OVERVIEW

The HB Series motor is the leader in its class, offering high efficiency and durability. The three-zone orbiting valve, laminated manifold and Roller Stator® motor work harmoniously to produce high overall efficiencies over a wide range of operating conditions. The standard case drain increases shaft seal life by reducing internal pressures experienced by the seal. Case oil leakage is also directed across all driveline components, increasing motor life. An internal drain option is also available. At the heart of the motor is a heavy-duty drivelink, offering 30% more torque capacity than competitive designs. These features make the HB Series motor the preferred choice for applications requiring peak efficiency for continuous operation.

FEATURES / BENEFITS

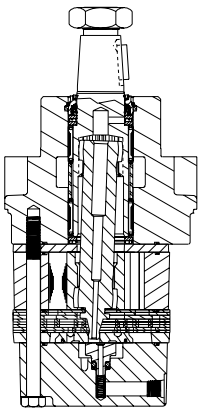
- Forced Drive Link Lubrication reduces wear and promotes longer life from motor.
- Heavy-Duty Drive Link is up to 30% stronger than competitive designs for longer life.
- Three-Zone Orbiting Valve precisely meters oil to produce exceptional volumetric efficiency.
- Rubber Energized Steel Face Seal does not extrude or melt under high pressure or high temperature.
- Standard Case Drain increases shaft seal life by reducing pressure on seal.

TYPICAL APPLICATIONS

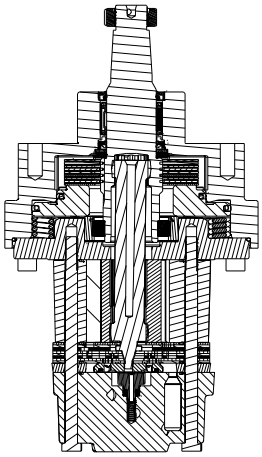
conveyors, carwashes, positioners, light-duty wheel drives, sweepers, machine tool indexers, grain augers, spreaders, feed rollers, screw drives, brush drives and more

SERIES DESCRIPTIONS

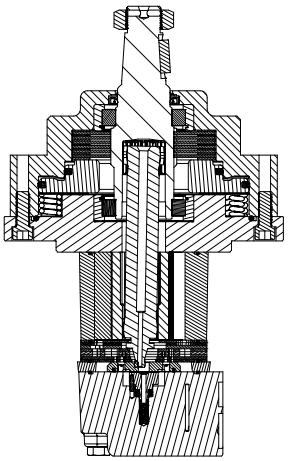
300 - Hydraulic Motor
Standard



310 - Hydraulic Motor/Brake
Standard



315 - Hydraulic Motor/Brake
With Greater Holding Torque



SPECIFICATIONS

CODE	Displacement cm^3 [in^3/rev]	Max. Speed rpm		Max. Flow lpm [gpm]		Max. Torque Nm [lb-in]		Max. Pressure bar [psi]		
		cont.	inter.	cont.	inter.	cont.	inter.	cont.	inter.	peak
050	52 [3.2]	680	830	38 [10]	45 [12]	135 [1200]	158 [1400]	207 [3000]	242 [3500]	276 [4000]
080	76 [4.6]	800	950	53 [14]	64 [17]	191 [1700]	222 [1975]	207 [3000]	242 [3500]	276 [4000]
090	89 [5.4]	680	840	61 [16]	76 [20]	225 [2000]	270 [2400]	207 [3000]	242 [3500]	276 [4000]
110	111 [6.8]	680	850	76 [20]	95 [25]	298 [2650]	349 [3100]	207 [3000]	242 [3500]	276 [4000]
125	127 [7.7]	580	740	76 [20]	95 [25]	338 [3000]	394 [3500]	207 [3000]	242 [3500]	276 [4000]
160	164 [10.0]	460	580	76 [20]	95 [25]	448 [3975]	512 [4550]	207 [3000]	242 [3500]	276 [4000]
200	205 [12.5]	370	460	76 [20]	95 [25]	569 [5050]	653 [5800]	207 [3000]	242 [3500]	276 [4000]
250	254 [15.5]	290	370	76 [20]	95 [25]	704 [6250]	799 [7100]	207 [3000]	242 [3500]	276 [4000]
300	293 [17.9]	250	320	76 [20]	95 [25]	811 [7200]	929 [8250]	207 [3000]	242 [3500]	276 [4000]
400	409 [24.9]	180	230	76 [20]	95 [25]	946 [8400]	1019 [9050]	173 [2500]	189 [2750]	207 [3000]

► Performance data is typical. Performance of production units varies slightly from one motor to another. See page 9 for additional information on product testing. Running at intermittent ratings should not exceed 10% of every minute of operation.

DISPLACEMENT PERFORMANCE

200

205 cm³ [12.5 in³] / rev

Pressure - bar [psi]

17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000] Max. Cont.	242 [3500] Max. Inter.

Torque - Nm [lb-in], **Speed rpm**

Intermittent Ratings - 10% of Operation

Flow - lpm [gpm]	17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000] Max. Cont.	242 [3500] Max. Inter.	Theoretical rpm
2 [0.5]	35 [314] **9**	83 [734] **9**	179 [1581] **8**	267 [2365] **7**	353 [3121] **6**	443 [3921] **5**	505 [4469] **4**	579 [5120] **3**	10
4 [1]	37 [325] **18**	81 [721] **18**	186 [1642] **17**	287 [2536] **14**	301 [2665] **13**	452 [4004] **11**	540 [4777] **9**	611 [5406] **8**	19
8 [2]	39 [349] **36**	89 [790] **36**	199 [1759] **35**	295 [2610] **31**	386 [3412] **27**	473 [4185] **24**	554 [4904] **21**	643 [5687] **20**	37
15 [4]	38 [338] **73**	87 [766] **73**	191 [1689] **72**	292 [2586] **68**	386 [3417] **61**	480 [4252] **53**	574 [5077] **49**	661 [5849] **46**	74
23 [6]		84 [742] **110**	185 [1635] **109**	287 [2542] **106**	382 [3380] **98**	480 [4247] **89**	570 [5046] **81**	657 [5817] **74**	111
30 [8]			176 [1556] **147**	279 [2468] **144**	376 [3327] **136**	479 [4243] **123**	571 [5051] **112**	658 [5827] **104**	148
38 [10]			166 [1471] **184**	268 [2374] **182**	368 [3256] **173**	467 [4131] **162**	556 [4923] **151**	651 [5761] **141**	185
45 [12]			154 [1361] **221**	257 [2275] **219**	360 [3185] **214**	460 [4069] **200**	558 [4939] **187**	650 [5751] **176**	222
53 [14]			147 [1304] **258**	245 [2165] **256**	355 [3141] **250**	441 [3906] **238**	539 [4773] **224**	640 [5666] **213**	259
61 [16]			123 [1089] **295**	235 [2083] **290**	333 [2949] **286**	429 [3797] **277**	523 [4628] **264**	624 [5519] **242**	296
68 [18]			112 [993] **331**	220 [1943] **327**	302 [2669] **323**	414 [3665] **319**	527 [4659] **303**	616 [5451] **289**	333
76 [20]				197 [1745] **369**	310 [2740] **365**	395 [3499] **360**	492 [4353] **343**	596 [5273] **331**	370
83 [22]				172 [1525] **405**	282 [2496] **401**	386 [3420] **395**	480 [4252] **382**		407
91 [24]				157 [1390] **442**	265 [2341] **441**	369 [3269] **438**	453 [4005] **425**		444
95 [25]				139 [1229] **460**	252 [2234] **458**	349 [3087] **456**	447 [3955] **444**		462

Overall Efficiency - 70 - 100% ☐ 40 - 69% ☐ 0 - 39% ☐

Rotor Width mm [in]	Theoretical Torque - Nm [lb-in]							
31.8 [1.251]	56 [498]	112 [995]	225 [1990]	337 [2986]	450 [3981]	562 [4976]	675 [5971]	787 [6967]

Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]

250

254 cm³ [15.5 in³] / rev

Pressure - bar [psi]

17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000] Max. Cont.	242 [3500] Max. Inter.

Torque - Nm [lb-in], **Speed rpm**

Intermittent Ratings - 10% of Operation

Flow - lpm [gpm]	17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000] Max. Cont.	242 [3500] Max. Inter.	Theoretical rpm
2 [0.5]	43 [381] **7**	104 [924] **6**	221 [1955] **6**	339 [3001] **5**	449 [3974] **3**	551 [4872] **1**			8
4 [1]	50 [439] **14**	115 [1014] **14**	240 [2128] **13**	361 [3196] **11**	466 [4128] **9**	574 [5080] **7**	668 [5907] **4**		15
8 [2]	51 [455] **29**	115 [1014] **29**	245 [2167] **28**	369 [3262] **26**	479 [4236] **22**	604 [5342] **17**	712 [6303] **13**	800 [7082] **9**	30
15 [4]	48 [428] **59**	105 [930] **58**	242 [2145] **57**	371 [3286] **56**	493 [4363] **51**	619 [5480] **41**	741 [6555] **33**	847 [7496] **25**	60
23 [6]	42 [368] **89**	110 [969] **88**	234 [2069] **88**	367 [3252] **87**	487 [4313] **82**	626 [5542] **69**	747 [6611] **58**	847 [7492] **48**	90
30 [8]		92 [818] **119**	223 [1978] **118**	357 [3159] **117**	490 [4332] **115**	622 [5508] **101**	744 [6587] **87**	846 [7490] **76**	120
38 [10]		80 [712] **149**	209 [1849] **148**	342 [3025] **147**	472 [4176] **141**	605 [5353] **129**	717 [6345] **114**	844 [7472] **104**	150
45 [12]			199 [1757] **178**	329 [2915] **176**	455 [4022] **174**	581 [5142] **165**	703 [6225] **147**	833 [7375] **127**	179
53 [14]			182 [1640] **208**	310 [2743] **206**	443 [3919] **205**	567 [5017] **197**	711 [6296] **176**	817 [7227] **158**	209
61 [16]			164 [1456] **238**	294 [2603] **235**	438 [3873] **233**	552 [4886] **227**	674 [5960] **205**	804 [7114] **191**	239
68 [18]			145 [1285] **268**	270 [2393] **266**	402 [3560] **263**	530 [4694] **259**	661 [5846] **245**	784 [6939] **222**	269
76 [20]			122 [1083] **298**	255 [2256] **295**	380 [3359] **292**	511 [4519] **289**	627 [5547] **277**	757 [6697] **252**	299
83 [22]				221 [1955] **326**	353 [3124] **323**	484 [4279] **319**	607 [5368] **307**		328
91 [24]				201 [1775] **357**	336 [2973] **355**	461 [4082] **353**	599 [5297] **342**		358
95 [25]				184 [1627] **371**	313 [2768] **368**	442 [3915] **365**	575 [5088] **360**		373

Overall Efficiency - 70 - 100% ☐ 40 - 69% ☐ 0 - 39% ☐

Rotor Width mm [in]	Theoretical Torque - Nm [lb-in]							
39.4 [1.551]	70 [617]	139 [1234]	279 [2468]	418 [3702]	558 [4936]	697 [6170]	837 [7404]	976 [8639]

Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]

► Performance data is typical. Performance of production units varies slightly from one motor to another. See page 9 for additional information on product testing.

DISPLACEMENT PERFORMANCE

300

293 cm³ [17.9 in³] / rev

Pressure - bar [psi]

17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000] Max. Cont.	242 [3500] Max. Inter.

Intermittent Ratings - 10% of Operation

Torque - Nm [lb-in], **Speed rpm**

Flow - lpm [gpm]	17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000]	242 [3500]	Theoretical rpm
2 [0.5]	61 [543] **6**	118 [1044] **5**	261 [2311] **5**	388 [3433] **4**					7
4 [1]	59 [521] **12**	140 [1237] **12**	271 [2397] **11**	414 [3666] **11**	546 [4833] **8**	681 [6025] **5**			13
8 [2]	61 [541] **25**	128 [1134] **25**	281 [2490] **24**	425 [3761] **23**	562 [4970] **19**	693 [6128] **14**	820 [7259] **10**	915 [8095] **4**	26
15 [4]	52 [461] **51**	128 [1130] **51**	275 [2436] **50**	427 [3782] **50**	578 [5119] **44**	715 [6327] **32**	827 [7317] **25**	956 [8457] **19**	52
23 [6]		115 [1017] **77**	266 [2351] **76**	406 [3592] **75**	557 [4931] **70**	706 [6250] **55**	840 [7435] **43**	945 [8361] **37**	78
30 [8]		107 [951] **103**	251 [2223] **102**	407 [3598] **101**	538 [4759] **96**	691 [6117] **82**	832 [7359] **66**	948 [8393] **52**	104
38 [10]		88 [779] **129**	229 [2026] **127**	393 [3475] **126**	528 [4672] **122**	672 [5950] **109**	826 [7307] **90**	959 [8487] **74**	130
45 [12]			217 [1923] **154**	368 [3256] **153**	504 [4457] **150**	663 [5864] **133**	800 [7076] **112**	931 [8239] **97**	155
53 [14]			201 [1782] **180**	347 [3067] **178**	510 [4513] **173**	646 [5713] **161**	798 [7060] **140**	921 [8149] **114**	181
61 [16]			168 [1491] **206**	324 [2865] **204**	472 [4180] **201**	621 [5492] **188**	764 [6765] **171**	917 [8112] **142**	207
68 [18]			143 [1266] **232**	298 [2638] **230**	427 [3783] **227**	591 [5234] **220**	745 [6591] **198**	878 [7773] **176**	233
Max. Cont. 76 [20]			114 [1013] **258**	283 [2501] **256**	443 [3916] **254**	597 [5284] **247**	717 [6344] **227**	849 [7512] **206**	259
83 [22]				246 [2179] **282**	397 [3512] **280**	559 [4943] **274**	681 [6023] **257**		284
91 [24]				181 [1601] **309**	357 [3159] **306**	502 [4442] **304**	642 [5684] **294**		310
Max. Inter. 95 [25]				166 [1466] **321**	323 [2858] **319**	491 [4347] **318**	630 [5577] **300**		323

Overall Efficiency - 70 - 100% ☐ 40 - 69% ☐ 0 - 39% ☐

Rotor Width

45.5 [1.790] mm [in]

Theoretical Torque - Nm [lb-in]

81 [713]	161 [1425]	322 [2850]	483 [4275]	644 [5701]	805 [7126]	966 [8551]	1127 [9976]

Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]

400

409 cm³ [24.9 in³] / rev

Pressure - bar [psi]

17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500] Max. Cont.	207 [3000] Peak

Intermittent Ratings - 10% of Operation

Torque - Nm [lb-in], **Speed rpm**

Flow - lpm [gpm]	17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000]	Theoretical rpm
2 [0.5]	85 [757] **4**	193 [1710] **4**	367 [3248] **3**	534 [4721] **2**				5
4 [1]	88 [776] **9**	185 [1640] **8**	383 [3386] **8**	580 [5129] **6**	745 [6590] **4**	899 [7954] **1**		10
8 [2]	86 [762] **18**	196 [1734] **18**	394 [3487] **17**	586 [5184] **15**	764 [6763] **11**	927 [8204] **5**		19
15 [4]	85 [749] **37**	188 [1661] **36**	404 [3571] **35**	602 [5325] **32**	796 [7047] **24**	962 [8517] **18**	1108 [9804] **9**	38
23 [6]	71 [629] **55**	180 [1593] **55**	387 [3428] **54**	596 [5274] **49**	787 [6969] **39**	978 [8653] **28**	1141 [10094] **20**	56
30 [8]		165 [1462] **74**	373 [3299] **73**	595 [5264] **69**	792 [7010] **58**	966 [8552] **44**	1149 [10167] **31**	75
38 [10]		143 [1269] **92**	356 [3150] **90**	581 [5144] **88**	782 [6923] **79**	974 [8617] **62**	1156 [10231] **45**	93
45 [12]		122 [1076] **111**	333 [2950] **109**	545 [4823] **107**	749 [6624] **98**	957 [8470] **83**	1143 [10116] **61**	112
53 [14]		95 [842] **129**	313 [2774] **128**	521 [4607] **126**	717 [6344] **117**	931 [8235] **103**	1131 [10007] **78**	130
61 [16]			282 [2493] **147**	496 [4385] **145**	685 [6063] **141**	919 [8131] **121**	1100 [9733] **100**	149
68 [18]			244 [2156] **166**	453 [4009] **165**	681 [6023] **158**	871 [7708] **142**	1071 [9478] **121**	167
Max. Cont. 76 [20]			197 [1741] **185**	420 [3713] **183**	650 [5756] **179**	838 [7417] **166**	1051 [9302] **145**	186
83 [22]			164 [1448] **203**	378 [3344] **201**	588 [5200] **198**	810 [7171] **186**		205
91 [24]				333 [2947] **222**	559 [4945] **220**	750 [6640] **211**		223
Max. Inter. 95 [25]				303 [2682] **231**	539 [4773] **228**	764 [6760] **221**		232

Overall Efficiency - 70 - 100% ☐ 40 - 69% ☐ 0 - 39% ☐

Rotor Width

63.5 [2.500] mm [in]

Theoretical Torque - Nm [lb-in]

112 [991]	224 [1982]	448 [3965]	672 [5947]	896 [7930]	1120 [9912]	1344 [11895]

Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]

► Performance data is typical. Performance of production units varies slightly from one motor to another. See page 9 for additional information on product testing.

PORTING

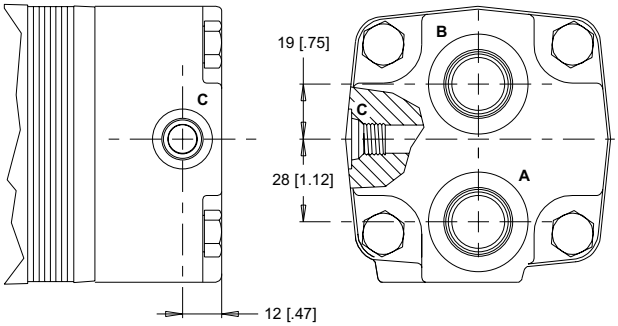
▶ Dimensions shown are without paint. Paint thickness can be up to 0.13 [.005].

END PORTED - ALIGNED

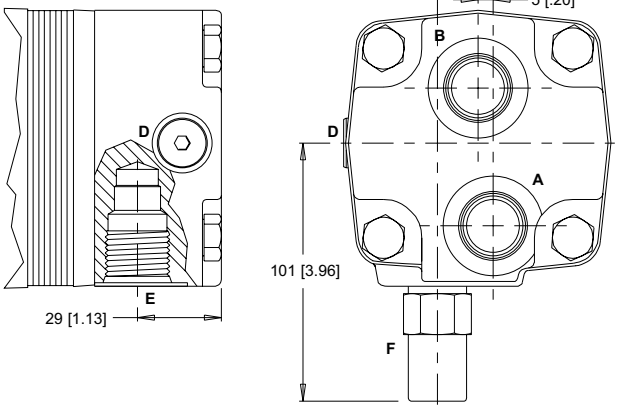
1 Main Ports **A, B**: 7/8-14 UNF
Drain Port **C**: 7/16-20 UNF

2 Main Ports **A, B**: G 1/2
Drain Port **C**: G 1/4

STANDARD



OPTIONAL



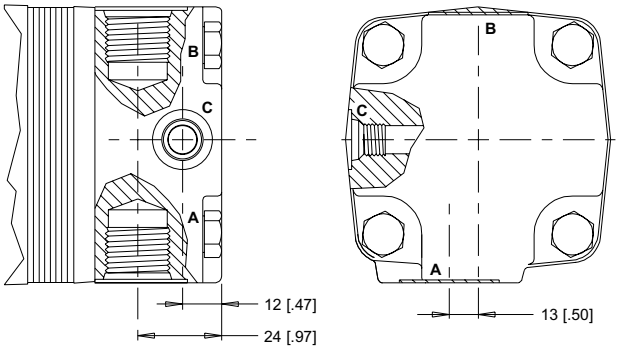
D: Internal Drain **E**: 10 Series/2-Way Valve Cavity 7/8-14 UNF **F**: Valve Cartridge Installed

SIDE PORTED - 180° OPPOSED

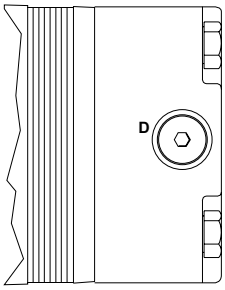
6 Main Ports **A, B**: 1 1/16-20 UN
Drain Port **C**: 7/16-20 UNF

7 Main Ports **A, B**: G 1/2
Drain Port **C**: G 1/4

STANDARD



OPTIONAL

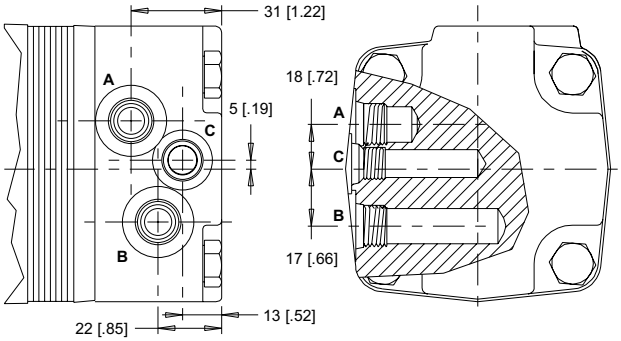


D: Internal Drain

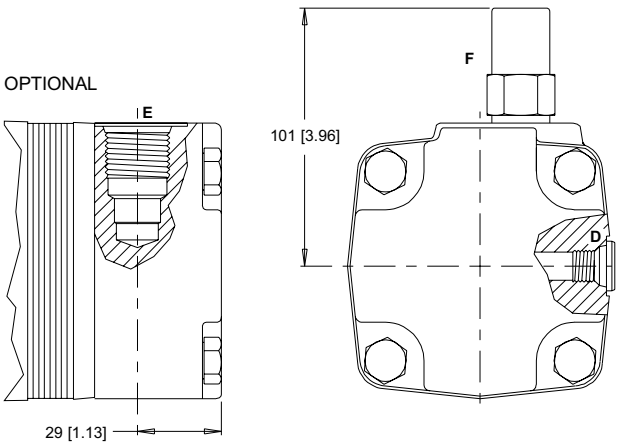
SIDE PORTED - OFFSET

5 Main Ports **A, B**: 9/16-18 UNF
Drain Port **C**: 7/16-20 UNF

STANDARD



OPTIONAL



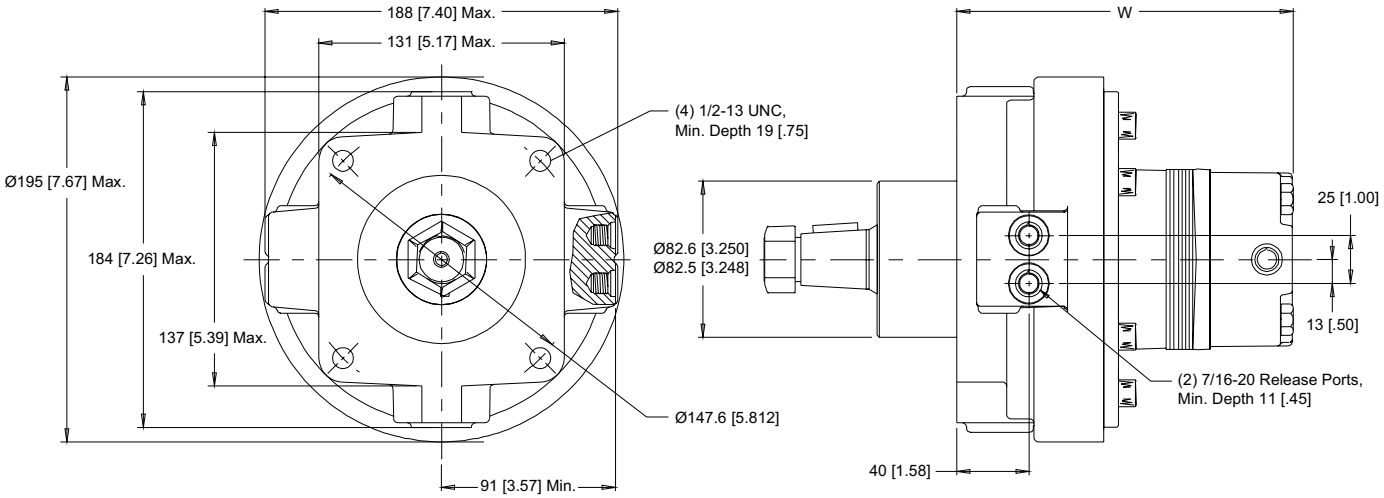
D: Internal Drain **E**: 10 Series/2-Way Valve Cavity 7/8-14 UNF **F**: Valve Cartridge Installed

HOUSINGS

► Dimensions shown are without paint. Paint thickness can be up to 0.13 [.005].

4-HOLE, MOTOR BRAKE

W2 End Ports **W8** Side Ports



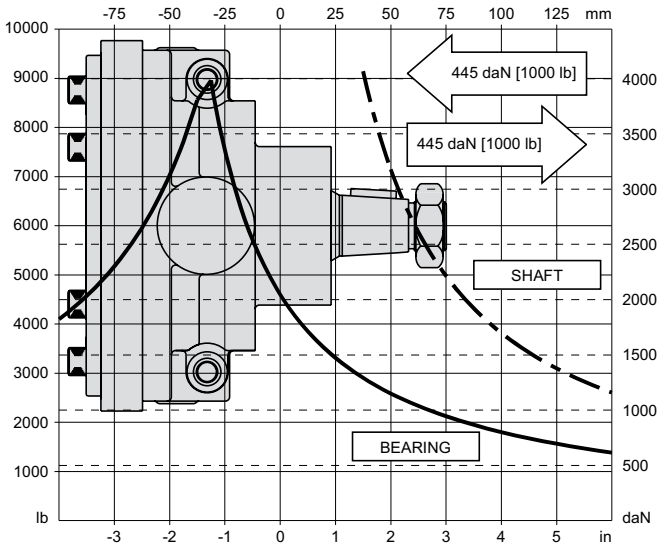
► Porting options listed on pages 108-109.

TECHNICAL INFORMATION

ALLOWABLE SHAFT LOAD / BEARING CURVE

The bearing curve represents allowable bearing loads based on ISO 281 bearing capacity for an L_{10} life of 2,000 hours at 100 rpm. Radial loads for speeds other than 100 rpm may be calculated using the multiplication factor table on page 10.

MOTOR BRAKE



SPECIFICATIONS

Rated brake torque.....904 Nm [8000 lb-in]
Initial release pressure .....21 bar [300 psi]
Full release pressure.....31 bar [450 psi]
Maximum release pressure .....207 bar [3000 psi]
Release volume..... 13-16 cm^3 [0.8 - 1.0 in^3]

LENGTH & WEIGHT CHART

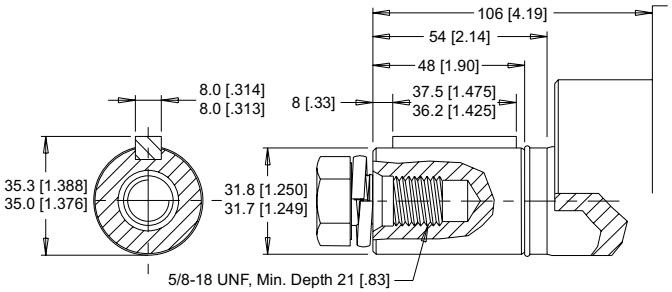
Dimension W is the overall motor length from the rear of the motor to the mounting flange surface.

W	Endcovers on pg. 108	Endcovers on pg. 109	Weight
#	mm [in]	mm [in]	kg [lb]
050	163 [6.41]	181 [7.12]	19.1 [42.2]
080	167 [6.56]	185 [7.27]	19.4 [42.7]
090	169 [6.64]	187 [7.35]	19.5 [42.9]
110	172 [6.78]	190 [7.49]	19.7 [43.4]
125	175 [6.87]	193 [7.58]	19.8 [43.7]
160	180 [7.10]	198 [7.81]	20.1 [44.4]
200	187 [7.35]	205 [8.06]	20.5 [45.3]
250	194 [7.32]	212 [8.36]	20.9 [46.1]
300	200 [7.65]	218 [8.59]	21.3 [47.0]
400	218 [8.60]	236 [9.31]	22.3 [49.1]

► 310 series motor/brake weights can vary ± 1kg [2 lb] depending on model configurations such as housing, shaft, endcover, options etc.

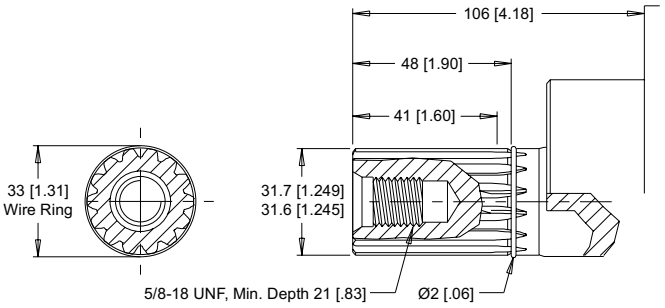
SHAFTS

20 1-1/4" Straight



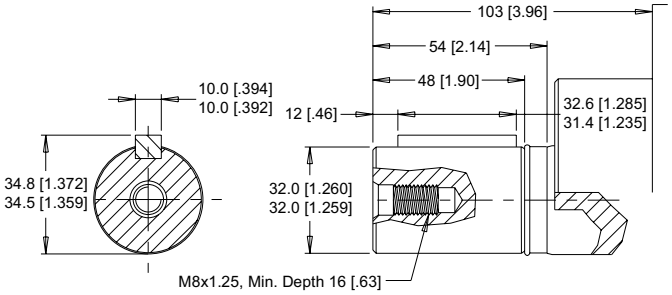
Max. Torque: 882 Nm [7804 lb-in]

23 14 Tooth Spline



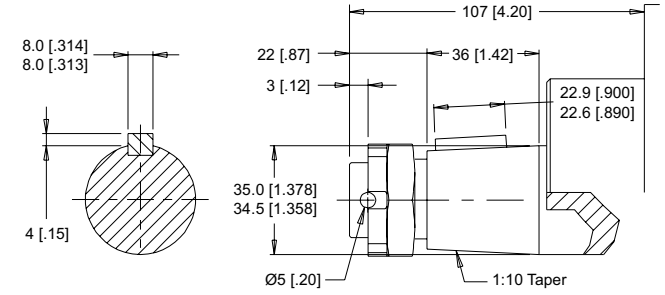
Max. Torque: 882 Nm [7804 lb-in]

21 32mm Straight



Max. Torque: 882 Nm [7804 lb-in]

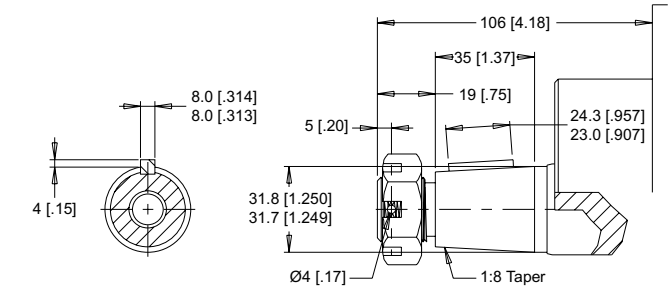
28 35mm Tapered



Max. Torque: 882 Nm [7804 lb-in]

▶ A slotted hex nut is standard on this shaft. Dimensional details & additional options are listed on page 14.

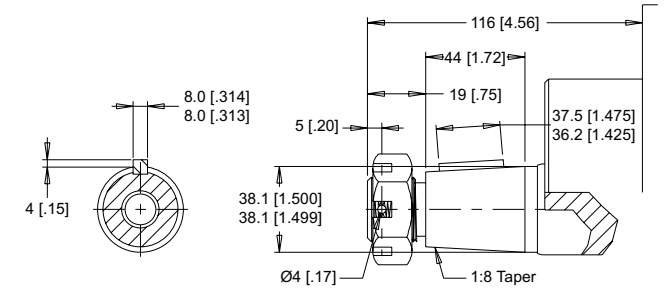
22 1-1/4" Tapered



Max. Torque: 882 Nm [7804 lb-in]

▶ A slotted hex nut is standard on this shaft. Dimensional details & additional options are listed on page 14.

31 1-1/2" Tapered



Max. Torque: 882 Nm [7804 lb-in]

▶ A slotted hex nut is standard on this shaft. Dimensional details & additional options are listed on page 14.

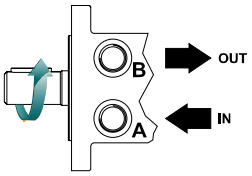
ORDERING INFORMATION

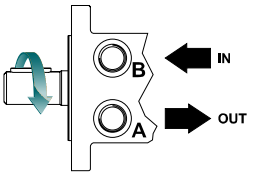
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □

1 2 3a 3b 4 5 6 7 8

1. CHOOSE SERIES DESIGNATION

310	HB Series Motor/Brake





▶ The 310 series is bi-directional. Reversing the inlet hose will reverse shaft rotation.

2. SELECT A DISPLACEMENT OPTION

050	52 cm^3/rev	[3.2 in^3/rev]	**160**	164 cm^3/rev	[10.0 in^3/rev]
080	76 cm^3/rev	[4.6 in^3/rev]	**200**	205 cm^3/rev	[12.5 in^3/rev]
090	89 cm^3/rev	[5.4 in^3/rev]	**250**	254 cm^3/rev	[15.5 in^3/rev]
110	111 cm^3/rev	[6.8 in^3/rev]	**300**	293 cm^3/rev	[17.9 in^3/rev]
125	127 cm^3/rev	[7.7 in^3/rev]	**400**	409 cm^3/rev	[24.9 in^3/rev]

3a. SELECT MOUNT TYPE

▼ **END MOUNT**

W2	4-Hole, Motor/Brake

▼ **SIDE MOUNT**

W8	4-Hole, Motor/Brake

3b. SELECT PORT SIZE

▼ **END PORT OPTIONS**

1	7/8-14 UNF Aligned
2	G 1/2 Aligned

▼ **SIDE PORT OPTIONS**

1	7/8-14 UNF, Aligned
2	G 1/2, Aligned
3	G 1/2, Offset Manifold
5	9/16-18 UNF Offset
6	1 1/16-20 UN, 180° Opposed
7	G 1/2, 180° Opposed

4. SELECT A SHAFT OPTION

20	1-1/4" Straight	**23**	14 Tooth Spline
21	32mm Straight	**28**	35mm Tapered
22	1-1/4" Tapered	**31**	1-1/2" Tapered

5. SELECT A PAINT OPTION

A	Black
B	Black, Unpainted Mounting Surface
Z	No Paint

6. SELECT A VALVE CAVITY / CARTRIDGE OPTION

A	None	**F**	121 bar [1750 psi] Relief
B	Valve Cavity Only	**G**	138 bar [2000 psi] Relief
C	69 bar [1000 psi] Relief	**J**	173 bar [2500 psi] Relief
D	86 bar [1250 psi] Relief	**L**	207 bar [3000 psi] Relief
E	104 bar [1500 psi] Relief		

▶ Valve cavity is only available on side ports 1, 2 & 5 and end ports 1 & 2.

7. SELECT AN ADD-ON OPTION

A	Standard
B	Lock Nut
C	Solid Hex Nut

8. SELECT A MISCELLANEOUS OPTION

AA	None
AC	Freeturning Rotor