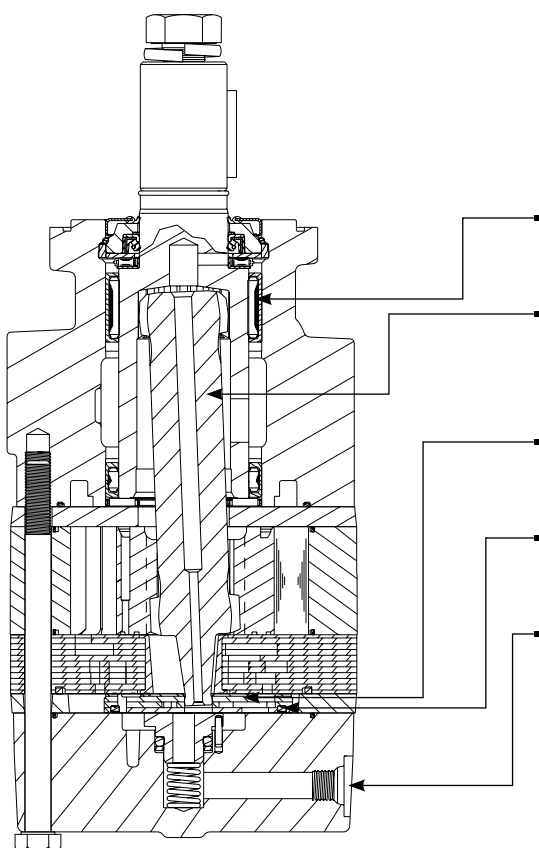




DR

SERIES HYDRAULIC MOTORS

Due to its case drain design, the DR Series motor is an excellent medium size motor for applications with high-duty cycles or frequent direction reversal. The case drain design produces a number of benefits including reduction of pressure on the shaft seal and the ability to provide a cooling loop for the system. The case flow also lubricates the vital drive components, extending motor life. An internal drain option is also available. A laminated manifold and three-zone orbiting valve are used to produce higher overall efficiencies and more usable power. A steel faced seal in the orbiting valve also reduces the risk of the seal extruding or melting, which is possible in competitive designs.



KEY FEATURES

- Four Bearing Options** allow load carrying capabilities of motor to be matched to application.
- Heavy-Duty Drive Link** is the most durable in its class and receives case flow lubrication for reduced wear and increased 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.

SPECIFICATIONS

Intermittent Ratings - 10% of Operation Peak Ratings - 1% of Operation

CODE	Displacement cc [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
200	204 [12.4]	470	560	95 [25]	114 [30]	554 [4900]	644 [5700]	207 [3000]	241 [3500]	276 [4000]
260	261 [15.9]	360	440	95 [25]	114 [30]	745 [6590]	859 [7600]	207 [3000]	241 [3500]	276 [4000]
300	300 [18.3]	320	380	95 [25]	114 [30]	842 [7450]	972 [8600]	207 [3000]	241 [3500]	276 [4000]
350	348 [21.2]	270	320	95 [25]	114 [30]	972 [8600]	1107 [9800]	207 [3000]	241 [3500]	276 [4000]
375	375 [22.8]	250	300	95 [25]	114 [30]	1085 [9600]	1243 [11000]	207 [3000]	241 [3500]	276 [4000]
470	465 [28.3]	200	240	95 [25]	114 [30]	1107 [9800]	1316 [11650]	172 [2500]	207 [3000]	241 [3500]
540	536 [32.7]	180	210	95 [25]	114 [30]	1034 [9150]	1277 [11300]	138 [2000]	172 [2500]	207 [3000]
750	748 [45.6]	130	150	95 [25]	114 [30]	1040 [9200]	1390 [12300]	103 [1500]	138 [2000]	172 [2500]

**200**

Pressure - bars [psi]

Max. Cont. Max. Inter.

17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000]	241 [3500]
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204 cc [12.4 in³/rev.]

Torque - Nm [lb-in], Speed rpm

Intermittent Ratings - 10% of Operation

2 [0.5]
4 [1]
8 [2]
15 [4]
23 [6]
30 [8]
38 [10]
45 [12]
53 [14]
61 [16]
68 [18]
76 [20]
83 [22]
91 [24]
95 [25]
114 [30]

38 [335] 7	77 [683] 4						
39 [342] 16	85 [748] 15	174 [1543] 13	258 [2284] 9	329 [2913] 5			
38 [339] 35	90 [795] 34	178 [1579] 32	271 [2396] 28	361 [3192] 23	454 [4016] 16	519 [4594] 11	562 [4977] 3
36 [323] 73	85 [749] 72	178 [1576] 69	283 [2506] 64	378 [3346] 57	459 [4059] 54	555 [4909] 44	636 [5625] 35
	78 [690] 110	177 [1562] 106	273 [2413] 101	362 [3202] 97	462 [4085] 89	551 [4880] 80	645 [5711] 70
	74 [654] 148	172 [1518] 145	268 [2368] 141	357 [3156] 133	469 [4154] 126	558 [4936] 117	653 [5778] 105
		168 [1491] 184	260 [2301] 178	349 [3091] 174	444 [3933] 167	541 [4783] 156	638 [5646] 144
		156 [1381] 221	255 [2256] 215	350 [3096] 209	450 [3985] 204	542 [4793] 199	634 [5607] 179
		150 [1332] 259	251 [2219] 254	330 [2919] 250	435 [3850] 241	526 [4653] 231	638 [5643] 213
		133 [1180] 297	241 [2129] 293	336 [2970] 286	430 [3803] 278	522 [4616] 276	613 [5423] 256
		122 [1082] 335	227 [2012] 332	328 [2899] 325	417 [3692] 319	510 [4510] 310	602 [5329] 298
		112 [993] 372	214 [1897] 371	309 [2732] 365	401 [3547] 356	496 [4391] 348	587 [5198] 337
			199 [1757] 409	303 [2680] 404	384 [3401] 396	493 [4358] 384	579 [5121] 374
			184 [1625] 447	285 [2526] 443	380 [3366] 433	474 [4192] 423	562 [4970] 417
			166 [1472] 465	277 [2453] 461	367 [3244] 454	463 [4101] 443	560 [4953] 432
				219 [1935] 558	332 [2934] 553		

10
19
38
75
112
150
187
224
261
299
336
373
410
448
466
559

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

Theoretical Torque - Nm [lb-in]

56 [494]	112 [987]	223 [1975]	335 [2962]	446 [3949]	558 [4936]	669 [5924]	781 [6911]
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Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]

Pressure - bars [psi]

Max. Cont. Max. Inter.

17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000]	241 [3500]
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260261 cc [15.9 in³/rev.]

Torque - Nm [lb-in], Speed rpm

Intermittent Ratings - 10% of Operation

2 [0.5]
4 [1]
8 [2]
15 [4]
23 [6]
30 [8]
38 [10]
45 [12]
53 [14]
61 [16]
68 [18]
76 [20]
83 [22]
91 [24]
95 [25]
114 [30]

47 [417] 5	109 [962] 4						
51 [454] 13	110 [972] 11	238 [2104] 11	355 [3139] 8	460 [4074] 5			
52 [462] 28	113 [1004] 27	242 [2145] 25	367 [3244] 22	485 [4292] 18	603 [5334] 14	715 [6323] 11	
49 [430] 57	111 [985] 56	239 [2115] 54	367 [3247] 51	491 [4343] 45	619 [5474] 41	746 [6598] 36	859 [7600] 30
44 [391] 87	107 [950] 86	234 [2067] 83	364 [3225] 78	487 [4311] 72	617 [5458] 67	738 [6530] 60	854 [7557] 54
	100 [884] 115	228 [2016] 113	355 [3146] 107	478 [4230] 103	612 [5418] 95	733 [6487] 89	868 [7677] 82
	90 [797] 145	220 [1947] 143	348 [3080] 138	468 [4143] 132	605 [5351] 123	734 [6498] 115	852 [7541] 107
	84 [748] 174	212 [1877] 172	340 [3011] 168	463 [4094] 162	596 [5272] 152	722 [6390] 143	845 [7481] 133
	71 [631] 203	205 [1813] 201	330 [2921] 198	452 [4004] 185	587 [5195] 179	706 [6244] 173	846 [7491] 163
		191 [1688] 231	317 [2807] 228	444 [3927] 223	574 [5077] 214	703 [6221] 203	824 [7291] 196
		174 [1540] 261	305 [2698] 256	429 [3798] 251	560 [4952] 246	690 [6111] 230	815 [7214] 220
		156 [1383] 290	289 [2558] 289	418 [3700] 282	544 [4817] 268	675 [5977] 262	810 [7166] 247
		143 [1270] 319	275 [2431] 317	405 [3585] 313	533 [4717] 300	659 [5828] 293	787 [6961] 277
		131 [1158] 348	255 [2253] 346	387 [3421] 342	515 [4554] 333	613 [5421] 322	769 [6805] 311
			239 [2115] 362	373 [3301] 357	505 [4471] 348	628 [5559] 342	772 [6832] 328
			157 [1388] 434	298 [2637] 432	426 [3768] 427		

8
15
30
59
88
117
146
175
204
233
262
291
320
349
364
436

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

Theoretical Torque - Nm [lb-in]

72 [633]	143 [1266]	286 [2532]	429 [3798]	572 [5064]	715 [6330]	858 [7596]	1001 [8861]
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Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]



300	Pressure - bars [psi]						Max. Cont.	Max. Inter.
	17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000]	241 [3500]

300 cc [18.3 in³/rev.]

Torque - Nm [lb-in], Speed rpm Intermittent Ratings - 10% of Operation

Flow - lpm [gpm]	2 [0.5]	58 [509] 5	117 [1039] 4	253 [2236] 4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										</
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Overall Efficiency - 70 - 100% ☐ 40 - 69% ☐ 0 - 39% ☐

Theoretical Torque - Nm [lb-in]

82 [729]	165 [1457]	329 [2914]	494 [4371]	659 [5828]	823 [7285]	988 [8742]	1152 [10199]
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Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]

350	Pressure - bars [psi]						Max. Cont.	Max. Inter.
	17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000]	241 [3500]

348 cc [21.2 in³/rev.]

Torque - Nm [lb-in], Speed rpm Intermittent Ratings - 10% of Operation

Flow - lpm [gpm]	2 [0.5]	69 [606] 4	140 [1243] 3	262 [2318] 2														6	Theoretical rpm
	4 [1]	75 [660] 10	153 [1350] 9	309 [2733] 7	454 [4014] 6													11	
	8 [2]	75 [667] 21	158 [1395] 20	325 [2880] 17	489 [4326] 16	647 [5727] 14	784 [6937] 13	917 [8119] 11									22		
	15 [4]	73 [648] 43	159 [1405] 42	333 [2943] 38	502 [4443] 36	677 [5988] 33	830 [7342] 31	984 [8704] 29	1123 [9935] 26								44		
	23 [6]	67 [594] 65	152 [1346] 63	328 [2901] 61	502 [4439] 55	670 [5926] 51	841 [7444] 49	1010 [8940] 49	1155 [10220] 46								66		
	30 [8]	56 [494] 87	143 [1268] 85	317 [2808] 83	494 [4368] 78	678 [6002] 72	833 [7376] 67	1018 [9010] 65	1172 [10367] 65								88		
	38 [10]		129 [1141] 108	305 [2700] 105	477 [4219] 99	655 [5798] 92	830 [7345] 88	994 [8801] 85	1159 [10260] 83								109		
	45 [12]		121 [1068] 130	291 [2578] 128	465 [4113] 122	641 [5672] 115	817 [7231] 107	991 [8766] 101	1169 [10342] 100								131		
	53 [14]		103 [907] 151	275 [2437] 148	452 [4001] 145	630 [5572] 136	815 [7212] 130	972 [8604] 123	1162 [10284] 115								153		
	61 [16]		85 [755] 174	258 [2281] 172	431 [3818] 168	609 [5390] 161	790 [6991] 152	983 [8696] 144	1141 [10099] 136								175		
	68 [18]		66 [587] 196	246 [2174] 193	432 [3823] 190	583 [5161] 185	768 [6800] 171	944 [8355] 164	1131 [10012] 159								197		
	76 [20]			223 [1969] 217	391 [3459] 211	568 [5026] 206	750 [6637] 196	925 [8186] 185	1101 [9742] 176								218		
	83 [22]			193 [1704] 239	372 [3293] 236	545 [4825] 230	724 [6408] 219	909 [8049] 209	1092 [9666] 198								240		
	91 [24]			169 [1492] 261	349 [3085] 257	537 [4755] 253	698 [6179] 243										262		
	95 [25]				325 [2874] 272	507 [4491] 265	687 [6082] 254										273		
	114 [30]				255 [2258] 326	429 [3796] 320	605 [5354] 315										327		

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

Theoretical Torque - Nm [lb-in]

95 [844]	191 [1688]	381 [3376]	572 [5064]	763 [6752]	954 [8439]	1144 [10127]	1335 [11815]
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Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]

**375**

Pressure - bars [psi]

Max. Cont. Max. Inter.

17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000]	241 [3500]
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374 cc [22.8 in³/rev.]

Torque - Nm [lb-in], Speed rpm

Intermittent Ratings - 10% of Operation

2 [0.5]
4 [1]
8 [2]
15 [4]
23 [6]
30 [8]
38 [10]
45 [12]
53 [14]
61 [16]
68 [18]
76 [20]
83 [22]
91 [24]
95 [25]
114 [30]

69 [611]							
4							
74 [651]	161 [1425]	330 [2920]	494 [4369]	653 [5783]	823 [7283]		
9	8	8	7	6	5		
76 [676]	173 [1527]	354 [3133]	518 [4582]	685 [6065]	860 [7611]	1021 [9038]	
20	19	18	17	15	13	13	
73 [649]	158 [1399]	350 [3098]	535 [4731]	706 [6250]	883 [7814]	1032 [9130]	1191 [10541]
40	40	38	37	34	32	30	30
66 [588]	159 [1407]	346 [3058]	547 [4841]	712 [6300]	899 [7956]	1080 [9561]	1231 [10898]
60	60	59	57	54	49	47	45
57 [502]	147 [1301]	337 [2980]	537 [4749]	700 [6192]	898 [7948]	1088 [9628]	1236 [10941]
81	80	79	77	74	70	65	62
	134 [1190]	323 [2856]	510 [4512]	694 [6139]	887 [7849]	1066 [9437]	1246 [11029]
	101	100	99	95	90	85	79
	124 [1097]	309 [2730]	496 [4385]	679 [6009]	883 [7817]	1073 [9493]	1244 [11010]
	121	120	119	114	109	104	99
	109 [961]	290 [2563]	477 [4217]	680 [6016]	854 [7556]	1041 [9214]	1230 [10888]
	141	140	138	136	130	123	117
	82 [728]	267 [2362]	453 [4005]	637 [5641]	846 [7489]	1041 [9209]	1209 [10702]
	162	161	159	157	150	144	136
		248 [2198]	434 [3842]	619 [5474]	812 [7190]	1002 [8864]	1148 [10161]
		182	180	175	171	165	162
		229 [2026]	416 [3685]	600 [5309]	790 [6994]	979 [8664]	1145 [10137]
		202	201	199	192	183	180
		199 [1764]	385 [3406]	572 [5065]	761 [6738]	953 [8435]	1111 [9834]
		222	221	219	215	210	201
		168 [1490]	362 [3204]	566 [5007]	731 [6471]		
		243	241	240	235		
			347 [3073]	554 [4905]	721 [6384]		
			253	250	245		
			261 [2314]	440 [3891]	623 [5514]		
			303	301	300		

6
11
21
41
61
82
102
122
142
163
183
203
223
244
254
304

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

Theoretical Torque - Nm [lb-in]

103 [908]	205 [1815]	410 [3631]	615 [5446]	821 [7261]	1026 [9076]	1231 [10892]	1436 [12707]
-----------	------------	------------	------------	------------	-------------	--------------	--------------

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

Pressure - bars [psi]

Max. Cont. Max. Inter.

17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000]
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470464 cc [28.3 in³/rev.]

Torque - Nm [lb-in], Speed rpm

Intermittent Ratings - 10% of Operation

2 [0.5]
4 [1]
8 [2]
15 [4]
23 [6]
30 [8]
38 [10]
45 [12]
53 [14]
61 [16]
68 [18]
76 [20]
83 [22]
91 [24]
95 [25]
114 [30]

92 [815]	195 [1723]	374 [3306]					
3	2	1					
109 [967]	188 [1661]	418 [3701]	615 [5447]				
7	6	5	4				
99 [875]	217 [1924]	440 [3892]	668 [5910]	871 [7709]	1066 [9436]	1227 [10855]	
15	14	13	12	9	7	5	
93 [825]	213 [1887]	441 [3906]	688 [6086]	907 [8027]	1131 [10008]	1343 [11886]	
32	30	29	28	25	22	18	
85 [751]	200 [1771]	434 [3841]	686 [6074]	906 [8017]	1141 [10098]	1362 [12056]	
48	48	46	44	40	35	30	
72 [635]	186 [1645]	422 [3738]	659 [5834]	889 [7871]	1142 [10106]	1352 [11963]	
65	64	63	61	58	50	45	
53 [472]	169 [1493]	404 [3579]	639 [5657]	874 [7734]	1115 [9871]	1351 [11958]	
81	80	79	77	74	66	59	
	152 [1348]	402 [3561]	608 [5377]	855 [7563]	1111 [9836]	1340 [11861]	
	97	96	94	89	82	76	
	133 [1175]	364 [3221]	598 [5292]	833 [7374]	1090 [9643]	1319 [11673]	
	114	113	112	107	98	90	
	103 [910]	333 [2947]	569 [5037]	803 [7110]	1063 [9410]	1294 [11450]	
	130	129	128	123	114	104	
	75 [661]	305 [2701]	555 [4908]	764 [6765]	1021 [9033]	1267 [11214]	
	146	144	143	141	133	124	
		281 [2489]	507 [4490]	745 [6597]	985 [8719]	1236 [10940]	
		163	162	156	150	141	
		227 [2011]	473 [4189]	714 [6322]	948 [8391]	1182 [10462]	
		179	178	176	168	162	
		193 [1705]	432 [3827]	687 [6079]	915 [8093]		
		194	192	191	186		
			423 [3743]	651 [5759]	896 [7928]		
			204	201	191		
			321 [2840]	538 [4761]	784 [6938]		
			244	242	238		

5
9
17
33
49
66
82
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115
131
147
164
180
196
205
245

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

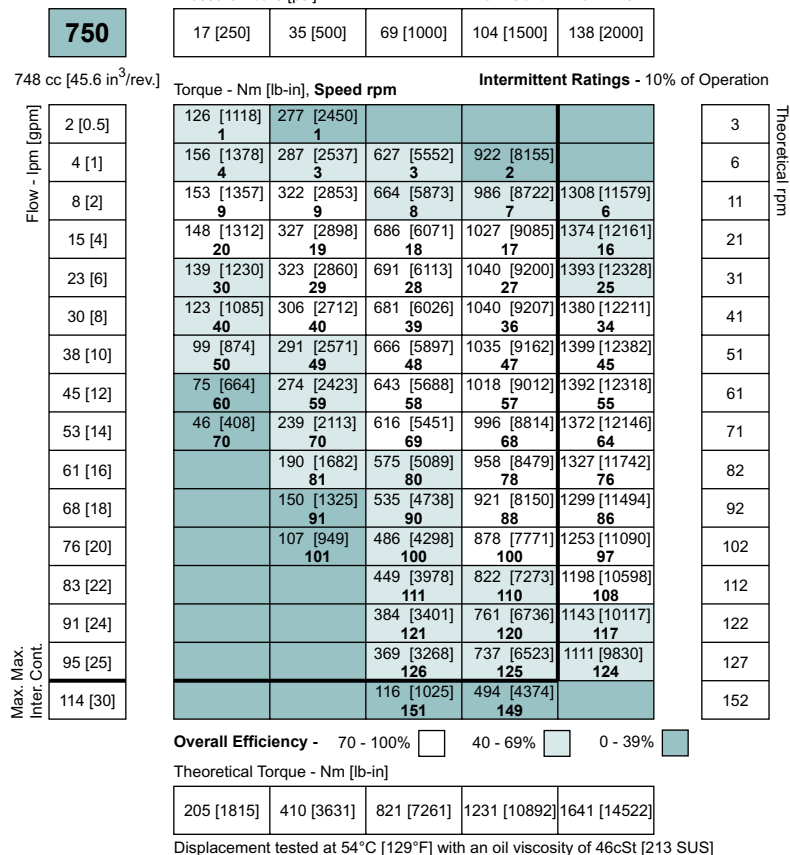
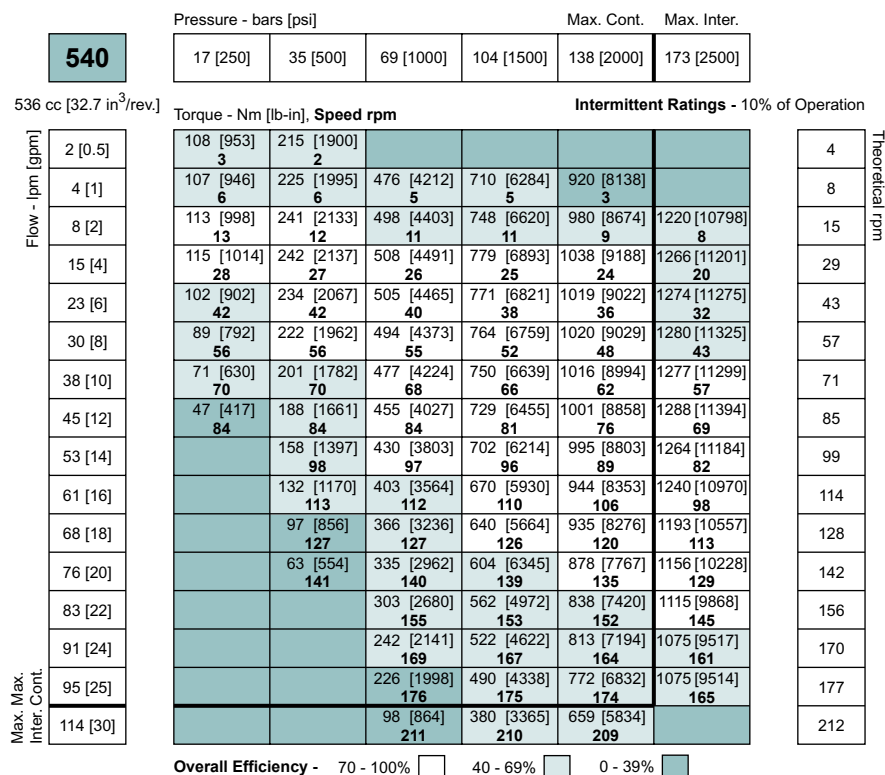
Theoretical Torque - Nm [lb-in]

127 [1127]	255 [2253]	509 [4506]	764 [6760]	1018 [9013]	1273 [11266]	1528 [13519]
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Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]



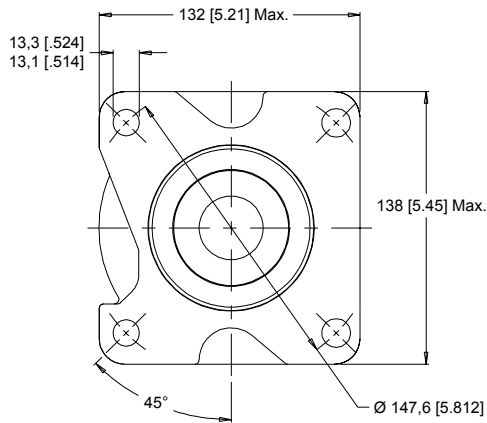
PERFORMANCE



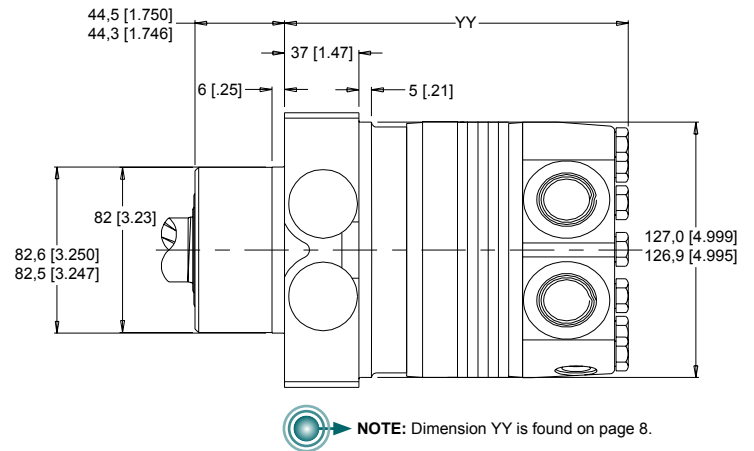


600 SERIES HOUSINGS (WHEEL & SAE A MOUNTS)

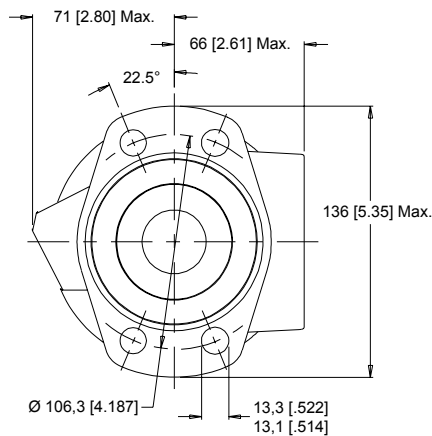
W2 4-Hole End Ports



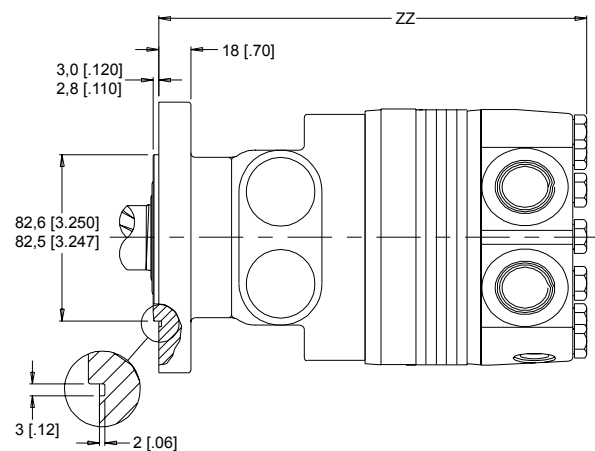
W8 4-Hole Side Ports



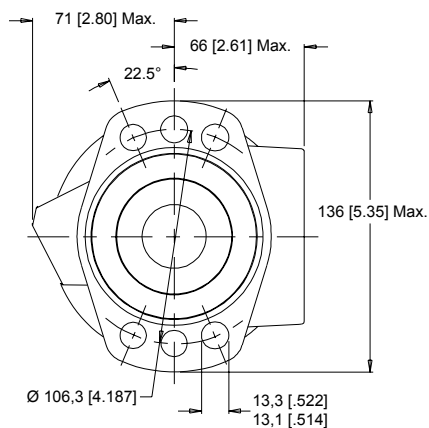
A2 4-Hole End Ports



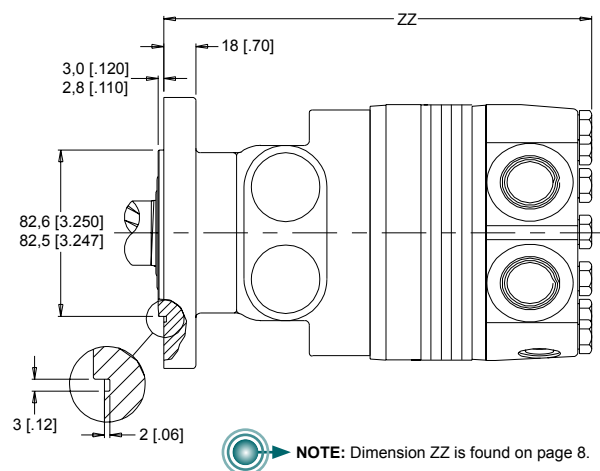
A8 4-Hole Side Ports



A4 6-Hole End Ports



A9 6-Hole Side Ports

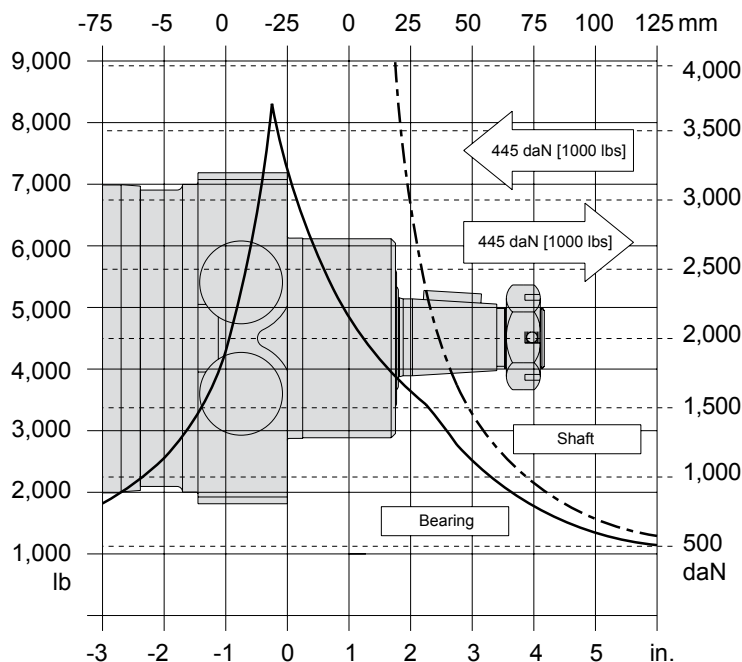




600 SERIES TECHNICAL INFORMATION

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 located below.

WHEEL MOUNT



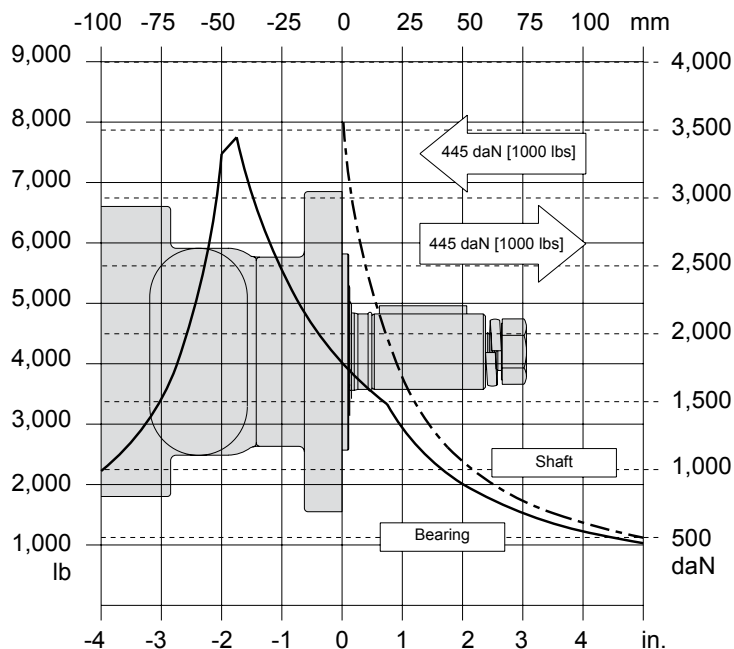
LENGTH / WEIGHT CHART Wheel Mount - Dimension YY		
Code	mm [in]	kg [lb]
200	166 [6.53]	13,4 [29.6]
260	171 [6.72]	13,9 [30.6]
300	174 [6.85]	14,6 [32.2]
350	188 [7.40]	15,7 [34.7]
375	180 [7.10]	15,2 [33.4]
470	188 [7.40]	15,7 [34.7]
540	194 [7.64]	16,2 [35.8]
750	212 [8.35]	17,7 [39.1]

NOTE:
DR motor weights vary $\pm 0,9$ kg [2 lb] depending upon motor configuration. Subtract 3 [.11] from dimensions YY for motors using the 1,2 or 5 Endcover.

LENGTH / WEIGHT CHART SAE A Mount - Dimension ZZ		
Code	mm [in]	kg [lb]
200	208 [8.19]	15,9 [35.0]
260	213 [8.37]	16,3 [36.0]
300	216 [8.50]	16,6 [36.6]
350	230 [9.06]	17,8 [39.2]
375	222 [8.75]	17,1 [37.8]
470	230 [9.06]	17,8 [39.2]
540	236 [9.29]	18,3 [40.3]
750	254 [10.00]	19,7 [43.5]

NOTE:
DR motor weights vary $\pm 0,9$ kg [2 lb] depending upon motor configuration. Subtract 3 [.11] from dimensions ZZ for motors using the 1,2 or 5 Endcover.

SAE A FLANGE

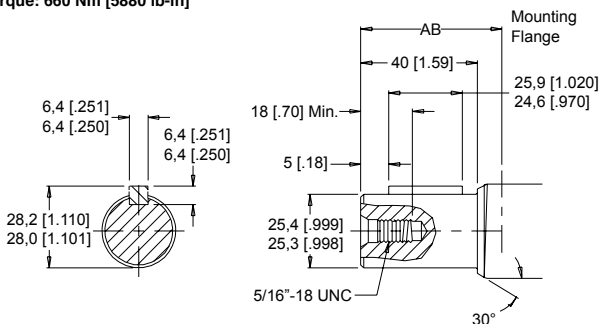


BEARING LOAD MULTIPLICATION FACTOR TABLE	
RPM	FACTOR
50	1.23
100	1.00
200	0.81
300	0.72
400	0.66
500	0.62
600	0.58
700	0.56
800	0.50



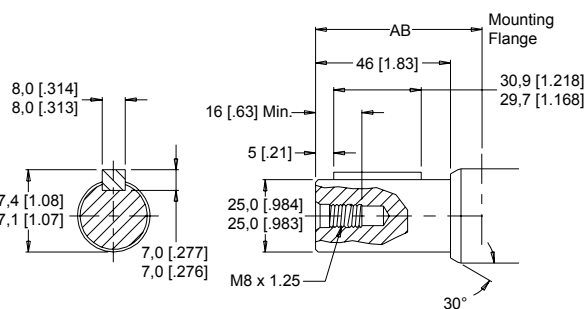
10 1" Straight

Max. Torque: 660 Nm [5880 lb-in]



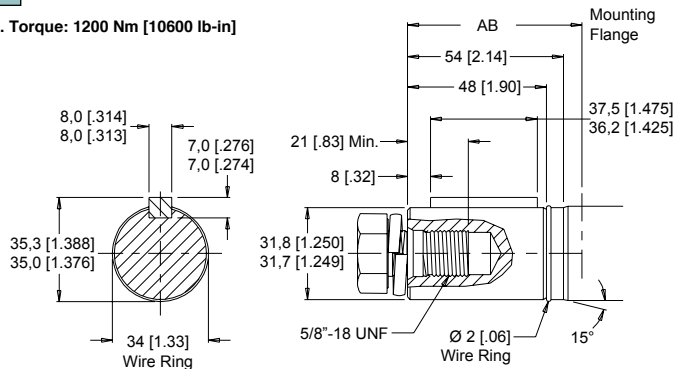
12 25mm Straight

Max. Torque: 635 Nm [5617 lb-in]



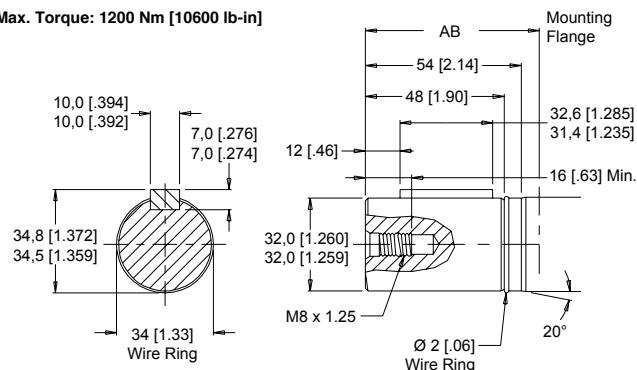
20 1-1/4" Straight

Max. Torque: 1200 Nm [10600 lb-in]



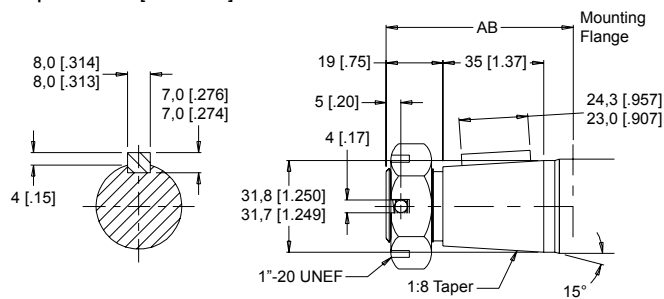
21 32mm Straight

Max. Torque: 1200 Nm [10600 lb-in]



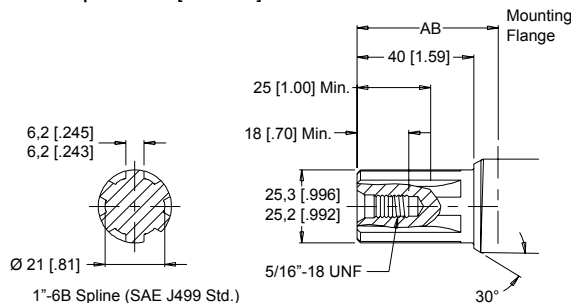
22 1-1/4" Tapered

Max. Torque: 1200 Nm [10600 lb-in]



02 6B Spline

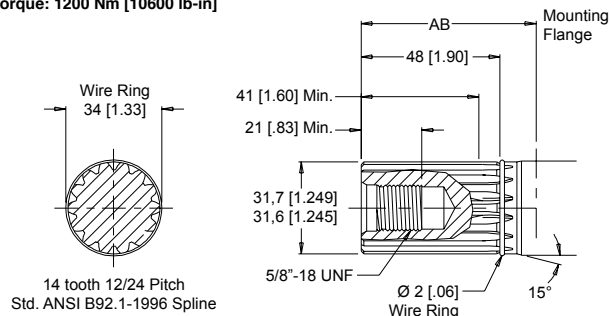
Max. Torque: 429 Nm [3800 lb-in]



Note: A slotted nut is standard on this shaft.

23 14 Tooth Spline

Max. Torque: 1200 Nm [10600 lb-in]



MOUNTING FLANGE TO SHAFT END Dimension AB		
Code	SAE A Mount mm [in]	Wheel Mount mm [in]
02	50 [1.97]	91 [3.60]
10	50 [1.97]	91 [3.60]
12	56 [2.21]	98 [3.84]
20	61 [2.41]	103 [4.05]
21	61 [2.41]	103 [4.05]
22	66 [2.58]	107 [4.22]
23	61 [2.41]	103 [4.05]

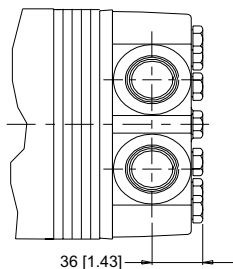


DR

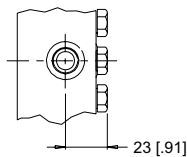
600 SERIES PORTING OPTIONS

SIDE PORTS

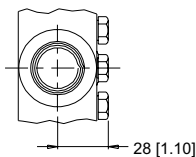
2 3/4" BSP.F with 1/4" Drain



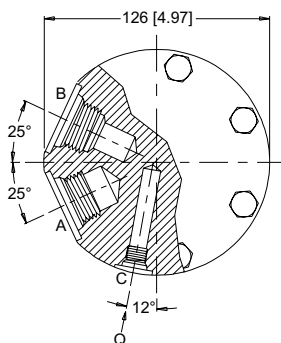
Auxiliary View Q - Case Drain



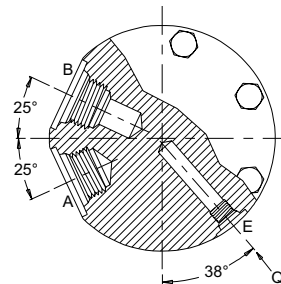
Auxiliary View V - Valve Cavity



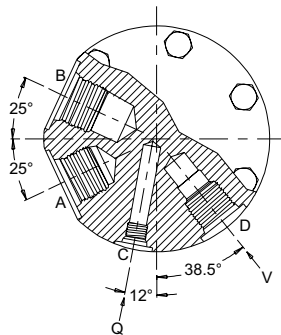
5 1-1/16" O-Ring with 7/16" Drain



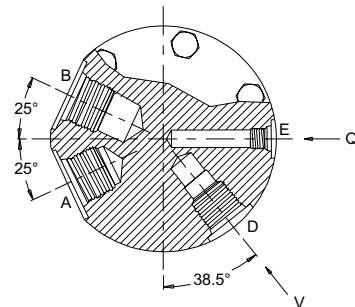
NOTE: Shown with standard case drain.



NOTE: Shown with internal drain option.

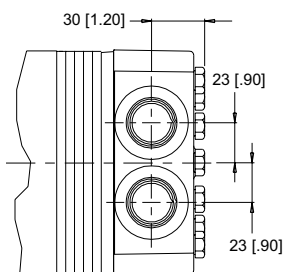


NOTE: Shown with standard case drain & valve cavity.

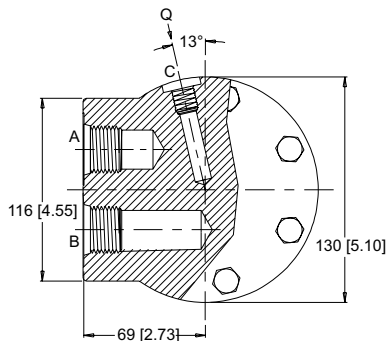


NOTE: Shown with internal drain & valve cavity.

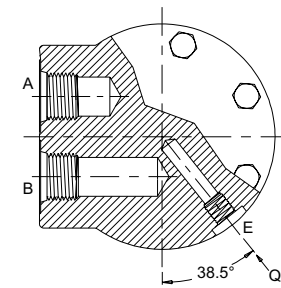
6 1-1/16" O-Ring with 7/16" Drain



7 3/4" BSP.F with 1/4" Drain



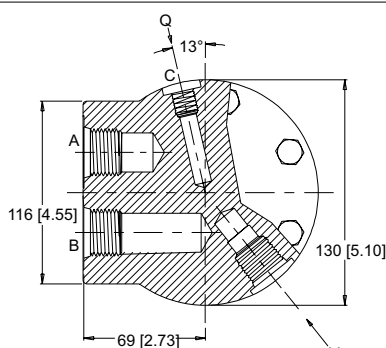
NOTE: Shown with standard case drain.



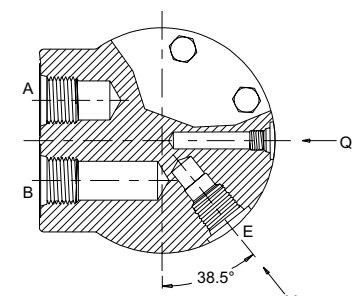
NOTE: Shown with internal drain option.



NOTE: A- Pressure Port B- Pressure Port C- Case Drain
D- 10 Series/2-way Valve Cavity (7/8"-14 UNF-2B)
E- Internal Drain



NOTE: Shown with standard case drain & valve cavity.

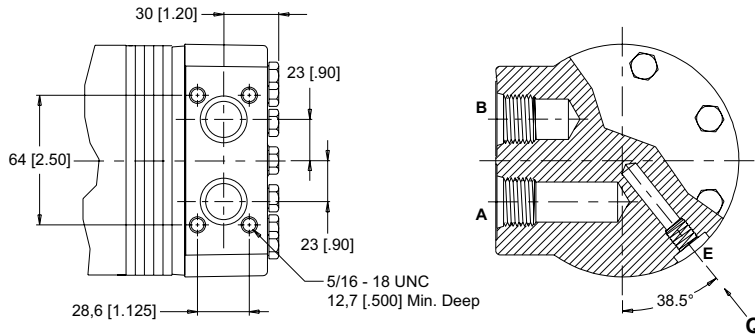


NOTE: Shown with internal drain & valve cavity.

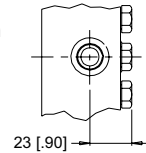


SIDE PORTS

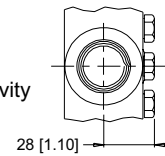
3 Manifold with 7/16" Drain



Q - Case Drain



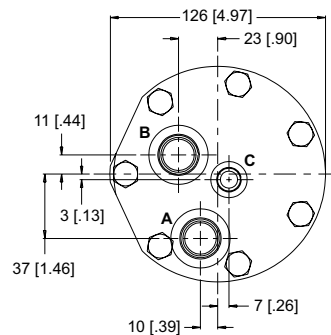
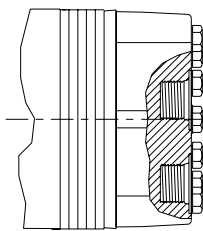
V - Valve Cavity



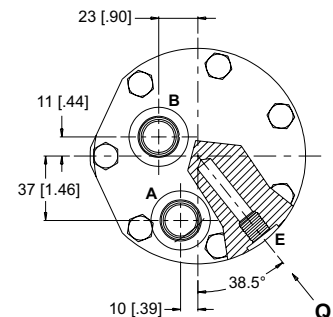
NOTE: The 3 endcover is only available with the internal drain option..

END PORTS

1 7/8" O-Ring with 7/16" Drain



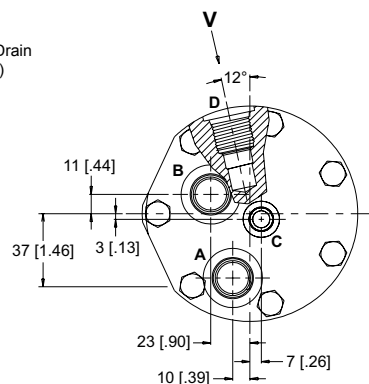
NOTE: Shown with standard case drain.



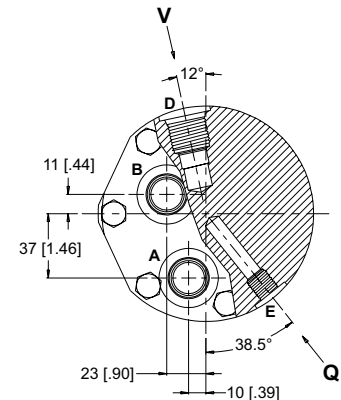
NOTE: Shown with internal drain option.



NOTE: A- Pressure Port B- Pressure Port C- Case Drain
D- 10 Series/2-way Valve Cavity (7/8"-14 UNF-2B)
E- Internal Drain



NOTE: Shown with standard case drain & valve cavity.



NOTE: Shown with internal drain & valve cavity.



600 SERIES MODEL CODE BUILDER

SERIES	DISPLACEMENT	HOUSING	SHAFT	PAINT	CAVITY	ADD ON	MISCELLANEOUS
STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7	STEP 8

STEP 1 - Select a series

600 DR Series Motor

STEP 2 - Select a displacement option

200	204 cc [12.4 in ³ /rev]	375	375 cc [22.8 in ³ /rev]
260	261 cc [15.9 in ³ /rev]	470	465 cc [28.3 in ³ /rev]
300	300 cc [18.3 in ³ /rev]	540	536 cc [32.7 in ³ /rev]
350	348 cc [21.2 in ³ /rev]	750	748 cc [45.6 in ³ /rev]

STEP 3 - Select a mounting option

NOTE: To complete the three (3) digit DR Series housing code a two (2) digit mounting option must be followed with the single (1) digit porting option found in STEP 3 part II. Side port mounting options need side port porting options and end port mounting options need end port porting options.

A2	4-Hole End Port Magneto Mount (S)
A8	4-Hole Side Port Magneto Mount (S)
A4	6-Hole End Port Magneto Mount
A9	6-Hole Side Port Magneto Mount
W2	4-Hole End Port Wheel Mount
W8	4-Hole Side Port Wheel Mount

STEP 3 (part II) - Select a porting option

END PORTS

1 7/8" O-Ring With 7/16" Drain

SIDE PORTS

2	3/4" BSP.F With 1/4" Drain (Radial Ports)
3	Manifold With 7/16" Drian (Parallel Ports)
5	1-1/16" O-Ring With 7/16" Drain (Radial Ports)
6	1-1/16" O-Ring With 7/16" Drain (Parallel Ports)
7	3/4" BSP.F With 1/4" Drain (Parallel Ports)

STEP 4 - Select a shaft option

02	6B Spline	03	6B Spline Extended (S)
10	1" Straight	15	1" Straight Extended (S)
12	25mm Straight	07	1-1/4" Straight Extended (S)
20	1-1/4" Straight	08	32mm Straight Extended (S)
21	32mm Straight	25	1-1/4" Tapered Extended (S)
22	1-1/4" Tapered	09	14 Tooth Spline Extended (S)
23	14 Tooth Spline		

NOTE: Extended shafts are intended for use when ordering a speed sensor motor. Dimensional data for these shafts are found in the DR (620) series section of this catalog.

STEP 5 - Select a paint option

A	Black
B	Black (unpainted flange face)
Z	No Paint

STEP 6 - Select a valve cavity option

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

NOTE: Valve cavity option is not available on porting option 3.

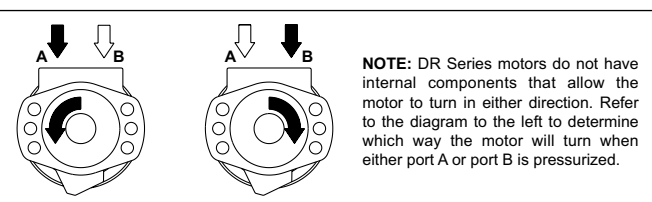
STEP 7 - Select an add on option

A	Standard
B	Lock Nut
C	Solid Hex Nut
W	4-Pin Dual Male Weatherpack Connector (S)
X	4-Pin M12 Dual Male Connector (S)
Y	3-Pin Single Male Weatherpack Connector (S)
Z	4-Pin M12 Single Male Connector (S)

NOTE: (S) - STEP 3 Mountings available for use with speed sensors. STEP 4 Shafts available for use with speed sensors. STEP 7 Speed sensor options.

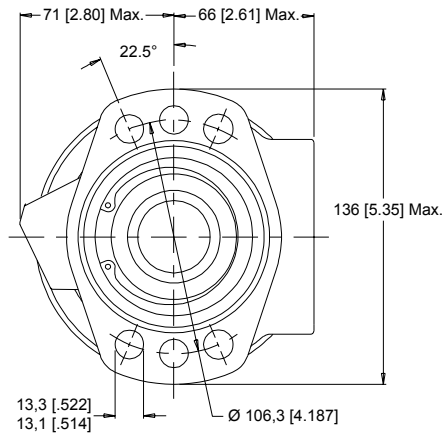
STEP 8 - Select a miscellaneous option

AA	None
AB	Internal Drain
AC	Freeturning Rotor
AD	Internal Drain with Freeturning Rotor

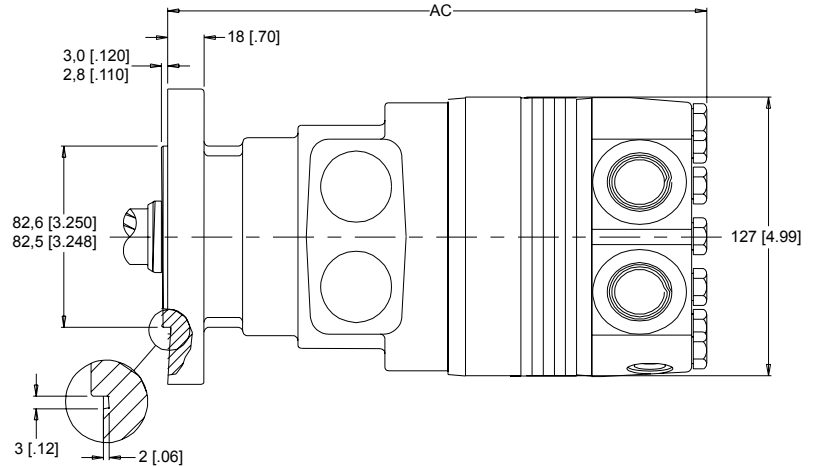




A4 6-Hole End Ports

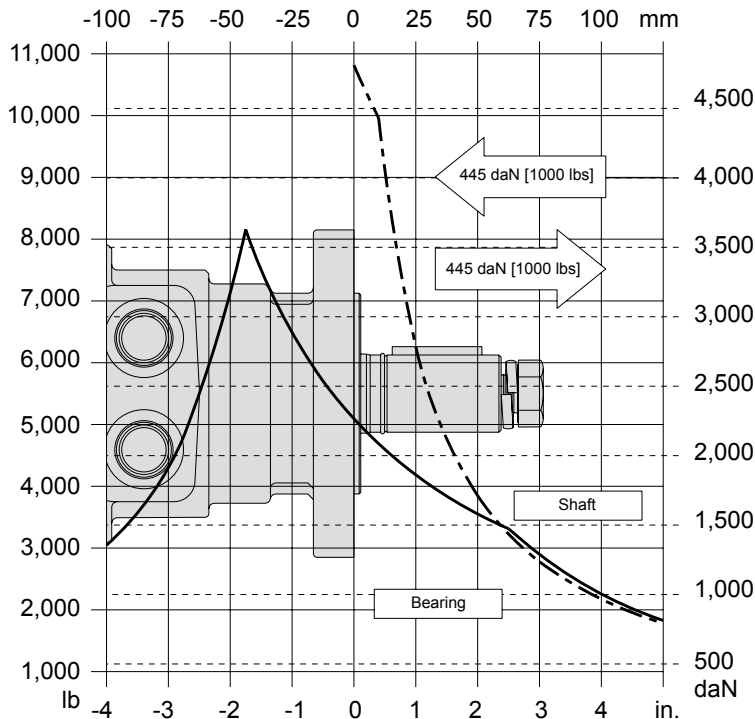


A9 6-Hole Side Ports



ALLOWABLE BEARING AND SHAFT LOADS

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 located on page 8.



LENGTH / WEIGHT CHART SAE A Mount - Dimension AC		
Code	mm [in]	kg [lb]
200	234 [9.19]	16,1 [35.4]
260	238 [9.38]	16,2 [35.6]
300	242 [9.51]	16,9 [37.2]
350	256 [10.06]	18,0 [39.6]
375	248 [9.76]	17,4 [38.3]
470	256 [10.06]	18,0 [39.6]
540	262 [10.30]	18,5 [40.7]
750	280 [11.01]	20,0 [44.0]

NOTE:
DR motor weights vary $\pm 0,9$ kg [2 lb] depending upon motor configuration. Subtract 3 [.11] from dimension AC for motors using the 1,2 or 5 Endcover.

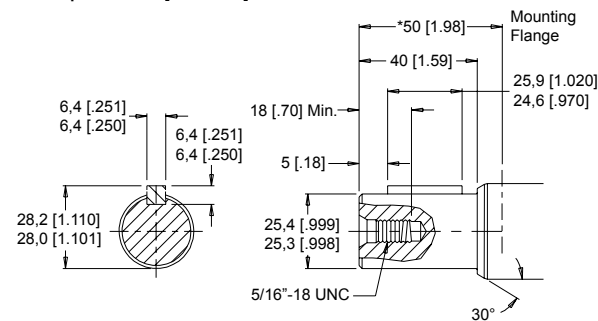


DR

620 SERIES SHAFTS

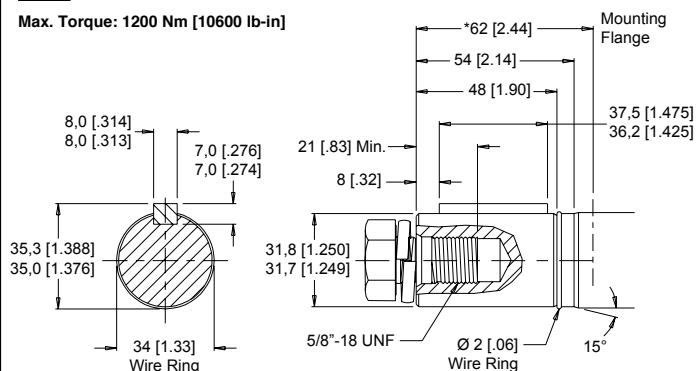
15 1" Straight

Max. Torque: 660 Nm [5880 lb-in]



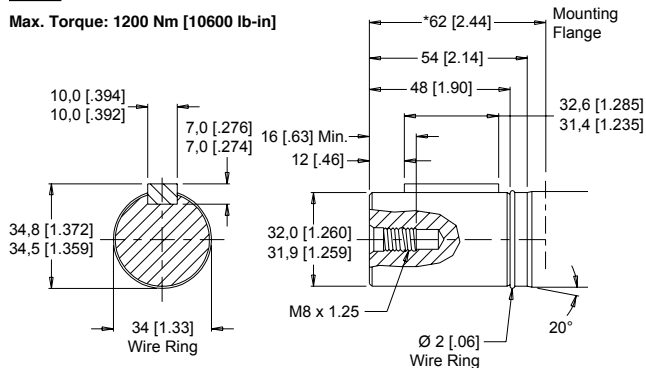
07 1-1/4" Straight

Max. Torque: 1200 Nm [10600 lb-in]



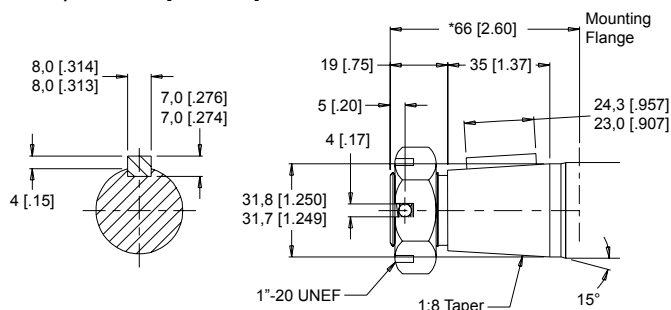
08 32mm Straight

Max. Torque: 1200 Nm [10600 lb-in]



25 1-1/4" Tapered

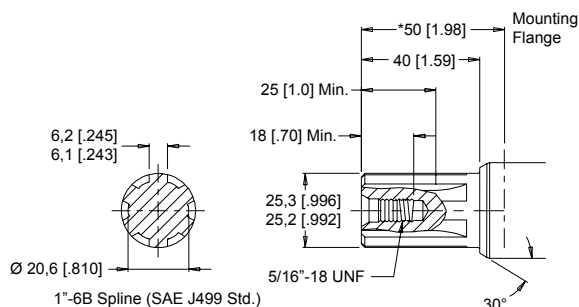
Max. Torque: 1200 Nm [10600 lb-in]



Note: A slotted nut is standard on this shaft.

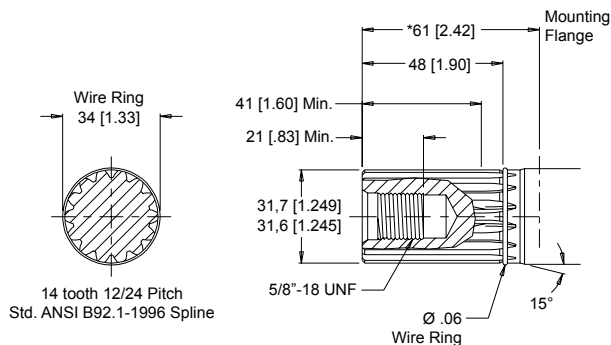
03 6B Spline

Max. Torque: 429 Nm [3800 lb-in]



09 14 Tooth Spline

Max. Torque: 1200 Nm [10600 lb-in]



NOTE: *Shaft lengths vary ± 0.8 [0.030]



620 SERIES MODEL CODE BUILDER

SERIES	DISPLACEMENT	HOUSING	SHAFT	PAINT	CAVITY	ADD ON	MISCELLANEOUS
STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7	STEP 8

STEP 1 - Select a series

620 DR Series Motor

STEP 2 - Select a displacement option

200	204 cc [12.4 in ³ /rev]	375	375 cc [22.8 in ³ /rev]
260	261 cc [15.9 in ³ /rev]	470	465 cc [28.3 in ³ /rev]
300	300 cc [18.3 in ³ /rev]	540	536 cc [32.7 in ³ /rev]
350	348 cc [21.2 in ³ /rev]	750	748 cc [45.6 in ³ /rev]

STEP 3 - Select a mounting option

NOTE: To complete the three (3) digit DR Series housing code a two (2) digit mounting option must be followed with the single (1) digit porting option found in STEP 3 part II. Side port mounting options need side port porting options and end port mounting options need end port porting options.

A4 6-Hole End Port Magneto Mount
A9 6-Hole Side Port Magneto Mount

STEP 3 (part II) - Select a porting option

END PORTS

1 7/8" O-Ring With 7/16" Drain

SIDE PORTS

2	3/4" BSP.F With 1/4" Drain (Radial Ports)
3	Manifold With 7/16" Drian (Parallel Ports)
5	1-1/16" O-Ring With 7/16" Drain (Radial Ports)
6	1-1/16" O-Ring With 7/16" Drain (Parallel Ports)
7	3/4" BSP.F With 1/4" Drain (Parallel Ports)

STEP 4 - Select a shaft option

03	6B Spline
07	1-1/4" Straight
08	32mm Straight
09	14 Tooth Spline
15	1" Straight
25	1-1/4" Tapered

STEP 5 - Select a paint option

A Black
B Black (unpainted flange face)
Z No Paint

STEP 6 - Select a valve cavity option

A None
B Relief Valve Cavity
C 1000 psi Relief Valve Installed
D 1250 psi Relief Valve Installed
E 1500 psi Relief Valve Installed
F 1750 psi Relief Valve Installed
G 2000 psi Relief Valve Installed
J 2500 psi Relief Valve Installed
L 3000 psi Relief Valve Installed

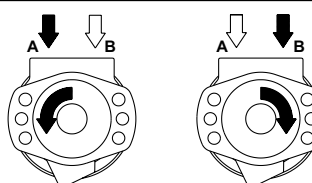
NOTE: Valve cavity option is not available on porting option 3.

STEP 7 - Select an add on option

A Standard
B Lock Nut
C Solid Hex Nut

STEP 8 - Select a miscellaneous option

AA None
AB Internal Drain
AC Freeturning Rotor
AD Internal Drain with Freeturning Rotor

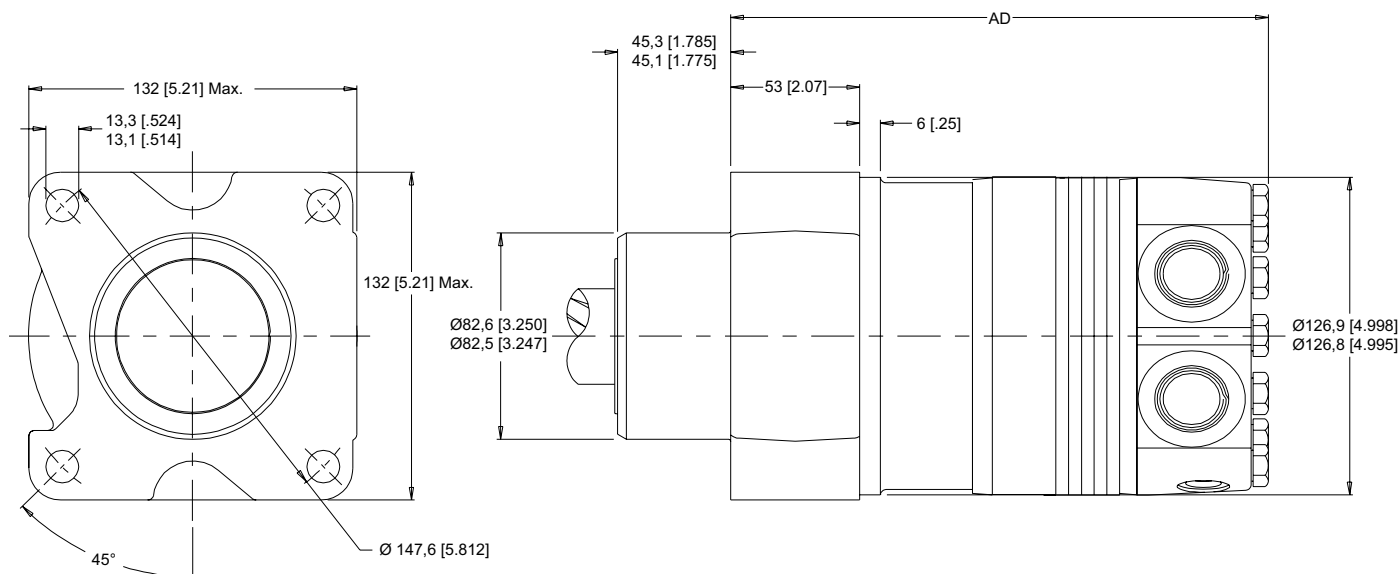


NOTE: DR Series motors do not have internal components that allow the motor to turn in either direction. Refer to the diagram to the left to determine which way the motor will turn when either port A or port B is pressurized.



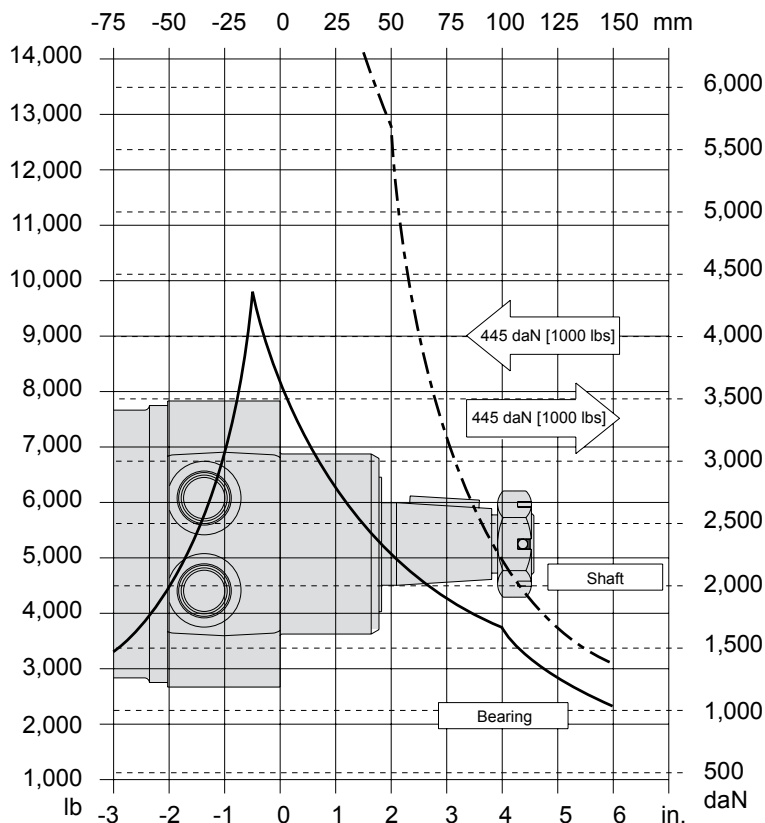
W2 4-Hole End Ports

W8 4-Hole Side Ports



ALLOWABLE BEARING AND SHAFT LOADS

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 located on page 8.



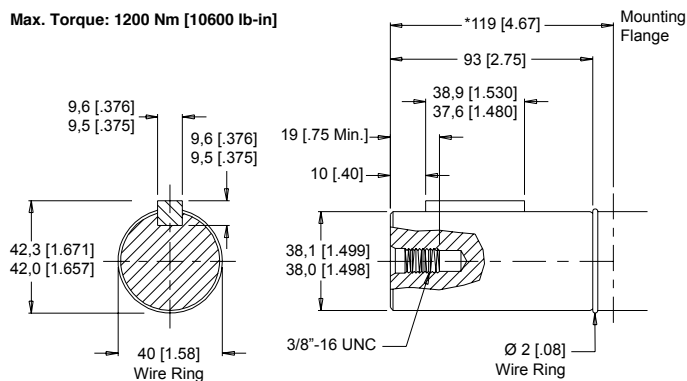
LENGTH / WEIGHT CHART		
Wheel Mount - Dimension AD		
Code	mm [in]	kg [lb]
200	202 [7.96]	17,5 [38.5]
260	207 [8.15]	17,9 [39.5]
300	210 [8.28]	18,2 [40.1]
350	224 [8.83]	19,3 [42.6]
375	217 [8.53]	18,7 [41.2]
470	224 [8.83]	19,3 [42.6]
540	230 [9.07]	19,8 [43.7]
750	248 [9.78]	21,3 [47.0]

NOTE:
DR motor weights vary $\pm 0,9$ kg [2 lb] depending upon motor configuration. Subtract 3 [1.1] from dimension AD for motors using the 1,2 or 5 Endcover.



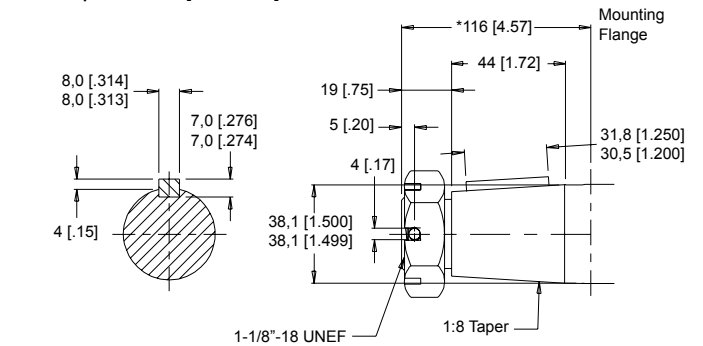
30 1-1/2" Straight

Max. Torque: 1200 Nm [10600 lb-in]



31 1-1/2" Tapered

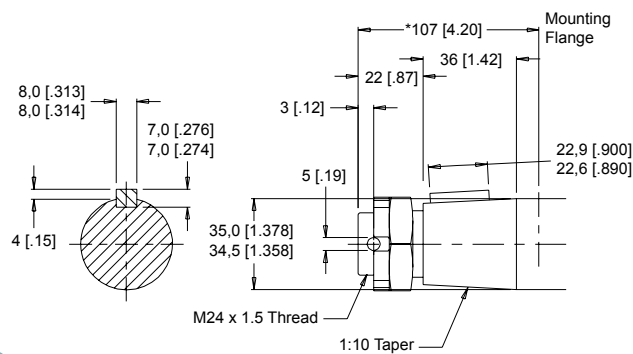
Max. Torque: 1200 Nm [10600 lb-in]



NOTE: A slotted nut is standard on this shaft.

28 35mm Tapered

Max. Torque: 1200 Nm [10600 lb-in]



NOTE: A slotted nut is standard on this shaft.



NOTE: *Shaft lengths vary ± 0.8 [.030]



630 SERIES MODEL CODE BUILDER

SERIES	DISPLACEMENT	HOUSING	SHAFT	PAINT	CAVITY	ADD ON	MISCELLANEOUS
STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7	STEP 8

STEP 1 - Select a series

630 DR Series Motor

STEP 2 - Select a displacement option

200	204 cc [12.4 in ³ /rev]	375	375 cc [22.8 in ³ /rev]
260	261 cc [15.9 in ³ /rev]	470	465 cc [28.3 in ³ /rev]
300	300 cc [18.3 in ³ /rev]	540	536 cc [32.7 in ³ /rev]
350	348 cc [21.2 in ³ /rev]	750	748 cc [45.6 in ³ /rev]

STEP 3 - Select a mounting option

NOTE: To complete the three (3) digit DR Series housing code a two (2) digit mounting option must be followed with the single (1) digit porting option found in STEP 3 part II. Side port mounting options need side port porting options and end port mounting options need end port porting options.

W2 4-Hole End Port Wheel Mount
W8 4-Hole Side Port Wheel Mount

STEP 3 (part II) - Select a porting option

END PORTS

1 7/8" O-Ring With 7/16" Drain

SIDE PORTS

2 3/4" BSP.F With 1/4" Drain (Radial Ports)
3 Manifold With 7/16" Drain (Parallel Ports)
5 1-1/16" O-Ring With 7/16" Drain (Radial Ports)
6 1-1/16" O-Ring With 7/16" Drain (Parallel Ports)
7 3/4" BSP.F With 1/4" Drain (Parallel Ports)

STEP 4 - Select a shaft option

28 35mm Tapered
30 1-1/2" Straight
31 1-1/2" Tapered

STEP 5 - Select a paint option

A Black
B Black (unpainted flange face)
Z No Paint

STEP 6 - Select a valve cavity option

A None
B Relief Valve Cavity
C 1000 psi Relief Valve Installed
D 1250 psi Relief Valve Installed
E 1500 psi Relief Valve Installed
F 1750 psi Relief Valve Installed
G 2000 psi Relief Valve Installed
J 2500 psi Relief Valve Installed
L 3000 psi Relief Valve Installed

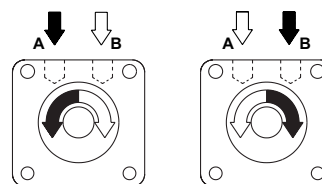
NOTE: Valve cavity option is not available on porting option 3.

STEP 7 - Select an add on option

A Standard
C Solid Hex Nut

STEP 8 - Select a miscellaneous option

AA None
AB Internal Drain
AC Freeturning Rotor
AD Internal Drain with Freeturning Rotor



NOTE: DR Series motors do not have internal components that allow the motor to turn in either direction. Refer to the diagram to the left to determine which way the motor will turn when either port A or port B is pressurized.



610 SERIES (DR MOTOR/BRAKE)

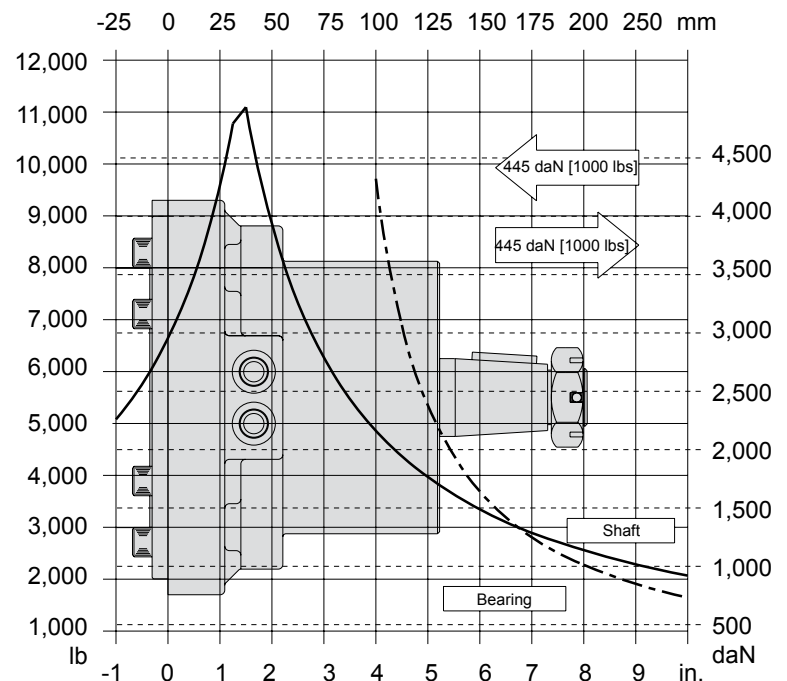
W8 4-Hole Side Ports



NOTE: Dimension AE is found on page 20.



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 located on page 8.



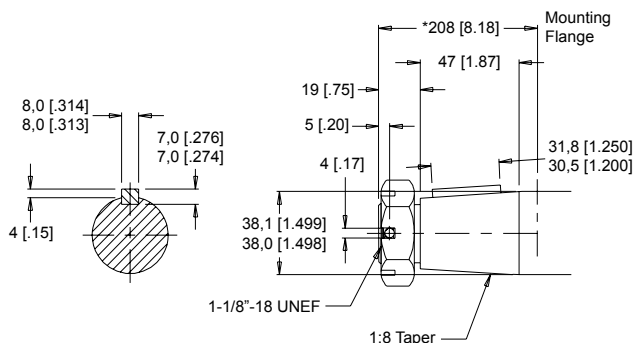


DR

610 SERIES SHAFTS

31 1-1/2" Tapered

Max. Torque: 1200 Nm [10600 lb-in]



NOTE: A slotted nut is standard on this shaft. *Shaft lengths vary $\pm 0,8$ [.030].

LENGTH / WEIGHT CHART Motor/Brake - Dimension AE

Code	mm [in]	kg [lb]
200	107 [4.22]	26,5 [58.4]
260	112 [4.41]	26,9 [59.4]
300	115 [4.54]	27,2 [60.0]
350	129 [5.09]	28,3 [62.5]
375	122 [4.79]	27,7 [61.1]
470	129 [5.09]	28,3 [62.5]
540	135 [5.33]	28,8 [63.6]
750	153 [6.04]	30,3 [66.9]

NOTE:

DR motor weights vary $\pm 0,9$ kg [2 lb] depending upon motor configuration. Subtract 3 [.11] from dimension AE for motors using the 1,2 or 5 Endcover.

SERIES	DISPLACEMENT	HOUSING	SHAFT	PAINT	CAVITY	ADD ON	MISCELLANEOUS
STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7	STEP 8

STEP 1 - Select a series

610 DR Series Motor/Brake

STEP 2 - Select a displacement option

200	204 cc [12.4 in ³ /rev]	375	375 cc [22.8 in ³ /rev]
260	261 cc [15.9 in ³ /rev]	470	465 cc [28.3 in ³ /rev]
300	300 cc [18.3 in ³ /rev]	540	536 cc [32.7 in ³ /rev]
350	348 cc [21.2 in ³ /rev]	750	748 cc [45.6 in ³ /rev]

STEP 3 - Select a mounting option

NOTE: To complete the three (3) digit DR Series housing code a two (2) digit mounting option must be followed with the single (1) digit porting option found in STEP 3 part II. Side port mounting options need side port porting options and end port mounting options need end port porting options.

W2	4-Hole End Port Wheel Mount
W8	4-Hole Side Port Wheel Mount

STEP 3 (part II) - Select a porting option

END PORTS

1	7/8" O-Ring With 7/16" Drain
---	------------------------------

SIDE PORTS

2	3/4" BSP.F With 1/4" Drain (Radial Ports)
3	Manifold With 7/16" Drian (Parallel Ports)
5	1-1/16" O-Ring With 7/16" Drain (Radial Ports)
6	1-1/16" O-Ring With 7/16" Drain (Parallel Ports)
7	3/4" BSP.F With 1/4" Drain (Parallel Ports)

STEP 4 - Select a shaft option

31 1-1/2" Tapered

STEP 5 - Select a paint option

A	Black
Z	No Paint

STEP 6 - Select a valve cavity option

A	None
B	Relief Valve Cavity
C	1000 psi Relief Valve Installed
D	1250 psi Relief Valve Installed
E	1500 psi Relief Valve Installed
F	1750 psi Relief Valve Installed
G	2000 psi Relief Valve Installed
J	2500 psi Relief Valve Installed
L	3000 psi Relief Valve Installed

NOTE: Valve cavity option is not available on porting option 3.

STEP 7 - Select an add on option

A	Standard
C	Solid Hex Nut

STEP 8 - Select a miscellaneous option

AA	None
AC	Freeturning Rotor



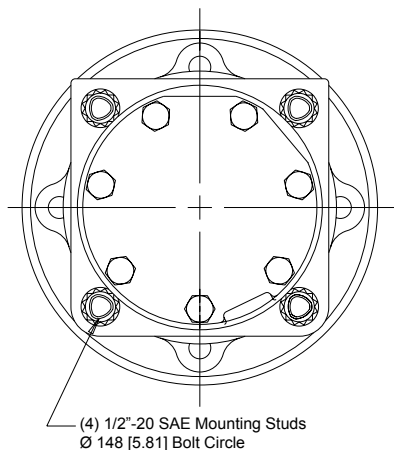
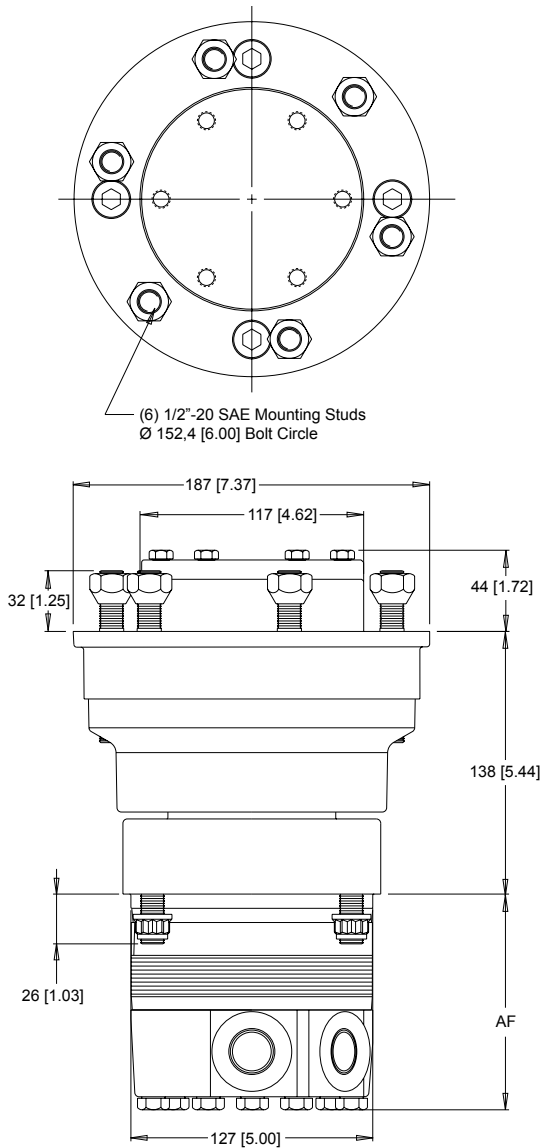
NOTE: The DR 610 series motor/brakes are available with different holding torque specifications. For additional information please contact White Drive Products Customer Service & Technical Support or your local White Drive Products' distributor.



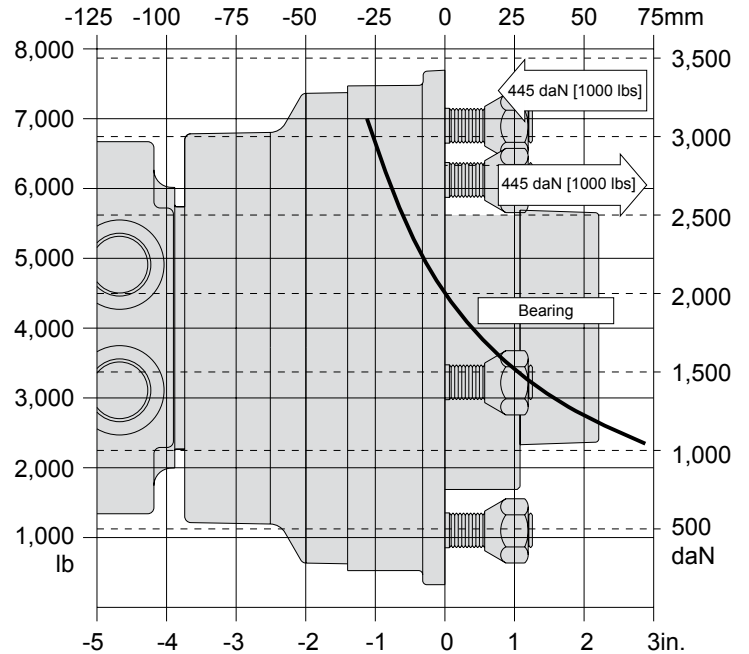
640 SERIES HOUSINGS

W2 4-Hole End Ports

W8 4-Hole Side Ports



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 located on page 8.



LENGTH / WEIGHT CHART
Wheel Mount - Dimension AF

Code	mm [in]	kg [lb]
200	112 [4.42]	24,4 [53.9]
260	117 [4.61]	24,8 [54.7]
300	120 [4.74]	25,2 [55.5]
350	134 [5.29]	26,3 [57.9]
375	127 [4.99]	25,7 [56.7]
470	134 [5.29]	26,3 [57.9]
540	141 [5.53]	26,8 [59.1]
750	159 [6.24]	28,2 [62.2]

NOTE:

DR motor weights vary $\pm 0,9$ kg [2 lb] depending upon motor configuration. Subtract 3 [1.1] from dimension AF for motors using the 1,2 or 5 Endcover.



640 SERIES MODEL CODE BUILDER

SERIES	DISPLACEMENT	HOUSING	SHAFT	PAINT	CAVITY	ADD ON	MISCELLANEOUS
STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7	STEP 8

STEP 1 - Select a series

640	DR Series 125mm Bearing Wheel Hub Motor
-----	---

STEP 2 - Select a displacement option

200	204 cc [12.4 in ³ /rev]	375	375 cc [22.8 in ³ /rev]
260	261 cc [15.9 in ³ /rev]	470	465 cc [28.3 in ³ /rev]
300	300 cc [18.3 in ³ /rev]	540	536 cc [32.7 in ³ /rev]
350	348 cc [21.2 in ³ /rev]	750	748 cc [45.6 in ³ /rev]

STEP 3 - Select a mounting option

NOTE: To complete the three (3) digit DR Series housing code a two (2) digit mounting option must be followed with the single (1) digit porting option found in STEP 3 part II. Side port mounting options need side port porting options and end port mounting options need end port porting options.

W2	4-Hole End Port Wheel Mount
W8	4-Hole Side Port Wheel Mount

STEP 3 (part II) - Select a porting option

END PORTS

1	7/8" O-Ring With 7/16" Drain
---	------------------------------

SIDE PORTS

2	3/4" BSP.F With 1/4" Drain (Radial Ports)
3	Manifold With 7/16" Drain (Parallel Ports)
5	1-1/16" O-Ring With 7/16" Drain (Radial Ports)
6	1-1/16" O-Ring With 7/16" Drain (Parallel Ports)
7	3/4" BSP.F With 1/4" Drain (Parallel Ports)

STEP 4 - Select a shaft option

61	6-Bolt Wheel Flange
----	---------------------

STEP 5 - Select a paint option

A	Black
Z	No Paint

STEP 6 - Select a valve cavity option

A	None
B	Relief Valve Cavity
C	1000 psi Relief Valve Installed
D	1250 psi Relief Valve Installed
E	1500 psi Relief Valve Installed
F	1750 psi Relief Valve Installed
G	2000 psi Relief Valve Installed
J	2500 psi Relief Valve Installed
L	3000 psi Relief Valve Installed

NOTE: Valve cavity option is not available on porting option 3.

STEP 7 - Select an add on option

A	Standard
H	Locking Hub

STEP 8 - Select a miscellaneous option

AA	None
AB	Internal Drain
AC	Freeturning Rotor
AD	Internal Drain with Freeturning Rotor

OPERATING AND TECHNICAL INFORMATION

WHITE DRIVE PRODUCT MOTOR/BRAKE PRECAUTION

CAUTION! - White Drive Products' motors/brakes are intended to operate as static or parking brakes. System circuitry must be designed to bring the load to a stop before applying the brake.

CAUTION! - Because it is possible for some large displacement motors to overpower the brake, it is critical that the maximum system pressure be limited for these applications. Failure to do so could cause serious injury or death. When choosing a motor/brake for an application, consult the performance chart for the series and displacement chosen for the application to verify that the maximum operating pressure of the system will not allow the motor to produce more torque than the maximum rating of the brake. Also, it is vital that the system relief be set low enough to insure that the motor is not able to overpower the brake.

To ensure proper operation of the brake, case drain back pressure must be maintained at 34 bar [500 psi] or less. Case drain back pressure above 34 bar [500 psi] can result in erratic operation of the brake. To avoid potential problems with the operation of the brake, a separate case drain line is recommended. Use of the internal drain option is not recommended due to the possibility of return line pressure spikes. A simple schematic of a system utilizing a motor/brake is shown in Figure A below. Although maximum brake release pressure may be used for an application, a 34 bar [500 psi] pressure reducing valve is recommended to promote maximum life for the brake release piston seals. However, if a pressure reducing valve is used in a system which has case drain back pressure, the pressure reducing valve should be set to 34 bar [500 psi] over the expected case pressure to ensure full brake release. To achieve proper brake release operation, it is necessary to bleed out any trapped air and fill brake release cavity and hoses before all connections are tightened. To facilitate this operation, all motor/brakes feature two release ports. One or both of these ports may be used to release the brake in the unit. Motor/brakes should be configured so that the release ports are near the top of the unit in the installed position. Once all system connections are made, one release port must be opened to atmosphere and the brake release line carefully charged with fluid until all air is removed from the line and motor/brake release cavity. When this has been accomplished the port plug or secondary release line must be reinstalled. In the event of a pump or battery failure, an external pressure source may be connected to the brake release port to release the brake, allowing the machine to be moved.

Typical motor/brake schematic

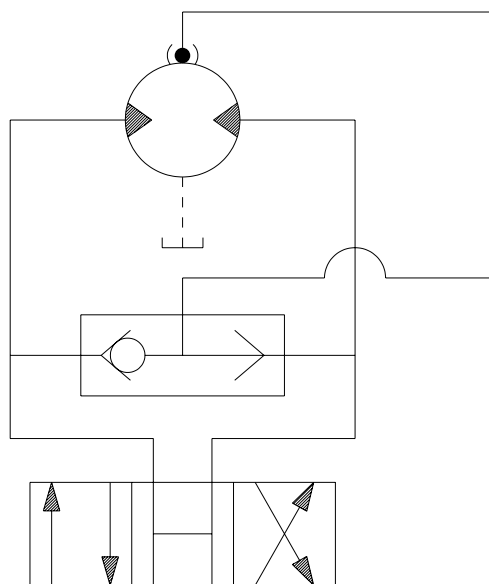


Figure A



NOTE: It is vital that all operating recommendations be followed. Failure to do so could result in injury or death.



Delivering The Power To Get Work Done.

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