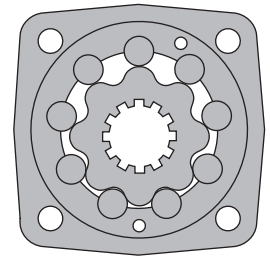
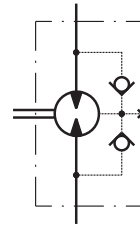


HYDRAULIC MOTORS MLHT



APPLICATION

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



CONTENTS

Specification data	26+27
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Dimensions and mounting	32+33
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Dimensions and mounting- MLHTS, V	35
Dimensions of the attached component	36
Internal Spline data	37
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Tacho connection.....	38
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OPTIONS

- » Model - Disc valve, roll-gerotor
- » Flange and wheel mount
- » Short motor
- » Tacho connection
- » Speed sensing
- » Side and rear ports
- » Shafts- straight, splined and tapered
- » SAE, Metric and BSPP ports
- » Other special features

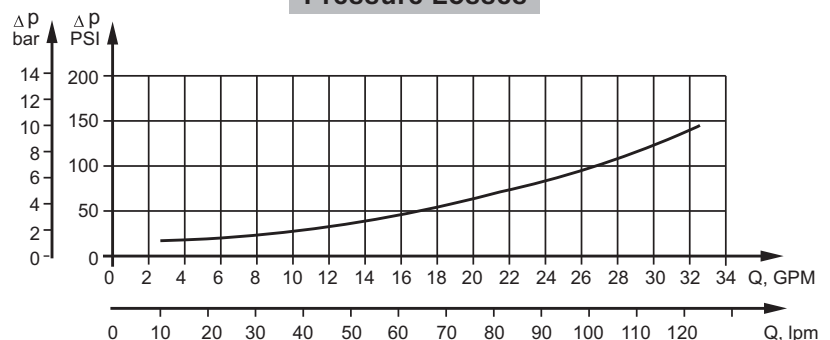
GENERAL

Max. Displacement, in ³ /rev [cm ³ /rev]	44.2 [724,3]
Max. Speed, [RPM]	775
Max. Torque, lb-in [daNm]	cont.: 11500 [130] int.: 13100 [148]
Max. Output, HP [kW]	54 [40]
Max. Pressure Drop, PSI [bar]	cont.: 2900 [200] int. 3480 [240]
Max. Oil Flow, GPM [lpm]	150 [39.6]
Min. Speed, [RPM]	5
Permissible Shaft Loads lbs [daN]	P _a =2250 [1000]
Pressure fluid	Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)
Temperature range, °F [°C]	-40÷284 [-40÷140]
Optimal Viscosity range, SUS [mm²/s]	98÷347 [20÷75]
Filtration	ISO code 20/16 (Min. recommended fluid filtration of 25 microns)

Oil flow in drain line

Pressure drop PSI [bar]	Viscosity SUS [mm ² /s]	Oil flow in drain line GPM [lpm]
2030 [140]	98 [20]	.660 [2,5]
	164 [35]	.396 [1,5]
3045 [210]	98 [20]	1.321 [5]
	164 [35]	.793 [3]

Pressure Losses



SPECIFICATION DATA

Type	MLHT 160	MLHT 200	MLHT 250	MLHT 315
Displacement, in³/rev [cm³/rev]	9.83 [161,1]	12.29 [201,4]	15.36 [251,8]	19.90 [326,3]
Max. Speed, [RPM]	Cont.	622	620	496
	Int.*	775	752	601
Max. Torque lb-in [daNm]	Cont.	4160 [47]	5220 [59]	6460 [73]
	Int.*	4960 [56]	6285 [71]	7790 [88]
	Peak**	5840 [66]	7260 [82]	9030 [102]
Max. Output HP [kW]	Cont.	36 [26,5]	45 [33,5]	45 [33,5]
	Int.*	43 [32]	54 [40]	54 [40]
Max. Pressure Drop PSI [bar]	Cont.	2900 [200]	2900 [200]	2900 [200]
	Int.*	3450 [240]	3450 [240]	3450 [240]
	Peak**	4050 [280]	4050 [280]	4050 [280]
Max. Oil Flow GPM [lpm]	Cont.	26.4 [100]	33 [125]	33 [125]
	Int.*	33 [125]	39.6 [150]	39.6 [150]
Max. Inlet Pressure PSI [bar]	Cont.	3050 [210]	3050 [210]	3050 [210]
	Int.*	3600 [250]	3600 [250]	3600 [250]
	Peak**	4350 [300]	4350 [300]	4350 [300]
Max. Return Pressure with Drain Line PSI [bar]	Cont.	2030 [140]	2030 [140]	2030 [140]
	Int.*	2540 [175]	2540 [175]	2540 [175]
	Peak**	3050 [210]	3050 [210]	3050 [210]
Max. Starting Pressure with Unloaded Shaft, PSI [bar]	150 [10]	150 [10]	150 [10]	150 [10]
Min. Starting Torque lb-in [daNm]	At max. press. drop Cont.	3010 [34]	3800 [43]	4690 [53]
	At max. press. drop Int.*	3630 [41]	4600 [52]	5580 [63]
Min. Speed***, [RPM]	10	9	8	7
Weight, lb [kg] For Rear Ports +0,450[.992]	MLHT	44.1 [20]	47.4 [21,5]	46.3[21]
	MLHTW	48.5 [22]	49.6 [22,5]	50.7 [23]
	MLHTS	33.1 [15]	34.2 [15,5]	35.3 [16]
	MLHTV	24.3 [11]	25.4 [11,5]	26.5 [12]

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

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

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

1. Intermittent speed and intermittent pressure drop 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 70 SUS [13 mm²/s] at 122°F [50°C].
5. Recommended maximum system operating temperature is 180°F [82°C].
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 (continued)

Type		MLHT 400	MLHT 500	MLHT 630	MLHT 725
Displacement, in³/rev [cm³/rev]		25.06 [410,9]	31.95 [523,6]	38.52 [631,2]	44.2 [724,3]
Max. Speed, [RPM]	Cont.	304	238	197	172
	Int.*	368	289	234	209
Max. Torque lb-in [daNm]	Cont.	9560 [108]	10800 [122]	11500 [130]	11240 [127]
	Int.*	11150 [126]	12125 [137]	13100 [148]	13010 [147]
	Peak**	12745 [144]	14160 [160]	15580 [176]	15490 [175]
Max. Output HP [kW]	Cont.	40 [30]	36 [26,5]	33 [24,3]	27 [20,2]
	Int.*	47 [35]	40 [30]	37 [27,5]	36 [26,8]
Max. Pressure Drop PSI [bar]	Cont.	2600 [180]	2300 [160]	2010 [140]	1740 [120]
	Int.*	3050 [210]	2600 [180]	2310 [160]	2010 [140]
	Peak**	3450 [240]	3050 [210]	2760 [190]	2395 [165]
Max. Oil Flow GPM [lpm]	Cont.	33 [125]	33 [125]	33 [125]	33 [125]
	Int.*	39.6 [150]	39.6 [150]	39.6 [150]	39.6 [150]
Max. Inlet Pressure PSI [bar]	Cont.	3050 [210]	3050 [210]	3050 [210]	3050 [210]
	Int.*	3600 [250]	3600 [250]	3600 [250]	3600 [250]
	Peak**	4350 [300]	4350 [300]	4350 [300]	4350 [300]
Max. Return Pressure with Drain Line PSI [bar]	Cont.	2000 [140]	2000 [140]	2000 [140]	2000 [140]
	Int.*	2500 [175]	2500 [175]	2500 [175]	2500 [175]
	Peak**	3000 [210]	3000 [210]	3000 [210]	3000 [210]
Max. Starting Pressure with Unloaded Shaft, PSI [bar]		150 [10]	150 [10]	150 [10]	150 [10]
Min. Starting Torque lb-in [daNm]	At max. press. drop Cont.	7435 [84]	8410 [95]	8410 [95]	8410 [95]
	At max. press. drop Int.*	8585 [97]	9380 [106]	9740 [110]	10180 [115]
Min. Speed***, [RPM]		6	5	5	5
Weight, lb [kg] For Rear Ports +0,450 [.992]	MLHT	50.7 [23]	52.9 [24]	51.8 [23,5]	54.0 [24,5]
	MLHTW	55.1 [25]	57.3 [26]	56.2 [25,5]	58.4 [26,5]
	MLHTS	39.7 [18]	41.9 [19]	40.8 [18,5]	43.0 [19,5]
	MLHTV	30.9 [14]	33.1 [15]	32.0 [14,5]	34.2 [15,5]

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

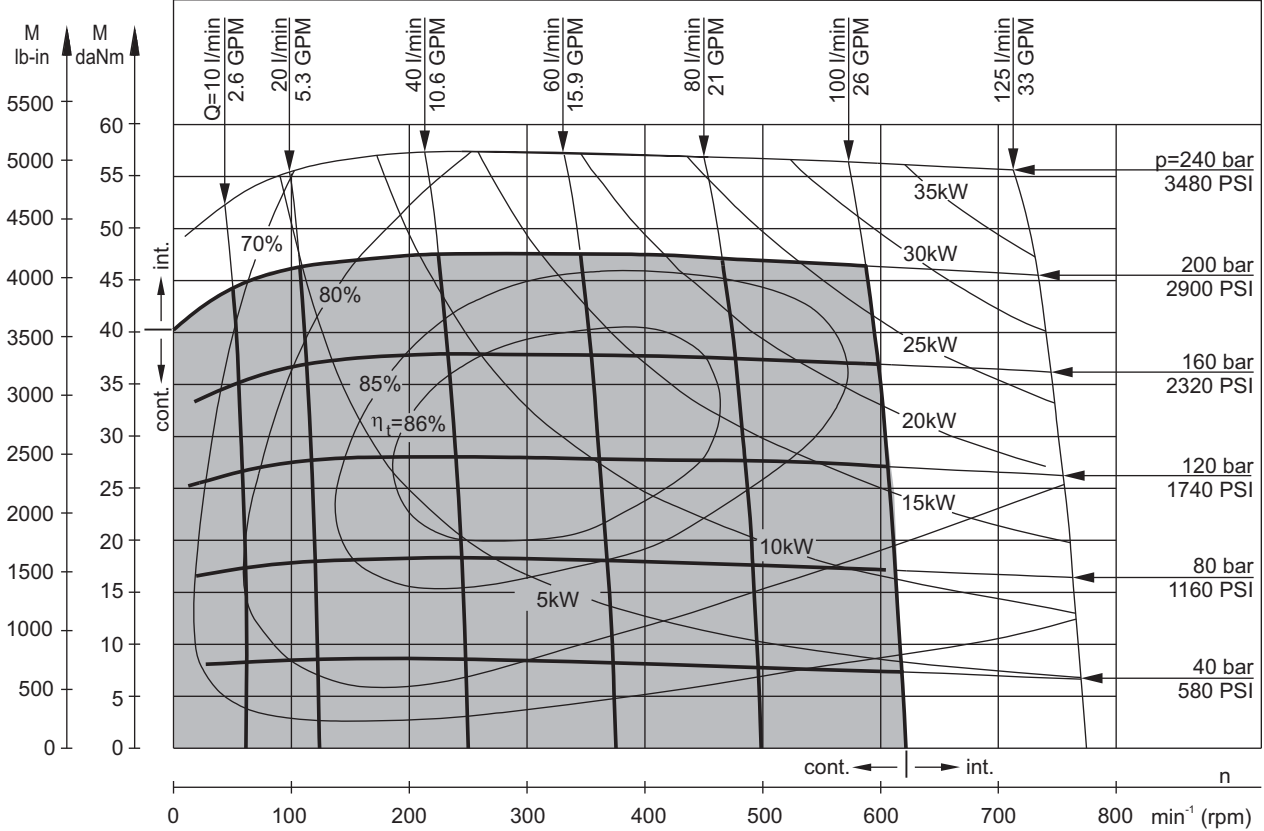
** Peak load: the permissible values may occur for max. 1% of every minute.

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

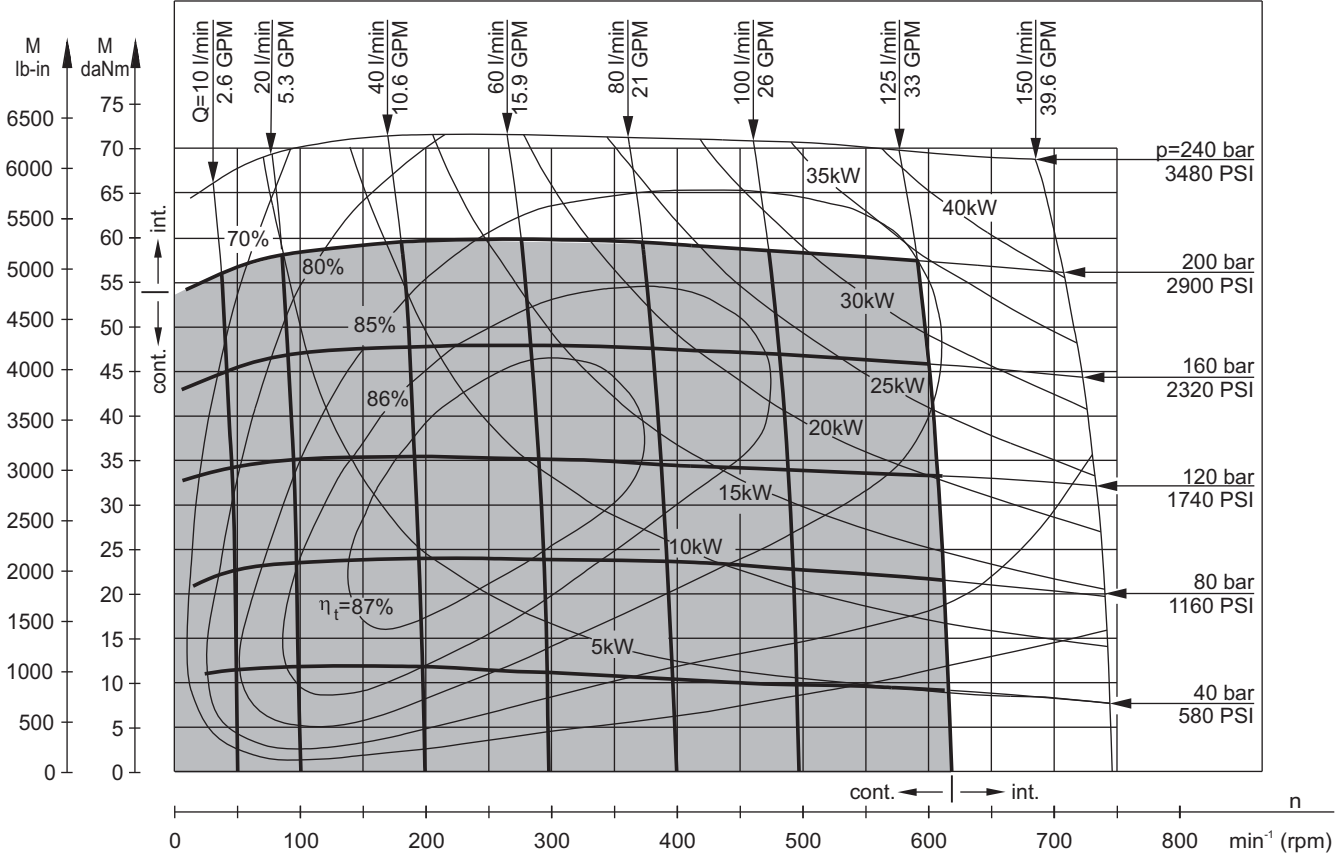
1. Intermittent speed and intermittent pressure drop must not occur simultaneously.
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).
If using synthetic fluids consult the factory for alternative seal materials.
4. Recommended minimum oil viscosity 70 SUS [13 mm²/s] at 122°F [50°C].
5. Recommended maximum system operating temperature is 180°F [82°C].
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

MLHT 160



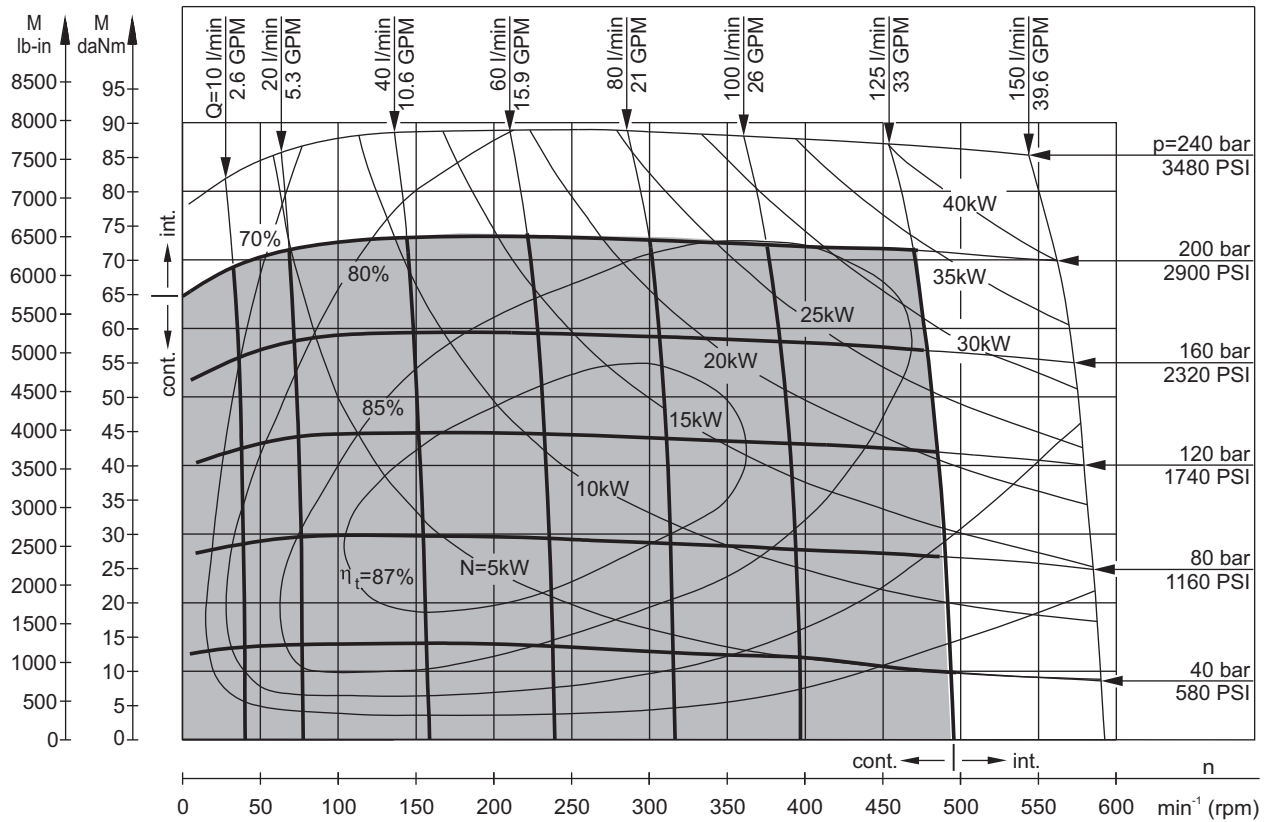
MLHT 200



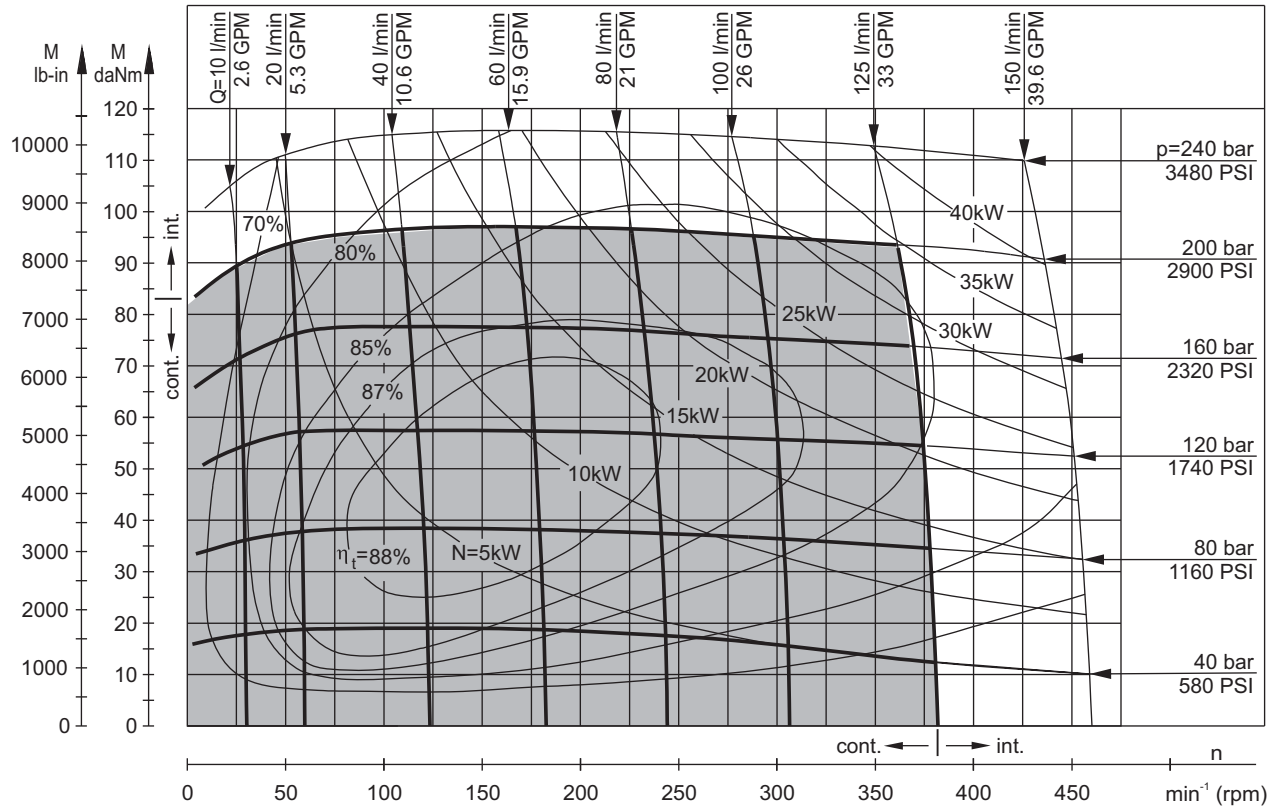
The function diagrams data is for average performance of randomly selected motors at back pressure 5 ± 10 bar [72.5 \pm 145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MLHT 250



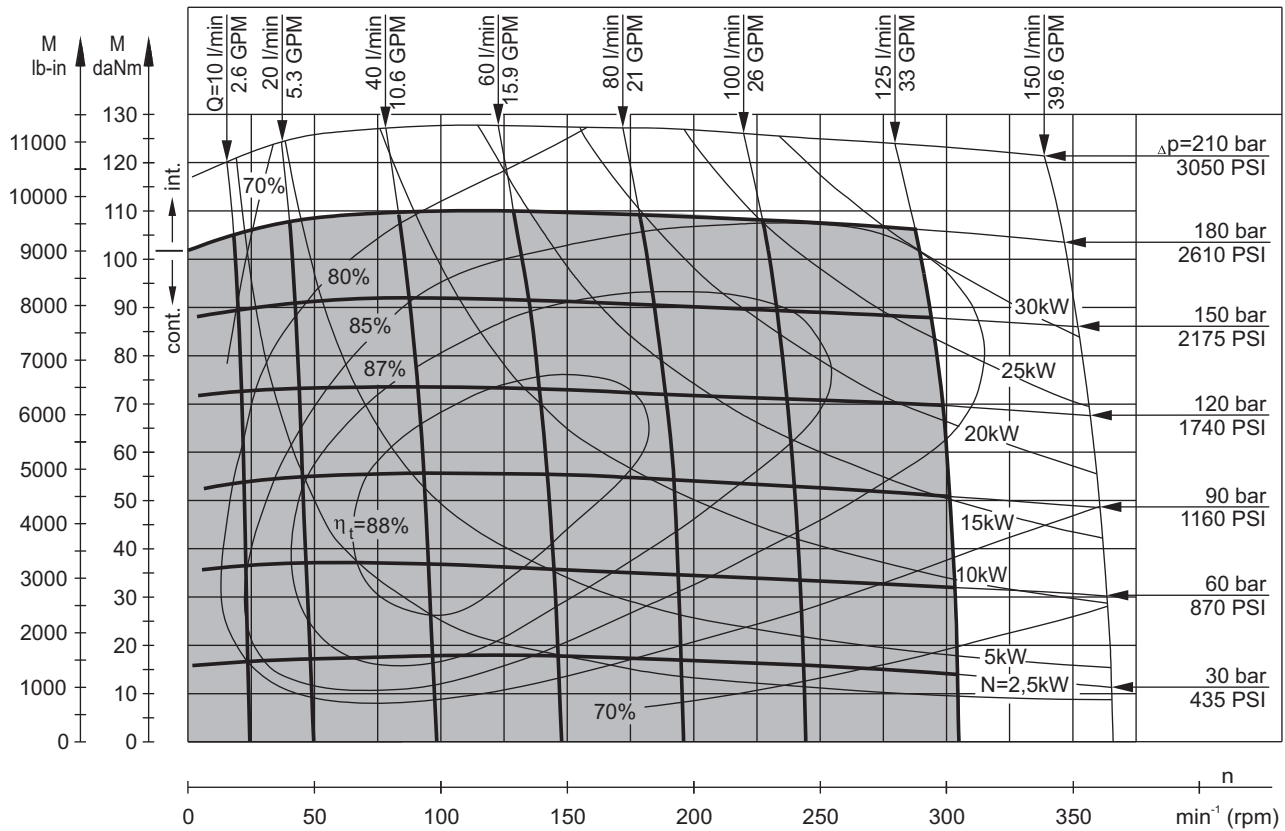
MLHT 315



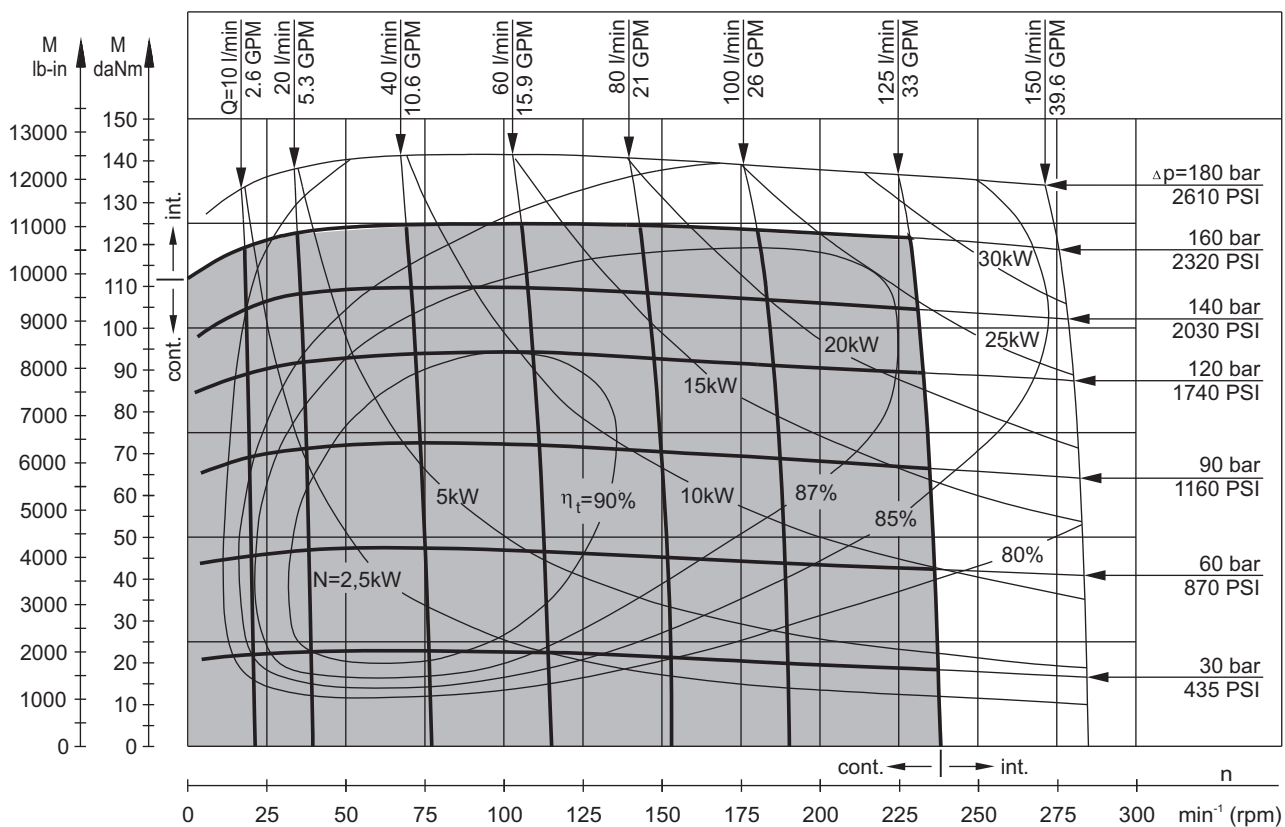
The function diagrams data is for average performance of randomly selected motors at back pressure 5±10 bar [72.5±145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MLHT 400



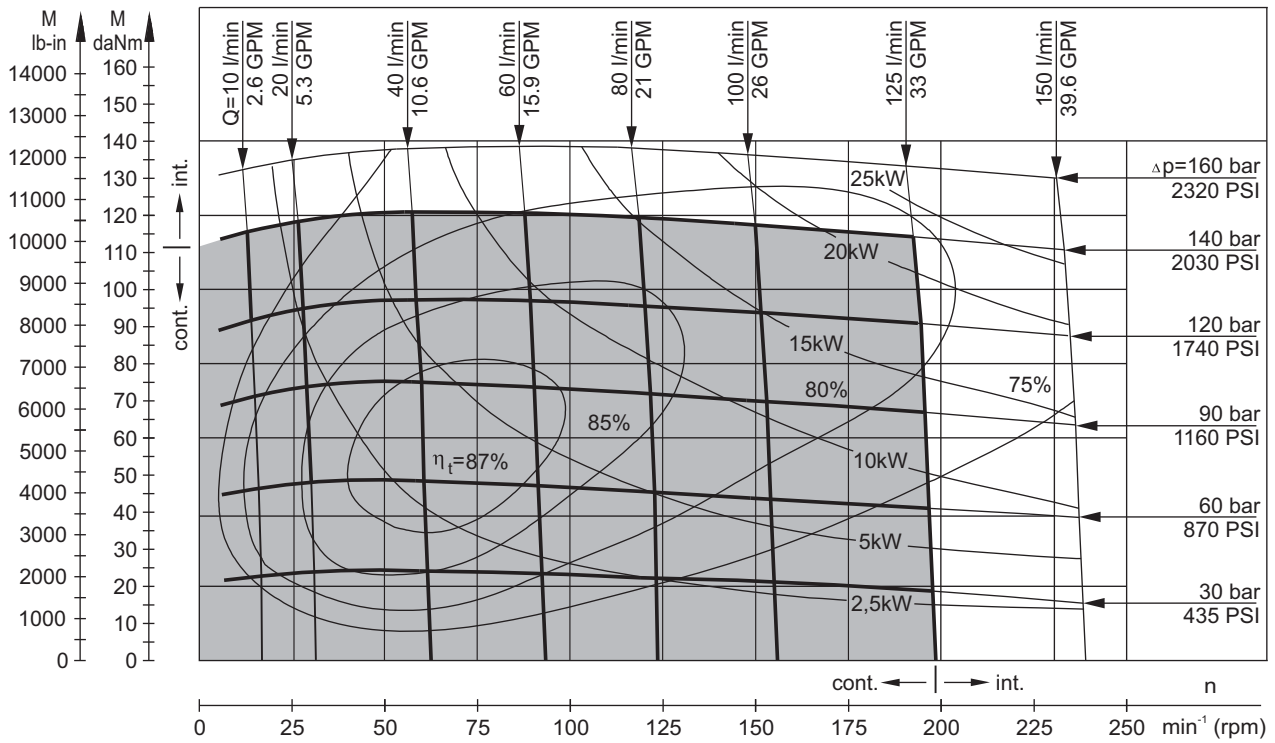
MLHT 500



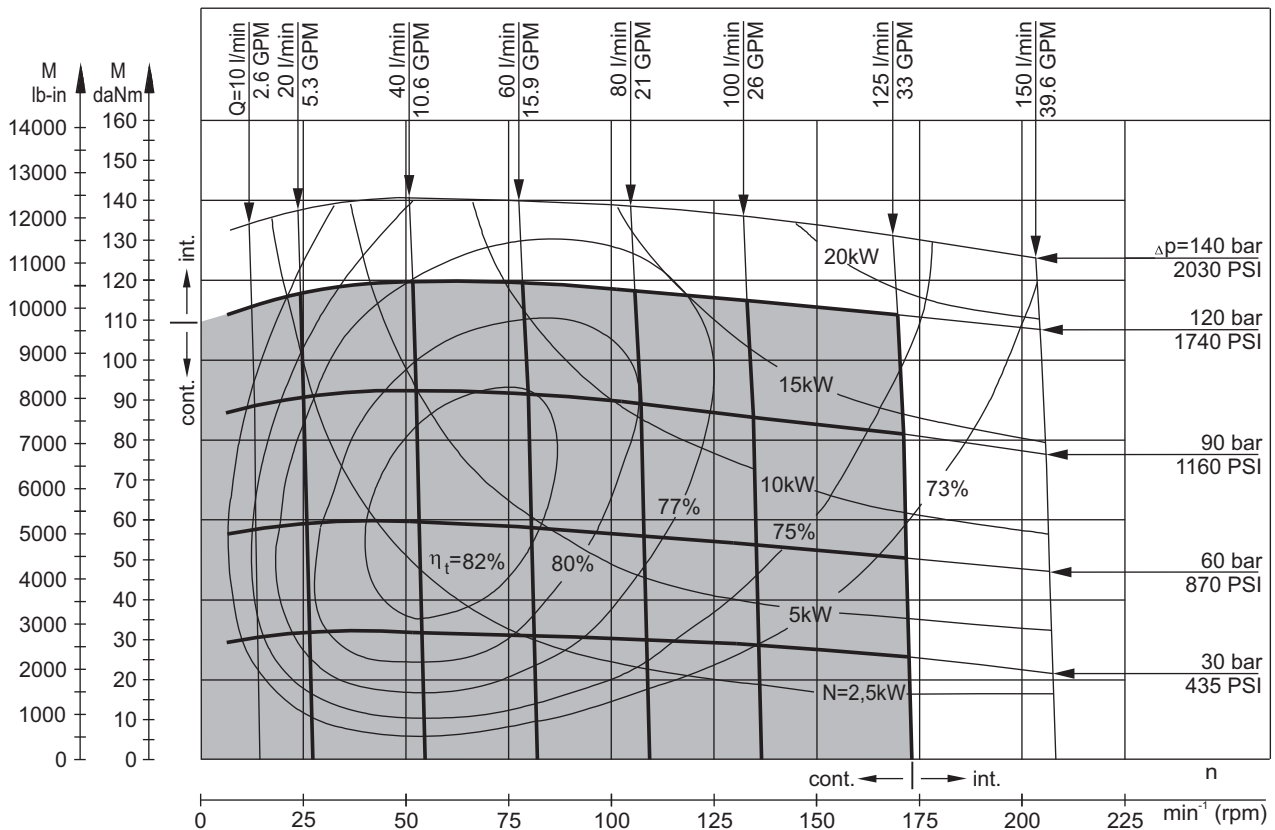
The function diagrams data is for average performance of randomly selected motors at back pressure 5 ± 10 bar [72.5 ± 145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

FUNCTION DIAGRAMS

MLHT 630



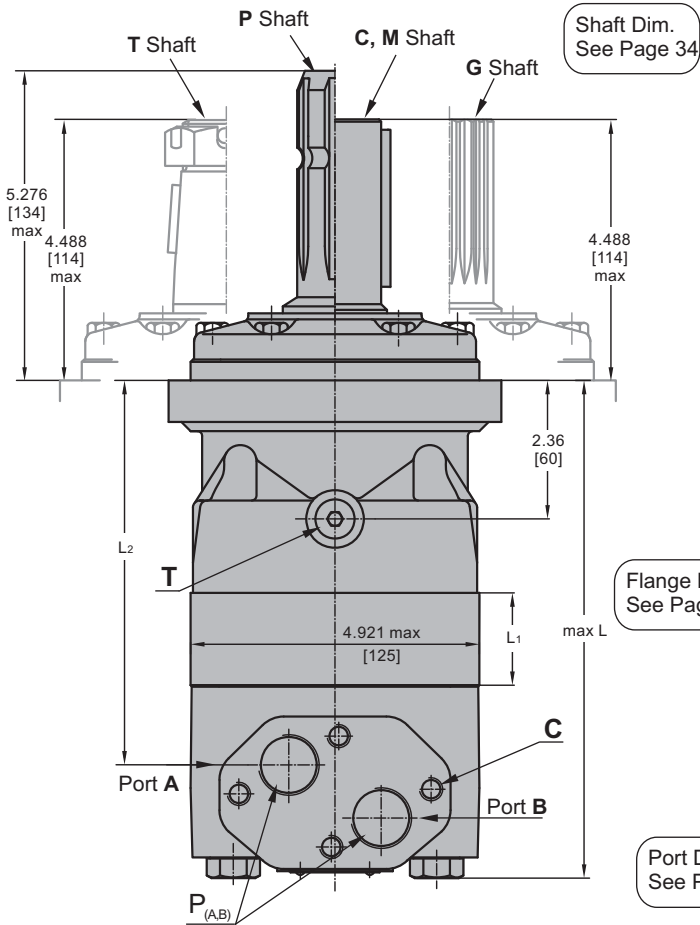
MLHT 725



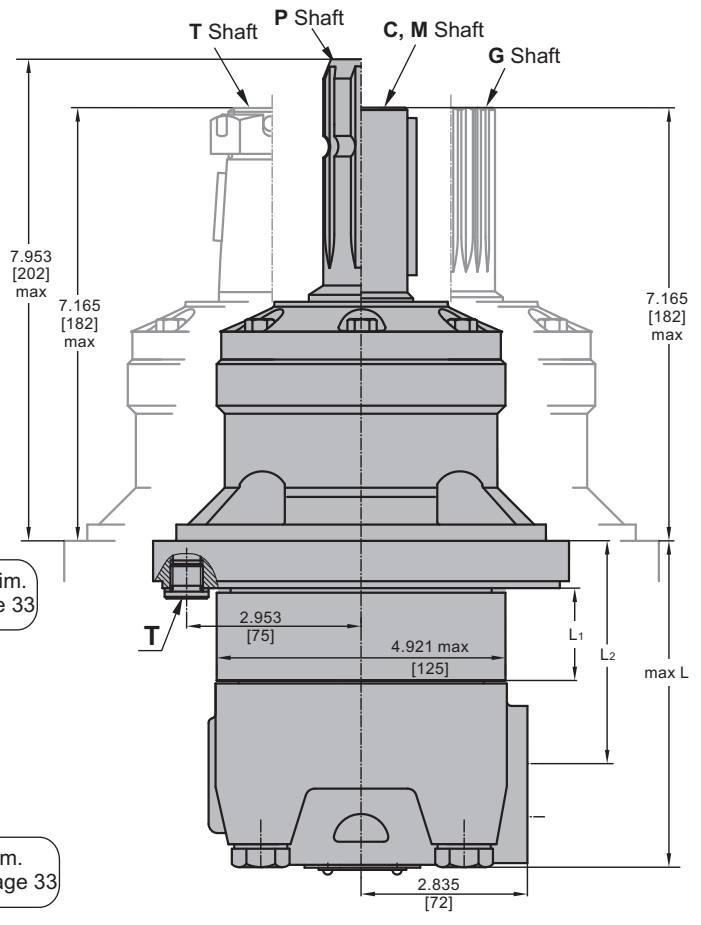
The function diagrams data is for average performance of randomly selected motors at back pressure 5 ± 10 bar [72.5 \pm 145 PSI] and oil with viscosity of 32 mm²/s [150 SUS] at 50°C [122°F].

DIMENSIONS AND MOUNTING DATA

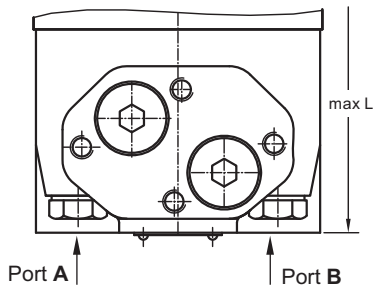
MLHT



MLHTW



Versions **6** **9**
Rear ports



	Versions		
	2,6	3,9	4
C	4xM10	4xM10	-
P (A,B)	2xG ³ / ₄	2xM27x2	2x1 ¹ / ₁₆ -12UN
T	G ¹ / ₄	M14x1,5	⁹ / ₁₆ -18UNF

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**

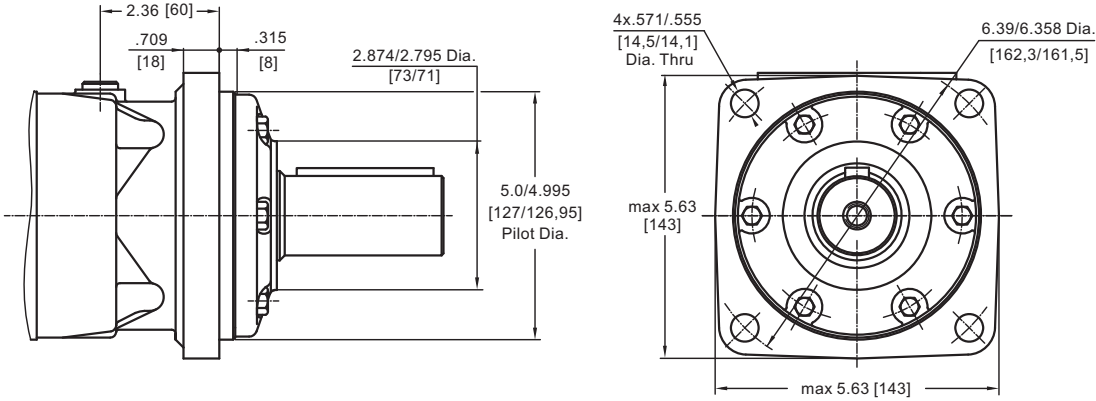
Type	L max, in [mm]		L2, in [mm]	Type	L max, in [mm]		L2, in [mm]	**L1, in [mm]
	Versions 2, 3, 4	*Versions 6, 9			Versions 2, 3, 4	*Versions 6, 9		
MLHT 160	7.48 [190]	7.87 [200]	5.51 [140]	MLHTW 160	4.84 [123]	5.23 [133]	2.87 [73]	.65 [16,5]
MLHT 200	7.68 [195]	8.07 [205]	5.71 [145]	MLHTW 200	5.04 [128]	5.43 [138]	3.07 [78]	.85 [21,5]
MLHT 250	7.91 [201]	8.31 [211]	5.95 [151]	MLHTW 250	5.28 [134]	5.67 [144]	3.31 [84]	1.09 [27,8]
MLHT 315	8.31 [211]	8.70 [221]	6.34 [161]	MLHTW 315	5.67 [144]	6.02 [154]	3.70 [94]	1.46 [37,0]
MLHT 400	8.70 [221]	9.09 [231]	6.73 [171]	MLHTW 400	6.06 [154]	6.45 [164]	4.09 [104]	1.87 [47,5]
MLHT 500	9.25 [235]	9.64 [245]	7.28 [185]	MLHTW 500	6.61 [168]	6.61 [178]	4.65 [118]	2.42 [61,5]
MLHT 630	9.09 [231]	9.49 [241]	7.13 [181]	MLHTW 630	6.46 [164]	6.85 [174]	4.49 [114]	2.26 [57,5]
MLHT 725	9.45 [240]	9.84 [250]	7.48 [190]	MLHTW 725	6.81 [173]	7.21 [183]	4.84 [123]	2.62 [66,5]

* -For Rear Ported Motors.

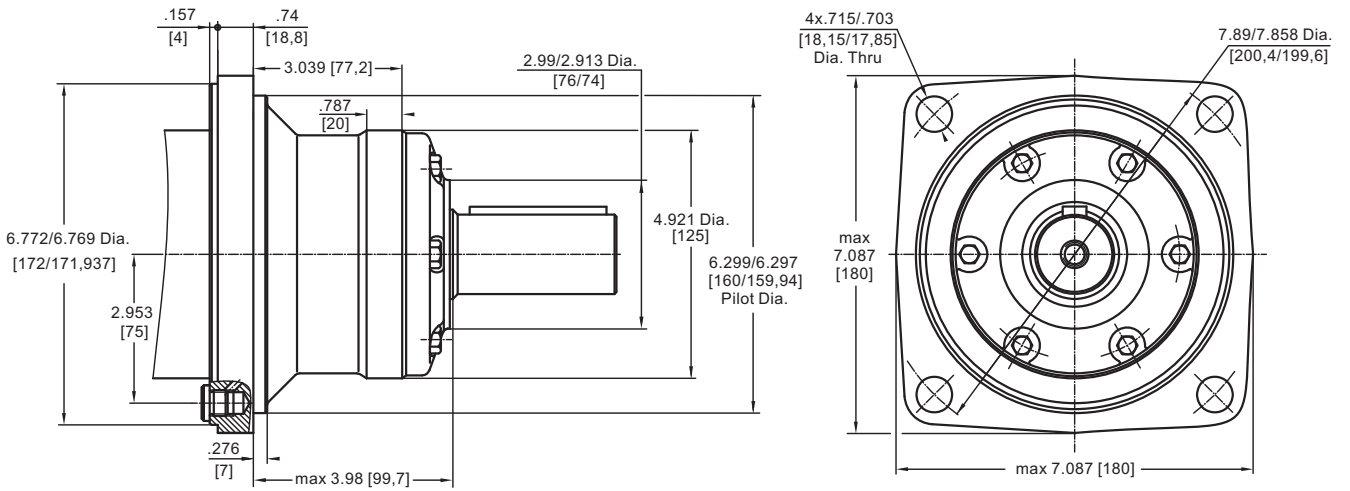
** -The width of the roll-gerotor is .138 in [3,5 mm] greater than L₁.

MOUNTING

SAE C Flange

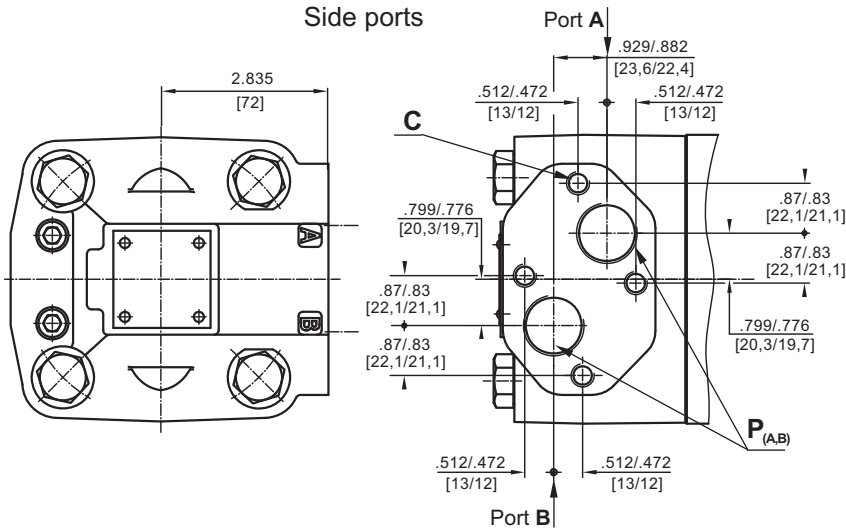


W Wheel Mount

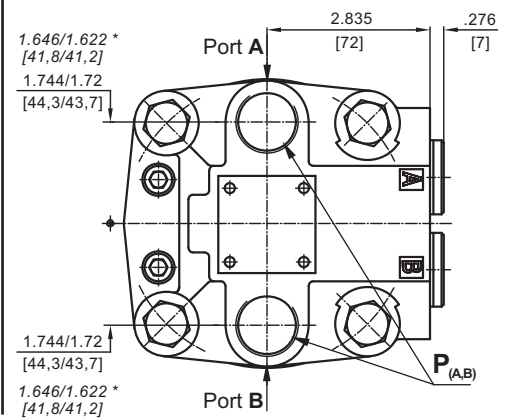


PORTS

**Versions 2 3 4
Side ports**



**Versions 6 7 9
Rear ports**

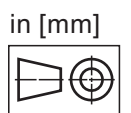


Standard Rotation
Viewed from Shaft End
Port A Pressurized - **CW**
Port B Pressurized - **CCW**

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

	Versions		
	2,6	3,9	4,7
C	4xM10	4xM10	-
P (A,B)	2xG ³ / ₄	2xM27x2	2x1 ¹ / ₁₆ -12UN
T	G ¹ / ₄	M14x1,5	9 ¹ / ₁₆ -18UNF

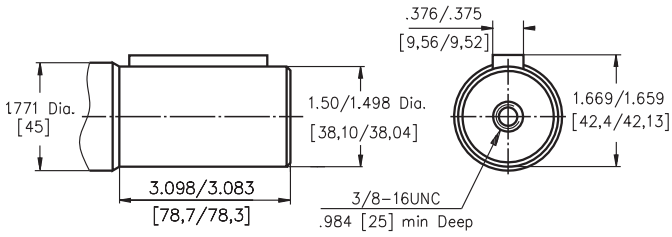
* For Version 7 only!



SHAFT EXTENSIONS

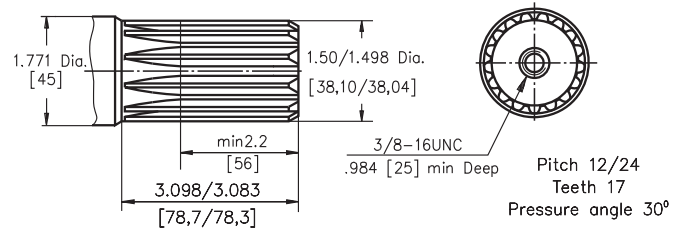
C

1½" [38,1] straight, Parallel key ¾"x ¾"x 2¼" BS46
Max. Torque 11750 in-lb [133 daNm]



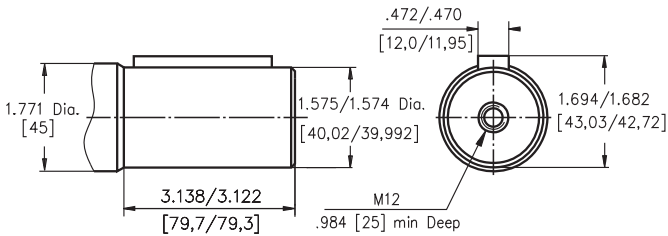
G

17T Splined, 1½" [38,1] ANS B92.1-1976
Max. Torque 11750 in-lb [133 daNm]



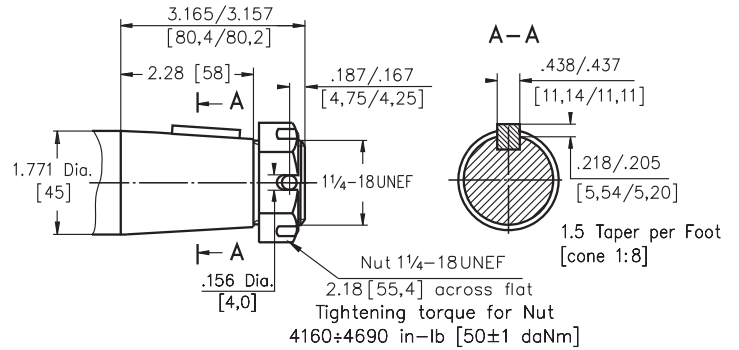
M

ø40 straight, Parallel key A12x8x70 DIN 6885
Max. Torque 11750 in-lb [133 daNm]



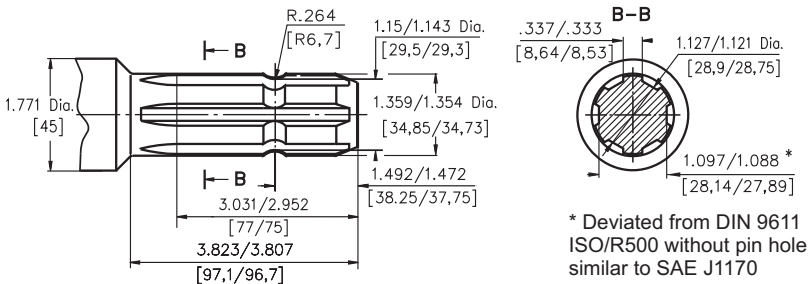
T

SAE J501 Tapered 1:8
Parallel key 7/16"x 7/16"x 1¼" BS46
Max. Torque 18650 in-lb [210 daNm]



P

ø 34,85 p.t.o. DIN 9611 Form 1
Max. Torque 6815 in-lb [77 daNm]



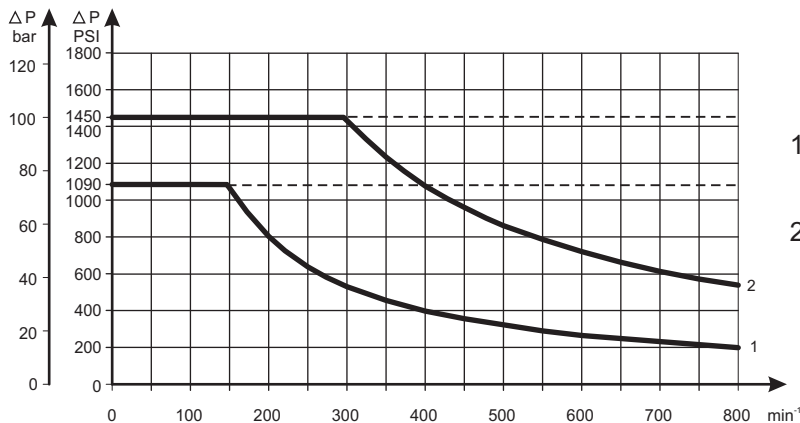
* Deviated from DIN 9611 ISO/R500 without pin hole similar to SAE J1170



Required max. Torque must not be exceeded.

MAX. PERMISSIBLE SHAFT SEAL PRESSURE

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



1: Drawing for Standard Shaft Seal

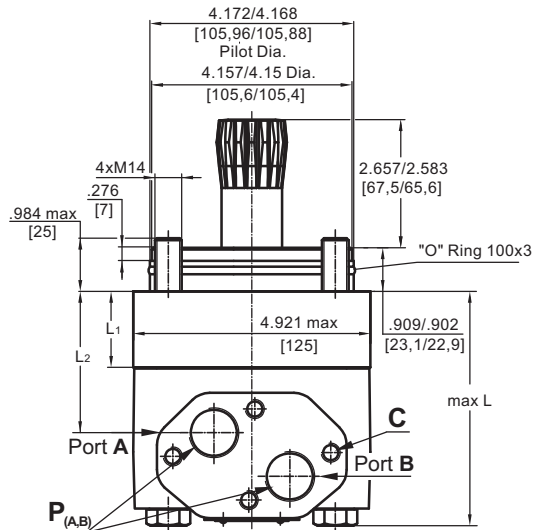
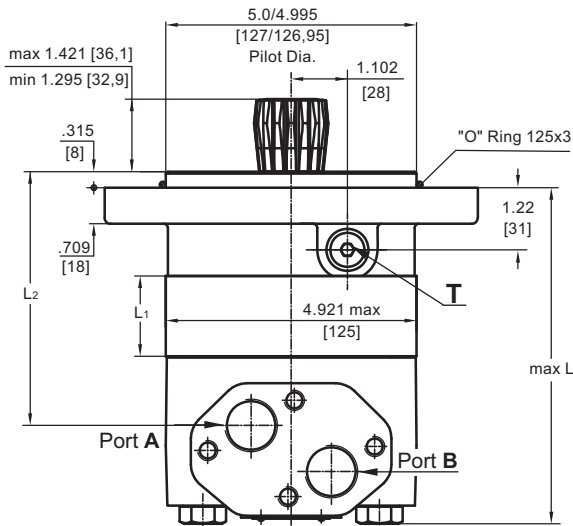
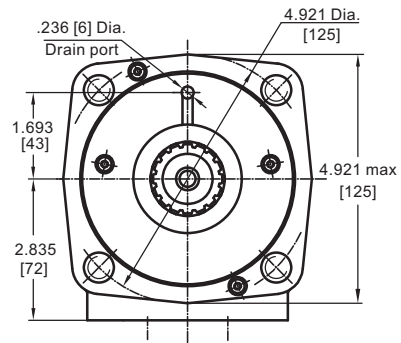
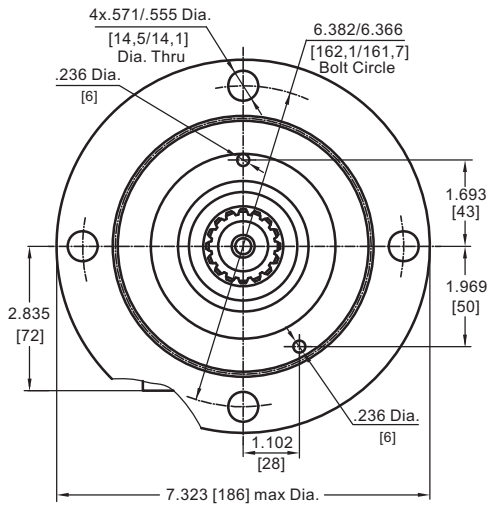
2: Drawing for High Pressure Seal ("U" Seal)

— - continuous operations
- - - - intermittent operations

DIMENSIONS AND MOUNTING DATA - MLHTS and MLHTV

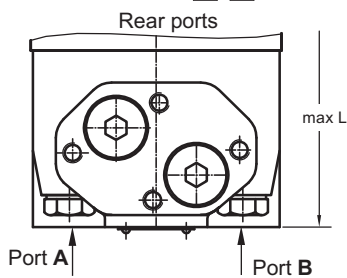
S Short Mount

V Very Short Mount



Port Dim.
See Page 33

Versions **6** **9**



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



	Versions		
	2, 6	3, 9	4
C	4xM10	4xM10	-
P (A,B)	2xG ³ / ₄	2xM27x2	2x1 ¹ / ₁₆ -12UN
T	G ¹ / ₄	M14x1,5	9 ¹⁶ / ₁₆ -18UNF

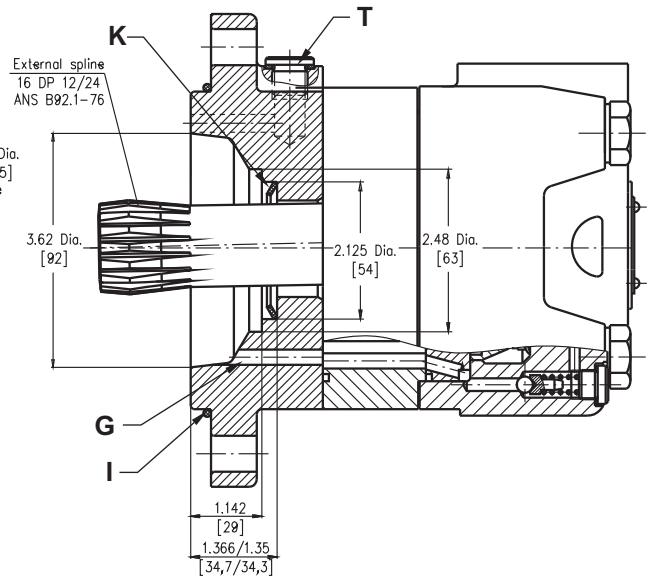
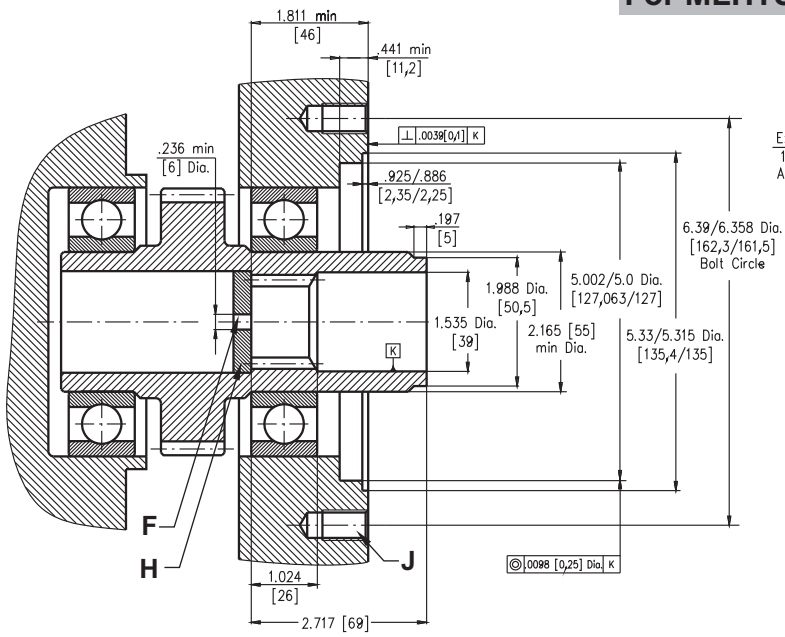
Type	L max, in [mm]		L2, in [mm]	Type	L max, in [mm]		L2, in [mm]	**L1, in [mm]
	Versions 2, 3, 4	*Versions 6, 9			Versions 2, 3, 4	*Versions 6, 9		
MLHTS 160	5.75 [146]	6.14 [156]	3.78 [96]	MLHTV 160	3.98 [101]	4.37 [111]	2.02 [51,5]	.65 [16,5]
MLHTS 200	5.95 [151]	6.33 [161]	3.98 [101]	MLHTV 200	4.17 [106]	4.57 [116]	2.22 [56,5]	.85 [21,5]
MLHTS 250	6.18 [157]	6.57 [167]	4.21 [107]	MLHTV 250	4.41 [112]	4.80 [122]	2.47 [62,8]	1.09 [27,8]
MLHTS 315	6.53 [166]	6.93 [176]	4.56 [116]	MLHTV 315	4.76 [121]	5.16 [131]	2.83 [72,0]	1.46 [37,0]
MLHTS 400	6.97 [177]	7.36 [187]	5.00 [127]	MLHTV 400	5.19 [132]	5.59 [142]	3.25 [82,5]	1.87 [47,5]
MLHTS 500	7.52 [191]	7.91 [201]	5.59 [142]	MLHTV 500	5.75 [146]	6.14 [156]	3.80 [96,5]	2.42 [61,5]
MLHTS 630	7.36 [187]	7.76 [197]	5.43 [138]	MLHTV 630	5.59 [142]	5.98 [152]	3.64 [92,5]	2.26 [57,5]
MLHTS 725	7.72 [196]	8.11 [206]	5.79 [147]	MLHTV 725	5.95 [151]	6.34 [161]	4.00 [101,5]	2.62 [66,5]

* - For Rear Ported Motors.

** - The width of the roll-gerotor is .138 in. [3,5 mm] greater than L₁.

DIMENSIONS OF THE ATTACHED COMPONENT

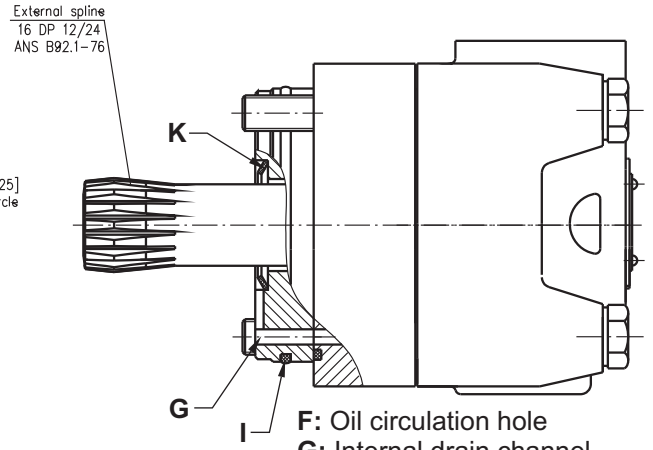
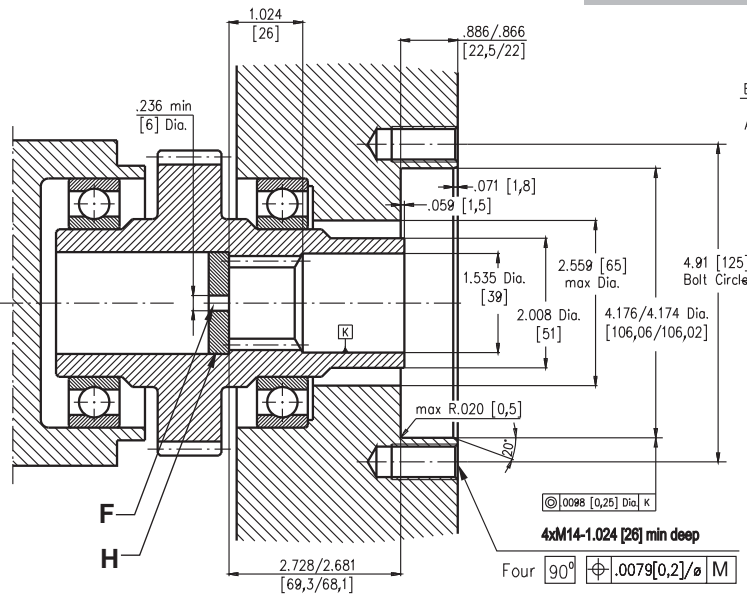
For MLHTS



- F:** Oil circulation hole
- G:** Internal drain channel
- H:** Hardened stop plate

- I:** O- Ring 4.921x.118 [125x3]
- J:** 4x1/2UN; .71 [18] Deep, 90°, 6.375 [162] Dia. B. C.
- K:** Conical seal ring
- T:** Drain connection G1/4, M14x1,5 or 9/16 - 18UNF

For MLHTV



- F:** Oil circulation hole
- G:** Internal drain channel
- H:** Hardened stop plate
- I:** O- Ring 3.94x.118 [100x3]
- K:** Conical seal ring

DRAIN CONNECTION

A drain line has to be used when pressure in the return line can exceed the permissible pressure. It can be connected:

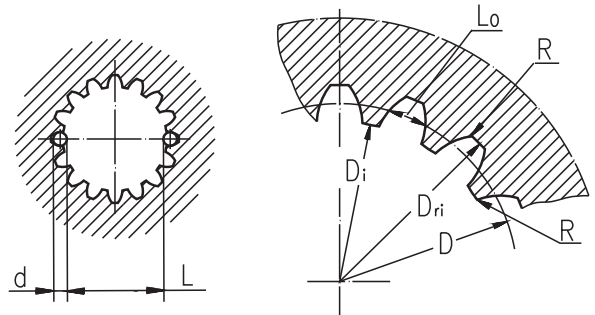
- For MLHTS at the drain port of the motor;
- For MLHTV at the drain connection of the attached component. The maximum pressure in the drain line is limited by the attached component and its shaft seal.

The drain line must be possible for oil to flow freely between motor and attached component and must be led to the tank. The maximum pressure in the drain line is limited by the attached component and its seal.

INTERNAL SPLINE DATA FOR THE ATTACHED COMPONENT

Standard ANS B92.1-1976, class 5
[$m=2.1166$; corrected $x.m=1$]

Fillet Root Side Fit		inch	mm
Number of Teeth	z	16	16
Diametral Pitch	DP	12/24	12/24
Pressure Angle		30°	30°
Pitch Dia.	D	1.3333	33,8656
Major Dia.	D_{ri}	1.5118÷1.5275	38,4 ^{+0,4}
Minor Dia.	D_i	1.2657÷1.2673	32,15 ^{+0,04}
Space Width [Circular]	L_o	.1763÷.1791	4,516±0,037
Fillet Radius	R	.02	0,5
Max. Measurement between Pins	L	1.063÷1.059	26,9 ^{+0,10}
Pin Dia.	d	.19026÷.19034	4,835±0,001

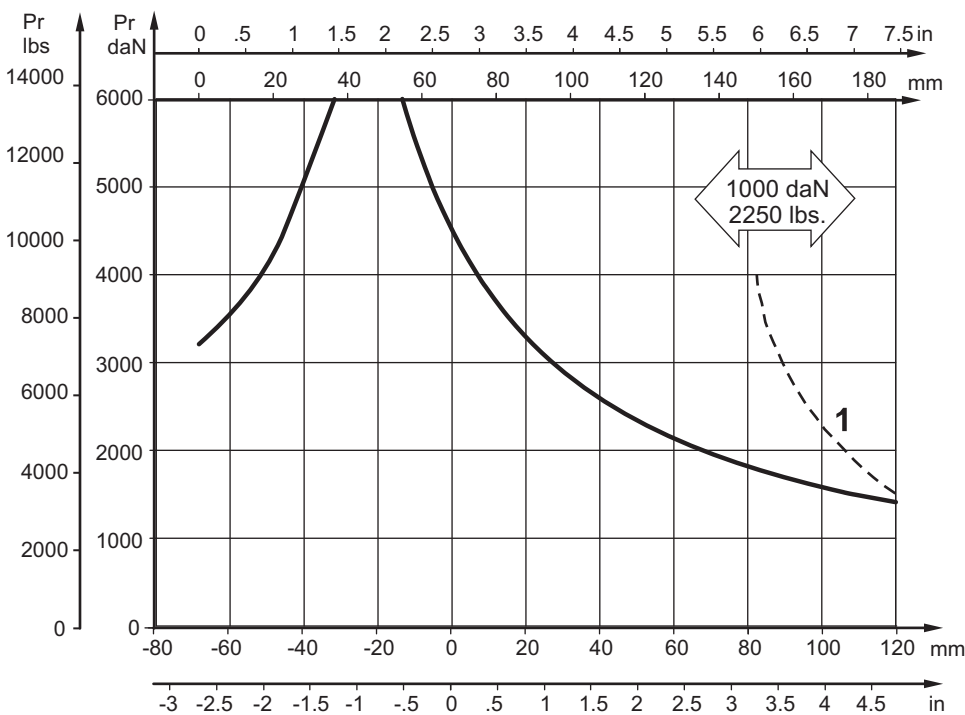


Hardening Specification:
 HV=750±50 on the surface.
 HV=560 at .035±.019 [0,7±0,2] case depth
 Material: 20 MoCr4 EN 10084 or SAE8620.

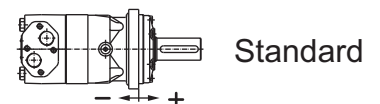
PERMISSIBLE SHAFT LOADS

The output shaft runs in tapered bearings that permit high axial and radial forces. The permissible radial load on the shaft is shown for an axial load of 0 N as function of the distance from the mounting flange to the point of load application. The curves apply to a B10 bearing life of 2000 hours at 100 RPM .

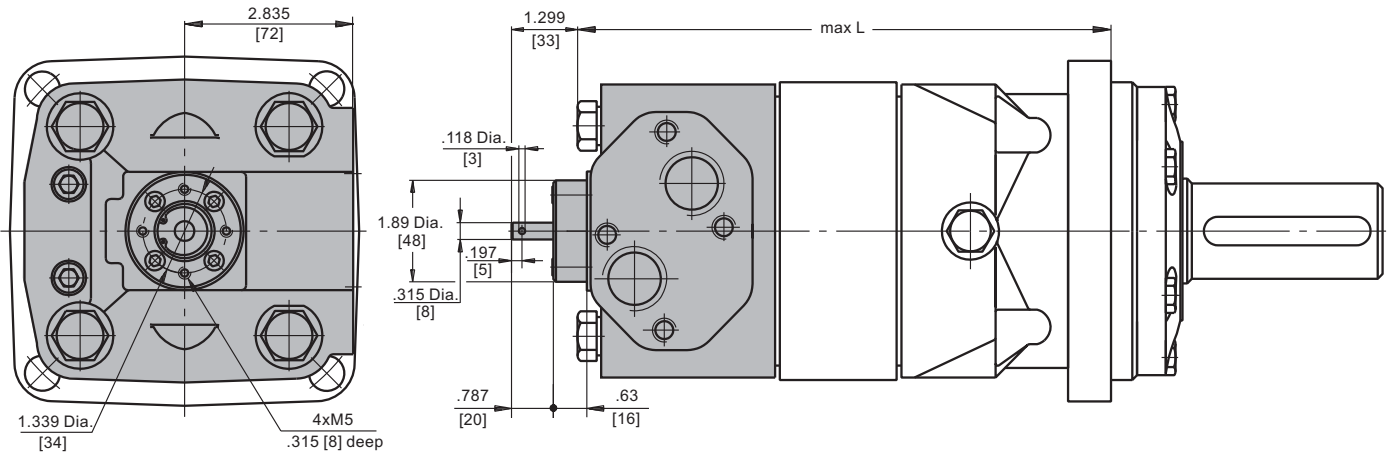
Curve "1" shows max. radial shaft load. Any shaft load exceeding the values shown by the curve will seriously reduce motor life.



Mounting Flange:



MOTORS WITH TACHO CONNECTION



ORDER CODE

	1	2	3	4	5	6	7
MLHT							

Pos.1 - Mounting Flange

omit - SAE C, four holes

S - Short

V - Very short

W - Wheel mount

Pos.2 - Displacement code

160	- 9.83 [61,6] in ³ /rev [cm ³ /rev]
200	- 12.29 [201,4] in ³ /rev [cm ³ /rev]
250	- 15.36 [251,8] in ³ /rev [cm ³ /rev]
315	- 19.90 [326,3] in ³ /rev [cm ³ /rev]
400	- 25.06 [410,9] in ³ /rev [cm ³ /rev]
500	- 31.95 [523,6] in ³ /rev [cm ³ /rev]
630	- 38.52 [631,2] in ³ /rev [cm ³ /rev]
725	- 44.20 [724,3] in ³ /rev [cm ³ /rev]

Pos.3 - Shaft Extensions*

omit - for **S** and **V** mounting flange

C - 1 1/2" [38,10] straight, Parallel key

G - 1 1/2" [38,10] 17T Splined

M - 40 mm straight, Parallel key

P - 34,85 mm Splined, p.t.o. DIN 9611 Form 1

T - 1 3/4" [44,50] J501 Tapered

Pos.4 - Port Size/Type [standard manifold to each]

2 - side ports, 2xG³/₄, G¹/₄, BSP thread, ISO 228

3 - side ports, 2xM27x2; M14x1,5; metric thread,ISO 262

4 - side ports, 2x 1 1/16-12 UN, O-ring, 9/16-18 UNF

6 - rear ports, 2xG³/₄, G¹/₄; BSP thread, ISO 228

7 - rear ports, 2x 1 1/16-12 UN, O-ring, 9/16-18 UNF

9 - rear ports, 2xM27x2; M14x1,5; metric thread,ISO 262

Pos.5 - Shaft Seal Version [see page 34]

omit - Low pressure seal

U - High pressure seal

Pos.6 - Special Features [see page 57]

Pos.7 - Design Series

omit - Factory specified

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

The hydraulic motors are mangano-phosphatized as standard.