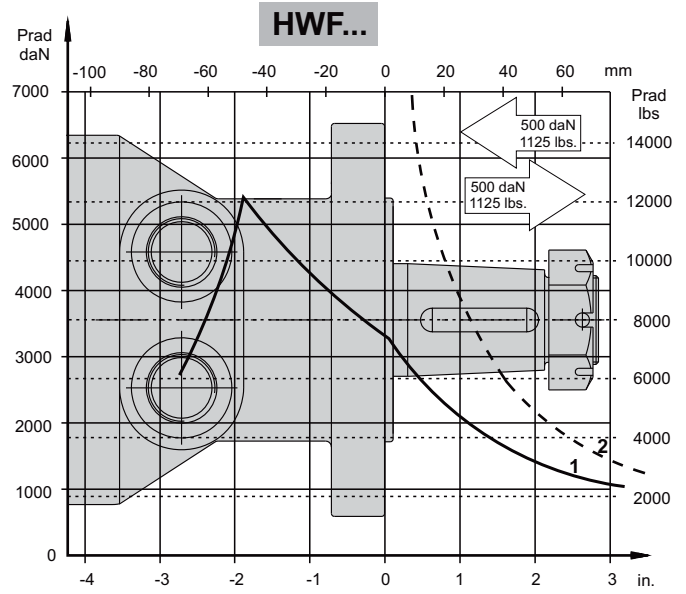
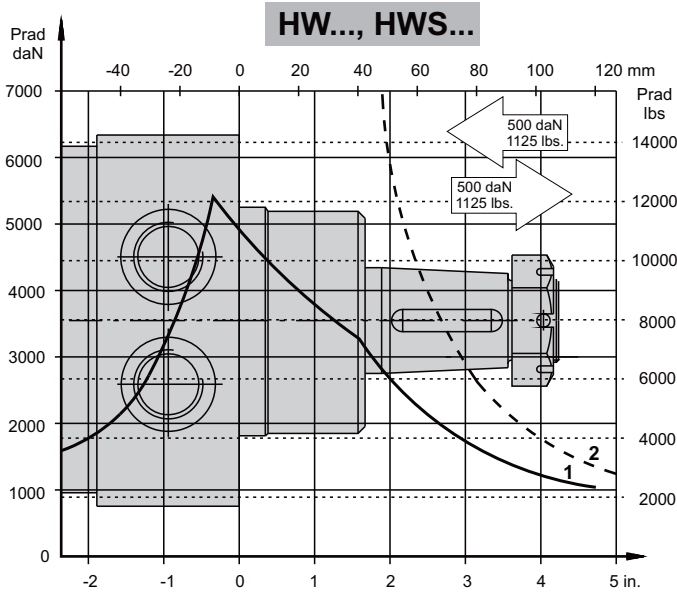
▽ - Motor Mounting Surface

N - for standart and S flange

Nf - for F flange



PERMISSIBLE SHAFT LOADS



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

ORDER CODE

| | | | | | |
|-----------|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |
| HW | | | | | |

Pos.1 - Mounting Flange

omit - Wheel mount, four holes

- F** - Oval mount, six holes
- S** - Wheel mount, four holes

Pos.2 - Displacement code

- 125** - 126,0 cm³/rev [7.69 in³/rev]
- 160** - 158,0 cm³/rev [9.64 in³/rev]
- 200** - 201,3 cm³/rev [12.28 in³/rev]
- 235** - 235,0 cm³/rev [14.33 in³/rev]
- 250** - 252,0 cm³/rev [15.37 in³/rev]
- 300** - 300,0 cm³/rev [18.30 in³/rev]
- 315** - 314,9 cm³/rev [19.21 in³/rev]
- 350** - 347,8 cm³/rev [21.21 in³/rev]
- 370** - 369,0 cm³/rev [22.51 in³/rev]
- 400** - 396,8 cm³/rev [24.20 in³/rev]
- 470** - 470,6 cm³/rev [28.71 in³/rev]
- 500** - 502,4 cm³/rev [30.65 in³/rev]
- 535** - 536,0 cm³/rev [32.70 in³/rev]
- 550** - 550,0 cm³/rev [33.55 in³/rev]

Pos.3 - Shaft Extensions*

- K** - 1¼"[31,75] straight, Parallel key 5/16"x5/16"x1½" BS46
- KB** - ø35 tapered 1:10, Parallel key 5/16"x5/16"x1¼" BS46
- L** - 1¼"[31,75] splined 14T, ANSI B92.1-1976
- M** - ø32 straight, Parallel key A10x8x32 DIN 6885
- R** - 1¼"[31,75] Tapered 1:8, Parallel key 5/16"x5/16"x1" BS46
- T** - 1½"[38,1] Tapered 1:8, Parallel key 5/16"x5/16"x1¼" BS46

Pos.4 - Ports

- 2** - BSPP (ISO 228)
- 4** - SAE (ANSI B1.1-1982)

Pos.5 - Special Features [see page 99]

Pos.6 - Design Series

omit - Factory specified

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

The hydraulic motors are manganophosphatized as standard.