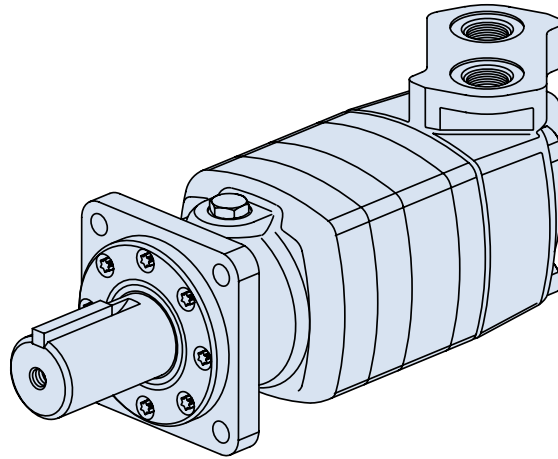


Disc Valve Hydraulic Motors  
**Series 10000**

10.2014



*inspired hydraulics.*

**10,000 Series  
Highlights**

**Features**

- High torque and flow
- Many options like 2 speed and speed sensors make this motor "smart"
- Low pressure loss even in higher flows

**Benefits**

- High power density for demanding mobile and industrial applications
- Many options to draw from

**Applications**

- Boring
- Industrial
- Metal Forming
- Port Equipment
- Saw Mill

**Description**

This is the biggest disc valve motor of our line with up to 45 GPM and 24,000 in-lb of torque in continuous mode, this motor is powerful and yet provides good efficiency.

**Specifications**

Geroler Element	4 Displacements
Flow l/min [GPM]	170 [45] Continuous** 265 [70] Intermittent*
Speed RPM	501 Cont.** 784 Inter.*
Pressure bar [PSI]	200 [3000] Cont.** 270 [4000] Inter.*
Torque Nm [lb-in]	2700 [23910] Cont.** 3440 [30460] Inter.*

\*\* Continuous—(Cont.) Continuous rating, motor may be run continuously at these ratings.

\* Intermittent—(Inter.) Intermittent operation, 10% of every minute.



Boring



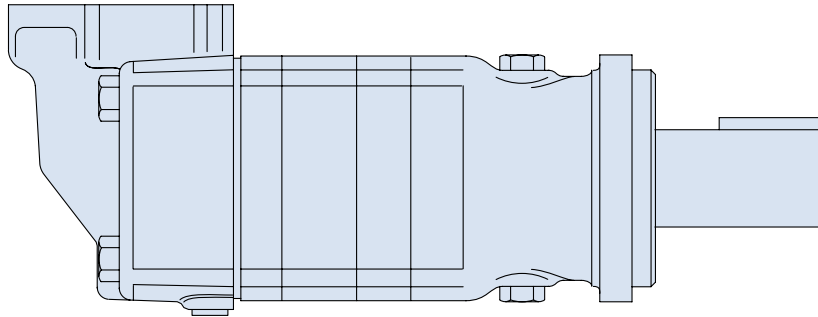
Metal Forming



Port Equipment



## 10,000 Series Specifications



### 10,000 SERIES MOTORS

Displ. cm <sup>3</sup> /r [in <sup>3</sup> /r]		345 [21.0]	480 [29.3]	665 [40.6]	940 [57.4]
Max. Speed (RPM) @ Flow	Continuous	501	354	254	179
	Intermittent	784	552	396	279
Flow l/min [GPM]	Continuous	170 [45]	170 [45]	170 [45]	170 [45]
	Intermittent	265 [70]	265 [70]	265 [70]	265 [70]
Torque* Nm [lb-in]	Continuous	1040 [9220]	1475 [13050]	2085 [18450]	2700 [23910]
	Intermittent	1390 [12310]	1965 [17410]	2610 [23080]	3440 [30460]
Pressure $\Delta$ bar [ $\Delta$ PSI]	Continuous	205 [3000]	205 [3000]	205 [3000]	190 [2750]
	Intermittent	275 [4000]	275 [4000]	260 [3750]	240 [3500]
	Peak	275 [4000]	275 [4000]	275 [4000]	260 [3750]
Weight kg [lb]	Standard or Wheel Mount	43,5 [96.0]	45,4 [100.0]	46,3 [100.0]	47,2 [104.0]
	Bearingless	31,3 [69.0]	33,1 [73.0]	33,1 [73.0]	34,9 [77.0]

\*See shaft torque ratings for limitations.

#### Note:

To assure best motor life, run motor for approximately one hour at 30% of rated pressure before application to full load. Be sure motor is filled with fluid prior to any load applications.

#### Maximum Inlet Pressure:

275 bar [4000 PSI]  
Do not exceed  $\Delta$  pressure rating (see chart above).

#### Maximum Return Pressure:

275 bar [4000 PSI] with case drain line installed.  
Do not exceed  $\Delta$  pressure rating (see chart above).

#### Maximum Case Pressure:

20 bar [300 PSI]

#### $\Delta$ bar [ $\Delta$ PSI] :

The true pressure difference between inlet port and outlet port

#### Continuous Rating:

Motor may be run continuously at these ratings

#### Intermittent Operation:

10% of every minute

#### Peak Operation:

1% of every minute

#### Recommended Fluids:

Premium quality, anti-wear type hydraulic oil with a viscosity of not less than 70 SUS at operating temperature.

#### Recommended Maximum System Operating Temp.:

82° C [180° F]

#### Recommended Filtration:

per ISO Cleanliness Code, 4406: 20/18/13



## 10,000 Series

### Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.

	Continuous		Peak
	Intermittent		No Operation

### 480 cm³/r [29.3 in³/r] Δ Pressure Bar [PSI]

	[250] 15	[500] 35	[1000] 70	[1500] 105	[2000] 140	[2500] 170	[3000] 205	[3500] 240	[4000] 275
[1] <b>3.8</b>	[760] 85 6	[1540] 175 5	[3120] 355 4	[4640] 525 2					
[2] <b>7.5</b>	[1040] 120 15	[2140] 240 13	[4320] 490 11	[6500] 735 8	[8690] 980 5	[10870] 1230 2			
[4] <b>15</b>	[1040] 120 31	[2130] 240 29	[4310] 485 27	[6490] 735 24	[8680] 980 21	[10860] 1225 18	[13050] 1475 16	[15230] 1720 13	[17410] 1965 10
[8] <b>30</b>	[1020] 115 62	[2110] 240 61	[4290] 485 58	[6480] 730 55	[8660] 980 53	[10840] 1225 50	[13030] 1470 47	[15210] 1720 44	[17390] 1965 42
[12] <b>45</b>	[990] 110 94	[2080] 235 93	[4270] 480 90	[6450] 730 87	[8630] 975 84	[10820] 1220 81	[13000] 1470 78	[15180] 1715 75	[17370] 1965 73
[16] <b>61</b>	[960] 110 125	[2060] 235 124	[4240] 480 122	[6420] 725 119	[8600] 970 116	[10790] 1220 113	[12970] 1465 110	[15150] 1710 107	[17340] 1960 104
[20] <b>76</b>	[930] 105 157	[2020] 230 156	[4200] 475 154	[6390] 720 150	[8570] 970 147	[10750] 1215 144	[12940] 1460 141	[15120] 1710 138	[17300] 1955 135
[24] <b>91</b>	[890] 100 189	[1980] 225 188	[4170] 470 185	[6350] 715 182	[8530] 965 179	[10720] 1210 175	[12900] 1460 172	[15080] 1705 169	
[28] <b>106</b>	[850] 95 221	[1940] 220 220	[4130] 465 217	[6310] 715 214	[8490] 960 210	[10680] 1205 207	[12860] 1455 203	[15040] 1700 200	
[32] <b>121</b>	[810] 90 252	[1900] 215 251	[4080] 460 249	[6270] 710 245	[8450] 955 242	[10630] 1200 238	[12820] 1450 235	[15000] 1695 231	
[36] <b>136</b>	[760] 85 282	[1850] 210 281	[4040] 455 280	[6220] 705 277	[8400] 950 273	[10590] 1195 270	[12770] 1445 266		
[40] <b>151</b>	[710] 80 318	[1800] 205 316	[3990] 450 312	[6170] 695 308	[8350] 945 305	[10540] 1190 301	[12720] 1440 297		
[45] <b>170</b>	[647] 75 354	[1740] 195 353	[3920] 445 351	[6110] 690 348	[8290] 935 344	[10470] 1185 340	[12660] 1430 336		
[60] <b>227</b>	[430] 50 474	[1520] 170 473	[3710] 420 471	[5890] 665 467	[8070] 910 462	[10260] 1160 458	[12440] 1405 454		
[70] <b>265</b>		[1360] 155 552	[3540] 400 550	[5730] 645 546	[7910] 895 541	[10100] 1140 536	[12280] 1385 532		

### 345 cm³/r [21.0 in³/r] Δ Pressure Bar [PSI]

	[250] 15	[500] 35	[1000] 70	[1500] 105	[2000] 140	[2500] 170	[3000] 205	[3500] 240	[4000] 275
[1] <b>3.8</b>	[600] 70 3	[1310] 150 1							
[2] <b>7.5</b>	[740] 85 21	[1510] 170 19	[3050] 345 15	[4600] 520 11	[6140] 695 8	[7680] 865 4			
[4] <b>15</b>	[730] 80 43	[1500] 170 41	[3040] 345 37	[4590] 520 33	[6140] 695 30	[7680] 870 26	[9220] 1040 22	[10770] 1215 18	[12310] 1390 14
[8] <b>30</b>	[720] 80 87	[1490] 170 86	[3030] 340 82	[4580] 515 78	[6120] 690 74	[7670] 865 70	[9210] 1040 66	[10760] 1215 62	[12300] 1390 58
[12] <b>45</b>	[700] 80 131	[1470] 165 130	[3020] 340 127	[4560] 515 123	[6100] 685 118	[7650] 865 114	[9190] 1040 110	[10740] 1215 106	[12280] 1385 102
[16] <b>61</b>	[680] 75 176	[1450] 165 175	[3000] 340 172	[4540] 515 167	[6080] 685 163	[7630] 865 158	[9170] 1035 154	[10720] 1210 149	[12260] 1385 145
[20] <b>76</b>	[660] 75 221	[1430] 160 220	[2970] 335 217	[4520] 510 212	[6060] 685 207	[7600] 865 202	[9150] 1035 198	[10690] 1210 193	[12230] 1380 189
[24] <b>91</b>	[630] 70 266	[1400] 160 265	[2950] 335 261	[4490] 505 256	[6030] 680 252	[7580] 855 246	[9120] 1030 242	[10660] 1205 237	[12210] 1380 232
[28] <b>106</b>	[600] 70 310	[1370] 155 309	[2920] 330 306	[4460] 505 301	[6000] 680 296	[7550] 855 291	[9090] 1025 286	[10640] 1200 280	[12180] 1375 275
[32] <b>121</b>	[570] 65 356	[1340] 150 355	[2890] 325 351	[4430] 500 346	[5970] 675 340	[7520] 850 335	[9060] 1025 329	[10610] 1200 324	[12150] 1370 319
[36] <b>136</b>	[540] 60 400	[1310] 150 399	[2850] 320 396	[4400] 495 390	[5940] 670 384	[7480] 845 379	[9030] 1020 373	[10570] 1195 368	[12120] 1370 362
[40] <b>151</b>	[500] 55 445	[1270] 145 444	[2820] 320 441	[4360] 495 435	[5910] 670 429	[7450] 840 423	[8990] 1015 417	[10540] 1190 412	
[45] <b>170</b>	[460] 50 501	[1220] 140 500	[2760] 310 498	[4300] 485 492	[5840] 660 486	[7380] 835 480	[8910] 1005 473	[10450] 1180 467	
[60] <b>227</b>		[1080] 130 668	[2620] 295 665	[4160] 470 658	[5710] 645 651	[7250] 820 644	[8800] 995 637		
[70] <b>265</b>		[960] 110 784	[2510] 285 777	[4050] 460 769	[5590] 630 761	[7140] 805 754	[8680] 980 746		

[2510]  
285  
777 } Torque [lb-in]  
Nm  
Speed RPM





## 10,000 Series

### Dimensions

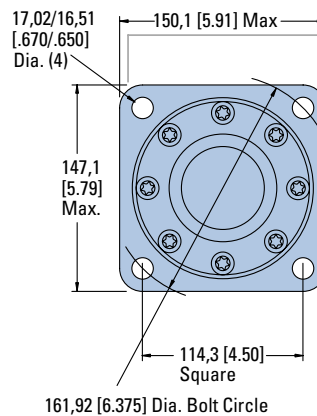
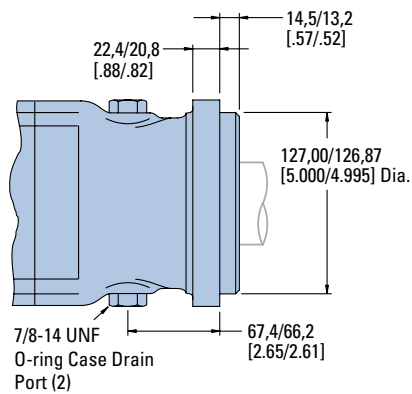
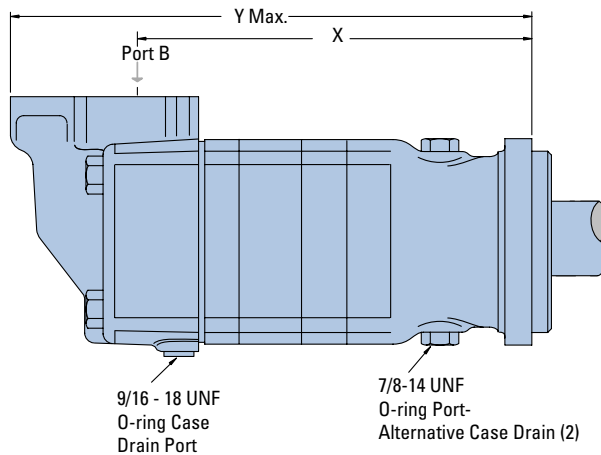
#### Ports

1 5/16 -12 UN-2B SAE O-ring Staggered Ports (2)  
 9/16 -18 UNF-2B SAE O-ring Case Drain Port (1) or  
 4 Bolt 1 1/4 inch Split Flange Ports (2)  
 9/16 -18 UNF-2B SAE O-ring Case Drain Port (1)

#### Standard Rotation Viewed from Shaft End

Port A Pressurized — CW  
 Port B Pressurized — CCW

#### Standard Mount



#### STANDARD MOUNT MOTOR DIMENSIONS

Displacement cm <sup>3</sup> /r [in <sup>3</sup> /r]	X mm [inch]	Y mm [inch]
345 [21.0]	282,4 [11.12]	380,7 [14.99]
480 [29.2]	295,1 [11.62]	393,4 [15.49]
665 [40.6]	295,1 [11.62]	393,4 [15.49]
940 [57.4]	313,4 [12.34]	411,7 [16.21]



## 10,000 Series

### Dimensions

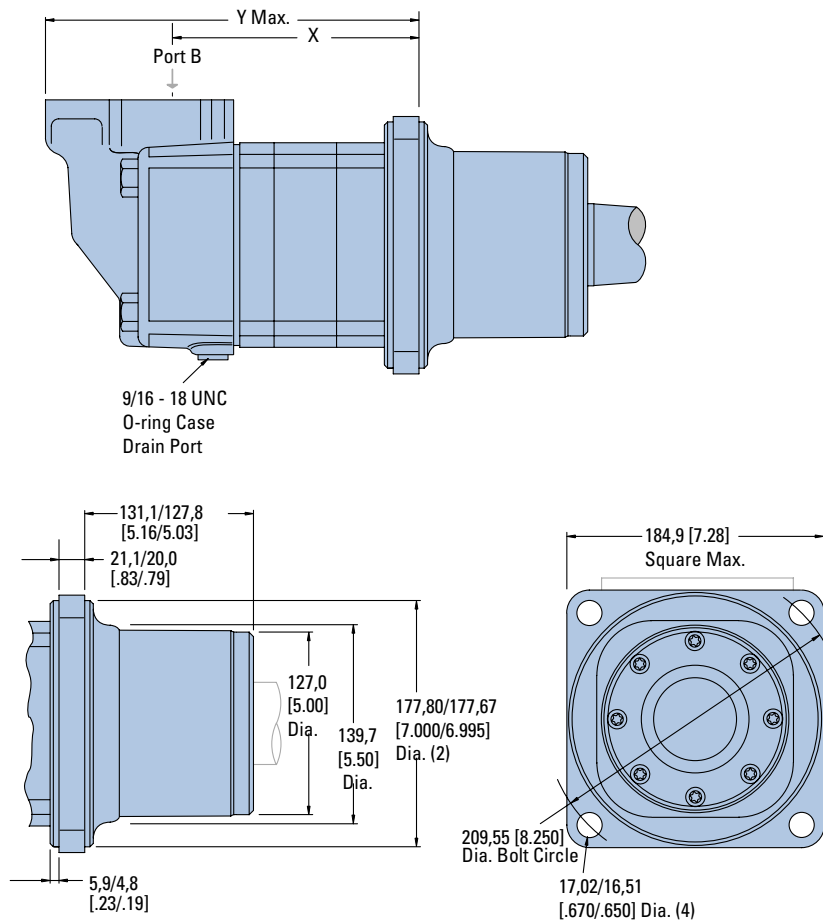
#### Ports

1 5/16 -12 UN-2B SAE O-ring Staggered Ports (2)  
 9/16 -18 UNF-2B SAE O-ring Case Drain Port (1) or  
 4 Bolt 1 1/4 inch Split Flange Ports (2)  
 9/16 -18 UNF-2B SAE O-ring Case Drain Port (1)

#### Standard Rotation Viewed from Shaft End

Port A Pressurized — CW  
 Port B Pressurized — CCW

### Wheel Mount



#### WHEEL MOUNT MOTOR DIMENSIONS

Displacement cm <sup>3</sup> /r [in <sup>3</sup> /r]	X mm [inch]	Y mm [inch]
345 [21.0]	166,9 [6.57]	265,9 [10.47]
480 [29.2]	179,6 [7.07]	278,6 [10.97]
665 [40.6]	179,6 [7.07]	278,6 [10.97]
940 [57.4]	197,8 [7.79]	297,2 [11.70]



## 10,000 Series

### Dimensions

Bearingless

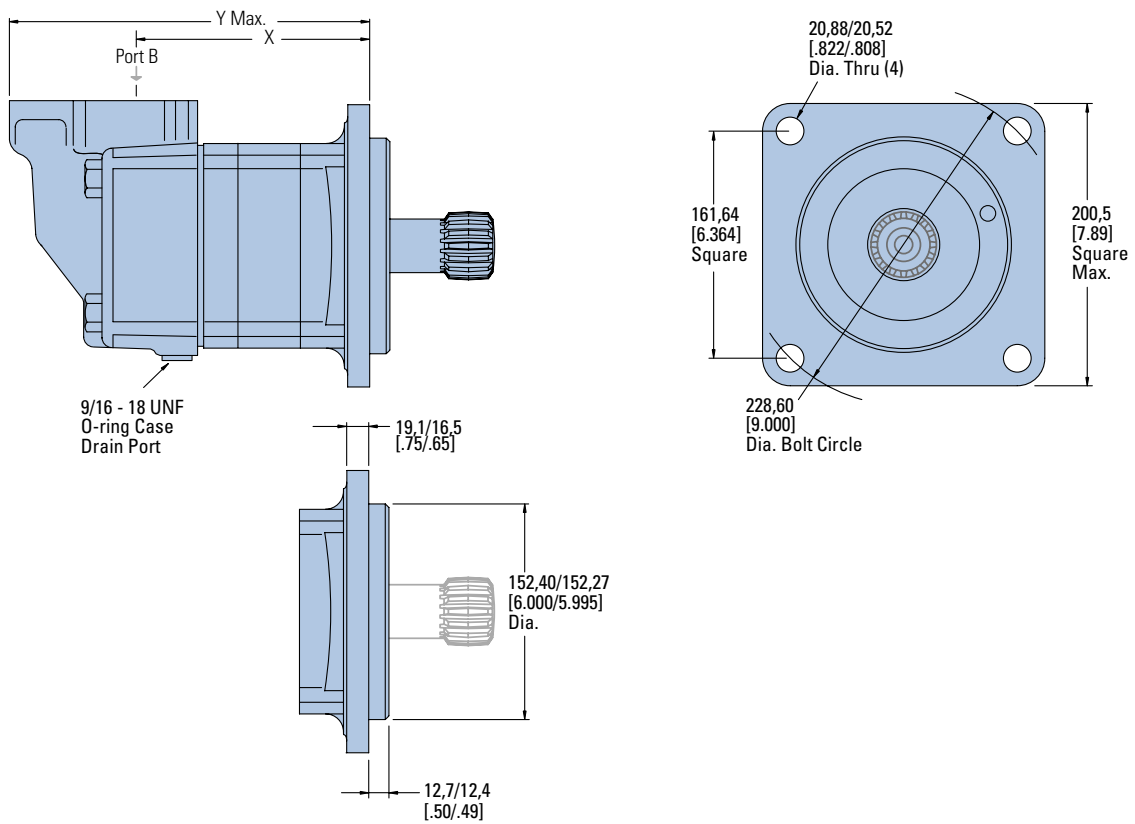
### Ports

1 5/16 -12 UN-2B SAE O-ring Staggered Ports (2)  
 9/16 -18 UNF-2B SAE O-ring Case Drain Port (1) or  
 4 Bolt 11/4 inch Split Flange Ports (2)  
 9/16 -18 UNF-2B SAE O-ring Case Drain Port (1)

### Standard Rotation Viewed from Shaft End

Port A Pressurized — CW  
 Port B Pressurized — CCW

### Bearingless



9/16 - 18 UNF  
 O-ring Case  
 Drain Port

### BEARINGLESS MOTOR DIMENSIONS

Displacement cm <sup>3</sup> /r [in <sup>3</sup> /r]	X mm [inch]	Y mm [inch]
345 [21.0]	158,0 [6.22]	256,3 [10.09]
480 [29.2]	170,7 [6.72]	269,0 [10.59]
665 [40.6]	170,7 [6.72]	269,0 [10.59]
940 [57.4]	189,0 [7.44]	287,5 [11.32]

### Mating Coupling Blank

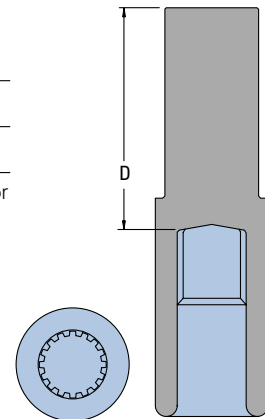
Dimension D mm [inch]  
 Eaton Part No.

13280-001	133,6/128,5 [5.26/5.06]
13280-002	156,0/150,9 [6.14/5.94]

For 10,000 bearingless motor application information, contact your Eaton representative (mating coupling blanks available from Eaton Hydraulics).

### Note:

After machining blank, part must be hardened per Eaton specification.



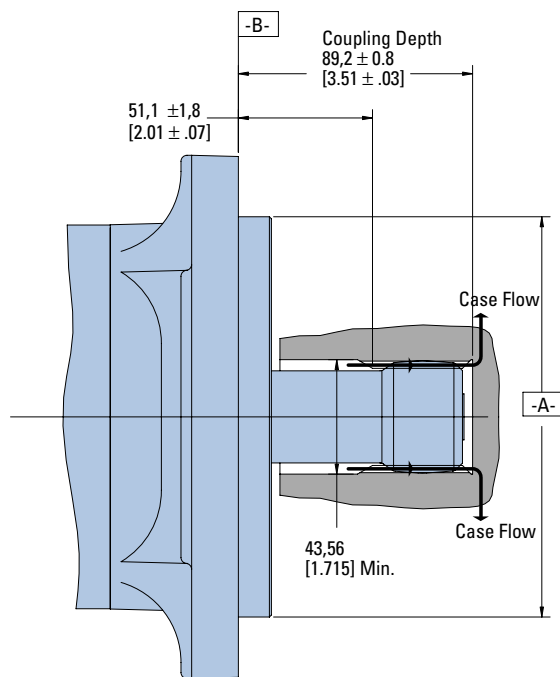




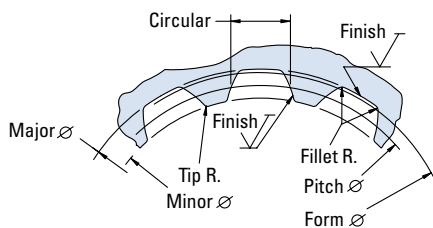
## 10,000 Series

### Installation Information

Bearingless



- 1 Internal spline in mating part to be as follows: Material to be ASTM A304, 8620H. Carbonize to a hardness of 60-64 HRc with case depth (to 50HRc) of 0,076 - 1,02 [.030 - .040] (dimensions apply after heat treat).



Spline Pitch.....	10/20
Pressure Angle.....	30°
Number of teeth.....	16
Class of Fit.....	Ref. 5
Type of Fit.....	Side
Pitch Diameter.....	Ref. 40,640000 [1.6000000] $\text{Ⓢ} 0,25 [0,010] \text{D}$
Base Diameter.....	Ref. 35,195272 [1.3856406]
Major Diameter.....	43,56 [1.715] Max. 43,18 [1.700] Min.
Min. Minor Diameter.....	36,83 - 37,08 [1.450 - 1.460]
Form Diameter, Min.....	42,47 [1.672]
Fillet Radius.....	0,64 - 0,76 [.025 - .030]
Tip Radius.....	0,25 - 0,51 [.010 - .020]
Finish.....	1,6 (63)
Involute Profile Variation.....	+0,000 -0,028 [+0.0000 -0.0011]
Total Index Variation.....	0,041 [0.0016]
Lead Variation.....	0,013 [0.0005]
Circular Space Width:	
Maximum Actual.....	4,105 [1.616]
Minimum Effective.....	3,995 [1.573]
Maximum Effective.....	Ref. 4,056 [1.597]
Minimum Actual.....	Ref. 4,018 [1.582]
Dimension Between Two Pins.....	Ref. 26,929 - 27,084 [1.0602 - 1.0663]
Pin Diameter.....	Ref. 34,272 - 34,450 [1.3493 - 1.3563]
	Wide Flat for Root Clearance

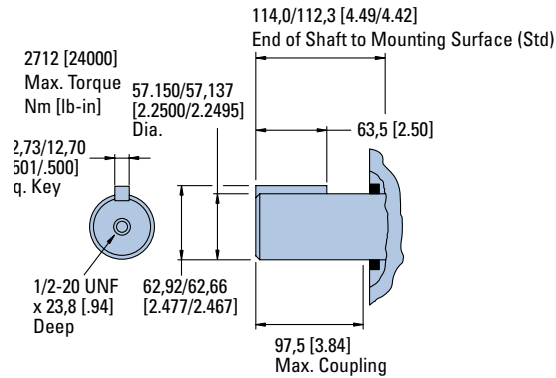


## 10,000 Series

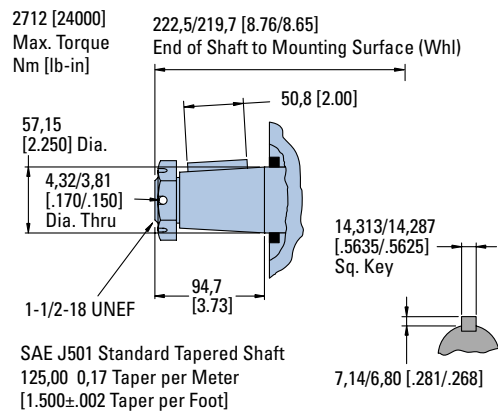
### Dimensions

Shafts

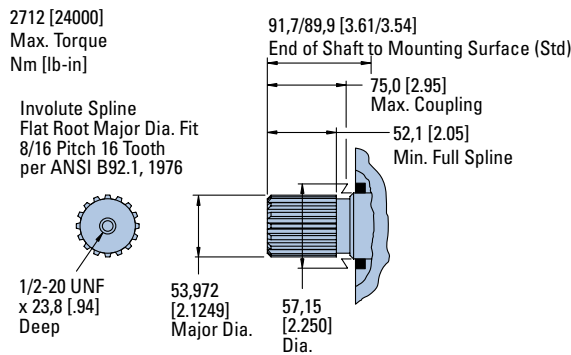
#### 2 1/4 Inch Straight



#### 2 1/4 Inch Tapered

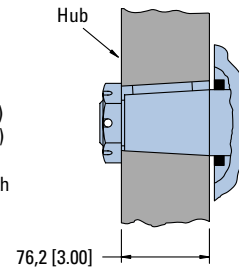


#### 2 1/8 Inch 16 Tooth Splined

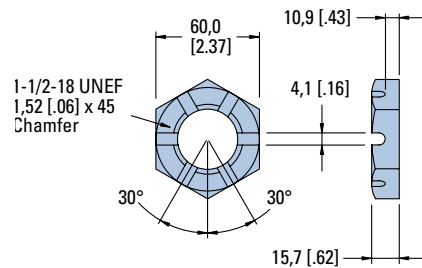


#### Tapered Shaft Hub Data

Recommended Torque:  
(1150 Nm [850 lb-ft] Dry)  
( 880 Nm [650 lb-ft] Lub)  
Plus Torque required to  
align the slotted nut with  
the Shaft Crosshole.



#### Slotted Hexagon Nut





## 10,000 Series

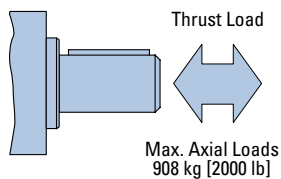
### Side Shaft Load Capacity

These curves indicate the radial load capacity on the motor shaft at various locations with an external thrust load of 454 kg [1000 lb]. The maximum allowable thrust load is 908 kg [2000 lb].

**Note:**

Case pressure will increase the allowable inward thrust load and decrease the allowable outward thrust load. Case pressure will push outward on the shaft at 200 kg/7 Bar [441 lb/100 PSI].

**Each curve is based on**

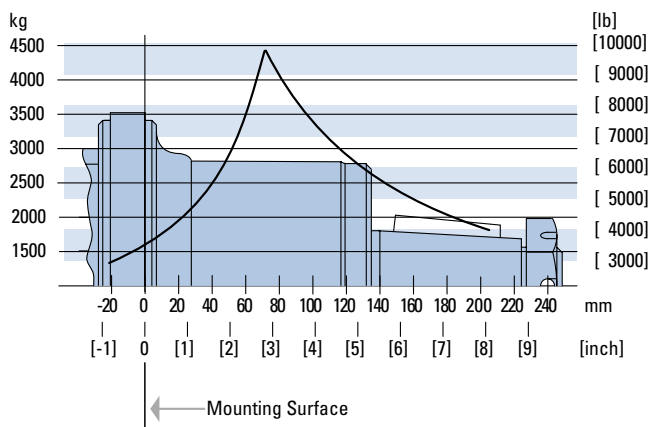
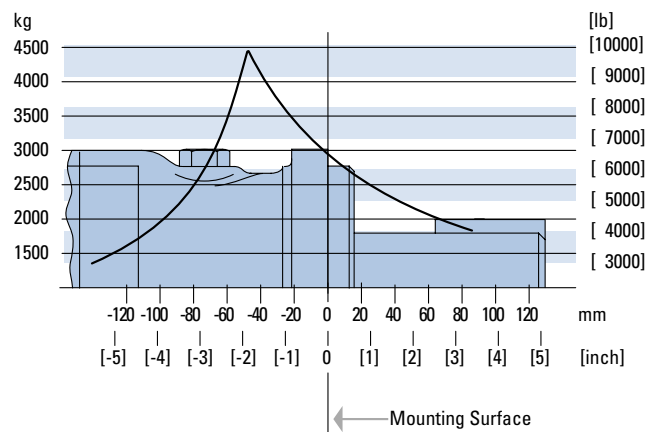


**B 10 bearing life (2000 hours of 12,000,000 shaft revolutions at 100 RPM) at rated output torque.**

To determine radial load at speeds other than 100 RPM, multiply the load values given on the bearing curve by the factors in the chart below.

RPM	Multiplication Factor
50	1.23
100	1.00
200	0.81
300	0.72
400	0.66
500	0.62
600	0.58
700	0.56
800	0.54

For 3,000,000 shaft revolutions or 500 hours—Increase these shaft loads 52%.



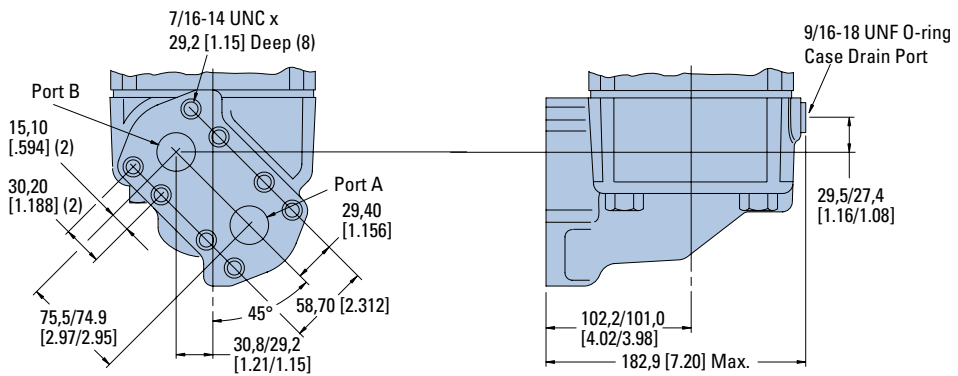


## 10,000 Series

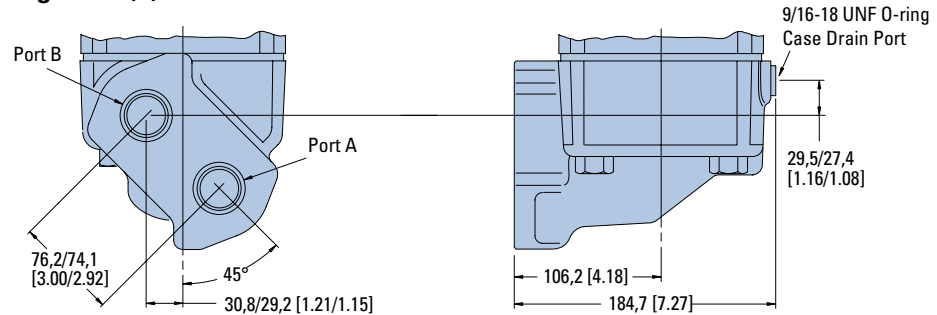
### Dimensions

Ports

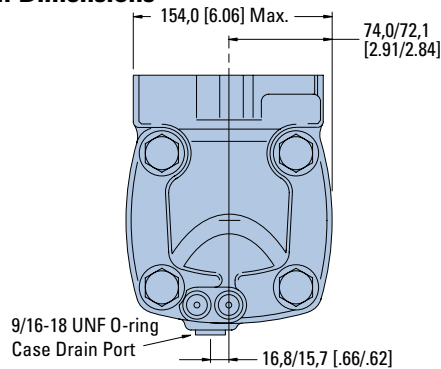
#### 1 1/4 Inch Split Flange Ports (2)



#### 1 5/16 -12 O-ring Ports (2)



#### End View Common Dimensions





## 10,000 Series Product Numbers

### Note:

For 10,000 Series Motors with a configuration **Not Shown** in the chart below: Use model code number system on the next page to specify product in detail.

Use digit prefix — 119-, 120-, or 121 - plus four digit number from charts for complete product number— Example 121-1014.

**Orders will not be accepted without three digit prefix.**

MOUNTING	SHAFT	PORT SIZE	DISPL. cm <sup>3</sup> /r [in <sup>3</sup> /r] / PRODUCT NUMBER			
			345 [21.0]	480 [29.3]	665 [40.6]	940 [57.4]
Standard SAE C-Mount	2 1/4 Inch Straight	1 5/16 O-ring	119-1028	-1029	-1030	-1031
		1 1/4 inch Split Flange	119-1040	-1041	-1042	-1043
	2 1/8 Inch 16 T Splined	1 5/16 O-ring	119-1032	-1033	-1034	-1035
		1 1/4 inch Split Flange	119-1044	-1045	-1046	-1047
	2 1/4 Inch Tapered	1 5/16 O-ring	119-1036	-1037	-1038	-1039
		1 1/4 inch Split Flange	119-1048	-1049	-1050	-1051
Wheel Motor	2 1/4 Inch Straight	1 5/16 O-ring	120-1005	-1006	-1007	-1008
		1 1/4 inch Split Flange	120-1017	-1018	-1019	-1020
	2 1/8 Inch 16 T Splined	1 5/16 O-ring	120-1009	-1010	-1011	-1012
		1 1/4 inch Split Flange	120-1021	-1022	-1023	-1024
	2 1/4 Inch Tapered	1 5/16 O-ring	120-1013	-1014	-1015	-1016
		1 1/4 inch Split Flange	120-1025	-1026	-1027	-1028
Bearingless		1 5/16 O-ring	121-1007	-1008	-1009	-1010
		1 1/4 inch Split Flange	121-1011	-1012	-1013	-1014

121-1014



## 10,000 Series

### Model Code

The following 30-digit coding system has been developed to identify all of the configuration options for the 10,000 Series motor. Use this model code to specify a motor with the desired features. All 30-digits of the code must be present when ordering. You may want to photocopy the matrix below to ensure that each number is entered in the correct box.

M	1	0	*	*	*	*	*	*	*	0	0	*	*	*	*	0	0	*	*	*	0	0	*	*	0	0	*			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

#### 1 Product

M – Motor

#### 2, 3 Series

10 – 10,000 Series

#### 4, 5, 6 Displacement

cm<sup>3</sup>/r [in<sup>3</sup>/r]

210 – 343.8 [20.98]

293 – 479.5 [29.26]

406 – 665.3 [40.60]

574 – 940.8 [57.41]

#### 7, 8 Mounting

Description

AA – Standard, 4 Bolt:  
127,0 [5.00] Pilot Dia. 16,76  
[.660] Dia. Holes on 161,92  
[6.375] Dia. Bolt Circle

AB – Wheel, 4 Bolt: 16,76  
[.660] Dia. Holes on 209,55  
[8.250] Dia. Bolt Circle

AC – Bearingless, 4 Bolt:  
152,4 [6.00] Pilot Dia. 20,70  
[.815] Holes on 228,60 [9.00]  
Dia. Bolt Circle

#### 9, 10 Output Shaft

Description

00 – None (Bearingless)

01 – 57,15 [2.250] Dia.  
Straight with .500-20 UNF-  
2B Thread in End, 12,7  
[.50] Square x 63,5 [2.50]  
Straight End

02 – 57,15 [2.250] Dia.  
.125:1 Tapered Shaft Per  
SAE J512 with 1.500-18  
UNEF-2A Threaded Shaft  
End and Slotted Hex Nut,  
14,288 [.5625] Square x  
50,8 [2.00] Straight Key

03 – 53,98 [2.125] Dia. Flat  
Root, Major Dia. Fit, 16  
Tooth, 8/16 DP, 30 Degree  
Involute Spline with .500-  
20 UNF-20 Thread in End.  
52,07 [2.050] Minimum  
Full Spline Length

#### 11, 12 Ports

AA – 1.3125 -12 UN O-Ring  
Staggered Ports

AB – 31,75 [1.250] Dia.  
4 Bolt Split Flange  
Staggered Ports with  
.4375-15 UNC-2B Tapped  
Mounting Holes

#### 13, 14 Case Flow Options

01 – .5625-18 UNF-2B Case  
Drain SAE O-Ring Port

#### 15 Low Pressure Relief

0 – None

#### 16, 17 Pressure/Flow

Option

00 – None

#### 18 Geroler Option

0 – Standard

1 – Free Running

#### 19 Seal Option

0 – Standard

4 – Seal Guard

#### 20, 21 Accessories

00 – None

#### 22, 23 Special Features

(Hardware)

00 – None

#### 24, 25 Special Features

(Assembly)

00 – None

AA – Reverse Rotation

#### 26, 27 Paint / Packaging

00 – None

AA – Painted Low Gloss  
Black

#### 28, 29 Customer

Identification

00 – None

#### 30 Design Code

C – Third (Standard and  
Wheel Mounts)

D – Fourth (Bearingless  
Mount)

Feature in **bold** are preferred and  
allow for shorter lead time.



## 10,000 Series Two-Speed

### Description

The Eaton 10,000 Series motors are available with an integral two speed feature that changes the displacement in a ratio of 1 to 2 and shifts the motor from a low speed high torque (LSHT) mode to a high speed low torque (HSLT) mode. The open center selector valve shifts the speed mode from low to high speed when pilot pressure of 6.9  $\Delta$  Bar [100  $\Delta$  PSI] minimum is applied to the pilot port (6.9 Bar [100 PSI] higher than case pressure). In the high speed mode torque values are approximately one half with twice the speed of the conventional 10,000 Series single speed motors.

An external two position three way valve is required for shifting the pilot pressure port between signal pressure (HSLT) and low pressure (LSHT)

Two speed motors are available with a return line closed center shuttle for closed circuit applications.

Low speed high torque mode is the normal position of the speed selector valve. When a differential pressure is supplied to the pilot port and 6,9 Bar [100 PSI] is reached, the selector valve overcomes the return spring force and the spool shifts to the high speed mode. The oil in the opposite side of the spool is drained internally. Pressure between the pilot supply and case drain or return line (depending on open or closed circuit system) must be maintained to keep the motor in the high speed mode.

When pilot pressure is removed from the pilot port the pressure in the pilot end of the spool valve is relieved and drained back through this three way valve, the spring force returns the spool valve to LSHT position.

Pilot pressure may come from any source that will provide uninterrupted pressure during the high speed mode operation. Pilot pressure 6,9  $\Delta$  Bar [100  $\Delta$  PSI] minimum, up to the full operating pressure of the motor.

In normal LSHT operation the Char-Lynn two speed motor will function with equal shaft output in either direction (CW or CCW), the same as the single speed Char-Lynn disc valve motors.

However, to prevent cavitation in the HSLT mode, the preferred direction of shaft rotation is counter clockwise (port B pressurized). This unique disc valve is not symmetrical in porting the fluid for the HSLT mode. Consequently, when the pressure is reversed for HSLT CW rotation, cavitation can occur. Installing a restriction (200 PSI or more depending on flow) in the hydraulic line that connects port B will prevent cavitation.

If you are operating in a critical area and a restriction in the hydraulic line causes concern, these two speed motors can be ordered timed with CW preferred HSLT shaft rotation. Hence, with this option port B will have to be pressurized for CW preferred HSLT shaft rotation. The restriction recommended for the line connecting port B remains unchanged. Finally in closed circuit applications a hydraulic line restriction is not required. Instead, the charge pump can be used to supply and maintain a minimum pressure of 14 Bar [200 PSI].

#### Note:

Be certain in closed loop applications that the charge pump when used for back pressure on the B port, has sufficient displacement to maintain charge pressure especially in dynamic braking or overrunning load conditions.

#### Important!

**Due to potential problems in maintaining charge pump pressure at port B for uninterrupted back pressure during dynamic braking, Eaton does not recommend the two speed motor where overrunning conditions may exist.**

### Performance Data

#### 10,000 Series Two-Speed

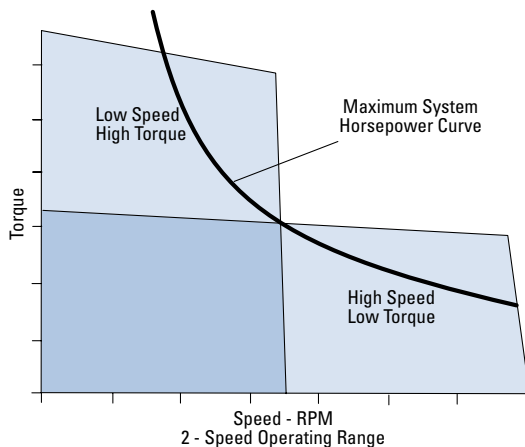
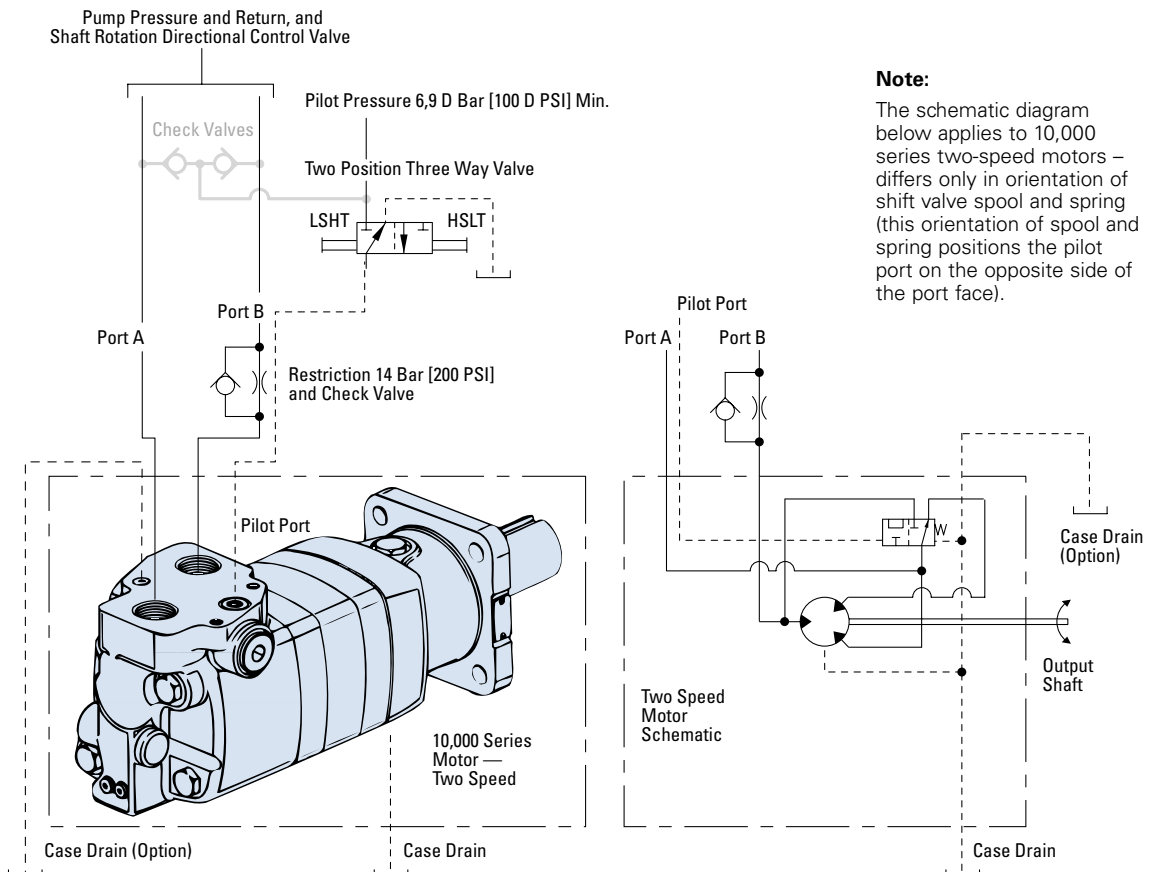
**In the high speed mode torque values are approximately one half with twice the speed** of the conventional 10,000 Series single speed motors.

**In the low speed mode torque and speed values are the same as the conventional 10,000 series single speed motors.**



## 10,000 Series Two-Speed

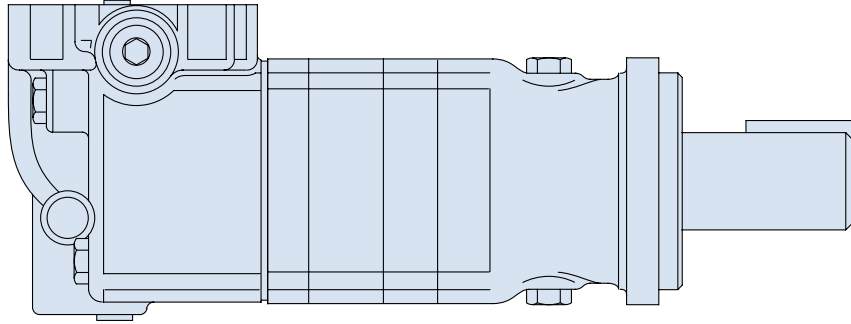
### Typical Hydraulic Circuit







## 10,000 Series Two-Speed Specifications



### 10,000 SERIES TWO-SPEED MOTORS

<b>Displ. cm<sup>3</sup>/r [in<sup>3</sup>/r]</b>	High Speed Mode	169 [10.3]	239 [14.6]	332,7 [20.3]	470 [28.7]
	Low Speed Mode	345 [21.0]	480 [29.3]	665 [40.6]	940 [57.4]
<b>Max. Speed (RPM) @ Continuous Flow</b>	High Speed Mode	750	630	500	400
	Low Speed Mode	375	315	250	200
<b>Flow l/min [GPM]</b>	High Speed Mode	130 [35]	170 [45]	170 [45]	170 [45]
	Low Speed Mode	130 [35]	170 [45]	170 [45]	170 [45]
<b>Torque* Nm [lb-in]</b>	High Speed Mode				
	Continuous	440 [3900]	630 [5600]	905 [8000]	1175 [10400]
	Intermittent	585 [5200]	845 [7500]	1130 [10000]	1470 [13000]
<b>Torque* Nm [lb-in]</b>	Low Speed Mode				
	Continuous	1015 [9000]	1470 [13000]	2090 [18500]	2710 [24000]
	Intermittent	1355 [12000]	1965 [17400]	2600 [23000]	3445 [30500]
<b>Pressure Δ bar [Δ PSI]</b>	Continuous	205 [3000]	205 [3000]	205 [3000]	190 [2750]
	Intermittent	275 [4000]	275 [4000]	260 [3750]	240 [3500]
<b>Weight kg [lb]</b>	Standard or Wheel Mount	50,3 [111.0]	52,2 [115.0]	52,2 [115.0]	54,0 [119.0]
	Bearingless	38,1 [84.0]	39,9 [88.0]	39,9 [88.0]	41,7 [92.0]

\*See shaft torque ratings for limitations.

#### Note:

To assure best motor life, run motor for approximately one hour at 30% of rated pressure before application to full load. Be sure motor is filled with fluid prior to any load applications.

#### High Speed Mode

(Reduced Motor Displacement)

#### Low Speed Mode

(Full Motor Displacement)

#### Maximum Inlet Pressure:

275 bar [4000 PSI]  
Do not exceed Δ pressure rating (see chart above).

#### Maximum Return Pressure:

275 bar [4000 PSI] with case drain line installed.  
Do not exceed Δ pressure rating (see chart above).

#### Δ bar [Δ PSI] :

The true pressure difference between inlet port and outlet port

#### Continuous Rating:

Motor may be run continuously at these ratings

#### Intermittent Operation:

10% of every minute

#### Peak Operation:

1% of every minute

#### Recommended Fluids:

Premium quality, anti-wear type hydraulic oil with a viscosity of not less than 70 SUS at operating temperature.

#### Recommended Maximum System Operating Temp.:

82° C [180° F]

#### Recommended Filtration:

per ISO Cleanliness Code, 4406: 20/18/13

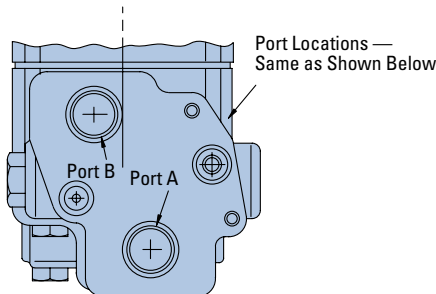


## 10,000 Series Two-Speed

### Dimensions

Standard and Wheel

#### 1 5/16 -12 O-ring Staggered Ports



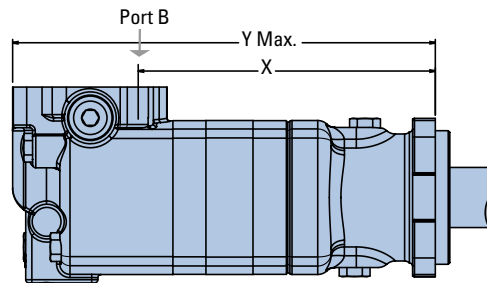
#### Ports

- 1 5/16 -12 UN-2B SAE O-ring Staggered Ports (2)
- 3/4 -16 UNF-2B SAE O-ring Case Drain Port (1)
- 7/16 -20 UNF-2B SAE O-ring Pilot Control Port (1) or
- 4 bolt 1 1/4 inch Split Flange Ports (2)
- 3/4 -16 UNF-2B SAE O-ring Case Drain Port (1)
- 7/16 -20 UNF-2B SAE O-ring Pilot Control Port (1)

#### Standard Rotation Viewed from Shaft End

- Port A Pressurized — CW
- Port B Pressurized — CCW

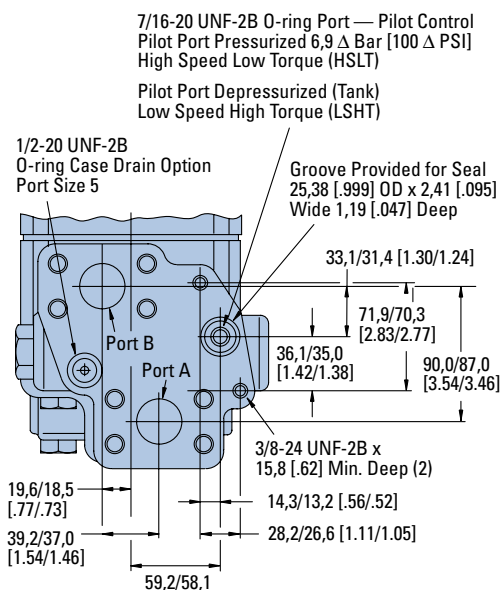
#### Two-Speed Standard Motors



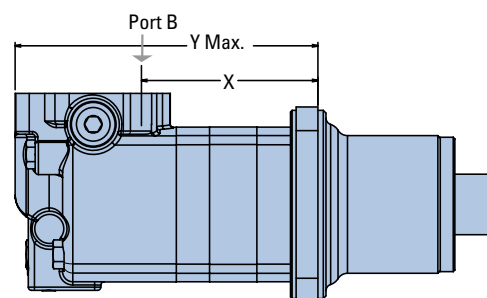
#### STANDARD MOUNT MOTOR DIMENSIONS

Displacement cm <sup>3</sup> /r [in <sup>3</sup> /r]	X mm [inch]	Y mm [inch]
345 [21.0]	270,8 [10.66]	392,7 [15.46]
480 [29.2]	283,5 [11.16]	405,4 [15.96]
665 [40.6]	283,5 [11.16]	405,4 [15.96]
940 [57.4]	301,8 [11.88]	423,7 [16.68]

#### 4 Bolt 1 1/4 Inch Split Flange Ports



#### Two-Speed Wheel Motors



#### WHEEL MOUNT MOTOR DIMENSIONS

Displacement cm <sup>3</sup> /r [in <sup>3</sup> /r]	X mm [inch]	Y mm [inch]
345 [21.0]	155,2 [6.11]	277,9 [10.94]
480 [29.2]	167,9 [6.61]	290,6 [11.44]
665 [40.6]	167,9 [6.61]	290,6 [11.44]
940 [57.4]	186,2 [7.33]	309,1 [12.17]



## 10,000 Series Two-Speed

### Dimensions

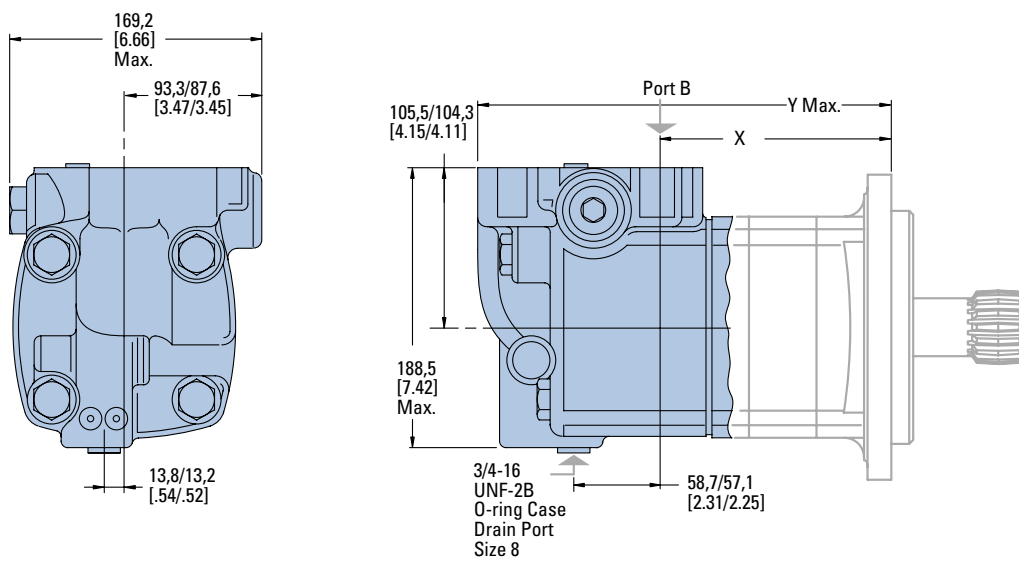
Bearingless

### Ports

- 1 5/16 -12 UN-2B SAE O-ring Staggered Ports (2)
- 3/4 -16 UNF-2B SAE O-ring Case Drain Port (1)
- 7/16 -20 UNF-2B SAE O-ring Pilot Control Port (1) or
- 4 bolt 1 1/4 inch Split Flange Ports (2)
- 3/4 -16 UNF-2B SAE O-ring Case Drain Port (1)
- 7/16 -20 UNF-2B SAE O-ring Pilot Control Port (1)

### Standard Rotation Viewed from Shaft End

- Port A Pressurized — CW
- Port B Pressurized — CCW



#### BEARINGLESS MOTOR DIMENSIONS

Displacement cm <sup>3</sup> /r [in <sup>3</sup> /r]	X mm [inch]	Y mm [inch]
345 [21.0]	146,3 [5.76]	268,2 [10.56]
480 [29.2]	159,0 [6.26]	280,9 [11.06]
665 [40.6]	159,0 [6.26]	280,9 [11.06]
940 [57.4]	177,3 [6.98]	299,5 [11.79]



## 10,000 Series Two-Speed Product Numbers

**Note:**

For 10,000 Series Motors with a configuration **Not Shown** in the chart below: Use model code number system on the page C-6-13 to specify product in detail.

Use digit prefix — 119-, 120-, or 121 - plus four digit number from charts for complete product number— Example 121-2002.

**Orders will not be accepted without three digit prefix.**

MOUNTING	SHAFT	PORT SIZE	DISPL. cm <sup>3</sup> /r [in <sup>3</sup> /r] / PRODUCT NUMBER			
			345 [21.0]	480 [29.3]	665 [40.6]	940 [57.4]
Standard	2 1/4 Inch Straight	1 5/16 O-ring	119-2013	-2014	-2015	-2016
		1 1/4 inch Split Flange	119-2001	-2002	-2003	-2004
	2 1/8 Inch 16 T Splined	1 5/16 O-ring	119-2021	-2022	-2023	-2024
		1 1/4 inch Split Flange	119-2009	-2010	-2011	-2012
	2 1/4 Inch Tapered	1 5/16 O-ring	119-2017	-2018	-2019	-2020
		1 1/4 inch Split Flange	119-2005	-2006	-2007	-2008
Wheel Motor	2 1/4 Inch Straight	1 1/4 inch Split Flange	120-2005	-2006	-2007	-2008
	2 1/8 Inch 16 T Splined	1 1/4 inch Split Flange	120-2009	-2010	-2011	-2012
	2 1/4 Inch Tapered	1 5/16 O-ring	120-2013	-2014	-2015	-2016
		1 1/4 inch Split Flange	120-2001	-2002	-2003	-2004
Bearingless		1 5/16 O-ring	121-2005	-2006	-2007	-2008
		1 1/4 inch Split Flange	121-2001	-2002	-2003	-2004

121-2002



### Order Numbers

FT Article Number	Eaton Code	Type
1248844	119-1028	CHAR-LYNN MOTOR SERIE 10.000
1248845	119-1029	CHAR-LYNN MOTOR SERIE 10.000
1248846	119-1030	CHAR-LYNN MOTOR SERIE 10.000
1248847	119-1031	CHAR-LYNN MOTOR SERIE 10.000
1248848	119-1032	CHAR-LYNN MOTOR SERIE 10.000
1427424	119-1032	CHAR-LYNN MOTOR SERIE 10.000
1248849	119-1033	CHAR-LYNN MOTOR SERIE 10.000
1248850	119-1034	CHAR-LYNN MOTOR SERIE 10.000
1248851	119-1035	CHAR-LYNN MOTOR SERIE 10.000
1427457	119-1035	CHAR-LYNN MOTOR SERIE 10.000
1248852	119-1040	CHAR-LYNN MOTOR SERIE 10.000
1410857	119-1041	CHAR-LYNN MOTOR SERIE 10.000
1248854	119-1042	CHAR-LYNN MOTOR SERIE 10.000
1248855	119-1043	CHAR-LYNN MOTOR SERIE 10.000
1434757	119-1043	CHAR-LYNN MOTOR SERIE 10.000
1417069	119-1045	CHAR-LYNN MOTOR SERIE 10.000
1248857	119-1046	CHAR-LYNN MOTOR SERIE 10.000
1248858	119-1047	CHAR-LYNN MOTOR SERIE 10.000
1248859	119-1065	CHAR-LYNN MOTOR SERIE 10.000
1429263	119-1095	CHAR-LYNN MOTOR SERIE 10.000
1431425	119-1119	CHAR-LYNN MOTOR SERIE 10.000
1411531	119-2002	CHAR-LYNN MOTOR SERIE 10.000
1422724	119-2003	CHAR-LYNN MOTOR SERIE 10.000
1417797	119-2004	CHAR-LYNN MOTOR SERIE 10.000
1426899	119-2010	CHAR-LYNN MOTOR SERIE 10.000
1427475	119-2011	CHAR-LYNN MOTOR SERIE 10.000
1418713	119-2012	CHAR-LYNN MOTOR SERIE 10.000
1248862	119-2013	CHAR-LYNN MOTOR SERIE 10.000
1432388	119-2013	CHAR-LYNN MOTOR SERIE 10.000
1248863	119-2014	CHAR-LYNN MOTOR SERIE 10.000
1434085	119-2014	CHAR-LYNN MOTOR SERIE 10.000
1434363	119-2014	CHAR-LYNN MOTOR SERIE 10.000
1248864	119-2015	CHAR-LYNN MOTOR SERIE 10.000
1248865	119-2016	CHAR-LYNN MOTOR SERIE 10.000
1248866	119-2021	CHAR-LYNN MOTOR SERIE 10.000
1248867	119-2022	CHAR-LYNN MOTOR SERIE 10.000
1248868	119-2023	CHAR-LYNN MOTOR SERIE 10.000
1416591	119-2023	CHAR-LYNN MOTOR SERIE 10.000
1248869	119-2024	CHAR-LYNN MOTOR SERIE 10.000
1248870	119-2034	CHAR-LYNN MOTOR SERIE 10.000
1248871	119-2036	CHAR-LYNN MOTOR SERIE 10.000
1248872	119-2038	CHAR-LYNN MOTOR SERIE 10.000
1323973	120-1007	CHAR-LYNN MOTOR SERIE 10.000
1429337	120-1010	CHAR-LYNN MOTOR SERIE 10.000
1428531	120-1011	CHAR-LYNN MOTOR SERIE 10.000
1434772	120-1012	CHAR-LYNN MOTOR SERIE 10.000
1426747	120-1015	CHAR-LYNN MOTOR SERIE 10.000
1405537	120-1020	CHAR-LYNN MOTOR SERIE 10.000
1428651	120-1024	CHAR-LYNN MOTOR SERIE 10.000
1414968	120-2005	CHAR-LYNN MOTOR SERIE 10.000
1414969	120-2006	CHAR-LYNN MOTOR SERIE 10.000
1341924	120-2007	CHAR-LYNN MOTOR SERIE 10.000



### Order Numbers

FT Article Number	Eaton Code	Type
1414970	120-2008	CHAR-LYNN MOTOR SERIE 10.000
1421379	121-1009	CHAR-LYNN MOTOR SERIE 10.000
1248875	121-1010	CHAR-LYNN MOTOR SERIE 10.000
1302110	121-1011	CHAR-LYNN MOTOR SERIE 10.000
1417602	121-1012	CHAR-LYNN MOTOR SERIE 10.000
1423115	121-1013	CHAR-LYNN MOTOR SERIE 10.000
1248876	121-1014	CHAR-LYNN MOTOR SERIE 10.000
1316874	121-2002	CHAR-LYNN MOTOR SERIE 10.000
1414966	121-2005	CHAR-LYNN MOTOR SERIE 10.000
1414967	121-2006	CHAR-LYNN MOTOR SERIE 10.000
1303702	121-2007	CHAR-LYNN MOTOR SERIE 10.000
1303703	121-2008	CHAR-LYNN MOTOR SERIE 10.000
1248877	121-2022	CHAR-LYNN MOTOR SERIE 10.000