EATON | Char-Lynn

Disc Valve Hydraulic Motors

State of the art motors benefiting from 45 years of experience and innovating constantly to fit your demands.

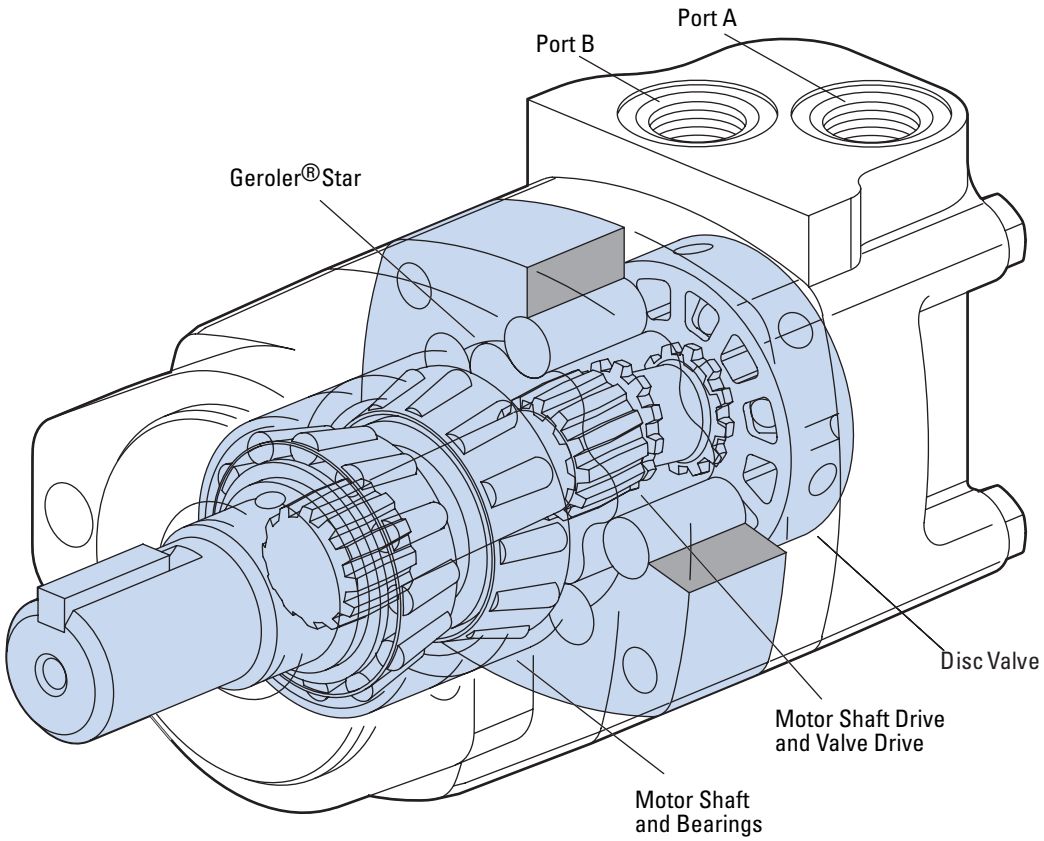
Disc Valve Hydraulic Motors

Highlights

Product Description

In the late 1950's the original low speed, high torque hydraulic motor was developed from a pump Geroter element consisting of an internal gear ring and a mating gear or star. While attaching the internal gear ring to the housing as a non moving part, oil was ported to pressurize and turn the internal star in an orbit around a center point. This slow turning star coupled with a splined drive to the output shaft became the Char-Lynn Orbit® motor.

A few years after this original Char-Lynn Orbit motor was introduced another original motor concept went into production. This motor had rolls incorporated into the internal gear ring, this element was identified by the name Geroler and is a registered trade name of Eaton Hydraulics. From these early years the Geroler motor has seen many design changes to make these Geroler motors the best the industry has to offer. Examine the simplicity of these Geroler disc valve motors shown below. Also examine all the following pages for high value Char-Lynn disc valve motors from Eaton Hydraulics.



Features, Benefits, and Applications

Features

Char-Lynn Hydraulic motors provide design flexibility. All disc valve motors are available with various configurations consisting of:

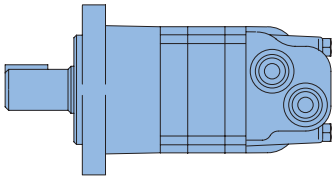
- Displacement (Geroler size)
- Output Shaft
- No Shaft and Bearing Assembly (Bearingless Motor)
- Port Configuration
- Mounting Flange
- Other Special Features

Benefits

- Lowest pressure drop motor in the industry
- Widest range of options
- The most experienced manufacturer of LSHT motors

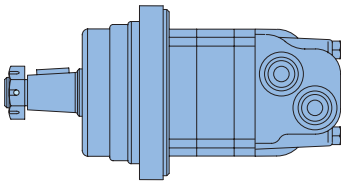
Applications

- Swing motor
- Brush Cutters & mowers
- Harvesting equipment
- Directional boring
- Turf equipment
- Skid Steer loaders
- Fairway mowers
- Harvesters
- Mowing
- Snow removal
- Sprayers
- Trencher
- Wood products
- Grinders and mixers
- Forestry equipment
- Irrigation reels



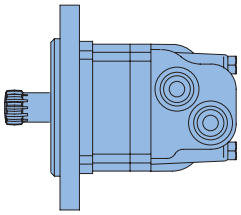
Standard Motor

The standard motor mounting flange is located as close to the output shaft as possible. This type of mounting supports the motor close to the shaft load. This mounting flange is also compatible with many standard gear boxes.



Wheel Motor

The wheel motor mounting flange is located near the center of the motor which permits part or all of the motor to be located inside the wheel or roller hub. In traction drive applications, loads can be positioned over the motor bearings for best bearing life. This wheel motor mounting flange provides design flexibility in many applications.



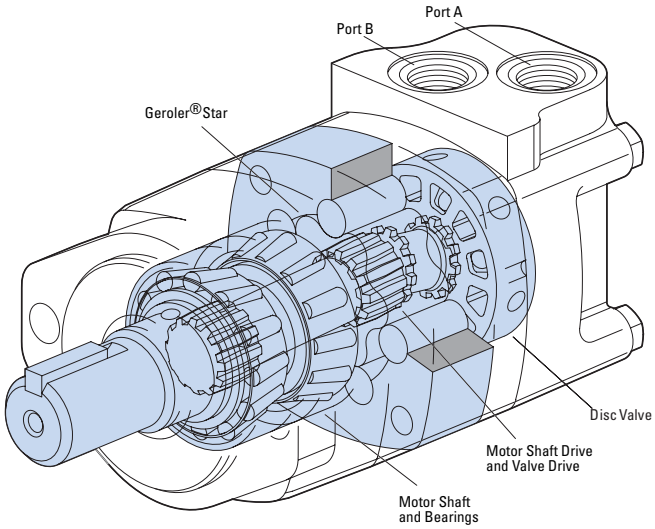
Bearingless Motor

The bearingless motor has the same drive components as the standard and wheel motors (with the exception that the motor is assembled without the output shaft, bearings and bearing housing). The bearingless motor is especially suited for applications such as gear boxes, winch drives, reel and roll drives. Bearingless motor applications must be designed with a bearing supported internal spline to mate with the bearingless motor drive. Product designs using these hydraulic motors provide considerable cost savings.

Table of Contents

2000 Series

Highlights



Description

The popular 2000 Series provides torque up to 7500 lb-in. This proven design is reliable and durable. Eaton has added options that make the motor more flexible to use in a wide variety of applications. The integral cross-over relief valve is the latest innovation in the 2000 series motors.

2000 Series

Geroler Element	10 Displacements
Flow l/min [GPM]	75 [20] Continuous**
	115 [30] Intermittent*
Speed RPM	908 Cont.**
	1042 Inter.*
Pressure bar [PSI]	200 [3000] Cont.**
	300 [4500] Inter.*
Torque Nm [lb-in]	845 [7470] Cont.**
	930 [8225] Inter.*

** Continuous— (Cont.) Continuous rating, motor may be run continuously at these ratings.
* Intermittent— (Inter.) Intermittent operation, 10% of every minute.

Features

- Three zone design for longer life and true bi-directionality.
- Bearings that meet the highest standards of the industry
- Options to optimize performance in every application
- Integrated cross-over relief valve option

Benefits

- Easy to design in a system
- Reliablity and performance in tough application
- Compact design of the integrated cross-over relief valve option

Applications

- Skid Steer Attachments
- Swing Motor
- Brush Cutters & Mowers
- Harvesting Equipment
- Directional Boring any place pressure relief protection is optimal for system or motor performance and life
- Turf equipment


Auger

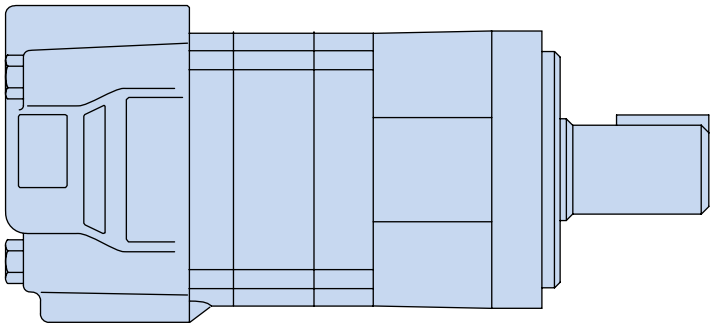

Boring


Plastic Injection


Oil and Gas Equipment

2000 Series

Specifications



SPECIFICATION DATA — 2000 SERIES MOTORS

Displ. cm³/r [in³/r]		80 [4.9]	90 [5.5]	100 [6.2]	130 [8.0]	160 [9.6]	195 [11.9]	245 14.9]	305 [18.7]	395 [24.0]	490 [29.8]
Max. Speed (RPM) @ Flow	Continuous	908	836	742	576	477	385	308	246	191	153
	Intermittent	908	1042	924	720	713	577	462	365	287	230
Flow l/min [GPM]	Continuous	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]
	Intermittent	75 [20]	95 [25]	95 [25]	95 [25]	115 [30]	115 [30]	115 [30]	115 [30]	115 [30]	115 [30]
Torque* Nm [lb-in]	Continuous	235 [2065]	265 [2326]	295 [2630]	385 [3420]	455 [4040]	540 [4780]	660 [5850]	765 [6750]	775 [6840]	845 [7470]
	Intermittent	345 [3035]	390 [3458]	445 [3950]	560 [4970]	570 [5040]	665 [5890]	820 [7250]	885 [7820]	925 [8170]	930 [8225]
Pressure Δ bar [Δ PSI]	Continuous	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	155 [2250]	120 [1750]
	Intermittent	310 [4500]	310 [4500]	310 [4500]	310 [4500]	260 [3750]	260 [3750]	260 [3750]	260 [3700]	170 [2750]	140 [2000]
	Peak	310 [4500]	310 [4500]	310 [4500]	310 [4500]	310 [4500]	310 [4500]	310 [4500]	310 [4500]	205 [3250]	170 [2500]
Weight kg [lb]	Standard or Wheel Mount	9.3 [20.5]	9.3 [20.5]	9.5 [21.0]	9.8 [21.5]	10.0 [22.0]	10.4 [23.0]	10.9 [24.0]	11.3 [25.0]	11.8 [26.0]	12.2 [27.0]
	Bearingless	7.3 [16.0]	7.3 [16.0]	7.5 [16.5]	7.7 [17.0]	7.9 [17.5]	8.4 [18.5]	8.8 [18.5]	9.3 [20.5]	9.8 [21.5]	10.2 [22.5]

Maximum Case Pressure: See case pressure seal limitation graph.

*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:

310 bar [4500 PSI]

Do not exceed Δ pressure rating (see chart above).

Maximum Return Pressure:

310 bar [4500 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

2000 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

80 cm³/r [4.9 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[500] 35	[1000] 70	[1500] 105	[2000] 140	[2500] 170	[3000] 205	[3500] 240	[4000] 275	[4500] 310
[.25] ,95	[210] 25 **3**	[420] 45 **1**							
[.5] 1,9	[250] 30 **17**	[500] 50 **8**	[740] 85 **3**						
[1] 3,8	[330] 35 **44**	[670] 75 **40**	[990] 110 **37**	[1300] 145 **34**	[1550] 175 **28**	[1800] 205 **22**	[1950] 220 **14**	[2110] 240 **2**	
[2] 7,5	[330] 35 **90**	[670] 75 **85**	[995] 110 **81**	[1310] 150 **78**	[1580] 180 **72**	[1840] 210 **65**	[2100] 235 **57**	[2365] 265 **49**	[2630] 295 **42**
[4] 15	[325] 35 **182**	[670] 75 **176**	[1005] 115 **170**	[1330] 150 **166**	[1620] 185 **159**	[1920] 215 **152**	[2200] 250 **140**	[2480] 280 **128**	[2765] 310 **117**
[6] 23	[320] 35 **273**	[665] 75 **267**	[1010] 115 **259**	[1340] 150 **254**	[1655] 185 **246**	[1975] 225 **238**	[2270] 255 **223**	[2570] 290 **207**	[2880] 325 **192**
[8] 30	[310] 35 **365**	[660] 75 **375**	[1015] 115 **349**	[1345] 150 **341**	[1685] 190 **333**	[2020] 230 **325**	[2330] 265 **306**	[2640] 300 **286**	[2960] 335 **266**
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[20] 76	[210] 25 **908**	[570] 65 **901**	[930] 105 **880**	[1290] 145 **861**	[1645] 185 **851**	[1985] 225 **842**	[2305] 260 **799**	[2600] 295 **755**	[2845] 320 **712**

[570] 65 **901** } Torque [lb-in] Nm **Speed RPM**

90 cm³/r [5.5 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[1000] 70	[1500] 105	[2000] 140	[2500] 170	[3000] 205	[3500] 240	[4000] 275	[4500] 310
[.25] ,95	[124] 14 **5**	[233] 26 **2**	[471] 53 **1**							
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[2] 7,5	[151] 17 **82**	[358] 40 **80**	[744] 84 **76**	[1099] 124 **72**	[1439] 163 **68**	[1737] 196 **61**	[2015] 228 **50**	[2293] 259 **38**	[2570] 290 **29**	[2855] 323 **20**
[4] 15	[151] 17 **167**	[350] 40 **163**	[899] 102 **158**	[1113] 126 **152**	[1473] 166 **148**	[1800] 203 **139**	[2132] 241 **126**	[2454] 277 **115**	[2775] 314 **102**	[3100] 350 **90**
[6] 23	[142] 16 **250**	[348] 39 **245**	[736] 83 **240**	[613] 69 **233**	[1492] 169 **227**	[1851] 209 **218**	[2208] 249 **203**	[2552] 288 **191**	[2898] 327 **176**	[3249] 367 **161**
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[14] 53	[98] 11 **585**	[298] 34 **575**	[706] 80 **567**	[1115] 126 **559**	[1525] 172 **543**	[1924] 217 **529**	[2326] 263 **521**	[2707] 306 **493**	[3080] 348 **467**	[3450] 390 **431**
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2000 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

100 cm³/r [6.2 in³/r]
Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[1000] 70	[1500] 105	[2000] 140	[2500] 170	[3000] 205	[3500] 240	[4000] 275	[4500] 310
[.25] ,95	[140] 15 **4**	[260] 30 **2**								
[.5] 1,9	[150] 15 **13**	[300] 35 **9**	[620] 70 **5**	[940] 105 **2**						
[1] 3,8	[170] 20 **35**	[390] 45 **34**	[830] 95 **31**	[1210] 135 **28**	[1570] 175 **23**	[1870] 210 **15**	[2130] 240 **6**			
[2] 7,5	[170] 20 **73**	[390] 45 **71**	[830] 95 **68**	[1220] 140 **63**	[1590] 180 **59**	[1920] 215 **51**	[2220] 250 **38**	[2520] 285 **24**	[2810] 315 **14**	[3120] 355 **4**
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[22] 83	[40] 5 **816**	[260] 30 **813**	[720] 80 **805**	[1180] 135 **794**	[1620] 185 **777**	[2070] 235 **758**	[2500] 280 **749**	[2930] 330 **712**	[3360] 380 **687**	
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[1560] 175 **890** } Torque [lb-in] Nm **Speed RPM**

130 cm³/r [8.0 in³/r]
Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[1000] 70	[1500] 105	[2000] 140	[2500] 170	[3000] 205	[3500] 240	[4000] 275	[4500] 310
[.25] ,95	[170] 20 **3**									
[.5] 1,9	[190] 20 **12**	[410] 45 **8**	[870] 100 **2**							
[1] 3,8	[230] 25 **28**	[510] 60 **27**	[1070] 120 **23**	[1580] 180 **19**	[2050] 230 **16**	[2520] 285 **13**	[2920] 330 **9**	[3310] 375 **3**		
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[4] 15	[220] 25 **114**	[500] 55 **113**	[1080] 120 **111**	[1620] 185 **104**	[2150] 245 **97**	[2660] 300 **95**	[3100] 350 **92**	[3540] 400 **85**	[3980] 450 **77**	[4420] 500 **70**
[6] 23	[220] 25 **172**	[490] 55 **171**	[1080] 120 **169**	[1640] 185 **161**	[2190] 245 **153**	[2740] 310 **149**	[3260] 370 **146**	[3770] 425 **132**	[4280] 485 **118**	[4800] 540 **104**
[8] 30	[200] 25 **230**	[480] 55 **224**	[1080] 120 **222**	[1650] 185 **219**	[2220] 250 **210**	[2780] 315 **204**	[3310] 375 **201**	[3840] 435 **192**	[4360] 495 **184**	[4890] 550 **175**
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[16] 61	[130] 15 **461**	[420] 45 **460**	[1010] 115 **452**	[1600] 180 **447**	[2200] 250 **443**	[2780] 315 **430**	[3330] 375 **411**	[3890] 440 **397**	[4440] 500 **384**	
[18] 68	[110] 10 **518**	[400] 45 **517**	[990] 110 **509**	[1580] 180 **504**	[2160] 245 **500**	[2750] 310 **484**	[3300] 375 **471**	[3860] 435 **456**	[4410] 500 **440**	
[20] 76	[90] 10 **576**	[380] 45 **575**	[960] 110 **568**	[1550] 175 **560**	[2130] 240 **551**	[2710] 305 **539**	[3280] 370 **524**	[3840] 435 **508**		
[22] 83	[60] 5 **634**	[350] 40 **633**	[940] 105 **624**	[1520] 170 **619**	[2100] 235 **604**	[2680] 305 **597**	[3250] 365 **579**	[3820] 430 **560**		
[24] 91	[40] 5 **692**	[325] 35 **691**	[920] 105 **682**	[1490] 170 **676**	[2070] 235 **665**	[2650] 300 **651**	[3220] 365 **633**	[3780] 425 **616**		
[25] 95	[20] 1,0 **720**	[310] 35 **719**	[900] 100 **712**	[1480] 165 **705**	[2050] 230 **692**	[2630] 295 **679**	[3200] 360 **682**	[3700] 420 **656**		

2000 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

160 cm³/r [9.6 in³/r]
Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[1000] 70	[1500] 105	[2000] 140	[2500] 170	[3000] 205	[3500] 240	[3750] 260
[.25] ,95	[200] 25 **3**								
[.5] 1,9	[240] 25 **9**	[490] 55 **7**	[990] 110 **5**	[1570] 175 **3**	[2140] 240 **1**				
[1] 3,8	[280] 30 **23**	[590] 65 **21**	[1170] 130 **19**	[1730] 195 **17**	[2290] 260 **13**	[2830] 320 **8**	[3330] 375 **3**	[3820] 430 **2**	[4070] 460 **1**
[2] 7.5	[300] 35 **46**	[610] 70 **45**	[1210] 135 **42**	[1790] 200 **39**	[2350] 265 **35**	[2920] 330 **34**	[3480] 395 **33**	[4050] 460 **28**	[4330] 490 **22**
[4] 15	[320] 35 **93**	[630] 70 **92**	[1260] 140 **89**	[1890] 215 **85**	[2530] 285 **79**	[3170] 360 **77**	[3820] 430 **75**	[4460] 505 **59**	[4780] 540 **43**
[6] 23	[320] 35 **142**	[650] 75 **140**	[1300] 145 **137**	[1960] 220 **131**	[2620] 295 **124**	[3280] 370 **118**	[3940] 445 **113**	[4600] 520 **104**	[4930] 560 **96**
[8] 30	[310] 35 **190**	[650] 75 **187**	[1330] 150 **184**	[2010] 225 **178**	[2670] 300 **170**	[3330] 375 **166**	[4000] 450 **164**	[4660] 525 **153**	[4990] 565 **142**
[10] 38	[290] 35 **237**	[640] 70 **235**	[1340] 150 **231**	[2030] 230 **226**	[2850] 320 **217**	[3410] 385 **212**	[4030] 455 **205**	[4700] 530 **193**	[5030] 570 **187**
[12] 45	[270] 30 **286**	[620] 70 **283**	[1320] 150 **279**	[2030] 230 **274**	[2700] 305 **265**	[3370] 380 **254**	[4040] 455 **246**	[4710] 530 **235**	[5040] 570 **224**
[14] 53	[240] 25 **334**	[590] 65 **331**	[1300] 145 **326**	[2020] 230 **322**	[2690] 305 **312**	[3360] 380 **305**	[4030] 455 **297**	[4700] 530 **286**	
[16] 61	[220] 25 **382**	[570] 65 **378**	[1270] 145 **374**	[1980] 225 **369**	[2660] 300 **360**	[3330] 375 **349**	[4010] 455 **339**	[4680] 530 **326**	
[18] 68	[190] 20 **429**	[540] 60 **426**	[1240] 140 **422**	[1960] 220 **416**	[2640] 300 **407**	[3320] 375 **394**	[3990] 450 **387**		
[20] 76	[170] 20 **477**	[510] 60 **474**	[1210] 135 **469**	[1920] 215 **462**	[2630] 300 **451**	[3310] 375 **440**	[3940] 445 **430**		
[22] 83	[150] 15 **525**	[480] 55 **522**	[1170] 130 **517**	[1880] 210 **510**	[2600] 295 **501**	[3290] 370 **484**	[3920] 445 **473**		
[24] 91	[120] 15 **572**	[450] 50 **569**	[1150] 130 **564**	[1860] 210 **556**	[2570] 290 **546**	[3260] 370 **531**	[3900] 440 **522**		
[25] 95	[90] 10 **596**	[440] 50 **593**	[1140] 130 **587**	[1840] 210 **580**	[2560] 290 **566**	[3230] 365 **553**	[3880] 440 **544**		
[30] 114		[330] 35 **713**	[1040] 120 **706**	[1750] 200 **696**	[2470] 280 **682**	[3140] 355 **672**	[3800] 430 **658**		

[330] 35 **713** } Torque [lb-in] Nm **Speed RPM**

195 cm³/r [11.9 in³/r]
Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140	[2250] 155	[2500] 170	[2750] 190	[3000] 205	[3250] 225	[3500] 240	[3750] 260
[.25] ,95	[240] 25 **4**	[590] 65 **2**													
[.5] 1,9	[290] 35 **8**	[640] 70 **6**	[990] 110 **5**	[1340] 150 **2**											
[1] 3,8	[380] 45 **17**	[730] 80 **16**	[1100] 125 **15**	[1430] 160 **14**	[1790] 200 **13**	[2120] 200 **11**	[2450] 275 **9**	[2720] 305 **7**	[2990] 340 **5**	[3260] 370 **4**	[3540] 400 **3**	[3810] 430 **2**	[4080] 460 **2**	[4350] 490 **1**	[4620] 520 **1**
[2] 7,5	[390] 45 **37**	[755] 85 **35**	[1135] 130 **34**	[1470] 165 **33**	[1860] 210 **32**	[2195] 250 **31**	[2535] 285 **28**	[2880] 325 **26**	[3120] 355 **24**	[3680] 415 **21**	[4090] 460 **20**	[4500] 510 **19**	[4800] 540 **17**	[5100] 575 **14**	[5400] 610 **14**
[4] 15	[405] 45 **76**	[795] 90 **74**	[1185] 135 **73**	[1540] 175 **72**	[1970] 225 **71**	[2310] 260 **70**	[2675] 300 **66**	[3040] 345 **64**	[3420] 385 **62**	[3790] 430 **61**	[4160] 470 **59**	[4520] 510 **57**	[4890] 550 **55**	[5260] 595 **51**	[5630] 635 **45**
[6] 23	[405] 45 **115**	[815] 90 **113**	[1220] 140 **111**	[1590] 180 **110**	[2035] 230 **109**	[2395] 270 **108**	[2780] 315 **104**	[3170] 360 **102**	[3560] 400 **100**	[3940] 445 **99**	[4320] 490 **96**	[4700] 530 **94**	[5070] 570 **91**	[5450] 615 **87**	[5830] 660 **81**
[8] 30	[400] 45 **154**	[820] 90 **151**	[1230] 140 **149**	[1625] 185 **148**	[2065] 235 **147**	[2450] 275 **146**	[2850] 320 **143**	[3260] 370 **140**	[3670] 415 **137**	[4040] 455 **135**	[4410] 500 **132**	[4780] 540 **130**	[5150] 580 **127**	[5520] 625 **123**	[5890] 665 **117**
[10] 38	[380] 45 **193**	[810] 95 **190**	[1230] 140 **188**	[1645] 185 **187**	[2095] 235 **186**	[2480] 280 **184**	[2895] 325 **181**	[3310] 375 **177**	[3730] 420 **175**	[4100] 465 **173**	[4470] 505 **170**	[4840] 545 **168**	[5210] 590 **164**	[5590] 630 **160**	
[12] 45	[355] 40 **231**	[790] 90 **229**	[1215] 135 **227**	[1650] 185 **226**	[2100] 235 **224**	[2485] 280 **221**	[2915] 330 **219**	[3340] 375 **218**	[3760] 425 **215**	[4120] 465 **211**	[4480] 505 **208**	[4850] 550 **204**			
[14] 53	[320] 35 **269**	[765] 85 **267**	[1190] 135 **267**	[1645] 185 **264**	[2090] 235 **261**	[2475] 280 **260**	[2915] 330 **257**	[3350] 380 **254**	[3770] 425 **250**	[4130] 465 **248**	[4480] 505 **245**	[4860] 550 **241**			
[16] 61	[290] 30 **308**	[730] 80 **306**	[1160] 130 **305**	[1625] 185 **303**	[2070] 235 **299**	[2455] 275 **296**	[2900] 330 **294**	[3340] 375 **290**	[3760] 425 **286**	[4130] 465 **283**	[4490] 505 **279**	[4860] 550 **276**			
[18] 68	[290] 30 **346**	[690] 80 **345**	[1120] 125 **345**	[1590] 180 **342**	[2035] 230 **337**	[2420] 270 **334**	[2870] 325 **333**	[3310] 375 **327**	[3730] 420 **321**	[4100] 465 **315**	[4480] 505 **308**				
[20] 76	[210] 25 **385**	[650] 75 **384**	[1080] 120 **383**	[1550] 175 **380**	[1995] 225 **375**	[2380] 270 **372**	[2830] 320 **371**	[3270] 370 **367**	[3690] 415 **363**	[4070] 460 **359**	[4450] 500 **355**				
[22] 83	[170] 20 **424**	[610] 70 **423**	[1040] 120 **422**	[1500] 170 **418**	[1955] 220 **414**	[2340] 265 **410**	[2785] 315 **408**	[3220] 365 **404**	[3640] 410 **399**	[4050] 460 **395**					
[24] 91	[135] 15 **462**	[570] 65 **461**	[1000] 115 **460**	[1440] 165 **457**	[1910] 215 **453**	[2300] 260 **449**	[2740] 310 **446**	[3170] 360 **441**	[3590] 405 **436**	[3980] 450 **432**					
[25] 95	[120] 15 **484**	[550] 60 **482**	[980] 110 **479**	[1410] 160 **476**	[1890] 215 **473**	[2280] 260 **469**	[2720] 305 **464**	[3150] 355 **459**	[3570] 405 **454**	[3960] 445 **449**					
[30] 114		[420] 45 **577**	[860] 95 **575**	[1290] 145 **571**	[1700] 190 **567**	[2120] 240 **562**	[2530] 285 **556**	[2940] 330 **550**	[3400] 385 **542**						

2000 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

245 cm³/r [14.9 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140	[2250] 155	[2500] 170	[2750] 190	[3000] 205	[3250] 225	[3500] 240	[3750] 260
[.5] 1,9	[410] 45 **4**	[850] 95 **2**													
[1] 3,8	[450] 50 **14**	[930] 105 **13**	[1420] 160 **12**	[1850] 210 **11**	[2320] 260 **10**	[2780] 315 **9**	[3250] 365 **8**	[3650] 410 **6**	[4100] 465 **5**	[4540] 515 **4**	[4980] 560 **4**	[5430] 615 **3**	[5870] 665 **2**	[6310] 715 **1**	
[2] 7,5	[460] 50 **29**	[960] 110 **28**	[1460] 165 **27**	[1900] 215 **26**	[2400] 270 **25**	[2860] 325 **23**	[3340] 375 **22**	[3780] 425 **20**	[4320] 490 **19**	[4770] 540 **18**	[5210] 590 **17**	[5660] 640 **15**	[6110] 690 **14**	[6570] 740 **12**	[6950] 785 **10**
[4] 15	[470] 55 **60**	[1000] 115 **59**	[1540] 175 **58**	[1980] 225 **56**	[2510] 285 **54**	[3010] 340 **53**	[3480] 395 **51**	[3980] 450 **49**	[4450] 505 **48**	[4910] 555 **47**	[5380] 610 **47**	[5850] 660 **46**	[6320] 715 **45**	[6780] 765 **44**	[7250] 820 **42**
[6] 23	[460] 50 **91**	[1020] 115 **90**	[1550] 175 **89**	[2040] 230 **87**	[2580] 290 **84**	[3110] 350 **83**	[3590] 405 **81**	[4120] 465 **78**	[4580] 515 **76**	[5050] 570 **73**	[5520] 625 **71**	[5980] 675 **69**	[6440] 730 **67**	[6910] 780 **65**	
[8] 30	[460] 50 **122**	[1010] 115 **121**	[1560] 175 **120**	[2080] 235 **118**	[2630] 295 **115**	[3170] 360 **113**	[3670] 415 **111**	[4210] 475 **108**	[4680] 530 **106**	[5160] 585 **104**	[5630] 635 **102**	[6110] 690 **101**	[6590] 745 **99**		
[10] 38	[440] 50 **153**	[1000] 115 **152**	[1550] 175 **150**	[2110] 240 **148**	[2650] 300 **146**	[3200] 360 **144**	[3730] 420 **142**	[4250] 480 **139**	[4730] 535 **137**	[5210] 560 **135**	[5720] 645 **133**	[6230] 705 **103**			
[12] 45	[410] 45 **184**	[960] 110 **183**	[1530] 175 **182**	[2100] 235 **180**	[2640] 300 **177**	[3190] 360 **175**	[3760] 425 **173**	[4260] 480 **170**	[4740] 535 **168**	[5220] 600 **165**	[5730] 645 **162**				
[14] 53	[380] 40 **215**	[910] 105 **214**	[1500] 170 **213**	[2080] 235 **211**	[2600] 295 **209**	[3160] 355 **207**	[3760] 425 **204**	[4230] 480 **201**	[4710] 530 **198**	[5190] 585 **195**					
[16] 61	[340] 40 **246**	[860] 95 **245**	[1460] 165 **244**	[2040] 230 **242**	[2570] 290 **240**	[3120] 355 **238**	[3740] 425 **235**	[4180] 470 **232**	[4660] 525 **227**	[5140] 580 **223**					
[18] 68	[290] 30 **277**	[810] 90 **276**	[1420] 160 **275**	[2000] 225 **273**	[2520] 285 **271**	[3060] 345 **269**	[3700] 420 **266**	[4130] 465 **263**	[4610] 520 **258**	[5090] 575 **253**					
[20] 76	[250] 30 **308**	[800] 90 **306**	[1350] 155 **304**	[1910] 215 **302**	[2460] 280 **300**	[3010] 340 **298**	[3630] 410 **295**	[4110] 465 **291**	[4610] 520 **288**						
[22] 83	[200] 25 **339**	[710] 80 **337**	[1300] 145 **337**	[1870] 210 **334**	[2390] 270 **332**	[2940] 330 **330**	[3560] 400 **327**	[4010] 455 **323**	[4510] 510 **318**						
[24] 91	[150] 15 **370**	[670] 75 **369**	[1240] 140 **367**	[1790] 200 **364**	[2330] 265 **362**	[2880] 325 **360**	[3460] 390 **357**	[3960] 445 **353**	[4460] 505 **344**						
[25] 95	[120] 15 **385**	[660] 75 **384**	[1210] 135 **382**	[1750] 200 **379**	[2300] 260 **377**	[2860] 325 **375**	[3410] 385 **372**	[3950] 445 **367**	[4470] 505 **363**						
[30] 114		[520] 60 **462**	[1080] 120 **460**	[1620] 185 **458**	[2180] 245 **456**	[2720] 305 **453**	[3260] 370 **450**	[3790] 430 **447**							

[3260] 370 **450** } Torque [lb-in] Nm **Speed RPM**

305 cm³/r [18.7 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140	[2250] 155	[2500] 170	[2750] 190	[3000] 205	[3250] 225	[3500] 240
[.5] 1,9	[500] 55 **4**	[1050] 120 **2**												
[1] 3,8	[610] 70 **12**	[1180] 135 **11**	[1750] 200 **11**	[2330] 260 **10**	[2870] 325 **10**	[3440] 390 **9**	[3930] 445 **8**	[4410] 500 **6**	[4900] 555 **3**	[5380] 610 **1**				
[2] 7,5	[620] 70 **24**	[1210] 135 **24**	[1800] 205 **23**	[2400] 270 **22**	[2970] 335 **22**	[3510] 395 **20**	[4050] 460 **19**	[4600] 520 **18**	[5140] 580 **17**	[5680] 640 **15**	[6220] 705 **13**	[6750] 765 **11**	[7290] 825 **8**	[7820] 885 **6**
[4] 15	[680] 75 **49**	[1250] 140 **49**	[1880] 210 **48**	[2500] 280 **47**	[3120] 355 **47**	[3690] 415 **45**	[4260] 480 **43**	[4840] 545 **42**	[5410] 610 **40**	[5980] 675 **38**	[6550] 740 **36**	[7120] 805 **34**	[7690] 870 **33**	
[6] 23	[620] 70 **74**	[1270] 145 **74**	[1920] 215 **72**	[2560] 290 **72**	[3230] 365 **71**	[3810] 430 **69**	[4390] 495 **66**	[4970] 560 **64**	[5560] 630 **61**	[6130] 695 **58**	[6710] 760 **55**	[7290] 825 **52**		
[8] 30	[600] 70 **98**	[1270] 145 **98**	[1940] 220 **97**	[2600] 295 **96**	[3290] 370 **95**	[3880] 440 **93**	[4470] 505 **90**	[5070] 575 **86**	[5660] 640 **83**	[6250] 705 **80**	[6840] 775 **77**			
[10] 38	[570] 65 **123**	[1250] 140 **122**	[1940] 220 **121**	[2610] 295 **120**	[3310] 375 **119**	[3920] 440 **117**	[4530] 510 **113**	[5150] 580 **110**	[5760] 650 **106**	[6370] 720 **102**				
[12] 45	[530] 60 **148**	[1220] 140 **147**	[1920] 215 **145**	[2600] 295 **144**	[3300] 375 **143**	[3920] 440 **142**	[4530] 510 **138**	[5150] 580 **133**	[5760] 650 **128**	[6370] 720 **124**				
[14] 53	[480] 55 **172**	[1180] 135 **172**	[1870] 210 **170**	[2560] 290 **168**	[3260] 370 **167**	[3900] 440 **165**	[4510] 510 **160**	[5120] 580 **156**	[5730] 645 **152**					
[16] 61	[430] 50 **196**	[1120] 125 **196**	[1820] 205 **194**	[2500] 280 **192**	[3210] 365 **191**	[3870] 440 **188**	[4480] 505 **183**	[5080] 575 **178**	[5690] 645 **174**					
[18] 68	[370] 40 **221**	[1060] 120 **221**	[1760] 200 **218**	[2440] 275 **217**	[3140] 355 **215**	[3800] 440 **212**	[4420] 500 **207**	[5050] 570 **202**						
[20] 76	[320] 35 **246**	[980] 110 **245**	[1680] 190 **243**	[2360] 265 **241**	[3050] 345 **239**	[3710] 420 **236**	[4370] 495 **231**	[5020] 565 **226**						
[22] 83	[240] 25 **271**	[920] 105 **270**	[1620] 185 **268**	[2300] 260 **266**	[2990] 340 **263**	[3560] 400 **260**	[4190] 475 **258**	[4820] 545 **255**						
[24] 91	[180] 20 **296**	[870] 100 **294**	[1550] 175 **293**	[2240] 255 **290**	[2920] 330 **288**	[3420] 385 **285**	[4020] 455 **283**	[4630] 525 **280**						
[25] 95	[150] 15 **308**	[840] 95 **307**	[1520] 170 **305**	[2200] 250 **303**	[2890] 325 **300**	[3340] 375 **298**	[3930] 445 **295**	[4520] 510 **293**						
[30] 114		[680] 75 **365**	[1360] 155 **362**	[2040] 230 **360**	[2720] 305 **357**	[3140] 355 **356**	[3810] 430 **352**							

2000 Series

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

Continuous | Peak | Intermittent | No Operation

490 cm³/r [29.8 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140
[.5] **1,9**	[670] 75 **2**	[1600] 180 **1**						
[1] **3,8**	[920] 105 **7**	[2000] 225 **6**	[2990] 340 **5**	[3900] 440 **4**	[4880] 550 **2**			
[2] **7,5**	[950] 105 **14**	[2060] 235 **13**	[3110] 350 **12**	[4080] 460 **10**	[5110] 575 **9**	[6320] 715 **7**		
[4] **15**	[980] 110 **30**	[2130] 240 **29**	[3230] 365 **28**	[4270] 480 **27**	[5350] 605 **26**	[6370] 720 **24**	[7380] 835 **22**	[7980] 900 **20**
[6] **23**	[980] 110 **45**	[2120] 240 **44**	[3230] 365 **43**	[4300] 485 **42**	[5370] 605 **41**	[6420] 725 **39**	[7470] 845 **37**	[8225] 930 **35**
[8] **30**	[980] 110 **61**	[2110] 240 **60**	[3220] 365 **59**	[4330] 490 **58**	[5400] 610 **57**	[6470] 730 **55**	[7550] 855 **52**	
[10] **38**	[920] 105 **76**	[2050] 230 **75**	[3170] 360 **74**	[4300] 485 **73**	[5390] 610 **72**	[6460] 730 **70**	[7550] 855 **68**	
[12] **45**	[860] 95 **91**	[1990] 225 **90**	[3120] 355 **90**	[4260] 480 **89**	[5370] 605 **87**	[6460] 730 **85**	[7560] 855 **84**	
[14] **53**	[790] 90 **106**	[1930] 220 **105**	[3055] 345 **105**	[4185] 475 **104**	[5300] 600 **102**	[6400] 725 **100**		
[16] **61**	[720] 80 **122**	[1870] 210 **121**	[2990] 340 **120**	[4110] 465 **119**	[5230] 590 **118**	[6340] 715 **116**		
[18] **68**	[630] 70 **137**	[1770] 200 **136**	[2890] 325 **135**	[4020] 455 **134**	[5140] 580 **133**	[6260] 705 **131**		
[20] **76**	[550] 60 **153**	[1670] 190 **152**	[2800] 315 **151**	[3940] 445 **150**	[5060] 570 **149**	[6180] 700 **146**		
[22] **83**	[450] 50 **168**	[1570] 175 **168**	[2700] 305 **167**	[3830] 435 **165**	[4960] 560 **164**	[6070] 685 **161**		
[24] **91**	[360] 40 **184**	[1480] 165 **184**	[2600] 295 **183**	[3730] 420 **181**	[4860] 550 **179**	[5970] 675 **177**		
[26] **98**	[270] 30 **199**	[1390] 155 **195**	[2510] 285 **194**	[3640] 410 **192**	[4770] 540 **190**			
[28] **106**		[1260] 140 **212**	[2370] 270 **211**	[3520] 400 **209**	[4630] 525 **207**			
[30] **114**		[1130] 125 **230**	[2240] 255 **229**	[3400] 385 **277**	[4500] 510 **224**			

395 cm³/r [24.0 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140	[2250] 155	[2500] 170	[2750] 190
[.5] **1,9**	[560] 65 **4**	[1310] 150 **3**									
[1] **3,8**	[770] 85 **9**	[1540] 175 **9**	[2290] 260 **9**	[3080] 350 **8**	[3780] 430 **8**	[4480] 505 **7**	[5170] 585 **7**	[5880] 665 **6**	[6580] 745 **5**	[7270] 820 **4**	[7980] 900 **3**
[2] **7,5**	[790] 90 **18**	[1580] 180 **18**	[2360] 265 **18**	[3180] 360 **17**	[3930] 445 **17**	[4680] 530 **16**	[5430] 615 **15**	[6180] 700 **14**	[6840] 775 **13**	[7500] 845 **11**	[8170] 925 **10**
[4] **15**	[810] 90 **37**	[1660] 190 **37**	[2480] 280 **37**	[3320] 375 **36**	[4130] 465 **36**	[4940] 560 **35**	[5740] 650 **34**	[6550] 740 **33**	[7230] 815 **31**	[7880] 890 **28**	
[6] **23**	[820] 90 **57**	[1700] 190 **56**	[2550] 290 **56**	[3420] 385 **55**	[4250] 480 **54**	[5080] 575 **52**	[5920] 670 **50**	[6750] 765 **49**	[7420] 840 **47**	[8000] 905 **45**	
[8] **30**	[820] 90 **76**	[1700] 190 **75**	[2580] 290 **75**	[3460] 390 **74**	[4300] 485 **73**	[5130] 580 **71**	[5960] 675 **69**	[6800] 770 **68**			
[10] **38**	[800] 90 **95**	[1700] 190 **94**	[2590] 295 **94**	[3480] 395 **93**	[4320] 490 **92**	[5160] 585 **90**	[6000] 680 **88**	[6840] 775 **86**			
[12] **45**	[770] 85 **114**	[1680] 190 **113**	[2570] 290 **113**	[3470] 390 **112**	[4310] 485 **111**	[5150] 580 **109**	[5990] 675 **106**	[6830] 770 **103**			
[14] **53**	[740] 85 **133**	[1640] 185 **132**	[2530] 285 **132**	[3430] 390 **131**	[4280] 485 **129**	[5120] 580 **127**	[5960] 675 **124**				
[16] **61**	[690] 80 **153**	[1590] 180 **152**	[2480] 280 **152**	[3370] 380 **150**	[4220] 475 **149**	[5060] 570 **146**	[5910] 670 **144**				
[18] **68**	[640] 70 **172**	[1530] 170 **171**	[2420] 275 **171**	[3310] 375 **170**	[4160] 470 **169**	[5010] 565 **167**	[5870] 665 **164**				
[20] **76**	[580] 65 **191**	[1470] 165 **190**	[2370] 270 **190**	[3260] 370 **189**	[4110] 465 **188**	[4960] 560 **186**	[5820] 660 **184**				
[22] **83**	[510] 60 **210**	[1390] 155 **209**	[2290] 260 **209**	[3170] 360 **208**	[4030] 455 **207**	[4880] 550 **206**					
[24] **91**	[440] 50 **230**	[1330] 150 **229**	[2220] 250 **228**	[3100] 350 **227**	[3950] 445 **225**	[4800] 540 **224**					
[26] **98**	[350] 40 **249**	[1240] 140 **248**	[2130] 240 **247**	[3020] 340 **246**	[3880] 440 **244**	[4730] 535 **242**					
[28] **106**	[270] 30 **268**	[1150] 130 **267**	[2050] 230 **265**	[2930] 330 **264**	[3790] 430 **261**	[4650] 525 **259**					
[30] **114**	[180] 20 **287**	[1060] 120 **286**	[1960] 220 **284**	[2850] 320 **283**	[3710] 420 **281**	[4570] 515 **277**					
[35] **132**		[840] 95 **335**	[1760] 200 **334**	[2640] 300 **333**	[3480] 395 **332**						

[1760] 200 **334** } Torque [lb-in] Nm **Speed RPM**

2000 Series

Dimensions

Ports

7/8 -14 UNF-2B SAE O-ring Staggered Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

1 1/16 -12 UN-2B SAE O-ring Ports (Positioned 180° Apart) (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

7/8 -14 UNF-2B SAE O-ring End Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

G 1/2 (BSP) Staggered Ports (2)
G 1/4 (BSP) Case Drain Port (1) or

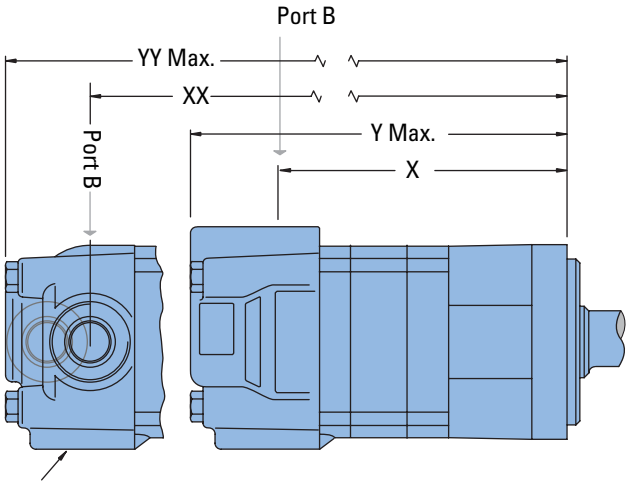
Manifold Mount
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1)

Standard Rotation Viewed from Shaft End

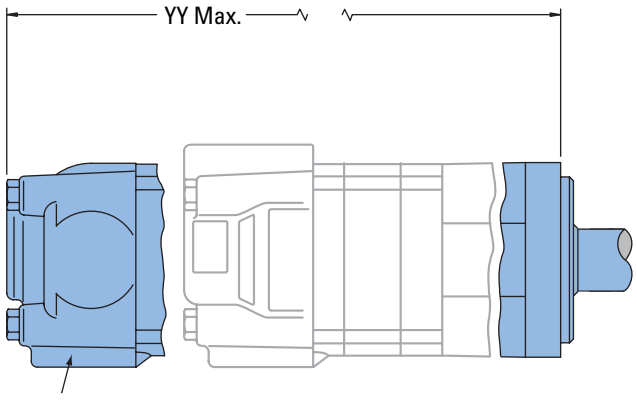
Port A Pressurized — CW

Port B Pressurized — CCW

Standard Mount



1-1/16-12 UN-2B SAE O-ring Ports
(Positioned 180º Apart)



7/8-14 UNF-2B SAE O-ring End Ports

STANDARD MOUNT MOTOR DIMENSIONS

Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]	XX mm [inch]	YY mm [inch]
80 [4.9]	136,9 [5.39]	184,2 [7.25]	139,2 [5.48]	185,4 [7.30]
100 [6.2]	141,5 [5.57]	189,0 [7.44]	143,8 [5.66]	190,3 [7.49]
130 [8.0]	147,9 [5.83]	195,4 [7.69]	150,2 [5.92]	196,6 [7.74]
160 [9.6]	147,9 [5.83]	195,4 [7.69]	150,2 [5.92]	196,6 [7.74]
195 [11.9]	154,7 [6.09]	202,2 [7.96]	157,0 [6.18]	203,2 [8.00]
245 [14.9]	163,7 [6.45]	211,1 [8.31]	166,0 [6.54]	212,4 [8.36]
305 [18.7]	175,1 [6.90]	222,3 [8.75]	177,4 [6.99]	223,5 [8.80]
395 [24.0]	191,0 [7.52]	238,6 [9.39]	193,3 [7.61]	239,8 [9.44]
490 [29.8]	208,4 [8.21]	255,8 [10.07]	210,7 [8.30]	270,1 [10.12]

2000 Series

Dimensions

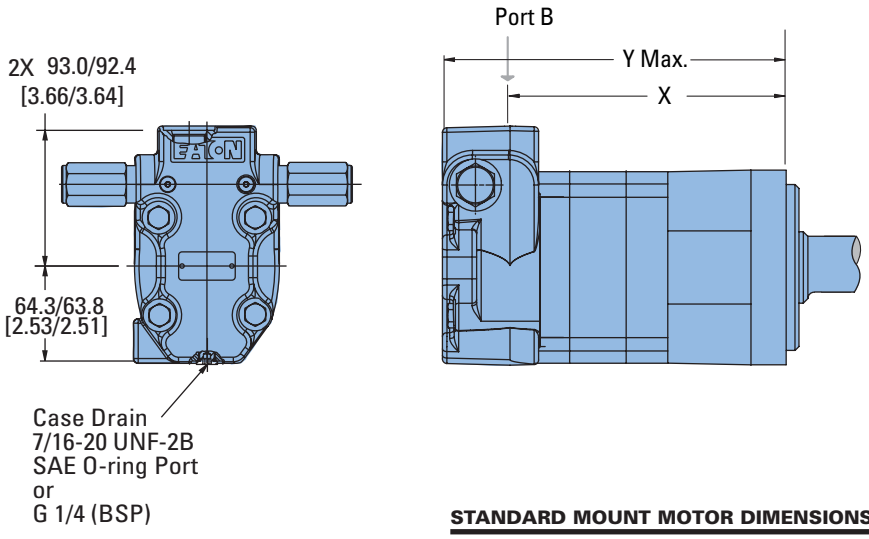
Ports

7/8 -14 UNF-2B SAE O-ring Staggered Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or
G 1/2 (BSP) Staggered Ports (2)
G 1/4 (BSP) Case Drain Port (1)

Standard Rotation Viewed from Shaft End

Port A Pressurized — CW
Port B Pressurized — CCW

Standard Mount with Integral Relief Valve



STANDARD MOUNT MOTOR DIMENSIONS

Displacement cm^3/r [in^3/r]	X mm [inch]	Y mm [inch]
80 [4.9]	137,0 [5.40]	184,5 [7.26]
100 [6.2]	141,6 [5.58]	189,0 [7.44]
130 [8.0]	147,9 [5.83]	195,4 [7.69]
160 [9.6]	147,9 [5.83]	195,4 [7.69]
195 [11.9]	154,8 [6.10]	202,2 [7.96]
245 [14.9]	163,7 [6.45]	211,1 [8.31]
305 [18.7]	175,1 [6.90]	222,6 [8.76]
395 [24.0]	191,1 [7.53]	238,6 [9.39]
490 [29.8]	208,4 [8.21]	255,8 [10.07]

2000 Series

Dimensions

Ports

7/8 -14 UNF-2B SAE O-ring Staggered Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

1 1/16 -12 UN-2B SAE O-ring Ports (Positioned 180° Apart) (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

7/8 -14 UNF-2B SAE O-ring End Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

G 1/2 (BSP) Staggered Ports (2)
G 1/4 (BSP) Case Drain Port (1) or

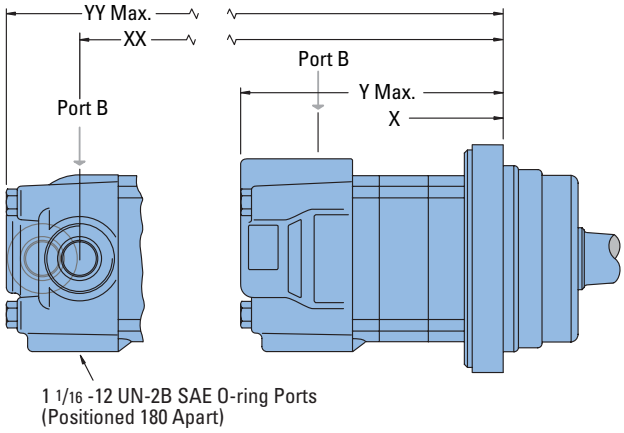
Manifold Mount
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1)

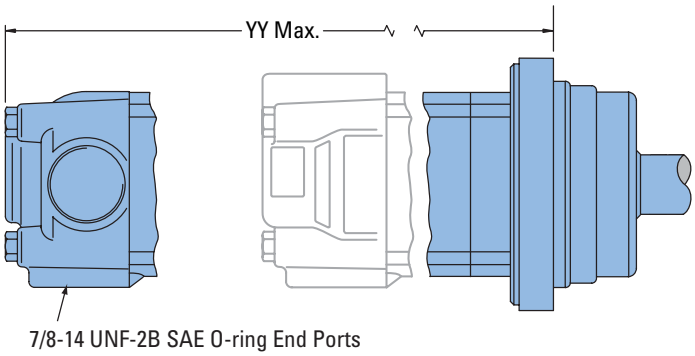
Standard Rotation Viewed from Shaft End

Port A Pressurized — CW

Port B Pressurized — CCW

Wheel Mount





WHEEL MOUNT MOTOR DIMENSIONS

Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]	XX mm [inch]	YY mm [inch]
80 [4.9]	96,8 [3.81]	144,0 [5.67]	99,1[3,90]	145,3 [5.72]
100 [6.2]	101,3 [3.99]	148,9 [5.86]	103,6 [4.08]	150,2 [5.91]
130 [8.0]	107,8 [4.25]	155,2 [6.11]	110,1 [4.34]	156,5 [6.16]
160 [9.6]	107,8 [4.25]	155,2 [6.11]	110,1 [4.34]	156,5 [6.16]
195 [11.9]	114.6 [4.51]	161,8 [6.37]	116,8 [4.60]	163,1 [6.42]
245 [14.9]	123,5 [4.87]	171,0 [6.73]	125,8 [4.96]	172,3 [6.78]
305 [18.7]	135,0 [5.32]	182,1 [7.17]	137,4 [5.41]	183,4 [7.22]
395 [24.0]	150,9 [5.94]	198,4 [7.81]	153,2 [6.03]	199,7 [7.86]
490 [29.8]	168,2 [6.63]	215,7 [8.49]	170,7 [6.72]	217,0 [8.54]

2000 Series

Dimensions

Ports

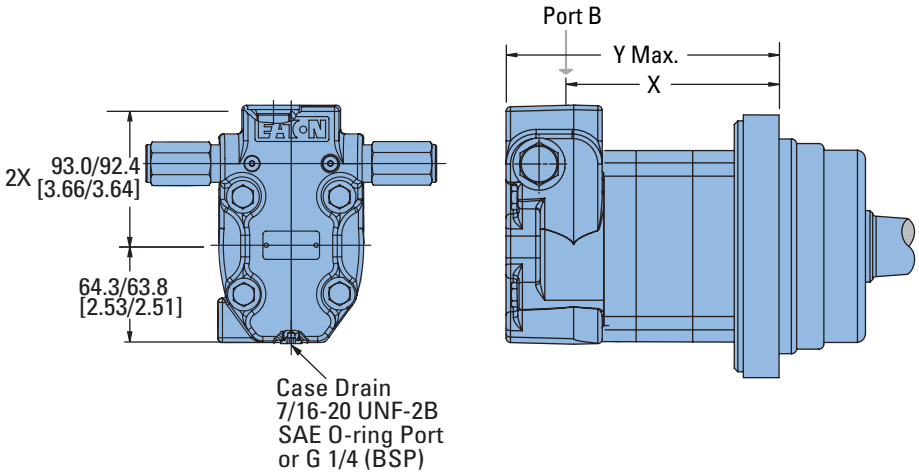
7/8 -14 UNF-2B SAE O-ring Staggered Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1)

G 1/2 (BSP) Staggered Ports (2)
G 1/4 (BSP) Case Drain Port (1)

Standard Rotation Viewed from Shaft End

Port A Pressurized — CW
Port B Pressurized — CCW

Wheel Mount with Integral Relief Valve



WHEEL MOUNT MOTOR DIMENSIONS

Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]
80 [4.9]	96,9 [3.82]	144,3 [5.68]
100 [6.2]	101,4 [4.00]	148,9 [5.86]
130 [8.0]	107,8 [4.25]	155,2 [6.11]
160 [9.6]	107,8 [4.25]	155,2 [6.11]
195 [11.9]	114.6 [4.52]	162,1 [6.38]
245 [14.9]	123,5 [4.87]	171,0 [6.73]
305 [18.7]	135,0 [5.32]	182,4 [7.18]
395 [24.0]	151,0 [5.95]	198,4 [7.81]
490 [29.8]	168,2 [6.63]	215,7 [8.49]

2000 Series

Dimensions

Ports

7/8 -14 UNF-2B SAE O-ring Staggered Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

1 1/16 -12 UN-2B SAE O-ring Ports (Positioned 180° Apart) (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

7/8 -14 UNF-2B SAE O-ring End Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

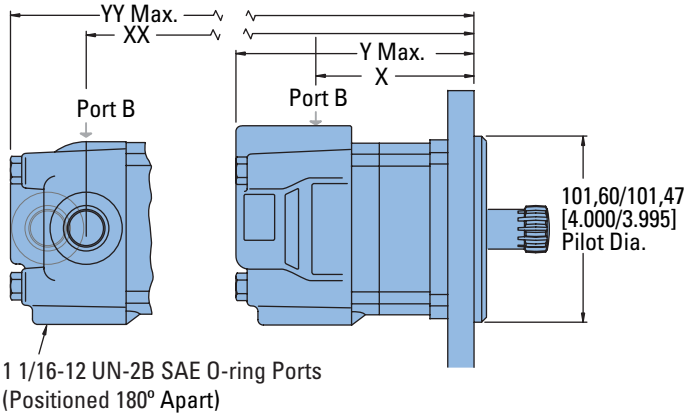
G 1/2 (BSP) Staggered Ports (2)
G 1/4 (BSP) Case Drain Port (1) or

Manifold Mount
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1)

Standard Rotation Viewed from Shaft End

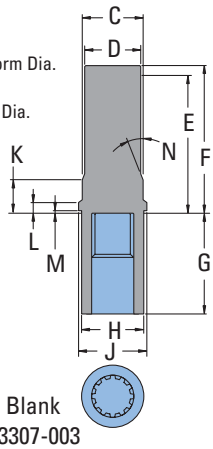
Port A Pressurized — CW
Port B Pressurized — CCW

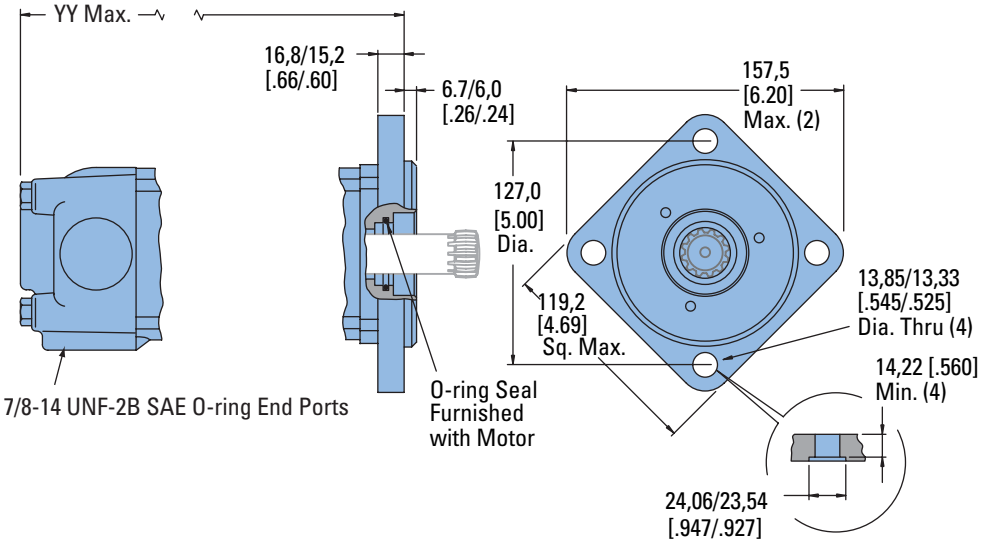
Bearingless



MAT'L

C	35,86 [1.412] Dia.
D	34,04 [1.340] Dia.
E	81,0 [3.19] Min. Full Form Dia.
F	86,1 [3.39] Max.
G	62,10 [2.445] Full Form Dia.
H	38,40 [1.512] Dia.
J	43,7 [1.72] Dia.
K	25,91 [1.020]
L	8,25 [.325]
M	0,89 [.035]
N	15°





For 2000 Series 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.

BEARINGLESS MOTOR DIMENSIONS

Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]	XX mm [inch]	YY mm [inch]
80 [4.9]	79,0 [3.11]	126,5 [4.98]	81,3 [3.20]	127,8 [5.03]
100 [6.2]	83,5 [3.29]	131,4 [5.17]	85,8 [3.38]	132,6 [5.22]
130 [8.0]	89,9 [3.54]	137,7 [5.42]	92,2 [3.63]	139,0 [5.47]
160 [9.6]	89,9 [3.54]	137,7 [5.42]	92,2 [3.63]	139,0 [5.47]
195 [11.9]	96,8 [3.81]	144,3 [5.68]	99,0 [3.90]	145,5 [5.73]
245 [14.9]	105,6 [4.16]	153,5 [6.04]	107,9 [4.25]	154,7 [6.09]
305 [18.7]	117,1 [4.61]	164,6 [6.48]	119,4 [4.70]	165,9 [6.53]
395 [24.0]	133,1 [5.24]	180,9 [7.12]	135,4 [5.33]	182,1 [7.17]
490 [29.8]	150,3 [5.92]	198,2 [7.80]	152,7 [6.01]	199,3 [7.85]

2000 Series

Dimensions

Ports

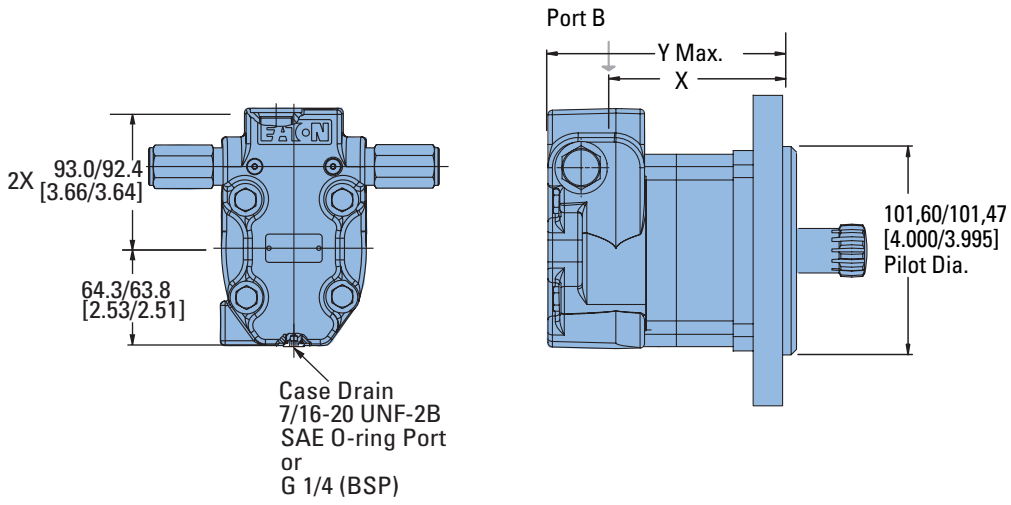
7/8 -14 UNF-2B SAE O-ring Staggered Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1)

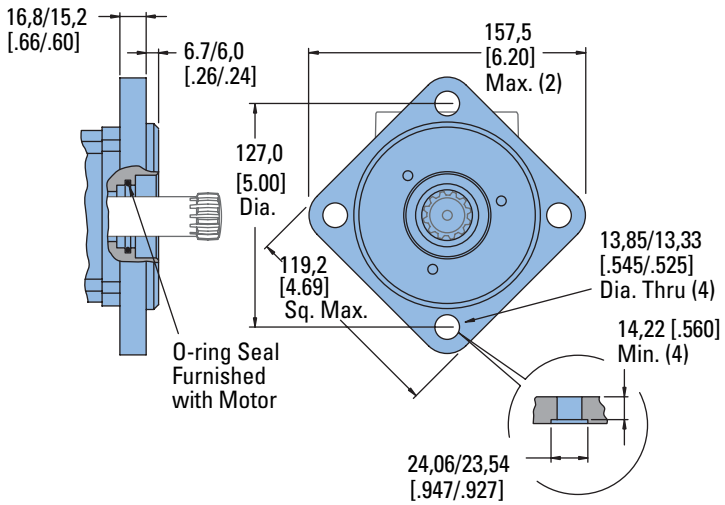
G 1/2 (BSP) Staggered Ports (2)
G 1/4 (BSP) Case Drain Port (1)

Standard Rotation Viewed from Shaft End

Port A Pressurized — CW
Port B Pressurized — CCW

Bearingless with Integral Relief Valve





BEARINGLESS MOTORS DIMENSIONS

Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]
80 [4.9]	79,0 [3.11]	126,8 [4.99]
100 [6.2]	83,5 [3.29]	131,4 [5.17]
130 [8.0]	89,9 [3.54]	137,7 [5.42]
160 [9.6]	89,9 [3.54]	137,7 [5.42]
195 [11.9]	96,8 [3.81]	144,6 [5.69]
245 [14.9]	105,6 [4.16]	153,5 [6.04]
305 [18.7]	117,1 [4.61]	164,9 [6.49]
395 [24.0]	133,1 [5.24]	180,9 [7.12]
490 [29.8]	150,3 [5.92]	198,2 [7.80]

2000 Series

Installation Information

1 Internal spline in mating part to be per spline data. Specification material to be ASTM A304, 8620H vacuum degassed alloy steel carbonize to a hardness of 59-62 HRc with case depth (to 50HRc) of 0,076 -1,02 [.030 -.040]. Dimensions apply after heat treat.

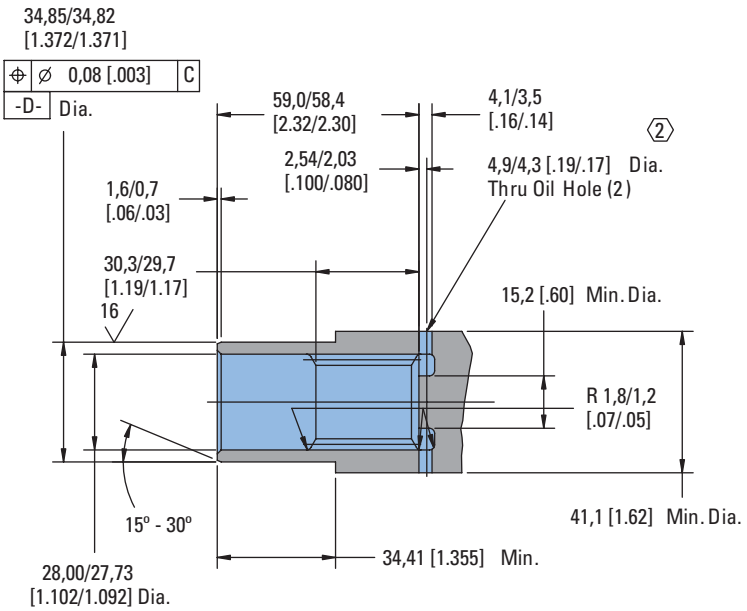
(2) Mating part to have critical dimensions as shown. Oil holes must be provided and open for proper oil circulation.

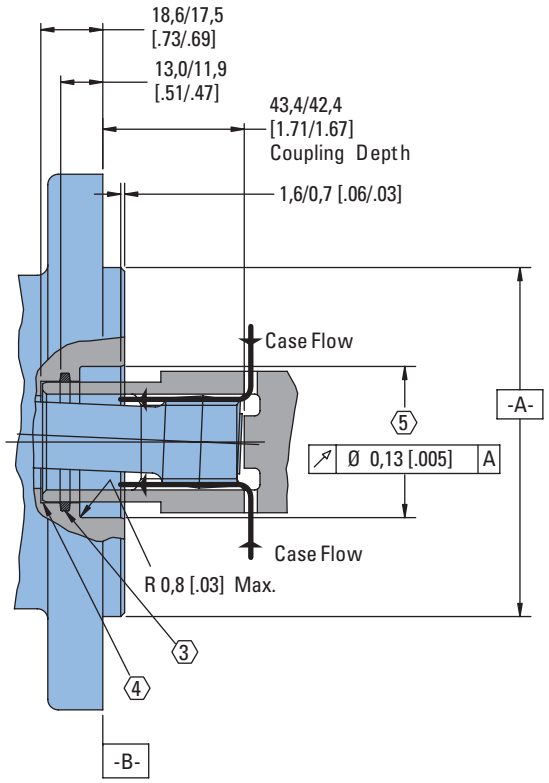
(3) Seal to be furnished with motor for proper oil circulation thru splines.

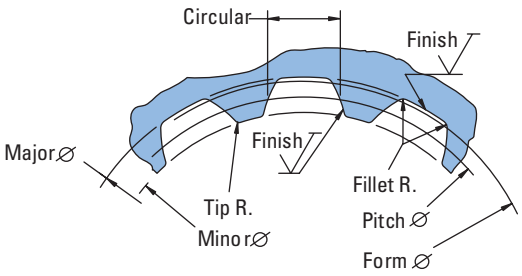
(4) Some means of maintaining clearance between shaft and mounting flange must be provided.

(5) Counterbore designed to adapt a standard sleeve bearing 35,010 -35,040 [1.3784 -1.3795] I.D. by 44,040 -44,070 [1.7339 -1.7350] O.D. (Oilite Bronze Sleeve Bearing AAM3544-22).

Bearingless

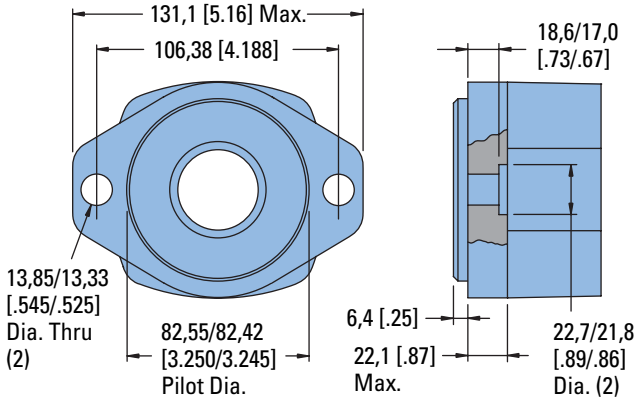




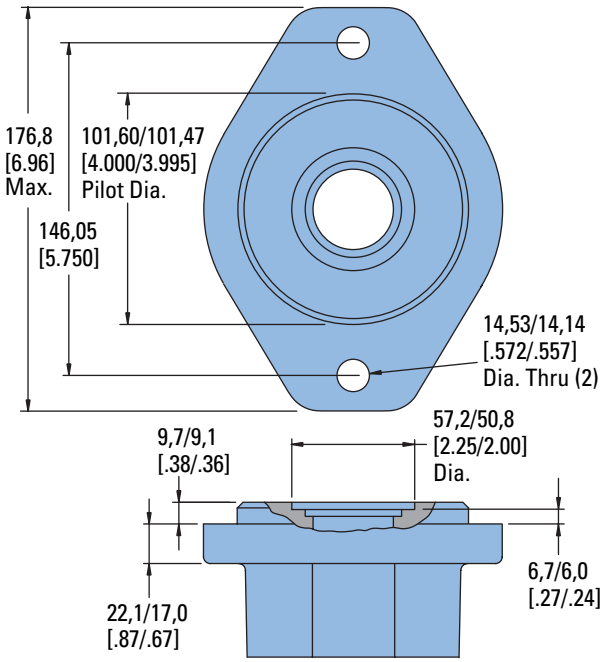


Spline Pitch	12/24
Pressure Angle	30°
Number of teeth	12
Class of Fit	Ref. 5
Type of Fit	Side
Pitch Diameter	Ref. 25,400000 [1.0000000]
Base Diameter	Ref. 21,997045 [.8660254] ◎ 0,21 [.008] D
Major Diameter	(27,74 [1.092] Max. 27,59 [1.086] Min.)
Minor Diameter	23,097 - 23,224 [.9093 - .9143]
Form Diameter, Min.	29,93 [1.060]
Fillet Radius	0,64 - 0,76 [.025 - .030]
Tip Radius	0,25 - 0,38 [.010 - .015]
Finish	1,6 (63)
Involute Profile Variation	+0,000 -0,025 [+.0000 -.0010]
Total Index Variation	0,038 [.0015]
Lead Variation	0,013 [.0005]
Circular Space Width:	
Maximum Actual	4,318 [.1700]
Minimum Effective	4,216 [.1660]
Maximum Effective	Ref. 4,270 [.1681]
Minimum Actual	Ref. 4,247 [.1672]
Dimension Between Two Pins	Ref. 19,020 - 19,190 [.7488 - .7555]
Pin Diameter	4,496 [.1770] Pins to Have 3,38 [.133] Wide Flat for Root Clearance

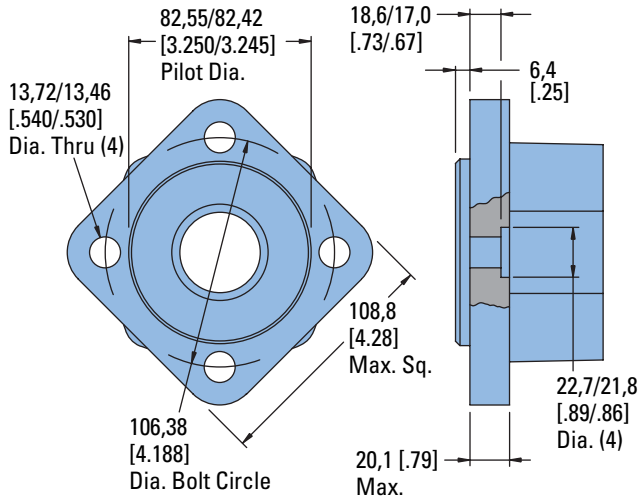
SAE A — Two Bolt (Standard Motor)



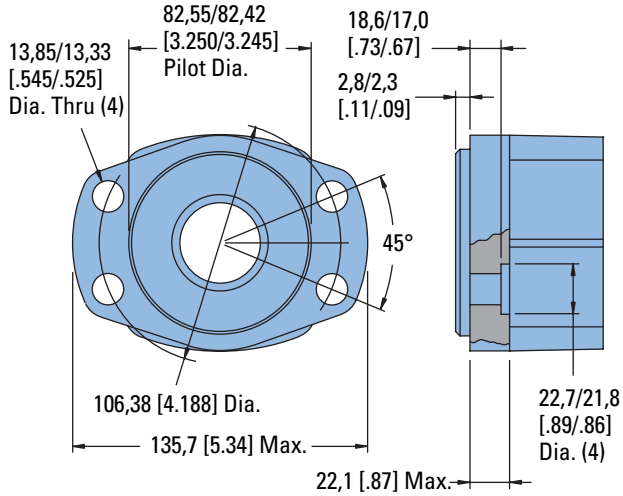
SAE B — Two Bolt



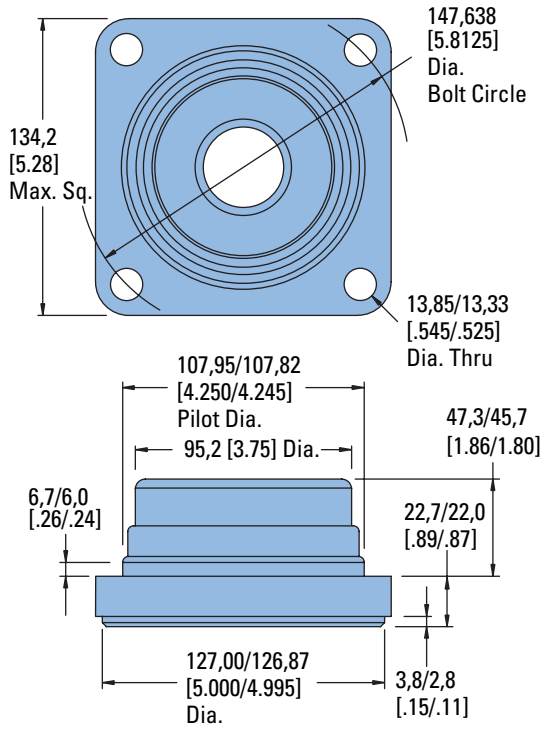
Four Bolt



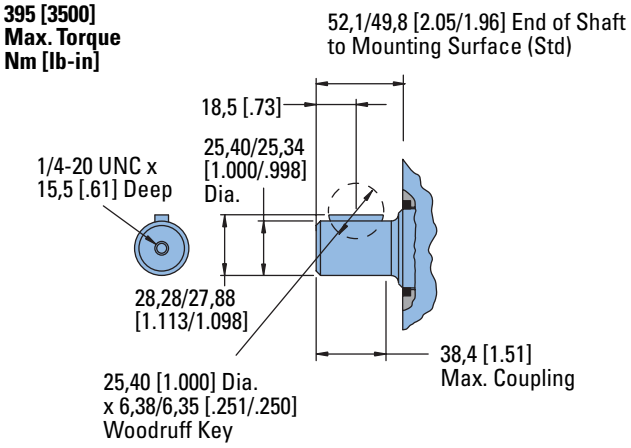
Four Bolt Magneto



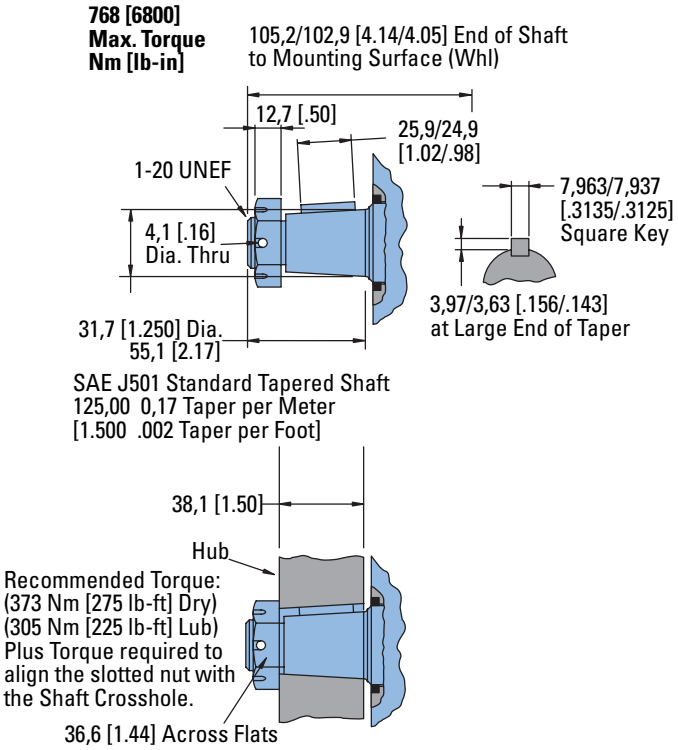
Four Bolt (Wheel Motor)



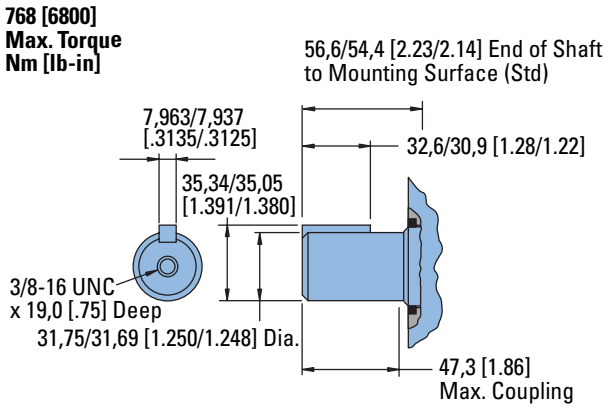
1 Inch Straight



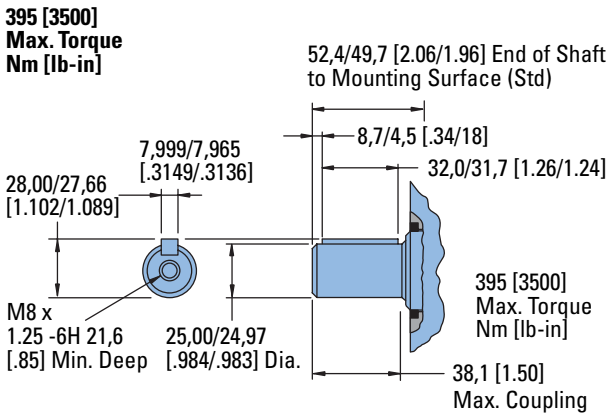
1 1/4 Inch Tapered



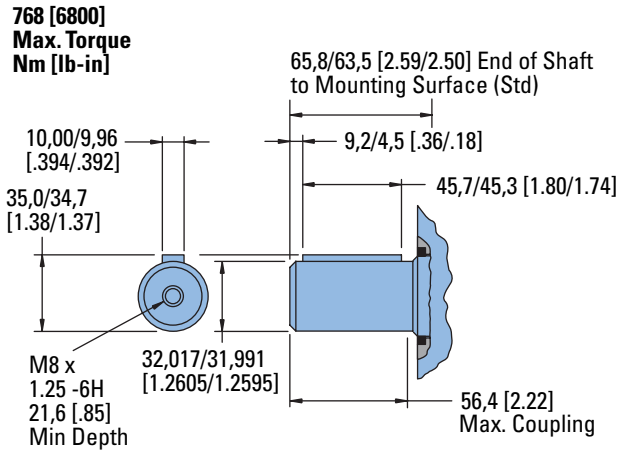
1 1/4 Inch Straight



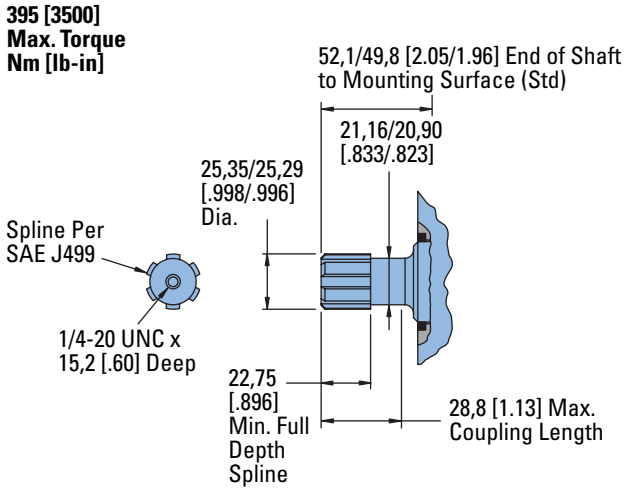
25 mm Straight



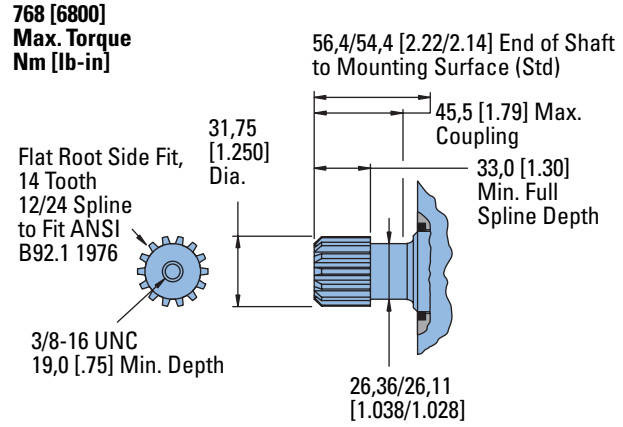
32 mm Straight



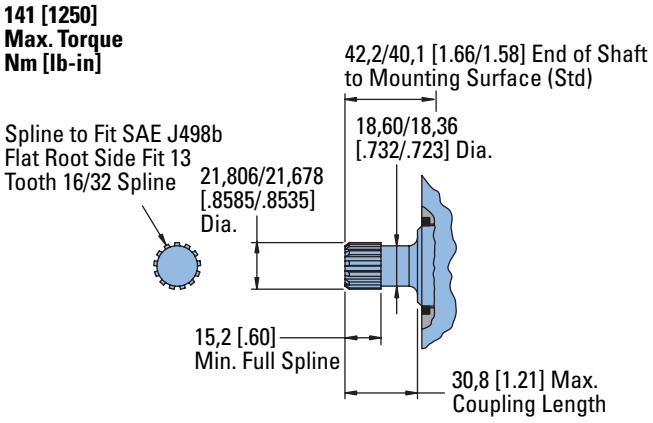
SAE 6B Splined



1 1/4 -14 Tooth Splined



13 Tooth Splined



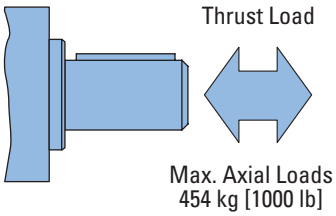
Shaft Side Load Capacity

These curves indicate the radial load capacity on the motor shaft at various locations with an allowable external thrust load of 454 kg [1000 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 61 kg/7 Bar [135 lb/100 PSI].

Each curve is based on

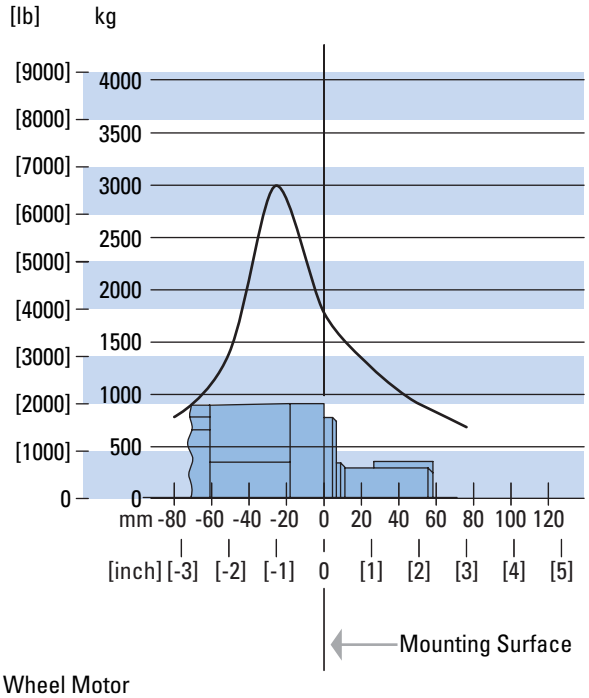


B 10 bearing life (2000 hours of 12,000,000 shaft revolutions at 100 RPM) at rated output torque.
To determine radial load at speeds other than 100 RPM, multiply the load values given on the bearing curve by the factors in the chart below.

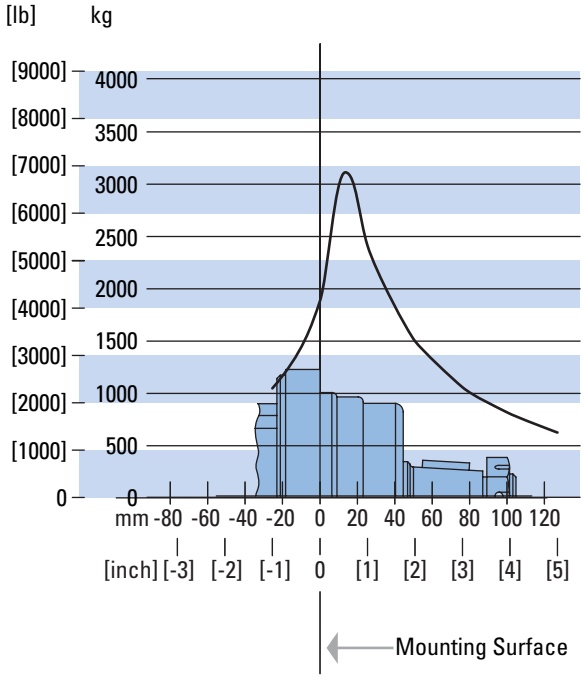
RPM	Multiplication Factor
50	1.23
100	1.00
200	0.81
300	0.72
400	0.66
500	0.62
600	0.58
700	0.56
800	0.54

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

Standard Motor
Straight and Splined Shafts



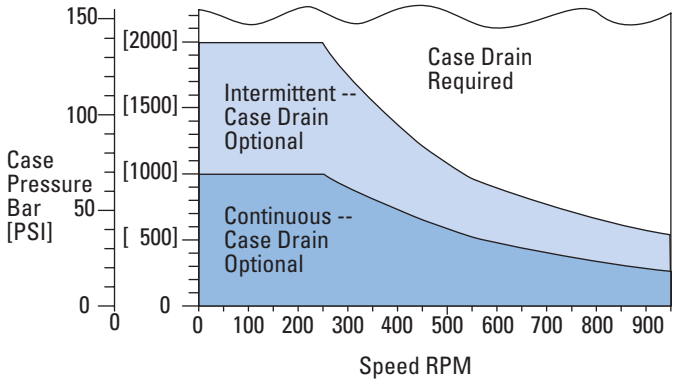
Wheel Motor
Tapered Shaft



Case Pressure and Case Porting

Char-Lynn 2000 Series motors are durable and have long life as long as the recommended case pressure is not exceeded. Allowable case pressure is highest at low shaft speeds. Consequently, motor life will be shortened if case pressure exceeds these ratings (acceptability may vary with application). Determine if an external case drain is required from the case pressure seal limitation chart.

Case Pressure Seal Limitation



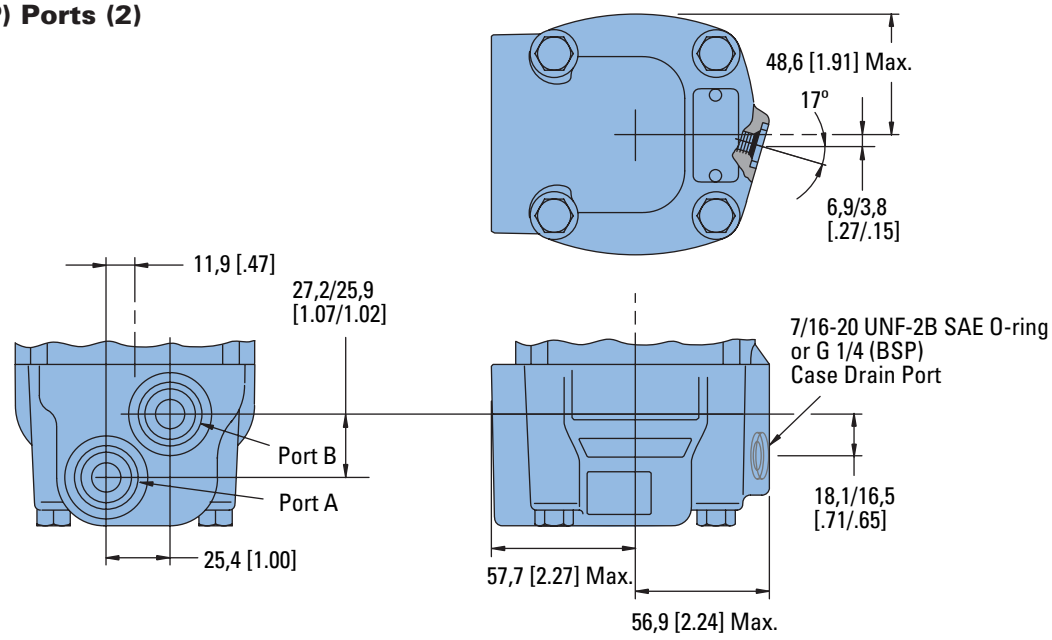
Case Porting Advantage

Contamination Control — flushing the motor case.

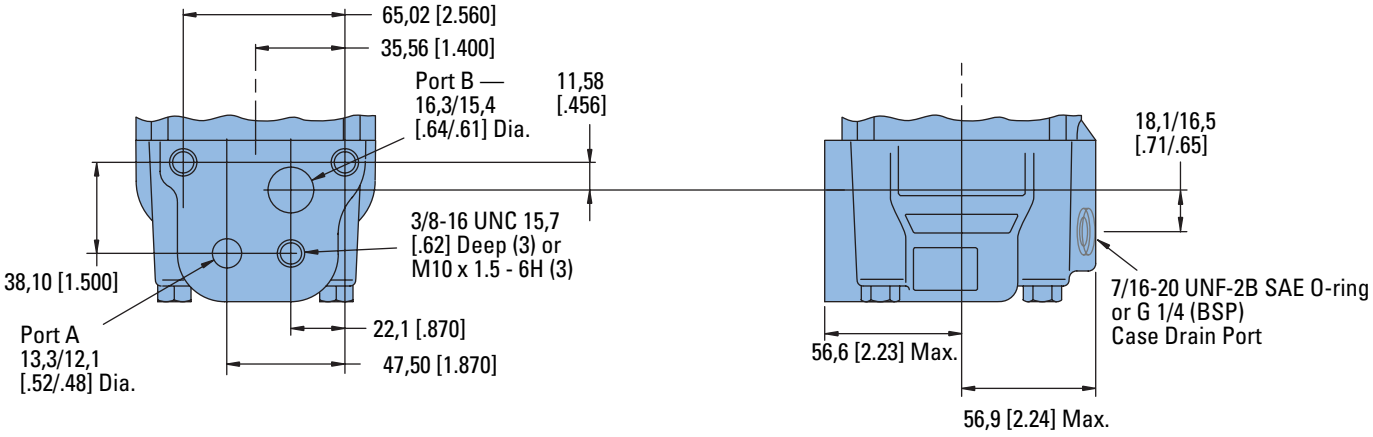
Cooler Motor — exiting oil draws motor heat away.

Extend Motor Seal Life — maintain low case pressure with a preset restriction in the case drain line.

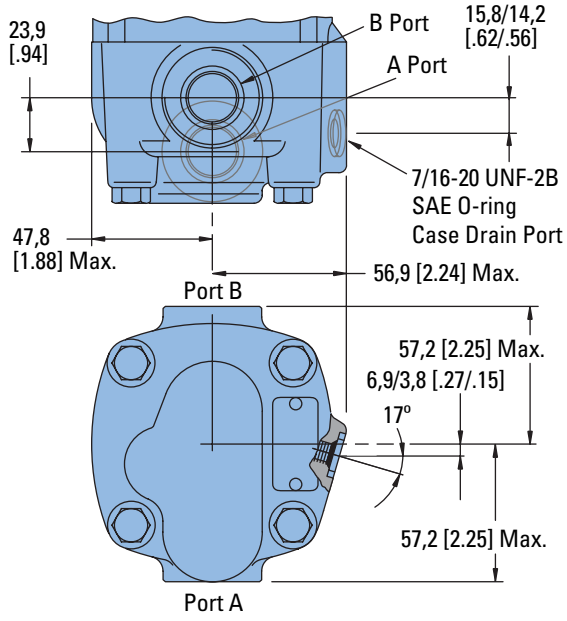
7/8-14 UNF-2B SAE O-ring Ports (2) or G 1/2 (BSP) Ports (2)



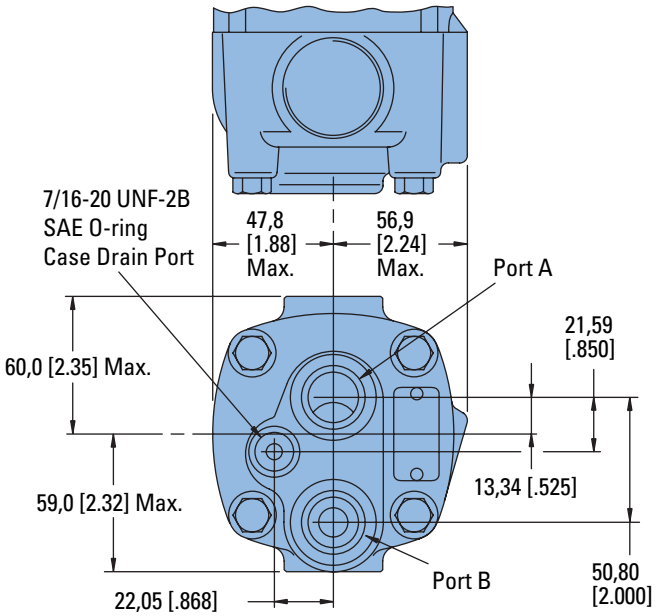
Manifold Mount



1-1/16-12 UN-2B SAE O-ring Ports (2) Positioned 180º Apart



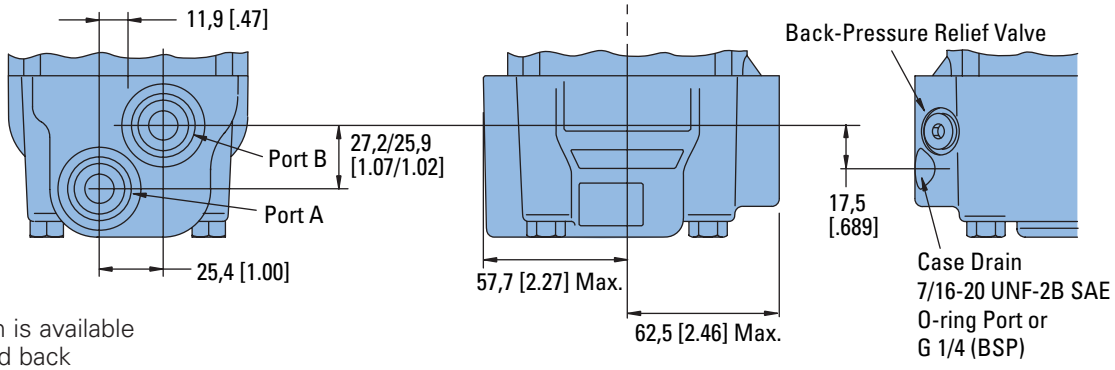
7/8-14 UNF-2B SAE O-ring End Ports (2)



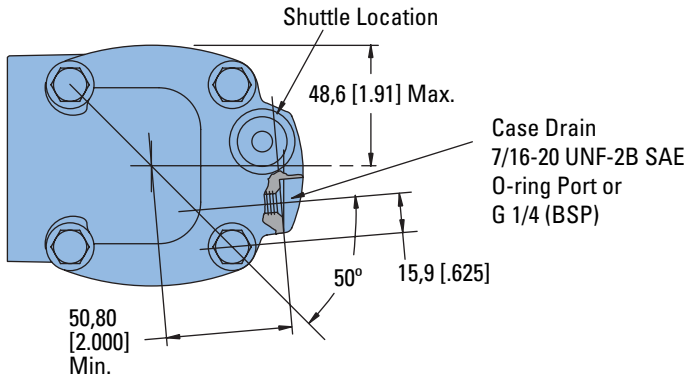
Dimensions

Ports with Shuttle

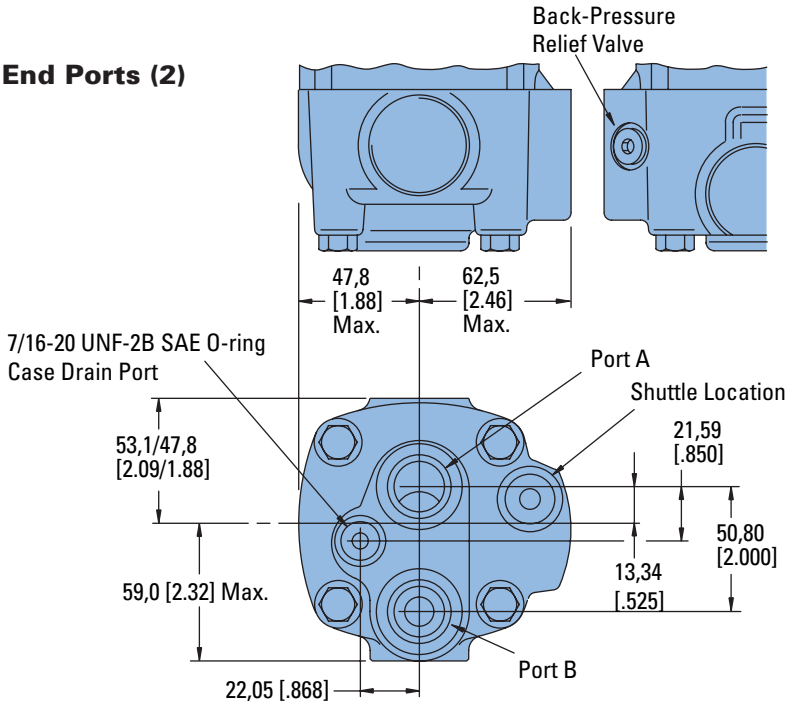
7/8 -14 UNF-2B SAE O-ring Ports (2) or G 1/2 (BSP) Ports (2)



This port option is available with shuttle and back pressure relief valve for closed loop applications.



7/8 -14 UNF-2B SAE O-ring End Ports (2)



This port option is available with shuttle and back pressure relief valve for closed loop applications.

2000 Series

Product Numbers

Note:

For 2000 Series Motors with a configuration **Not Shown** in the charts below: Use model code number system on the next page to specify product in detail.

Use digit prefix — 104-, 105-, or 106- plus four digit number from charts for complete product number— Example 106-1043.

Orders will not be accepted without three digit prefix.

MOUNTING	SHAFT	PORT SIZE	DISPL. cm³/r [in³/r] / PRODUCT NUMBER									
			80 [4.9]	90* [5.5]	100 [6.2]	130 [8.0]	160 [9.6]	195 [11.9]	245 [14.9]	305 [18.7]	395 [24.0]	490 [29.8]
2 Bolt SAE A Flange	1 Inch Straight	7/8 -14 O-ring Staggered	104-1001	—	-1002	-1003	-1004	-1005	-1006	-1007	-1143	—
		1 1/16 -12 O-ring 180° Apart	104-1037	—	-1038	-1039	-1040	-1041	-1042	-1043	-1044	—
	1 1/4 Inch Straight	7/8 -14 O-ring Staggered	104-1022	—	-1023	-1024	-1025	-1026	-1027	-1028	-1228	-1420
		1 1/16 -12 O-ring 180° Apart	104-1061	—	-1062	-1063	-1064	-1065	-1066	-1067	-1068	-1421
	1 1/4 Inch 14 T Splined	7/8 -14 O-ring Staggered	104-1029	—	-1030	-1031	-1032	-1033	-1034	-1035	-1229	-1422
		1 1/16 -12 O-ring 180° Apart	104-1087	—	-1088	-1089	-1090	-1091	-1092	-1093	-1094	-1423
2 Bolt SAE B Flange	1 1/4 Inch Straight	7/8-14 O-ring Staggered	104-1200	—	-1201	-1202	-1203	-1204	-1205	-1206	-1207	—
	1 1/4 Inch Involute SAE C Splined	7/8 -14 O-ring Staggered	104-1208	—	-1209	-1210	-1211	-1212	-1213	-1214	-1215	—
	1 Inch SAE 6B Splined	7/8 -14 O-ring Staggered	104-1193	—	-1194	-1195	-1196	-1197	-1198	-1199	—	—
	7/8 Inch SAE B Splined	7/8 -14 O-ring Staggered	104-1216	—	-1217	-1218	-1219	-1220	—	—	—	—
Standard with 4 Bolt Flange	32 mm Straight	G 1/2 (BSP))	104-1384	—	-1385	-1386	-1387	-1388	-1389	-1390	-1391	—
	1 1/4 Inch 14 T Splined	G 1/2 (BSP)	104-1376	—	-1377	-1378	-1379	-1380	-1381	-1382	-1383	—
Wheel Motor	1 1/4 Inch Straight	7/8 -14 O-ring Staggered	105-—	—	—	—	—	—	—	—	—	-1148
		1 1/16 -12 O-ring 180° Apart	105-—	—	—	—	—	—	—	—	—	-1149
	32 mm Straight	G 1/2 (BSP)	105-1134		-1135	-1136	-1137	-1138	-1139	-1140	-1141	—
	1 1/4 Inch Tapered	7/8 -14 O-ring Staggered	105-1001	—	-1002	-1003	-1004	-1005	-1006	-1007	-1060	-1152
		1 1/16 -12 O-ring 180° Apart	105-1071	—	-1072	-1073	-1074	-1075	-1076	-1077	-1078	—
	1 1/4 Inch 14 T Splined	7/8 -14 O-ring Staggered	105-1029	—	-1030	-1031	-1032	-1033	-1034	-1035	-1096	—
		1 1/16 -12 O-ring 180° Apart	105-1079	—	-1080	-1081	-1082	-1083	-1084	-1085	-1086	—
Bearingless		7/8 -14 O-ring Staggered	106-1008	—	-1009	-1010	-1011	-1012	-1013	-1014	-1015	-1047
		G 1/2 (BSP)	106-1038	—	-1039	-1040	-1041	-1042	-1043	-1044	-1045	—

*New Release

106-1044

Motors with Corrosion Protection

MOUNTING	SHAFT	PORT SIZE	DISPL. cm³/r [in³/r] / PRODUCT NUMBER									
			80 [4.9]	90* [5.5]	100 [6.2]	130 [8.0]	160 [9.6]	195 [11.9]	245 [14.9]	305 [18.7]	395 [24.0]	490 [29.8]
2 Bolt SAE A Flange	1 inch Straight	7/8 -14 O-ring Staggered	104-1528	—	-1529	-1530	-1531	-1532	-1533	-1534	-1519	-1535
	1 1/4 Inch Straight	7/8 -14 O-ring	104-1516	—	-1536	-1537	-1538	-1539	-1452	-1479	-1509	-1489

*New Release

2000 Series

Model Code

The following 30-digit coding system has been developed to identify all of the configuration options for the 2000 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	0 2	* **	**	* *	**	**	*	**	1	*	**	**	**	**	**	F
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 – 2000 Series Motor

2, 3 Product Series
02 – 2000 Series Motor

4, 5, 6 Displacement cm3/r [in3/r]
049 – 80.6 [4.92]
055 – 90.6 [5.53]
062 – 101.6 [6.20]
080 – 130.6 [7.97]
096 – 158.1 [9.65]
119 – 194.8 [11.89]
149 – 244.3 [14.91]
187 – 306.6 [18.71]
240 – 393.8 [24.03
298 – 489.0 [29.84]

7, 8 Mounting Type
AB – Wheel, 4 Bolt: 108.0 [4-1/8] Pilot Dia. 13.59 [.535] Dia. Holes On 147.6 [5.81] Dia. Bolt Circle. 127.0 [5.00] Dia. Rear Mount Pilot

AC – Standard, 2 Bolt: 82.6 [3.25] Pilot Dia. 13.59 [.535] Dia. Holes on 106.4 [4.19] Dia. Bolt Circle. SAE A

AD – Bearingless (w/ Leakage Slots), 4 Bolt: 101.6 [4.00] Pilot Dia. 13.59 [.535] Dia. Holes on 127.0 [5.00] Dia. Bolt Circle

AF – Standard, 2 Bolt: 101.6 [4.00] Pilot Dia. 14.35 [.565] Dia. Holes on 146.0 [5.75] Dia. Bolt Circle. SAE B

AH – Standard, 4 Bolt: 82.6 [3.25] Pilot Dia. 13.59 [.535] Dia. Holes on 106.4 [4.19] Dia. Bolt Circle

AJ – Standard (Magneto), 4 Bolt: 82.6 [3.25] Pilot Dia. 13.59 [.535] Dia. Holes on 106.4 [4.19] Dia. Bolt Circle. 2.79 [.110] Pilot Length

AP – Wheel, 4 Bolt: 108.0 [4.25] Pilot Dia. 13.59 [.535] Dia. Holes on 147.6 [5.81] Dia. Bolt Circle. 127.0 [5.00] Dia. Rear Mount Pilot. Spigot Reduced to 88.9 [3.50] Dia. by 25.4 [1.00] Depth.

AZ – Bearingless (w/ Leakage Slots), 4 Bolt: 100.0 [3.94] Pilot Dia. 11.0 [.43] Dia. Holes on 125.0 [4.92] Dia Bolt Circle (European)

9, 10 Output Sha ft
00 – None (Bearingless)
01 – 25.40 [1.000] Dia. Straight Shaft with 1/4-20UNC-2B Thread in End, 6.35 [.250] Wide x 25.40 [1.000] Dia. Woodruff Key

02 – 31.75 [1.250] Dia. Straight Shaft with 3/8-16UNC-2B Thread in End, 7.938 [.3125] Sq x 31.75 [1.250] Straight Key

03 – 31.75 [1.250] Dia. .125:1 Tapered Shaft Per SAE J501 w/ 1.000-20 UNEF-2A Threaded Shaft End and Slotted Hex Nut, 7.938 [.3125] Sq x 25.40 [1.0] Straight Key

04 – 31.75 [1.250] Dia. Flat Root Side Fit, 14 Tooth, 12/24 DP 30° Involute Spline w/ .375-16UNC-2B Thread in End, 33.0 [1.30] Min. Full Spline Length

05 – 25.40 [1.000] Dia. 6B Spline per SAE J499 with .250-20UNC-2B Thread in End, 22.76 [.896] Min. Full Spline Length

07 – 22.22 [.875] Dia. Flat Root Side Fit, 13 Tooth, 16/32 DP 30° SAE B Involute Spline, 15.2 [.60] Min. Full Spline Length

16 – 32.00 [1.260] Dia. Straight Shaft with M8 x 1.25-6H Thread in End, 9.982 [.3930]W x 7.995 [.3132]H x 45.00 [1.772]L Key

17 – 31.75 [1.250] Dia. Straight Shaft With 3/8 -16UNC-2B Thread in End, 7.938 [.3125] Sq x 31.75 [1.250] Straight Key, Corrosion Resistant (Seal area to shaft end)

18 – 31.75 [1.250] Dia. .125:1 Tapered Shaft per SAE J501 with 1.000-20UNEF-2A Threaded Shaft End and Slotted Hex Nut, 7.938 [.3125] Sq x 25.40 [1.000] Straight Key, Corrosion Resistant (Under seal area only)

19 – 25.00 [.984] Dia. Straight Shaft with M8 x 1.25-6h Thread in End, 7.982 [.3142]W x 6.954 [.2738]H x 31.82 [1.254]L Key

28 – 32.00 [1.260] Dia. 10:1 Tapered Shaft Per ISO R775 with M10 X 1.50-6H Thread in End, 6.00 [.236] Sq. x 50.00 [1.968] Key

39 – None (Bearingless) European Spline

41 – 35.00 [1.378] Dia. 10:1 Tapered Shaft Per ISO R775 with M20 x 1.5-6g Threaded Shaft End and Slotted Hex Nut, 6.00 [.236] Sq. X 20.00 [.787] Key

42 – 35.00 [1.378] Dia. Straight Shaft with M8 x 1.25-6h Thread in End, 9.982 [.3930]W x 7.995 [.3132]H x 45.00 [1.772]L Key

11, 12 Ports
AA – .875-14 UNF-2B SAE O-ring Ports - Staggered Ports

AB –12.70 [.500] and 15.88 [.625] Dia. Manifold Ports with 3 x .375-16 UNC-2B Port Block Mounting Holes

AC –.875-14 UNF-2B SAE O-ring Ports - Ports Oriented 180° to each other

AE – 12.70 [.500] And 15.88 [.625] Dia. Manifold Ports with 3 x M10 x 1.5-6H Port Block Mounting Holes

AF – 1.0625-12 UN-2B SAE O-ring Ports - Ports Oriented 180° to each other

AG – G 1/2 BSP Straight THD Ports - Staggered Ports

AN – G 1/2 BSP Straight Thd Ports - End Ported

AR – .875-14 UNF-2B SAE O-ring Ports - End Ported, Cast Boss Removed

AS – G 1/2 Bsp Straight THD Ports - Staggered Port with 2 x M10 x 1.5-6H Port Block Mounting Holes - European

13, 14 Case Flow Options
Shuttles available with port code AA or AD only)

00 – None

01 – .4375-20 UNF-2B SAE O-Ring Port

02 – G 1/4 BSP Straight THD Port

09 – Reverse Flow Shuttle Valve w/ G 1/4 BSP Straight THD Port, .062 Dia. Shuttle Flow Orifice

13 – Reverse Flow Shuttle Valve w/ .4375-20 UNF-2B SAE O-Ring Port, .062 Dia. Shuttle Flow Orifice

15 Low Pressure Relief
0 – None
A – Set at 4.5 bar [65 lbf/in^2]
B – Set at 15.2 bar [220 lbf/in^2]
C – Set at 20,7 bar [300 lbf/in^2]
D – Set at 13.1 bar [190 lbf/in^2]

16, 17 Pressure/Flow Option
Integral Cross-Over Relief Valve:
00 – None
30 – Set at 103.4 bar [1500 lbf/in^2]
31 – Set at 120.6 bar [1750 lbf/in^2]
32 – Set at 137.9 bar [2000 lbf/in^2]
33 – Set at 155.1 bar [2250 lbf/in^2]
34 – Set at 172.4 bar [2500 lbf/in^2]
35 – Set at 189.6 bar [2750 lbf/in^2]
36 – Set at 206.8 bar [3000 lbf/in^2]

18 Geroler Option
1 – Standard

19 Seal Options
0 – Standard
1 – Viton
2 – Viton Shaft Seal
4 – Seal Guard

20, 21 Accessories
0 – None
AD – M 12 Threaded Connector, Digital Speed Pickup (30 Pulse)
AE – M 12 Threaded Connector, Long Body Digital Speed and Direction Pickup

22, 23 Special Features (Hardware)
0 – None

24, 25 Special Features (Assembly)
00 – None
AB – Reverse Rotation

26, 27 Paint/Packaging
AA – No Paint, Indiv. Box
AB – Painted, Low Gloss Black, Indiv. Box
AC – Epoxy Coated (Frost Gray) Indiv. Box

28, 29 Customer Identification
AA – None

30 Design Code
F – Sixth

2000 Series Two-Speed

Description

The Eaton 2000 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 Δ Bar [100 Δ 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 2000 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 Δ Bar [100 Δ 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].

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

In the high speed mode torque values are approximately one half with twice the speed of the conventional 2000 Series single speed motors.

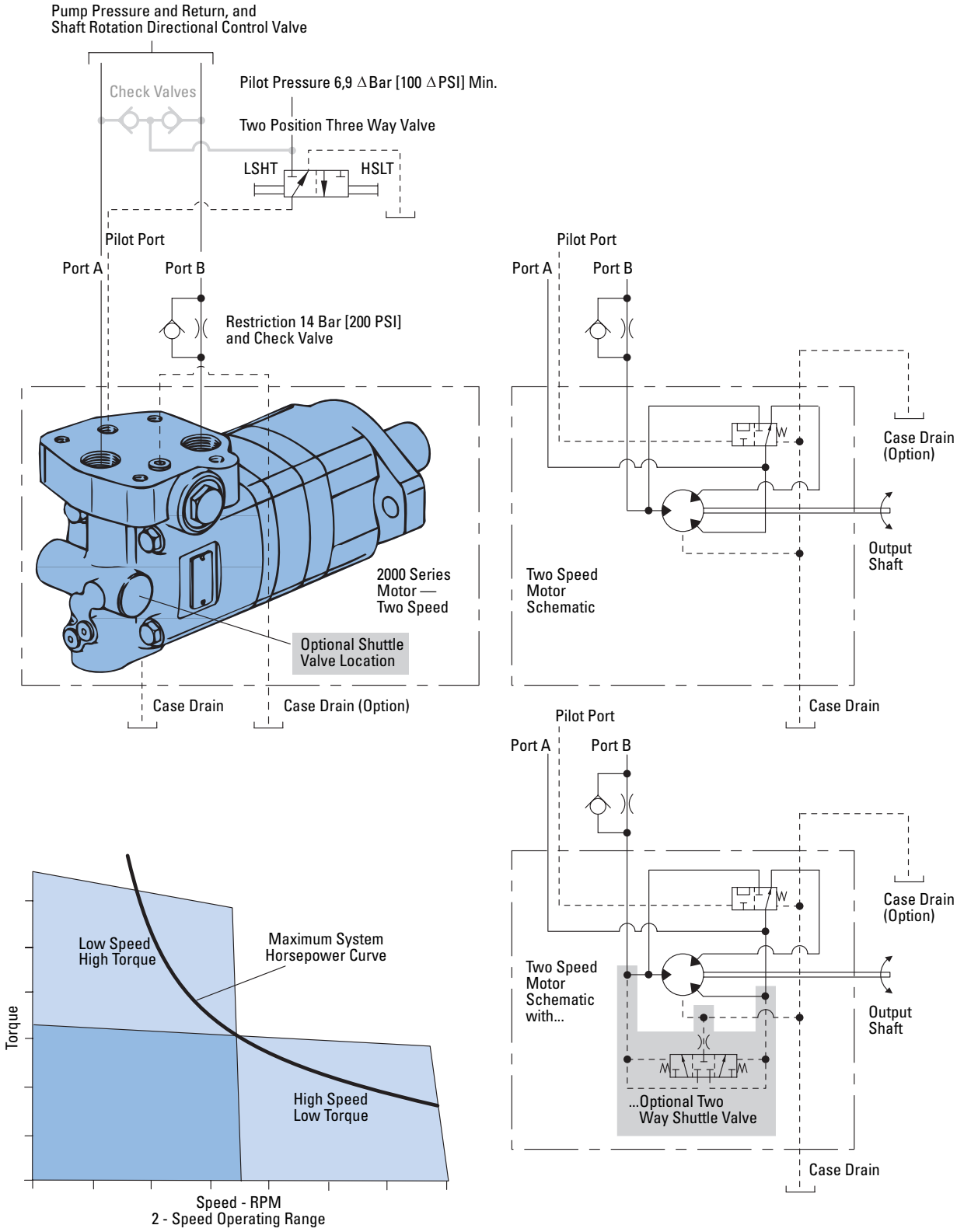
In the low speed mode torque and speed values are the same as the conventional 2000 Series motors.

Note:

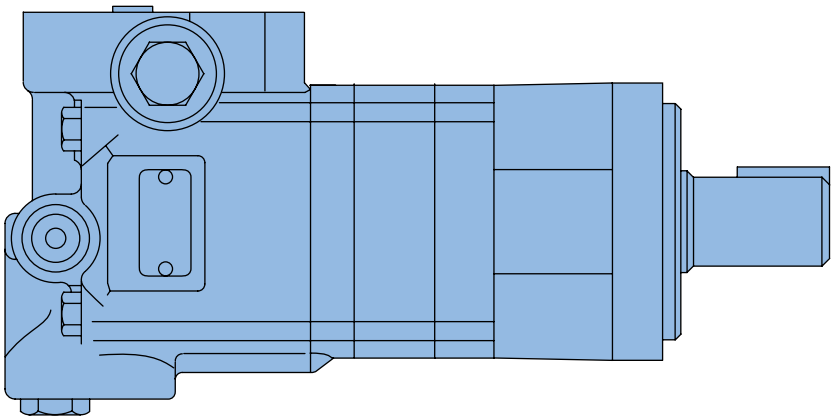
Low displacement (4.9 to 8.0 CID) motors have limited starting torque when started in high speed mode.

2000 Series Two-Speed

Typical Hydraulic Circuit



2000 Series Two-Speed
Specifications



SPECIFICATION DATA — 2000 SERIES TWO-SPEED MOTORS

Displ. cm^3/r [in^3/r]	High Speed Mode	40 [2.45]	50 [3.1]	65 [4.0]	80 [4.8]	95 [5.95]	120 [7.45]	155 [9.35]	195 [12.0]	245 [14.9]
	Low Speed Mode	80 [4.9]	100 [6.2]	130 [8.0]	160 [9.6]	195 [11.9]	245 14.9]	305 [18.7]	395 [24.0]	490 [29.8]
Max. Speed (RPM) @ Continuous Flow	High Speed Mode	1000	1000	990	860	700	560	450	350	230
	Low Speed Mode	500	500	495	430	350	280	225	175	115
Flow l/min [GPM]	High Speed Mode	45 [12]	55 [15]	70 [19]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]
	Low Speed Mode	45 [12]	55 [15]	70 [19]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]
Torque*	High Speed Mode									
Nm	Continuous	100 [880]	125 [1115]	165 [1450]	195 [1725]	240 [2150]	300 [2675]	380 [3350]	365 [3225]	448 [3970]
[lb-in]	Intermittent	145 [1300]	185 [1660]	240 [2150]	240 [2150]	300 [2650]	375 [3330]	440 [3900]	445 [3940]	486 [4300]
Torque*	Low Speed Mode									
Nm	Continuous	235 [2065]	295 [2630]	385 [3420]	455 [4040]	540 [4780]	660 [5850]	765 [6750]	775 [6840]	845 [7470]
[lb-in]	Intermittent	345 [3035]	445 [3950]	560 [4970]	570 [5040]	665 [5890]	820 [7250]	885 [7820]	925 [8170]	930 [8225]
Pressure	Continuous	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	155 [2250]	120 [1750]
Δ bar [Δ PSI]	Intermittent	310 [4500]	310 [4500]	310 [4500]	260 [3750]	260 [3750]	260 [3750]	260 [3750]	190 [2750]	140 [2000]
Weight kg [lb]	Standard or Wheel Mount	13,8 [30.5]	14,1 [31.0]	14,3 [31.5]	14,5 [32.0]	15,0 [33.0]	15,4 [34.0]	15,9 [35.0]	16,3 [36.0]	16,8 [37.0]
	Bearingless	11.8 [26.0]	12,0 [26.5]	12,2 [27.0]	12,5 [27.5]	12.9 [28.5]	13,4 [29.5]	13,8 [30.5]	14,3 [31.5]	14,7 [32.5]

Maximum Case Pressure: See case pressure seal limitation graph.

*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:

310 bar [4500 PSI]

Do not exceed Δ pressure rating (see chart above).

Maximum Return Pressure:

310 bar [4500 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

2000 Series Two-Speed

Dimensions

Standard and Wheel

Ports

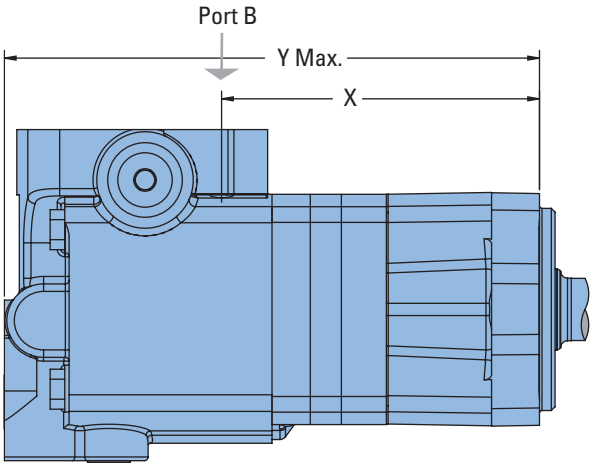
7/8 -14 UNF-2B SAE O-ring Staggered Ports (2)
9/16 -18 UNF-2B SAE O-ring Case Drain Port (1)
7/16 -20 UNF-2B SAE O-ring Pilot Control Port (1) or

G 1/2 (BSP) Staggered Ports (2)
G 1/4 (BSP) Case Drain Port (1)
G 1/4 (BSP) Pilot Control Port (1)

Standard Rotation Viewed from Shaft End

Port A Pressurized — CW
Port B Pressurized — CCW

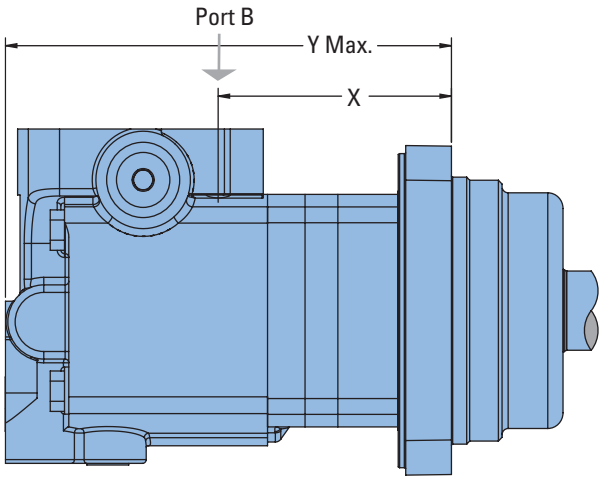
Two-Speed Standard Motors



STANDARD MOUNT MOTOR DIMENSIONS

Displacement cm^3/r [in^3/r]	X mm [inch]	Y mm [inch]
80 [4.9]	137,4 [5.41]	231,6 [9.12]
100 [6.2]	142,0 [5.59]	236,5 [9.31]
130 [8.0]	148,5 [5.85]	242,9 [9.56]
160 [9.6]	148,5 [5.85]	242,9 [9.56]
195 [11.9]	155,2 [6.11]	249,4 [9.82]
245 [14.9]	164,2 [6.47]	258,6 [10.18]
305 [18.7]	175,7 [6.92]	270,1 [10.63]
395 [24.0]	191,5 [7.54]	286,1 [11.26]
490 [29.8]	209,0 [8.23]	303,3 [11.94]

Two-Speed Wheel Motors



WHEEL MOUNT MOTOR DIMENSIONS

Displacement cm^3/r [in^3/r]	X mm [inch]	Y mm [inch]
80 [4.9]	97,2 [3.83]	191,5 [7.54]
100 [6.2]	101,8 [4.01]	196,4 [7.73]
130 [8.0]	108,3 [4.27]	202,7 [7.98]
160 [9.6]	108,3 [4.27]	202,7 [7.98]
195 [11.9	115,0 [4.53]	209,3 [8.24]
245 [14.9]	124,2 [4.89]	218,5 [8.60]
305 [18.7]	135,5 [5.34]	229,9 [9.05]
395 [24.0]	151,4 [5.96]	245,9 [9.68]
490 [29.8]	168,9 [6.65]	263,1 [10.36]

2000 Series Two-Speed

Dimensions

Bearingless

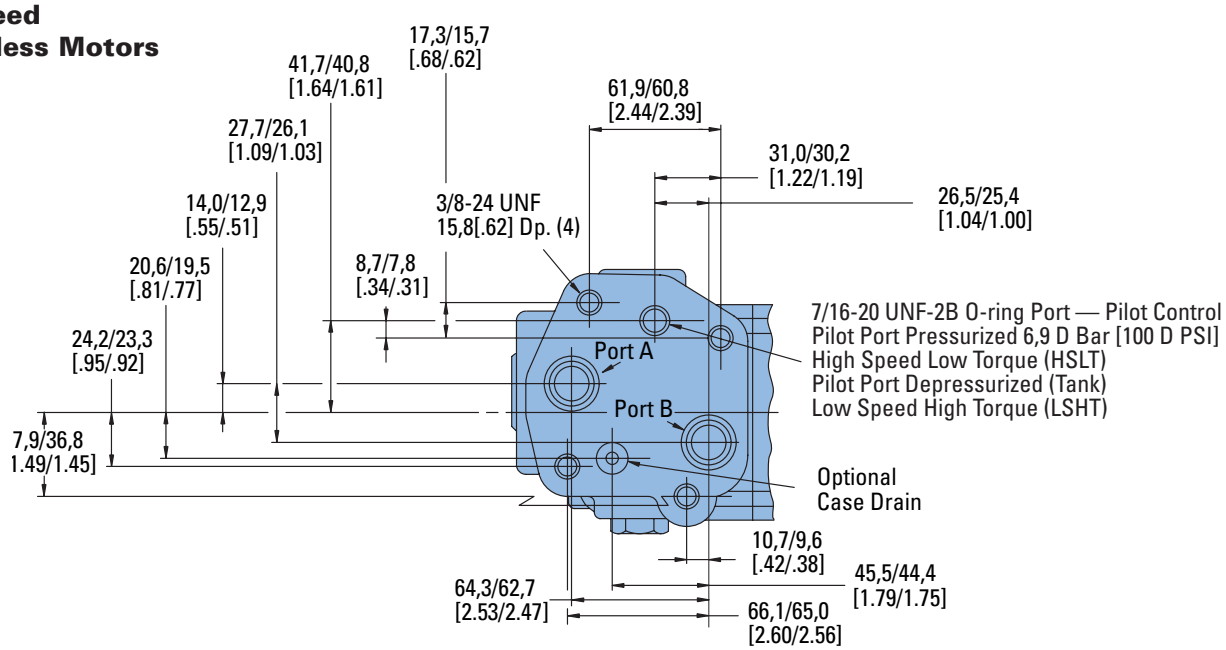
Ports

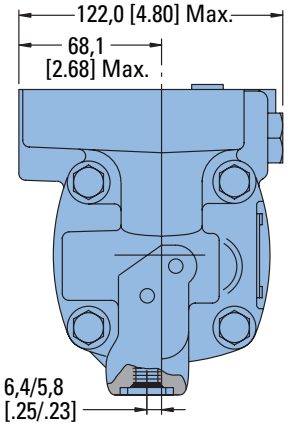
7/8 -14 UNF-2B SAE O-ring Staggered Ports (2)
9/16 -18 UNF-2B SAE O-ring Case Drain Port (1)
7/16 -20 UNF-2B SAE O-ring Pilot Control Port (1) or
G 1/2 (BSP) Staggered Ports (2)
G 1/4 (BSP) Case Drain Port (1)
G 1/4 (BSP) Pilot Control Port (1)

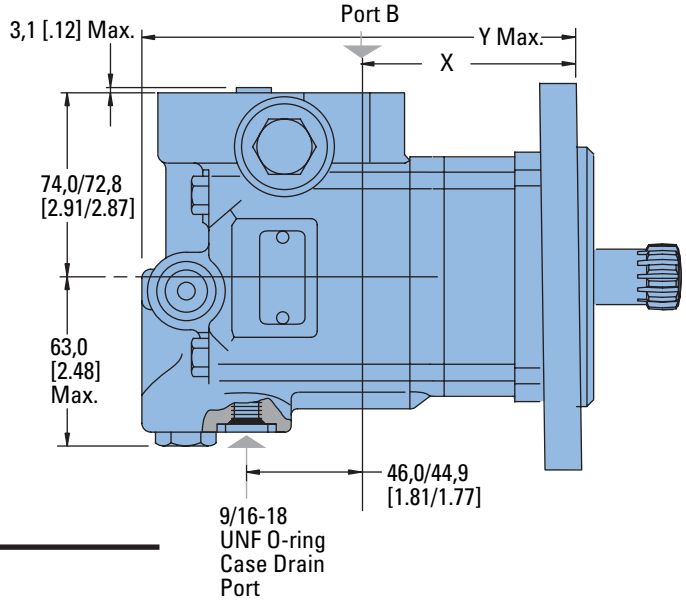
Standard Rotation Viewed from Shaft End

Port A Pressurized — CW
Port B Pressurized — CCW

Two-Speed Bearingless Motors







BEARINGLESS MOTOR DIMENSIONS

Displacement cm^3/r [in^3/r]	X mm [inch]	Y mm [inch]
80 [4.9]	79,3 [3.13]	174,0 [6.85]
100 [6.2]	84,1 [3.31]	178,9 [7.04]
130 [8.0]	90,7 [3.57]	185,2 [7.29]
160 [9.6]	90,7 [3.57]	185,2 [7.29]
195 [11.9]	97,3 [3.83]	191,8 [7.55]
245 [14.9]	106,4 [4.19]	201,0 [7.91]
305 [18.7]	117,8 [4.64]	212,4 [8.36]
395 [24.0]	133,6 [5.26]	228,4 [8.99]
490 [29.8]	151,1 [5.95]	245,6 [9.67]

2000 Series Two-Speed

Product Numbers

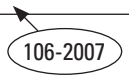
Note:

For 2000 Series Motors with a configuration **Not Shown** in the charts below, contact your Eaton Representative.

Use digit prefix — 104-, 105-, or 106- plus four digit number from charts for complete product number— Example 106-2007.

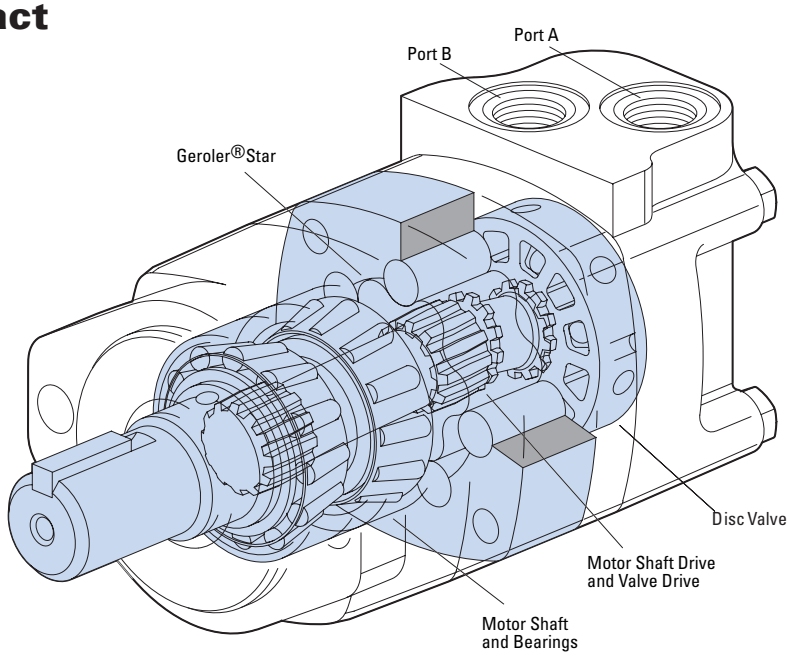
Orders will not be accepted without three digit prefix.

MOUNTING	SHAFT	PORT SIZE	DISPL. cm^3/r [in^3/r] / PRODUCT NUMBER								
			80 [4.9]	100 [6.2]	130 [8.0]	160 [9.6]	195 [11.9]	245 [14.9]	305 [18.7]	395 [24.0]	490 [29.8]
2 Bolt SAE A Flange	1 Inch Straight	7/8 -14 O-ring Staggered	104-2001	-2002	-2003	-2004	-2005	-2006	-2007	-2008	—
	1 1/4 Inch Straight	7/8 -14 O-ring Staggered	104-2009	-2010	-2011	-2012	-2013	-2014	-2015	-2016	-2219
	1 1/4 Inch 14 T Splined	7/8 -14 O-ring Staggered	104-2017	-2018	-2019	-2020	-2021	-2022	-2023	-2024	—
Wheel Motor	1 1/4 Inch Tapered	7/8 -14 O-ring Staggered	105-2001	-2002	-2003	-2004	-2005	-2006	-2007	-2008	—
	1 1/4 Inch 14 T Splined	7/8 -14 O-ring Staggered	105-2009	-2010	-2011	-2012	-2013	-2014	-2015	-2016	—
Bearingless		7/8 -14 O-ring Staggered	106-2001	-2002	-2003	-2004	-2005	-2006	-2007	-2008	—



4000 Compact Series

Highlights



Features

- Shuttle Valve with Back-Pressure Relief Valve
- Speed Sensors
- End Ports.

Benefits

- Higher bearing capacity than 2000 Series
- Torque of 4000 Series

Applications

- Skid Steer Loaders
- Fairway Mowers
- Harvesters
- Vehicles where space may be at a premium.

Description

This new compact addition in a family of disc valve hydraulic motors produces the same amount of torque as the current 4000 Series. Yet, it is housed in an envelope similar to its smaller counterpart, the 2000 Series. The unit's intermittent torque rating is 1220 Nm [10800 lb-in]. A variety of mounting options include two 2 bolt mounts (SAE A, SAE B), and four 4 bolt mounts (magneto, standard and wheel mounts.) For added flexibility, the motor can be specified with either the larger size shafts of the 2000 Series of standard output shaft sizes of the 4000 Series, plus one new 1-1/2 inch straight (the small envelope and optional shaft sizes make this motor ideal for vehicles like skid-steer loaders whose hallmark is high power and productivity in a small frame.)

Specifications

Geroler Element	6 Displacements
Flow l/min [GPM]	75 [20] Continuous**
	115 [30] Intermittent*
Speed RPM	464 Cont.**
	699 Inter.*
Pressure bar [PSI]	200 [3000] Cont.**
	300 [4500] Inter.*
Torque Nm [lb-in]	975 [8627] Cont.**
	1218 [10788] Inter.*

** Continuous— (Cont.) Continuous rating, motor may be run continuously at these ratings.
* Intermittent— (Inter.) Intermittent operation, 10% of every minute.


Lawn and Turf

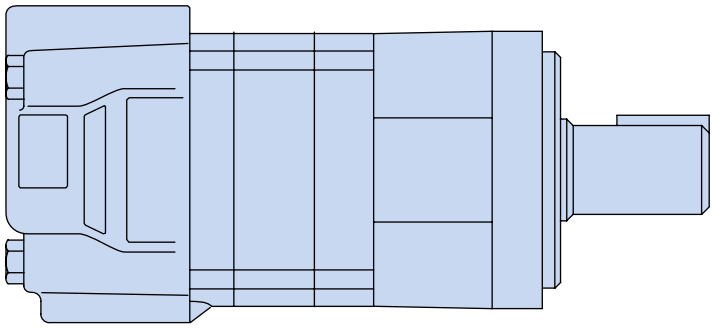

Skid Steer


Boom Lift


Harvestor

4000 Compact Series

Specifications



SPECIFICATION DATA — 4000 COMPACT SERIES MOTORS

Displ. cm3/r [in3/r]		160 [9.8]	200 [12.3]	250 [15.4]	325 [19.8]	405 [24.6]	490 [29.8]
Max. Speed (RPM)	Continuous	464	375	300	234	188	155
@ Flow	Intermittent	699	562	450	351	282	232
Flow	Continuous	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]
l/min [GPM]	Intermittent	115 [30]	115 [30]	115 [30]	115 [30]	115 [30]	115 [30]
Torque*	Continuous	510 [4514]	758 [5715]	734 [6500]	793 [7021]	800 [7079]	975 [8627]
Nm [lb-in]	Intermittent	690 [6108]	840 [7436]	935 [8272]	1053 [9320]	921 [8153]	1218 [10778]
Pressure	Continuous	225 [3000]	225 [3000]	205 [3000]	170 [2500]	140 [2000]	140 [2000]
Δ bar	Intermittent	310 [4500]	295 [4250]	260 [3750]	240 [3500]	170 [2500]	171 [2500]
[Δ PSI]	Peak	310 [4500]	310 [4500]	310 [4500]	310 [4500]	275 [4000]	260 [3750]
Weight kg [lb]	Standard or Wheel Mount	10,4 [23.0]	10,9 [24.0]	11,3 [25.0]	11,8 [26.0]	12,2 [27.0]	12,2 [27.0]
	Bearingless	8,4 [18.5]	8,8 [19.5]	9,3 [20.5]	9,8 [21.5]	10,2 [22.5]	10,2 [22.5]

Maximum Case Pressure: See case pressure seal limitation graph.
*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:

310 bar [4500 PSI]

Do not exceed Δ pressure rating (see chart above).

Maximum Return Pressure:

310 bar [4500 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

4000 Compact 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

Intermittent

Peak

No Operation

160 cm³/r [9.8 in³/r]
Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140	[2250] 155	[2500] 170	[2750] 190	[3000] 205	[3250] 225	[3500] 240	[3750] 260	[4000] 275	[4250] 295
[0.25]	244	543															
	28	61															
0,95	**4**	**3**															
[0.5]	274	554	854														
	31	63	96														
1,9	**10**	**8**	**7**														
[1]	274	593	899	1210	1513	1816	2092	2361	2621	2874	3088						
	31	67	102	137	171	205	236	267	296	325	349						
3,8	**22**	**21**	**20**	**19**	**17**	**14**	**12**	**10**	**9**	**7**	**6**						
[2]	301	623	940	1261	1579	1898	2197	2492	2766	3033	3270	3496	3761	4022			
	34	70	106	143	178	214	248	282	313	343	369	395	425	454			
7,5	**40**	**39**	**38**	**36**	**35**	**33**	**31**	**28**	**24**	**20**	**17**	**14**	**10**	**6**			
[4]	305	662	1004	1354	1699	2046	2386	2725	3049	3368	3693	4016	4319	4618	4828	5022	
	34	75	113	153	192	231	270	308	344	381	417	454	488	522	545	567	
15	**87**	**85**	**83**	**81**	**79**	**77**	**74**	**72**	**67**	**63**	**59**	**55**	**49**	**44**	**35**	**27**	
[6]	293	659	1003	1357	1705	2056	2399	2741	3074	3405	3751	4098	4417	4732	5023	5308	
	33	74	113	153	193	232	271	310	347	385	424	463	499	535	568	600	
23	**133**	**131**	**129**	**127**	**124**	**121**	**118**	**114**	**109**	**104**	**99**	**93**	**87**	**80**	**71**	**63**	
[8]	280	656	1002	1360	1711	2066	2412	2758	3100	3442	3809	4180	4514	4846	5218	5593	5856
	32	74	113	154	193	233	273	312	350	389	430	472	510	548	590	632	662
30	**181**	**179**	**177**	**175**	**172**	**169**	**166**	**162**	**157**	**152**	**145**	**139**	**133**	**127**	**120**	**113**	**104**
[10]	259	630	978	1348	1701	2061	2408	2755	3102	3450	3806	4163	4500	4835	5191	5547	5784
	29	71	110	152	192	233	272	311	351	390	430	470	508	546	586	627	653
38	**228**	**225**	**223**	**220**	**217**	**213**	**209**	**204**	**199**	**193**	**186**	**179**	**172**	**165**	**157**	**150**	**141**
[12]	238	604	954	1336	1692	2056	2403	2752	3105	3458	3802	4146	4485	4824	5163	5501	
	27	68	108	151	191	232	272	311	351	391	430	468	507	545	583	622	
45	**275**	**272**	**269**	**266**	**262**	**258**	**253**	**247**	**241**	**235**	**229**	**223**	**214**	**205**	**197**	**189**	
[14]	210	577	923	1308	1665	2034	2385	2739	3092	3447	3796	4144	4487	4830			
	24	65	104	148	188	230	269	310	349	390	429	468	507	546			
53	**322**	**319**	**316**	**313**	**308**	**304**	**298**	**293**	**286**	**279**	**272**	**265**	**256**	**247**			
[16]	182	550	893	1280	1638	2012	2367	2727	3080	3436	3789	4143	4489	4836			
	21	62	101	145	185	227	267	308	348	388	428	468	507	546			
61	**370**	**367**	**363**	**360**	**356**	**351**	**345**	**339**	**332**	**324**	**317**	**309**	**301**	**292**			
[18]	143	514	853	1247	1601	1973	2329	2692	3045	3401	3756	4114					
	16	58	96	141	181	223	263	304	344	384	424	465					
68	**417**	**414**	**410**	**406**	**401**	**397**	**390**	**383**	**375**	**366**	**358**	**350**					
[20]	105	478	814	1213	1564	1935	2291	2658	3010	3366	3724	4085					
	12	54	92	137	177	219	259	300	340	380	421	462					
76	**464**	**461**	**457**	**453**	**448**	**442**	**435**	**428**	**418**	**409**	**400**	**390**					
[22]		433	762	1167	1518	1893	2252	2623	2973	3328	3682	4040					
		49	86	132	172	214	254	296	336	376	416	456					
83		**508**	**504**	**500**	**495**	**489**	**482**	**474**	**465**	**456**	**446**	**436**					
[24]		387	711	1121	1472	1851	2212	2589	2937	3291	3641	3995					
		44	80	127	166	209	250	292	332	372	411	451					
91		**556**	**552**	**548**	**542**	**537**	**529**	**521**	**513**	**504**	**493**	**483**					
[25]		363	683	1095	1445	1824	2184	2561	2910	3266							
		41	77	124	163	206	247	289	329	369							
95		**580**	**576**	**572**	**566**	**560**	**552**	**544**	**535**	**526**							
[30]		244	546	967	1308	1689	2045	2421	2777	3144							
		28	62	109	148	191	231	274	314	355							
114		**699**	**695**	**692**	**685**	**678**	**669**	**660**	**648**	**637**							

[2777] 314 **648** } Torque [lb-in] Nm **Speed RPM**

4000 Compact 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

Intermittent

Peak

No Operation

200 cm³/r [12.3 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140	[2250] 155	[2500] 170	[2750] 190	[3000] 205	[3250] 225	[3500] 240	[3750] 260	[4000] 275	[4250] 295
[0.25]	115	504															
	13	57															
0,95	**4**	**3**															
[0.5]	268	584	963	1274													
	30	66	109	144													
1,9	**8**	**7**	**4**	**3**													
[1]	306	721	1104	1516	1913	2243	2397	2772									
	35	81	125	171	216	253	271	313									
3,8	**17**	**16**	**14**	**13**	**12**	**10**	**9**	**6**									
[2]	402	841	1218	1647	2107	2478	2826	3238	3954	4451	4755	5127	5407	5569	5855		
	45	95	138	186	238	280	319	366	447	503	537	579	611	629	662		
7,5	**35**	**34**	**32**	**31**	**30**	**28**	**27**	**24**	**29**	**26**	**23**	**21**	**17**	**11**	**8**		
[4]	403	896	1361	1780	2247	2649	3068	3513	3947	4367	4710	5125	5509	5880	6249	6547	6753
	46	101	154	201	254	299	347	397	446	493	532	579	622	664	706	740	763
15	**72**	**70**	**69**	**68**	**66**	**65**	**62**	**60**	**56**	**53**	**50**	**46**	**42**	**37**	**31**	**24**	**19**
[6]	385	863	1354	1785	2260	2657	3087	3547	3965	4389	4793	5218	5610	6015	6408	6754	7436
	44	98	153	202	255	300	349	401	448	496	542	590	634	680	724	763	840
23	**109**	**107**	**106**	**104**	**102**	**100**	**97**	**93**	**90**	**86**	**81**	**77**	**72**	**66**	**60**	**52**	**47**
[8]	368	831	1347	1790	2273	2665	3106	3581	3982		4876	5311	5712	6151	6567	6961	7334
	42	94	152	202	257	301	351	405	450	498	551	600	645	695	742	786	829
30	**147**	**146**	**144**	**142**	**140**	**137**	**134**	**130**	**127**	**122**	**117**	**113**	**108**	**103**	**98**	**91**	**83**
[10]	353	822	1319	1774	2212	2642	3086	3556	3974	4410	4839	5297	5715	6147	6563		
	40	93	149	200	250	299	349	402	449	498	547	598	646	695	742		
38	**185**	**184**	**181**	**179**	**177**	**174**	**170**	**165**	**161**	**156**	**151**	**146**	**140**	**134**	**129**		
[12]	339	813	1291	1758	2151	2620	3067	3530	3965	4408	4802	5283	5718	6144	6568		
	38	92	146	199	243	296	346	399	448	498	543	597	646	694	742		
45	**223**	**222**	**219**	**217**	**214**	**211**	**207**	**202**	**197**	**192**	**186**	**180**	**174**	**167**	**164**		
[14]	282	762	1237	1693	2121	2601	2968	3504	3953	4368	4832	5261	5690				
	32	86	140	191	240	294	335	396	447	493	546	594	643				
53	**261**	**260**	**257**	**255**	**252**	**248**	**244**	**238**	**233**	**227**	**221**	**214**	**208**				
[16]	224	712	1183	1629	2091	2581	2870	3477	3940	4328	4861	5240	5661				
	25	80	134	184	236	292	324	393	445	489	549	592	640				
61	**299**	**298**	**296**	**293**	**290**	**286**	**282**	**275**	**269**	**263**	**256**	**249**	**243**				
[18]	200	667	1148	1619	2053	2520	2899	3442	3906	4337	4819	5245	5644				
	23	75	130	183	232	285	328	389	441	490	544	593	638				
68	**337**	**336**	**334**	**331**	**328**	**324**	**320**	**314**	**307**	**301**	**293**	**285**	**278**				
[20]	176	623	1112	1609	2014	2458	2929	3407	3872	4347	4777	5250	5627				
	20	70	126	182	228	278	331	385	437	491	540	593	636				
76	**375**	**374**	**372**	**369**	**366**	**363**	**358**	**353**	**346**	**339**	**331**	**322**	**315**				
[22]		565	1053	1530	1934	2387	2868	3347	3804	4254	4698						
		64	119	173	219	270	324	378	430	481	531						
83		**412**	**410**	**407**	**404**	**401**	**396**	**390**	**383**	**375**	**367**						
[24]		507	994	1450	1855	2316	2806	3287	3737	4162	4618						
		57	112	164	210	262	317	371	422	470	522						
91		**449**	**448**	**446**	**443**	**439**	**434**	**427**	**420**	**412**	**403**						
[25]		465	950	1411	1820	2276	2768	3233	3688	4116	4493						
		53	107	159	206	257	313	365	417	465	508						
95		**468**	**467**	**464**	**462**	**458**	**453**	**446**	**439**	**431**	**423**						
[30]		259	726	1214	1645	2072	2577	2961	3443	3889	3866						
		29	82	137	186	234	291	335	389	439	437						
114		**562**	**563**	**559**	**555**	**556**	**550**	**545**	**536**	**527**	**521**						

[2072] 234 **556** } Torque [lb-in] Nm **Speed RPM**

4000 Compact 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

Intermittent

Peak

No Operation

250 cm³/r [15.4 in³/r]
Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140	[2250] 155	[2500] 170	[2750] 190	[3000] 205	[3250] 225	[3500] 240	[3750] 260
[0.5]	384	833													
	43	94													
1,9	**6**	**5**													
[1]	438	904	1403	1887	2359	2798	3221	3657	3822	4326					
	49	102	158	213	267	316	364	413	432	489					
3,8	**14**	**14**	**13**	**12**	**11**	**9**	**8**	**7**	**4**	**3**					
[2]	492	1054	1563	2081	2623	3160	3717	4147	4585	5070	5470	5721	5962		
	56	119	177	235	296	357	420	469	518	573	618	646	674		
7,5	**28**	**27**	**26**	**25**	**24**	**23**	**21**	**17**	**16**	**13**	**9**	**7**	**5**		
[4]	603	1183	1771	2275	2817	3364	3895	4495	5005	5496	5982	6500	7054	7519	7941
	68	134	200	257	318	380	440	508	565	621	676	734	797	850	897
15	**58**	**56**	**55**	**54**	**52**	**50**	**47**	**44**	**42**	**38**	**35**	**32**	**28**	**24**	**17**
[6]	587	1159	1741	2329	2815	3369	3951	4483	5021	5555	6068	6557	7131	7641	8107
	66	131	197	263	318	381	446	506	567	628	686	741	806	863	916
23	**88**	**86**	**84**	**82**	**80**	**77**	**74**	**71**	**67**	**63**	**59**	**55**	**50**	**45**	**38**
[8]	571	1135	1710	2384	2813	3375	4008	4471	5038	5613	6154	6614	7209	7763	8272
	65	128	193	269	318	381	453	505	569	634	695	747	815	877	935
30	**118**	**116**	**114**	**112**	**110**	**107**	**103**	**100**	**96**	**92**	**87**	**83**	**78**	**73**	**67**
[10]	552	1138	1671	2304	2804	3361	3950	4452	5006	5587	6123	6612	7201		
	62	129	189	260	317	380	446	503	566	631	692	747	814		
38	**148**	**146**	**144**	**142**	**139**	**136**	**131**	**127**	**123**	**119**	**113**	**109**	**102**		
[12]	532	1140	1631	2224	2796	3347	3892	4434	4974	5561	6093	6610	7193		
	60	129	184	251	316	378	440	501	562	628	688	747	813		
45	**178**	**177**	**175**	**173**	**170**	**166**	**161**	**157**	**151**	**146**	**141**	**136**	**129**		
[14]	441	1072	1600	2207	2754	3320	3888	4433	4958	5529	6066	6590			
	50	121	181	249	311	375	439	501	560	625	685	745			
53	**209**	**207**	**205**	**202**	**199**	**195**	**190**	**185**	**179**	**174**	**168**	**162**			
[16]	349	1003	1568	2190	2711	3292	3884	4431	4941	5496	6039	6570			
	39	113	177	247	306	372	439	501	558	621	682	742			
61	**239**	**237**	**235**	**233**	**229**	**225**	**220**	**214**	**208**	**202**	**195**	**189**			
[18]	306	940	1513	2114	2653	3251	3830	4380	4904	5446	5984	6518			
	35	106	171	239	300	367	433	495	554	615	676	736			
68	**269**	**267**	**265**	**263**	**259**	**255**	**250**	**243**	**236**	**230**	**223**	**214**			
[20]	263	876	1458	2038	2595	3210	3777	4328	4867	5395	5928	6471			
	30	99	165	230	293	363	427	489	550	610	670	731			
76	**300**	**298**	**296**	**293**	**290**	**285**	**280**	**272**	**265**	**259**	**251**	**241**			
[22]		826	1414	1991	2528	3144	3709	4262	4806	5354	5915				
		93	160	225	286	355	419	482	543	605	668				
83		**328**	**326**	**323**	**320**	**315**	**309**	**302**	**295**	**288**	**279**				
[24]		776	1370	1945	2462	3079	3642	4196	4745	5313	5901				
		88	155	220	278	348	411	474	536	600	667				
91		**359**	**356**	**354**	**350**	**345**	**339**	**332**	**325**	**317**	**308**				
[25]		732	1322	1959	2426	3026	3594	4153	4696	5152					
		83	149	221	274	342	406	469	531	582					
95		**374**	**371**	**369**	**365**	**360**	**354**	**347**	**340**	**333**					
[30]		509	1082	2029	2246	2761	3358	3939	4450	4347					
		57	122	229	254	312	379	445	503	491					
114		**450**	**449**	**445**	**442**	**437**	**430**	**423**	**414**	**413**					

[2246] Torque [lb-in]
254 Nm
442 Speed RPM

4000 Compact 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

Intermittent

Peak

No Operation

325 cm³/r [19.8 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140	[2250] 155	[2500] 170	[2750] 190	[3000] 205	[3250] 225	[3500] 240
[0.5]	536	1152												
	61	130												
1,9	**5**	**4**												
[1]	555	1220	1900	2559	3222	3862	4522	5061	5580	6106				
	63	138	215	289	364	436	511	572	630	690				
3,8	**11**	**10**	**10**	**9**	**9**	**8**	**7**	**5**	**3**	**3**				
[2]	643	1349	2025	2712	3378	4051	4696	5335	5889	6366	6876			
	73	152	229	306	382	458	531	603	665	719	777			
7,5	**22**	**21**	**20**	**19**	**19**	**17**	**15**	**13**	**10**	**5**	**3**			
[4]	679	1420	2140	2852	3557	4259	4947	5628	6300	6960	7596	8201	8767	9320
	77	160	242	322	402	481	559	636	712	786	858	927	991	1053
15	**45**	**44**	**43**	**42**	**40**	**38**	**36**	**33**	**30**	**26**	**23**	**19**	**14**	**11**
[6]	654	1400	2132	2859	3575	4281	4977	5668	6346	7021	7678	8244	8792	
	74	158	241	323	404	484	562	640	717	793	868	931	993	
23	**68**	**67**	**66**	**64**	**62**	**59**	**56**	**53**	**49**	**44**	**40**	**38**	**35**	
[8]	629	1379	2125	2866	3592	4304	5007	5707	6392	7082	7760	8400		
	71	156	240	324	406	486	566	645	722	800	877	949		
30	**92**	**90**	**89**	**87**	**85**	**82**	**79**	**75**	**71**	**66**	**61**	**56**		
[10]	587	1337	2082	2827	3556	4272	4976	5672	6362	7053				
	66	151	235	319	402	483	562	641	719	797				
38	**115**	**114**	**112**	**110**	**107**	**103**	**100**	**94**	**90**	**85**				
[12]	546	1295	2040	2787	3520	4240	4944	5638	6332	7023				
	62	146	230	315	398	479	559	637	715	794				
45	**139**	**137**	**136**	**134**	**130**	**125**	**121**	**115**	**110**	**105**				
[14]	489	1238	1984	2729	3467	4193	4903	5600	6293					
	55	140	224	308	392	474	554	633	711					
53	**162**	**161**	**159**	**157**	**153**	**148**	**143**	**136**	**131**					
[16]	431	1182	1929	2671	3415	4145	4861	5562	6254					
	49	134	218	302	386	468	549	628	707					
61	**186**	**185**	**183**	**181**	**177**	**171**	**165**	**159**	**153**					
[18]	360	1110	1856	2600	3343	4073	4794	5499						
	41	125	210	294	378	460	542	621						
68	**210**	**208**	**206**	**204**	**200**	**195**	**189**	**183**						
[20]	288	1038	1784	2529	3271	4001	4726	5436						
	33	117	202	286	370	452	534	614						
76	**234**	**232**	**230**	**228**	**224**	**220**	**214**	**207**						
[22]		958	1706	2451	3194	3926	4650	5360						
		108	193	277	361	444	525	606						
83		**256**	**254**	**251**	**248**	**243**	**237**	**229**						
[24]		878	1628	2373	3116	3850	4574	5285						
		99	184	268	352	435	517	597						
91		**279**	**277**	**275**	**271**	**266**	**260**	**252**						
[25]		826	1576	2320	3063	3798	4523							
		93	178	262	346	429	511							
95		**291**	**289**	**287**	**283**	**277**	**271**							
[30]		566	1314	2056	2799	3536	4268							
		64	148	232	316	399	482							
114		**351**	**349**	**346**	**342**	**337**	**332**							

[2799] Torque [lb-in]
316 Nm
342 Speed RPM

4000 Compact 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

Intermittent

Peak

No Operation

405 cm³/r [24.6 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140	[2250] 155	[2500] 170
[0.5]	719	1458								
	81	165								
1,9	**3**	**2**								
[1]	777	1631	2423	3148	3690					
	88	184	274	356	417					
3,8	**8**	**7**	**5**	**4**	**3**					
[2]	853	1812	2596	3375	4179	4845	5375	5841	6501	
	96	205	293	381	472	547	607	660	735	
7,5	**17**	**15**	**14**	**12**	**11**	**9**	**8**	**3**	**2**	
[4]	878	1859	2687	3667	4554	5388	6232	7004	7660	8153
	99	210	304	414	515	609	704	791	865	921
15	**35**	**34**	**32**	**30**	**28**	**25**	**23**	**19**	**16**	**11**
[6]	882	1836	2716	3680	4577	5388	6269	7079	7856	
	100	207	307	416	517	609	708	800	888	
23	**54**	**52**	**51**	**48**	**46**	**42**	**39**	**35**	**31**	
[8]	885	1813	2746	3694	4600	5388	6307	7153	8052	
	100	205	310	417	520	609	713	808	910	
30	**73**	**72**	**70**	**68**	**65**	**62**	**58**	**55**	**50**	
[10]	810	1736	2693	3639	4540	5390	6310	7151	7994	
	92	196	304	411	513	609	713	808	903	
38	**92**	**90**	**89**	**86**	**84**	**80**	**75**	**71**	**67**	
[12]	735	1660	2640	3584	4480	5391	6314	7149		
	83	188	298	405	506	609	713	808		
45	**111**	**110**	**108**	**106**	**103**	**98**	**93**	**88**		
[14]	661	1622	2560	3512	4412	5330	6242	7059		
	75	183	289	397	498	602	705	798		
53	**130**	**128**	**127**	**124**	**121**	**117**	**112**	**108**		
[16]	587	1585	2480	3440	4343	5268	6170			
	66	179	280	389	491	595	697			
61	**149**	**147**	**146**	**143**	**141**	**137**	**131**			
[18]	492	1472	2379	3333	4270	5190	6084			
	56	166	269	377	482	586	687			
68	**168**	**167**	**165**	**162**	**160**	**156**	**150**			
[20]	397	1359	2279	3226	4197	5112	5999			
	45	153	257	365	474	578	678			
76	**188**	**186**	**184**	**182**	**179**	**175**	**170**			
[22]		1264	2194	3124	4093	5008	5904			
		143	248	353	462	566	667			
83		**205**	**203**	**201**	**198**	**193**	**188**			
[24]		1169	2110	3023	3989	4904	5810			
		132	238	342	451	554	656			
91		**224**	**222**	**220**	**216**	**212**	**207**			
[25]		1106	2049	2961	3929	4851	5766			
		125	231	335	444	548	651			
95		**233**	**232**	**229**	**226**	**222**	**217**			
[30]		790	1744	2655	3634	4587	5543			
		89	197	300	411	518	626			
114		**282**	**280**	**277**	**274**	**270**	**266**			

[2655] Torque [lb-in]
300 Nm
227 Speed RPM

4000 Compact 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
- Intermittent
- Peak
- No Operation

490 cm³/r [29.8 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140	[2250] 155	[2500] 170
[0.5]	375	1669								
	42	189								
1,9	**3**	**3**								
[1]	525	1762	2945	3965	5099	5926	6715	7503		
	59	199	333	448	576	670	759	848		
3,8	**7**	**7**	**6**	**6**	**6**	**5**	**4**	**3**		
[2]	639	2108	3287	4169	5416	6570	7188	8295	8959	
	72	238	371	471	612	742	812	937	1012	
7,5	**14**	**14**	**13**	**13**	**11**	**11**	**9**	**6**	**5**	
[4]	981	2201	3333	4574	5558	6634	7694	8627	9567	10399
	111	249	377	517	628	750	869	975	1081	1175
15	**30**	**29**	**29**	**28**	**27**	**26**	**24**	**21**	**18**	**13**
[6]	1049	2218	3332	4584	5604	6670	7711	8713	9698	10588
	119	251	376	518	633	754	871	984	1096	1196
23	**45**	**45**	**44**	**43**	**42**	**40**	**38**	**35**	**31**	**26**
[8]	1118	2236	3331	4593	5650	6705	7727	8798	9828	10778
	126	253	376	519	638	758	873	994	1110	1218
30	**61**	**60**	**60**	**59**	**58**	**56**	**54**	**51**	**48**	**44**
[10]	1060	2230	3304	4503	5607	6693	7721	8836		
	120	252	373	509	633	756	872	998		
38	**76**	**76**	**75**	**75**	**73**	**72**	**69**	**66**		
[12]	1003	2223	3276	4413	5564	6680	7715	8874		
	113	251	370	499	629	755	872	1003		
45	**92**	**91**	**91**	**90**	**89**	**88**	**85**	**82**		
[14]	858	2127	3136	4320	5496	6542	7653			
	97	240	354	488	621	739	865			
53	**108**	**107**	**107**	**106**	**105**	**103**	**100**			
[16]	713	2030	2997	4226	5428	6403	7590			
	81	229	339	477	613	723	858			
61	**124**	**123**	**122**	**122**	**121**	**119**	**115**			
[18]	631	1907	2935	4133	5330	6339	7431			
	71	215	332	467	602	716	840			
68	**139**	**139**	**138**	**137**	**136**	**134**	**130**			
[20]	548	1784	2872	4041	5232	6275	7362			
	62	202	325	457	591	709	832			
76	**155**	**154**	**153**	**153**	**152**	**150**	**148**			
[22]		1669	2704	3928	5048	6124	7208			
		189	306	444	570	692	814			
83		**170**	**169**	**169**	**168**	**166**	**164**			
[24]		1553	2536	3816	4864	5972	7055			
		175	287	431	550	675	797			
91		**186**	**185**	**185**	**184**	**182**	**179**			
[25]		1469	2475	3737	4810	5909	6959			
		166	280	422	543	668	786			
95		**193**	**193**	**193**	**192**	**190**	**187**			
[30]		1047	2172	3341	4538	5592	6482			
		118	245	378	513	632	732			
114		**232**	**232**	**232**	**231**	**229**	**227**			

[3341] } Torque [lb-in]
378 } Nm
232 } **Speed RPM**

4000 Compact Series

Dimensions

Ports

7/8 -14 UNF-2B SAE O-ring Staggered Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

1 1/16 -12 UN-2B SAE O-ring Ports (Positioned 180° Apart) (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

7/8 -14 UNF-2B SAE O-ring End Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

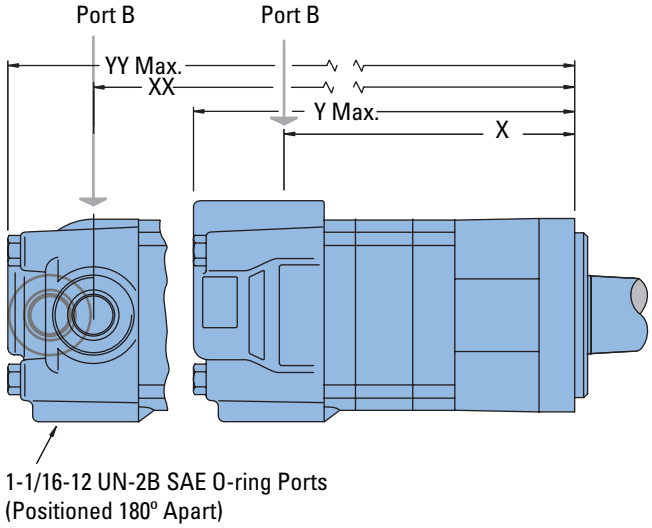
G 1/2 (BSP) Staggered Ports (2)
G 1/4 (BSP) Case Drain Port (1) or

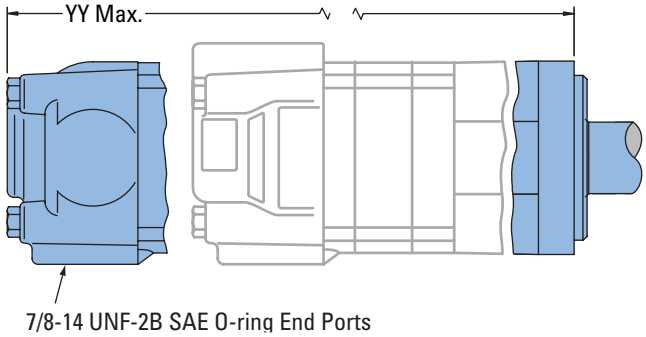
Manifold Mount
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1)

Standard Rotation Viewed from Shaft End

Port A Pressurized — CW
Port B Pressurized — CCW

Standard Mount





STANDARD MOUNT MOTOR DIMENSIONS

Displacement cm^3/r [in^3/r]	X mm [inch]	Y mm [inch]	XX mm [inch]	YY mm [inch]
160 [9.8]	154,7 [6.09]	201,9 [7.95]	157,0 [6.18]	203,3 [8.00]
200 [12.3]	163,8 [6.45]	211,1 [8.31]	166,1 [6.54]	212,3 [8.36]
250 [15.4]	175,3 [6.90]	222,5 [8.76]	177,5 [6.99]	223,8 [8.81]
325 [19.8]	191,0 [7.52]	238,5 [9.39]	193,3 [7.61]	239,8 [9.44]
405 [24.6]	208,5 [8.21]	255,8 [10.07]	210,8 [8.30]	257,0 [10.12]
490 [29.8]	208,5 [8.21]	255,8 [10.07]	210,8 [8.30]	257,0 [10.12]

4000 Compact Series

Dimensions

Ports

7/8 -14 UNF-2B SAE O-ring Staggered Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

1 1/16 -12 UN-2B SAE O-ring Ports (Positioned 180° Apart) (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

7/8 -14 UNF-2B SAE O-ring End Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

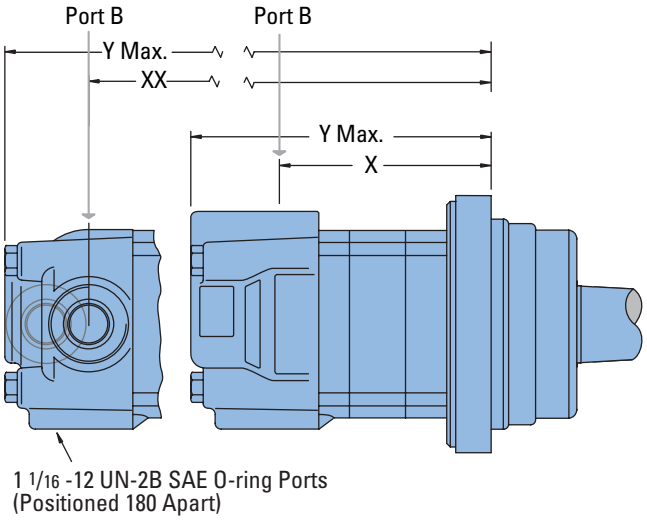
G 1/2 (BSP) Staggered Ports (2)
G 1/4 (BSP) Case Drain Port (1) or

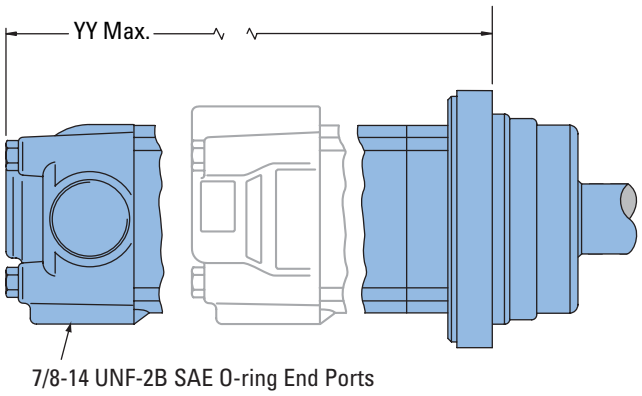
Manifold Mount
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1)

Standard Rotation Viewed from Shaft End

Port A Pressurized — CW
Port B Pressurized — CCW

Wheel Mount





WHEEL MOUNT MOTOR DIMENSIONS

Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]	XX mm [inch]	YY mm [inch
160 [9.8]	114,6 [4.51]	161,8 [6.37]	114,6 [4.51]	161,8 [6.37]
200 [12.3]	123,7 [4.87]	170,9 [6.73]	123,7 [4.87]	170,9 [6.73]
250 [15.4]	135,1 [5.32]	182,4 [7.18]	135,1 [5.32]	182,4 [7.18]
325 [19.8]	150,9 [5.94]	198,4 [7.81]	150,9 [5.94]	198,4 [7.81]
405 [24.6]	168,4 [6.63]	215,6 [8.49]	168,4 [6.63]	215,6 [8.49]
490 [29.8]	168,4 [6.63]	215,6 [8.49]	168,4 [6.63]	215,6 [8.49]

4000 Compact Series

Dimensions

Ports

7/8 -14 UNF-2B SAE O-ring Staggered Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

1 1/16 -12 UN-2B SAE O-ring Ports (Positioned 180° Apart) (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

7/8 -14 UNF-2B SAE O-ring End Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

G 1/2 (BSP) Staggered Ports (2)
G 1/4 (BSP) Case Drain Port (1) or

Manifold Mount
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1)

Standard Rotation Viewed from Shaft End

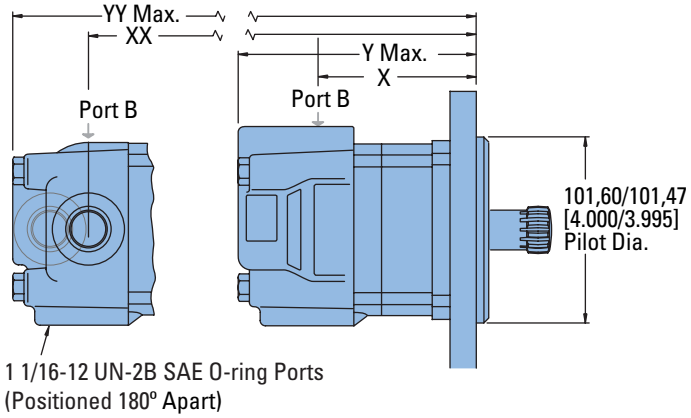
Port A Pressurized — CW
Port B Pressurized — CCW

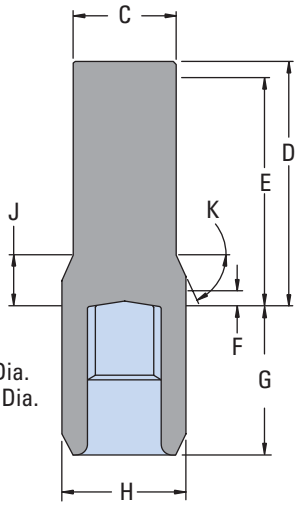
For 4000 bearingless motor application information, contact your Eaton representative (mating coupling blanks available from Eaton Hydraulics).

Note:

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

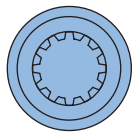
Bearingless

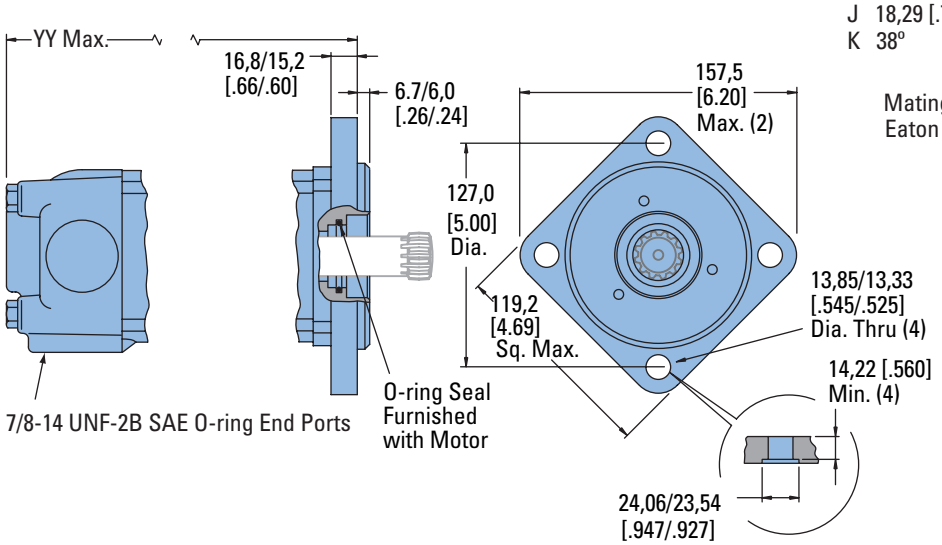




C 47,2 [1.86] Dia.
D 112,5 [4.43] Max.
E 107,4 [4.23] Full Form Dia.
F 7,4 [.29]Min. Full Form Dia.
G 68,8 [2.71] Max.
H 56,9 [2.24] Dia.
J 18,29 [.720]
K 38º

Mating Coupling Blank
Eaton Part No. 12745-003





BEARINGLESS MOTOR DIMENSIONS

Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]	XX mm [inch]	YY mm [inch]
160 [9.8]	96,8 [3.81]	144,3 [5.68]	99,1 [3.90]	145,5 [5.73]
200 [12.3]	105,7 [4.16]	153,4 [6.04]	108,0 [4.25]	154,7 [6.09]
250 [15.4]	117,1 [4.61]	164,8 [6.49]	119,4 [4.70]	166,1 [6.54]
325 [19.8]	133,1 [5.24]	180,8 [7.12]	135,4 [5.33]	182,1 [7.17]
405 [24.6]	150,4 [5.92]	198,1 [7.80]	152,7 [6.01]	199,4 [7.85]
490 [29.8]	150,4 [5.92]	198,1 [7.80]	152,7 [6.01]	199,4 [7.85]

4000 Compact Series

Installation Information

Bearingless

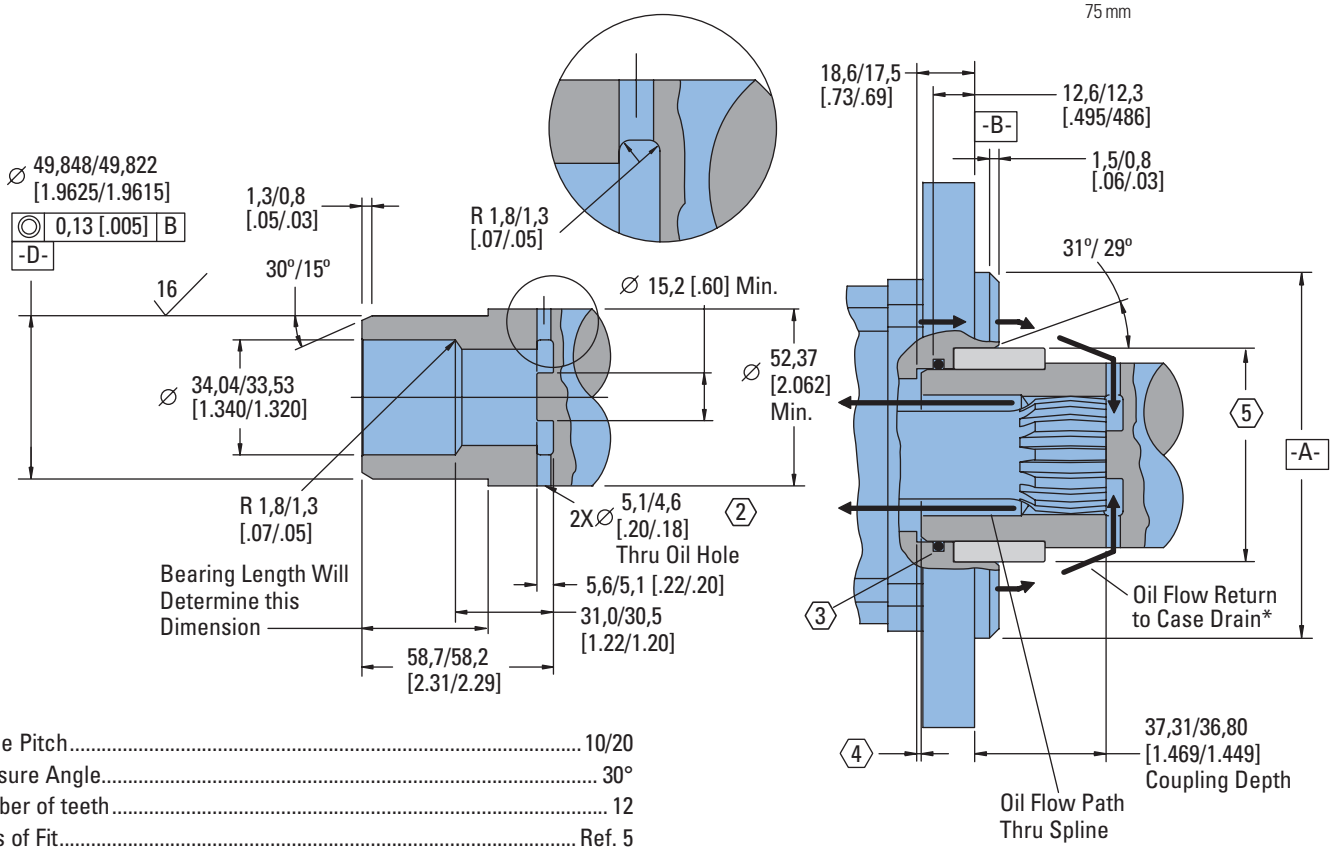
1 Internal spline in mating part to be per spline data specification. Material to be ASTM A304, 8620H vacuum degassed alloy steel carbonize to a hardness of 59-62 HRc with case depth (to 50HRc) of 0,76 - 1,02 [.030 - .040] dimensions apply after heat treat.

2 Mating part to have critical dimensions as shown. Oil holes must be provided and open for proper oil circulation.

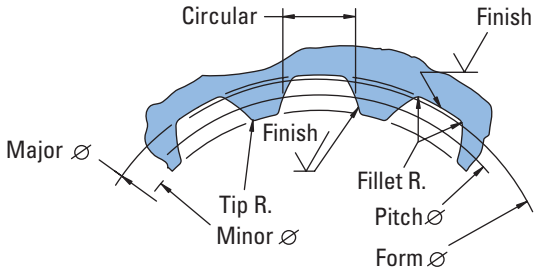
3 Seal to be furnished with motor for proper oil circulation thru splines.

4 Some means of maintaining clearance between shaft and mounting flange must be provided.

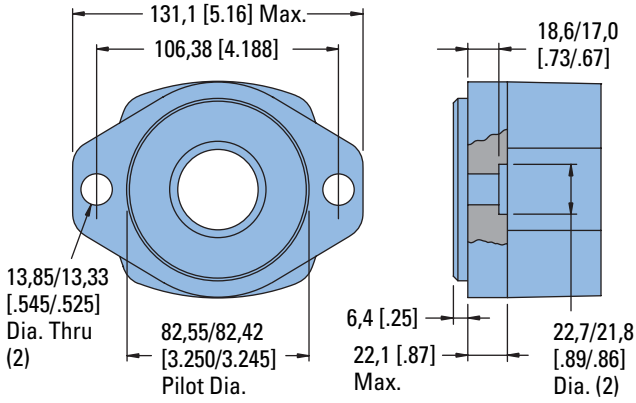
5 Counterbore designed to adapt to a standard sleeve bearing 50,010 - 50,040 [1.9689 - 1.9700] ID by 60,050 - 60,080 [2.3642 - 2.3653] (Oilite bronze sleeve bearing) Source: Beemer Precision Inc. www.oilite.com, 1-800-836-2340
AAM 50 mm ID - 60 mm OD Length Determined by the Customer.
Stock Bearing Lengths:
35 mm
50 mm
60 mm
70 mm
75 mm



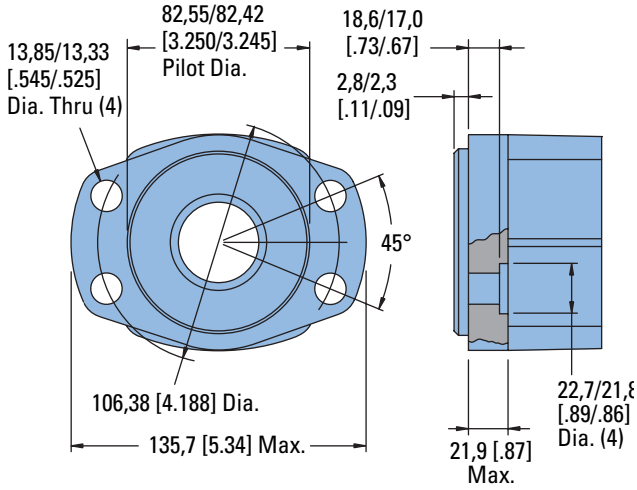
Spline Pitch	10/20
Pressure Angle	30°
Number of teeth	12
Class of Fit	Ref. 5
Type of Fit	Side
Pitch Diameter	Ref. 30,480000 [1.2000000] ↗ 0,20 [.008] D
Base Diameter	Ref. 26,396455 [1.0392305]
Major Diameter	(33,43 [1.316] Max. 33,23 [1.308] Min.)
Minor Diameter	28,40 - 25,58 [1.118 - 1.125]
Form Diameter, Min.	32,59 [1.283]
Fillet Radius	0,63 - 0,76 [.025 - .030]
Tip Radius	0,26 - 0,51 [.010 - .020]
Finish	1,6 (63)
Involute Profile Variation	+0,000 -0,025 [+.0000 -.0010]
Total Index Variation	0,038 [.0015]
Lead Variation	0,013 [.0005]
Circular Space Width:	
Maximum Actual	5,045 [.1986]
Minimum Effective	4,995 [.1951]
Maximum Effective	Ref. 5,009 [.1972]
Minimum Actual	Ref. 4,986 [.1963]
Dimension Between Two Pins	Ref. 22,783 - 22,929 [.8970 - .9027]
Pin Diameter	5,334 [.2100] Pins to Have 3,73 [.147] Wide Flat for Root Clearance



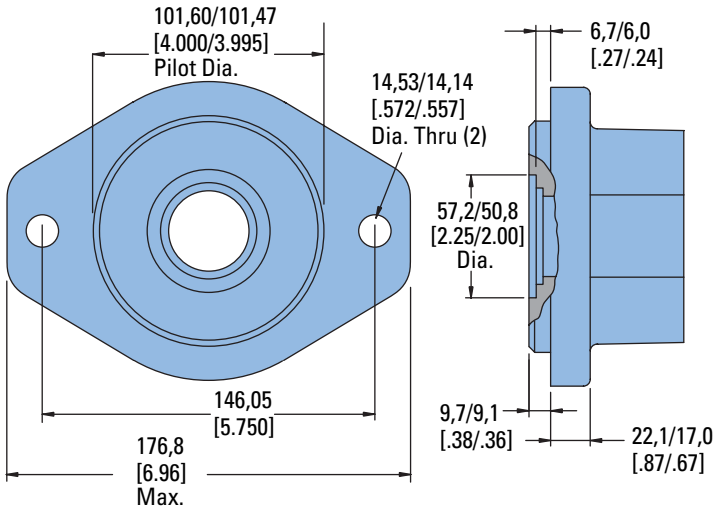
SAE A — Two Bolt (Standard Motor)



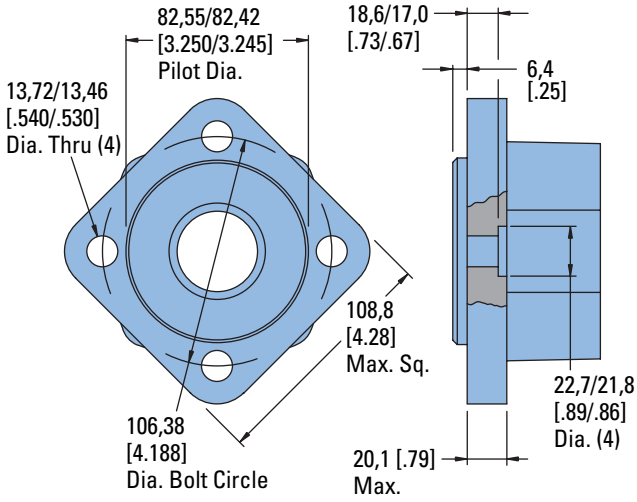
Four Bolt Magneto



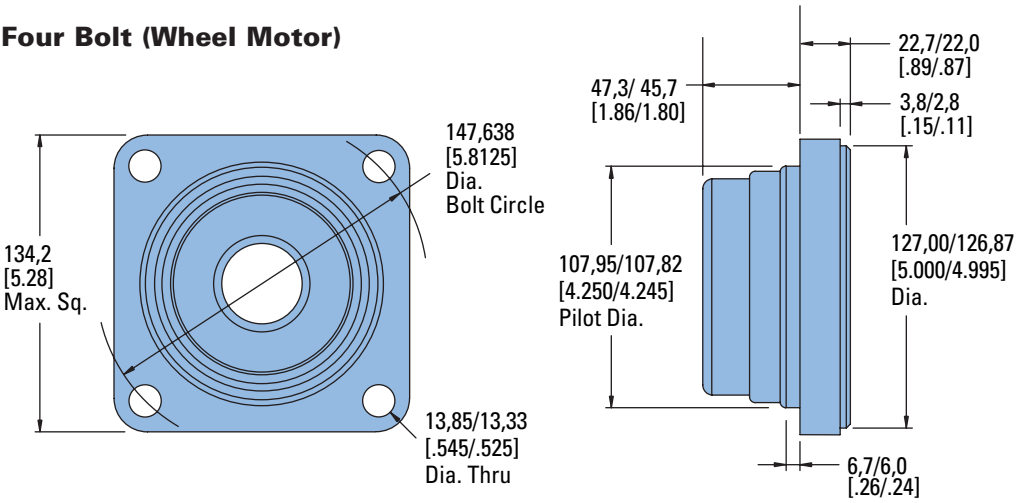
Two Bolt SAE B



Four Bolt



Four Bolt (Wheel Motor)

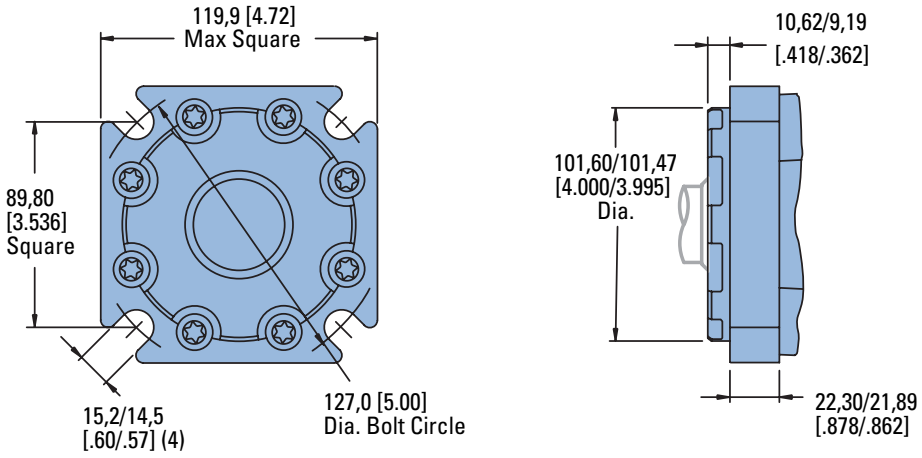


4000 Compact Series

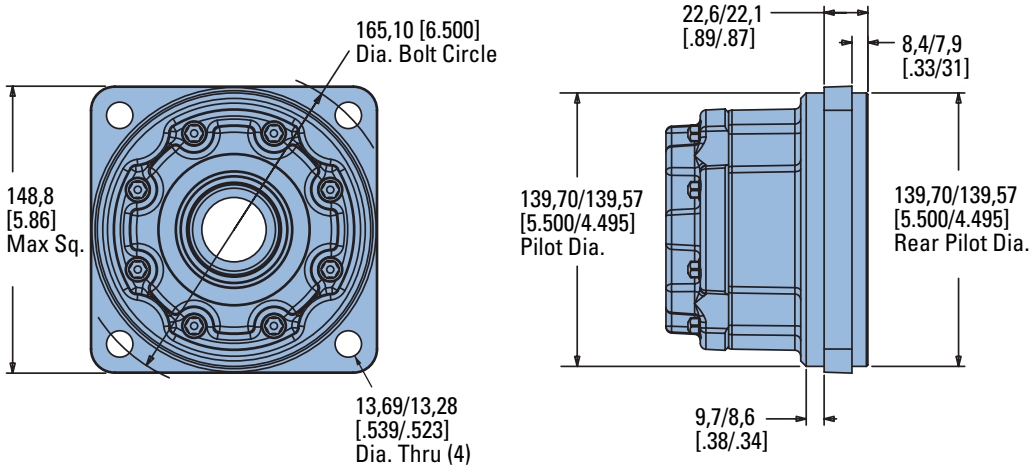
Dimensions

Mounting Options for use with Enhanced Bearings

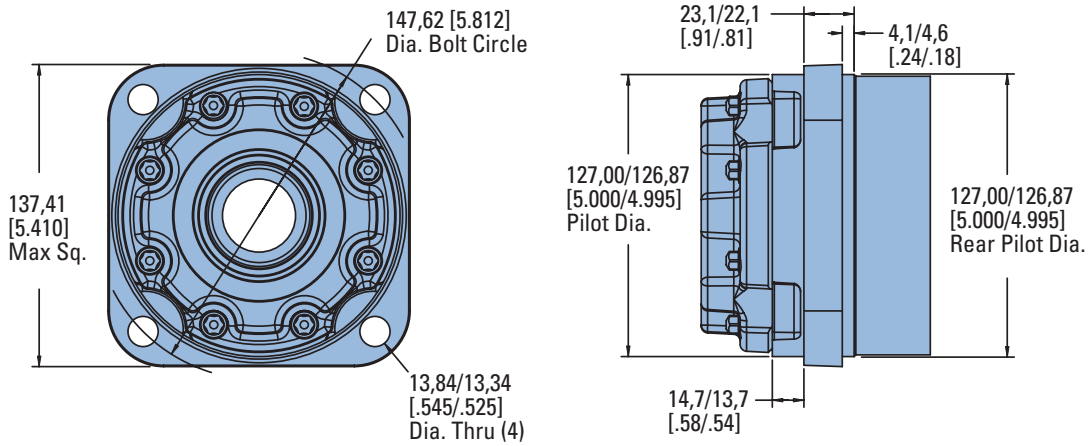
Standard Flange- Similar to SAE B type



Four Bolt (Wheel Motor)



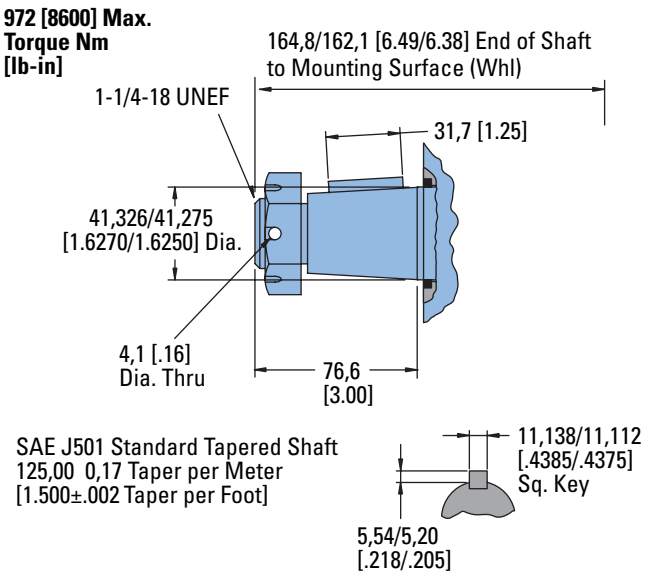
Four Bolt (Wheel Motor- Short)



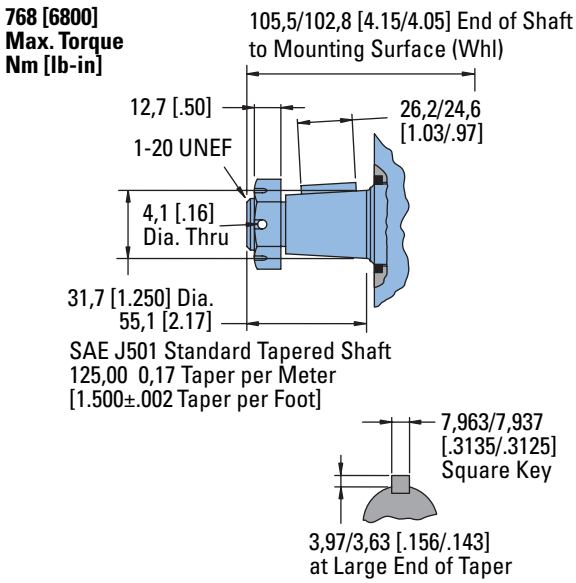
Dimensions

Shafts

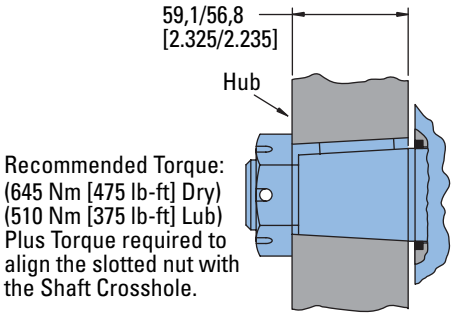
1-5/8 Inch Tapered



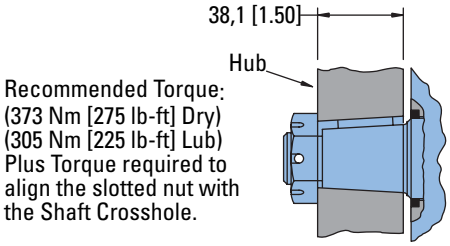
1-1/4 Inch Tapered



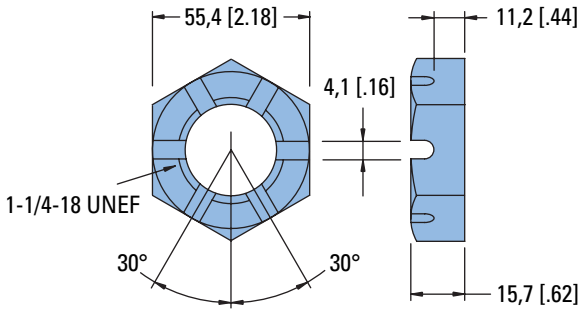
Tapered Shaft Hub Data



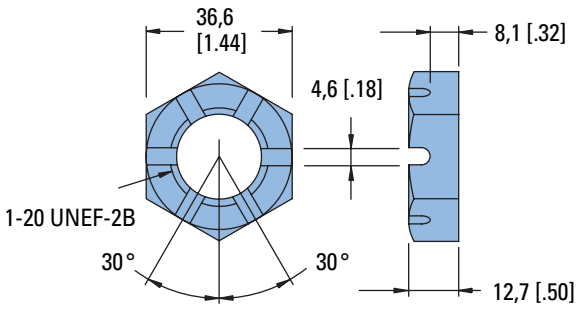
Tapered Shaft Hub Data



Slotted Hexagon Nut



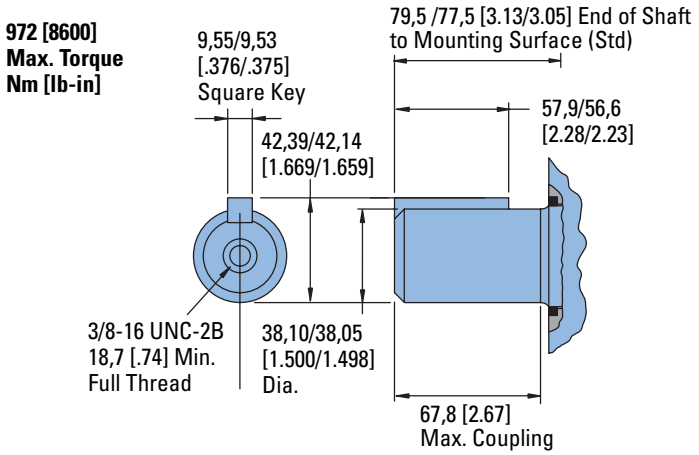
Slotted Hexagon Nut



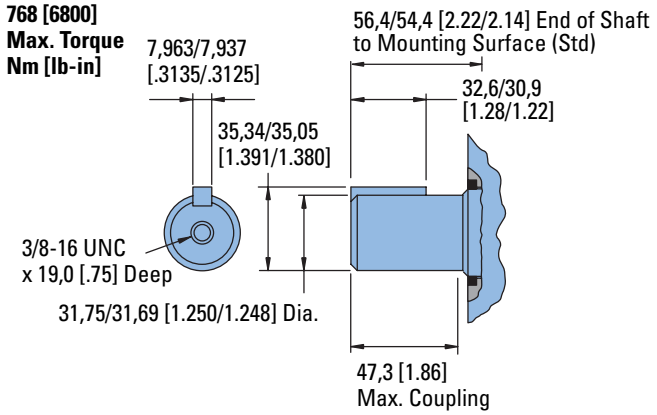
Dimensions

Shafts

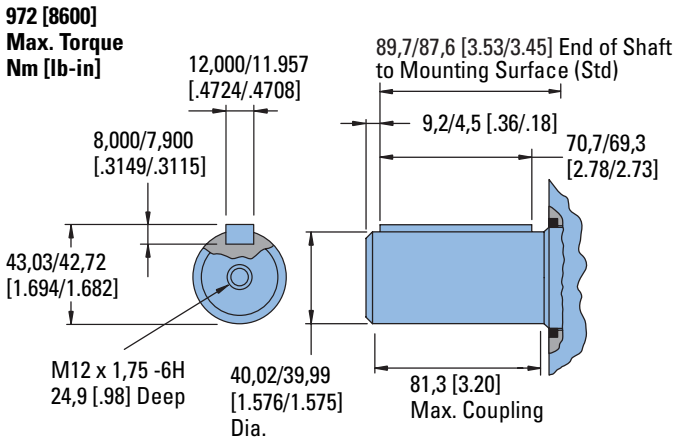
1-1/2 Inch Straight



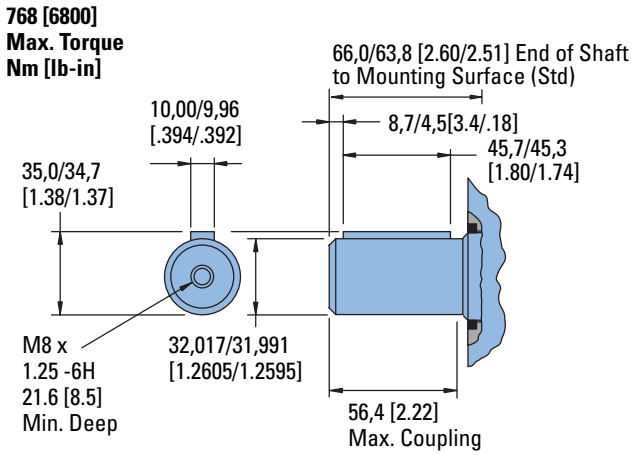
1-1/4 Inch Straight



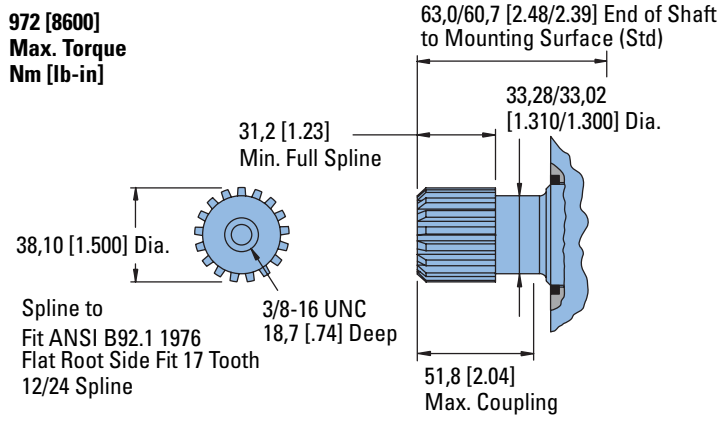
40 mm Straight



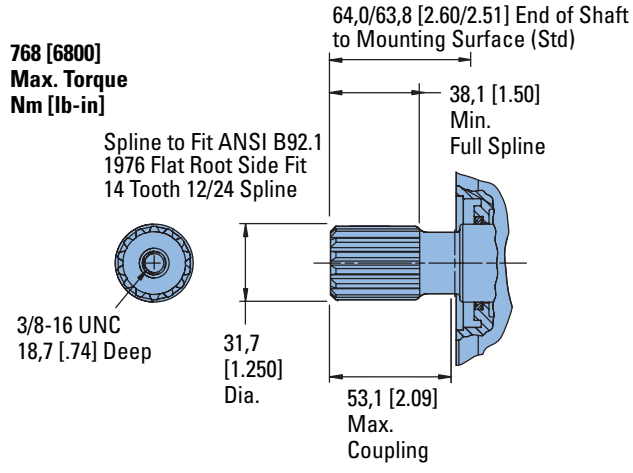
32 mm Straight



1-1/2 Inch 17 Tooth Straight



1-1/4 Inch 14 Tooth Splined



4000 Compact Series

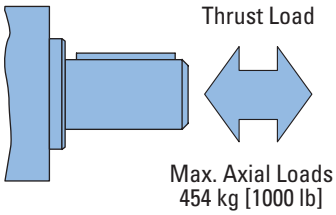
Shaft Side Load Capacity

These curves indicate the radial load capacity on the motor shafts) at various locations with an allowable external thrust load of 454 kg [1000 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 94 kg/7 Bar [208 lb/100 PSI].

Each curve is based on

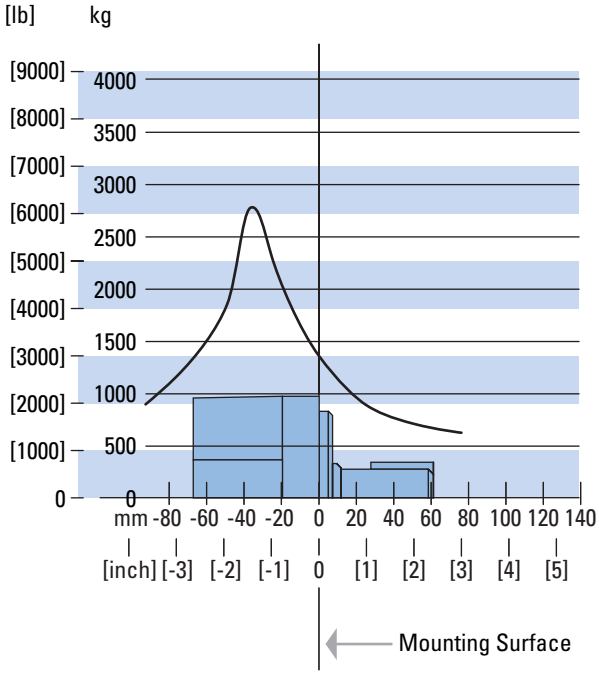


B 10 bearing life (2000 hours of 12,000,000 shaft revolutions at 100 RPM) at rated output torque.
To determine radial load at speeds other than 100 RPM, multiply the load values given on the bearing curve by the factors in the chart below.

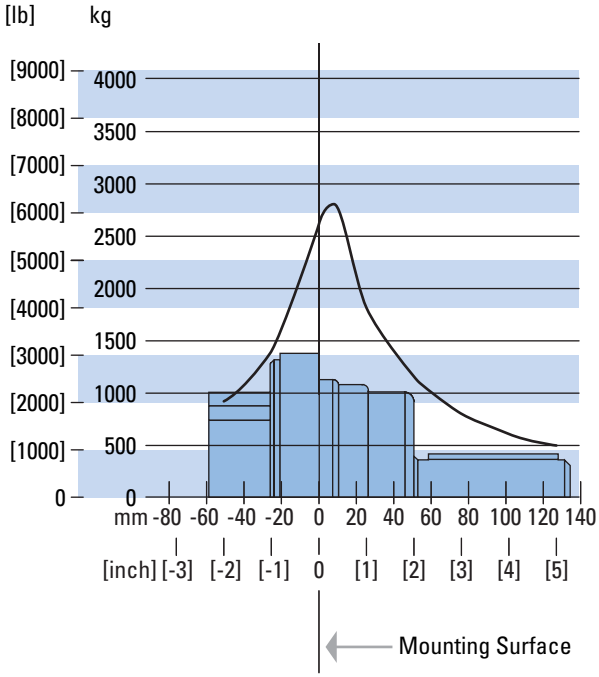
RPM	Multiplication Factor
50	**1.23**
100	1.00
200	0.81
300	0.72
400	0.66
500	0.62
600	0.58
700	0.56
800	0.54

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

Standard Mount- All shaft options 1-1/4 inch and larger



Wheel Mount- All shaft options 1-1/4 inch and larger



4000 Compact Series

Case Pressure and Case Port

Char-Lynn 4000 Compact Series motors are durable and have long life as long as the recommended case pressure is not exceeded. Allowable case pressure is highest at low shaft speeds. Consequently, motor life will be shortened if case pressure exceeds these ratings (acceptability may vary with application). Determine if an external case drain is required from the case pressure seal limitation charts.

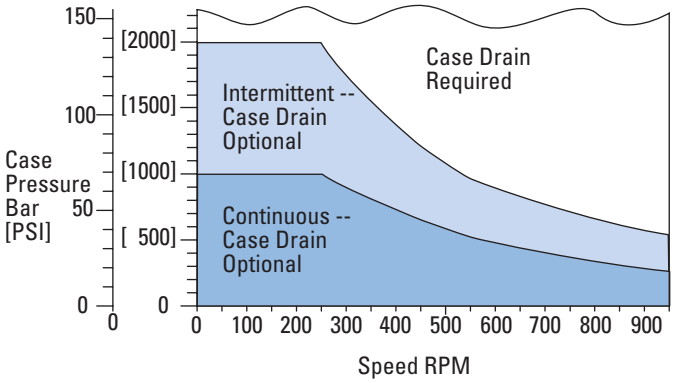
Case Porting Advantage

Contamination Control — flushing the motor case.

Cooler Motor — exiting oil draws motor heat away.

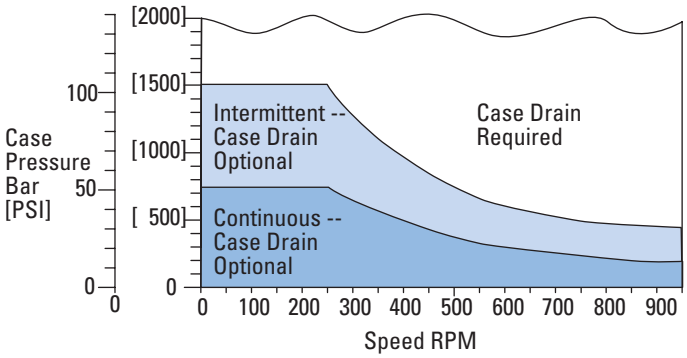
Extend Motor Seal Life — maintain low case pressure with a preset restriction in the case drain line.

Case Pressure Seal Limitation



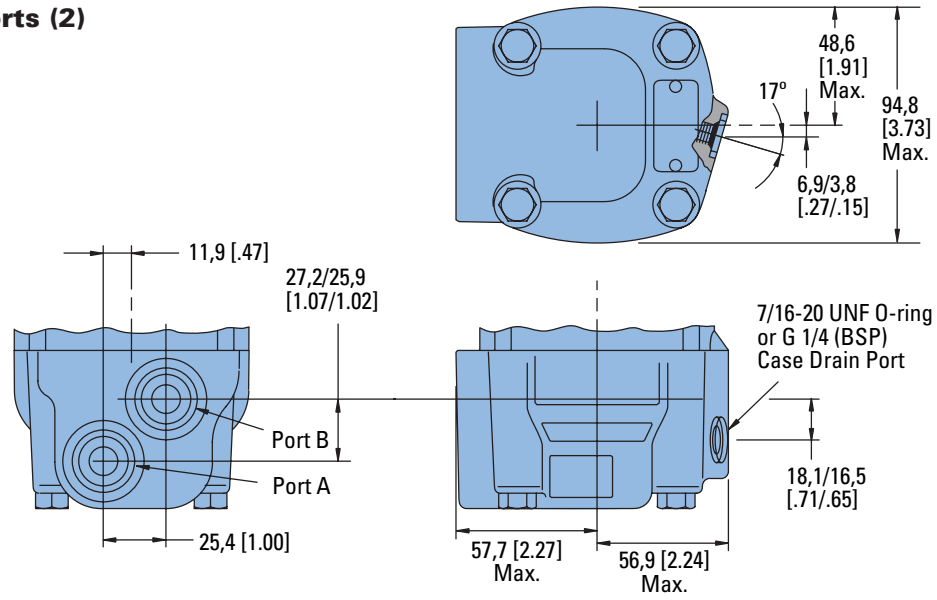
All Shaft options 1-1/4 inch and smaller.

Case Pressure Seal Limitation

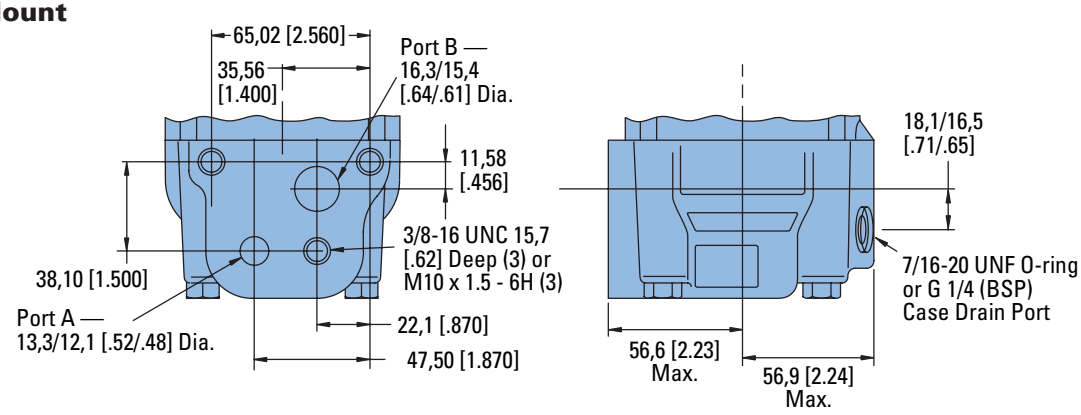


All Shaft options larger than 1-1/4 inch.

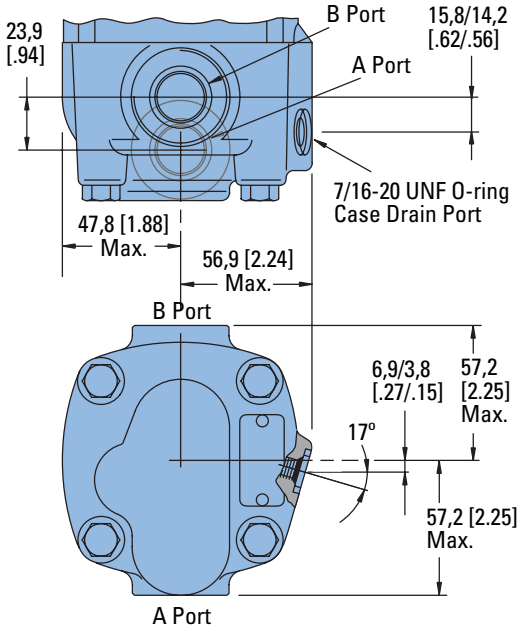
7/8-14 O-ring Ports (2) or G 1/2 (BSP) Ports (2)



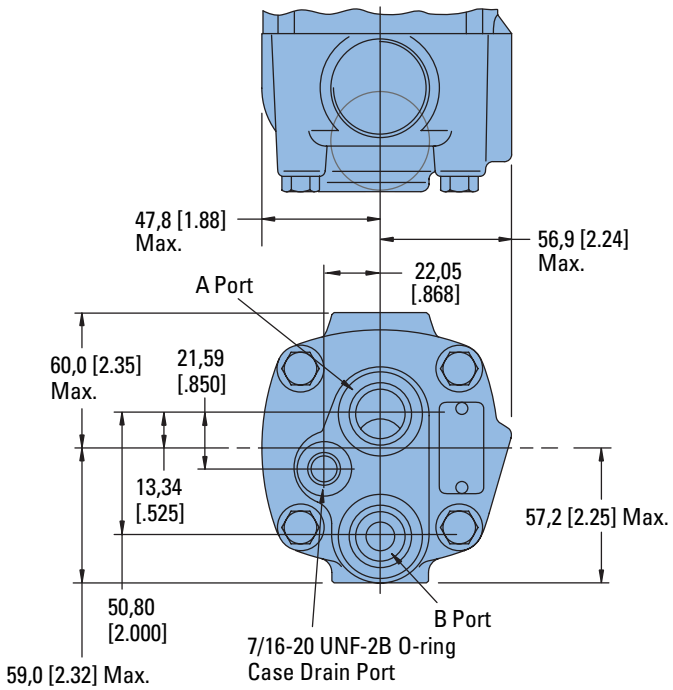
Manifold Mount



1-1/16-12 O-ring Ports (2) Positioned 180 Apart



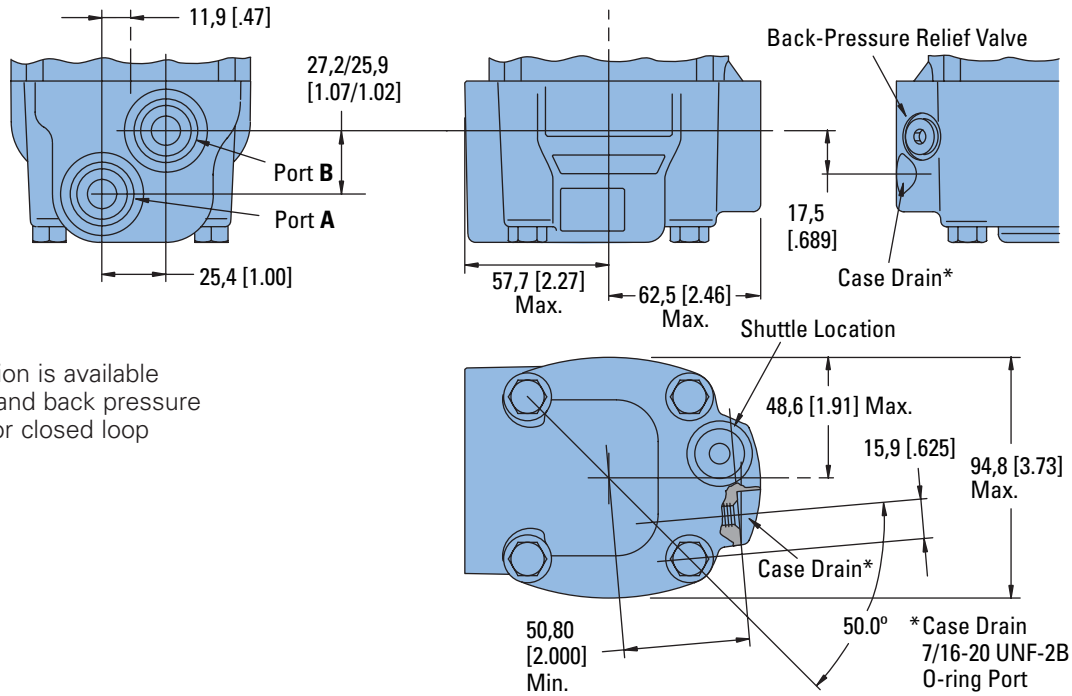
7/8-14 O-ring End Ports (2)



Dimensions

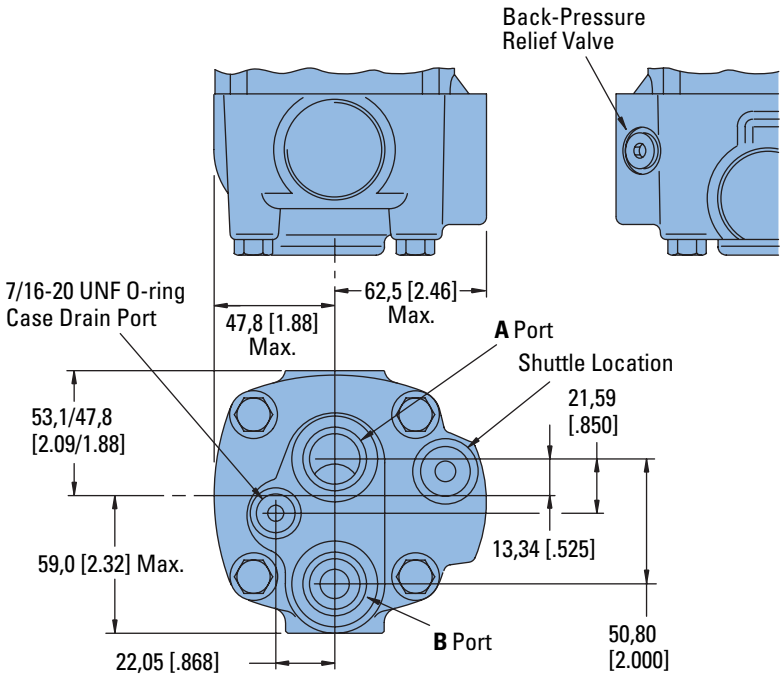
Ports with Shuttle

7/8-14 O-ring Ports (2) or G 1/2 (BSP) Ports (2)



This port option is available with shuttle and back pressure relief valve for closed loop applications.

7/8-14 O-ring End Ports (2)

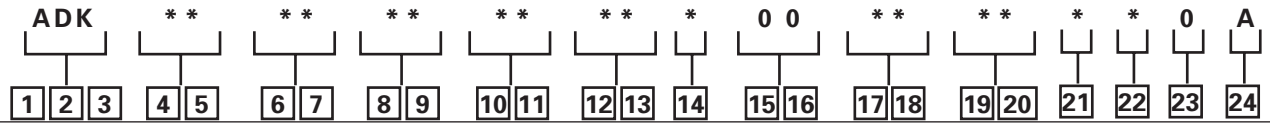


This port option is available with shuttle and back pressure relief valve for closed loop applications.

4000 Compact Series

Model Code

The following 24-digit coding system has been developed to identify all of the configuration options for the 4000 Compact Series motor. Use this model code to specify a motor with the desired features. All 24 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.



1, 2, 3 Product Series

ADK – 4000 Compact Series Motor

4, 5 Displacement cm3/r [in3/r]

10 – 160 [9.8]

12 – 200 [12.3]

15 – 250 [15.4]

20 – 325 [19.8]

25 – 405 [24.6]

30 – 490 [29.8]

6, 7 Mounting Type

AB – 4 Bolt (Wheel) 108,0 [4.25] Pilot Dia. and 13,59 [.535] Dia. Mounting Holes on 147,6 [5.81] Dia. B.C. 127,0 [5.00] Dia. Rear Mount Pilot

AC – 2 Bolt SAE A (Std.) 82,5 [3.25] Pilot Dia and 13,59 [.535] Dia. Mtg. Holes on 106,4 [4.19] Dia. B.C.

AE – 4 Bolt (Bearingless) 101,6 [4.00] Pilot Dia. and 13,59 [.535] Dia. Mounting Holes on 127,0 [5.00] Dia. B.C.

AF – 2 Bolt SAE B (Std.) 101,6 [4.00] Pilot Dia. and 14,35 [.565] Dia. Mtg. Holes on 146,0 [5.75] Dia. B.C.

AH – 4 Bolt (Standard) 82,5 [3.25] Pilot Dia. and 14,59 [.535] Dia. Mounting Holes on 106,4 [4.19] Dia. B.C.

AJ – 4 Bolt Magneto (Std.) 82,6 [3.25] Pilot Dia. and 13,59 [.535] Dia. Mtg. Holes on 106,4 [4.19] Dia. B.C. 2,79 [.110] Pilot Length

AP – 4 Bolt (wheel compatible for Hayes Brake) 107,9 [4.25] Pilot Dia. and 13,59 [.535] Dia. Mounting Holes on 147,6 [5.81] Dia. B.C. with Turned Down Housing to 88,9 [3.50] Dia.

BB* – 4 Bolt (SAE B) (Standard) 101,6 [4.00] Pilot Dia. and 14,7 [.58] Dia. Mounting Slots on 127,0 [5.00] Dia. B.C.

BE* – 4 Bolt (Wheel) 139,7 [5.50] Front and Rear Pilot Dia. and 13,49 [.531] Dia. Mounting Holes on 165,1 [6.50] Dia. B.C.

BG* – 4 Bolt (Wheel- Short) 127,0 [5.00] Front and Rear Pilot Dia. and 13,59 [.535] Dia. Mounting Holes on 147,62 [5.812] Dia. B.C.

8, 9 Output Shaft

00 – None (Bearingless)

02 – 1 1/4 inch Dia. Straight with 3/8-16 Thread in end, 7,938 [.3125] Sq. x 31,75 [1.250] Straight Key

03 – 1 1/4 inch Dia. .125 : 1 Tapered Shaft Per SAE J501 with 1-20 UNEF -2A Threaded Shaft end, and slotted Hex Nut, 7,938 [.3125] Sq. x 25,40 [1.000] Straight Key

06 – 1 1/4 inch Dia. Splined 14T with 38,1 [1.50] Min. Full Spline Length and 53,1 [2.09] Max. Coupling Length

08 – 40 mm Dia. Straight (with Straight Key) M12 x 1,75 - 6H Thread in end

10 – 32 mm dia. Straight (with Straight Key) M8 x 1,25 -6H Thread in end, and 56,4 [2.22] Max. Coupling Length

11 – 1 1/2 inch Dia. Straight (with Straight Key) 3/8-16 Thread in end

98 – 1 5/8 inch Dia. Tapered with Straight Key and 1 1/4 -18 UNEF Slotted Hex. Nut

99 – 1 1/2 inch Dia. Splined 17T with 31,2 [1.23] Min. Full Spline Length

10, 11 Ports

AA – 7/8-14 UNF –2B SAE O-ring (Staggered)

AB – 12,70 [.500] and 15,88 [.625] Dia. Ports (Manifold) and 3x 3/8-16 UNC Port Block Mounting Holes

AD – 7/8-14 UNF –2B SAE O-ring (End Ports)

AE – 12,70 [.500] and 15,88 [.625] Dia. Ports (Manifold) and 3 x M10 x 1,5-6H Port Block Mounting Holes

AG – G 1/2 BSP Straight Thread ports (Staggered)

AH – 1 1/16 - 12 UN-2B O-Ring ports (Positioned 180° Apart)

12, 13 Case Flow Options

00 – None

01 – 7/16-20 UNF –2B SAE O-ring Port (Case Drain)

02 – G 1/4 (BSP) Straight Thread Port (Case Drain)

14 – Reverse Flow Shuttle Valve with G 1/4 (BSP) Straight Thread Port (Case Drain)

14 Back-Pressure Relief Valve

0 – None

A – Set at 4,5 bar [65 PSI] (for Manual Pumps)

15, 16 Valve Options

00 – None

17, 18 Accessories

00 – None

AA – Seal Guard

AF – M12 Threaded Connector Digital Speed Sensor (Two 30 Pulse per rev. signals in quadrature)

AG – M12 Threaded Connector Digital Speed Sensor (One 60 Pulse per rev. speed signal and one directional signal)

19, 20 Special Features (Hardware)

00 – None

01 – Viton Seals

21 Special Features (Assembly)

0 – None

A – Flange Rotated 90°

B – Reverse Rotation

22 Paint/ Special Packaging

0 – No Paint, Individual Box

A – Painted Low Gloss Black, Individual Box

B – Corrosion Protected

23 Eaton Assigned Code when Applicable

0 – Assigned Code

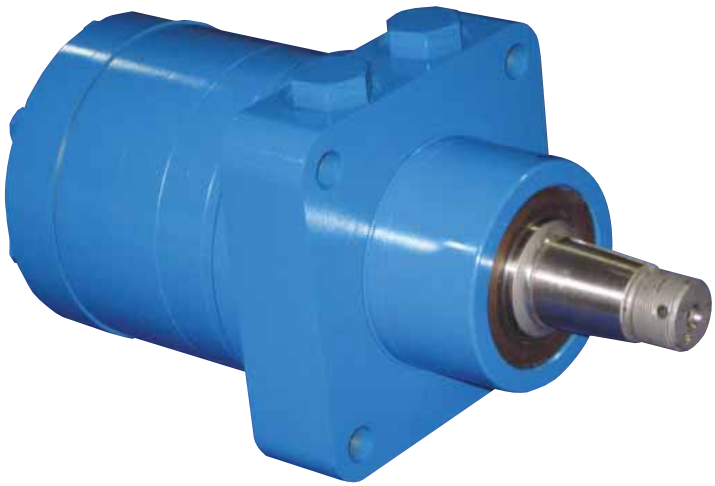
24 Eaton Assigned Design Code

A – Assigned Design Code

* These mounting options are available with shaft options 08, 11, 98 and 99.

Delta Series

Highlights



Features:

- Excellent reliability with time proven Char-Lynn components
- Proven disc valve technology with the highest efficiencies in its class
- Leak resistant motor with the front bearing protecting the shaft seal
- Torque up to 10,500 lb-in intermittant duty / Flow up to 30 GPM intermittant
- 12 displacements available from 6.9 to 46 CID
- Shaft sizes up to 1-5/8 inch
- 3-1/4 inch front pilot and 5 inch rear pilot
- STC ports available

Benefits:

- Perfect replacement for Parker® TF-TG and White™ RE motors
- Lowest no load pressure drop which leads to longer life and lower temperature operation
- Highest overall efficiency: more available HP to the system than competitive motors
- The highest side load capacity with 4,500 lbs standard at 3" from the mount face

Applications:

- Scissor Lift
- Boom Lift
- Industrial Sweeper
- Mower

Description

This wheel motor is the latest addition to the Char Lynn product line. The Delta motor provides torques up to 11,500 in-lbs. Eaton has packed this motor with many "best in class" features: the optimized geroler profile ensures smooth operation; the disc valve technology has the best performance and the bearing capacity is the highest in the industry for very demanding applications.

Delta Series

Geroler Element	12 Displacements
Flow l/min [GPM]	75 [20] Continuous**
	115 [30] Intermittent*
Speed RPM	670 Cont.**
	837 Inter.*
Pressure bar [PSI]	200 [3000] Cont.**
	275 [4000] Inter.*
Torque Nm [lb-in]	1015 [9000] Cont**.
	1185 [10500] Inter.*

** Continuous— (Cont.) Continuous rating, motor may be run continuously at these ratings.
* Intermittent— (Inter.) Intermittent operation, 10% of every minute.

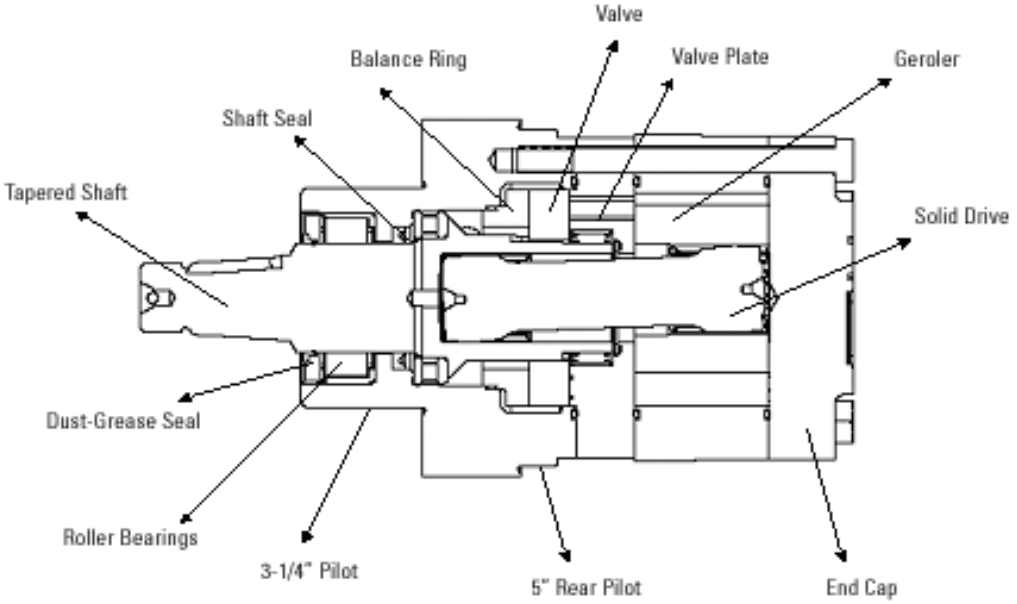
Boom Lift

Sweeper

Mower

Delta Series

Performance Data



DISPLACEMENT	CONTINUOUS FLOW CAPACITY	INTERMITTENT FLOW CAPACITY	CONTINUOUS PRESSURE RATING	INTERMITTENT PRESSURE RATING
cm^3/r (in^3/rev)	**gpm**	**gpm**	**psid**	**psid**
110 (6.9)	20	25	3000	4000
142 (8.9)	20	30	3000	4000
194 (12.1)	20	30	3000	4000
229 (14.3)	20	30	3000	4000
246 (15.4)	20	30	3000	4000
293 (18.3)	20	30	3000	4000
340 (21.2)	20	30	3000	4000
386 (24.1)	20	30	2750	3500
459 (28.7)	20	30	2500	3000
530 (33.1)	20	30	2000	2500
634 (39.6)	20	30	1750	2250
736 (46)	20	30	1500	2000

Note:

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

Maximum Inlet Pressure:

310 bars (4500 PSI)

Do not exeed "delta sign" pressure rating (see chart above).

Recommended Fluids:

Premium quality, anti wear type hydrauli coil with a viscosity of no 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

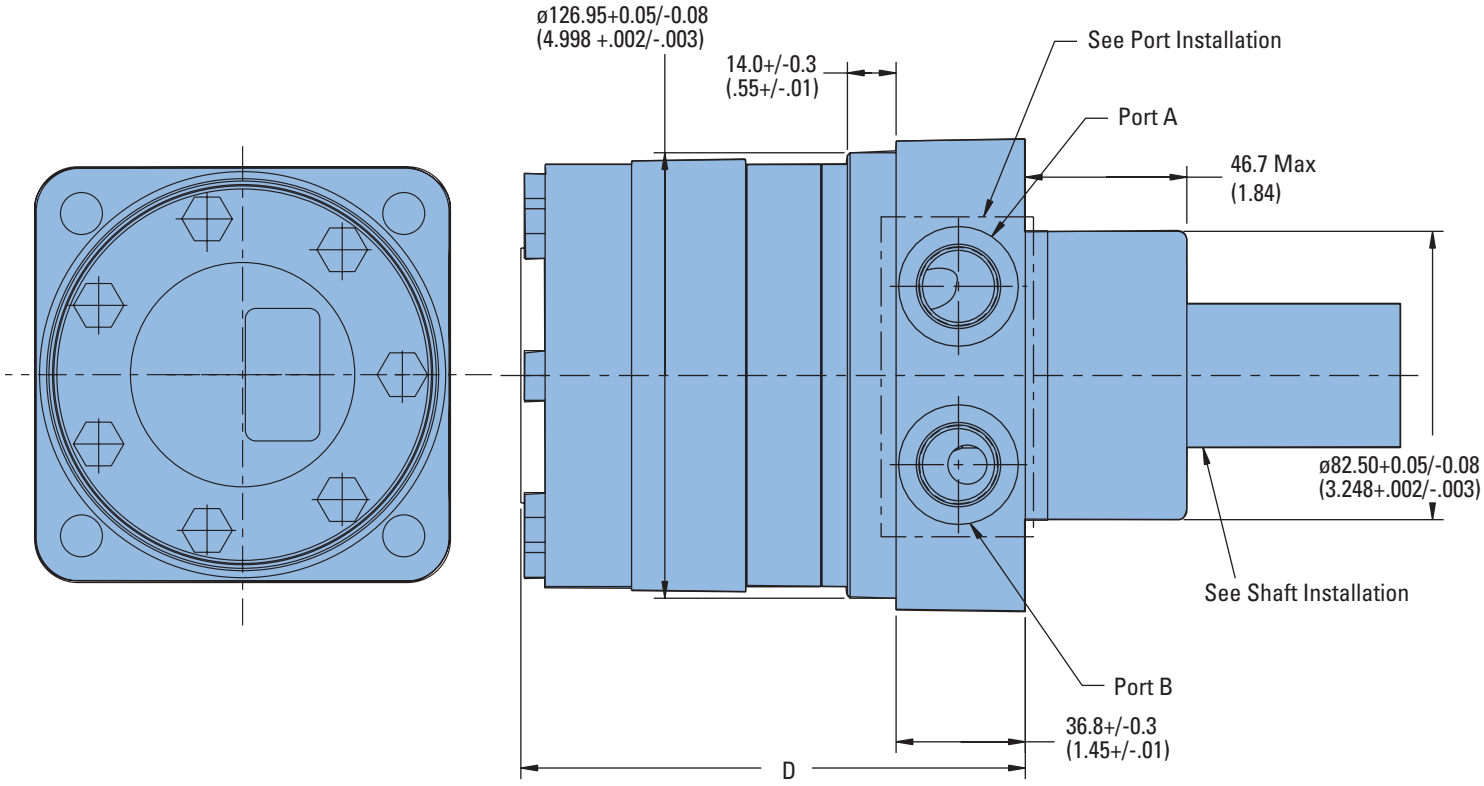
MOUNTING	SHAFT	PORTS	TIMING	DISPLACEMENT			
				6.9 CID 113 cm^3	**8.9 CID 146 cm^3**	**12.1 CID 198 cm^3**	**14.3 CID 234 cm^3**
Wheel Motor	1-1/4" Tapered	7/8" O-ring	Standard -CCW	184-0005-001	184-0006-001	184-0002-001	184-0001-001
			Standard -CW	184-0025-001	184-0026-001	184-0027-001	184-0028-001
Wheel Motor	1-1/2" 17 T Splined	7/8" O-ring	Standard -CCW	184-0013-001	184-0014-001	184-0015-001	184-0016-001
			Standard -CW	184-0037-001	184-0038-001	184-0039-001	184-0040-001

MOUNTING	SHAFT	PORTS	TIMING	DISPLACEMENT			
				15.4 CID 252 cm^3	**18.3 CID 300 cm^3**	**21.2 CID 347 cm^3**	**24.1 CID 395 cm^3**
Wheel Motor	1-1/4" Tapered	7/8" O-ring	Standard -CCW	184-0003-001	184-0004-001	184-0007-001	184-0008-001
			Standard -CW	184-0029-001	184-0030-001	184-0031-001	184-0032-001
Wheel Motor	1-1/2" 17 T Splined	7/8" O-ring	Standard -CCW	184-0017-001	184-0018-001	184-0019-001	184-0020-001
			Standard -CW	184-0041-001	184-0042-001	184-0043-001	184-0044-001

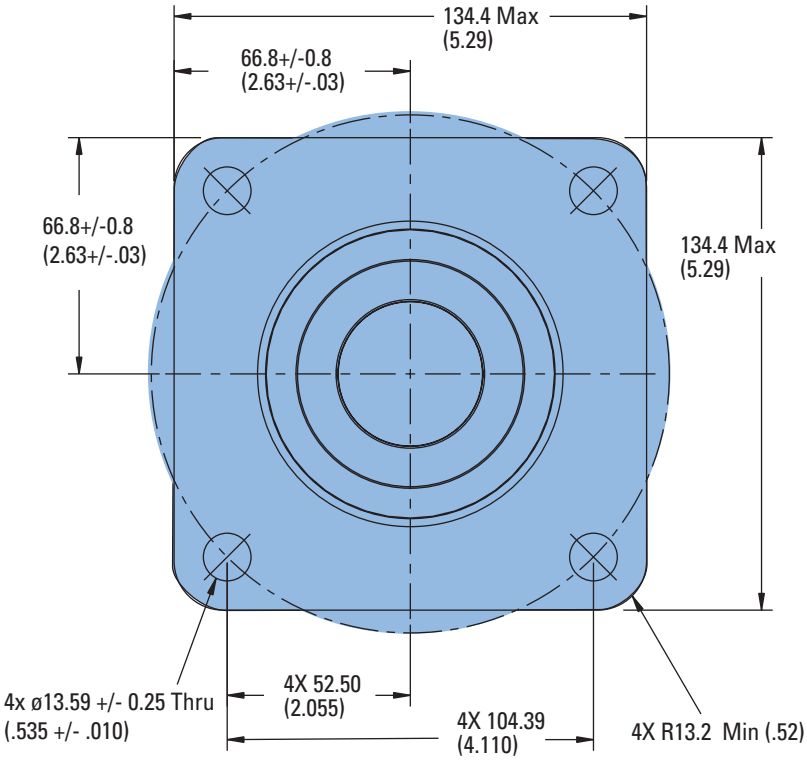
MOUNTING	SHAFT	PORTS	TIMING	DISPLACEMENT			
				28.7 CID 470 cm^3	**33.1 CID 542 cm^3**	**39.6 CID 649 cm^3**	**46.0 CID 754 cm^3**
Wheel Motor	1-1/4" Tapered	7/8" O-ring	Standard -CCW	184-0009-001	184-0010-001	184-0011-001	184-0012-001
			Standard -CW	184-0033-001	184-0034-001	184-0035-001	184-0036-001
Wheel Motor	1-1/2" 17 T Splined	7/8" O-ring	Standard -CCW	184-0021-001	184-0022-001	184-0023-001	184-0024-001
			Standard -CW	184-0045-001	184-0046-001	184-0047-001	184-0048-001

Delta Series

Dimensional Data



DISPLACEMENT CODE	D MAX
069	130.6 (5.14)
089	135.9 (5.35)
121	144.3 (5.68)
143	150.4 (5.92)
154	153.2 (6.03)
183	150.4 (5.92)
212	156.5 (6.16)
241	162.6 (6.40)
287	172.5 (6.79)
331	181.9 (7.16)
396	195.6 (7.70)
460	209.0 (8.23)

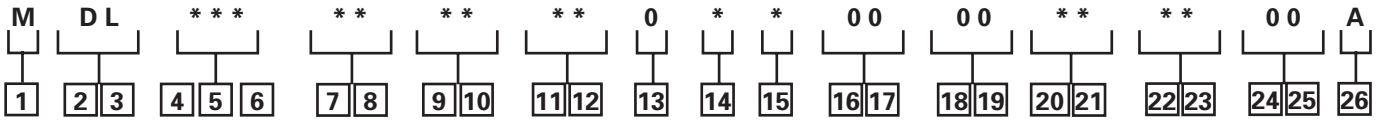


Delta Series

Model Code

The following 26-digit coding system has been developed to identify all of the configuration options for the Delta Low Speed High Torque motor. Use this model code to specify a motor with the desired features. All 26 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.

Item not in bold are not standard and may have a longer lead time.



1 Product

M – Motor

2, 3 Series

DL – Delta Series

4, 5, 6 Displacement cm3/r [in3/r]

069 – 113 [6.9]
089 – 146 [8.9]
121 – 198 [12.1]
143 – 234 [14.3]
154 – 252 [15.4]
183 – 300 [18.3]
212 – 347 [21.2]
241 – 395 [24.1]
287 – 470 [28.7]
331 – 542 [33.1]
396 – 649 [39.6]
460 – 754 [46.0]

7, 8 Mounting Type

AA – Wheel, 4 Bolt: 82.6 [3.25] Pilot Dia. 13.59 [.535] Dia. Holes On 147.6 [5.81] Dia. Bolt Circle. 127.0 [5.00] Dia. Rear Mount Pilot

AB – Standard, 6 Bolt: 82.6 [3.25] Pilot Dia. 13.59 [.535] Dia. Holes on 106.4 [4.19] Dia. Bolt Circle. .100 [2.54] Pilot Length. Sae A, Magneto

AC – Standard, 6 Bolt: 82.6 [3.25] Pilot Dia. 13.59 [.535] Dia. Holes on 106.4 [4.19] Dia. Bolt Circle. .250 [6.35] Pilot Length. SAE A, Magneto

9, 10 Output Shaft

01 – 38.10 [1.500] Dia. Straight with .375-16 UNC-2B Thread, and 9.52 [.375] Sq x 25.40 [1.000] Straight Key

02 – 31.75 [1.250] Dia. .125:1 Tapered Shaft per SAE J501 with 1.000-20 UNEF-2A Threaded Shaft End and Slotted Hex Nut, 7.938 [.3125] Sq x 25.40 [1.000] Straight Key

03 – 41.30 [1.626] Dia. .125:1 Tapered Shaft per SAE J501 with 1.250-18 UNEF-2A Threaded Shaft End and Slotted Hex Nut, 11.125 [.4380] Sq x 34.04 [1.340] Straight Key

04 – 31.75 [1.250] Dia. Flat Root Side Fit, 14 Tooth, 12/24 DP 30 Deg. Involute Spline with .375-16 UNC-2B Thread in End, 33.0 [1.30] Minimum Full Spline Length

05 – 38.10 [1.500] Dia. Flat Root Side Fit, 17 Tooth, 12/24 DP 30 Deg. Involute Spline, 31.8 [1.25] Minimum Full Spline Length, with .375-16 UNC-2B Thread in End

06 – 38.10 [1.500] Dia. Tapered Shaft per SAE J501 with 1.250-18 UNEF-2A Thread in End, 7.938 [.3125] Sq x 31.75 [1.250] Key

11, 12 Ports

AA – .875-14 UNF-2B SAE O-Ring

AB – Dash 10 STC Type II+ (Snap to Connect)

AC – G 1/2 BSP Straight Thread

13 Pressure/Flow Option

0 – None

14 Geroler Option

0 – Standard

B – Tight Fitting Geroler

15 Seal Option

0 – Standard

1 – Viton

4 – Seal Guard

16, 17 Accessories

00 – None

18, 19 Special Features (Hardware)

00 – None

20, 21 Special Features (Assembly)

00 – Standard Rotation - CCW

01 – Standard Rotation - CW

22, 23 Paint/Packaging

AA - No Paint, Individual Box

AB - Painted Low Gloss Black, Individual Box

AC - Epoxy Coated (Frost Gray), Individual Box

AE - No Paint, Bulk Box

AF - Painted Low Gloss Black, Bulk Box

24, 25 Customer Identification

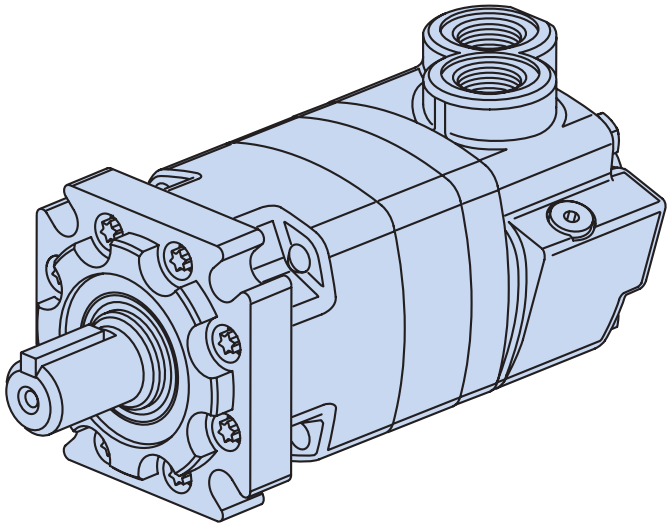
00 – None

26 Design Code

A – One (1)

4000 Series

Highlights



Features

- 10 displacements, a variety of mounting flanges and output shafts
- Reliable, proven design
- High efficiency
- Environmental protection options

Benefits

- Flexiblilty in designing this motor into a system
- Options that fit well into tough applications

Applications

- Mowing
- Snow Removal
- Sprayer
- Trencher
- Wood Products

Description

The 4000 Series offers up to 8600 in-lb of torque and 25 gpm (continuous ratings). This is the corner stone of the Char-Lynn line.

4000 Series Motors

Geroler Element	10 Displacements
Flow l/min [GPM]	95 [25] Continuous**
	150 [40] Intermittent*
Speed RPM	722 Cont.**
	868 Inter.*
Pressure bar [PSI]	200 [3000] Cont.**
	300 [4500] Inter.*
Torque Nm [lb-in]	970 [8600] Cont.**
	1180 [10450] Inter.*

** Continuous— (Cont.) Continuous rating, motor may be run continuously at these ratings
* Intermittent— (Inter.) Intermittent operation, 10% of every minute.

Mowing

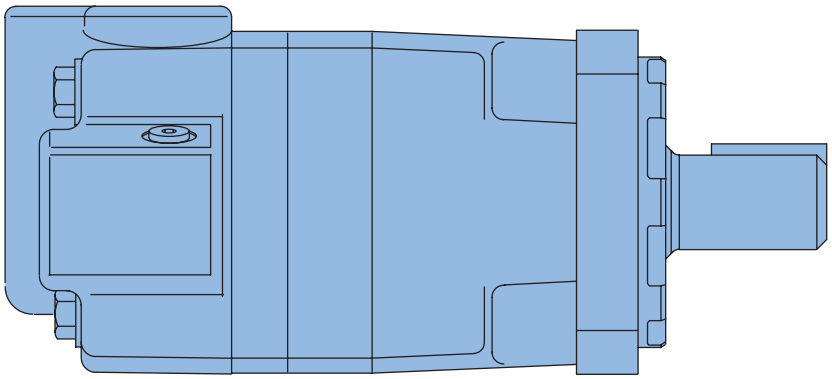
Snow Removal

Sprayer

Trencher

4000 Series

Specifications



4000 SERIES MOTORS

Displ. cm^3/r [in^3/r]		110 [6.7]	130 [7.9]	160 [9.9]	205 [12.5]	245 [15.0]	280 [17.1]	310 [19.0]	395 [24.0]	495 [30.0]	625 [38.0]
Max. Speed (RPM) @ Flow	Continuous	697	722	582	459	383	336	303	239	191	151
	Intermittent	868	862	693	546	532	488	422	376	305	241
Flow l/min [GPM]	Continuous	75 [20]	95 [25]	95 [25]	95 [25]	95 [25]	95 [25]	95 [25]	95 [25]	95 [25]	95 [25]
	Intermittent	95 [25]	115 [30]	115 [30]	115 [30]	130 [35]	130 [35]	130 [35]	150 [40]	150 [40]	150 [40] .
Torque* Nm [lb-in]	Continuous	320 [2850]	375 [3330]	485 [4290]	600 [5300]	705 [6240]	753 [6666]	850 [7530]	930 [8240]	945 [8375]	970 [8605]
	Intermittent	470 [4160]	560 [4940]	705 [6240]	800 [7100]	845 [7470]	957 [8471]	1065 [9420]	1185 [10470]	1170 [10350]	1180 [10450]
Pressure Δ bar [Δ PSI]	Continuous	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	190 [2750]	140 [2000]	115 [1700]
	Intermittent	310 [4500]	310 [4500]	310 [4500]	260 [3750]	310 [4500]	260 [3750]	260 [3750]	240 [3500]	170 [2500]	140 [2000]
	Peak	310 [4500]	310 [4500]	310 [4500]	310 [4500]	310 [4500]	310 [4500]	310 [4500]	295 [4250]	230 [3300]	180 [2600]
Weight kg [lb]	Standard or Wheel Mount	17.9 [39.5]	18.1 [40.0]	18.1 [40.0]	18.4 [40.5]	18.6 [41.0]	19.1 [42.0]	19.5 [43.0]	20.4 [45.0]	21.8 [48.0]	23.1 [51.0]
	Bearingless	14.1 [31.0]	14.3 [31.5]	14.1 [31.0]	14.5 [32.0]	14.7 [32.5]	15.2 [33.5]	15.6 [34.5]	16.6 [36.5]	17.9 [39.5]	19.3 [[42.5]

Maximum Case Pressure: See case pressure seal limitation graph.
*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:

310 bar [4500 PSI]

Do not exceed Δ pressure rating (see chart above).

Maximum Return Pressure:

310 bar [4500 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

4000 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

110 cm³/r [6.7 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]	[250] 15	[500] 35	[1000] 70	[1500] 105	[2000] 140	[2500] 170	[3000] 205	[3500] 240	[4000] 275	[4500] 310
[.5] 1,9	[150] 15 **14**	[390] 45 **10**	[850] 95 **5**	[1290] 145 **2**						
[1] 3,8	[170] 20 **34**	[440] 50 **33**	[900] 100 **31**	[1380] 155 **28**	[1860] 210 **25**	[2270] 255 **22**	[2680] 305 **18**	[3110] 350 **11**		
[2] 7,5	[180] 20 **68**	[450] 50 **67**	[910] 105 **62**	[1390] 155 **56**	[1860] 210 **50**	[2280] 260 **44**	[2700] 305 **36**	[3120] 355 **28**	[3450] 390 **18**	
[4] 15	[190] 20 **138**	[460] 50 **136**	[940] 105 **123**	[1400] 160 **110**	[1870] 210 **97**	[2310] 260 **84**	[2730] 310 **70**	[3140] 355 **56**	[3560] 400 **42**	[3880] 440 **28**
[6] 23	[200] 25 **207**	[470] 55 **204**	[960] 110 **200**	[1420] 160 **193**	[1880] 210 **184**	[2320] 260 **174**	[2760] 310 **163**	[3200] 360 **150**	[3640] 410 **136**	[3950] 455 **121**
[8] 30	[190] 20 **277**	[460] 50 **274**	[950] 105 **270**	[1420] 160 **262**	[1880] 210 **253**	[2340] 265 **241**	[2790] 315 **228**	[3230] 365 **213**	[3670] 415 **196**	[4010] 455 **179**
[10] 38	[180] 20 **347**	[460] 50 **344**	[950] 105 **340**	[1420] 160 **331**	[1890] 215 **322**	[2350] 265 **308**	[2820] 320 **292**	[3260] 370 **274**	[3700] 420 **255**	[4070] 460 **236**
[12] 45	[160] 20 **417**	[450] 50 **414**	[940] 105 **410**	[1420] 160 **400**	[1880] 210 **390**	[2350] 265 **374**	[2820] 320 **355**	[3260] 370 **335**	[3710] 420 **313**	[4080] 460 **292**
[14] 53	[140] 15 **487**	[440] 50 **484**	[930] 105 **480**	[1420] 160 **469**	[1880] 210 **458**	[2350] 265 **440**	[2830] 320 **419**	[3280] 370 **446**	[3730] 420 **471**	[4110] 465 **348**
[16] 61	[130] 15 **556**	[440] 50 **553**	[920] 105 **549**	[1410] 160 **537**	[1870] 210 **525**	[2350] 265 **505**	[2840] 320 **482**	[3300] 375 **455**	[3750] 425 **428**	[4120] 465 **404**
[18] 68	[100] 10 **626**	[440] 50 **622**	[910] 105 **618**	[1400] 160 **606**	[1870] 210 **593**	[2350] 265 **570**	[2840] 320 **545**	[3300] 375 **516**	[3770] 425 **485**	[4140] 465 **460**
[20] 76	[80] 10 **697**	[430] 50 **694**	[900] 100 **690**	[1370] 155 **677**	[1860] 210 **664**	[2350] 265 **638**	[2850] 320 **611**	[3320] 375 **579**	[3790] 430 **545**	[4160] 470 **518**
[25] 95		[400] 45 **868**	[860] 95 **861**	[1350] 155 **838**	[1850] 210 **816**	[2320] 260 **792**	[2830] 320 **767**	[3300] 375 **729**	[3780] 425 **690**	

[3780] 425 **690** } Torque [lb-in] Nm **Speed RPM**

130 cm³/r [7.9 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]	[250] 15	[500] 35	[1000] 70	[1500] 105	[2000] 140	[2500] 170	[3000] 205	[3500] 240	[4000] 275	[4500] 310
[.5] 1,9	[310] 35 **12**	[510] 60 **9**	[1060] 120 **5**	[1590] 180 **2**						
[1] 3,8	[290] 35 **30**	[530] 60 **28**	[1080] 120 **25**	[1600] 180 **19**	[2110] 240 **14**	[2640] 300 **13**	[3060] 345 **12**	[3450] 390 **4**		
[2] 7,5	[280] 30 **57**	[530] 60 **56**	[1100] 125 **53**	[1620] 185 **47**	[2140] 240 **42**	[2660] 300 **40**	[3180] 360 **38**	[3600] 405 **29**	[4020] 455 **20**	[4080] 460 **12**
[4] 15	[260] 30 **116**	[520] 60 **114**	[1100] 125 **111**	[1650] 185 **105**	[2200] 250 **100**	[2700] 305 **95**	[3210] 365 **90**	[3660] 415 **70**	[4100] 465 **50**	[4560] 515 **37**
[6] 23	[240] 25 **173**	[510] 60 **170**	[1100] 125 **167**	[1650] 185 **161**	[2200] 250 **156**	[2720] 305 **149**	[3240] 365 **142**	[3710] 420 **123**	[4180] 470 **104**	[4660] 525 **91**
[8] 30	[230] 25 **228**	[510] 60 **225**	[1080] 120 **222**	[1640] 185 **216**	[2210] 250 **210**	[2740] 310 **202**	[3270] 370 **194**	[3770] 425 **176**	[4270] 480 **158**	[4750] 535 **145**
[10] 38	[210] 25 **283**	[510] 60 **281**	[1080] 120 **278**	[1640] 185 **272**	[2210] 250 **266**	[2750] 310 **256**	[3300] 375 **246**	[3820] 430 **229**	[4350] 490 **212**	[4840] 545 **189**
[12] 45	[200] 25 **341**	[500] 55 **338**	[1070] 120 **335**	[1640] 185 **329**	[2220] 250 **323**	[2750] 310 **312**	[3300] 375 **300**	[3840] 435 **282**	[4370] 495 **263**	[4870] 550 **237**
[14] 53	[180] 20 **400**	[490] 55 **396**	[1060] 120 **392**	[1640] 185 **386**	[2220] 250 **380**	[2750] 310 **368**	[3310] 375 **355**	[3860] 435 **335**	[4390] 495 **315**	[4890] 550 **286**
[16] 61	[160] 20 **457**	[490] 55 **453**	[1050] 120 **449**	[1630] 185 **443**	[2220] 250 **437**	[2760] 310 **424**	[3310] 375 **410**	[3860] 435 **388**	[4400] 495 **366**	[4920] 555 **335**
[18] 68	[130] 15 **516**	[480] 55 **511**	[1050] 120 **506**	[1630] 185 **500**	[2220] 250 **494**	[2760] 310 **480**	[3320] 375 **465**	[3870] 435 **442**	[4420] 500 **418**	[4940] 560 **384**
[20] 76	[110] 10 **574**	[470] 55 **569**	[1040] 120 **564**	[1620] 185 **559**	[2210] 250 **551**	[2760] 310 **536**	[3330] 375 **520**	[3890] 440 **495**	[4440] 500 **470**	
[22] 83	[70] 10 **633**	[450] 50 **628**	[1020] 115 **624**	[1610] 180 **615**	[2190] 245 **606**	[2750] 310 **590**	[3320] 375 **573**	[3880] 440 **547**	[4440] 500 **520**	
[25] 95	[50] 5 **722**	[430] 50 **718**	[1000] 115 **714**	[1580] 180 **702**	[2160] 245 **690**	[2720] 305 **672**	[3300] 375 **653**	[3860] 435 **625**	[4430] 500 **595**	
[30] 114		[400] 45 **862**	[940] 105 **855**	[1500] 170 **842**	[2080] 235 **827**	[2670] 300 **806**	[3200] 360 **783**	[3740] 425 **749**		

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

205 cm³/r [12.5 in³/r]
Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[1000] 70	[1500] 105	[2000] 140	[2500] 170	[3000] 205	[3500] 240	[4000] 275	[4500] 310
[.5] **1,9**	[400] 45 **8**	[810] 90 **5**	[1500] 170 **1**							
[1] **3,8**	[410] 45 **17**	[830] 95 **17**	[1590] 180 **16**	[2220] 250 **15**	[2860] 325 **14**	[3860] 435 **12**	[4560] 515 **11**	[5390] 610 **9**	[5510] 625 **3**	
[2] **7,5**	[420] 45 **36**	[850] 95 **35**	[1680] 190 **34**	[2410] 270 **32**	[3140] 355 **29**	[4060] 460 **27**	[4800] 540 **25**	[5420] 610 **22**	[6000] 680 **16**	[6210] 700 **8**
[4] **15**	[430] 50 **73**	[870] 100 **73**	[1770] 200 **71**	[2590] 295 **70**	[3410] 385 **68**	[4260] 480 **61**	[5040] 570 **57**	[5730] 645 **45**	[6340] 715 **35**	[6740] 760 **23**
[6] **23**	[430] 50 **107**	[880] 100 **106**	[1800] 205 **105**	[2620] 295 **103**	[3530] 400 **101**	[4370] 495 **98**	[5170] 585 **90**	[5900] 665 **81**	[6590] 745 **74**	[7100] 800 **65**
[8] **30**	[410] 45 **144**	[870] 100 **143**	[1820] 205 **142**	[2660] 300 **138**	[3560] 400 **136**	[4410] 500 **132**	[5240] 590 **125**	[6020] 680 **116**	[6770] 765 **109**	
[10] **38**	[390] 45 **182**	[860] 95 **180**	[1820] 205 **179**	[2700] 305 **174**	[3580] 405 **170**	[4460] 505 **166**	[5300] 600 **160**	[6110] 690 **152**	[6890] 780 **143**	
[12] **45**	[350] 40 **217**	[850] 95 **216**	[1810] 205 **215**	[2690] 305 **211**	[3570] 405 **202**	[4440] 500 **200**	[5300] 600 **194**	[6120] 690 **185**		
[14] **53**	[330] 35 **256**	[840] 95 **254**	[1790] 200 **252**	[2670] 300 **248**	[3560] 400 **243**	[4430] 500 **237**	[5290] 600 **229**	[6120] 690 **219**		
[16] **61**	[290] 35 **291**	[820] 95 **290**	[1770] 200 **289**	[2650] 300 **284**	[3540] 400 **280**	[4410] 500 **272**	[5280] 595 **264**	[6120] 690 **253**		
[18] **68**	[270] 30 **329**	[810] 90 **327**	[1750] 200 **325**	[2640] 300 **321**	[3520] 400 **316**	[4400] 495 **308**	[5270] 595 **298**	[6120] 690 **287**		
[20] **76**	[230] 25 **366**	[800] 90 **364**	[1730] 195 **362**	[2620] 295 **358**	[3510] 395 **353**	[4380] 495 **345**	[5270] 595 **334**	[6120] 690 **321**		
[22] **83**	[190] 20 **402**	[780] 90 **400**	[1690] 190 **398**	[2600] 295 **394**	[3500] 395 **389**	[4370] 495 **380**	[5260] 595 **368**			
[25] **95**	[150] 15 **459**	[750] 85 **456**	[1640] 185 **453**	[2560] 290 **448**	[3480] 395 **442**	[4360] 495 **434**	[5240] 590 **421**			
[30] **114**		[710] 80 **546**	[1540] 175 **542**	[2510] 285 **537**	[3350] 380 **529**	[4190] 475 **520**	[5030] 570 **504**			

160 cm³/r [9.9 in³/r]
Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[1000] 70	[1500] 105	[2000] 140	[2500] 170	[3000] 205	[3500] 240	[4000] 275	[4500] 310
[.5] **1,9**	[300] 35 **8**	[680] 75 **7**	[1320] 150 **5**	[2050] 230 **3**	[2750] 310 **1**					
[1] **3,8**	[320] 35 **23**	[700] 80 **22**	[1350] 155 **20**	[2070] 235 **19**	[2780] 315 **18**	[3300] 375 **16**	[3940] 445 **15**	[4410] 500 **8**	[4950] 560 **2**	
[2] **7,5**	[330] 35 **46**	[700] 80 **45**	[1360] 155 **41**	[2080] 235 **40**	[2790] 315 **37**	[3340] 375 **32**	[3970] 450 **29**	[4530] 510 **27**	[5090] 575 **25**	[5590] 630 **13**
[4] **15**	[320] 35 **93**	[710] 80 **92**	[1400] 160 **90**	[2100] 240 **88**	[2820] 320 **84**	[3420] 385 **76**	[4020] 455 **73**	[4620] 520 **62**	[5220] 590 **51**	[5730] 645 **35**
[6] **23**	[300] 35 **137**	[710] 80 **135**	[1420] 160 **134**	[2140] 240 **131**	[2850] 320 **126**	[3510] 395 **120**	[4180] 470 **114**	[4760] 540 **90**	[5340] 605 **75**	[5870] 665 **57**
[8] **30**	[280] 30 **184**	[720] 80 **182**	[1450] 165 **180**	[2180] 245 **176**	[2900] 330 **171**	[3560] 400 **163**	[4230] 480 **154**	[4850] 550 **138**	[5470] 620 **122**	[6010] 680 **100**
[10] **38**	[260] 30 **232**	[720] 80 **229**	[1480] 165 **226**	[2220] 250 **221**	[2950] 335 **216**	[3610] 410 **206**	[4290] 485 **194**	[4920] 555 **182**	[5560] 630 **169**	[6160] 695 **142**
[12] **45**	[240] 25 **277**	[700] 80 **274**	[1450] 165 **272**	[2190] 245 **266**	[2920] 330 **260**	[3590] 405 **250**	[4280] 485 **238**	[4920] 555 **224**	[5570] 630 **209**	[6180] 700 **182**
[14] **53**	[220] 25 **321**	[680] 75 **319**	[1420] 160 **318**	[2160] 245 **311**	[2890] 325 **304**	[3570] 405 **294**	[4270] 480 **282**	[4920] 555 **266**	[5580] 630 **249**	[6200] 700 **222**
[16] **61**	[200] 25 **366**	[670] 75 **364**	[1400] 160 **362**	[2130] 240 **356**	[2860] 325 **348**	[3550] 400 **338**	[4260] 480 **326**	[4920] 555 **308**	[5590] 630 **289**	[6220] 705 **262**
[18] **68**	[180] 20 **410**	[650] 75 **409**	[1360] 155 **407**	[2100] 235 **401**	[2830] 320 **392**	[3530] 400 **382**	[4250] 480 **370**	[4910] 555 **350**	[5600] 635 **329**	[6240] 705 **302**
[20] **76**	[150] 15 **460**	[630] 70 **458**	[1340] 150 **456**	[2070] 235 **448**	[2800] 315 **440**	[3510] 395 **429**	[4240] 480 **417**	[4910] 555 **396**	[5610] 635 **373**	
[22] **83**	[120] 15 **509**	[620] 70 **506**	[1330] 150 **502**	[2060] 235 **494**	[2790] 315 **484**	[3500] 395 **473**	[4220] 475 **461**	[4910] 555 **438**	[5600] 635 **413**	
[25] **95**	[70] 10 **582**	[600] 70 **578**	[1320] 150 **573**	[2050] 230 **563**	[2780] 315 **552**	[3480] 395 **540**	[4210] 475 **526**	[4900] 555 **501**	[5590] 630 **474**	
[30] **114**		[560] 65 **693**	[1280] 145 **687**	[1990] 225 **675**	[2700] 305 **661**	[3430] 390 **647**	[3970] 450 **630**	[4640] 525 **600**		

[1990] 225 **675** } Torque [lb-in] Nm **Speed RPM**

4000 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

245 cm³/r [15.0 in³/r]
Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140	[2250] 155	[2500] 170	[2750] 190	[3000] 205	[3250] 225	[3500] 240	[3750] 260
[.5] **1,9**	[460] 50 **5**	[980] 110 **2**													
[1] **3,8**	[480] 55 **14**	[990] 110 **14**	[1490] 170 **14**	[1990] 225 **13**	[2480] 280 **13**	[2970] 335 **12**	[3400] 385 **12**	[3830] 435 **11**	[4250] 480 **11**	[4680] 530 **10**	[5020] 565 **4**				
[2] **7,5**	[500] 55 **30**	[1000] 115 **30**	[1520] 170 **29**	[2040] 230 **29**	[2540] 285 **28**	[3050] 345 **27**	[3420] 385 **26**	[3930] 445 **24**	[4440] 500 **23**	[4900] 555 **22**	[5320] 600 **20**	[5740] 650 **18**	[6160] 695 **16**	[6640] 750 **14**	[7150] 810 **11**
[4] **15**	[510] 60 **61**	[1030] 115 **61**	[1560] 175 **60**	[2080] 235 **60**	[2600] 295 **59**	[3130] 355 **59**	[3630] 410 **58**	[4130] 465 **56**	[4630] 525 **53**	[5120] 580 **49**	[5570] 630 **47**	[6030] 680 **44**	[6480] 730 **42**	[6870] 775 **39**	[7340] 830 **36**
[6] **23**	[510] 60 **91**	[1040] 120 **90**	[1570] 175 **90**	[2100] 235 **89**	[2620] 295 **88**	[3160] 355 **88**	[3660] 415 **86**	[4200] 475 **83**	[4710] 530 **80**	[5220] 590 **75**	[5690] 645 **72**	[6150] 695 **70**	[6620] 750 **67**	[7050] 795 **63**	[7430] 840 **59**
[8] **30**	[500] 55 **121**	[1020] 115 **121**	[1560] 175 **120**	[2110] 240 **119**	[2630] 295 **118**	[3150] 355 **117**	[3680] 415 **115**	[4210] 475 **113**	[4740] 535 **111**	[5250] 595 **106**	[5720] 645 **103**	[6200] 700 **99**	[6670] 755 **96**	[7090] 800 **91**	[7470] 845 **87**
[10] **38**	[470] 55 **152**	[1000] 115 **151**	[1540] 175 **150**	[2100] 235 **148**	[2620] 295 **148**	[3150] 355 **147**	[3690] 415 **145**	[4230] 480 **143**	[4770] 540 **141**	[5290] 600 **137**	[5760] 650 **133**	[6240] 705 **129**	[6710] 760 **125**	[7140] 805 **120**	
[12] **45**	[450] 50 **183**	[980] 110 **182**	[1530] 175 **180**	[2080] 235 **179**	[2610] 295 **178**	[3140] 355 **178**	[3680] 415 **176**	[4220] 475 **173**	[4760] 540 **170**	[5280] 595 **166**	[5750] 650 **161**	[6230] 705 **157**	[6700] 755 **152**		
[14] **53**	[420] 45 **213**	[960] 110 **212**	[1520] 170 **211**	[2060] 235 **210**	[2600] 295 **209**	[3130] 355 **208**	[3670] 415 **206**	[4200] 475 **203**	[4740] 535 **200**	[5260] 595 **195**	[5740] 650 **190**	[6220] 705 **185**			
[16] **61**	[400] 45 **244**	[950] 105 **243**	[1500] 170 **242**	[2040] 230 **241**	[2580] 290 **240**	[3120] 355 **239**	[3660] 415 **236**	[4190] 475 **232**	[4730] 535 **229**	[5250] 595 **225**	[5730] 650 **219**	[6210] 700 **213**			
[18] **68**	[380] 45 **275**	[930] 105 **274**	[1480] 165 **273**	[2020] 230 **272**	[2560] 290 **270**	[3110] 350 **269**	[3650] 415 **266**	[4180] 470 **262**	[4710] 530 **259**	[5230] 590 **254**	[5720] 645 **248**	[6200] 700 **241**			
[20] **76**	[350] 40 **305**	[910] 105 **305**	[1460] 165 **304**	[2000] 225 **303**	[2550] 290 **302**	[3100] 350 **300**	[3640] 410 **296**	[4170] 470 **292**	[4700] 530 **288**	[5220] 590 **283**	[5710] 645 **276**				
[22] **83**	[310] 35 **337**	[870] 100 **336**	[1420] 160 **335**	[1970] 225 **334**	[2500] 280 **332**	[3050] 345 **330**	[3590] 405 **326**	[4140] 465 **323**	[4680] 530 **319**	[5200] 590 **313**	[5680] 640 **306**				
[25] **95**	[260] 30 **383**	[820] 95 **382**	[1380] 155 **381**	[1930] 220 **380**	[2460] 280 **378**	[2980] 335 **376**	[3540] 400 **372**	[4090] 460 **369**	[4640] 525 **365**	[5180] 585 **357**					
[30] **114**		[680] 75 **457**	[1250] 140 **456**	[1860] 210 **455**	[2390] 270 **453**	[2900] 330 **450**	[3430] 390 **445**	[3960] 445 **442**	[4460] 505 **437**	[4950] 560 **427**					
[35] **132**			[1110] 125 **532**	[1740] 195 **531**	[2270] 255 **528**	[2790] 315 **525**	[3340] 375 **519**	[3910] 440 **515**	[4400] 495 **509**						

[3340] Torque [lb-in]
375 Nm
519 **Speed RPM**

280 cm³/r [17.1 in³/r]
Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140	[2250] 155	[2500] 170	[2750] 190	[3000] 205	[3250] 225	[3500] 240	[3750] 260
[.5] **1,9**	[533] 60 **4**	[1074] 121 **2**													
[1] **3,8**	[553] 62 **12**	[1136] 128 **12**	[1714] 194 **12**	[2287] 258 **11**	[2841] 321 **11**	[3394] 384 **11**	[3868] 437 **10**	[4389] 496 **10**	[4895] 553 **10**	[6080] 685 **8**	[5870] 663 **6**	[368] 720 **6**	[6811] 770 **6**	[7239] 818 **5**	[7654] 865 **4**
[2] **7,5**	[568] 64 **26**	[1146] 130 **26**	[1740] 197 **25**	[2328] 263 **25**	[2902] 328 **24**	[3461] 391 **24**	[3955] 447 **23**	[4524] 511 **22**	[2922] 330 **21**	[5630] 636 **20**	[6146] 694 **19**	[6666] 753 **17**	[7191] 813 **17**	[7749] 876 **15**	[8323] 940 **13**
[4] **15**	[579] 65 **53**	[1167] 132 **53**	[1771] 200 **52**	[2374] 268 **52**	[2962] 335 **51**	[3557] 402 **51**	[4139] 468 **50**	[4712] 532 **49**	[5285] 597 **47**	[5848] 661 **45**	[6395] 722 **44**	[6946] 785 **42**	[7502] 848 **41**	[8020] 906 **40**	[8471] 957 **38**
[6] **23**	[583] 66 **79**	[1177] 133 **79**	[1781] 201 **78**	[2395] 271 **78**	[2987] 338 **77**	[3601] 407 **77**	[4193] 474 **76**	[4793] 542 **74**	[5376] 607 **72**	[5959] 673 **69**	[6521] 737 **67**	[7082] 800 **66**	[7607] 859 **65**	[8097] 915 **64**	
[8] **30**	[573] 65 **106**	[167] 132 **106**	[1780] 201 **105**	[2404] 272 **105**	[3007] 340 **104**	[3610] 408 **104**	[4218] 477 **102**	[4812] 544 **101**	[5411] 611 **99**	[5994] 677 **96**	[6556] 741 **94**	[7022] 793 **92**	[7518] 849 **90**		
[10] **38**	[547] 62 **134**	[1146] 130 **133**	[1765] 199 **133**	[2395] 271 **131**	[2997] 339 **131**	[3629] 410 **130**	[4238] 479 **129**	[4837] 547 **127**	[5442] 615 **126**	[6035] 682 **122**	[6601] 746 **119**	[7022] 793 **115**	[7518] 849 **111**		
[12] **45**	[527] 60 **161**	[1126] 127 **160**	[1745] 197 **186**	[2369] 268 **158**	[2991] 338 **157**	[3609] 408 **157**	[4228] 478 **156**	[4832] 546 **154**	[5441] 615 **152**	[6034] 682 **148**	[6586] 744 **144**	[6940] 784 **141**			
[14] **53**	[497] 56 **187**	[1106] 125 **187**	[1730] 195 **186**	[2344] 265 **186**	[2972] 336 **185**	[3585] 405 **184**	[4213] 476 **182**	[4816] 544 **180**	[5430] 614 **178**	[6028] 681 **174**	[6511] 736 **170**	[6940] 784 **166**			
[16] **61**	[472] 53 214	[1096] 124 **214**	[1715] 194 **213**	[2324] 263 **212**	[2947] 333 **211**	[3565] 403 **210**	[4203] 475 **208**	[4811] 544 **206**	[5420] 612 **203**	[5919] 669 **199**	[6436] 727 **195**				
[18] **68**	[437] 39 **241**	[1075] 121 **241**	[1690] 191 **240**	[2299] 260 **239**	[2917] 330 **237**	[3541] 400 **236**	[4188] 473 **234**	[4801] 542 **231**	[5400] 610 **229**	[5919] 669 **224**	[6362] 719 **219**				
[20] **76**	[402] 45 **268**	[1055] 1119 **268**	[1669] 189 **268**	[2274] 257 **267**	[2898] 327 **266**	[3521] 398 **264**	[4178] 472 **261**	[4791] 541 **258**	[5394] 609 **255**	[5851] 661 **249**					
[22] **83**	[366] 41 **296**	[1005] 114 **295**	[1629] 184 **295**	[2257] 255 **294**	[2856] 323 **292**	[3480] 393 **290**	[4136] 467 **288**	[4756] 537 **285**	[5205] 588 **279**						
[25] **95**	[301] 34 **336**	[940] 106 **336**	[1588] 179 **335**	[2231] 252 **334**	[2825] 319 **333**	[3419] 386 **331**	[4086] 462 **328**	[4710] 532 **325**	[5205] 588 **314**						
[30] **114**		[845] 96 **402**	[1480] 167 **401**	[2151] 243 **400**	[2759] 312 **398**	[3328] 376 **396**	[3984] 450 **392**	[4573] 517 **389**	[5021] 567 **377**						
[35] **132**			[1348] 152 **468**	[2057] 232 **466**	[2623] 296 **464**	[3183] 360 **463**	[3883] 439 **457**	[4354] 492 **449**							

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

310 cm³/r [19.0 in³/r]
Δ Pressure Bar [PSI]

Flow LPM [GPM]	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140	[2250] 155	[2500] 170	[2750] 190	[3000] 205	[3250] 225	[3500] 240	[3750] 260
[.5] 1,9	[600] 70 **4**	[1150] 130 **2**													
[1] 3,8	[620] 70 **11**	[1270] 145 **11**	[1920] 215 **11**	[2560] 290 **10**	[3170] 360 **10**	[3780] 425 **10**	[4290] 485 **9**	[4900] 555 **9**	[5490] 620 **9**	[6080] 685 **8**	[6670] 755 **8**	[7270] 820 **7**	[7880] 890 **7**	[8490] 960 **6**	[9080] 1025 **5**
[2] 7,5	[630] 70 **23**	[1280] 145 **23**	[1940] 220 **22**	[2590] 295 **22**	[3230] 365 **21**	[3830] 435 **21**	[4450] 505 **20**	[5070] 575 **20**	[5680] 640 **19**	[6300] 710 **18**	[6910] 780 **18**	[7530] 850 **17**	[8160] 920 **17**	[8790] 995 **16**	[9420] 1065 **15**
[4] 15	[640] 70 **47**	[1290] 145 **47**	[1960] 220 **46**	[2640] 300 **46**	[3290] 370 **45**	[3940] 445 **45**	[4600] 520 **44**	[5240] 590 **44**	[5880] 665 **43**	[6510] 735 **42**	[7150] 810 **42**	[7790] 880 **41**	[8450] 955 **41**	[9100] 1030 **40**	
[6] 23	[650] 75 **71**	[1300] 145 **71**	[1970] 225 **70**	[2660] 300 **70**	[3320] 375 **69**	[4000] 450 **69**	[4680] 530 **68**	[5330] 600 **67**	[5980] 675 **66**	[6630] 750 **64**	[7280] 825 **64**	[7940] 895 **63**			
[8] 30	[640] 70 **96**	[1300] 145 **96**	[1980] 225 **95**	[2670] 300 **95**	[3350] 380 **94**	[4030] 455 **94**	[4710] 530 **93**	[5360] 605 **92**	[6020] 680 **91**	[6670] 755 **89**	[7320] 825 **88**				
[10] 38	[620] 70 **121**	[1280] 145 **120**	[1970] 225 **120**	[2660] 300 **119**	[3340] 375 **119**	[4070] 460 **118**	[4740] 535 **117**	[5390] 610 **116**	[6050] 685 **115**	[6710] 760 **112**	[7370] 835 **109**				
[12] 45	[600] 70 **145**	[1260] 140 **144**	[1940] 220 **144**	[2630] 295 **143**	[3340] 375 **142**	[4040] 455 **142**	[4730] 535 **141**	[5390] 610 **140**	[6060] 685 **139**	[6720] 760 **135**					
[14] 53	[570] 65 **169**	[1240] 140 **169**	[1920] 215 **168**	[2600] 295 **168**	[3310] 375 **167**	[4000] 450 **167**	[4710] 530 **165**	[5380] 610 **164**	[6060] 685 **163**	[6730] 760 **159**					
[16] 61	[540] 60 **193**	[1230] 140 **193**	[1900] 215 **192**	[2580] 290 **192**	[3280] 370 **190**	[3970] 450 **189**	[4700] 530 **188**	[5380] 610 **187**	[6050] 685 **185**						
[18] 68	[490] 55 **217**	[1210] 135 **217**	[1880] 210 **216**	[2550] 290 **216**	[3240] 365 **214**	[3930] 445 **213**	[4680] 530 **211**	[5370] 605 **209**	[6040] 680 **207**						
[20] 76	[450] 50 **242**	[1190] 135 **242**	[1860] 210 **242**	[2520] 285 **241**	[3210] 365 **240**	[3900] 440 **238**	[4670] 530 **236**	[5360] 605 **234**	[6030] 680 **232**						
[22] 83	[420] 45 **267**	[1130] 130 **266**	[1820] 205 **266**	[2520] 285 **265**	[3180] 360 **264**	[3870] 440 **262**	[4640] 525 **260**	[5320] 600 **258**							
[25] 95	[340] 40 **303**	[1050] 120 **303**	[1780] 200 **302**	[2510] 285 **301**	[3160] 355 **300**	[3820] 430 **299**	[4590] 520 **296**	[5280] 595 **293**							
[30] 114		[1010] 115 **363**	[1700] 190 **362**	[2420] 275 **360**	[3100] 350 **359**	[3720] 420 **358**	[4500] 510 **354**	[5140] 580 **351**							
[35] 132			[1580] 180 **422**	[2360] 265 **420**	[2950] 335 **419**	[3540] 400 **418**	[4390] 495 **413**								

395 cm³/r [24.0 in³/r]
Δ Pressure Bar [PSI]

Flow LPM [GPM]	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140	[2250] 155	[2500] 170	[2750] 190	[3000] 205	[3250] 225	[3500] 240
[.5] 1,9	[700] 80 **4**	[1340] 150 **2**												
[1] 3,8	[750] 85 **9**	[1430] 160 **9**	[2110] 240 **8**	[2770] 315 **8**	[3460] 390 **8**	[4170] 470 **7**	[4890] 550 **7**	[5610] 635 **7**	[6310] 715 **5**	[7010] 790 **4**	[7700] 870 **2**			
[2] 7,5	[800] 90 **18**	[1500] 170 **18**	[2290] 260 **17**	[3030] 340 **16**	[3850] 435 **16**	[4620] 520 **15**	[5310] 600 **15**	[6000] 680 **14**	[6750] 765 **13**	[7490] 845 **13**	[8240] 930 **12**	[8990] 1015 **11**	[9730] 1100 **10**	[10470] 1185 **8**
[4] 15	[860] 95 **38**	[1630] 185 **38**	[2470] 280 **37**	[3310] 375 **36**	[4120] 465 **36**	[4900] 555 **35**	[5640] 635 **35**	[6390] 720 **34**	[7190] 810 **34**	[7890] 890 **33**	[8780] 990 **32**			
[6] 23	[860] 95 **57**	[1690] 190 **57**	[2540] 285 **56**	[3410] 385 **55**	[4180] 470 **54**	[4980] 565 **53**	[5780] 655 **52**	[6580] 745 **50**	[7400] 835 **49**	[8220] 930 **47**				
[8] 30	[840] 95 **76**	[1680] 190 **76**	[2550] 290 **75**	[3400] 385 **74**	[4260] 480 **73**	[5090] 575 **72**	[5870] 665 **70**	[6650] 750 **68**	[7480] 845 **66**					
[10] 38	[800] 90 **95**	[1680] 190 **95**	[2550] 290 **94**	[3400] 385 **93**	[4260] 480 **92**	[5100] 575 **91**	[5920] 670 **89**	[6730] 760 **86**	[7560] 855 **84**					
[12] 45	[760] 85 **114**	[1660] 190 **114**	[2520] 285 **113**	[3380] 380 **112**	[4270] 480 **111**	[5110] 575 **110**	[5900] 665 **108**	[6690] 755 **105**						
[14] 53	[740] 85 **133**	[1640] 185 **133**	[2490] 280 **132**	[3370] 380 **131**	[4260] 480 **130**	[5100] 575 **129**	[5880] 665 **127**	[6650] 750 **124**						
[16] 61	[710] 80 **153**	[1620] 185 **153**	[2460] 280 **152**	[3350] 380 **151**	[4240] 480 **149**	[5080] 575 **147**	[5840] 660 **145**							
[18] 68	[680] 75 **172**	[1600] 180 **172**	[2430] 275 **171**	[3340] 375 **170**	[4220] 475 **168**	[5060] 570 **166**	[5810] 655 **164**							
[20] 76	[610] 70 **192**	[1580] 180 **191**	[2400] 270 **190**	[3320] 375 **189**	[4210] 475 **187**	[5040] 570 **185**	[5780] 655 **183**							
[22] 83	[570] 65 **211**	[1490] 170 **210**	[2340] 265 **209**	[3220] 365 **208**	[4160] 470 **206**	[5010] 565 **204**	[5740] 650 **201**							
[25] 95	[490] 55 **239**	[1350] 155 **238**	[2250] 255 **237**	[3080] 350 **236**	[4070] 460 **235**	[4960] 560 **233**	[5700] 645 **230**							
[30] 114		[1080] 120 **285**	[1650] 185 **284**	[2270] 255 **282**	[3020] 340 **281**	[3850] 435 **279**								
[35] 132			[1520] 170 **331**	[2120] 240 **330**	[2870] 325 **328**	[3760] 425 **325**								
[40] 151				[2050] 230 **376**	[2790] 315 **374**	[3620] 410 **371**								

[4390] 495 **413** } Torque [lb-in] Nm **Speed RPM**

4000 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

625 cm³/r [38.0 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1600] 100	[1700] 115	[1800] 125	[2000] 140
[.5] **1,9**	[1000] 115 **2**									
[1] **3,8**	[1080] 120 **5**	[2340] 265 **5**	[3600] 405 **5**	[4850] 550 **4**	[6100] 690 **4**	[7350] 830 **3**	[7820] 885 **3**	[8290] 935 **2**	[8760] 990 **2**	
[2] **7,5**	[1085] 125 **14**	[2380] 270 **14**	[3675] 415 **14**	[5010] 565 **13**	[6350] 715 **12**	[7625] 860 **11**	[8115] 915 **10**	[8605] 970 **9**	[9095] 1030 **8**	[10075] 1140 **7**
[4] **15**	[1090] 125 **23**	[2420] 275 **23**	[3750] 425 **23**	[5175] 585 **22**	[6600] 745 **21**	[7900] 895 **19**	[8410] 950 **18**	[9000] 1015 **17**	[9590] 1085 **16**	[10450] 1180 **14**
[6] **23**	[1095] 125 **35**	[2460] 280 **35**	[3825] 430 **35**	[5220] 590 **34**	[6620] 750 **33**	[7950] 900 **31**	[8430] 950 **30**	[8910] 1005 **29**	[9490] 1070 **28**	
[8] **30**	[1100] 125 **48**	[2500] 280 **48**	[3900] 440 **47**	[5270] 595 **46**	[6640] 750 **45**	[7990] 905 **43**	[8460] 955 **43**	[8925] 1010 **42**		
[10] **38**	[1130] 130 **60**	[2550] 290 **60**	[3975] 450 **59**	[5320] 600 **58**	[6670] 755 **57**	[8045] 910 **54**	[8595] 970 **53**	[9150] 1035 **52**		
[12] **45**	[1160] 130 **72**	[2600] 295 **72**	[4050] 460 **71**	[5375] 605 **70**	[6700] 755 **69**	[8100] 915 **65**	[8660] 980 **64**			
[14] **53**	[1105] 125 **84**	[2535] 285 **84**	[3965] 450 **83**	[5325] 600 **82**	[6685] 755 **81**	[8065] 910 **77**	[8620] 975 **76**			
[16] **61**	[1050] 120 **96**	[2465] 280 **95**	[3880] 440 **95**	[5275] 595 **94**	[6670] 755 **93**	[8035] 910 **89**	[8580] 970 **88**			
[18] **68**	[990] 110 **108**	[2405] 270 **107**	[3825] 430 **107**	[5240] 590 **105**	[6655] 750 **104**	[7345] 830 **100**				
[20] **76**	[930] 105 **121**	[2350] 265 **120**	[3770] 425 **120**	[5205] 590 **118**	[6640] 750 **116**					
[25] **95**	[750] 85 **151**	[2175] 245 **150**	[3600] 405 **149**	[5000] 565 **147**	[6400] 725 **146**					
[30] **114**	[550] 60 **181**	[1975] 225 **180**	[3400] 385 **179**	[4800] 530 **177**	[6200] 700 **176**					
[35] **132**			[3125] 355 **210**	[4545] 515 **208**						
[40] **151**			[2850] 320 **241**	[4295] 485 **239**						

495 cm³/r [30.0 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140	[2250] 155	[2500] 170
[.5] **1,9**	[800] 90 **3**	[1750] 200 **1**								
[1] **3,8**	[880] 100 **7**	[1875] 210 **6**	[2875] 325 **6**	[3825] 430 **5**	[4775] 540 **4**	[5720] 645 **3**	[6670] 755 **2**	[7600] 860 **1**		
[2] **7,5**	[905] 100 **18**	[1940] 220 **17**	[2975] 335 **17**	[3990] 450 **16**	[5010] 565 **15**	[6010] 680 **12**	[7010] 790 **11**	[8000] 905 **10**	[8980] 1015 **8**	
[4] **15**	[935] 105 **30**	[2005] 225 **29**	[3075] 345 **28**	[4160] 470 **27**	[5245] 595 **26**	[6300] 710 **23**	[7355] 830 **21**	[8375] 945 **19**	[9400] 1060 **17**	[10350] 1170 **14**
[6] **23**	[920] 105 **45**	[2010] 225 **44**	[3100] 350 **43**	[4185] 475 **42**	[5265] 595 **40**	[6345] 715 **37**	[7420] 840 **35**	[8445] 955 **32**	[9465] 1070 **30**	
[8] **30**	[905] 100 **61**	[2015] 230 **60**	[3125] 355 **59**	[4205] 475 **57**	[5290] 600 **55**	[6385] 720 **52**	[7485] 845 **49**	[8510] 960 **46**		
[10] **38**	[880] 100 **76**	[1995] 225 **75**	[3095] 350 **74**	[4205] 475 **72**	[5295] 600 **70**	[6390] 720 **66**	[7480] 845 **63**	[8525] 960 **59**		
[12] **45**	[860] 95 **91**	[1975] 225 **90**	[3095] 350 **89**	[4200] 475 **87**	[5305] 600 **85**	[6390] 720 **81**	[7475] 845 **77**			
[14] **53**	[830] 95 **106**	[1945] 220 **105**	[3055] 345 **104**	[4165] 470 **102**	[5275] 595 **100**	[6360] 720 **96**	[7445] 840 **92**			
[16] **61**	[805] 90 **122**	[1910] 215 **120**	[3020] 340 **119**	[4130] 465 **117**	[5245] 595 **115**	[6330] 715 **111**	[7420] 840 **107**			
[18] **68**	[740] 85 **137**	[1860] 210 **136**	[2980] 335 **134**	[4105] 465 **132**	[5235] 590 **130**	[6305] 715 **125**	[7380] 835 **121**			
[20] **76**	[680] 75 **153**	[1810] 205 **152**	[2940] 330 **150**	[4085] 460 **147**	[5225] 590 **145**	[6285] 710 **140**				
[25] **95**	[570] 65 **191**	[1665] 190 **189**	[2800] 315 **187**	[4005] 455 **184**	[5210] 590 **182**	[6135] 695 **177**				
[30] **114**		[1520] 170 **228**	[2645] 300 **226**	[3765] 425 **223**	[4885] 550 **220**	[5985] 675 **215**				
[35] **132**			[2400] 270 **265**	[3510] 395 **263**						
[40] **151**			[2155] 245 **305**	[3260] 370 **303**						

[2850] 320 **241** } Torque [lb-in] Nm **Speed RPM**

4000 Series

Dimensions

Ports

1 1/16 -12 UN-2B SAE O-ring Staggered Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

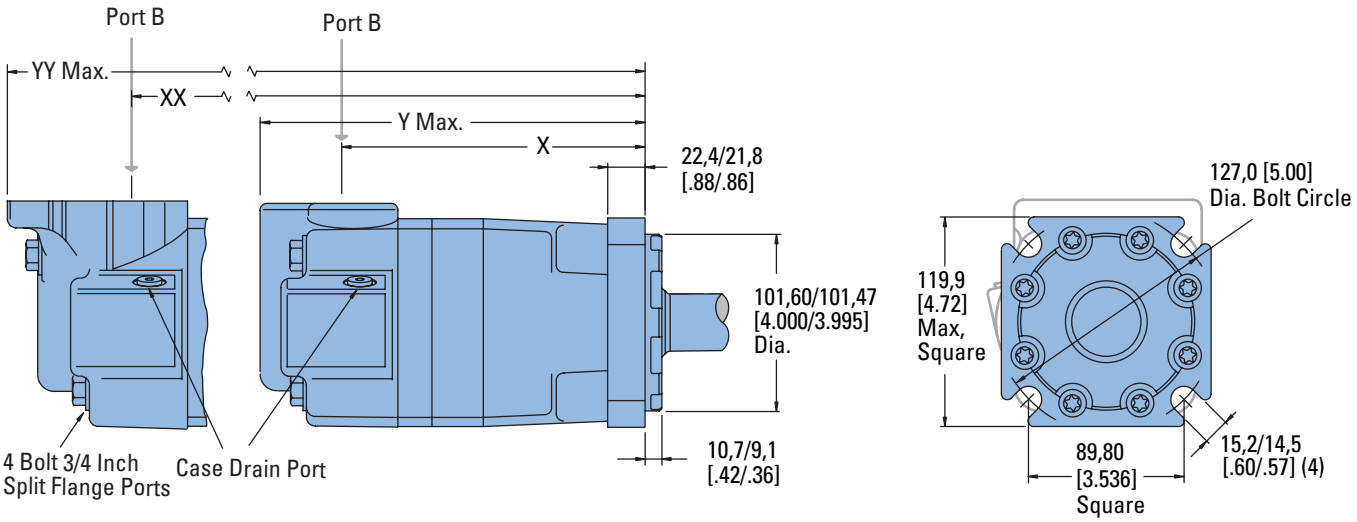
4 Bolt 3/4 inch Split Flange Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

G 3/4 (BSP) Staggered Ports (2)
G 1/4 (BSP) Case Drain Port (1)

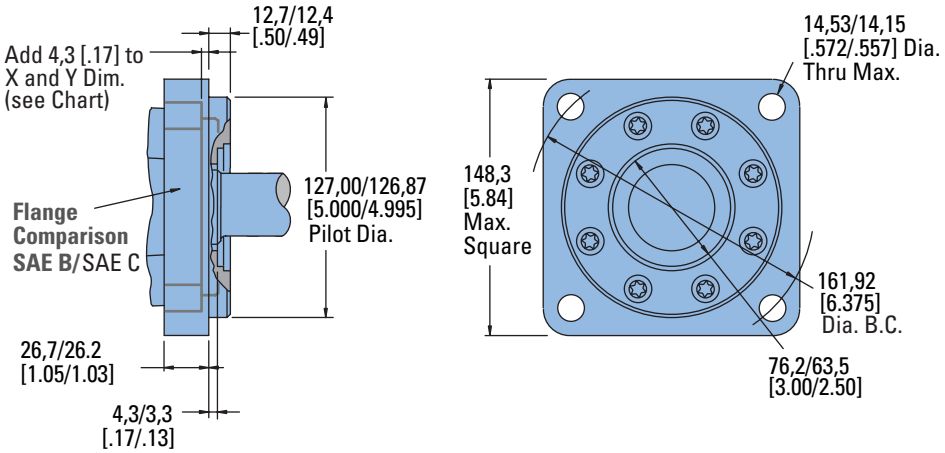
Standard Rotation Viewed from Shaft End

Port A Pressurized — CW
Port B Pressurized — CCW

Standard Mount



SAE C Flange



STANDARD MOUNT MOTOR DIMENSIONS

Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]	XX mm [inch]	YY mm [inch]
110 [6.7]	158,3 [6.23]	214,4 [8.44]	167,3 [6.59]	246,3 [9.70]
130 [7.9]	162,3 [6.39]	218,4 [8.60]	171,3 [6.75]	250,4 [9.86]
160 [9.9]	168,7 [6.64]	224,7 [8.85]	177,7 [7.00]	256,7 [10.11]
205 [12.5]	177,2 [6.98]	233,2 [9.18]	186,2 [7.33]	265,2 [10.44]
245 [15.0]	168,7 [6.64]	224,7 [8.85]	177,7 [7.00]	256,7 [10.11]
310 [19.0]	177,2 [6.98]	233,2 [9.18]	186,2 [7.33]	265,2 [10.44]
395 [24.0]	187,9 [7.40]	243,9 [9.60]	196,9 [7.75]	275,9 [10.86]
495 [30.0]	200,7 [7.90]	256,8 [10.11]	209,7 [8.26]	288,8 [11.37]
625 [38.0]	217,8 [8.58]	273,9 [10.78]	226,7 [8.93]	305,9 [12.04]

4000 Series

Dimensions

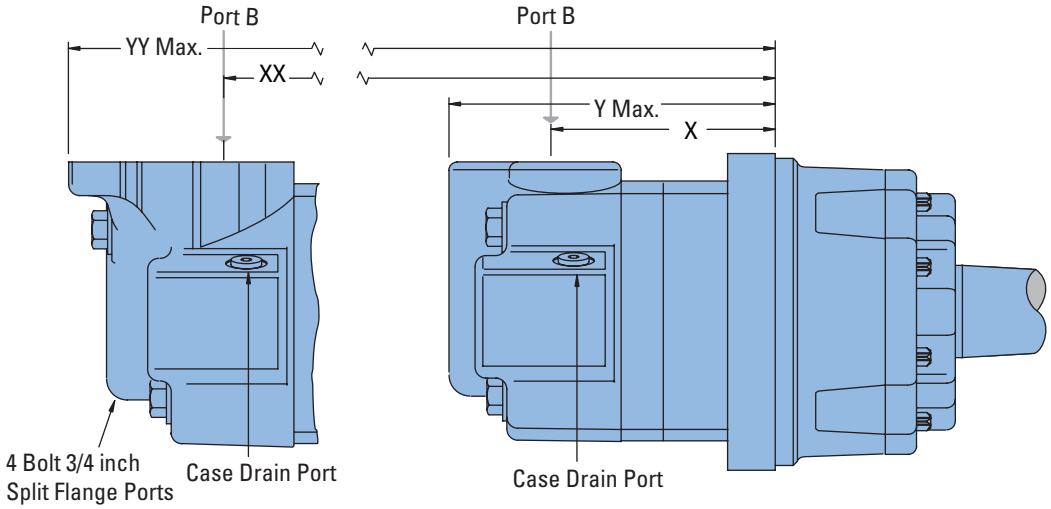
Ports

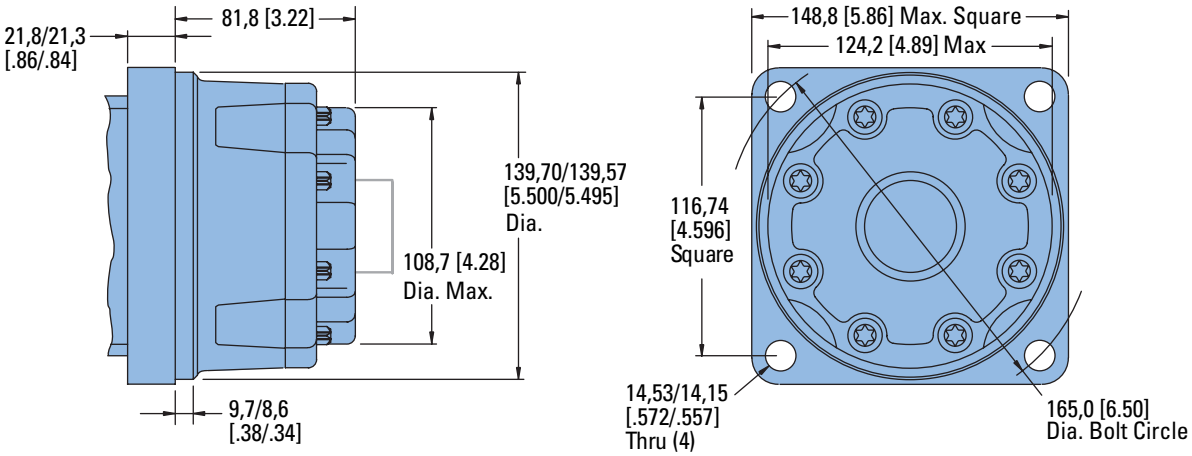
1 1/16 -12 UN-2B SAE O-ring Staggered Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or
4 Bolt 3/4 inch Split Flange Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or
G 3/4 (BSP) Staggered Ports (2)
G 1/4 (BSP) Case Drain Port (1)

Standard Rotation Viewed from Shaft End

Port A Pressurized — CW
Port B Pressurized — CCW

Wheel Mount





WHEEL MOUNT MOTOR DIMENSIONS

Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]	XX mm [inch]	YY mm [inch]
110 [6.7]	87,5 [3.45]	143,3 [5.64]	96,4 [3.80]	175,3 [6.90]
130 [7.9]	91,6 [3.61]	147,3 [5.80]	100,5 [3.96]	179,3 [7.06]
160 [9.9]	97,8 [3.85]	153,7 [6.05]	106,8 [4.21]	185,7 [7.31]
205 [12.5]	106,4 [4.19]	162,3 [6.39]	115,4 [4.55]	194,3 [7.65]
245 [15.0]	97,8 [3.85]	153,7 [6.05]	106,8 [4.21]	185,7 [7.31]
310 [19.0]	106,4 [4.19]	162,3 [6.39]	115,4 [4.55]	194,3 [7.65]
395 [24.0]	117,1 [4.61]	173,0 [6.81]	126,1 [4.97]	205,0 [8.07]
495 [30.0]	129,9 [5.12]	185,7 [7.31]	138,8 [5.47]	217,7 [8.57]
625 [38.0]	146,9 [5.79]	202,9 [7.99]	156,0 [6.14]	235,0 [9.25]

4000 Series

Dimensions

Ports

1 1/16 -12 UN-2B SAE O-ring Staggered Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

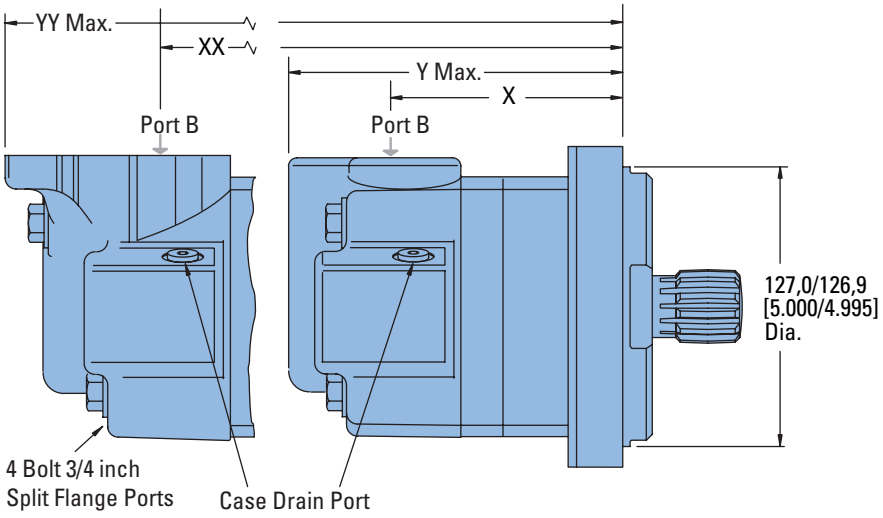
4 Bolt 3/4 inch Split Flange Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

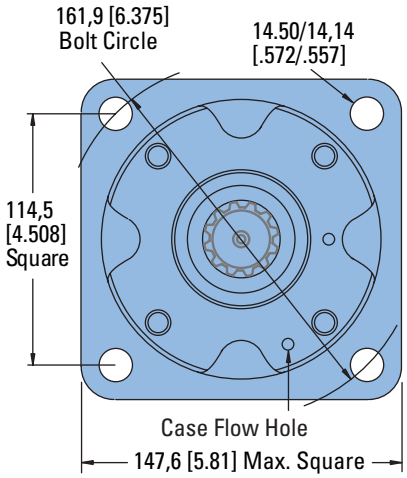
G 3/4 (BSP) Staggered Ports (2)
G 1/4 (BSP) Case Drain Port (1)

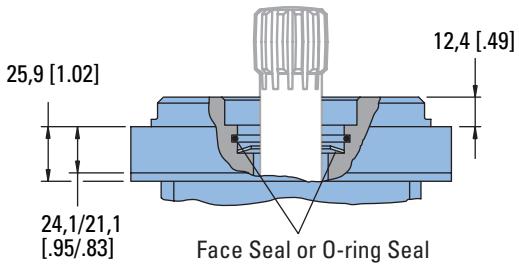
Standard Rotation Viewed from Shaft End

Port A Pressurized — CW
Port B Pressurized — CCW

Bearingless



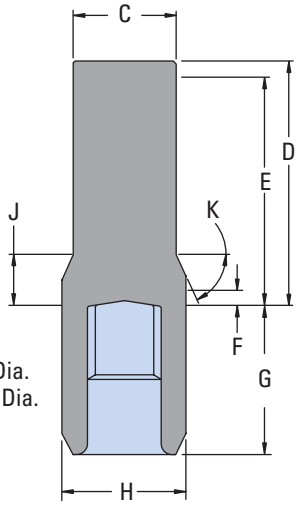




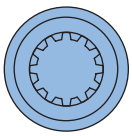
For 4000 Series Bearingless Motor application information contact your Eaton representative (mating coupling blanks available from Eaton Hydraulics).

Note:

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



C 47,2 [1.86] Dia.
D 112,5 [4.43] Max.
E 107,4 [4.23] Full Form Dia.
F 7,4 [.29]Min. Full Form Dia.
G 68,8 [2.71] Max.
H 56,9 [2.24] Dia.
J 18,29 [.720]
K 38°



Mating Coupling Blank
Eaton Part No. 12745-003

BEARINGLESS MOTOR DIMENSIONS

Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]	XX mm [inch]	YY mm [inch]
110 [6.7]	91,0 [3.58]	146,8 [5.78]	100,1 [3.94]	178,8 [7.04]
130 [7.9]	95,0 [3.74]	150,8 [5.94]	104,1 [4.10]	182,9 [7.20]
160 [9.9]	101,4 [4.00]	157,1 [6.19]	110,5 [4.35]	189,2 [7.45]
205 [12.5]	109,9 [4.33]	165,7 [6.52]	118,9 [4.68]	197,6 [7.78]
245 [15.0]	101,4 [4.00]	157,1 [6.19]	110,5 [4.35]	189,2 [7.45]
310 [19.0]	109,9 [4.33]	165,7 [6.52]	118,9 [4.68]	197,6 [7.78]
395 [24.0]	120,6 [4.75]	176,3 [6.94]	129,5 [5.10]	208,3 [8.20]
495 [30.0]	133,5 [5.26]	189,2 [7.45]	142,5 [5.61]	221,2 [8.71]
625 [38.0]	150,5 [5.93]	206,3 [8.12]	159,5 [6.28]	238,3 [9.38]

4000 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 - 1,27 [.030 - .050] (dimensions apply after heat treat).

2 Mating part to have critical dimensions as shown. Oil holes must be provided and open for proper oil circulation.

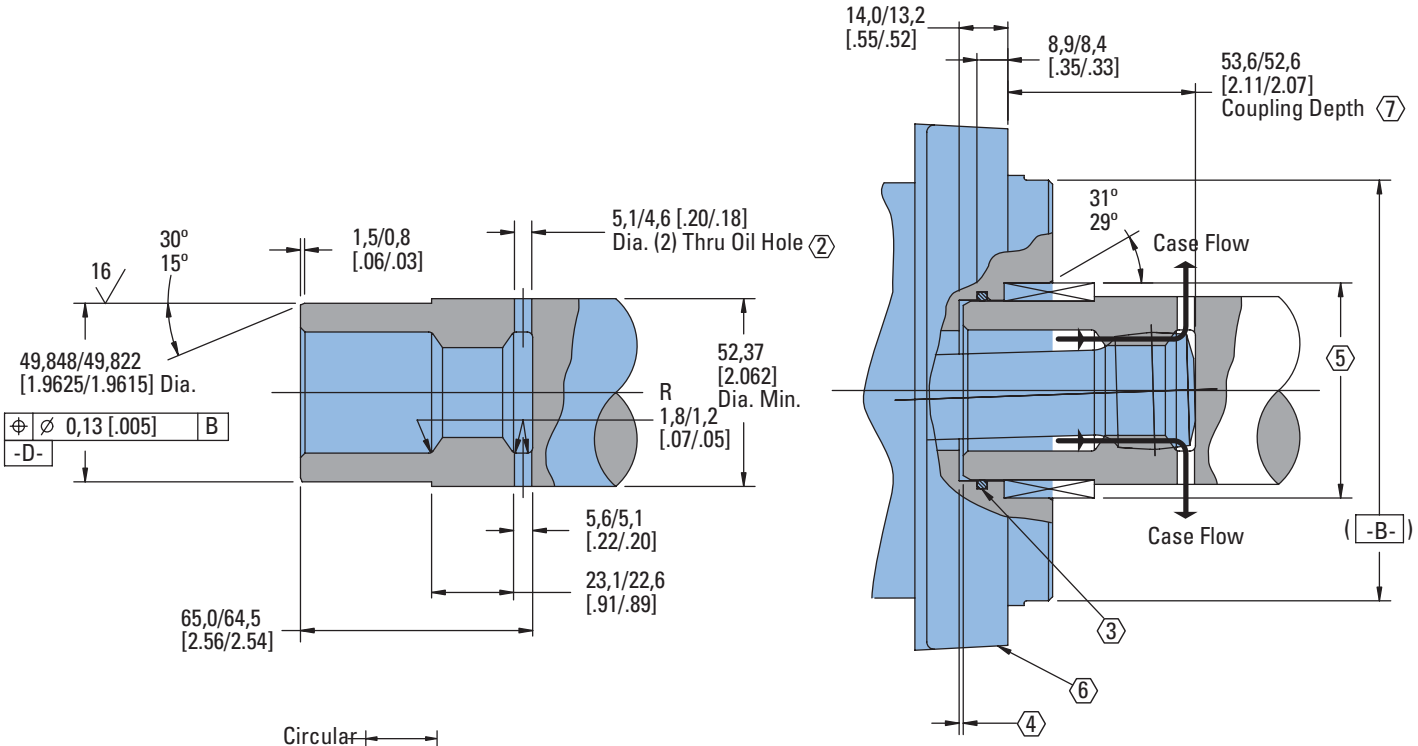
3 Seal to be furnished with motor for proper oil circulation thru splines.

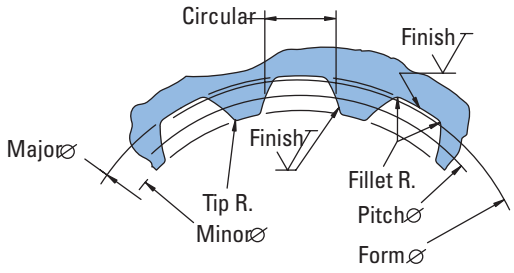
4 Some means of maintaining clearance between shaft and mounting flange must be provided.

5 Counterbore designed to adapt to a standard sleeve bearing 50,010 - 50,040 [1.9689 - 1.9700] ID by 60,050 - 60,080 [2.3642 - 2.3653] (Oilite bronze sleeve bearing).

6 Similar to SAE "C" Four Bolt Flange.

7 52,8 [2.08] Max. dimension to be maintained when assembling shipping and installing unit to insure valve drive engagement with valve (this is required on displacement code number 24 only).



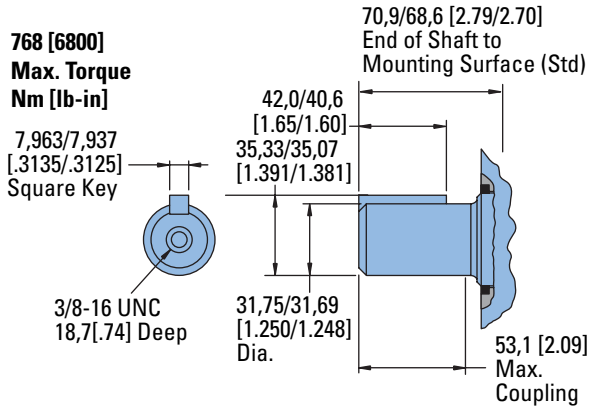


Spline Pitch	10/20
Pressure Angle	30°
Number of teeth	12
Class of Fit	Ref. 5
Type of Fit	Side
Pitch Diameter	Ref. 30,480000 [1.2000000] ⌖ 0,20 [.008] D
Base Diameter	Ref. 26,396455 [1.0392305]
Major Diameter	33,43 [1.316] Max. 33,23 [1.308] Min.
Min. Minor Diameter	28,40 - 28,58 [1.118 - 1.125]
Form Diameter, Min.	32,59 [1.283]
Fillet Radius	0,63 - 0,76 [.025 - .030]
Tip Radius	0,26 - 0,51 [.010 - .020]
Finish	1,6 (63)
Involute Profile Variation	+0,000 -0,025 [+.0000 -.0010]
Total Index Variation	0,038 [.0015]
Lead Variation	0,013 [.0005]
Circular Space Width:	
Maximum Actual	5,045 [.1986]
Minimum Effective	4,995 [.1951]
Maximum Effective	Ref. 5,009 [.1972]
Minimum Actual	Ref. 4,986 [.1963]
Dimension Between Two Pins	Ref. 22,783 - 22,929 [.8970 - .9027]
Pin Diameter	5,334 [.2100] Pins to Have 3,73 [.147] Wide Flat for Root Clearance

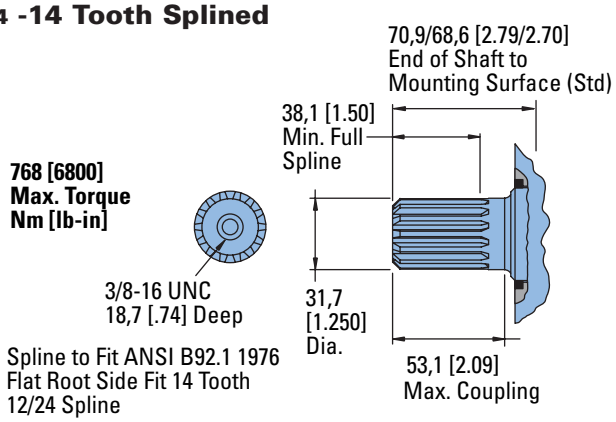
Dimensions

Shafts

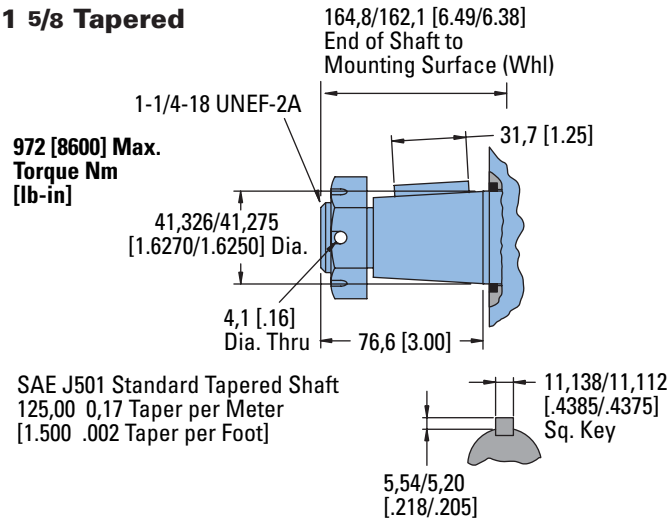
1 1/4 Inch Straight



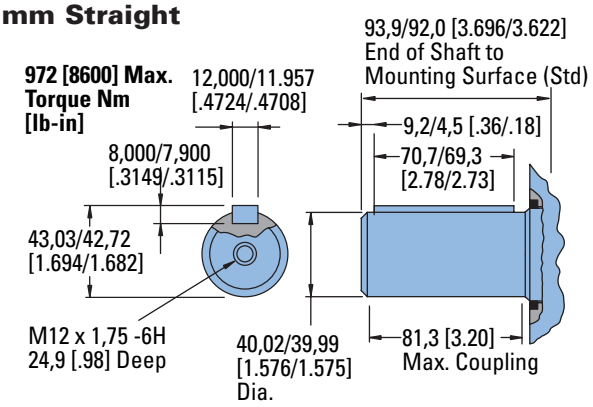
1 1/4 -14 Tooth Splined



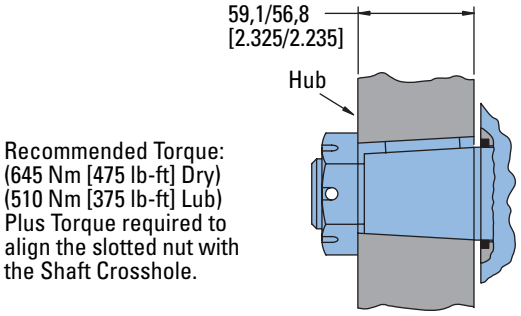
1 5/8 Tapered



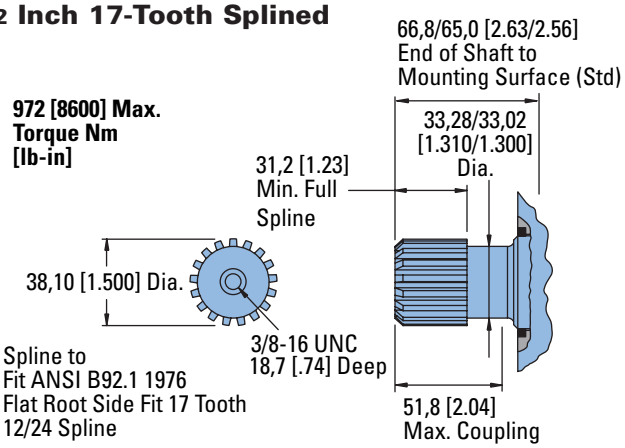
40 mm Straight



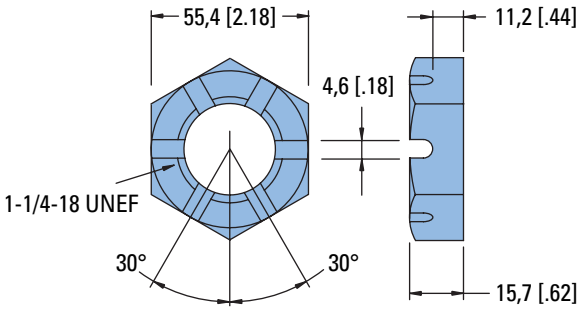
Tapered Shaft Hub Data



1 1/2 Inch 17-Tooth Splined



Slotted Hexagon Nut

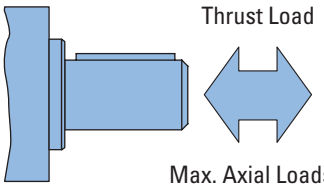


Shaft Side Load Capacity

These curves indicate the radial load capacity on the motor shaft(s) at various locations with an allowable external thrust load of 454 kg [1000 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 94 kg/7 Bar [208 lb/100 PSI].

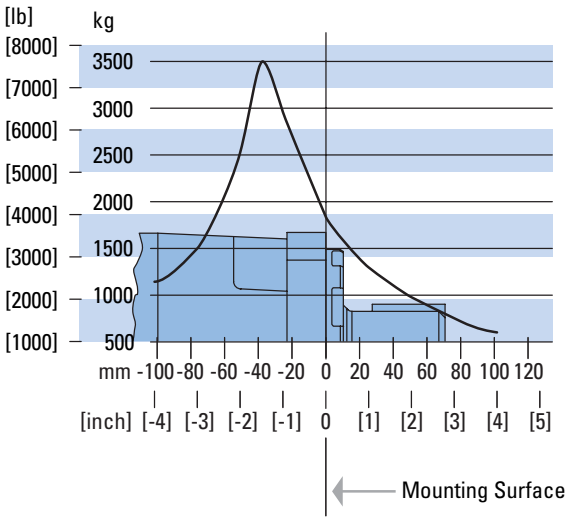


Each curve is based on B 10 bearing life (2000 hours of 12,000,000 shaft revolutions at 100 RPM) at rated output torque. To determine radial load at speeds other than 100 RPM, multiply the load values given on the bearing curve by the factors in the chart below.

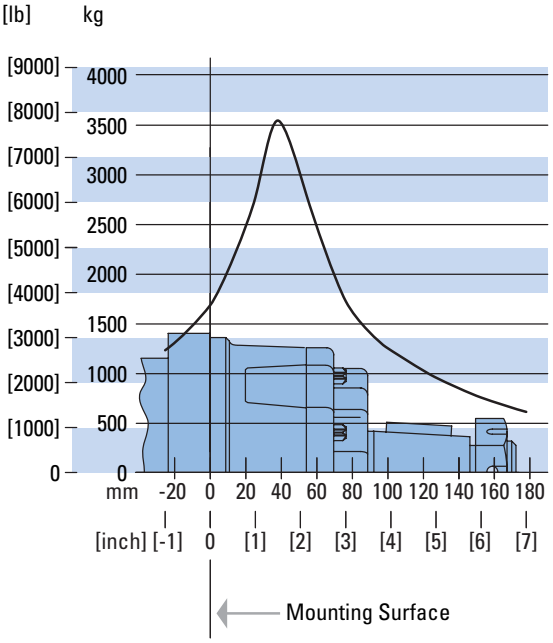
RPM	Multiplication Factor
50	1.23
100	1.00
200	0.81
300	0.72
400	0.66
500	0.62
600	0.58
700	0.56
800	0.54

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

Standard Motor
Straight and Splined Shafts



Wheel Motor Tapered Shaft



Case Pressure and Case Port

Char-Lynn 4000 Series motors are durable and have long life as long as the recommended case pressure is not exceeded. Allowable case pressure is highest at low shaft speeds. Consequently, motor life will be shortened if case pressure exceeds these ratings (acceptability may vary with application). Determine if an external case drain is required from the case pressure seal limitation chart.

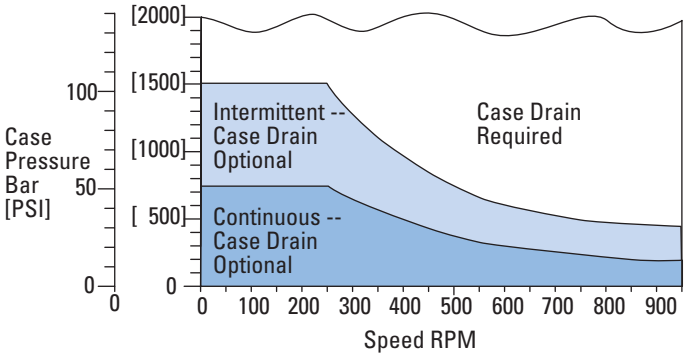
Case Porting Advantage

Contamination Control — flushing the motor case.

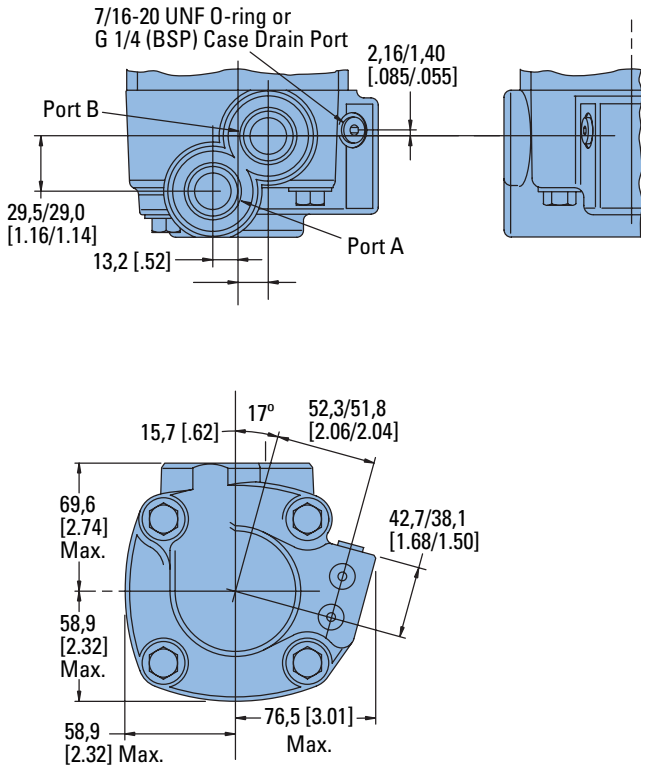
Cooler Motor — exiting oil draws motor heat away.

Extend Motor Seal Life — maintain low case pressure with a preset restriction in the case drain line.

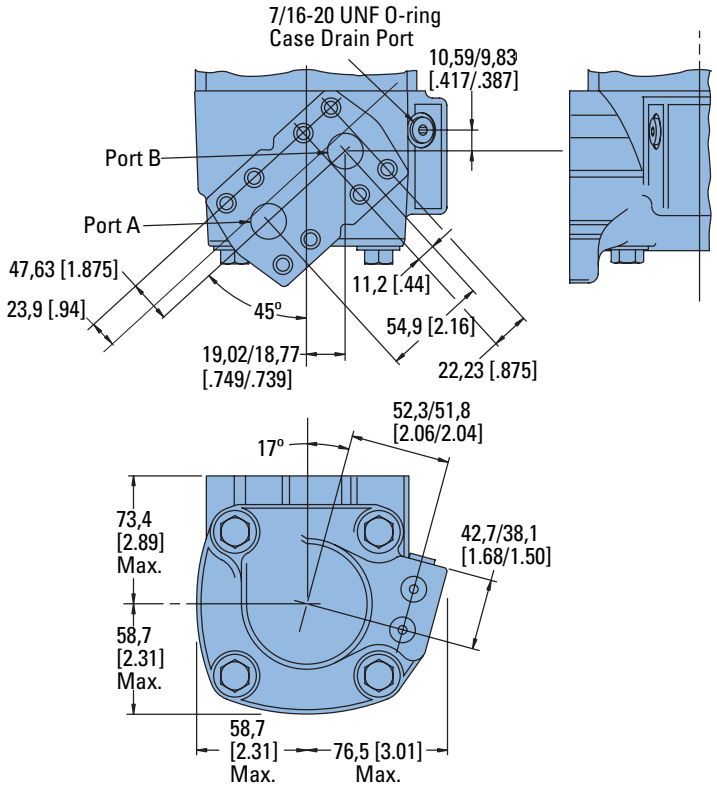
Case Pressure Seal Limitation



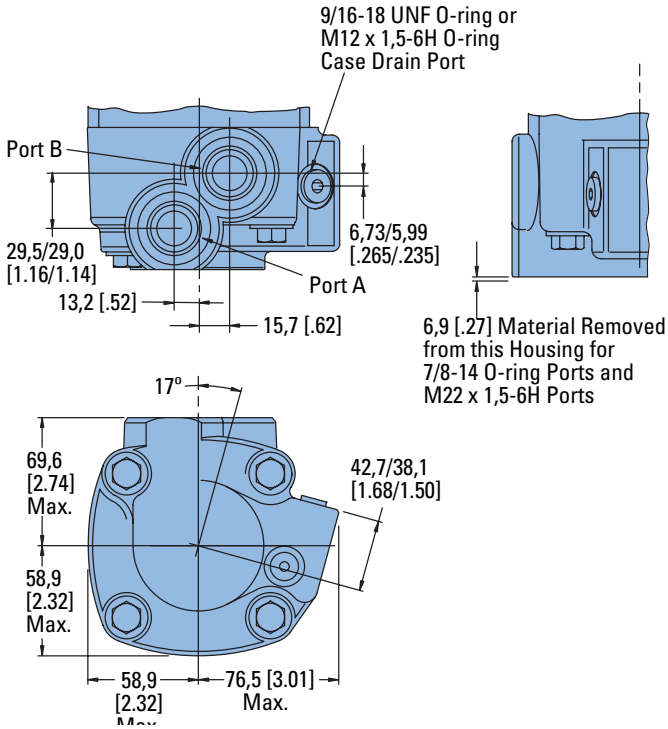
1-1/16-12 O-ring Ports (2) or G 3/4 (BSP) Ports (2)



4 Bolt 3/4 Inch Split Flange Ports to Fit SAE J518 c (2)



7/8-14 O-ring Ports (2) or M22 x 1,5-6H Ports (2)



4000 Series

Product Numbers

Note:

For 4000 Series Motors with a configuration **Not Shown** in the charts below: Use model code number system on the next page to specify product in detail.

Use digit prefix —109-, 110-, or 111- plus four digit number from charts for complete product number—Example 111-1057.

Orders will not be accepted without three digit prefix.

MOUNTING		SHAFT	PORT SIZEDISPL. cm^3/r [in^3/r] / PRODUCT NUMBER									
			110 [6.7]	130 [7.9]	160 [9.9]	205 [12.5]	245 [15.0]	280* [17.1]	310 [19.0]	395 [24.0]	495 [30.0]	625 [38.0]
Standard SAE B-Mount	1 1/4 Inch Straight	1 1/16 O-ring	109-1100	-1101	-1102	-1103	-1104	-1094	-1105	-1106	-1212	-1215
		3/4 inch Split Flange	109-1001	-1054	-1002	-1003	-1055	—	-1056	-1057	—	—
	1 5/8 Inch Tapered	1 1/16 O-ring	109-1107	-1108	-1109	-1110	-1111	—	-1112	-1113	-1479	-1455
		3/4 inch Split Flange	109-1006	-1058	-1007	-1008	-1059	—	-1402	-1061	—	—
	1 1/4 Inch 14 T Splined	1 1/16 O-ring	109-1114	-1115	-1116	-1117	-1118	—	-1119	-1120	—	—
		3/4 inch Split Flange	109-1011	-1062	-1012	-1013	-1063	—	-1064	-1065	—	—
Standard SAE C-Mount	40 mm Straight	G 3/4 (BSP)	109-1184	-1185	-1227	-1224	-1225	—	-1189	-1190	—	—
	1 1/4 Inch 17 T Splined	G 3/4 (BSP)	109-1191	-1192	-1193	-1194	-1195	—	-1196	-1197	—	—
Wheel Motor	1 1/4 Inch Straight	1 1/16 O-ring	110-1074	-1075	-1076	-1077	-1078	—	-1079	-1080	—	-1122
		3/4 inch Split Flange	110-1001	-1040	-1002	-1003	-1041	—	-1042	-1043	—	—
	40 mm Straight	G 3/4 (BSP)	110-1108	-1109	-1110	-1111	-1112	—	-1113	-1125	—	—
	1 5/8 Inch Tapered	1 1/16 O-ring	110-1081	-1082	-1083	-1084	-1085	—	-1086	-1087	1116	-1117
		3/4 inch Split Flange	110-1006	-1044	-1007	-1008	-1045	—	-1046	-1047	—	—
	1 1/4 Inch 14 T Splined	1 1/16 O-ring	110-1088	-1089	-1090	-1091	-1092	—	-1093	-1094	—	—
		3/4 inch Split Flange	110-1011	-1048	-1012	-1013	-1049	—	-1050	-1051	—	—
Bearingless		1 1/16 O-ring	111-1033	-1034	-1035	-1036	-1037	—	-1038	-1039	-1062	-1063
		3/4 inch Split Flange	111-1044	-1015	-1045	-1046	-1016	—	-1017	-1018	—	—
		G 3/4 (BSP)	111-1052	-1053	-1054	-1055	-1056	—	-1057	-1058	—	—

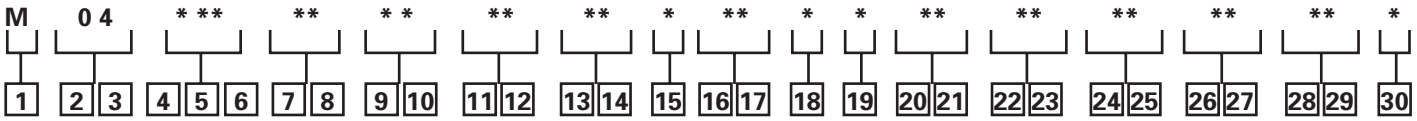
* New Release

111-1057

4000 Series

Model Code

The following 30-digit coding system has been developed to identify all of the configuration options for the 4000 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.



1 Product M

2, 3 Series

04 – 4000 Series

4, 5, 6 Displacement cm³/r [in³/r]

067 – 109.8
080 – 130.3
099 – 162.2
125 – 205.5
150 – 246.3
171 – 280.1
190 – 311.8
225 – 369.0
240 – 393.9
301 – 492.6
342 – 560.2
381 – 623.9

7, 8 Mounting Type

AA – Bearingless, 4 Bolt: 127.00 [5.000] Pilot Dia. 14.27 [.562] Dia. Holes on 161.92 [6.375] Dia. Bolt Circle

AB – Standard, 4 Bolt: 101.60 [4.000] Pilot Dia. 14.7 [.58] Slots on 127.00 [5.000] Dia. Bolt Circle. (SAE B)

AC – Wheel, 4 Bolt: 139.70 [5.500] Pilot Dia. 14.27 [.562] Dia. Holes on 165.10 [6.500] Dia. Bolt Circle.

AF – Standard, 4 Bolt: 127.00 [5.000] Pilot Dia. 14.27 [.562] Dia. Holes on 161.92 [6.375] Dia. Bolt Circle. (SAE C)

AH – Standard: ISO Flange 125 B4hw (ISO 3019/2) 124.97 [4.920] Pilot Dia. 14.27 [.562] Dia. Holes on 160.00 [6.299] Dia. Bolt Circle

AP – Wheel, 4 Bolt: 160.0 [6.30] Pilot Dia. with 5.8 [.23] Pilot Length and 18.00 [.709] Dia Holes on 200.00 [7.874] Bolt Circle (ISO Compatible)

9, 10 Output Shaft

00 – None (Bearingless)

01 – 31.75 [1.250] Dia. Straight With .375-16UNC-2B Thread, 53.1 [2.09] Max Coupling Length, 7.938 [.3125] Sq x 41.27 [1.625] Straight Key

02 – 41.28 [1.625] Dia. Tapered with 11.112 [.4375] Sq x 31.75 [1.250] Straight Key, 1.250-18UNEF-2A Thread with Slotted Hex Nut

03 – 31.75 [1.250] Dia. Flat Root Side Fit, 14 Tooth, 12/24 DP 30° Involute Spline, 38.1 [1.50] Minimum Full Spline Length with .375-16unc-2b Thread

10 – 38.10 [1.500] Dia. Flat Root Side Fit, 17 Tooth, 12/24 DP 30°. Involute Spline, 31.2 [1.23] Minimum Full Spline Length, with .375-16 UNC-2B Thread in End

11 – 40.00 [1.575] Dia. Straight with M12 x 1.75-6H Thread, 7.955 [.3132] x 11.979 [.4716] Wide X 69.98 [2.755] Straight Key

21 – 40.00 [1.575] Dia. 10:1 Tapered Shaft per ISO R775 with .750-16 UNF-2B Threaded in End, 12W x 8H 70L [.472W x .313H x 2.76L] Key

22 – None (Bearingless) European Spline

25 – 42.00 [1.654] Dia. 10:1 Tapered Shaft per ISO R775 with .750-16 UNF-2B Thread in End, 12W x 8H X 63L [.472W X .313H X 2.48L] Key

11, 12 Ports

AA – .875-14 UNF-2B SAE O-Ring Ports - Staggered Ports

AB – 1.0625-12 UN-2B SAE O-Ring Ports - Staggered Ports

AC – G 3/4 Ports - Staggered Ports

AD – 19.05 [.750] 4 Bolt Split Flange Staggered Ports Standard Pressure Series (Code 61)

AE – M22 X 1.5-6H O-Ring Port - Staggered Ports

AG – 12.70 [.500] Dia. Manifold Ports

AJ – Dash 12 Stc Type II+ (Snap to Connect) Ports - Staggered Ports

13, 14 Case Flow Options

00 – None

02 – .4375-20 UNF-2B SAE O-ring Port with Check Valve

03 – G 1/4 BSP Straight Thread with Check Valve

06 – .4375-20 UNF-2B SAE O-ring Port with Reverse Flow Shuttle

10 – Dash 6 Stc Type II + (Snap to Connect) Port

15 Low Pressure Relief

00 – None

A – Set at 4.5 Bar [65 Lbf/In²]

B – Set at 15.2 Bar [220 Lbf/In²]

C – Set at 13.1 Bar [190 Lbf/In²]

16, 17 Pressure/Flow Option

00 – None

18 Geroler Option

0 – Standard

19 Seal Option

0 – Standard
1 – Viton
4 – Seal Guard

20, 21 Accessories

00 – None

AC – M 12 Threaded Connector, Long Body Digital Speed and Direction Pickup (Two 36 Pulse Signals in Quadrature per Revolution Pin 1=Power Supply, Pin 2=Output Signal 1, Pin 3=Common, Pin 4=Output Signal 2)

AD – M 12 Threaded Connector, Digital Speed And Direction Pickup (One 72 Pulse per Rev Speed Signal and One Directional Signal (Pin 1=Power, Pin 2=Direction, Pin 2=Common, Pin 4=Speed)

22, 23 Special Features (Hardware)

00 – None
17 – Low Noise Valve Plate

24, 25 Special Features (Assembly)

0 – No Paint, Individual Box

26, 27 Paint/Packaging

0 – No Paint, Individual Box

A – Painted Low Gloss Black, Individual Box

C – Epoxy Coated (Frost Gray), Individual Box

28, 29 Customer Identification

0 –None

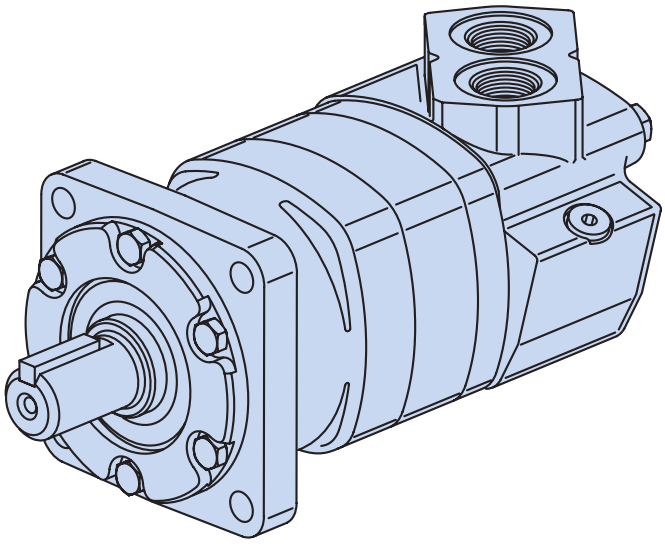
30 Design Code

F – Sixth

Notes

6000 Series

Highlights



Features

- 9 displacements available
- Presents a multitude of options that make this motor very "smart" and flexible to apply

Benefits

- Very tough motor for demanding applications
- Can be used in a multitude of industries
- Very easy/flexible to integrate in a system

Applications

- Mobile equipment
- Snow Removal, mowing
- Spayer, trencher
- Wood products

Description

With torque up to 15,000 in-lb and 40 gpm continuous, this motor is packed with power operates very smoothly.

Specifications

Geroler Element	9 Displacements
Flow l/min [GPM]	150 [40] Continuous**
	225 [60] Intermittent*
Speed RPM	775 Cont.**
	866 Inter.*
Pressure bar [PSI]	200 [3000] Cont.**
	300 [4500] Inter.*
Torque Nm [lb-in]	1685 [14920] Cont.**
	1875 [16580] Inter.*

** Continuous — (Cont.) Continuous rating, motor may be run continuously at these ratings.
* Intermittent — (Inter.) Intermittent operation, 10% of every minute.

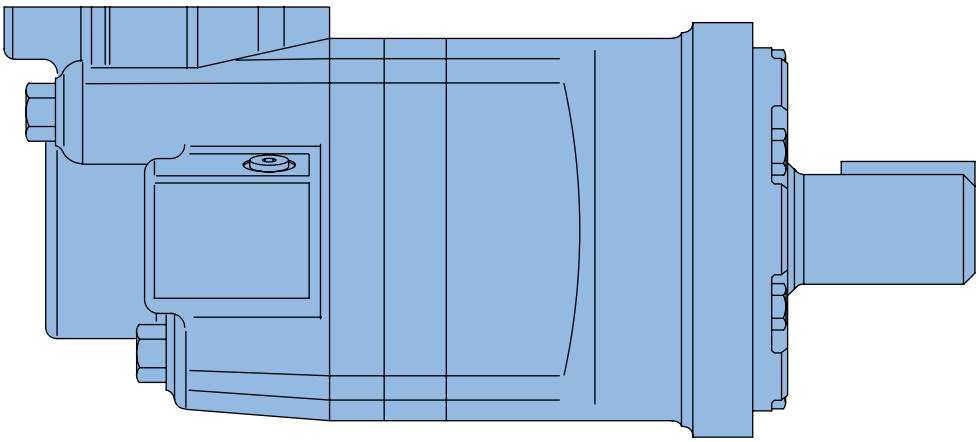
Mowing

Snow Removal

Sprayer

Trencher

6000 Series
Specifications



6000 SERIES MOTORS

Displ. cm³/r [in³/r]		195 [11.9]	245 [15.0]	310 [19.0]	390 [23.9]	490 [30.0]	625 [38.0]	735 [45.0]	805 [49.0]	985 [60.0]
Max. Speed (RPM) @ Flow	Continuous	775	615	485	387	307	241	203	187	153
	Intermittent	866	834	698	570	454	355	303	280	230
Flow l/min [GPM]	Continuous	150 [40]	150 [40]	150 [40]	150 [40]	150 [40]	150 [40]	150 [40]	150 [40]	150 [40]
	Intermittent	170 [45]	210 [55]	225 [60]	225 [60]	225[60]	225 [60]	225[60]	225[60]	225 [60]
Torque* Nm [lb-in]	Continuous	575 [5100]	735 [6510]	930 [8230]	1155 [10230]	1445 [12800]	1480 [13100]	1378 [12192]	1582 [14004]	1685 [14920]
	Intermittent	860 [7620]	1100 [9740]	1355 [11990]	1635 [14490]	1885 [16670]	1898 [16800]	1699 [15040]	1850 [16377]	1875 [16580]
Pressure Δ bar [Δ PSI]	Continuous	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	170 [2500]	140 [2000]	140 [2000]	140 [2000]
	Intermittent	310 [4500]	310 [4500]	310 [4500]	310 [4500]	275 [4000]	221 [3200]	170 [2500]	170 [2500	140 [2000]
	Peak	310 [4500]	310 [4500]	310 [4500]	310 [4500]	310 [4500]	240 [3500]	205 [3000]	170 [2500	170 [2250]
Weight kg [lb]	Standard or Wheel Mount	24,9 [55.0]	25,2 [55.5]	25,6 [56.5]	26,3 [58.0]	27.0 [59.5]	27,9 [61.5]	28.6 [63.0]	29 [64.0]	30,4 [67.0]
	Bearingless	20.2 [44.5]	20.4 [45.0]	20.9 [46.0]	21.5 [47.5]	22.2 [49.0]	23.1 [51.0]	28.3 [52.5]	28.8 [53.5]	30.2 [56.5]

Maximum Case Pressure: See case pressure seal limitation graph.

*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:

310 bar [4500 PSI]

Do not exceed Δ pressure rating (see chart above).

Maximum Return Pressure:

310 bar [4500 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

6000 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

195 cm³/r [11.9 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[1000] 70	[1500] 105	[2000] 140	[2500] 170	[3000] 205	[3500] 240	[4000] 275	[4500] 310
[.5] 1,9	[280] 30 **9**	[650] 75 **7**	[1450] 165 **5**	[2290] 260 **2**						
[2] 7,5	[290] 35 **38**	[680] 75 **37**	[1500] 170 **35**	[2340] 265 **34**	[3100] 350 **30**	[3880] 440 **26**	[4140] 470 **18**			
[4] 15	[300] 35 **77**	[710] 80 **76**	[1500] 175 **74**	[2390] 270 **72**	[3210] 365 **66**	[4030] 455 **62**	[4600] 520 **46**	[5200] 590 **32**	[5790] 655 **18**	
[8] 30	[310] 35 **154**	[740] 85 **153**	[1590] 180 **148**	[2450] 275 **144**	[3280] 370 **131**	[4120] 465 **119**	[4810] 545 **116**	[5530] 625 **99**	[6250] 705 **83**	[6900] 780 **65**
[12] 45	[320] 35 **232**	[750] 85 **230**	[1610] 180 **225**	[2480] 280 **221**	[3330] 375 **212**	[4190] 475 **203**	[4990] 565 **186**	[5810] 655 **167**	[6630] 750 **148**	[7320] 825 **118**
[16] 61	[300] 35 **309**	[730] 80 **307**	[1600] 180 **303**	[2470] 280 **300**	[3340] 375 **291**	[4210] 475 **283**	[5090] 575 **258**	[5900] 665 **236**	[6710] 760 **214**	[7470] 845 **181**
[20] 76	[270] 30 **387**	[720] 80 **384**	[1590] 180 **379**	[2460] 280 **374**	[3350] 380 **365**	[4240] 480 **356**	[5100] 575 **332**	[5950] 670 **306**	[6800] 770 **280**	[7620] 860 **247**
[24] 91	[240] 25 **465**	[700] 80 **462**	[1570] 175 **456**	[2440] 275 **450**	[3330] 375 **440**	[4220] 475 **429**	[5080] 575 **413**	[5940] 670 **388**	[6810] 770 **363**	
[28] 106	[190] 20 **542**	[660] 75 **539**	[1530] 175 **532**	[2400] 270 **526**	[3300] 375 **514**	[4200] 475 **502**	[5060] 570 **476**	[5940] 670 **448**	[6810] 770 **421**	
[32] 121	[160] 20 **620**	[630] 70 **617**	[1500] 170 **609**	[2370] 270 **602**	[3270] 370 **589**	[4160] 470 **576**	[5040] 570 **542**	[5920] 670 **511**	[6790] 765 **480**	
[36] 136	[120] 15 **697**	[620] 70 **692**	[1480] 165 **683**	[2350] 265 **674**	[3240] 365 **659**	[4130] 465 **645**	[5000] 565 **601**	[5880] 665 **564**	[6760] 765 **527**	
[40] 151	[80] 10 **775**	[610] 70 **770**	[1450] 165 **759**	[2320] 260 **749**	[3210] 365 **733**	[4100] 465 **718**	[4960] 560 **666**	[5840] 660 **624**		
[45] 170		[590] 65 **866**	[1410] 160 **854**	[2280] 260 **843**	[3170] 360 **825**	[4060] 460 **808**	[4920] 555 **749**	[5790] 655 **702**		

[5790] 655 **702** } Torque [lb-in] Nm **Speed RPM**

245 cm³/r [15.0 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[1000] 70	[1500] 105	[2000] 140	[2500] 170	[3000] 205	[3500] 240	[4000] 275	[4500] 310
[.5] 1,9	[430] 50 **7**	[860] 95 **4**	[1890] 215 **1**							
[2] 7,5	[440] 50 **30**	[900] 100 **29**	[1940] 220 **26**	[2990] 340 **24**	[3960] 445 **21**	[4920] 555 **17**	[5040] 570 **11**	[5930] 670 **6**		
[4] 15	[460] 50 **61**	[940] 105 **60**	[2000] 225 **56**	[3060] 345 **54**	[4080] 460 **48**	[5090] 575 **42**	[5680] 640 **39**	[6630] 750 **30**	[7570] 855 **12**	[8520] 965 **6**
[8] 30	[470] 55 **122**	[960] 110 **120**	[2060] 235 **116**	[3150] 355 **113**	[4210] 475 **104**	[5260] 595 **95**	[6180] 700 **81**	[7100] 800 **67**	[8020] 905 **53**	[9020] 1020 **37**
[12] 45	[480] 55 **183**	[970] 110 **182**	[2080] 235 **178**	[3180] 360 **174**	[4270] 480 **165**	[5360] 605 **157**	[6390] 720 **141**	[7420] 840 **125**	[8450] 955 **109**	[9510] 1075 **92**
[16] 61	[450] 50 **245**	[960] 110 **244**	[2070] 235 **240**	[3180] 360 **236**	[4290] 485 **228**	[5420] 610 **221**	[6480] 730 **202**	[7490] 845 **184**	[8480] 960 **165**	[9540] 1180 **145**
[20] 76	[420] 45 **307**	[940] 105 **306**	[2050] 230 **301**	[3160] 355 **297**	[4290] 485 **287**	[5440] 615 **277**	[6510] 735 **257**	[7580] 855 **238**	[8660] 980 **218**	[9740] 1100 **197**
[24] 91	[380] 45 **368**	[920] 105 **365**	[2020] 230 **361**	[3120] 355 **358**	[4260] 480 **348**	[5400] 610 **338**	[6490] 735 **316**	[7590] 860 **294**	[8680] 980 **271**	
[28] 106	[330] 35 **430**	[870] 100 **426**	[1980] 225 **421**	[3100] 350 **416**	[4240] 480 **404**	[5380] 610 **376**	[6480] 730 **358**	[7580] 855 **340**	[8670] 980 **322**	
[32] 121	[290] 35 **491**	[800] 90 **489**	[1920] 215 **481**	[3050] 345 **475**	[4170] 470 **461**	[5290] 600 **448**	[6410] 725 **423**	[7520] 850 **398**	[8640] 975 **373**	
[36] 136	[250] 30 **556**	[730] 80 **549**	[1850] 210 **543**	[2980] 335 **537**	[4060] 460 **524**	[5150] 580 **509**	[6300] 710 **482**	[7440] 840 **456**		
[40] 151	[200] 25 **615**	690] 80 **612**	[1790] 200 **606**	[2940] 330 **599**	[4010] 455 **585**	[5130] 580 **570**	[6190] 700 **540**	[7100] 800 **510**		
[45] 170		[570] 65 **688**	[1760] 200 **682**	[2860] 325 **674**	[3960] 445 **658**	[5070] 575 **641**	[6080] 685 **608**	[6690] 755 **574**		
[50] 189			[1720] 195 **758**	[2800] 315 **749**	[3890] 440 **731**	[4920] 555 **712**	[5940] 670 **676**			
[55] 208			[1670] 190 **834**	[2740] 310 **824**	[3820] 430 **804**	[4890] 550 **783**	[5880] 665 **744**			

6000 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

310 cm³/r [19.0 in³/r]
Δ Pressure Bar [PSI]

Flow LPM [GPM]	[250] 15	[500] 35	[1000] 70	[1500] 105	[2000] 140	[2500] 170	[3000] 205	[3500] 240	[4000] 275	[4500] 310
[.5] **1,9**	[530] 60 **6**	[1120] 125 **4**	[2440] 275 **1**							
[2] **7,5**	[540] 60 **24**	[1150] 130 **23**	[2460] 280 **22**	[3620] 410 **20**	[4780] 540 **17**	[5690] 645 **14**	[6670] 755 **10**	[7780] 880 **4**		
[4] **15**	[550] 60 **48**	[1180] 135 **47**	[2560] 290 **45**	[3800] 430 **42**	[5030] 570 **38**	[6050] 685 **32**	[7070] 800 **24**	[8260] 935 **17**	[9070] 1025 **10**	[9530] 1075 **3**
[8] **30**	[560] 65 **96**	[1250] 140 **95**	[2650] 300 **91**	[3970] 450 **87**	[5280] 595 **81**	[6480] 730 **73**	[7710] 870 **64**	[8740] 985 **55**	[9770] 1105 **46**	[10990] 1240 **35**
[12] **45**	[570] 65 **144**	[1260] 140 **143**	[2690] 305 **140**	[4050] 460 **135**	[5420] 610 **129**	[6730] 760 **121**	[8040] 910 **111**	[9260] 1045 **99**	[10490] 1185 **88**	[11800] 1335 **76**
[16] **61**	[540] 60 **193**	[1230] 140 **192**	[2660] 300 **188**	[4060] 460 **184**	[5450] 615 **178**	[6800] 770 **167**	[8150] 920 **156**	[9400] 1060 **141**	[10660] 1205 **126**	[11990] 1355 **109**
[20] **76**	[510] 60 **242**	[1200] 135 **241**	[2630] 295 **236**	[4040] 455 **232**	[5450] 615 **226**	[6820] 770 **216**	[8190] 925 **201**	[9520] 1075 **184**	[10840] 1225 **167**	
[24] **91**	[480] 55 **290**	[1160] 130 **289**	[260] 295 **282**	[4020] 455 **279**	[5440] 615 **273**	[6840] 775 **260**	[8230] 930 **248**	[9560] 1080 **232**	[10900] 1230 **215**	
[28] **106**	[420] 45 **339**	[1130] 130 **336**	[2570] 290 **333**	[3990] 450 **328**	[5420] 610 **320**	[6820] 770 **308**	[8220] 930 **295**	[9520] 1075 **276**	[10840] 1225 **257**	
[32] **121**	[360] 40 **388**	[1100] 125 **384**	[2510] 285 **381**	[3920] 445 **375**	[5330] 600 **368**	[6750] 765 **354**	[8170] 920 **341**	[9440] 1065 **320**		
[36] **136**	[300] 35 **436**	[1060] 120 **430**	[2440] 275 **421**	[3830] 435 **416**	[5220] 590 **410**	[6660] 750 **396**	[8100] 915 **383**	[9330] 1055 **360**		
[40] **151**	[270] 30 **485**	[1020] 115 **478**	[2400] 270 **466**	[3780] 425 **461**	[5150] 580 **456**	[6580] 745 **441**	[8020] 905 **427**	[9220] 1040 **403**		
[50] **189**		[982] 110 **597**	[2180] 245 **582**	[3420] 385 **576**	[4660] 525 **570**	[6050] 685 **551**	[7440] 840 **534**			
[60] **227**			[1960] 220 **698**	[3250] 365 **691**	[4540] 515 **684**	[5750] 650 **661**	[7080] 800 **641**			

[5750] 650 **661** } Torque [lb-in] Nm **Speed RPM**

390 cm³/r [23.9 in³/r]
Δ Pressure Bar [PSI]

Flow LPM [GPM]	[250] 15	[500] 35	[1000] 70	[1500] 105	[2000] 140	[2500] 170	[3000] 205	[3500] 240	[4000] 275	[4500] 310
[1] **3,8**	[760] 85 **4**	[1570] 175 **2**	[3230] 365 **1**							
[2] **7,5**	[780] 90 **19**	[1610] 180 **18**	[3270] 370 **17**	[4910] 555 **16**	[6440] 730 **14**	[7760] 875 **12**	[9080] 1025 **9**	[10590] 1195 **4**		
[4] **15**	[800] 90 **38**	[1640] 185 **38**	[3300] 375 **37**	[4970] 560 **35**	[6570] 740 **33**	[8160] 920 **29**	[9570] 1080 **22**	[11270] 1275 **14**	[12120] 1370 **5**	[14490] 1635 **1**
[8] **30**	[810] 90 **77**	[1650] 185 **76**	[3370] 380 **74**	[5080] 575 **72**	[6740] 760 **68**	[8430] 950 **65**	[10050] 1135 **55**	[11620] 1315 **45**	[12880] 1455 **33**	[14480] 1635 **21**
[12] **45**	[800] 90 **115**	[1620] 185 **115**	[3390] 385 **112**	[5130] 580 **109**	[6810] 770 **105**	[8520] 965 **100**	[10190] 1150 **91**	[11860] 1340 **81**	[13640] 1540 **79**	
[16] **61**	[750] 85 **154**	[1600] 180 **154**	[3380] 380 **151**	[5120] 580 **147**	[6820] 770 **143**	[8560] 965 **132**	[10230] 1155 **126**	[11920] 1345 **116**		
[20] **76**	[680] 75 **193**	[1580] 180 **193**	[3360] 380 **189**	[5120] 580 **187**	[6840] 775 **182**	[8590] 970 **175**	[10280] 1160 **162**	[11980] 1355 **152**		
[24] **91**	[620] 70 **232**	[1520] 170 **230**	[3280] 370 **229**	[5060] 570 **225**	[6780] 765 **220**	[8530] 965 **212**	[10240] 1155 **204**			
[28] **106**	[570] 65 **270**	[1460] 165 **268**	[3210] 365 **266**	[5000] 565 **261**	[6730] 760 **256**	[8480] 960 **248**	[10200] 1150 **236**			
[32] **121**	[530] 60 **309**	[1420] 160 **306**	[3140] 355 **304**	[4930] 555 **299**	[6640] 750 **292**	[8380] 945 **282**	[10120] 1145 **269**			
[36] **136**	[450] 50 **348**	[1370] 155 **346**	[3010] 340 **340**	[4840] 545 **336**	[6500] 730 **329**	[8250] 930 **317**	[10000] 1130 **301**			
[40] **151**	[380] 45 **387**	[1320] 150 **386**	[2880] 325 **380**	[4740] 535 **375**	[6460] 730 **368**	[8120] 915 **359**				
[50] **189**		[1140] 130 **482**	[2650] 300 **475**	[4540] 515 **469**	[6440] 730 **460**	[8050] 910 **449**				
[60] **227**			[2460] 280 **570**	[4430] 500 **562**	[6360] 720 **552**	[7860] 890 **538**				

6000 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

490 cm³/r [30.0 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[1000] 70	[1500] 105	[2000] 140	[2500] 170	[3000] 205	[3500] 240	[4000] 275
[1] **3,8**	[1010] 115 **7**	[1200] 235 **7**	[4260] 480 **5**	[6140] 695 **3**					
[2] **7,5**	[1020] 115 **15**	[2110] 240 **14**	[4270] 480 **13**	[6280] 710 **12**	[8350] 945 **11**	[10420] 1175 **8**	[12140] 1370 **3**		
[4] **15**	[1030] 115 **30**	[2100] 235 **30**	[4280] 485 **29**	[6410] 725 **28**	[8500] 960 **27**	[10590] 1195 **25**	[12500] 1410 **21**	[14580] 1645 **17**	[16670] 1885 **12**
[8] **30**	[1020] 115 **60**	[2090] 235 **60**	[4290] 485 **59**	[6490] 735 **57**	[8620] 975 **54**	[10740] 1215 **51**	[12800] 1445 **45**	[14930] 1685 **38**	
[12] **45**	[1000] 115 **91**	[2080] 235 **91**	[4290] 485 **89**	[6500] 735 **87**	[8650] 975 **84**	[10800] 1220 **79**	[12890] 1455 **71**		
[16] **61**	[110] 960 **122**	[2060] 235 **122**	[4260] 480 **121**	[6480] 730 **118**	[8650] 975 **114**	[10820] 1220 **109**	[12900] 1460 **100**		
[20] **76**	[900] 100 **153**	[1980] 225 **152**	[4180] 470 **150**	[6420] 725 **147**	[8620] 975 **144**	[10820] 1220 **139**			
[24] **91**	[850] 95 **184**	[1930] 220 **184**	[4150] 470 **181**	[6390] 720 **180**	[8580] 970 **176**	[10770] 1215 **171**			
[28] **106**	[740] 85 **215**	[1840] 210 **214**	[4070] 460 **211**	[6290] 710 **208**	[8500] 960 **204**	[10720] 1210 **198**			
[32] **121**	[690] 80 **245**	[1710] 195 **244**	[3970] 450 **241**	[6190] 700 **237**	[8420] 950 **232**	[10660] 1205 **226**			
[36] **136**	[670] 75 **276**	[1560] 175 **275**	[3860] 435 **272**	[6080] 685 **265**	[8340] 940 **260**	[10420] 1175 **255**			
[40] **151**	[570] 65 **307**	[1400] 160 **306**	[3750] 425 **303**	[5970] 675 **295**	[8140] 920 **290**	[10180] 1150 **284**			
[50] **189**		[1140] 130 **382**	[3240] 365 **379**	[5220] 590 **369**	[7620] 860 **362**				
[60] **227**			[2860] 325 **454**	[4860] 550 **442**	[7140] 805 **435**				

[2860] 325 **454** } Torque [lb-in] Nm **Speed RPM**

625 cm³/r [38.0 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[1000] 70	[1500] 105	[2000] 140	[2500] 170	[3000] 205	[3200] 221
[1] **3,8**	[1060] 120 **5**	[2205] 250 **5**	[4515] 510 **4**	[6690] 755 **2**				
[2] **7,5**	[1090] 125 **12**	[2300] 260 **12**	[4720] 535 **13**	[7025] 795 **10**	[9360] 1060 **6**			
[4] **15**	[1145] 130 **24**	[2450] 275 **24**	[5052] 570 **24**	[7520] 850 **21**	[9410] 1065 **16**	[12700] 1434 **13**		
[8] **30**	[1195] 135 **45**	[2600] 295 **45**	[5350] 605 **44**	[8195] 925 **42**	[11220] 1270 **37**	[13100] 1480 **35**	[15800] 1785 **32**	[16800] 1898 **30**
[12] **45**	[1200] 135 **72**	[2600] 295 **72**	[5390] 610 **71**	[8145] 920 **68**	[11770] 1330 **64**	[13000] 1469 **60**	[15700] 1774 **56**	
[16] **61**	[1120] 125 **94**	[2530] 285 **94**	[5340] 605 **92**	[8105] 915 **89**	[11740] 1325 **85**	[13000] 1469 **83**		
[20] **76**	[1050] 120 **120**	[2465] 280 **119**	[5285] 595 **117**	[8080] 915 **115**	[11725] 1325 **110**			
[24] **91**	[950] 105 **144**	[2365] 265 **143**	[5180] 585 **140**	[7990] 905 **138**	[11705] 1320 **132**			
[28] **106**	[855] 95 **169**	[2255] 255 **168**	[5080] 575 **165**	[7915] 895 **162**	[11640] 1315 **156**			
[32] **121**	[730] 80 **193**	[2140] 240 **192**	[4960] 560 **188**	[7775] 880 **185**	[11505] 1300 **179**			
[36] **136**	[555] 65 **217**	[1965] 220 **216**	[4780] 540 **213**	[7585] 855 **210**				
[40] **151**	[380] 45 **241**	[1790] 200 **240**	[4600] 520 **238**	[7395] 835 **236**				
[50] **189**			[4180] 470 **296**	[6985] 790 **290**				
[60] **227**			[3800] 430 **353**	[6600] 745 **345**				

6000 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

735 cm³/r [45.0 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140	[2250] 155	[2500] 170
[1] **3,8**	[1311] 148 **4**	[2775] 314 **4**	[4200] 475 **3**	[5480] 619 **3**	[7000] 791 **2**					
[2] **7,5**	[1340] 151 **10**	[2856] 323 **10**	[4535] 512 **10**	[5809] 656 **10**	[7551] 853 **9**	[8685] 981 **7**	[10182] 1150 **6**	[11121] 1257 **5**		
[4] **15**	[1253] 142 **20**	[2854] 322 **20**	[4363] 493 **19**	[5813] 657 **18**	[7272] 822 **17**	[8714] 985 **16**	[10135] 1145 **14**	[11537] 1303 **13**	[12970] 1465 **11**	[15040] 1699 **11**
[8] **30**	[1290] 146 **40**	[2889] 326 **39**	[4540] 513 **38**	[6130] 693 **38**	[7703] 870 **37**	[9202] 1040 **37**	[10666] 1205 **35**	[12192] 1378 **33**	[13713] 1549 **32**	
[12] **45**	[1277] 144 **61**	[2821] 319 **60**	[4528] 512 **59**	[6180] 698 **58**	[7795] 881 **57**	[9338] 1055 **56**	[10877] 1229 **54**	[12419] 1403 **52**		
[16] **61**	[1196] 135 **82**	[2753] 311 **80**	[4478] 506 **79**	[6148] 695 **78**	[7768] 878 **77**	[9376] 1059 **76**	[10984] 1241 **74**			
[20] **76**	[1092] 123 **102**	[2794] 316 **101**	[4320] 488 **101**	[6021] 680 **99**	[7697] 870 **97**	[9311] 1052 **96**	[10907] 1232 **93**			
[24] **91**	[1206] 136 **123**	[2556] 289 **122**	[4162] 470 **120**	[5871] 663 **119**	[7564] 855 **118**	[9289] 1049 **116**				
[28] **106**	[1083] 122 **145**	[2338] 264 **142**	[4040] 456 **141**	[5666] 640 **139**	[7365] 832 **137**	[9022] 1019 **135**				
[32] **121**	[950] 107 **163**	[2110] 238 **162**	[3795] 429 **162**	[5457] 617 **159**	[7122] 805 **159**	[8828] 997 **156**				
[36] **136**	[726] 82 **184**	[1845] 208 **183**	[3517] 397 **182**	[5223] 590 **181**	[6853] 774 **179**					
[40] **151**	[515] 58 **203**	[2227] 252 **202**	[3270] 369 **202**	[4965] 561 **201**	[6672] 754 **199**					
[50] **189**			[3869] 437 **254**	[4148] 469 **252**	[5850] 661 **250**					
[60] **227**				[4856] 549 **303**	[6604] 746 **301**					

[6604] 746 **301** } Torque [lb-in] Nm **Speed RPM**

805 cm³/r [49.0 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140	[2250] 155	[2500] 170
[1] **3,8**	[1455] 164 **4**	[3100] 350 **4**	[4680] 529 **2**	[6031] 681 **2**	[7799] 881 **1**					
[2] **7,5**	[1483] 168 **9**	[3173] 359 **9**	[5121] 579 **9**	[6432] 727 **8**	[8510] 961 **7**	[9633] 1088 **6**	[11319] 1279 **5**	[12127] 1370 **5**		
[4] **15**	[1547] 175 **19**	[3331] 376 **19**	[5292] 598 **18**	[6744] 762 **17**	[8714] 984 **16**	10075] 1138 **15**	[11352] 1283 **14**	[12539] 1417 **12**	[14564] 1645 **11**	[16377] 1850 **10**
[8] **30**	[1599] 181 **35**	[3473] 392 **35**	[5415] 612 **34**	[7039] 795 **33**	[8934] 1009 **32**	[10629] 1201 **31**	[11842] 1338 **29**	[14004] 1582 **29**	[15441] 1745 **28**	
[12] **45**	[1599] 181 **56**	[3469] 392 **56**	[5415] 612 **55**	[7093] 801 **53**	[9024] 1020 **53**	[10658] 1204 **52**	[12283] 1388 **50**	[13726] 1551 **50**		
[16] **61**	[1543] 174 **73**	[3395] 384 **73**	[5357] 605 **72**	[7032] 794 **70**	[8983] 1015 **69**	[10640] 1202 **68**	[12010] 1357 **67**			
[20] **76**	[1457] 165 **93**	[3312] 374 **92**	[5292] 598 **91**	[6968] 787 **89**	[8943] 1010 **88**	[10583] 1196 **87**	[12146] 1372 **86**			
[24] **91**	[1352] 153 **112**	[3183] 360 **112**	[5088] 575 **111**	[6811] 769 **110**	[8812] 996 **108**	[10411] 1176 **106**				
[28] **106**	[1213] 137 **131**	[3055] 345 **131**	[5047] 570 **131**	[6713] 758 **129**	[8681] 981 **128**	[10411] 1176 **127**				
[32] **121**	[1075] 121 **150**	[2907] 328 **149**	[4884] 552 **149**	[6546] 740 **146**	[8395] 949 **145**	[10060] 1137 **144**				
[36] **136**	[823] 93 **168**	[2692] 304 **168**	[4663] 527 **168**	[6320] 714 **167**	[8118] 917 **165**					
[40] **151**	[592] 67 **187**	[2477] 280 **186**	[4426] 500 **186**	[6085] 688 **185**	[7832] 885 **184**					
[50] **189**		[2730] 308 **234**	[4214] 476 **233**	[5849] 661 **231**	[7603] 859 **230**					
[60] **227**			[3806] 430 **280**	[5459] 617 **277**	[7407] 837 **275**					

6000 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

985 cm³/r [60.0 in³/r]

D Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140
[1] **3,8**	[1890] 215 **3**	[4110] 465 **3**	[5730] 645 **2**	[7640] 865 **2**	[9550] 1080 **1**			
[2] **7,5**	[1910] 215 **8**	[4140] 470 **8**	[6270] 710 **7**	[8300] 940 **7**	[10420] 1175 **6**	[12500] 1410 **5**	[13860] 1565 **4**	[14920] 1685 **3**
[4] **15**	[1980] 225 **15**	[4290] 485 **15**	[6480] 775 **15**	[8540] 965 **14**	[10670] 1205 **14**	[12800] 1445 **13**	[13900] 1570 **13**	[15850] 1790 **12**
[8] **30**	[2030] 230 **30**	[4400] 495 **30**	[6630] 750 **30**	[8790] 995 **29**	[10940] 1235 **28**	[13090] 1480 **27**	[14500] 1640 **26**	[16580] 1875 **25**
[12] **45**	[2020] 230 **45**	[4390] 495 **45**	[6630] 750 **45**	[8860] 1000 **44**	[11050] 1250 **43**	[13240] 1495 **42**	[15040] 1700 **41**	
[16] **61**	[2010] 225 **61**	[4320] 490 **61**	[6560] 740 **61**	[8790] 995 **60**	[11000] 1245 **59**	[13260] 1500 **58**		
[20] **76**	[1910] 215 **77**	[4220] 475 **77**	[6480] 730 **76**	[8720] 985 **76**	[10950] 1235 **75**	[13160] 1485 **74**		
[24] **91**	[1810] 205 **92**	[4060] 460 **92**	[6230] 705 **92**	[8500] 960 **91**	[10790] 1220 **90**	[12990] 1470 **89**		
[28] **106**	[1620] 185 **107**	[3920] 445 **107**	[6180] 700 **107**	[8420] 950 **106**	[10630] 1200 **105**	[12820] 1450 **103**		
[32] **121**	[1480] 165 **123**	[3740] 425 **123**	[5980] 675 **122**	[8200] 925 **121**	[10280] 1160 **120**			
[36] **136**	[1140] 130 **138**	[3490] 395 **138**	[5710] 645 **138**	[7930] 895 **137**	[9940] 1125 **135**			
[40] **151**	[850] 95 **153**	[3240] 365 **153**	[5420] 610 **152**	[7640] 865 **151**	[9590] 1085 **150**			
[50] **189**		[2960] 325 **191**	[5160] 585 **190**	[7350] 830 **189**	[9310] 1050 **188**			
[60] **227**			[4660] 525 **230**	[7160] 810 **229**	[9070] 1025 **226**			

[7160] 810 **229** } Torque [lb-in] Nm **Speed RPM**

6000 Series
Dimensions

Ports

1 5/16 -12 UN-2B SAE O-ring Staggered Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

4 Bolt 3/4 inch Split Flange Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

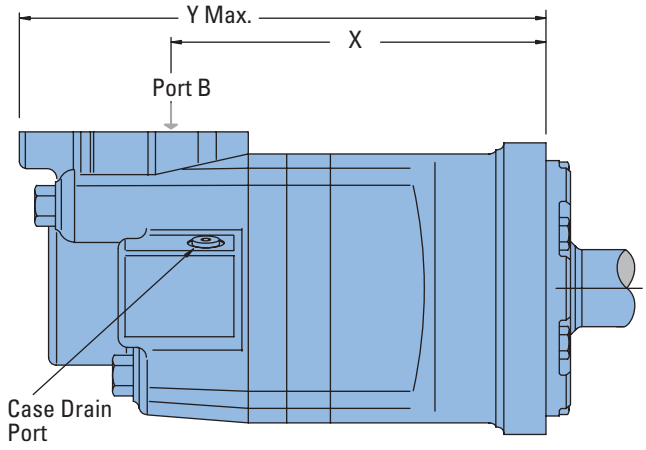
G 1 (BSP) Staggered Ports (2)
G 1/4 (BSP) Case Drain Port (1) or

1 5/16 UN-2B SAE O-ring Staggered Ports (2) with Shuttle
9/16 -20 UNF-2B SAE O-ring Case Drain Port (1)

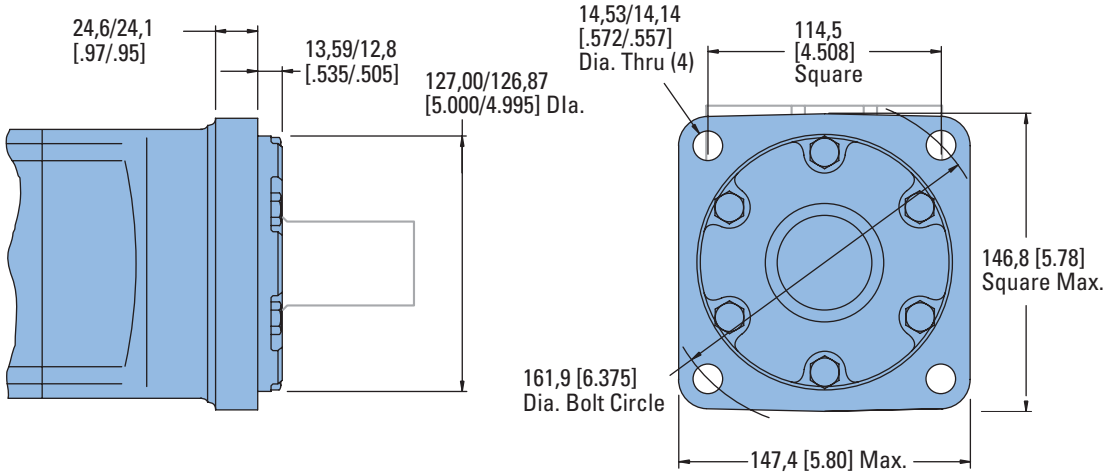
Standard Rotation Viewed from Shaft End

Port A Pressurized — CW
Port B Pressurized — CCW

Standard Mount



Standard SAE CC Flange



STANDARD MOTOR MOUNT DIMENSIONS

Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]
195 [11.9]	187,5 [7.38]	270,0 [10.63]
245 [15.0]	193,0 [7.60]	275,6 [10.85]
310 [19.0]	200,4 [7.89]	283,0 [11.14]
390 [23.9]	209,0 [8.23]	291,6 [11.48]
490 [30.0]	220,2 [8.67]	302,8 [11.92]
625 [38.0]	235,0 [9.25]	317,5 [12.50]
985 [60.0]	274,6 [10.81]	357,1 [14.06]

6000 Series
Dimensions

Ports

1 5/16 -12 UN-2B SAE O-ring Staggered Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

4 Bolt 3/4 inch Split Flange Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

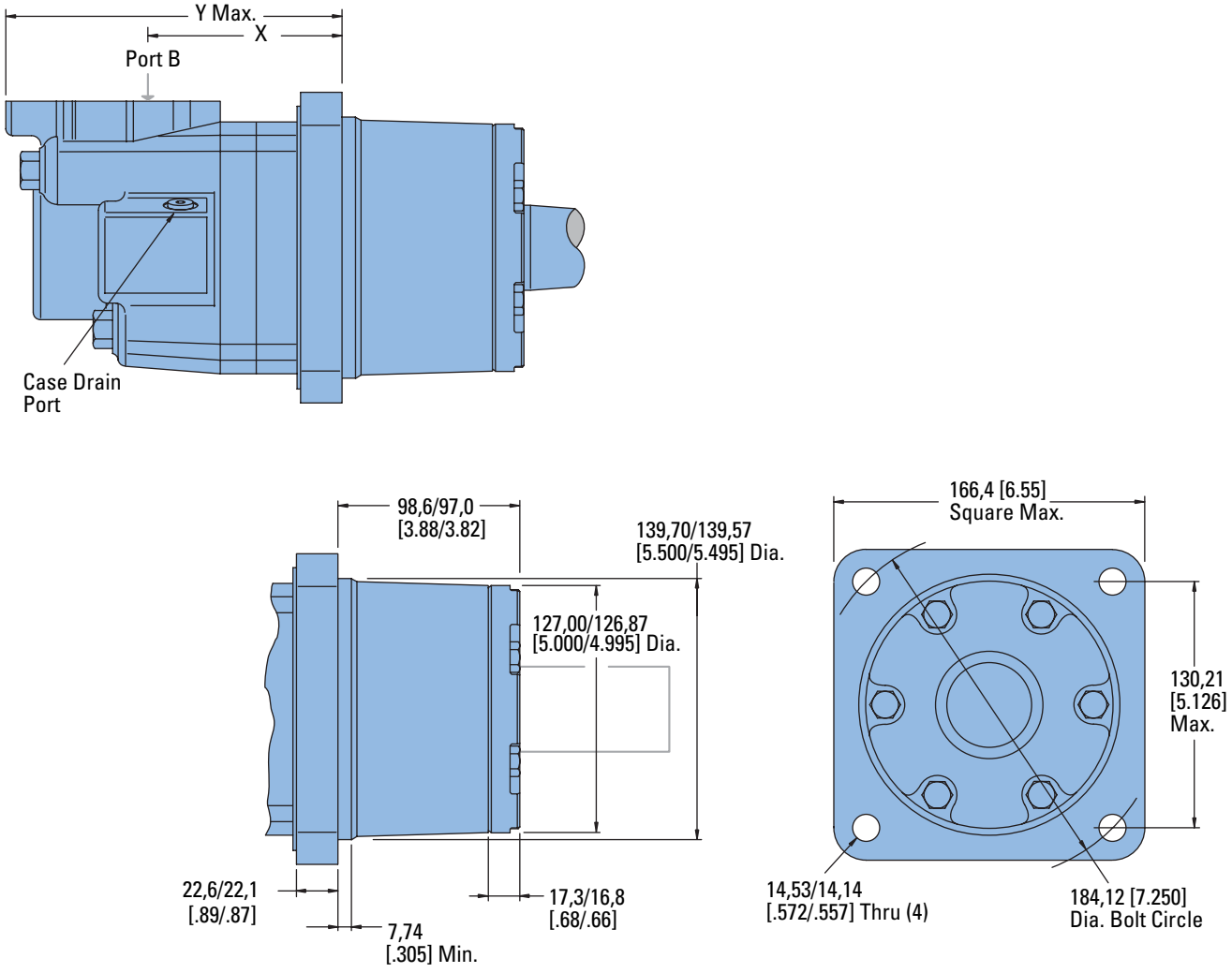
G 1 (BSP) Staggered Ports (2)
G 1/4 (BSP) Case Drain Port (1) or

1 5/16 UN-2B SAE O-ring Staggered Ports (2) with Shuttle
9/16 -20 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 cm³/r [in³/r]	X mm [inch]	Y mm [inch]
195 [11.9]	102,6 [4.04]	185,2 [7.29]
245 [15.0]	108,2 [4.26]	190,8 [7.51]
310 [19.0]	115,6 [4.55]	198,1 [7.80]
390 [23.9]	124,5 [4.90]	207,1 [8.15]
490 [30.0]	135,4 [5.33]	217,9 [8.58]
625 [38.0]	150,1 [5.91]	232,7 [9.16]
985 [60.0]	189,7 [7.47]	272,5 [10.73]

6000 Series
Dimensions

Ports

1 5/16 -12 UN-2B SAE O-ring Staggered Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

4 Bolt 3/4 inch Split Flange Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

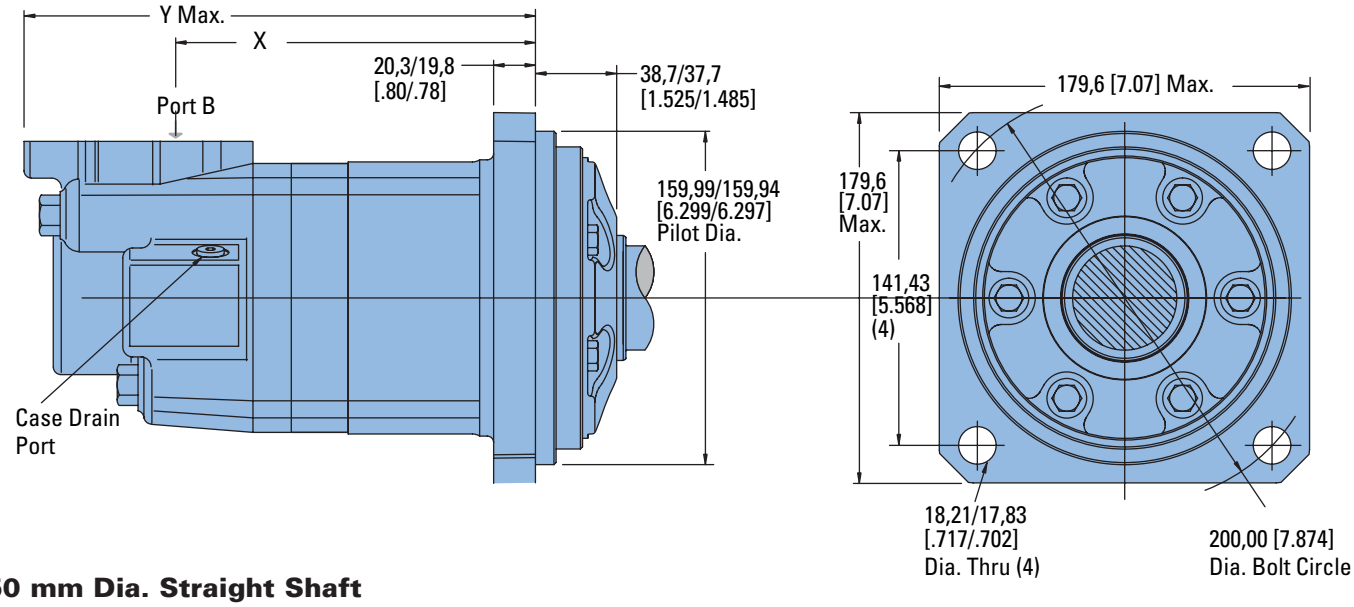
G 1 (BSP) Staggered Ports (2)
G 1/4 (BSP) Case Drain Port (1) or

1 5/16 UN-2B SAE O-ring Staggered Ports (2) with Shuttle
9/16 -20 UNF-2B SAE O-ring Case Drain Port (1)

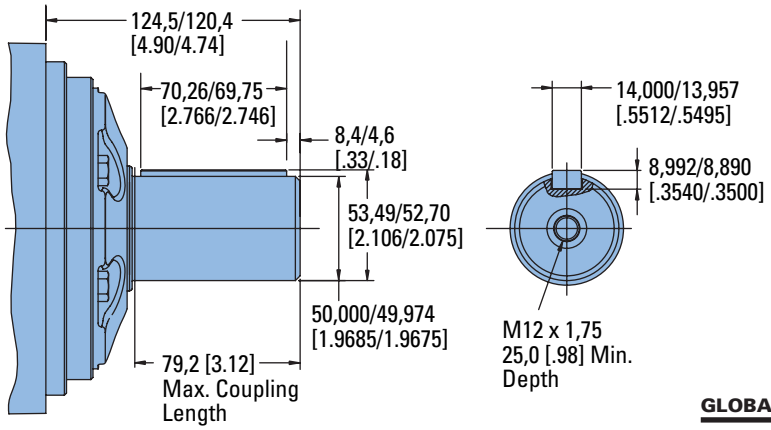
Standard Rotation Viewed from Shaft End

Port A Pressurized — CW
Port B Pressurized — CCW

Global Mount (ISO)



50 mm Dia. Straight Shaft



GLOBAL MOUNT MOTOR DIMENSIONS

Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]
310 [19.0]	182,4 [7.18]	264,9 [10.43]
390 [24.0]	191,0 [7.52]	273,6 [10.77]
490 [30.0]	202,2 [7.96]	284,7 [11.21]
625 [38.0]	216,9 [8.54]	299,5 [11.79]
800 [45.0]	229,4 [9.03]	312,2 [12.29]
800 [49.0]	236,7 [9.32]	319,3 [12.57]
985 [60.0]	256,5 [10.10]	339,1 [13.35]

6000 Series
Dimensions

Ports

1 5/16 -12 UN-2B SAE O-ring Staggered Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

4 Bolt 3/4 inch Split Flange Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1) or

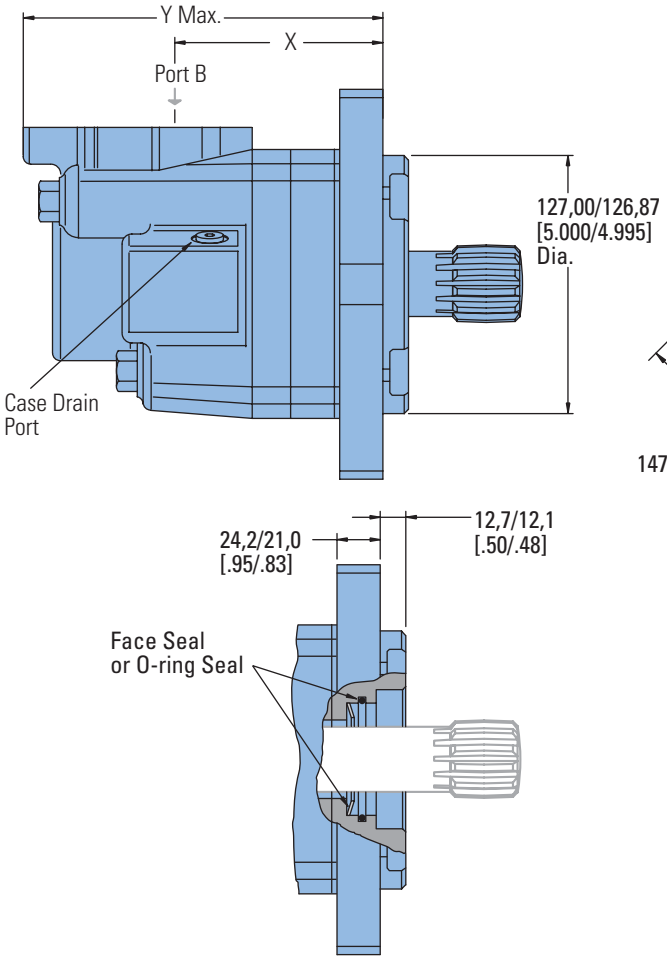
G 1 (BSP) Staggered Ports (2)
G 1/4 (BSP) Case Drain Port (1) or

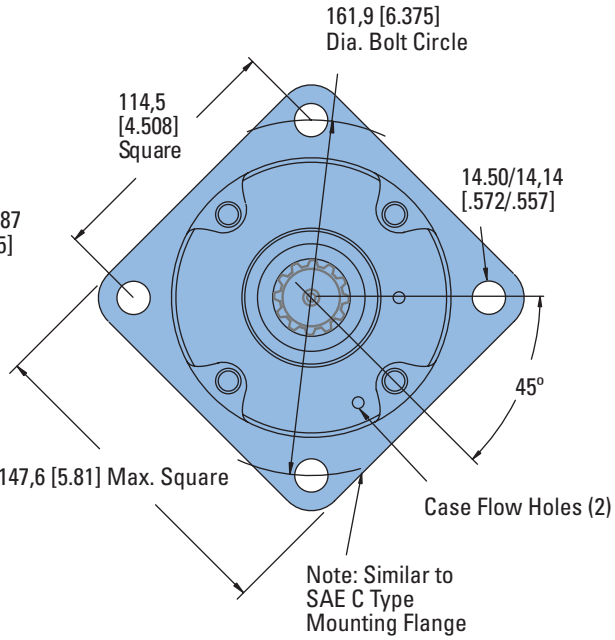
1 5/16 UN-2B SAE O-ring Staggered Ports (2) with Shuttle
9/16 -20 UNF-2B SAE O-ring Case Drain Port (1)

Standard Rotation Viewed from Shaft End

Port A Pressurized — CW
Port B Pressurized — CCW

Bearingless





BEARINGLESS MOTOR DIMENSIONS

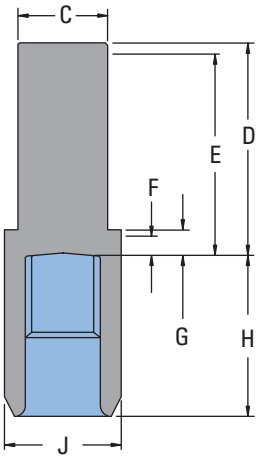
Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]
195 [11.9]	105,4 [4.15]	188,0 [7.40]
245 [15.0]	111,0 [4.37]	193,5 [7.62]
310 [19.0]	118,4 [4.66]	200,9 [7.91]
390 [23.9]	127,3 [5.01]	209,6 [8.25]
490 [30.0]	138,2 [5.44]	220,7 [8.69]
625 [38.0]	152,9 [6.02]	235,5 [9.27]
985 [60.0]	192,8 [7.59]	275,1 [10.83]

For 6000 bearingless motor application information, contact your Eaton representative (mating coupling blanks available from Eaton Hydraulics).

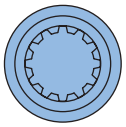
Note:

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

C 47,2 [1.86] Dia.
D 111,5 [4.39] Max.
E 106,4 [4.19] Full Form Dia.
F 6,9 [.27] Min. Full Form Dia.
G 10,2 [.40] Min.
H 86,1 [3.39] Max.
J 66,5 [2.62] Dia.



Mating Coupling Blank
Eaton Part No. 12778-002



6000 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).

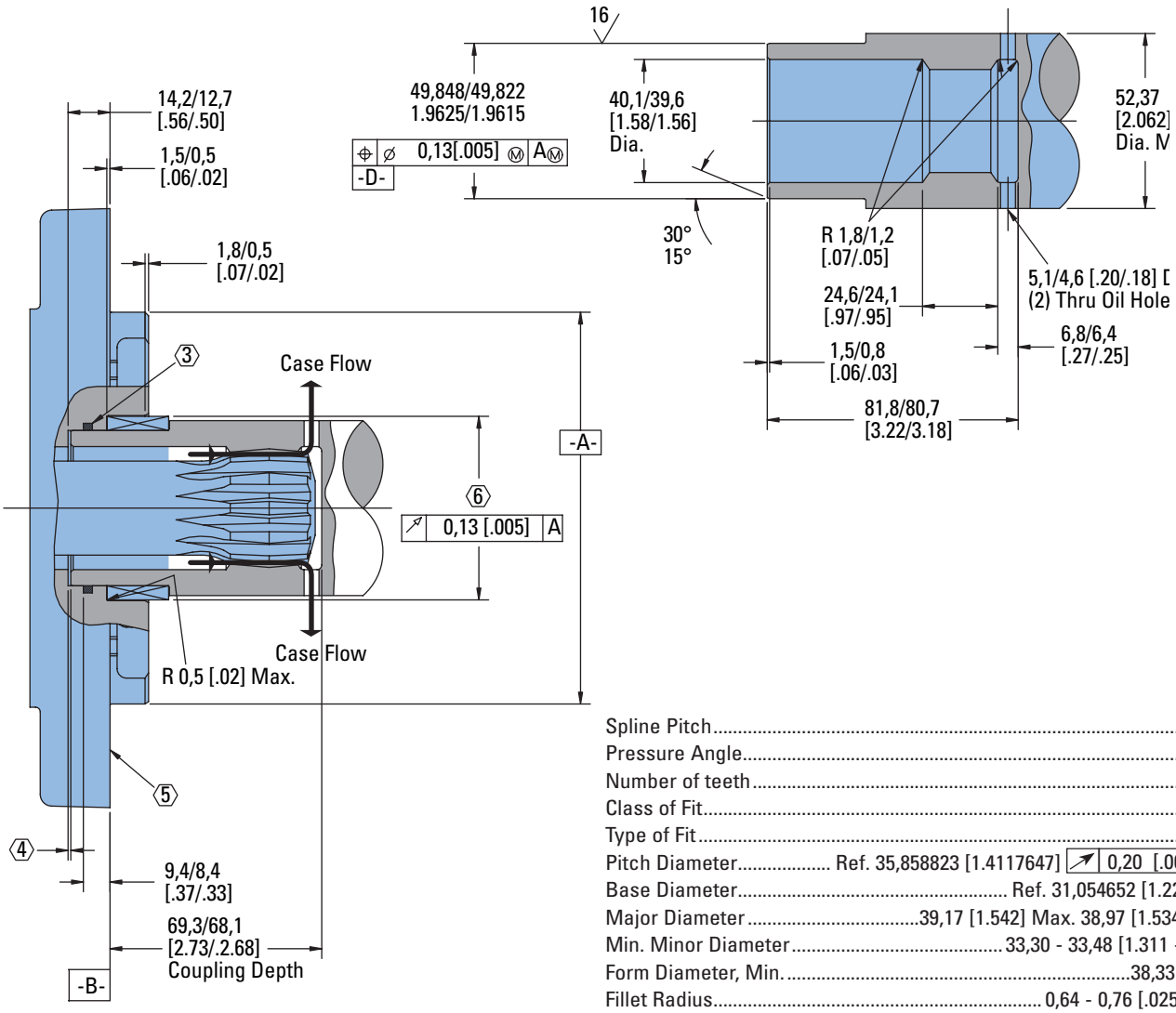
2 Mating part to have critical dimensions as shown. Oil holes must be provided and open for proper oil circulation.

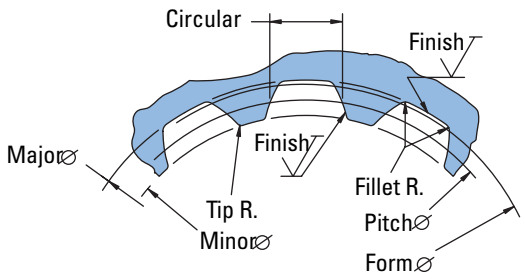
3 Seal to be furnished with motor for proper oil circulation thru splines.

4 Some means of maintaining clearance between shaft and mounting flange must be provided.

5 Similar to SAE "C" Four Bolt Flange..

6 Counterbore designed to adapt to a standard sleeve bearing 50,010 - 50,038 [1.9689 - 1.9700] ID by 60,051 - 60,079 [2.3642 - 2.3653] O.D. (Oilite bronze sleeve bearing).





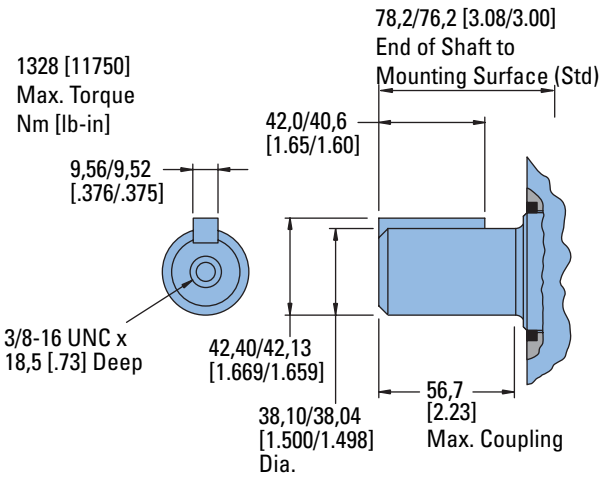
Spline Pitch	8.5/17
Pressure Angle	30°
Number of teeth	12
Class of Fit	Ref. 5
Type of Fit	Side
Pitch Diameter	Ref. 35,858823 [1.4117647] ⟋ 0,20 [.008] D
Base Diameter	Ref. 31,054652 [1.2226241]
Major Diameter	39,17 [1.542] Max. 38,97 [1.534] Min..
Min. Minor Diameter	33,30 - 33,48 [1.311 - 1.318]
Form Diameter, Min.	38,33 [1.509]
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 -0,025 [+.0000 -.0010]
Total Index Variation	0,038 [.0015]
Lead Variation	0,013 [.0005]
Circular Space Width:	
Maximum Actual	5,898 [.2322]
Minimum Effective	5,804 [.2285]
Maximum Effective	Ref. 5,857 [.2306]
Minimum Actual	Ref. 5,834 [.2297]
Dimension Between Two Pins	Ref. 26,929 - 27,084 [1.0602 - 1.0663]
Pin Diameter	6,223 [.2450] Pins to Have 4,0 [.160] Wide Flat for Root Clearance

6000 Series

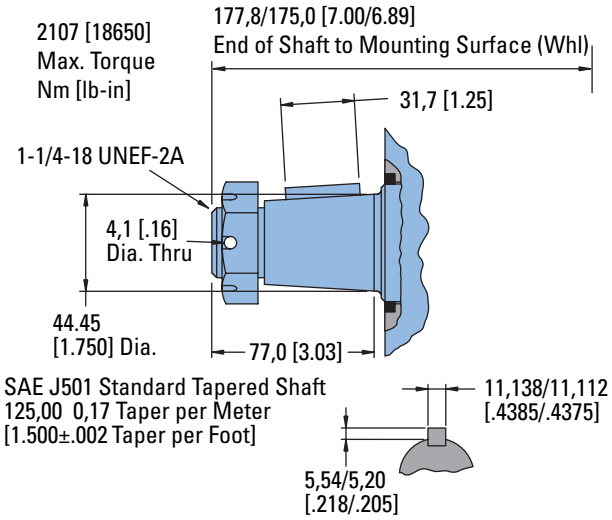
Dimensions

Shafts Splined

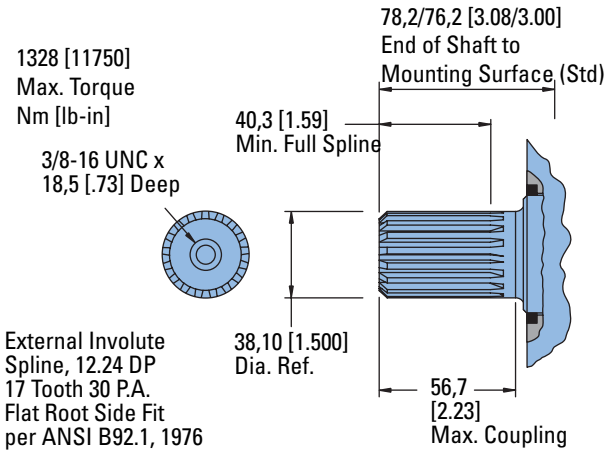
1 1/2 Inch Straight



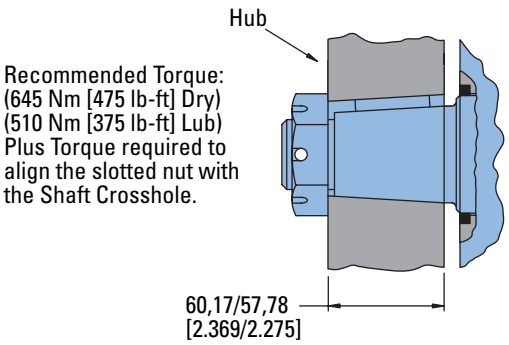
1 3/4 Inch Tapered



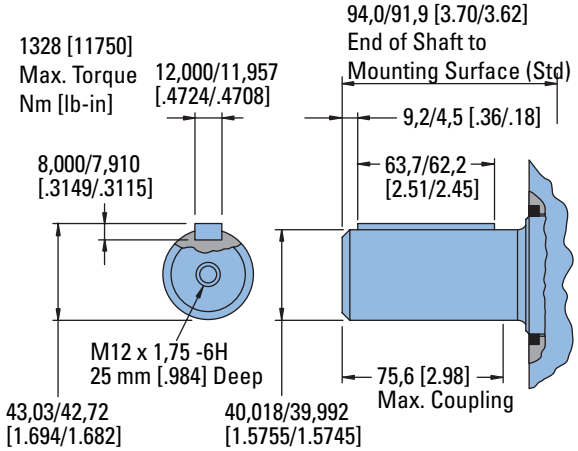
1 1/2 Inch 17 Tooth Splined



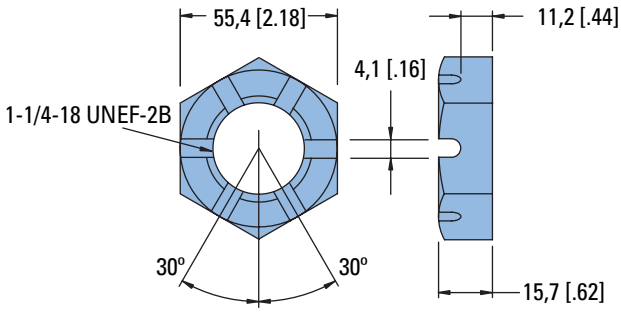
Tapered Shaft Hub Data



40 mm Straight



Slotted Hexagon Nut



6000 Series

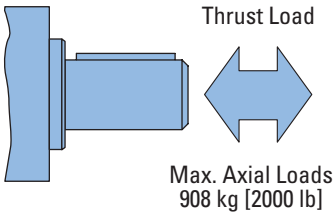
Shaft Side Load Capacity

These curves indicate the radial load capacity on the motor shaft(s) 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 109 kg/7 Bar [241 lb/100 PSI].

Each curve is based on

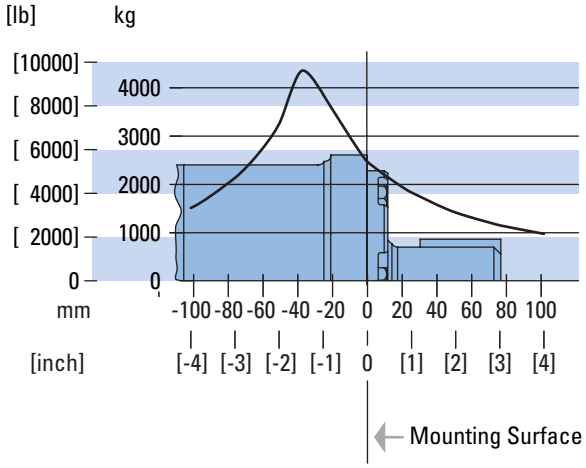


B 10 bearing life (2000 hours of 12,000,000 shaft revolutions at 100 RPM) at rated output torque.
To determine radial load at speeds other than 100 RPM, multiply the load values given on the bearing curve by the factors in the chart below.

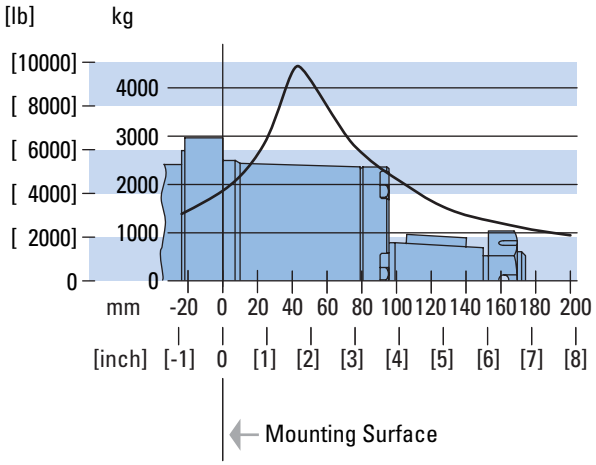
RPM	Multiplication Factor
50	1.23
100	1.00
200	0.81
300	0.72
400	0.66
500	0.62
600	0.58
700	0.56
800	0.54

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

Standard Motor
Straight and Splined Shafts



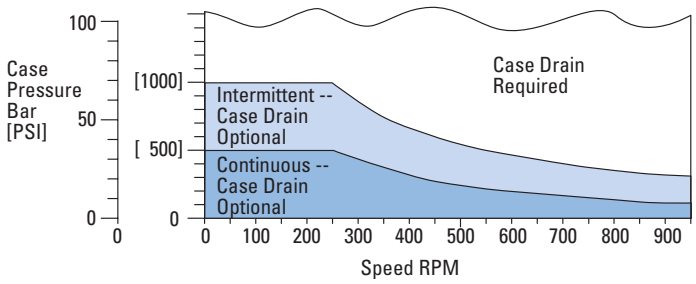
Wheel Motor Tapered Shaft



Case Pressure and Case Port

Char-Lynn 6000 Series motors are durable and have long life as long as the recommended case pressure is not exceeded. Allowable case pressure is highest at low shaft speeds. Consequently, motor life will be shortened if case pressure exceeds these ratings (acceptability may vary with application). Determine if an external case drain is required from the case pressure seal limitation chart.

Case Pressure Seal Limitation



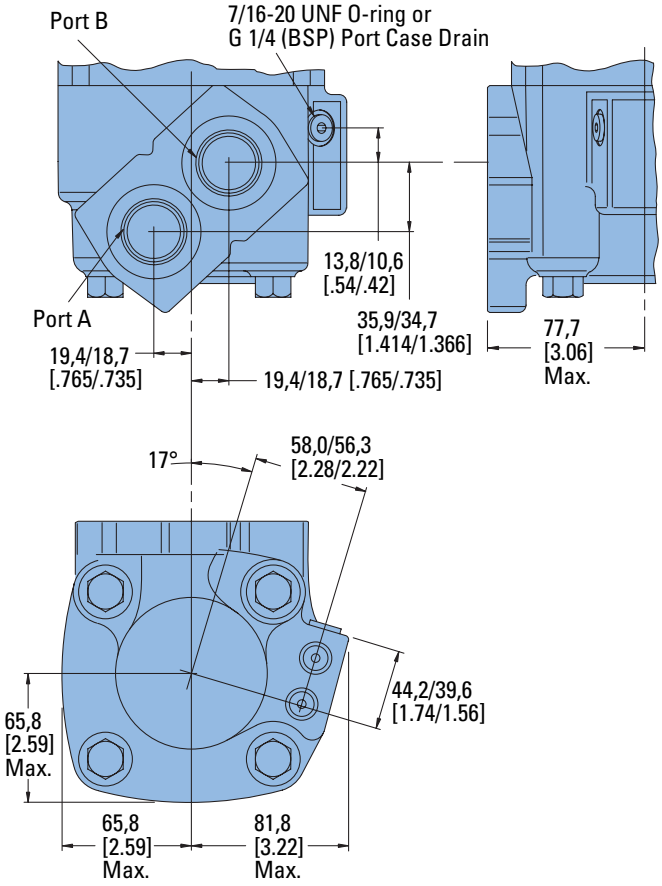
Case Porting Advantage

Contamination Control — flushing the motor case.

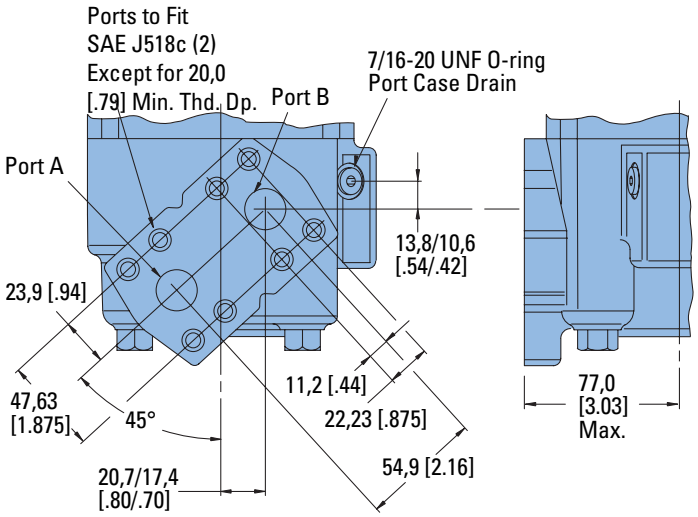
Cooler Motor — exiting oil draws motor heat away.

Extend Motor Seal Life — maintain low case pressure with a preset restriction in the case drain line.

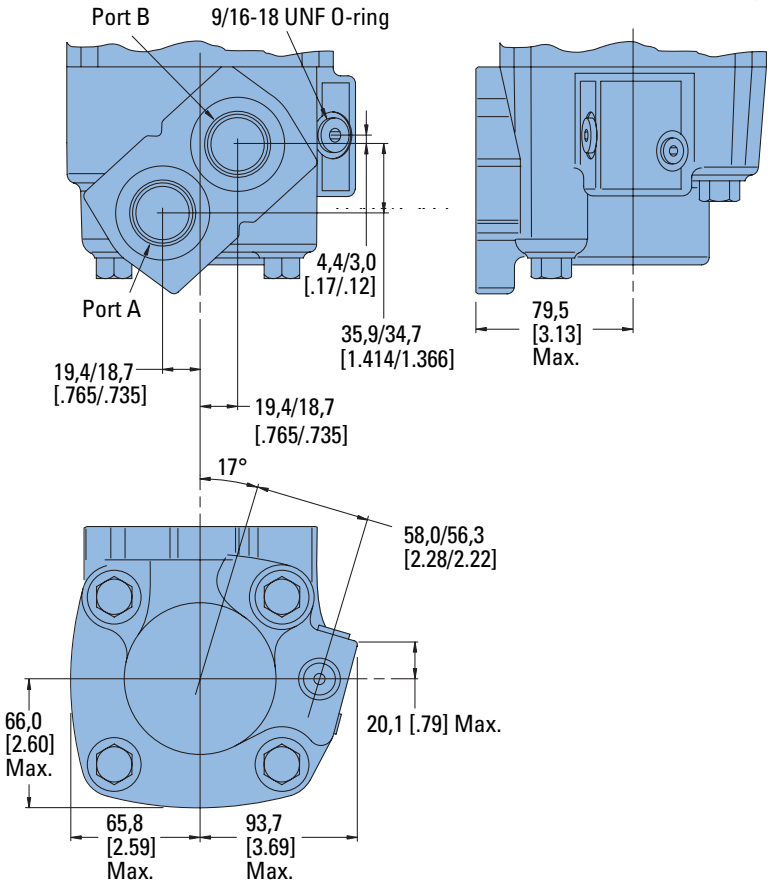
1 5/16 -12 O-ring Ports (2) or G 1 (BSP) Ports (2)



4 Bolt 3/4 Inch Split Flange



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



6000 Series
Product Numbers

Note:

For 6000 Series Motors with a configuration **Not Shown** in the charts above: Use model code number system on the next page to specify product in detail.

Use digit prefix — 112-, 113-, or 114 - plus four digit number from charts for complete product number— Example 114-1047.

Orders will not be accepted without three digit prefix.

MOUNTING	SHAFT	PORT SIZE	DISPL. cm^3/r [in^3/r] / PRODUCT NUMBER								
			195 [11.9]	245 [15.0]	310 [19.0]	390 [23.9]	490 [30.0]	625 [38.0]	735* [45.0]	805* [49.0]	985 [60.0]
Standard	1 1/2 inch Straight	1 5/16 O-ring	112-1064	-1065	-1066	-1067	-1068	-1107	-1145	—	-1069
	40 mm Straight	G 1 (BSP)	112-1094	-1095	-1096	-1097	-1098	—	—	—	-1099
	1 1/2 Inch 17 T Splined	1 5/16 O-ring	112-1058	-1059	-1060	-1061	-1062	-1109	1163	—	-1063
		G 1 (BSP)	112-1088	-1089	-1090	-1091	-1092	—	—	—	-1093
Wheel Motor	40 mm Straight	G 1 (BSP)	113-1082	-1083	-1084	-1085	-1086	-1100	—	—	-1087
	1-3/4 Inch Tapered	1 5/16 O-ring	113-1070	-1071	-1072	-1073	-1074	-1093	—	—	-1075
Bearingless		1 5/16 O-ring	114-1031	-1032	-1033	-1034	-1035	-1055	—	—	-1036
		G 1 (BSP)	114-1043	-1044	-1045	-1046	-1047	—	—	—	-1048

*New release

114-1047

Mounting Type - Standard (Code H), 4 Bolt:

- 160,0 [6.30] Pilot Dia.
- 18,01 [.709] Dia. Mounting Holes
- 200,0 [7.87] Dia. Bolt Circle

Output Shaft - Straight (Code 21)

Ports - G1 (BSP) Staggered G 1/4 Case Drain (Code C)

Paint - Low Gloss Black (Code A)

Use digit prefix — 112- plus four digit number from charts for complete product number— Example 112-1215.

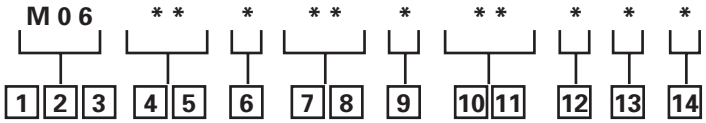
Orders will not be accepted without three digit prefix.

MOUNTING	SHAFT	PORT SIZE	DISPL. cm^3/r [in^3/r] / PRODUCT NUMBER						
			310 [19.0]	390 [23.9]	490 [30.0]	625 [38.0]	735 [45.0]	805 [49.0]	985 [60.0]
Standard	50 mm Straight	G 1 (BSP)	112-1217	-1218	-1215	-1216	-1247	-1219	-1220

112-1215

6000 Series
Model Code

The following 14-digit coding system has been developed to identify all of the configuration options for the 6000 Series motor. Use this model code to specify a motor with the desired features. All 14 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.



1, 2, 3 Product Series

M06 – 6000 Motor

4, 5 Displacement cm³/r [in³/r]

07 – 110 [6.7]

12 – 195 [11.9]

15 – 245 [15.0]

19 – 310 [19.0]

24 – 390 [23.9]

30 – 490 [30.0]

38 – 625 [38.0]

45 – 740 [45.0]

49 – 805 [49.0]

60 – 985 [60.0]

6 Mounting Type

A – 4 Bolt (Bearingless 127,0 [5.00] Pilot Dia. and 14,3 [.56] Dia. Mounting Holes 161,9 [6.38] Dia. B.C.

B – 4 Bolt (SAE CC) (Standard) 127,0 [5.00] Pilot Dia. and 14,3 [.56] Mounting Holes on 161,9 [6.38] Dia. B.C.

C – 4 Bolt (Wheel) 139,7 [5.50] Pilot Dia. and 14,3 [.56] Dia. Mounting Holes on 184,1 [7.25] Dia. B.C.

H – 4 Bolt (Global) (Standard) 160,0 [6.30] Pilot Dia. and 18,0 [.709] Dia. Mounting Holes on 200,0 [7.87] Dia. Bolt Circle

7, 8 Output Shaft

00 – None (Bearingless)

01 – 1 1/2 inch Dia. Straight with Straight Key, 3/8 -16 Threaded Hole and 56,7 [2.23] Max. Coupling Length

02 – 1 3/4 inch Dia. Tapered with Straight Key and 1–1/4 18 UNEF Slotted Hex. Nut

03 – 1 1/2 inch Dia. Splined 17T with 40,3 [1.59] Min. Full Spline Length and 3/8 -16 Threaded Hole

10 – 40 mm Dia. Straight with Straight Key, M12 x 1,75- 6H Threaded Hole

21 – 50 mm Dia. Straight with Straight Key, 14W x 9H x 70L, M12 x 1,75-6H Thread in End (Available with Mounting Flange Code H Only)

24 – 60 mm Dia. 10:1 Tapered Shaft with M42 x 3-6H Threaded End (Available with Mounting Flange Code H Only)

25 – 2 1/8 inch Dia. Splined 16 Tooth, 55,9 mm [2.20] Min. Full Spline Length (Available with Mounting Flange Code H Only)

9 Ports

A – 1 5/16 - 12 O-ring with 7/16-20 O-ring Case Drain and Check Valve

B – 3/4 inch 4 Bolt Split Flange with 7/16-20 O-ring Case Drain and Check Valve

C – G 1 (BSP) O-ring with G 1/4 (BSP) O-ring Case Drain and Check Valve

D – 1 5/16 -12 O-ring with (2) 9/16-18 O-ring Case Drain Ports and Hot Oil Shuttle Valve

R – 1 5/16 -12 O-ring with (2) 9/16 -18 O-ring Ports for External Lubrication Circuit (both case ports must be connected)

10, 11 Special Features (Hardware)

00 – None

10 – Viton Shaft Seal

07 – Viton Seals

13 – Reverse Rotation

14 – Seal Guard

21 – Speed Sensor (Std.)

12 Paint/ Special Packaging

0 – No Paint, Individual Box

A – Painted Low Gloss Black, Individual Box

B – Corrosion Protected

13 Eaton Assigned Code when Applicable

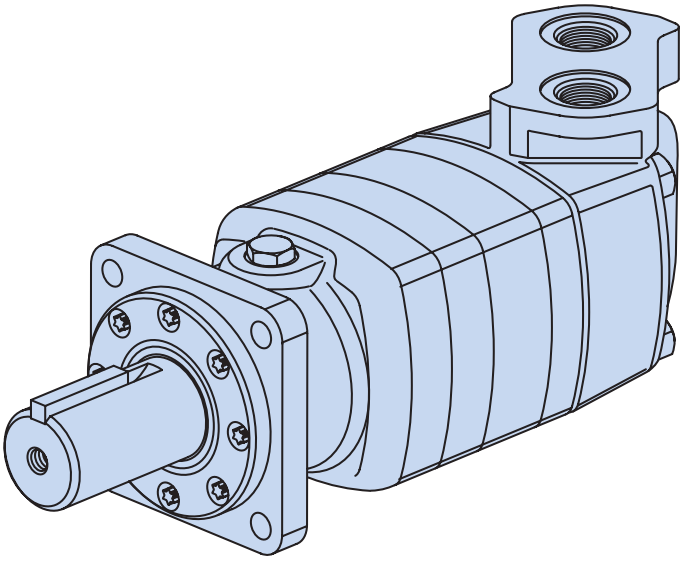
0 – Assigned Code

14 Eaton Assigned Design Code

F – Assigned Design Code

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.

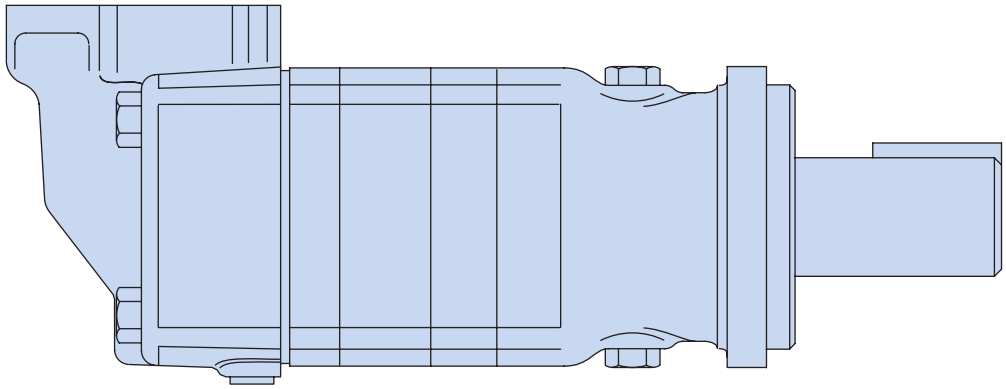
Boring

Metal Forming

Port Equipment

10,000 Series

Specifications



10,000 SERIES MOTORS

Displ. cm³/r [in³/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 Δ bar [Δ 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 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).

Maximum Case Pressure:

20 bar [300 PSI]

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

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

345 cm³/r [21.0 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[1000] 70	[1500] 105	[2000] 140	[2500] 170	[3000] 205	[3500] 240	[4000] 275
[1] 3,8	[600] 70 **3**	[1310] 150 **1**							
[2] 7,5	[740] 85 **21**	[1510] 170 **19**	[3050] 345 **15**	[4600] 520 **11**	[6140] 695 **8**	[7680] 865 **4**			
[4] 15	[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] 30	[720] 80 **87**	[1490] 170 **86**	[3030] 340 **82**	[4580] 515 **78**	[6120] 690 **74**	[7670] 865 **70**	[9210] 1040 **66**	[10750] 1215 **62**	[12300] 1390 **58**
[12] 45	[700] 80 **131**	[1470] 165 **130**	[3020] 340 **127**	[4560] 515 **123**	[6100] 690 **118**	[7650] 865 **114**	[9190] 1040 **110**	[10740] 1215 **106**	[12280] 1385 **102**
[16] 61	[680] 75 **176**	[1450] 165 **175**	[3000] 340 **172**	[4540] 515 **167**	[6080] 685 **163**	[7630] 860 **158**	[9170] 1035 **154**	[10720] 1210 **149**	[12260] 1385 **145**
[20] 76	[660] 75 **221**	[1430] 160 **220**	[2970] 335 **217**	[4520] 510 **212**	[6060] 685 **207**	[7600] 860 **202**	[9150] 1035 **198**	[10690] 1210 **193**	[12230] 1380 **189**
[24] 91	[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] 106	[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] 121	[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] 136	[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] 151	[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] 170	[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] 227		[1080] 130 **668**	[2620] 295 **665**	[4160] 470 **658**	[5710] 645 **651**	[7250] 820 **644**	[8800] 995 **637**		
[70] 265		[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**

480 cm³/r [29.3 in³/r]

Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[1000] 70	[1500] 105	[2000] 140	[2500] 170	[3000] 205	[3500] 240	[4000] 275
[1] 3,8	[760] 85 **6**	[1540] 175 **5**	[3120] 355 **4**	[4640] 525 **2**					
[2] 7,5	[1040] 120 **15**	[2140] 240 **13**	[4320] 490 **11**	[6500] 735 **8**	[8690] 980 **5**	[10870] 1230 **2**			
[4] 15	[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] 30	[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] 45	[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] 61	[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] 76	[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] 91	[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] 106	[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] 121	[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] 136	[760] 85 **282**	[1850] 210 **281**	[4040] 455 **280**	[6220] 705 **277**	[8400] 950 **273**	[10590] 1195 **270**	[12770] 1445 **266**		
[40] 151	[710] 80 **318**	[1800] 205 **316**	[3990] 450 **312**	[6170] 695 **308**	[8350] 945 **305**	[10540] 1190 **301**	[12720] 1440 **297**		
[45] 170	[647] 75 **354**	[1740] 195 **353**	[3920] 445 **351**	[6110] 690 **348**	[8290] 935 **344**	[10470] 1185 **340**	[12660] 1430 **336**		
[60] 227	[430] 50 **474**	[1520] 170 **473**	[3710] 420 **471**	[5890] 665 **467**	[8070] 910 **462**	[10260] 1160 **458**	[12440] 1405 **454**		
[70] 265		[1360] 155 **552**	[3540] 400 **550**	[5730] 645 **546**	[7910] 895 **541**	[10100] 1140 **536**	[12280] 1385 **532**		

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

665 cm³/r [40.6 in³/r]
Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140	[2250] 155	[2500] 170	[2750] 190	[3000] 205	[3250] 225	[3500] 240	[3750] 260
[1] **3,8**	[1470] 165 **4**	[3010] 340 **3**	[4550] 515 **3**	[6100] 690 **2**	[7630] 860 **1**										
[2] **7,5**	[1480] 165 **10**	[3020] 340 **9**	[4560] 515 **8**	[6110] 690 **7**	[7650] 865 **7**	[9200] 1040 **6**	[10740] 1215 **5**	[12280] 1385 **4**	[13830] 1565 **3**	[15370] 1735 **2**	[16910] 1910 **1**				
[4] **15**	[1470] 165 **22**	[3010] 340 **21**	[4550] 515 **20**	[6100] 690 **19**	[7640] 865 **18**	[9190] 1040 **17**	[10730] 1210 **16**	[12270] 1385 **15**	[13820] 1560 **14**	[15360] 1735 **13**	[16900] 1910 **12**	[18450] 2085 **11**	[19990] 2260 **10**	[21540] 2435 **9**	[23080] 2610 **8**
[8] **30**	[1440] 165 **44**	[2980] 335 **43**	[4530] 510 **42**	[6070] 685 **41**	[7610] 860 **40**	[9160] 1035 **39**	[10700] 1210 **38**	[12250] 1385 **37**	[13790] 1560 **36**	[15330] 1730 **35**	[16880] 1905 **34**	[18420] 2080 **33**	[19960] 2255 **32**	[21510] 2430 **32**	[23050] 2605 **31**
[12] **45**	[1400] 160 **67**	[2950] 335 **66**	[4490] 505 **65**	[6040] 680 **64**	[7580] 855 **63**	[9120] 1030 **62**	[10670] 1205 **61**	[12210] 1380 **60**	[13750] 1555 **59**	[15300] 1730 **58**	[16840] 1905 **57**	[18380] 2075 **56**	[19930] 2255 **55**	[21470] 2425 **54**	[23020] 2600 **53**
[16] **61**	[1360] 155 **89**	[2910] 330 **88**	[4450] 505 **87**	[5990] 675 **86**	[7540] 850 **85**	[9080] 1025 **84**	[10620] 1200 **83**	[12170] 1375 **82**	[13710] 1550 **81**	[15260] 1725 **80**	[16800] 1900 **79**	[18340] 2070 **78**	[19890] 2245 **77**	[21430] 2420 **76**	
[20] **76**	[1310] 150 **112**	[2860] 375 **111**	[4400] 495 **110**	[5940] 670 **109**	[7490] 845 **108**	[9030] 1020 **107**	[10580] 1195 **106**	[12120] 1370 **104**	[13660] 1545 **103**	[15210] 1720 **102**	[16750] 1890 **101**	[18300] 2070 **100**	[19840] 2240 **99**		
[24] **91**	[1260] 140 **135**	[2800] 315 **134**	[4350] 490 **132**	[5890] 665 **131**	[7440] 840 **130**	[8980] 1015 **129**	[10520] 1190 **128**	[12070] 1365 **127**	[13610] 1540 **126**	[15150] 1710 **124**	[16700] 1885 **123**	[18240] 2060 **122**			
[28] **106**	[1200] 135 **157**	[2750] 310 **156**	[4290] 485 **155**	[5840] 660 **154**	[7380] 835 **153**	[8920] 1010 **151**	[10470] 1185 **150**	[12010] 1355 **149**	[13550] 1530 **148**	[15100] 1705 **147**	[16640] 1880 **146**				
[32] **121**	[1140] 130 **180**	[2690] 305 **179**	[4230] 480 **177**	[5770] 650 **176**	[7320] 825 **175**	[8860] 1000 **174**	[10400] 1175 **173**	[11950] 1350 **172**	[13490] 1525 **170**	[15040] 1700 **169**	[16580] 1875 **168**				
[36] **136**	[1080] 120 **202**	[2620] 295 **201**	[4160] 470 **200**	[5710] 645 **199**	[7250] 820 **198**	[8800] 995 **196**	[10340] 1170 **195**	[11880] 1340 **194**	[13430] 1515 **193**	[14970] 1690 **191**	[16510] 1865 **190**				
[40] **151**	[1010] 115 **225**	[2550] 290 **224**	[4100] 465 **222**	[5640] 635 **221**	[7180] 810 **220**	[8730] 985 **219**	[10270] 1160 **217**	[11810] 1335 **216**	[13360] 1510 **215**	[14900] 1685 **214**	[16440] 1855 **212**				
[45] **170**	[920] 105 **254**	[2460] 280 **252**	[4000] 450 **251**	[5550] 625 **249**	[7090] 800 **248**	[8630] 975 **247**	[10180] 1150 **245**	[11720] 1325 **244**	[13260] 1500 **243**	[14810] 1675 **242**					
[60] **227**	[610] 70 **338**	[2150] 245 **336**	[3700] 420 **335**	[5240] 590 **334**	[6780] 765 **332**	[8330] 940 **331**	[9870] 1115 **329**	[11420] 1290 **328**	[12960] 1465 **327**						
[70] **265**	[380] 45 **396**	[1930] 220 **393**	[3470] 390 **391**	[5010] 565 **390**	[6560] 740 **388**	[8100] 915 **387**	[9640] 1090 **385**	[11190] 1265 **384**							

[3470] 390 **391** } Torque [lb-in] Nm **Speed RPM**

940 cm³/r [57.4 in³/r]
Δ Pressure Bar [PSI]

Flow LPM [GPM]

	[250] 15	[500] 35	[750] 50	[1000] 70	[1250] 85	[1500] 105	[1750] 120	[2000] 140	[2250] 155	[2500] 170	[2750] 190	[3000] 205	[3250] 225	[3500] 240
[1] **3,8**	[2080] 235 **3**	[4260] 480 **2**	[6440] 730 **1**											
[2] **7,5**	[2090] 235 **7**	[4270] 480 **6**	[6450] 730 **5**	[8640] 975 **5**	[10820] 1220 **4**	[13000] 1470 **3**	[15190] 1715 **2**	[17370] 1965 **1**						
[4] **15**	[2080] 235 **15**	[4260] 480 **14**	[6440] 730 **13**	[8620] 975 **13**	[10810] 1220 **12**	[12990] 1470 **11**	[15170] 1715 **10**	[17360] 1960 **9**	[19540] 2210 **8**	[21720] 2455 **7**	[23910] 2700 **7**	[26090] 2950 **6**	[28270] 3195 **5**	[30460] 3440 **4**
[8] **30**	[2040] 230 **31**	[4220] 475 **30**	[6400] 725 **29**	[8590] 970 **28**	[10770] 1215 **28**	[12950] 1465 **27**	[15140] 1710 **26**	[17320] 1955 **25**	[19500] 2200 **24**	[21690] 2450 **23**	[23870] 2695 **22**			
[12] **45**	[1990] 225 **47**	[4170] 470 **46**	[6350] 715 **45**	[8540] 965 **44**	[10720] 1210 **43**	[12900] 1460 **43**	[15090] 1705 **42**	[17270] 1950 **41**	[19450] 2200 **40**	[21640] 2445 **39**				
[16] **61**	[1930] 220 **63**	[4110] 465 **62**	[6290] 710 **61**	[8480] 960 **60**	[10660] 1205 **59**	[12840] 1450 **58**	[15030] 1700 **58**	[17210] 1945 **57**	[19390] 2190 **56**					
[20] **76**	[1860] 210 **79**	[4040] 455 **78**	[6220] 705 **77**	[8410] 950 **76**	[10590] 1195 **75**	[12770] 1445 **74**	[14960] 1690 **73**	[17140] 1935 **72**	[19320] 2185 **72**					
[24] **91**	[1780] 200 **95**	[3970] 450 **94**	[6150] 695 **93**	[8330] 940 **92**	[10520] 1190 **91**	[12700] 1435 **90**	[14880] 1680 **89**	[17070] 1930 **88**						
[28] **106**	[1700] 190 **111**	[3890] 440 **110**	[6070] 685 **109**	[8250] 930 **108**	[10440] 1180 **107**	[12620] 1425 **106**	[14800] 1675 **105**	[16990] 1920 **104**						
[32] **121**	[1620] 185 **127**	[3800] 430 **126**	[5980] 675 **125**	[8160] 920 **124**	[10350] 1170 **123**	[12530] 1415 **122**	[14720] 1665 **121**							
[36] **136**	[1520] 170 **143**	[3710] 420 **142**	[5890] 665 **141**	[8070] 910 **140**	[10260] 1160 **139**	[12440] 1405 **138**	[14620] 1650 **137**							
[40] **151**	[1420] 160 **159**	[3610] 410 **158**	[5790] 655 **157**	[7970] 900 **156**	[10160] 1150 **155**	[12340] 1395 **154**	[14520] 1640 **153**							
[45] **170**	[1290] 145 **179**	[3480] 395 **178**	[5660] 640 **177**	[7840] 885 **176**	[10020] 1130 **174**	[12210] 1380 **174**	[14400] 1625 **173**							
[60] **227**	[860] 95 **239**	[3040] 345 **238**	[5230] 590 **236**	[7410] 835 **235**	[9600] 1085 **234**	[11780] 1330 **233**								
[70] **265**	[540] 60 **279**	[2720] 305 **278**	[4910] 555 **276**	[7090] 800 **275**	[9270] 1045 **274**	[11460] 1295 **273**								

10,000 Series

Dimensions

Ports

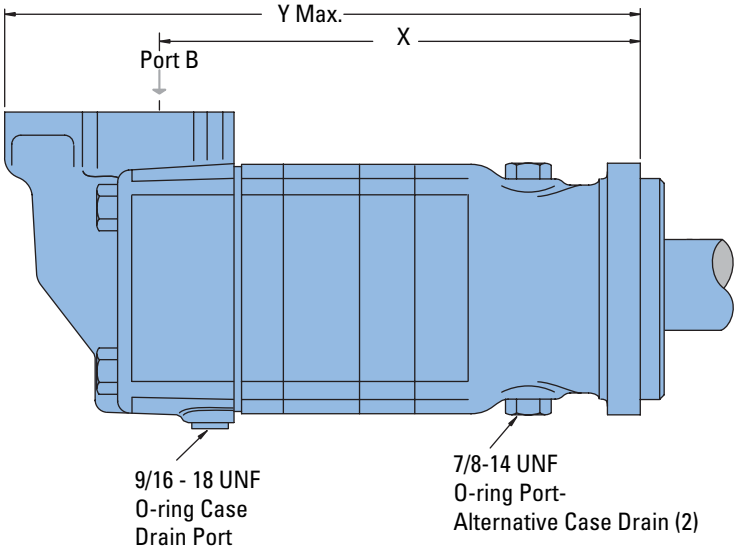
1 5/16 -12 UN-2B SAE O-ring Staggered Ports (2)
9/16 -18 UNF-2B SAE O-ring Case Drain Port (1) or

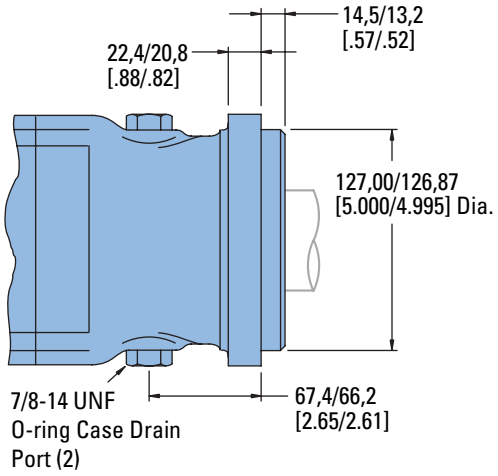
4 Bolt 1 1/4 inch Split Flange Ports (2)
9/16 -18 UNF-2B SAE O-ring Case Drain Port (1)

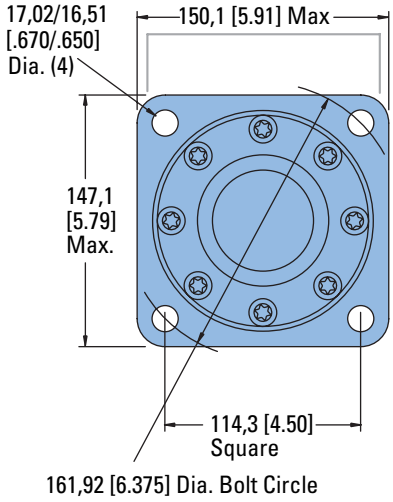
Standard Rotation Viewed from Shaft End

Port A Pressurized — CW
Port B Pressurized — CCW

Standard Mount







STANDARD MOUNT MOTOR DIMENSIONS

Displacement cm³/r [in³/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

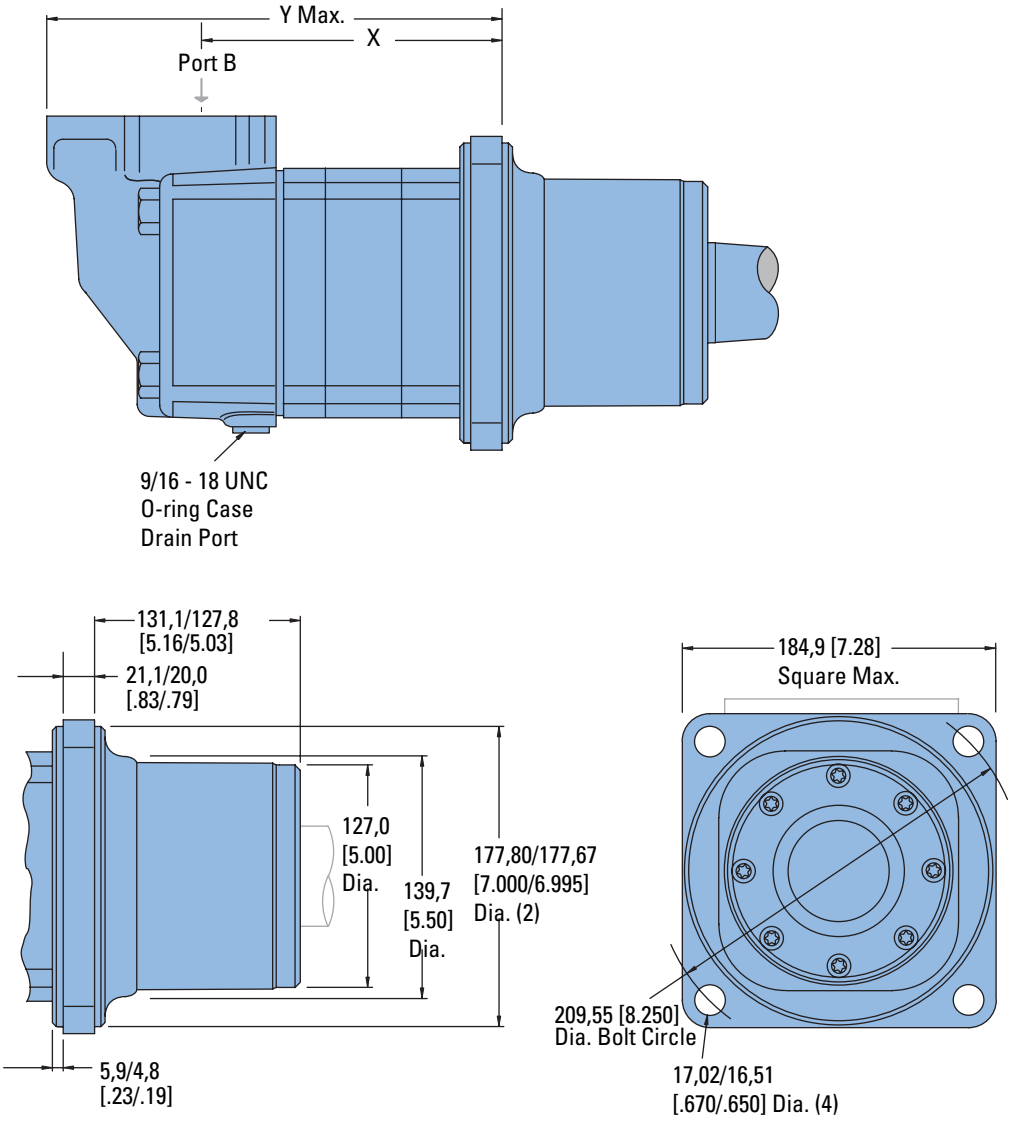
1 5/16 -12 UN-2B SAE O-ring Staggered Ports (2)
9/16 -18 UNF-2B SAE O-ring Case Drain Port (1) or

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 cm³/r [in³/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

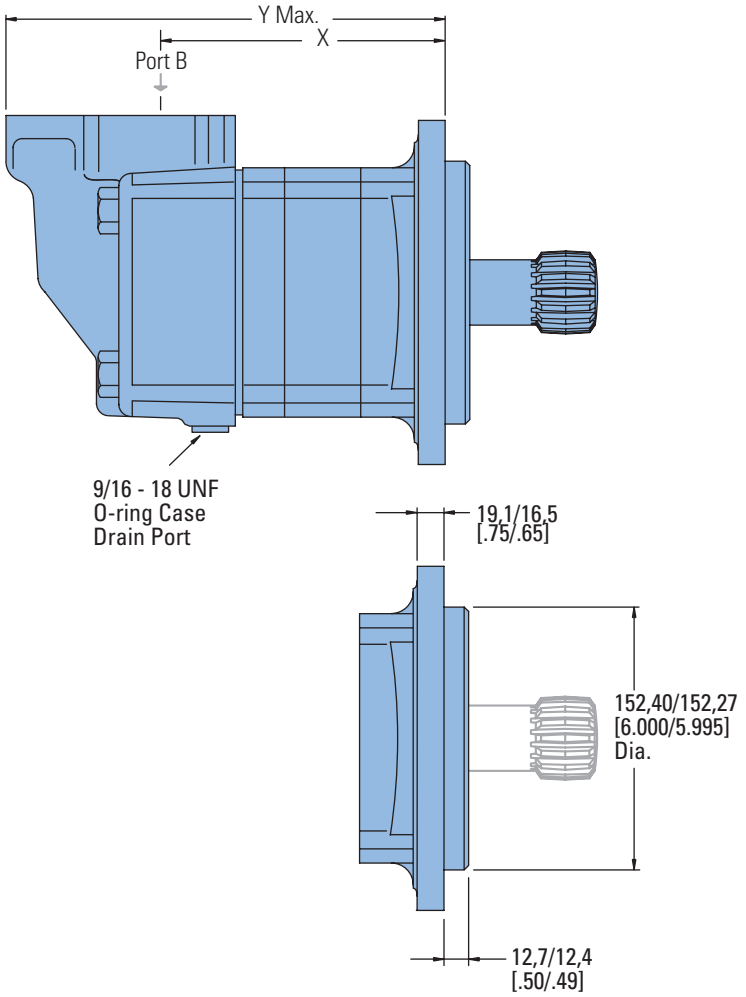
Ports

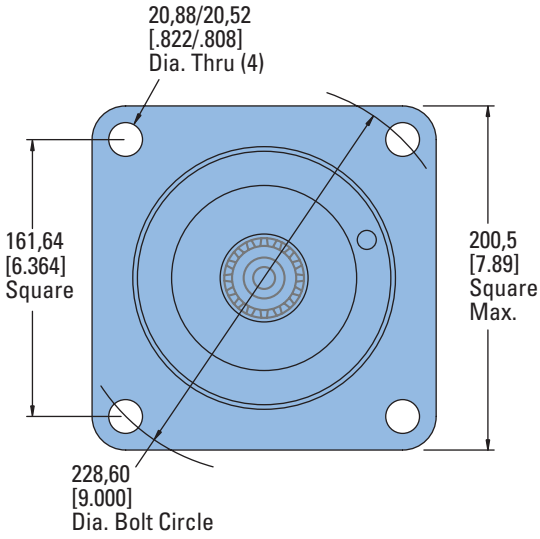
1 5/16 -12 UN-2B SAE O-ring Staggered Ports (2)
9/16 -18 UNF-2B SAE O-ring Case Drain Port (1) or
4 Bolt 1 1/4 inch Split Flange Ports (2)
9/16 -18 UNF-2B SAE O-ring Case Drain Port (1)

Standard Rotation Viewed from Shaft End

Port A Pressurized — CW
Port B Pressurized — CCW

Bearingless





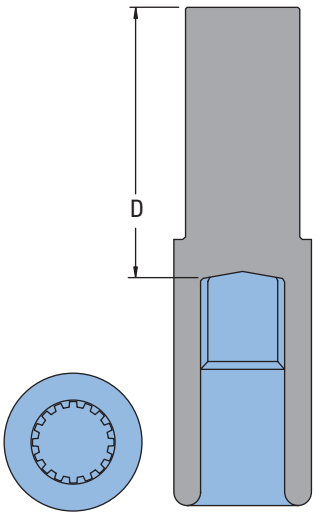
BEARINGLESS MOTOR DIMENSIONS

Displacement cm³/r [in³/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).

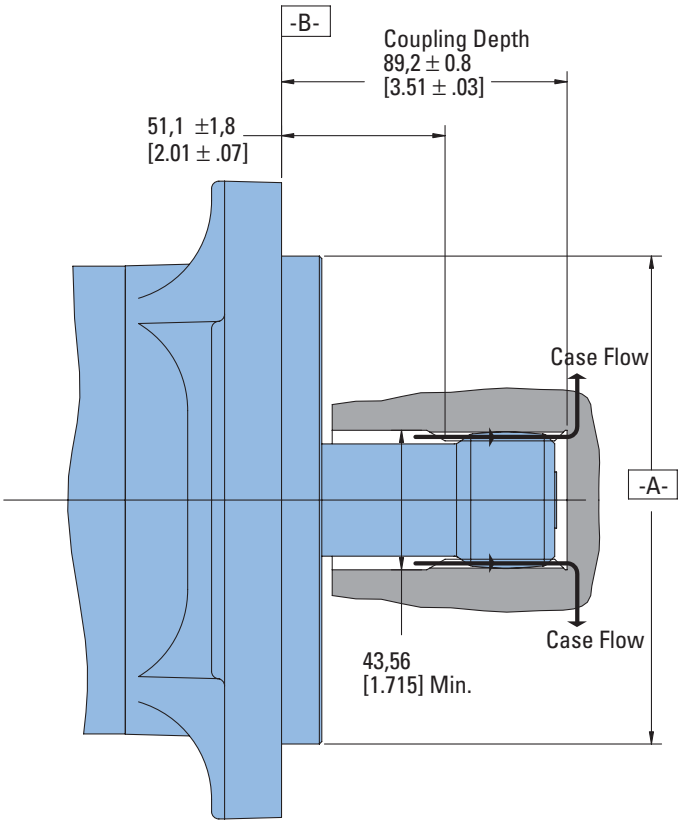


Note:

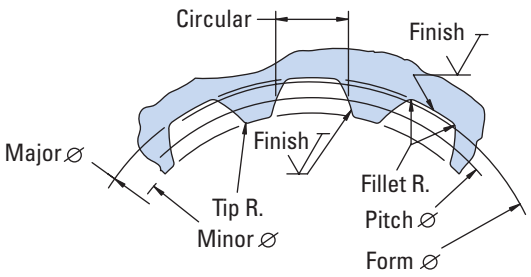
After machining blank, part must be hardened per Eaton specification.

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).



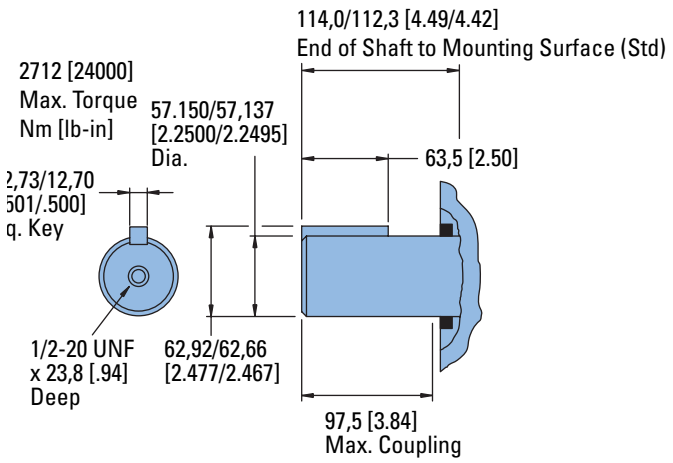
Spline Pitch	10/20
Pressure Angle	30°
Number of teeth	16
Class of Fit	Ref. 5
Type of Fit	Side
Pitch Diameter	Ref. 40,640000 [1.6000000] ⌀ 0,25 [.010] D
Base Diameter	Ref. 35,195272 [1.3856406]
Major Diameter	43,56 [1.715] Max. 43,18 [1.700] Min.
Min. Minor Diameter	36,83 - 37,08 [1.450 - 1.460]
Form 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 [+.0000 -.0011]
Total Index Variation	0,041 [.0016]
Lead Variation	0,013 [.0005]
Circular Space Width:	
Maximum Actual	4,105 [.1616]
Minimum Effective	3,995 [.1573]
Maximum Effective	Ref. 4,056 [.1597]
Minimum Actual	Ref. 4,018 [.1582]
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

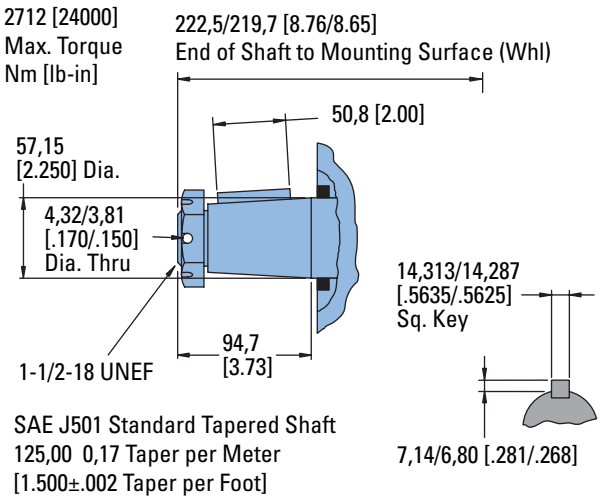
Dimensions

Shafts

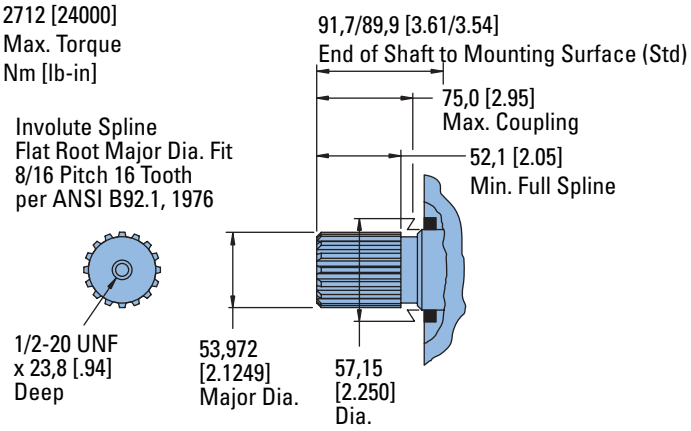
2 1/4 Inch Straight



2 1/4 Inch Tapered

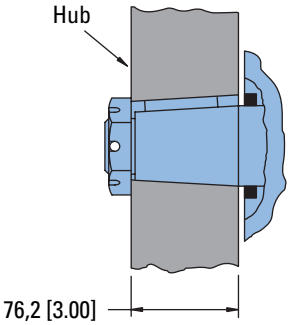


2 1/8 Inch 16 Tooth Splined

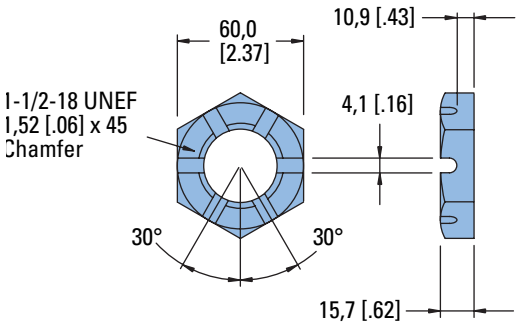


Tapered Shaft Hub Data

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

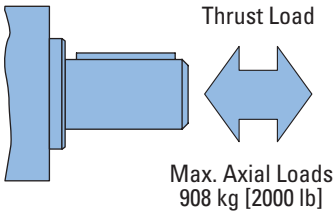
Side Shaft Load Capacity

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].

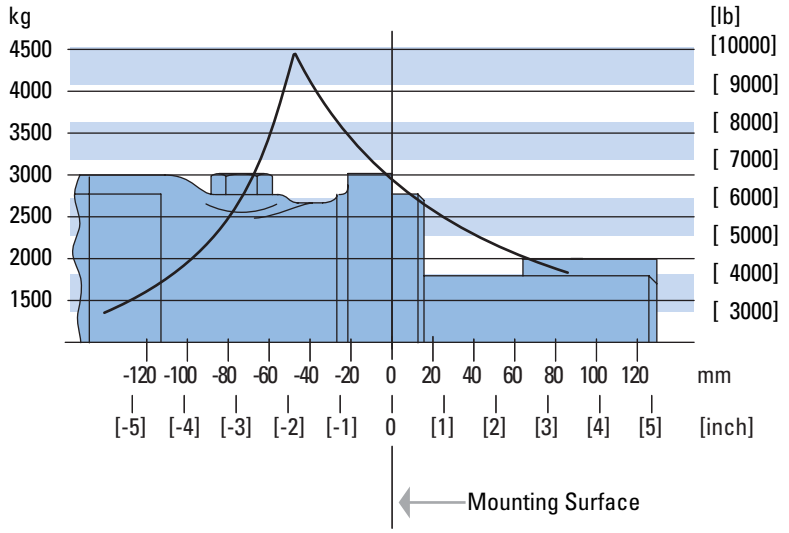
Each curve is based on

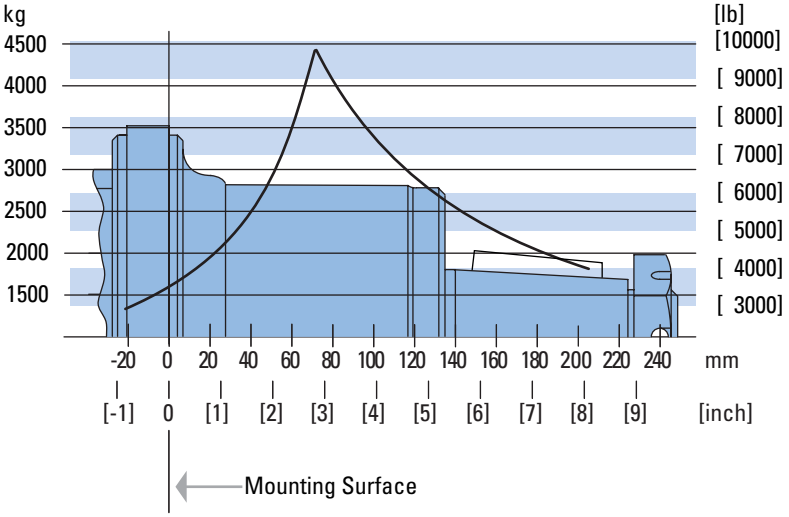


B 10 bearing life (2000 hours of 12,000,000 shaft revolutions at 100 RPM) at rated output torque.
To determine radial load at speeds other than 100 RPM, multiply the load values given on the bearing curve by the factors in the chart below.

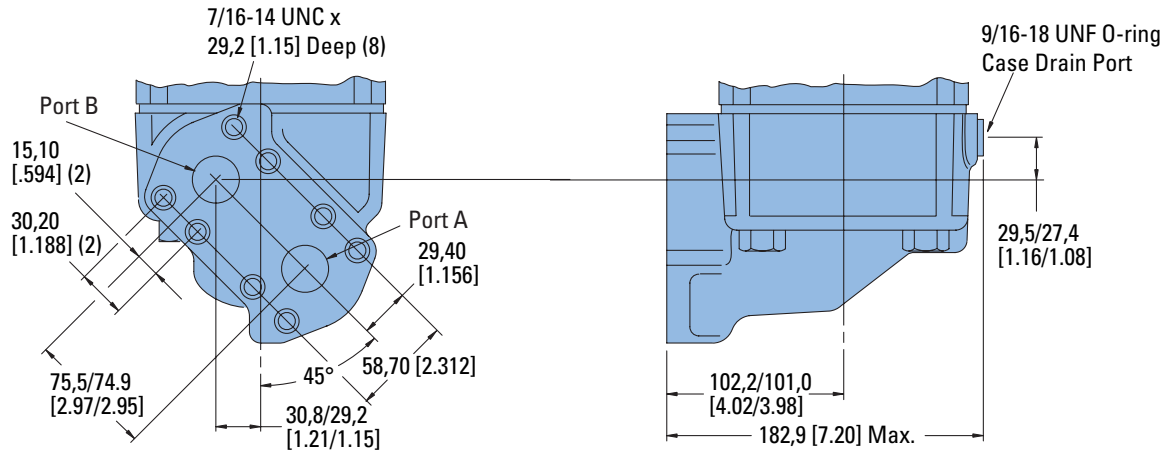
RPM	Multiplication Factor
50	1.23
100	1.00
200	0.81
300	0.72
400	0.66
500	0.62
600	0.58
700	0.56
800	0.54

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

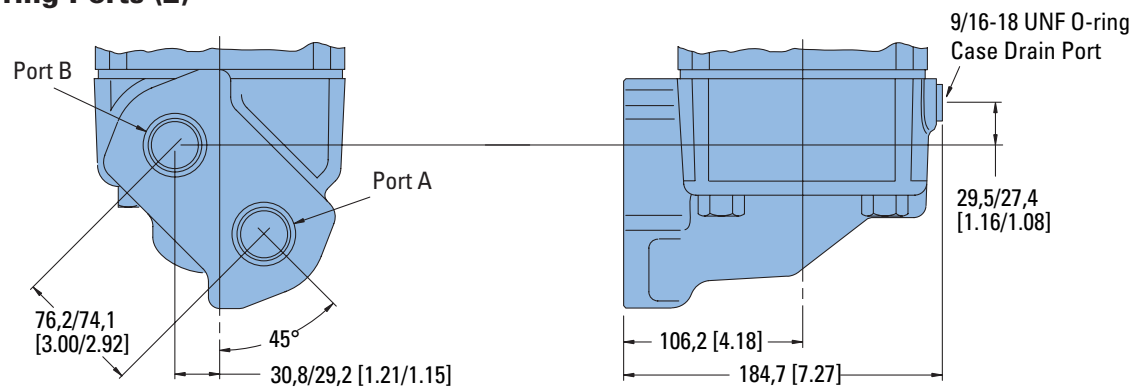




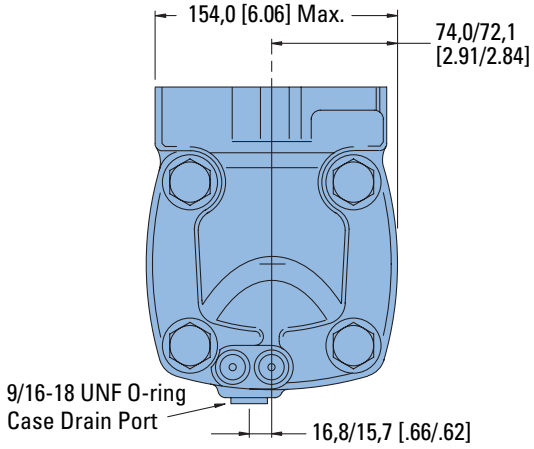
1 1/4 Inch Split Flange Ports (2)



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.

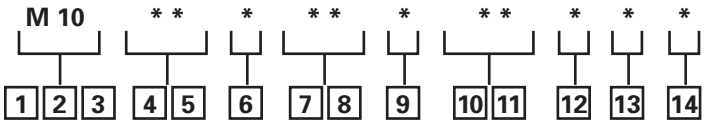
Orders will not be accepted without three digit prefix.

MOUNTING	SHAFT	PORT SIZE	DISPL. cm^3/r [in^3/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

10,000 Series

Model Code

The following 14-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 14 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.



1, 2, 3 Product Series

M10 – 10,000 Motor

4, 5 Displacement cm³/r [in³/r]

20 – 345 [21.0]

29 – 480 [29.2]

40 – 665 [40.6]

57 – 940 [57.4]

6 Mounting Type

A – 4 Bolt (Std.): Dia. 127,0 [5.00] Pilot 16,76 [.660] Mounting Holes on 161,92 [6.375] Dia. Bolt Circle

B – 4 Bolt (Whl.): Dia. 177,8 [7.00] Pilot 16,76 [.660] Mounting Holes on 209,55 [8.250] Dia. Bolt Circle

C – 4 Bolt (Brgl.): Dia. 152,4 [6.00] Pilot 20,70[.815] Mounting Holes on 228,60 [9.000] Dia. Bolt Circle

7, 8 Output Shaft

00 – None (Bearingless)

01 – 2 1/4 inch Dia. Straight with 12,7 [.50] Square Key x 63,5 [2.50] and 1/2 - 20 Threaded Hole

02 – 2 1/4 inch Dia. Tapered with 14,3 [.56] Square Key x 50,8 [2.00] and 1 1/2 - 18 UNEF -2A Threaded Shaft End and Slotted Hex Nut

03 – 2 1/8 inch 16 Tooth Splined with 52,1 [2.05] Min. Full Spline Length 1/2 - 20 UNF Threaded Hole

9 Ports

A – 1 5/16 -12 UN O-ring End Ports (Size -16), 9/16 - 18 UNF O-ring Case Drain Port (Size - 6)

B – 1 1/4 Inch Split Flange Ports, 9/16 - 18 UNF O-ring Case Drain Port (Size - 6)

10, 11 Special Features (Hardware)

00 – None

01 – Free Running Geroler

03 – Reverse Rotation

12 Paint/ Special Packaging

0 – No Paint, Individual Box

A – Painted Low Gloss Black, Individual Box

13 Eaton Assigned Code when Applicable

0 – Assigned Code

14 Eaton Assigned Design Code

C – Standard and Wheel Mounts

D – Bearingless Mount

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 Δ Bar [100 Δ 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 Δ Bar [100 Δ 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

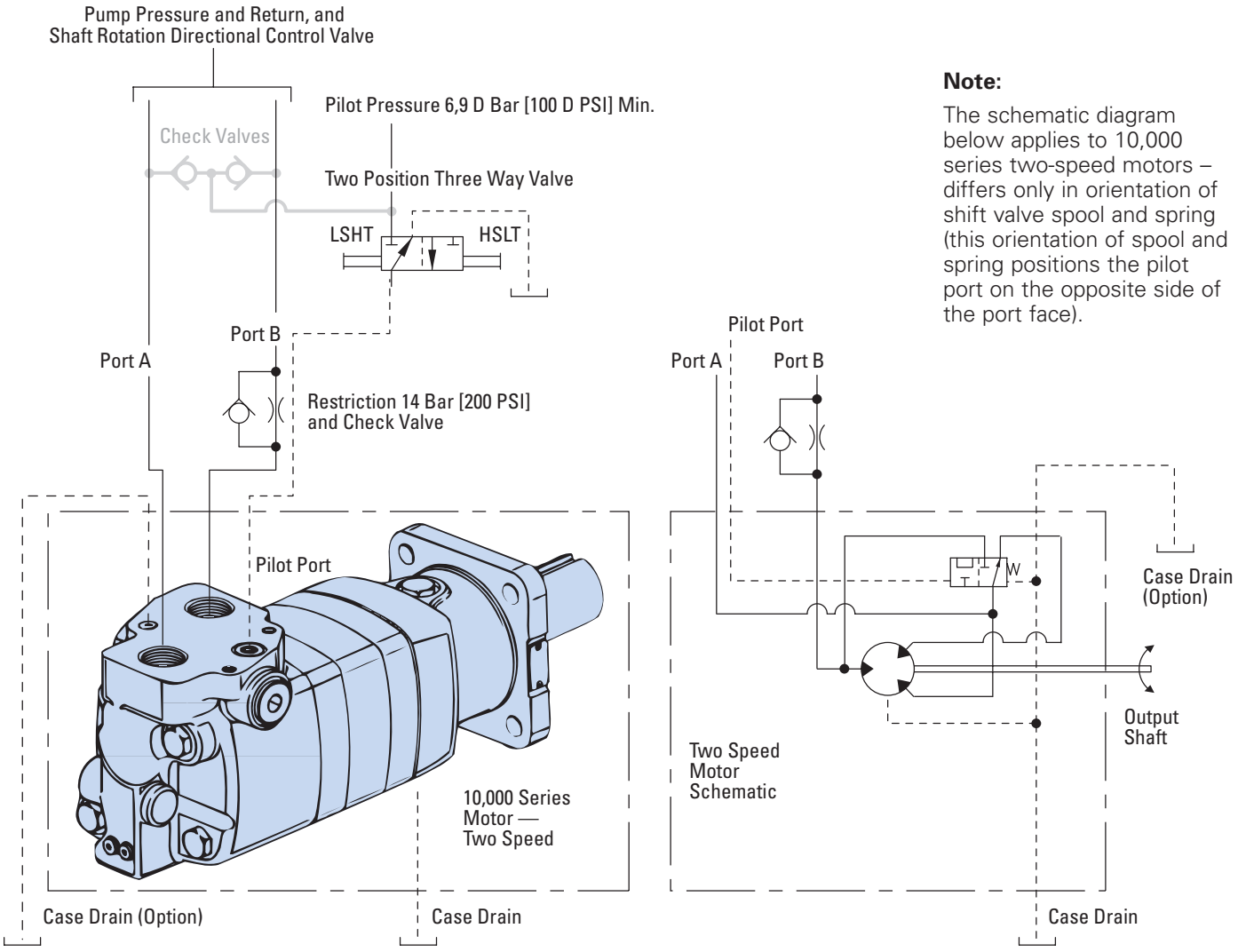
10,000 Series Two-Speed

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.

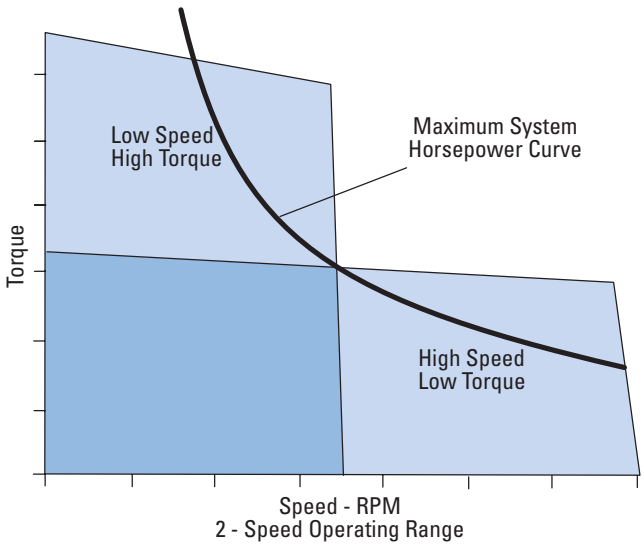
10,000 Series Two-Speed

Typical Hydraulic Circuit



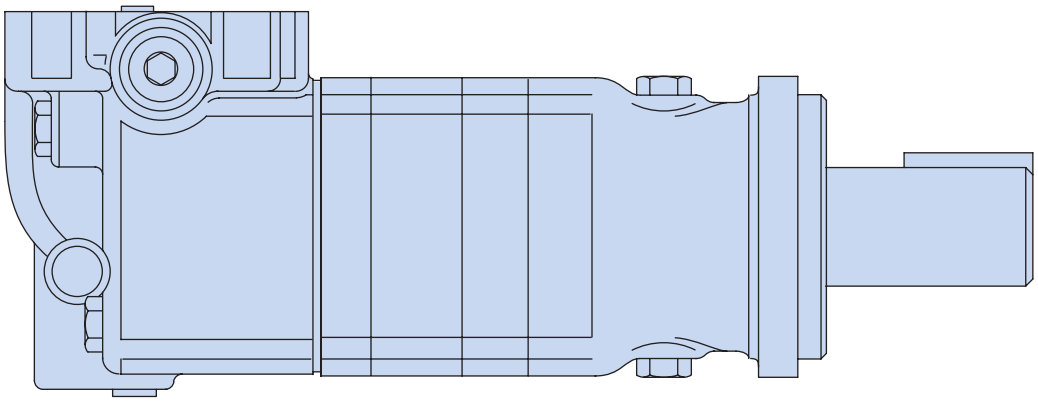
Note:

The schematic diagram below applies to 10,000 series two-speed motors – differs only in orientation of shift valve spool and spring (this orientation of spool and spring positions the pilot port on the opposite side of the port face).



10,000 Series Two-Speed

Specifications



10,000 SERIES TWO-SPEED MOTORS

Displ. cm³/r [in³/r]	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]
Max. Speed (RPM)	High Speed Mode	750	630	500	400
@ Continuous Flow	Low Speed Mode	375	315	250	200
Flow	High Speed Mode	130 [35]	170 [45]	170 [45]	170 [45]
l/min [GPM]	Low Speed Mode	130 [35]	170 [45]	170 [45]	170 [45]
Torque*	High Speed Mode				
Nm [lb-in]	Continuous	440 [3900]	630 [5600]	905 [8000]	1175 [10400]
	Intermittent	585 [5200]	845 [7500]	1130 [10000]	1470 [13000]
Torque*	Low Speed Mode				
Nm [lb-in]	Continuous	1015 [9000]	1470 [13000]	2090 [18500]	2710 [24000]
	Intermittent	1355 [12000]	1965 [17400]	2600 [23000]	3445 [30500]
Pressure	Continuous	205 [3000]	205 [3000]	205 [3000]	190 [2750]
Δ bar [Δ PSI]	Intermittent	275 [4000]	275 [4000]	260 [3750]	240 [3500]
Weight kg [lb]	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

Ports

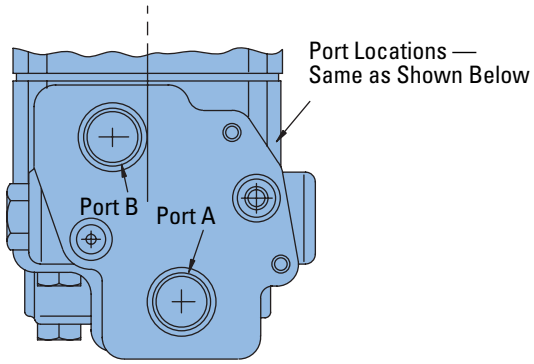
1 5/16 -12 UN-2B SAE O-ring Staggered Ports (2)
3/4 -16 UNF-2B SAE O-ring Case Drain Port (1)
7/16 -20 UNF-2B SAE O-ring Pilot Control Port (1) or

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)

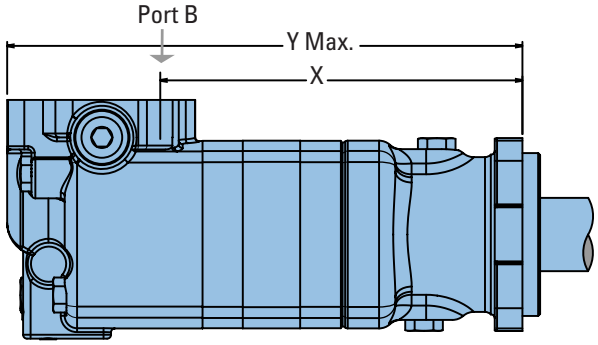
Standard Rotation Viewed from Shaft End

Port A Pressurized — CW
Port B Pressurized — CCW

1 5/16 -12 O-ring Staggered Ports



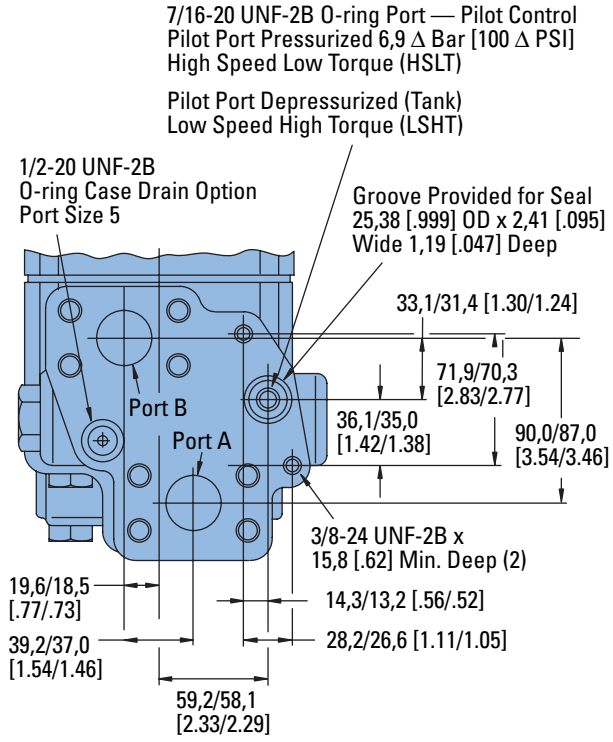
Two-Speed Standard Motors



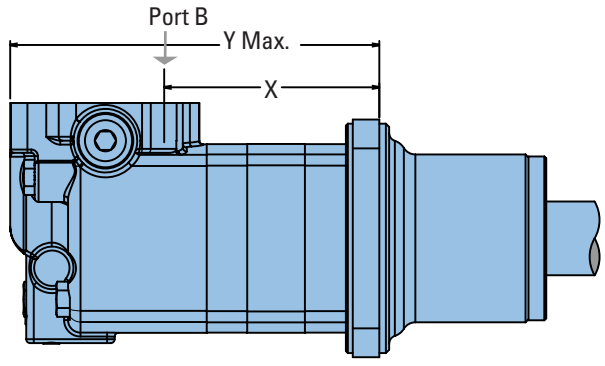
STANDARD MOUNT MOTOR DIMENSIONS

Displacement cm³/r [in³/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 cm³/r [in³/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

Ports

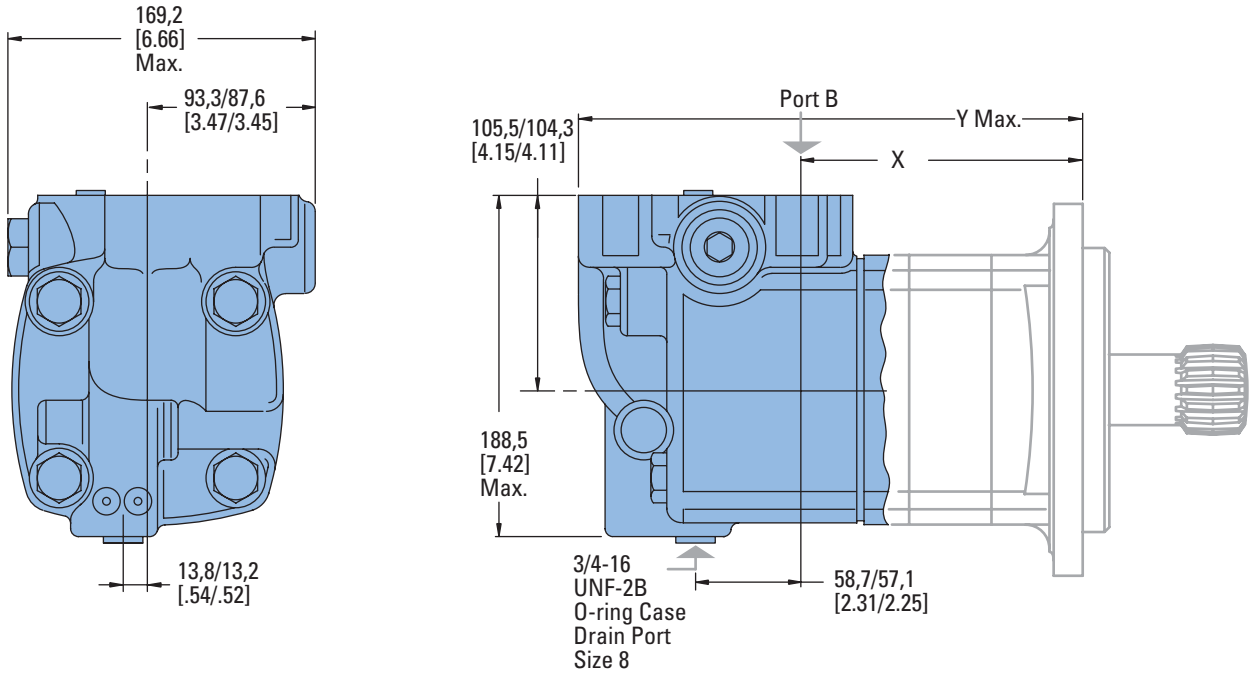
1 5/16 -12 UN-2B SAE O-ring Staggered Ports (2)
3/4 -16 UNF-2B SAE O-ring Case Drain Port (1)
7/16 -20 UNF-2B SAE O-ring Pilot Control Port (1) or

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



BEARINGLESS MOTOR DIMENSIONS

Displacement cm^3/r [in^3/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

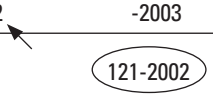
Note:

For 10,000 Series Motors with a configuration **Not Shown** in the chart below: Use model code number system on the page C-5-13 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^3/r [in^3/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



Notes