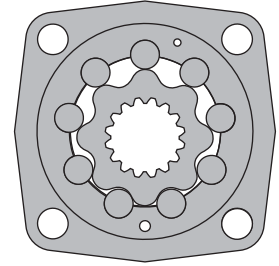
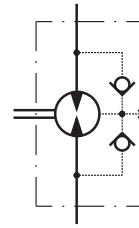


# HYDRAULIC MOTORS MLHV



## APPLICATION

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



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## OPTIONS

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

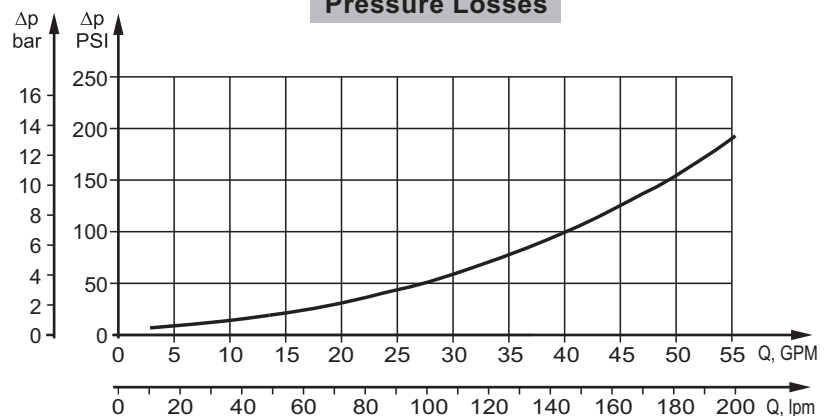
## GENERAL

<b>Max. Displacement,</b> in <sup>3</sup> /rev [cm <sup>3</sup> /rev]	48.91 [801,8]
<b>Max. Speed,</b> [RPM]	630
<b>Max. Torque,</b> lb-in [daNm]	cont.: 16650 [188] int.: 18650 [211]
<b>Max. Output,</b> HP [kW]	85,8 [64]
<b>Max. Pressure Drop,</b> PSI [bar]	cont.: 2900 [200] int.: 3480 [240]
<b>Max. Oil Flow,</b> GPM [lpm]	63.4 [240]
<b>Min. Speed,</b> [RPM]	5
<b>Permissible Shaft Loads</b> lbs [daN]	P <sub>a</sub> =3300 [1500]
<b>Pressure fluid</b>	Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)
<b>Temperature range,</b> °F [°C]	-40÷284 [-40÷140]
<b>Optimal Viscosity range, SUS [mm<sup>2</sup>/s]</b>	98÷347 [20÷75]
<b>Filtration</b>	ISO code 20/16 (Min. recommended fluid filtration of 25 microns)

Oil flow in drain line

Pressure drop PSI [bar]	Viscosity SUS [mm <sup>2</sup> /s]	Oil flow in drain line GPM [lpm]
2030 [140]	98 [20]	.793 [3]
	164 [35]	.528 [2]
3045 [210]	98 [20]	.1.585 [6]
	164 [35]	1.057 [4]

Pressure Losses



## SPECIFICATION DATA

Type		MLHV 315	MLHV 400	MLHV 500	MLHV 630	MLHV 800
<b>Displacement, in<sup>3</sup>/rev [cm<sup>3</sup>/rev]</b>		19.18 [314,5]	24.45 [400,9]	30.48 [499,6]	38.38 [629,1]	48.91 [801,8]
<b>Max. Speed, [RPM]</b>	Cont.	510	500	400	320	250
	Int.*	630	600	480	380	300
<b>Max. Torque lb-in [daNm]</b>	Cont.	8150 [92]	10450 [118]	12950 [146]	14700 [166]	16650 [188]
	Int.*	9800 [111]	12500 [141]	15550 [176]	17150 [194]	18650 [211]
	Peak**	11400 [129]	14500 [164]	18150 [205]	19550 [221]	21850 [247]
<b>Max. Output HP [kW]</b>	Cont.	57 [42,5]	71.7 [53,5]	71.7 [53,5]	64.4 [48]	57 [42,5]
	Int.*	68,4 [51]	85.8 [64]	85.8 [64]	75 [56]	64.4 [48]
<b>Max. Pressure Drop PSI [bar]</b>	Cont.	2900 [200]	2900 [200]	2900 [200]	2600 [180]	2320 [160]
	Int.*	3480 [240]	3480 [240]	3480 [240]	3050 [210]	2610 [180]
	Peak**	4060 [280]	4060 [280]	4060 [280]	3480 [240]	3050 [210]
<b>Max. Oil Flow GPM [lpm]</b>	Cont.	42.3 [160]	52.8 [200]	52.8 [200]	52.8 [200]	52.8 [200]
	Int.*	52.8 [200]	63.4 [240]	63.4 [240]	63.4 [240]	63.4 [240]
<b>Max. Inlet Pressure PSI [bar]</b>	Cont.	3050 [210]	3050 [210]	3050 [210]	3050 [210]	3050 [210]
	Int.*	3620 [250]	3620 [250]	3620 [250]	3620 [250]	3620 [250]
	Peak**	4350 [300]	4350 [300]	4350 [300]	4350 [300]	4350 [300]
<b>Max. Return Pressure with Drain Line PSI [bar]</b>	Cont.	2040 [140]	2040 [140]	2040 [140]	2040 [140]	2040 [140]
	Int.*	2540 [175]	2540 [175]	2540 [175]	2540 [175]	2540 [175]
	Peak**	3050 [210]	3050 [210]	3050 [210]	3050 [210]	3050 [210]
<b>Max. Starting Pressure with Unloaded Shaft, PSI [bar]</b>		120 [8]	120 [8]	120 [8]	120 [8]	120 [8]
<b>Min. Starting Torque lb-in [daNm]</b>	At max. press. drop Cont.	6300 [71]	8100 [91]	10000 [113]	11800 [133]	13400 [151]
	At max. press. drop Int.*	7500 [85]	9600 [109]	12000 [136]	13700 [155]	15000 [170]
<b>Min. Speed***, [RPM]</b>		10	10	10	10	10
<b>Weight, lb [kg]</b>	MLHV	67.7 [30,7]	69.5 [31,5]	71.4 [32,4]	74.1 [33,6]	77.6 [35,2]
	MLHVW	69.2 [31,4]	71.0 [32,2]	73.0 [33,1]	75.6 [34,3]	79.2 [35,9]
	MLHVS	49.2 [22,3]	50.9 [23,1]	52.9 [24,0]	55.6 [25,2]	59.1 [26,8]

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

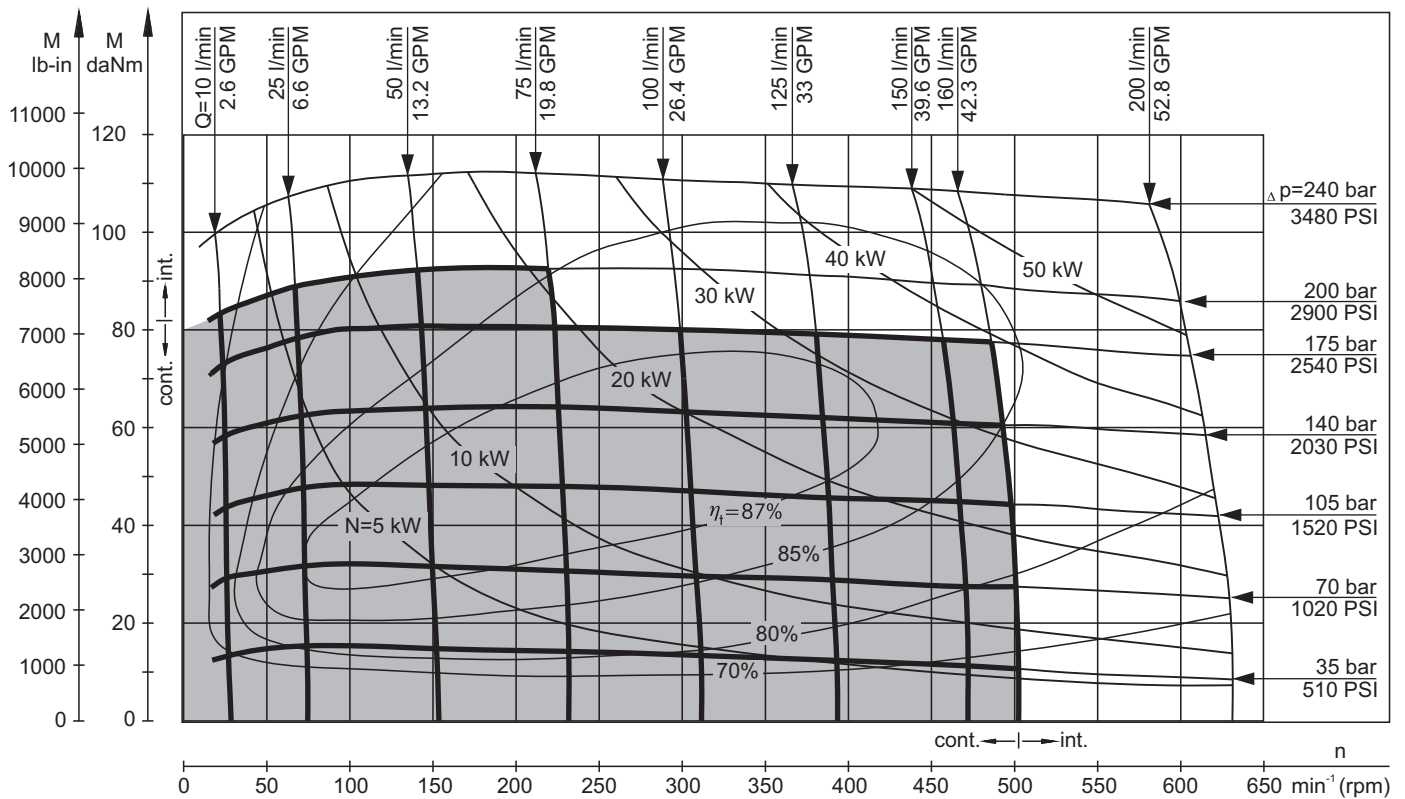
\*\* Peak load: the permissible values may occur for max. 1% of every minute.

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

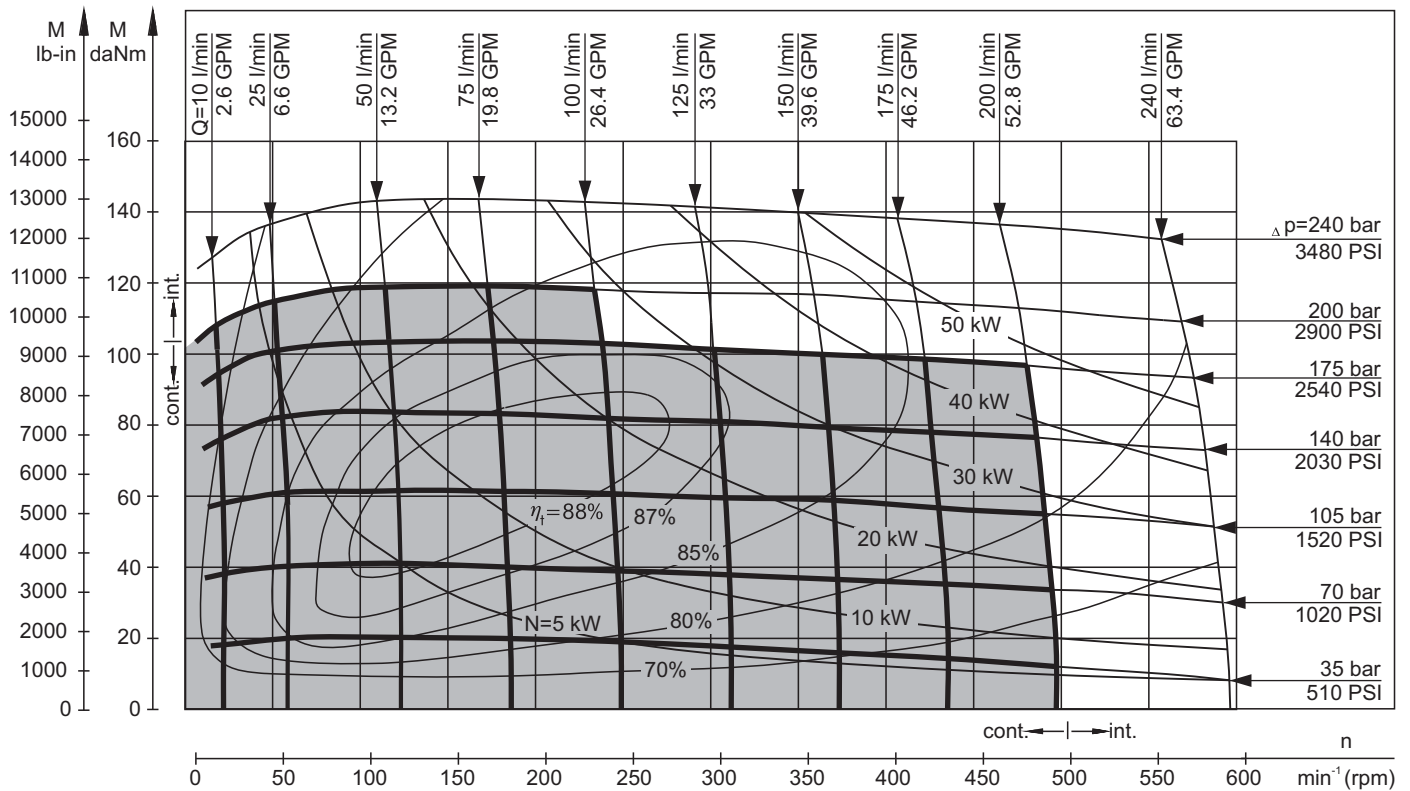
1. Intermittent speed and intermittent pressure drop must not occur simultaneously.
2. Recommended filtration is per ISO cleanliness code 20/16. A nominal filtration of 25 micron or better.
3. Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM (ISO 6743/4).  
If using synthetic fluids consult the factory for alternative seal materials.
4. Recommended minimum oil viscosity 70 SUS [13 mm<sup>2</sup>/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**

**MLHV 315**



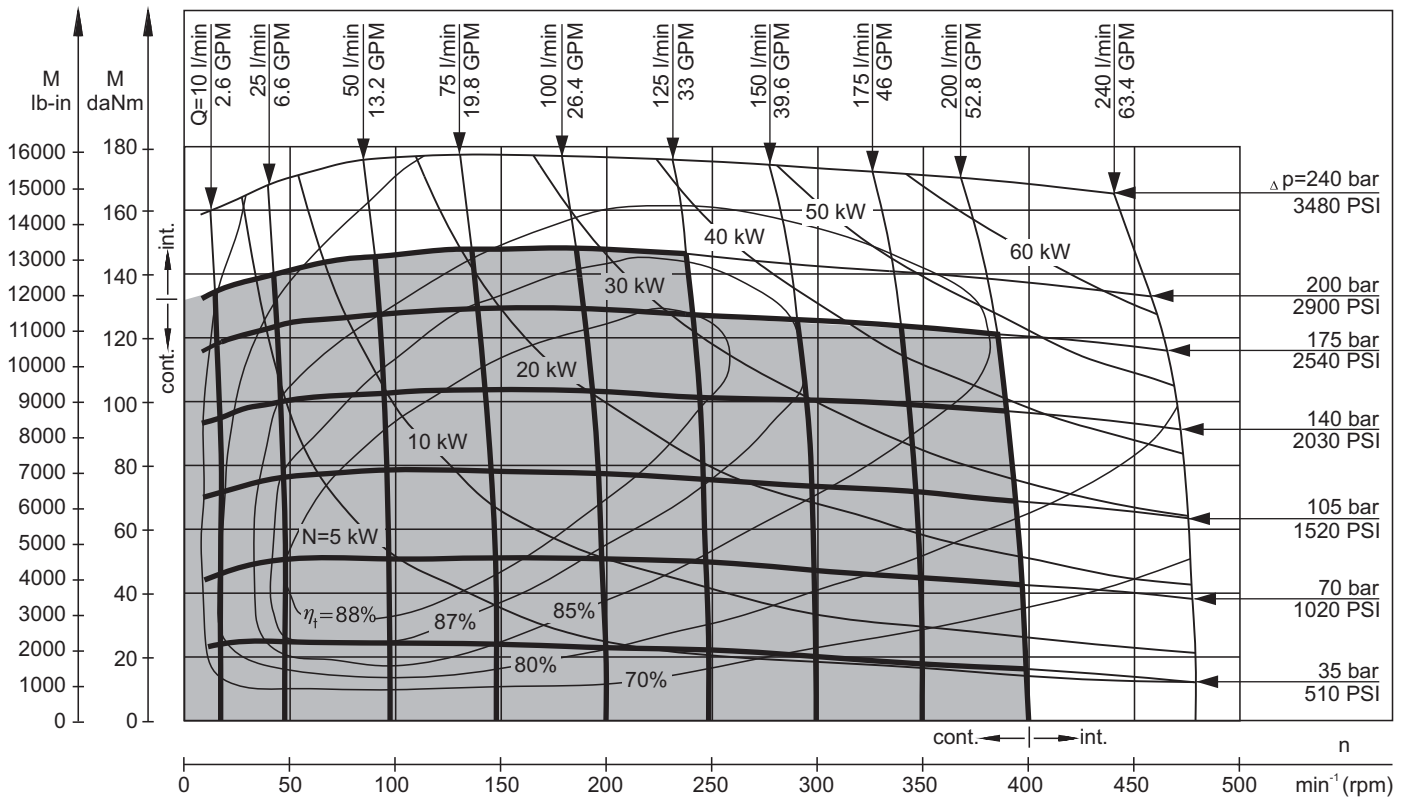
**MLHV 400**



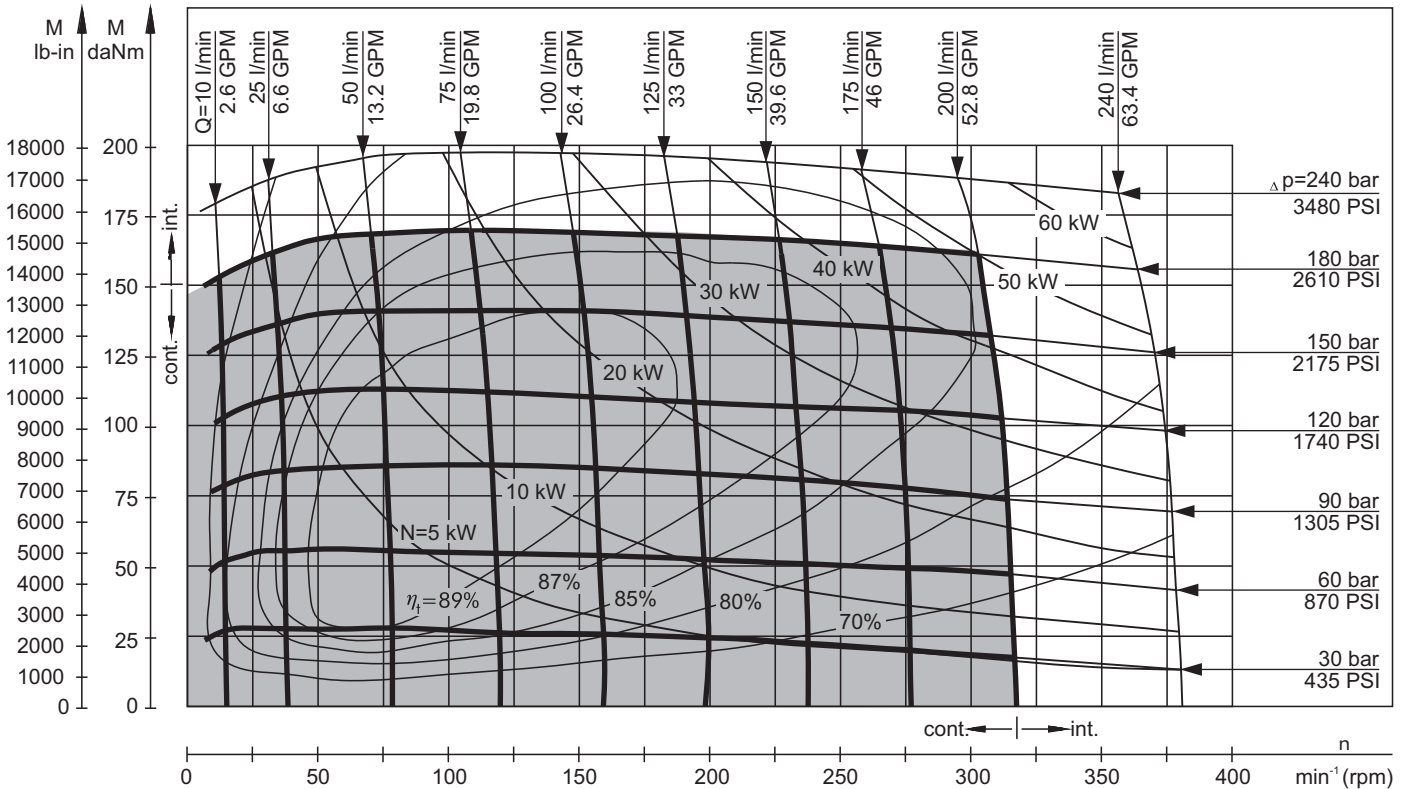
The function diagrams data is for average performance of randomly selected motors at back pressure 72.5÷145 PSI [5÷10 bar] and oil with viscosity of 150 SUS [32 mm<sup>2</sup>/s] at 122°F [50°C].

**FUNCTION DIAGRAMS**

**MLHV 500**



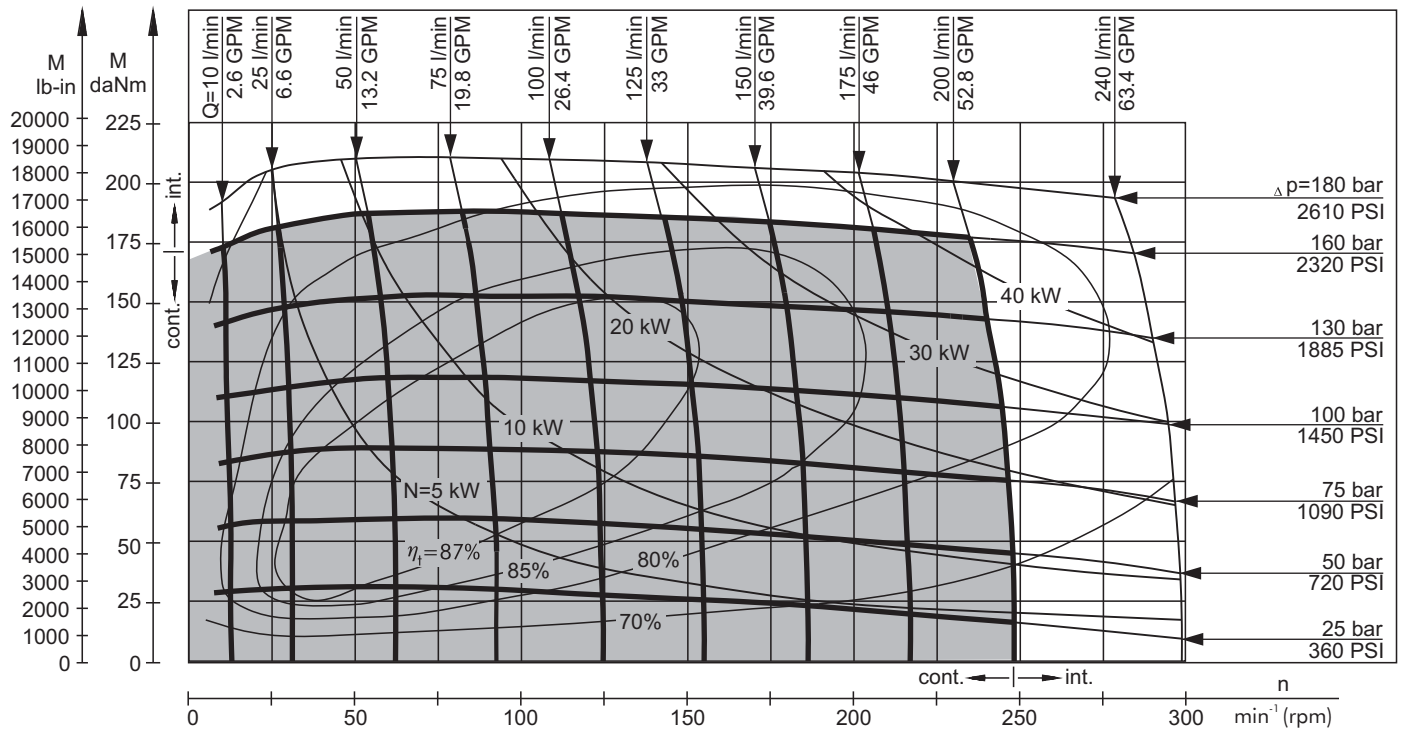
**MLHV 630**



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

**FUNCTION DIAGRAMS**

**MLHV 800**



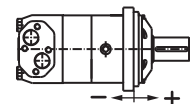
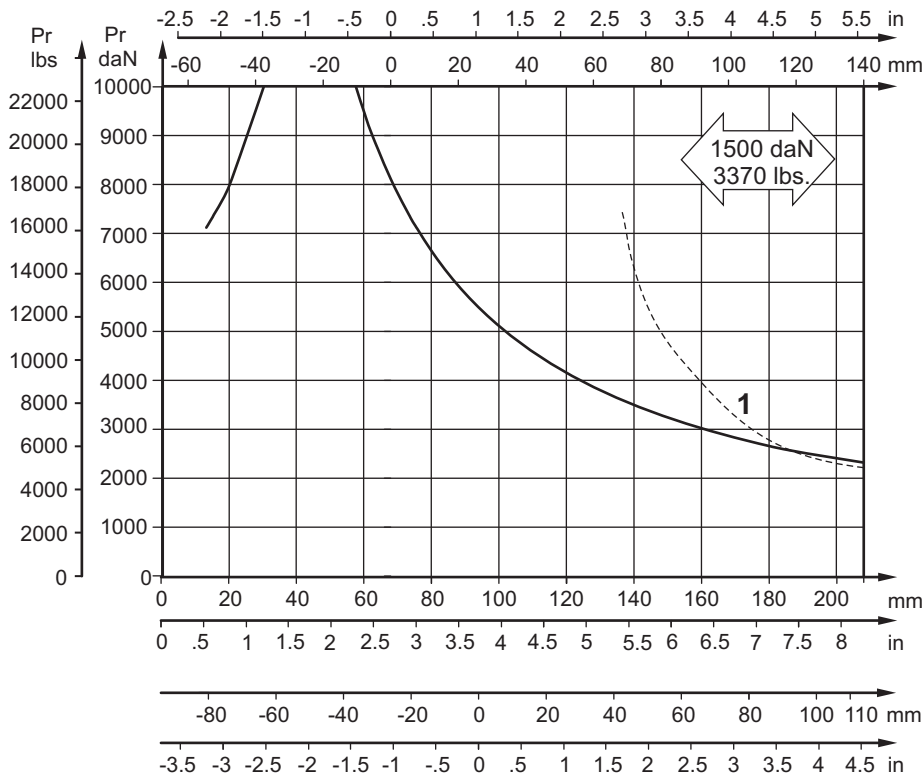
The function diagrams data is for average performance of randomly selected motors at back pressure 72.5÷145 PSI [5÷10 bar] and oil with viscosity of 150 SUS [32 mm<sup>2</sup>/s] at 122°F [50°C].

**PERMISSIBLE SHAFT LOADS**

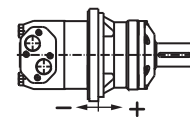
The output shaft runs in tapered bearings that permit high axial and radial forces. The permissible radial load on the shaft is shown for an axial load of 0 N as function of the distance from the mounting flange to the point of load application. The curves apply to a B10 bearing life of 2000 hours at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

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

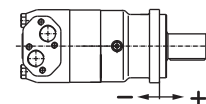
Mounting Flange:



Standard

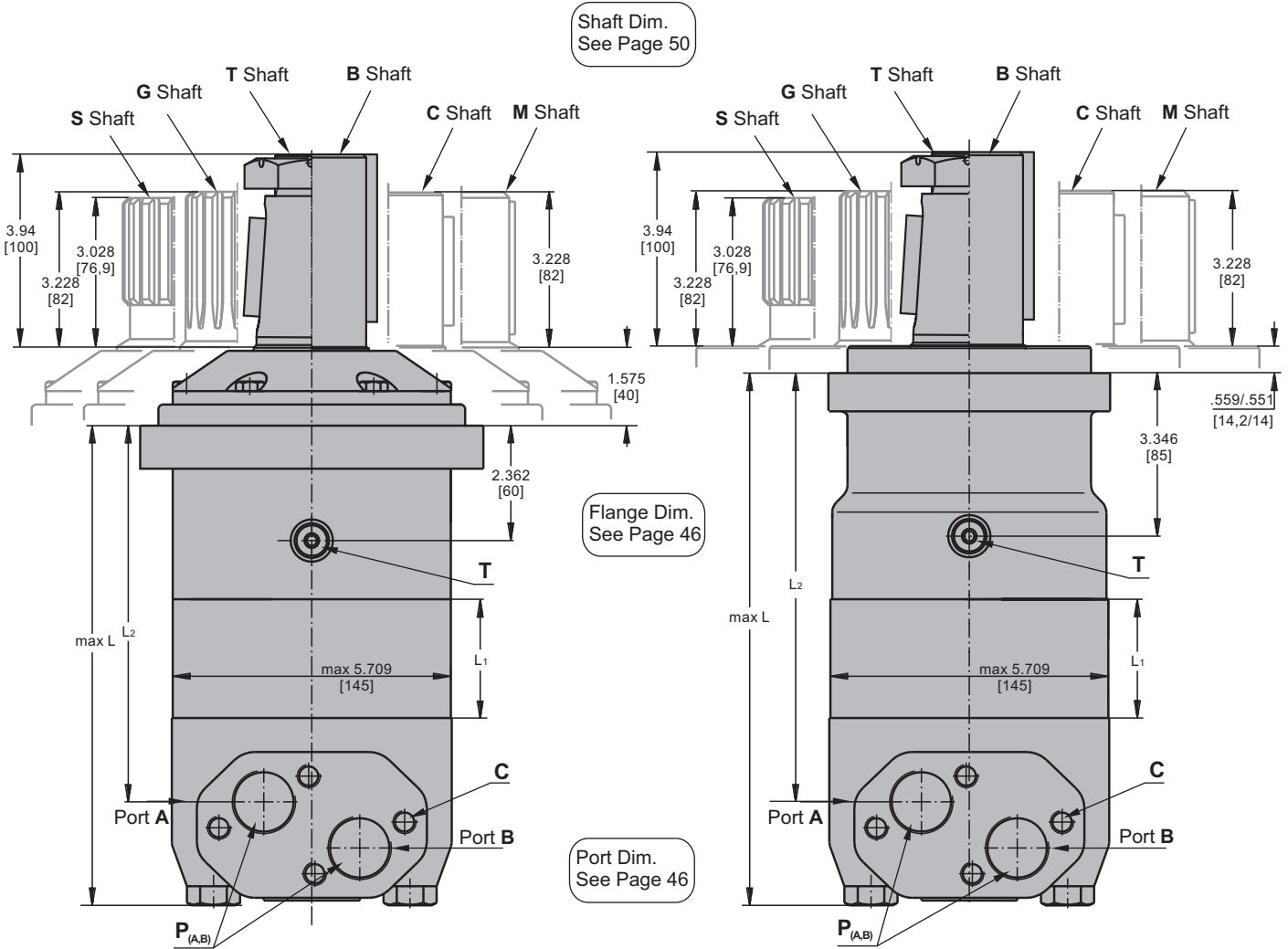


W - Wheel



C - Flange

**DIMENSIONS AND MOUNTING DATA - MLHV and MLHVC**



**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

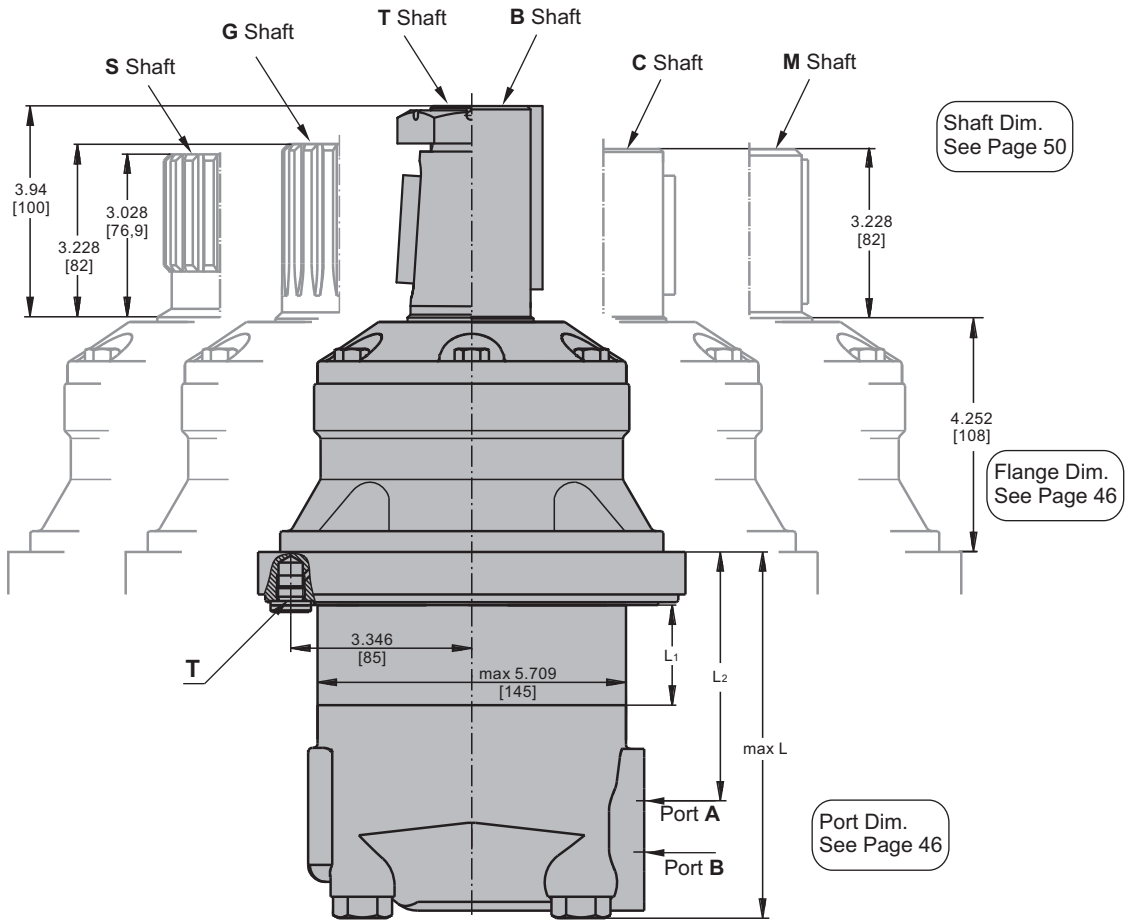
	Versions	
	2	4
C	4xM12	-
P (A,B)	2xG1	2x1 <sup>5</sup> / <sub>16</sub> -12UN
T	G <sup>1</sup> / <sub>4</sub>	<sup>9</sup> / <sub>16</sub> -18UNF



Type	L, in [mm]	L2, in [mm]	Type	L, in [mm]	L2, in [mm]	*L1, in [mm]
MLHV 315	8.45[214,5]	6.30[160]	MLHVC 315	9.38[238,25]	7.25[184,26]	.87 [22,0]
MLHV 400	8.72[221,5]	6.58[167]	MLHVC 400	9.66[245,25]	7.53[191,26]	1.14 [29,0]
MLHV 500	9.04[229,5]	6.89[175]	MLHVC 500	9.97[253,25]	7.85[199,26]	1.46 [37,0]
MLHV 630	9.45[240,0]	7.32[186]	MLHVC 630	10.38[263,75]	8.25[209,76]	1.87 [47,5]
MLHV 800	10.0[254,0]	7.87[200]	MLHVC 800	10.94[277,75]	8.81[223,76]	2.42 [61,5]

\* The width of the gerolor is .157 in. [4 mm] greater than L<sub>1</sub>.

**DIMENSIONS AND MOUNTING DATA - MLHVW**



**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	4
<b>C</b>	4xM12	-
<b>P (A,B)</b>	2xG1	2x1 <sup>5</sup> / <sub>16</sub> -12UN
<b>T</b>	G <sup>1</sup> / <sub>4</sub>	<sup>9</sup> / <sub>16</sub> -18UNF

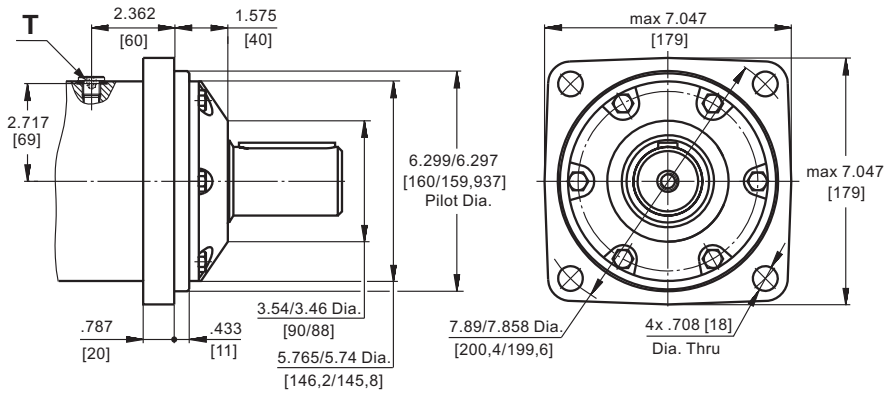


Type	L, in [mm]	L2, in [mm]	*L <sub>1</sub> , in [mm]
MLHVW 315	5.75 [146]	3.62 [92]	.87 [22,0]
MLHVW 400	6.02 [153]	3.90 [99]	1.14 [29,0]
MLHVW 500	6.34 [161]	4.21 [107]	1.46 [37,0]
MLHVW 630	6.77 [172]	4.65 [118]	1.87 [47,5]
MLHVW 800	7.28 [185]	5.20 [132]	2.42 [61,5]

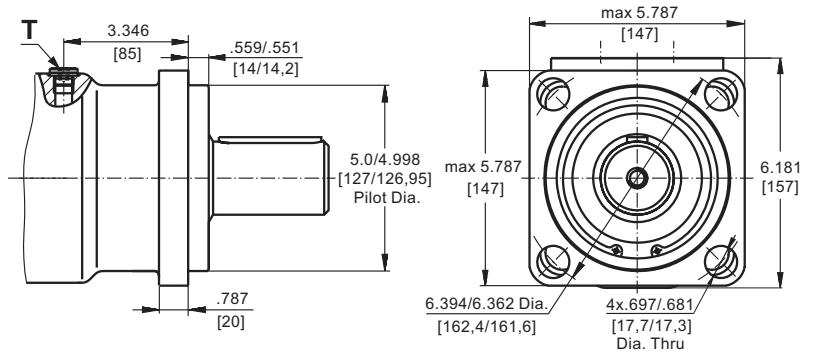
\* The width of the gerotor is .157 in. [4 mm] greater than L<sub>1</sub>.

**MOUNTING**

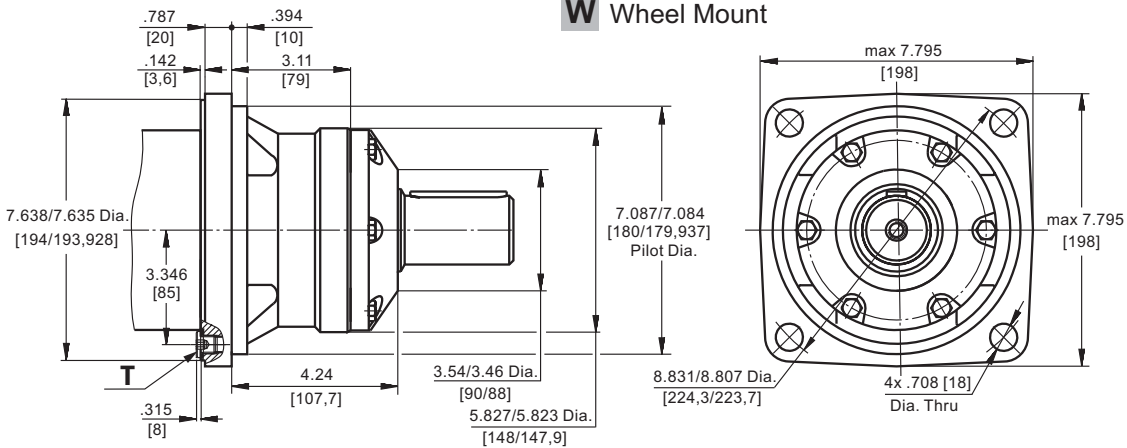
**Square Mount (4 Holes)**



**C Mount**



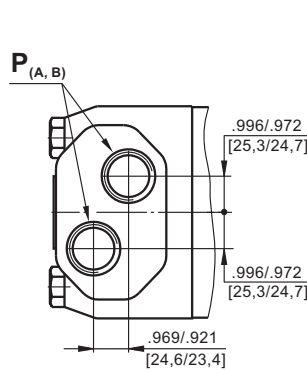
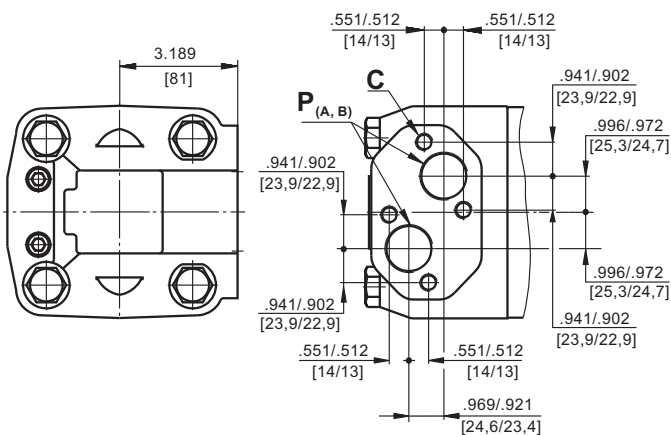
**W Wheel Mount**



**PORTS**

**Version 2**

**Version 4**



**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

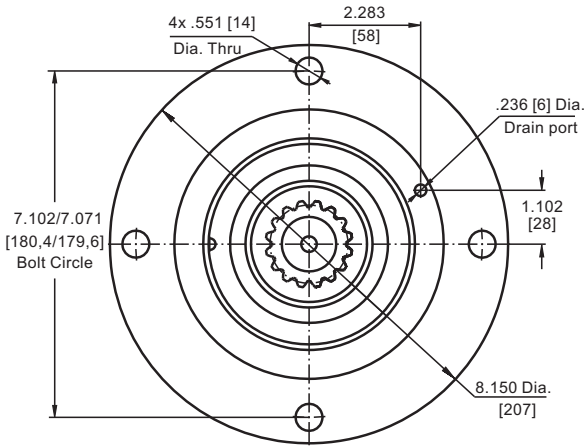
	Versions	
	2	4
<b>C</b>	4xM12	-
<b>P (A,B)</b>	2xG1	2x1 $\frac{5}{16}$ -12UN
<b>T</b>	G $\frac{1}{4}$	$\frac{9}{16}$ -18UNF





**DIMENSIONS AND MOUNTING DATA**

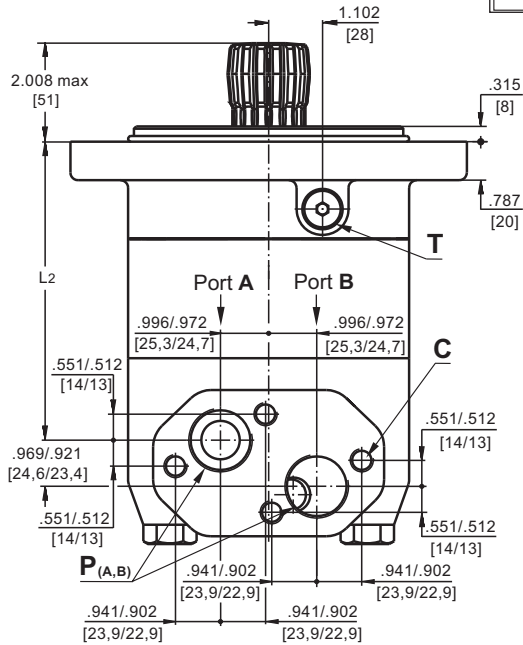
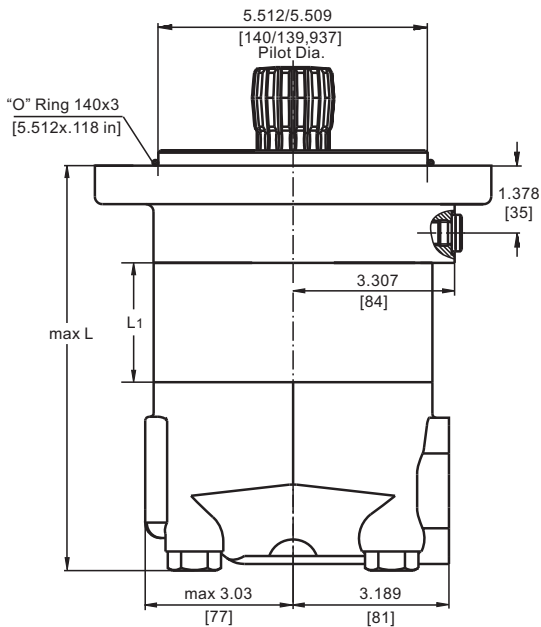
**S Short Mount**



Type	L, in [ mm ]	L2, in [ mm ]	*L1, in [ mm ]
MLHVS 315	6.73[171]	4.61 [117]	.87 [22,0]
MLHVS 400	7.05[179]	4.88 [124]	1.14 [29,0]
MLHVS 500	7.32[186]	5.20 [132]	1.46 [37,0]
MLHVS 630	7.76[197]	5.63 [143]	1.87 [47,5]
MLHVS 800	8.31[211]	6.18 [157]	2.42 [61,5]

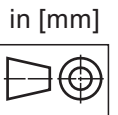
\* The width of the gerolor is .157 in [4 mm] greater than L1.

	Versions	
	2	4
<b>C</b>	4xM12	-
<b>P (A,B)</b>	2xG1	2x1 <sup>5</sup> / <sub>16</sub> -12UN
<b>T</b>	G <sup>1</sup> / <sub>4</sub>	9 <sup>16</sup> / <sub>16</sub> -18UNF

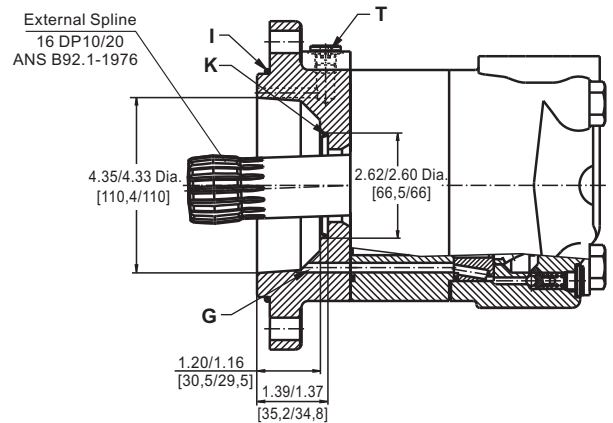
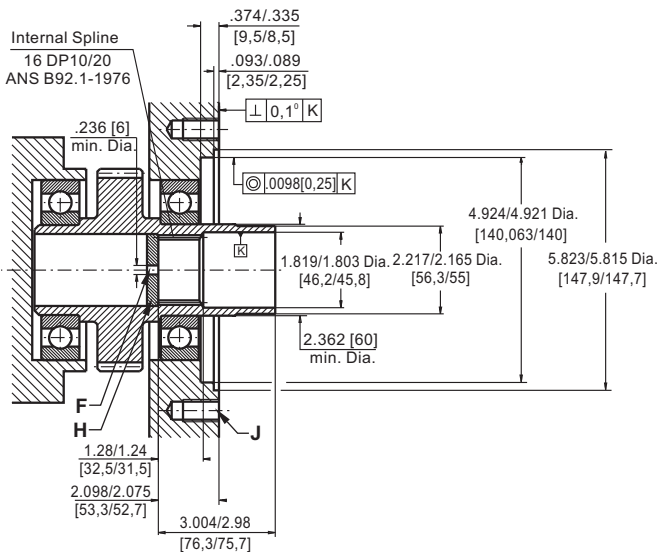


**Standard Rotation**  
Viewed from Shaft End  
Port A Pressurized - CW  
Port B Pressurized - CCW

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



**DIMENSIONS OF THE ATTACHED COMPONENT**

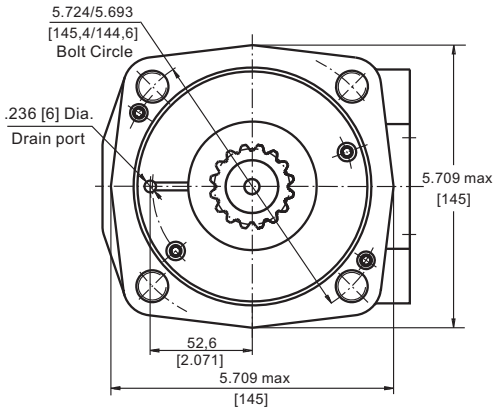


**F:** Oil circulation hole  
**G:** Internal drain channel  
**H:** Hardened stop plate

**I:** O- Ring 5.512x.118 [140x3]  
**J:** 4x1/2UN; .71 [18] Deep, 90°, 7.087 [180] Dia. B. C.  
**K:** Conical seal ring  
**T:** Drain connection G1/4 or 9/16 - 18UNF

**DIMENSIONS AND MOUNTING DATA**

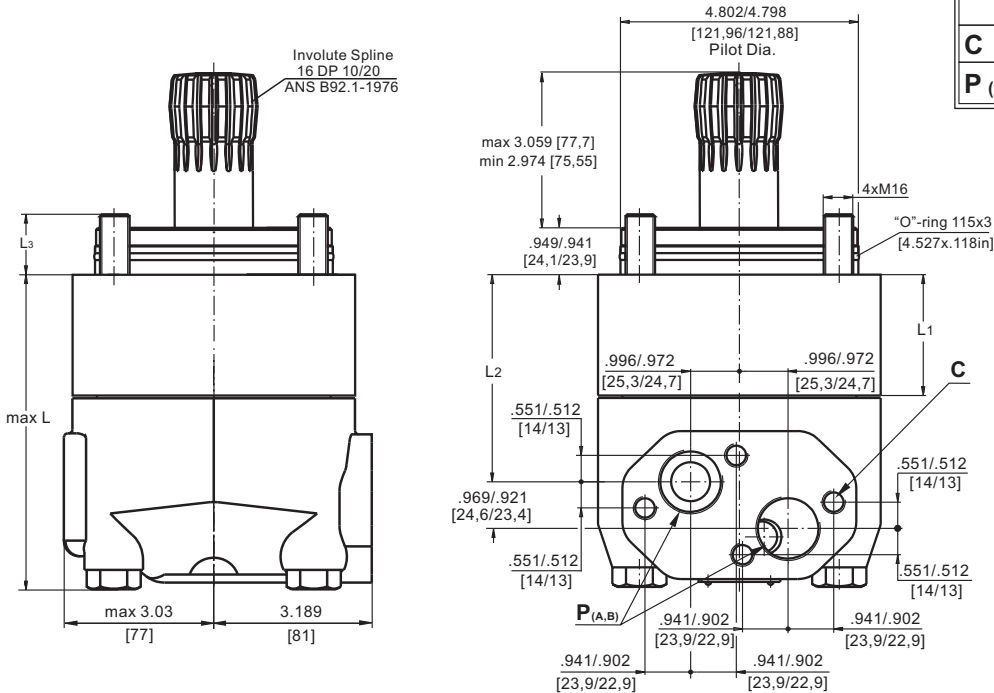
**V Very Short Mount**



Type	L, in. [mm]	L2, in. [mm]	L3, in. [mm]	*L1, in. [mm]
MLHVV 315	4.78 [121,5]	2.68 [68]	1.16 [29,5]	.87 [22,0]
MLHVV 400	5.06 [128,5]	2.95 [75]	1.28 [32,5]	1.14 [29,0]
MLHVV 500	5.37 [136,5]	3.27 [83]	1.36 [34,5]	1.46 [37,0]
MLHVV 630	5.79 [147,0]	3.66 [93]	1.34 [34,0]	1.87 [47,5]
MLHVV 800	6.34 [161,0]	4.23 [107,5]	1.18 [30,0]	2.42 [61,5]

\* The width of the gerolator is .157 in. [4 mm] greater than L<sub>1</sub>.

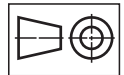
	Versions	
	2	4
<b>C</b>	4xM12	-
<b>P (A,B)</b>	2xG1	2x1 <sup>5</sup> / <sub>16</sub> -12UN



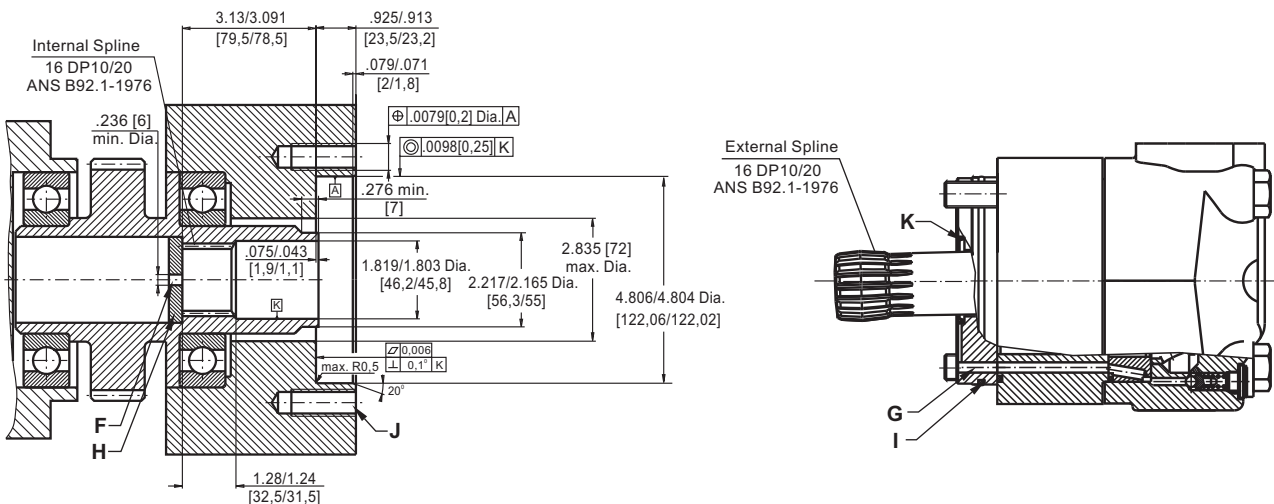
**Standard Rotation**  
Viewed from Shaft End  
Port A Pressurized - CW  
Port B Pressurized - CCW

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

in [mm]



**DIMENSIONS OF THE ATTACHED COMPONENT**



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

**I:** O- Ring 4.528x.118 [115x3mm]  
**J:** 4xM16; 1.42 [36] Deep, 90°, 5.709 [145] Dia. B. C.  
**K:** Conical seal ring

**DRAIN CONNECTION**

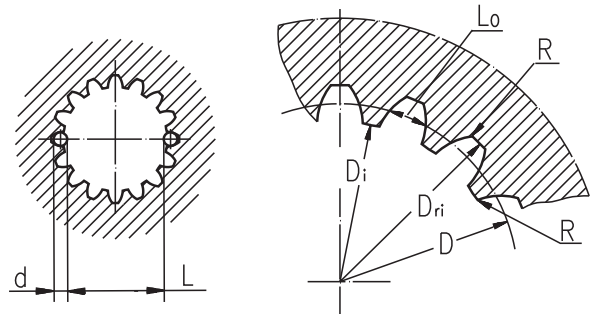
A drain line has to be used when pressure in the return line can exceed the permissible pressure. It can be connected:  
 - For MLHVS at the drain port of the motor;  
 - For MLHVV at the drain connection of the attached component. The maximum pressure in the drain line is limited by the attached component 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**

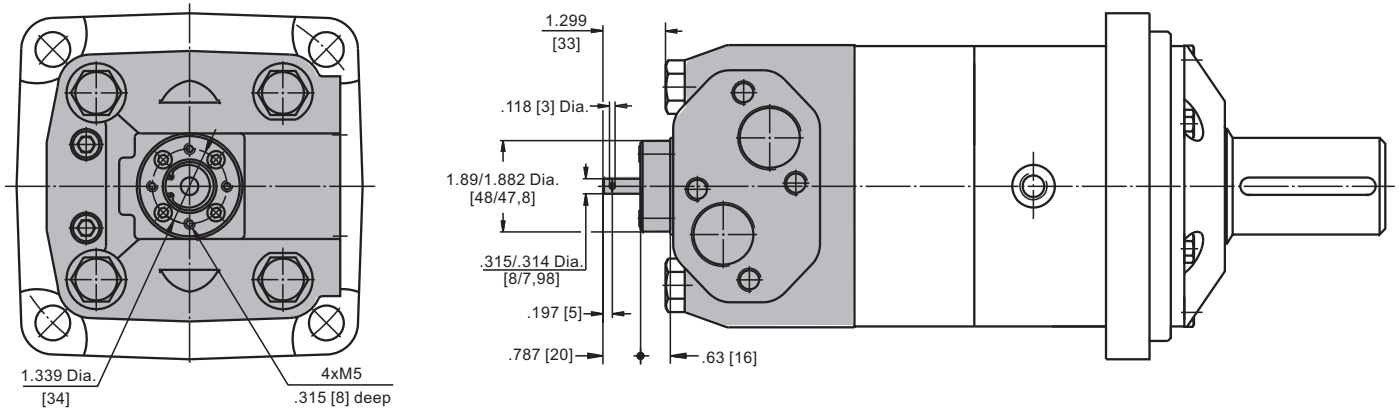
Standard ANS B92.1-1976, class 5  
 [m=2.54; corrected x.m=1]

Fillet Root Side Fit		inch	mm
Number of Teeth	z	16	16
Diametral Pitch	DP	10/20	10/20
Pressure Angle		30°	30°
Pitch Dia.	D	1.6	40,640
Major Dia.	D <sub>ri</sub>	1.796±1.780	45,2 <sup>+0,4</sup>
Minor Dia.	D <sub>i</sub>	1.5175±1.516	38,5 <sup>+0,039</sup>
Space Width [Circular]	L <sub>o</sub>	.2055±.2025	5,18±0,037
Fillet Radius	R	.015	0,4
Max. Measurement between Pins	L	1.284±1.278	32,47 <sup>+0,15</sup>
Pin Dia.	d	.22051±.22043	5,6±0,001



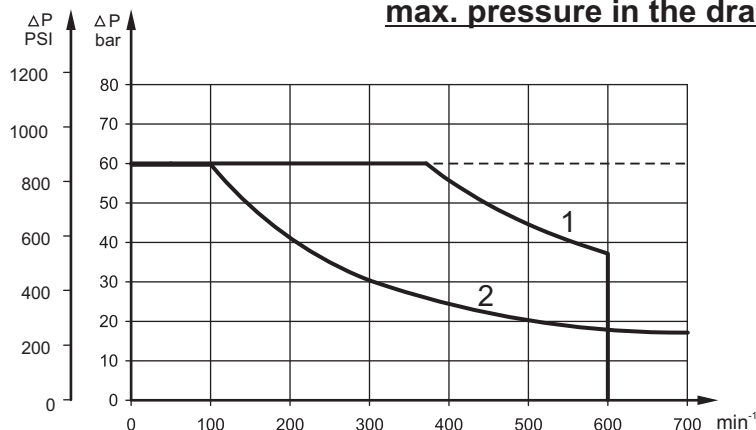
**Hardening Specification:**  
 HV=750±50 on the surface.  
 HV=560 at .035-.019 [0,7±0,2] case depth  
 Material: 20 MoCr4 DIN 17210 or SAE8620.

**MOTOR WITH TACHO CONNECTION**



**MAX. PERMISSIBLE SHAFT SEAL PRESSURE**

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



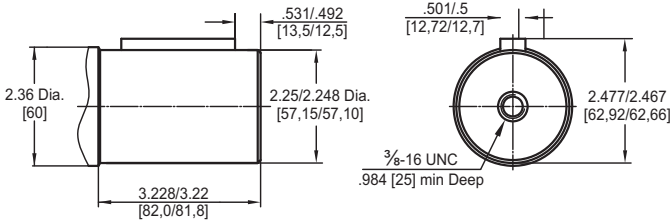
- 1: Drawing for High Pressure Seal ("U" Seal)
- 2: Drawing for Standard Shaft Seal

— - continuous operations  
 - - - - - intermittent operations

**SHAFT EXTENSIONS**

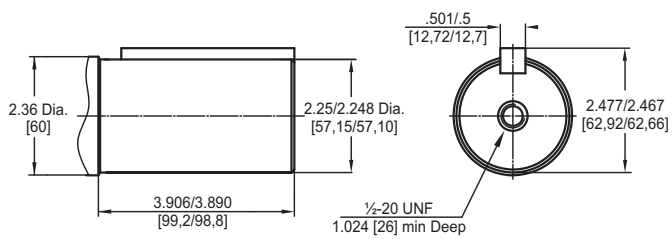
**C**

2 1/4" [57,15] straight, Parallel key 1/2 "x 1/2" x 2 1/4" BS46



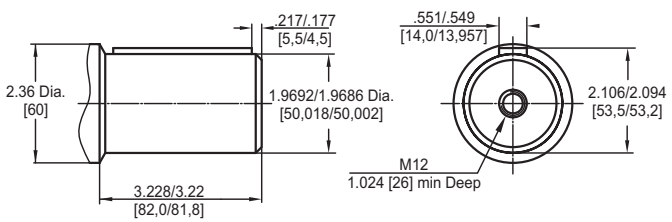
**B**

2 1/4" [57,15] straight, Parallel key 1/2 "x 1/2" x 2 1/4" BS46



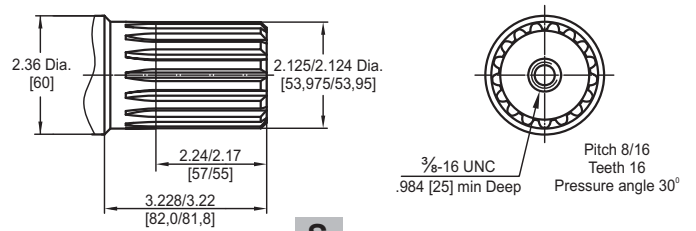
**M**

ø50 straight, Parallel key A14x9x70 DIN 6885



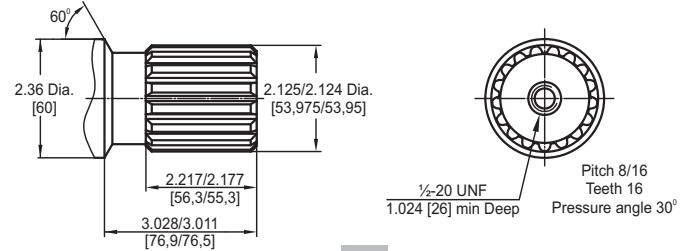
**G**

16T Splined, 2 1/8" [53,975] ANS B92.1-1976



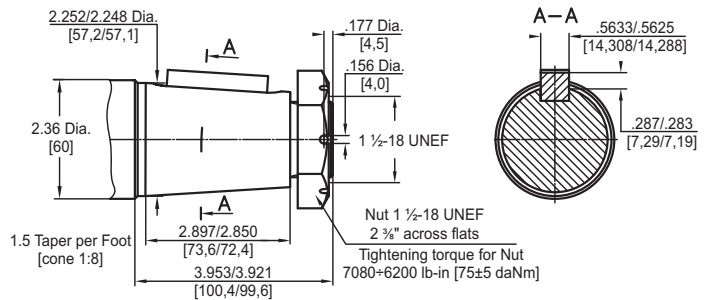
**S**

16T Splined, 2 1/8" [53,975] ANS B92.1-1976



**T**

2 1/4" [57,15] SAE J501 Tapered 1:8  
Parallel key 9/16 "x 9/16 "x 2" BS46



**ORDER CODE**



1	2	3	4	5	6	7
<b>MLHV</b>						

**Pos.1 - Mounting Flange**

- omit - Square, 4 holes
- C** - C Flange, 4 holes
- W** - Wheel mount
- S** - Short
- V** - Very short

**Pos.2 - Displacement code**

- 315** - 19.18 [314,5] in<sup>3</sup>/rev [cm<sup>3</sup>/rev]
- 400** - 24.45 [400,9] in<sup>3</sup>/rev [cm<sup>3</sup>/rev]
- 500** - 30.48 [499,6] in<sup>3</sup>/rev [cm<sup>3</sup>/rev]
- 630** - 38.38 [629,1] in<sup>3</sup>/rev [cm<sup>3</sup>/rev]
- 800** - 48.91 [801,8] in<sup>3</sup>/rev [cm<sup>3</sup>/rev]

**Pos.3 - Shaft Extensions**

- omit - for **S** and **V** mounting flange
- C** - 2 1/4" [57,15] straight, Parallel key
- B** - 2 1/4" [57,15] straight, Parallel key
- M** - 50 mm straight, Parallel key
- G** - 2 1/8" [53,975] 16T Splined
- S** - 2 1/8" [53,975] 16T Splined
- T** - 2 1/4" [57,15] SAE J501 Tapered

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

- 2** - side ports, 2xG1, G 1/4, BSP thread, ISO 228
- 4** - side ports, 2x1 1/16-12 UN, O-ring, 3/16-18 UNF

**Pos.5 - Shaft Seal Version [see page 49]**

- omit - Low pressure shaft seal
- U** - High pressure shaft seal

**Pos.6 - Special Features [see page 57]**

**Pos.7 - Design Series**

- omit - Factory specified

The hydraulic motors are mangano-phosphatized as standard.