

# WS (365/366 Series)

## Heavy Duty Hydraulic Motor

### OVERVIEW

The WS targets agricultural equipment, skid steer attachments, and other applications that require greater torque under demanding conditions. A distinguishing feature of the WS in relation to competitive products is its heavy duty drive link with a larger pitch diameter. This enables the WS to better withstand pressure and torque spikes and is reflected in its intermittent and peak performance ratings.

Additional product features include a three zone commutator valve, heavy-duty tapered roller bearings, and case drain with integral internal drain.

### FEATURES / BENEFITS

- Ten shaft and six mounting options to meet the most common SAE and European requirements.
- Heavy-duty tapered roller bearings for extra side load capacity.
- Heavy-duty drive link with larger pitch diameter than competitors for greater resistance to pressure and torque spikes.
- Three zone commutator valve for high flow capacity.
- Standard case drain with integral internal drain for extended shaft seal life.

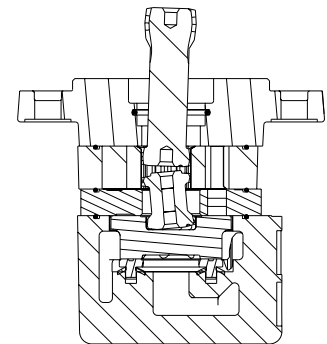
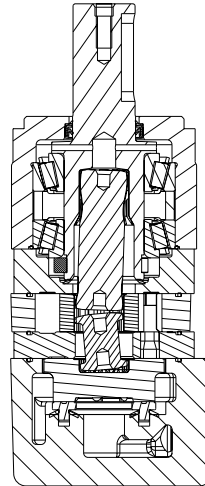
### TYPICAL APPLICATIONS

Heavy-duty wheel drives, sweepers, grain augers, spreaders, feed rollers, brush drives, mowers, harvesting equipment gear box mounts and more

### SERIES DESCRIPTIONS

**365/366 - Hydraulic Motor**  
*Compact*

**365-366 - Hydraulic Motor**  
*Short Motor*



### SPECIFICATIONS

CODE	Displacement cm <sup>3</sup> [in <sup>3</sup> /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
080	79 [4.8]	843	929	68 [18]	76 [20]	230 [2036]	305 [2699]	207 [3000]	276 [4000]	310 [4500]
100	100 [6.1]	756	945	76 [20]	95 [25]	270 [2390]	362 [3204]	207 [3000]	276 [4000]	310 [4500]
110	112 [6.8]	669	837	76 [20]	95 [25]	312 [2761]	418 [3699]	207 [3000]	276 [4000]	310 [4500]
130	129 [7.9]	588	734	76 [20]	95 [25]	370 [3328]	499 [4416]	207 [3000]	276 [4000]	310 [4500]
160	161 [9.8]	471	707	76 [20]	114 [30]	472 [4177]	627 [5549]	207 [3000]	276 [4000]	310 [4500]
200	201 [12.3]	377	566	76 [20]	114 [30]	579 [5124]	765 [6770]	207 [3000]	276 [4000]	310 [4500]
230	229 [14.0]	330	495	76 [20]	114 [30]	655 [5779]	872 [7717]	207 [3000]	276 [4000]	310 [4500]
250	248 [15.1]	305	459	76 [20]	114 [30]	657 [5814]	769 [6806]	190 [2750]	224 [3250]	259 [3750]
320	322 [19.6]	235	352	76 [20]	114 [30]	861 [7620]	1003 [8877]	190 [2750]	224 [3250]	259 [3750]
400	396 [24.2]	191	285	76 [20]	114 [30]	858 [7593]	1048 [9275]	155 [2250]	190 [2750]	224 [3250]
500	495 [30.2]	153	229	76 [20]	114 [30]	851 [7531]	1064 [9416]	121 [1750]	155 [2250]	172 [2500]

▶ Performance data is typical. Performance of production units varies slightly from one motor to another. Running at intermittent ratings should not exceed 10% of every minute of operation.

**DISPLACEMENT PERFORMANCE**

► Performance data is typical. Performance of production units varies slightly from one motor to another. Operating at maximum continuous pressure and maximum continuous flow simultaneously is not recommended. For additional information on product testing please refer to page 6.

		Pressure - bar [psi]								Max. Cont.	Max. Inter.	
<b>080</b>		17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	207 [3000]	242 [3500]	276 [4000]		
79 cm <sup>3</sup> [4.8 in <sup>3</sup> ] / rev		Intermittent Ratings are below and to the right of the BOLD line. Intermittent Ratings - 10% of Operation										
Flow - lpm [gpm]	2 [0.5]	18 [159] <b>23</b>	38 [336] <b>22</b>	74 [655] <b>19</b>								25
	4 [1]	18 [159] <b>50</b>	40 [354] <b>47</b>	77 [682] <b>42</b>	115 [1018] <b>38</b>	150 [1328] <b>30</b>	182 [1611] <b>23</b>					51
	8 [2]	18 [159] <b>100</b>	39 [345] <b>96</b>	77 [682] <b>91</b>	117 [1036] <b>82</b>	154 [1363] <b>74</b>	192 [1699] <b>63</b>	224 [1983] <b>53</b>				101
	15 [4]	18 [159] <b>187</b>	39 [345] <b>182</b>	78 [690] <b>179</b>	118 [1044] <b>169</b>	156 [1381] <b>154</b>	194 [1717] <b>138</b>	230 [2036] <b>126</b>	260 [2301] <b>107</b>			190
	23 [6]	17 [150] <b>290</b>	37 [327] <b>282</b>	77 [682] <b>272</b>	116 [1027] <b>264</b>	155 [1372] <b>248</b>	192 [1699] <b>229</b>	223 [1974] <b>217</b>	264 [2337] <b>193</b>	302 [2673] <b>168</b>		291
	30 [8]	16 [142] <b>379</b>	36 [319] <b>369</b>	76 [673] <b>348</b>	117 [1036] <b>349</b>	155 [1372] <b>335</b>	194 [1717] <b>315</b>	224 [1983] <b>300</b>	266 [2354] <b>277</b>	304 [2691] <b>242</b>		380
	38 [10]	14 [124] <b>480</b>	34 [301] <b>468</b>	73 [646] <b>457</b>	114 [1009] <b>451</b>	153 [1354] <b>435</b>	191 [1690] <b>414</b>	230 [2036] <b>390</b>	265 [2345] <b>383</b>	305 [2699] <b>340</b>		481
	45 [12]	13 [115] <b>565</b>	33 [292] <b>556</b>	72 [637] <b>544</b>	113 [1000] <b>537</b>	152 [1345] <b>518</b>	190 [1682] <b>496</b>	223 [1974] <b>477</b>	265 [2345] <b>447</b>	304 [2691] <b>424</b>		570
	53 [14]		30 [266] <b>655</b>	69 [611] <b>642</b>	115 [1018] <b>630</b>	148 [1310] <b>616</b>	189 [1673] <b>585</b>	223 [1974] <b>572</b>	264 [2337] <b>545</b>	305 [2699] <b>519</b>		671
	61 [16]		26 [230] <b>752</b>	66 [584] <b>747</b>	103 [912] <b>736</b>	146 [1292] <b>705</b>	182 [1611] <b>678</b>	225 [1991] <b>650</b>	262 [2319] <b>644</b>	303 [2682] <b>600</b>		772
	68 [18]		26 [230] <b>843</b>	65 [575] <b>830</b>	106 [938] <b>825</b>	147 [1301] <b>798</b>	186 [1646] <b>769</b>	218 [1929] <b>768</b>	260 [2301] <b>753</b>	303 [2682] <b>682</b>		861
	76 [20]			61 [540] <b>929</b>	101 [894] <b>924</b>	140 [1239] <b>898</b>	174 [1540] <b>873</b>	214 [1894] <b>848</b>	258 [2283] <b>803</b>	302 [2673] <b>772</b>		962
	<b>Rotor Width</b>		Torque - Nm [lb-in], Speed rpm									
	15.7 [617]		Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>									
mm [in]		22 [192]	45 [394]	88 [778]	132 [1172]	176 [1556]	219 [1939]	264 [2334]	308 [2728]	351 [3111]		
		Theoretical Torque - Nm [lb-in] Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]										

		Pressure - bar [psi]								Max. Cont.	Max. Inter.	
<b>100</b>		17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	207 [3000]	242 [3500]	276 [4000]		
100 cm <sup>3</sup> [6.1 in <sup>3</sup> ] / rev		Intermittent Ratings are below and to the right of the BOLD line. Intermittent Ratings - 10% of Operation										
Flow - lpm [gpm]	2 [0.5]	14 [124] <b>19</b>	38 [336] <b>19</b>	77 [681] <b>17</b>								20
	4 [1]	17 [150] <b>39</b>	42 [372] <b>39</b>	86 [761] <b>37</b>	130 [1151] <b>35</b>	169 [1496] <b>31</b>	205 [1814] <b>24</b>					40
	8 [2]	15 [133] <b>79</b>	43 [381] <b>78</b>	89 [788] <b>76</b>	135 [1195] <b>73</b>	179 [1584] <b>68</b>	220 [1947] <b>61</b>	259 [2292] <b>52</b>	290 [2567] <b>35</b>			80
	15 [4]	14 [124] <b>148</b>	43 [381] <b>148</b>	91 [805] <b>145</b>	136 [1204] <b>140</b>	181 [1602] <b>134</b>	224 [1982] <b>125</b>	267 [2363] <b>113</b>	308 [2726] <b>98</b>	341 [3018] <b>67</b>		150
	23 [6]	14 [124] <b>228</b>	43 [381] <b>228</b>	90 [797] <b>224</b>	137 [1212] <b>218</b>	182 [1611] <b>209</b>	226 [2000] <b>197</b>	270 [2390] <b>185</b>	314 [2779] <b>164</b>	354 [3133] <b>135</b>		230
	30 [8]	12 [106] <b>299</b>	41 [363] <b>298</b>	88 [779] <b>294</b>	136 [1204] <b>286</b>	181 [1602] <b>275</b>	225 [1991] <b>262</b>	270 [2390] <b>246</b>	314 [2779] <b>226</b>	356 [3151] <b>194</b>		300
	38 [10]	10 [89] <b>372</b>	38 [336] <b>372</b>	85 [752] <b>369</b>	132 [1168] <b>365</b>	178 [1575] <b>351</b>	223 [1974] <b>337</b>	269 [2381] <b>319</b>	315 [2788] <b>296</b>	360 [3186] <b>263</b>		380
	45 [12]		37 [327] <b>444</b>	84 [743] <b>435</b>	132 [1168] <b>434</b>	178 [1575] <b>419</b>	223 [1974] <b>403</b>	270 [2390] <b>384</b>	317 [2805] <b>361</b>	362 [3204] <b>325</b>		450
	53 [14]		35 [310] <b>525</b>	82 [726] <b>520</b>	129 [1142] <b>514</b>	176 [1558] <b>498</b>	221 [1956] <b>481</b>	269 [2381] <b>457</b>	317 [2805] <b>432</b>	363 [3213] <b>397</b>		530
	61 [16]		33 [292] <b>604</b>	79 [699] <b>600</b>	126 [1115] <b>592</b>	172 [1522] <b>576</b>	218 [1929] <b>558</b>	266 [2354] <b>533</b>	314 [2779] <b>503</b>	361 [3195] <b>474</b>		610
	68 [18]		31 [274] <b>675</b>	75 [664] <b>674</b>	123 [1089] <b>662</b>	169 [1496] <b>643</b>	216 [1912] <b>622</b>	263 [2328] <b>597</b>	313 [2770] <b>566</b>	360 [3186] <b>532</b>		680
	76 [20]		29 [257] <b>756</b>	71 [628] <b>754</b>	120 [1062] <b>742</b>	167 [1478] <b>723</b>	214 [1894] <b>700</b>	262 [2319] <b>673</b>	310 [2744] <b>640</b>	359 [3177] <b>600</b>		760
	83 [22]			69 [611] <b>825</b>	117 [1035] <b>813</b>	164 [1451] <b>794</b>	211 [1967] <b>769</b>	259 [2292] <b>743</b>	308 [2726] <b>708</b>	356 [3151] <b>669</b>		830
	91 [24]			65 [575] <b>905</b>	114 [1009] <b>893</b>	161 [1425] <b>875</b>	208 [1841] <b>853</b>	256 [2266] <b>823</b>	305 [2699] <b>781</b>	352 [3115] <b>749</b>		910
95 [25]			62 [549] <b>945</b>	111 [982] <b>931</b>	159 [1407] <b>908</b>	206 [1823] <b>882</b>	254 [2248] <b>854</b>	304 [2690] <b>805</b>	351 [3106] <b>750</b>		950	
<b>Rotor Width</b>		Torque - Nm [lb-in], Speed rpm										
19.7 [776]		Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>										
mm [in]		27 [239]	56 [493]	110 [972]	166 [1465]	220 [1944]	274 [2423]	329 [2916]	385 [3409]	439 [3888]		
		Theoretical Torque - Nm [lb-in] Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]										

**DISPLACEMENT PERFORMANCE**

► Performance data is typical. Performance of production units varies slightly from one motor to another. Operating at maximum continuous pressure and maximum continuous flow simultaneously is not recommended. For additional information on product testing please refer to page 6.

		Pressure - bar [psi]							Max. Cont.	Max. Inter.		
<b>110</b>		17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	207 [3000]	242 [3500]	276 [4000]		
112 cm <sup>3</sup> [6.8 in <sup>3</sup> ] / rev		<b>Intermittent Ratings are below and to the right of the BOLD line.</b>							<b>Intermittent Ratings - 10% of Operation</b>			
Flow - lpm [gpm]	Max. Cont.	2 [0.5]	22 [195] 17	49 [434] 17	98 [867] 15						18	
		4 [1]	23 [204] 35	51 [451] 35	102 [903] 34	149 [1319] 32	197 [1743] 29				36	
		8 [2]	23 [204] 70	51 [451] 70	105 [929] 68	156 [1381] 66	204 [1805] 63	242 [2142] 56	281 [2487] 40	302 [2673] 24		71
		15 [4]	22 [195] 133	50 [443] 131	103 [912] 128	156 [1381] 123	207 [1832] 117	256 [2266] 107	304 [2690] 92	345 [3053] 73	371 [3283] 41	134
		23 [6]	22 [195] 203	48 [425] 202	101 [894] 198	156 [1381] 192	209 [1850] 184	261 [2310] 173	312 [2761] 159	361 [3195] 136	405 [3584] 106	205
		30 [8]	20 [177] 267	45 [398] 265	100 [885] 260	155 [1372] 252	208 [1841] 242	260 [2301] 231	312 [2761] 215	363 [3213] 192	412 [3646] 159	268
		38 [10]	19 [168] 337	42 [372] 336	95 [841] 330	153 [1354] 320	205 [1814] 308	258 [2283] 292	312 [2761] 278	363 [3213] 254	415 [3673] 224	339
		45 [12]	17 [150] 400	42 [372] 399	94 [832] 392	151 [1336] 383	204 [1805] 370	257 [2274] 355	312 [2761] 336	366 [3239] 313	418 [3699] 277	402
		53 [14]		38 [336] 470	93 [823] 463	148 [1310] 452	201 [1779] 437	254 [2248] 418	309 [2735] 399	364 [3221] 372	418 [3699] 338	473
		61 [16]		36 [319] 542	90 [797] 534	142 [1257] 524	198 [1752] 509	252 [2230] 489	308 [2726] 465	362 [3204] 438	417 [3690] 407	545
		68 [18]		32 [283] 606	87 [770] 598	143 [1266] 586	195 [1726] 571	249 [2204] 549	305 [2699] 525	360 [3186] 497	415 [3673] 461	607
		76 [20]		28 [248] 669	82 [726] 668	138 [1221] 656	191 [1690] 641	245 [2168] 618	300 [2655] 593	357 [3159] 560	412 [3646] 521	679
83 [22]			78 [690] 731	134 [1186] 719	185 [1637] 702	239 [2115] 679	296 [2620] 652	352 [3115] 621	408 [3611] 576	741		
91 [24]			72 [637] 803	127 [1124] 790	181 [1602] 771	235 [2080] 747	291 [2575] 721	349 [3089] 683	406 [3593] 635	813		
95 [25]			70 [620] 837	125 [1106] 821	179 [1584] 801	233 [2062] 780	289 [2558] 751	346 [3062] 714	403 [3567] 668	848		
<b>Rotor Width</b>		Torque - Nm [lb-in], Speed rpm									Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>	
22.1 [871] mm [in]		30 [268]	62 [552]	123 [1089]	185 [1641]	246 [2177]	307 [2713]	369 [3266]	431 [3181]	492 [4354]		
		Theoretical Torque - Nm [lb-in]									Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]	

		Pressure - bar [psi]							Max. Cont.	Max. Inter.		
<b>130</b>		17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	207 [3000]	242 [3500]	276 [4000]		
129 cm <sup>3</sup> [7.9 in <sup>3</sup> ] / rev		<b>Intermittent Ratings are below and to the right of the BOLD line.</b>							<b>Intermittent Ratings - 10% of Operation</b>			
Flow - lpm [gpm]	Max. Cont.	2 [0.5]	23 [204] 15	53 [469] 15							16	
		4 [1]	24 [212] 30	55 [487] 30	113 [1000] 30	167 [1478] 29	225 [1991] 27				31	
		8 [2]	25 [221] 61	57 [504] 61	119 [1053] 60	179 [1584] 58	234 [2071] 54	290 [2567] 46	331 [2929] 29			62
		15 [4]	26 [230] 115	58 [513] 115	122 [1080] 113	186 [1646] 109	247 [2186] 103	306 [2708] 93	363 [3213] 77	416 [3682] 55		116
		23 [6]	25 [221] 177	57 [504] 177	122 [1080] 174	187 [1655] 169	250 [2213] 161	312 [2761] 147	373 [3301] 130	431 [3814] 105	483 [4275] 70	178
		30 [8]	23 [204] 232	57 [504] 232	120 [1062] 228	186 [1646] 222	250 [2213] 212	313 [2770] 197	376 [3328] 179	437 [3867] 156	494 [4372] 125	233
		38 [10]	22 [195] 294	54 [478] 294	118 [1044] 290	184 [1628] 283	248 [2195] 273	312 [2761] 257	376 [3328] 237	439 [3885] 212	499 [4416] 182	295
		45 [12]	20 [177] 348	53 [469] 348	116 [1027] 343	183 [1620] 334	246 [2177] 321	310 [2744] 304	375 [3319] 282	439 [3885] 255	499 [4416] 221	349
		53 [14]		49 [434] 410	113 [1000] 405	179 [1584] 395	243 [2151] 380	307 [2717] 361	373 [3301] 336	437 [3867] 311	499 [4416] 275	411
		61 [16]		46 [407] 472	110 [974] 467	176 [1558] 456	240 [2124] 439	304 [2690] 417	370 [3275] 392	435 [3850] 364	497 [4398] 328	473
		68 [18]		42 [372] 526	106 [938] 521	172 [1522] 510	236 [2089] 493	300 [2655] 470	366 [3239] 442	432 [3823] 411	495 [4381] 376	527
		76 [20]		38 [336] 588	102 [903] 583	167 [1478] 572	232 [2053] 553	297 [2628] 527	363 [3213] 499	428 [3788] 467	491 [4345] 423	589
83 [22]		33 [292] 642	98 [867] 638	164 [1451] 627	228 [2018] 607	293 [2593] 581	359 [3177] 549	423 [3744] 517	485 [4292] 473	643		
91 [24]		30 [266] 704	93 [823] 702	158 [1398] 692	222 [1965] 677	288 [2549] 648	354 [3133] 625	421 [3726] 576	483 [4275] 531	705		
95 [25]		27 [239] 734	91 [805] 733	158 [1398] 720	220 [1947] 703	286 [2531] 672	351 [3106] 639	419 [3708] 602	483 [4275] 559	736		
<b>Rotor Width</b>		Torque - Nm [lb-in], Speed rpm									Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>	
25.4 [1.000] mm [in]		35 [309]	72 [636]	142 [1254]	214 [1890]	283 [2508]	353 [3125]	425 [3761]	497 [4397]	567 [5015]		
		Theoretical Torque - Nm [lb-in]									Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]	

**DISPLACEMENT PERFORMANCE**

► Performance data is typical. Performance of production units varies slightly from one motor to another. Operating at maximum continuous pressure and maximum continuous flow simultaneously is not recommended. For additional information on product testing please refer to page 6.

		Pressure - bar [psi]								Max. Cont.	Max. Inter.	
<b>160</b>		17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	207 [3000]	242 [3500]	276 [4000]		
161 cm <sup>3</sup> [9.8 in <sup>3</sup> ] / rev		<b>Intermittent Ratings are below and to the right of the BOLD line.</b>								<b>Intermittent Ratings - 10% of Operation</b>		
Flow - lpm [gpm]	Max. Cont.	2 [0.5]	21 [186] <b>11</b>	65 [575] <b>10</b>								12
		4 [1]	29 [257] <b>24</b>	67 [593] <b>24</b>	140 [1239] <b>23</b>	209 [1850] <b>21</b>						25
		8 [2]	31 [274] <b>49</b>	71 [628] <b>48</b>	143 [1266] <b>47</b>	214 [1894] <b>46</b>	285 [2522] <b>43</b>	352 [3115] <b>36</b>				50
		15 [4]	34 [301] <b>92</b>	75 [664] <b>92</b>	154 [1363] <b>91</b>	231 [2044] <b>88</b>	306 [2708] <b>84</b>	380 [3363] <b>77</b>	454 [4018] <b>64</b>	519 [4593] <b>43</b>		93
		23 [6]	32 [283] <b>142</b>	75 [664] <b>141</b>	155 [1372] <b>140</b>	235 [2080] <b>139</b>	314 [2779] <b>133</b>	390 [3452] <b>123</b>	466 [4124] <b>108</b>	537 [4752] <b>85</b>	604 [5345] <b>52</b>	143
		30 [8]	31 [274] <b>185</b>	73 [646] <b>185</b>	154 [1363] <b>184</b>	234 [2071] <b>183</b>	315 [2788] <b>178</b>	394 [3487] <b>166</b>	472 [4177] <b>151</b>	547 [4841] <b>130</b>	615 [5443] <b>99</b>	186
		38 [10]	28 [248] <b>233</b>	72 [637] <b>231</b>	153 [1354] <b>229</b>	231 [2044] <b>229</b>	311 [2752] <b>223</b>	391 [3460] <b>210</b>	471 [4168] <b>194</b>	548 [4850] <b>175</b>	620 [5487] <b>144</b>	236
		45 [12]	25 [221] <b>280</b>	67 [593] <b>280</b>	151 [1336] <b>272</b>	229 [2027] <b>269</b>	310 [2744] <b>260</b>	391 [3460] <b>243</b>	466 [4124] <b>227</b>	544 [4814] <b>202</b>	624 [5522] <b>159</b>	280
		53 [14]	23 [204] <b>328</b>	63 [558] <b>327</b>	145 [1283] <b>320</b>	227 [2009] <b>312</b>	307 [2717] <b>303</b>	388 [3434] <b>288</b>	467 [4133] <b>271</b>	548 [4850] <b>247</b>	622 [5505] <b>216</b>	329
		61 [16]		58 [513] <b>378</b>	139 [1230] <b>372</b>	221 [1956] <b>366</b>	302 [2673] <b>361</b>	386 [3416] <b>350</b>	468 [4142] <b>328</b>	549 [4859] <b>305</b>	626 [5540] <b>273</b>	379
		68 [18]		53 [469] <b>418</b>	135 [1195] <b>412</b>	217 [1920] <b>410</b>	298 [2637] <b>406</b>	380 [3363] <b>389</b>	468 [4142] <b>370</b>	549 [4859] <b>348</b>	627 [5549] <b>312</b>	422
		76 [20]		53 [469] <b>471</b>	133 [1177] <b>467</b>	216 [1912] <b>455</b>	296 [2620] <b>440</b>	377 [3336] <b>423</b>	461 [4080] <b>397</b>	544 [4814] <b>368</b>	609 [5390] <b>348</b>	472
		83 [22]		44 [389] <b>515</b>	126 [1115] <b>514</b>	205 [1814] <b>513</b>	282 [2496] <b>504</b>	359 [3177] <b>491</b>	440 [3894] <b>467</b>	523 [4629] <b>434</b>	602 [5328] <b>384</b>	516
		91 [24]		38 [336] <b>560</b>	119 [1053] <b>556</b>	207 [1832] <b>547</b>	284 [2513] <b>546</b>	368 [3257] <b>532</b>	440 [3894] <b>515</b>	521 [4611] <b>493</b>	606 [5363] <b>461</b>	565
95 [25]		34 [301] <b>585</b>	112 [991] <b>580</b>	194 [1717] <b>579</b>	276 [2443] <b>574</b>	365 [3230] <b>555</b>	445 [3938] <b>540</b>			590		
114 [30]			94 [832] <b>707</b>	177 [1566] <b>706</b>	269 [2381] <b>687</b>	341 [3018] <b>676</b>	418 [3699] <b>654</b>			708		
<b>Rotor Width</b>		<b>Torque - Nm [lb-in], Speed rpm</b>										
31.8 [1.251]		44 [386]	90 [794]	177 [1565]	266 [2358]	354 [3130]	441 [3901]	530 [4694]	620 [5488]	707 [6259]		
mm [in]		Theoretical Torque - Nm [lb-in] Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]										
		Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>										

		Pressure - bar [psi]								Max. Cont.	Max. Inter.		
<b>200</b>		17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	190 [2750]	207 [3000]	242 [3500]	276 [4000]		
201 cm <sup>3</sup> [12.3 in <sup>3</sup> ] / rev		<b>Intermittent Ratings are below and to the right of the BOLD line.</b>								<b>Intermittent Ratings - 10% of Operation</b>			
Flow - lpm [gpm]	Max. Cont.	4 [1]	40 [354] <b>19</b>	87 [770] <b>18</b>	189 [1673] <b>17</b>	282 [2496] <b>15</b>						20	
		8 [2]	44 [389] <b>39</b>	97 [858] <b>39</b>	192 [1699] <b>38</b>	286 [2531] <b>37</b>	370 [3275] <b>36</b>	456 [4036] <b>33</b>				40	
		15 [4]	45 [398] <b>74</b>	99 [876] <b>74</b>	198 [1752] <b>73</b>	298 [2637] <b>71</b>	391 [3460] <b>67</b>	481 [4257] <b>63</b>	526 [4655] <b>60</b>	566 [5009] <b>57</b>	645 [5708] <b>50</b>	75	
		23 [6]	42 [372] <b>113</b>	97 [858] <b>113</b>	196 [1735] <b>112</b>	296 [2620] <b>108</b>	389 [3443] <b>104</b>	478 [4230] <b>98</b>	523 [4629] <b>93</b>	568 [5027] <b>93</b>	653 [5779] <b>80</b>	724 [6407] <b>66</b>	114
		30 [8]	40 [354] <b>148</b>	94 [832] <b>147</b>	194 [1717] <b>146</b>	293 [2593] <b>142</b>	388 [3434] <b>136</b>	478 [4230] <b>129</b>	525 [4646] <b>125</b>	568 [5027] <b>121</b>	658 [5823] <b>109</b>	724 [6407] <b>96</b>	149
		38 [10]	36 [319] <b>188</b>	91 [805] <b>187</b>	191 [1690] <b>186</b>	292 [2584] <b>181</b>	388 [3434] <b>175</b>	483 [4275] <b>167</b>	533 [4717] <b>162</b>	579 [5124] <b>158</b>	672 [5947] <b>146</b>	759 [6717] <b>126</b>	189
		45 [12]	32 [283] <b>223</b>	87 [770] <b>222</b>	186 [1646] <b>221</b>	288 [2549] <b>217</b>	386 [3416] <b>208</b>	482 [4266] <b>198</b>	532 [4708] <b>194</b>	579 [5124] <b>188</b>	675 [5974] <b>175</b>	765 [6770] <b>162</b>	224
		53 [14]	30 [266] <b>263</b>	81 [717] <b>262</b>	181 [1602] <b>261</b>	283 [2505] <b>257</b>	382 [3381] <b>248</b>	479 [4239] <b>236</b>	528 [4673] <b>235</b>	576 [5098] <b>224</b>	673 [5956] <b>212</b>	765 [6770] <b>194</b>	264
		61 [16]	27 [239] <b>302</b>	72 [637] <b>301</b>	172 [1522] <b>299</b>	276 [2443] <b>297</b>	375 [3319] <b>288</b>	473 [4186] <b>276</b>	524 [4637] <b>269</b>	571 [5053] <b>263</b>	667 [5903] <b>248</b>	761 [6735] <b>231</b>	303
		68 [18]		66 [584] <b>337</b>	167 [1478] <b>336</b>	269 [2381] <b>332</b>	368 [3257] <b>324</b>	466 [4124] <b>312</b>	518 [4584] <b>303</b>	566 [5009] <b>297</b>	664 [5876] <b>279</b>	757 [6699] <b>262</b>	338
		76 [20]		58 [513] <b>377</b>	157 [1389] <b>375</b>	260 [2301] <b>372</b>	359 [3177] <b>364</b>	457 [4044] <b>353</b>	510 [4514] <b>343</b>	559 [4947] <b>336</b>	656 [5806] <b>320</b>	751 [6646] <b>302</b>	378
		83 [22]		50 [443] <b>412</b>	153 [1354] <b>410</b>	251 [2221] <b>408</b>	352 [3115] <b>398</b>	449 [3974] <b>387</b>	503 [4452] <b>377</b>	550 [4868] <b>372</b>			413
		91 [24]		41 [363] <b>452</b>	145 [1283] <b>450</b>	244 [2159] <b>448</b>	346 [3062] <b>436</b>	445 [3938] <b>421</b>	496 [4390] <b>415</b>	538 [4761] <b>410</b>			453
		95 [25]			139 [1230] <b>472</b>	239 [2115] <b>466</b>	339 [3000] <b>456</b>	438 [3876] <b>441</b>	491 [4345] <b>430</b>	539 [4770] <b>423</b>			473
114 [30]			116 [1027] <b>566</b>	213 [1885] <b>561</b>	313 [2770] <b>549</b>	416 [3682] <b>531</b>	468 [4142] <b>521</b>	512 [4531] <b>519</b>			567		
<b>Rotor Width</b>		<b>Torque - Nm [lb-in], Speed rpm</b>											
39.4 [1.552]		54 [481]	112 [991]	221 [1954]	333 [2944]	441 [3907]	550 [4870]	608 [5379]	662 [5861]	774 [6852]	883 [7814]		
mm [in]		Theoretical Torque - Nm [lb-in] Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]											
		Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>											

# WS (365/366 Series)

## Heavy Duty Hydraulic Motor



### DISPLACEMENT PERFORMANCE

► Performance data is typical. Performance of production units varies slightly from one motor to another. Operating at maximum continuous pressure and maximum continuous flow simultaneously is not recommended. For additional information on product testing please refer to page 6.

		Pressure - bar [psi]										Max. Cont.		Max. Inter.	
<b>230</b>		17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	190 [2750]	207 [3000]	242 [3500]	276 [4000]				
229 cm <sup>3</sup> [14.0 in <sup>3</sup> ] / rev		Intermittent Ratings are below and to the right of the BOLD line.										Intermittent Ratings - 10% of Operation			
Flow - lpm [gpm]	4 [1]	50 [443] <b>16</b>	98 [867] <b>15</b>	198 [1752] <b>14</b>	310 [2744] <b>13</b>										17
	8 [2]	42 [372] <b>34</b>	99 [876] <b>34</b>	204 [1805] <b>34</b>	316 [2797] <b>33</b>	416 [3682] <b>32</b>	510 [4514] <b>28</b>	552 [4885] <b>25</b>	594 [5257] <b>22</b>					35	
	15 [4]	47 [416] <b>65</b>	104 [920] <b>64</b>	214 [1894] <b>63</b>	325 [2876] <b>62</b>	426 [3770] <b>58</b>	526 [4655] <b>55</b>	580 [5133] <b>51</b>	626 [5540] <b>47</b>	721 [6381] <b>37</b>				66	
	23 [6]	45 [398] <b>99</b>	105 [929] <b>99</b>	218 [1929] <b>98</b>	331 [2929] <b>96</b>	438 [3876] <b>93</b>	544 [4814] <b>87</b>	598 [5292] <b>83</b>	649 [5744] <b>79</b>	752 [6655] <b>67</b>	843 [7461] <b>50</b>			100	
	30 [8]	43 [381] <b>130</b>	103 [912] <b>129</b>	217 [1920] <b>127</b>	332 [2938] <b>125</b>	441 [3903] <b>121</b>	549 [4859] <b>116</b>	602 [5328] <b>111</b>	654 [5788] <b>106</b>	758 [6708] <b>39</b>	859 [7602] <b>76</b>			131	
	38 [10]	40 [354] <b>165</b>	100 [885] <b>164</b>	214 [1894] <b>162</b>	330 [2921] <b>159</b>	440 [3894] <b>154</b>	548 [4850] <b>148</b>	604 [5345] <b>144</b>	655 [5797] <b>138</b>	761 [6735] <b>123</b>	866 [7664] <b>105</b>			166	
	45 [12]	35 [310] <b>196</b>	95 [841] <b>194</b>	211 [1867] <b>192</b>	328 [2903] <b>189</b>	438 [3876] <b>184</b>	546 [4832] <b>177</b>	604 [5345] <b>172</b>	656 [5806] <b>167</b>	764 [6761] <b>152</b>	869 [7691] <b>130</b>			197	
	53 [14]	30 [266] <b>230</b>	90 [797] <b>230</b>	206 [1823] <b>227</b>	323 [2859] <b>223</b>	435 [3850] <b>217</b>	544 [4814] <b>210</b>	601 [5319] <b>204</b>	654 [5788] <b>197</b>	763 [6753] <b>183</b>	871 [7708] <b>113</b>			231	
	61 [16]	28 [248] <b>265</b>	84 [743] <b>265</b>	200 [1770] <b>262</b>	317 [2805] <b>257</b>	430 [3806] <b>251</b>	540 [4779] <b>243</b>	598 [5292] <b>237</b>	652 [5770] <b>231</b>	763 [6753] <b>216</b>	872 [7717] <b>192</b>			266	
	68 [18]		77 [681] <b>295</b>	191 [1690] <b>292</b>	311 [2752] <b>288</b>	425 [3761] <b>281</b>	536 [4744] <b>272</b>	593 [5248] <b>266</b>	648 [5735] <b>260</b>	759 [6717] <b>244</b>	869 [7691] <b>222</b>			297	
	76 [20]		68 [602] <b>330</b>	184 [1628] <b>327</b>	302 [2673] <b>323</b>	416 [3682] <b>316</b>	529 [4682] <b>306</b>	586 [5186] <b>300</b>	642 [5682] <b>294</b>					332	
	83 [22]		58 [513] <b>361</b>	176 [1558] <b>358</b>	295 [2611] <b>353</b>	410 [3629] <b>346</b>	523 [4629] <b>329</b>	580 [5133] <b>323</b>	636 [5629] <b>323</b>					362	
	91 [24]		51 [451] <b>396</b>	167 [1478] <b>393</b>	285 [2522] <b>388</b>	400 [3540] <b>380</b>	513 [4531] <b>370</b>	571 [5053] <b>363</b>	627 [5549] <b>357</b>					397	
	95 [25]			164 [1451] <b>411</b>	250 [2478] <b>406</b>	395 [3496] <b>399</b>	507 [4487] <b>389</b>	564 [4991] <b>382</b>	622 [5505] <b>375</b>					415	
Max. Inter.	114 [30]		130 [1151] <b>495</b>	253 [2239] <b>489</b>	368 [3257] <b>480</b>	483 [4275] <b>467</b>	541 [4788] <b>460</b>	594 [5257] <b>452</b>					498		
<b>Rotor Width</b>		Torque - Nm [lb-in], Speed rpm										Overall Efficiency - 70 - 100%		0 - 39%	
45.5 [1.791] mm [in]		62 [548]	128 [1129]	251 [2226]	379 [3355]	503 [4451]	627 [5548]	693 [6129]	754 [6677]	882 [7806]	1006 [8903]				
		Theoretical Torque - Nm [lb-in]										Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]			

		Pressure - bar [psi]										Max. Cont.		Max. Inter.	
<b>250</b>		17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	155 [2250]	172 [2500]	190 [2750]	207 [3000]	224 [3250]				
248 cm <sup>3</sup> [15.1 in <sup>3</sup> ] / rev		Intermittent Ratings are below and to the right of the BOLD line.										Intermittent Ratings - 10% of Operation			
Flow - lpm [gpm]	4 [1]	51 [481] <b>15</b>	112 [991] <b>15</b>	230 [2036] <b>14</b>										16	
	8 [2]	53 [469] <b>31</b>	118 [1044] <b>31</b>	236 [2089] <b>30</b>	355 [3142] <b>28</b>	464 [4106] <b>23</b>	522 [4620] <b>19</b>	575 [5089] <b>15</b>					32		
	15 [4]	50 [443] <b>59</b>	119 [1053] <b>59</b>	239 [2115] <b>58</b>	361 [3195] <b>54</b>	476 [4213] <b>46</b>	531 [4699] <b>42</b>	586 [5186] <b>37</b>	644 [5699] <b>31</b>	696 [6160] <b>26</b>	740 [6549] <b>22</b>		60		
	23 [6]	50 [443] <b>92</b>	115 [1018] <b>92</b>	237 [2097] <b>90</b>	360 [3186] <b>83</b>	476 [4213] <b>74</b>	525 [4646] <b>70</b>	585 [5177] <b>64</b>	640 [5664] <b>58</b>	697 [6168] <b>52</b>	751 [6646] <b>47</b>		93		
	30 [8]	47 [416] <b>120</b>	111 [982] <b>120</b>	234 [2071] <b>117</b>	357 [3159] <b>110</b>	475 [4204] <b>101</b>	531 [4699] <b>93</b>	598 [5292] <b>87</b>	657 [5814] <b>78</b>	712 [6301] <b>72</b>	759 [6717] <b>71</b>		121		
	38 [10]	42 [372] <b>152</b>	108 [956] <b>151</b>	231 [2044] <b>150</b>	355 [3142] <b>144</b>	475 [4204] <b>131</b>	533 [4717] <b>126</b>	591 [5230] <b>119</b>	654 [5788] <b>108</b>	707 [6257] <b>105</b>	769 [6806] <b>90</b>		153		
	45 [12]	35 [310] <b>180</b>	102 [903] <b>180</b>	225 [1991] <b>179</b>	351 [3106] <b>172</b>	469 [4151] <b>162</b>	528 [4673] <b>155</b>	585 [5177] <b>147</b>	647 [5726] <b>138</b>	704 [6230] <b>130</b>	755 [6682] <b>119</b>		181		
	53 [14]	32 [283] <b>213</b>	92 [814] <b>212</b>	216 [1912] <b>212</b>	342 [3027] <b>205</b>	462 [4089] <b>193</b>	521 [4611] <b>187</b>	580 [5133] <b>181</b>	641 [5673] <b>170</b>	698 [6177] <b>163</b>	754 [6673] <b>152</b>		214		
	61 [16]	29 [257] <b>245</b>	83 [735] <b>244</b>	210 [1859] <b>244</b>	333 [2947] <b>238</b>	454 [4018] <b>226</b>	512 [4531] <b>221</b>	571 [5053] <b>213</b>	633 [5602] <b>203</b>	691 [6115] <b>196</b>	746 [6602] <b>184</b>		246		
	68 [18]	27 [239] <b>273</b>	73 [646] <b>272</b>	200 [1770] <b>271</b>	323 [2859] <b>267</b>	445 [3938] <b>256</b>	504 [4460] <b>249</b>	563 [4983] <b>240</b>	623 [5514] <b>231</b>				274		
	76 [20]		63 [558] <b>305</b>	188 [1664] <b>303</b>	310 [2744] <b>301</b>	433 [3832] <b>289</b>	494 [4372] <b>283</b>	552 [4885] <b>273</b>	613 [5425] <b>267</b>				306		
	83 [22]		57 [504] <b>334</b>	179 [1584] <b>334</b>	302 [2673] <b>328</b>	425 [3761] <b>314</b>	484 [4283] <b>307</b>	545 [4823] <b>297</b>	608 [5381] <b>286</b>				335		
	91 [24]		41 [363] <b>366</b>	171 [1513] <b>364</b>	291 [2575] <b>358</b>	413 [3655] <b>343</b>	476 [4213] <b>334</b>	534 [4726] <b>327</b>	596 [5275] <b>316</b>				367		
	95 [25]		32 [283] <b>382</b>	160 [1416] <b>381</b>	280 [2478] <b>381</b>	401 [3549] <b>368</b>	463 [4098] <b>359</b>	524 [4637] <b>348</b>	584 [5168] <b>341</b>				383		
Max. Inter.	114 [30]		128 [1133] <b>459</b>	246 [2177] <b>456</b>	372 [3292] <b>442</b>	431 [3814] <b>434</b>	494 [4372] <b>422</b>	554 [4903] <b>412</b>				460			
<b>Rotor Width</b>		Torque - Nm [lb-in], Speed rpm										Overall Efficiency - 70 - 100%		0 - 39%	
39.4 [1.552] mm [in]		67 [594]	138 [1223]	272 [2410]	411 [3633]	545 [4821]	612 [5415]	679 [6008]	750 [6637]	817 [7231]	884 [7825]				
		Theoretical Torque - Nm [lb-in]										Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]			

**DISPLACEMENT PERFORMANCE**

► Performance data is typical. Performance of production units varies slightly from one motor to another. Operating at maximum continuous pressure and maximum continuous flow simultaneously is not recommended. For additional information on product testing please refer to page 6.

		Pressure - bar [psi]									Max. Cont.	Max. Inter.
<b>320</b>		17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	155 [2250]	172 [2500]	190 [2750]	207 [3000]	224 [3250]	
322 cm <sup>3</sup> [19.6 in <sup>3</sup> ] / rev		<b>Intermittent Ratings are below and to the right of the BOLD line.</b>						<b>Intermittent Ratings - 10% of Operation</b>				
Flow - lpm [gpm]	4 [1]	68 [602] <b>11</b>	145 [1283] <b>9</b>									12
	8 [2]	77 [681] <b>24</b>	156 [1381] <b>24</b>	311 [2752] <b>23</b>	455 [4027] <b>21</b>	590 [5222] <b>20</b>	640 [5664] <b>19</b>					25
	15 [4]	77 [681] <b>46</b>	160 [1416] <b>45</b>	311 [2752] <b>43</b>	458 [4053] <b>40</b>	594 [5257] <b>36</b>	655 [5797] <b>32</b>	705 [6239] <b>28</b>	770 [6815] <b>24</b>	835 [7390] <b>18</b>		47
	23 [6]	73 [646] <b>70</b>	157 [1389] <b>69</b>	316 [2797] <b>68</b>	478 [4230] <b>64</b>	628 [5558] <b>57</b>	698 [6177] <b>53</b>	768 [6797] <b>48</b>	841 [7443] <b>43</b>	910 [8054] <b>38</b>	975 [8629] <b>30</b>	71
	30 [8]	69 [611] <b>92</b>	154 [1363] <b>90</b>	316 [2797] <b>87</b>	479 [4239] <b>83</b>	631 [5584] <b>77</b>	705 [6239] <b>73</b>	780 [6903] <b>68</b>	860 [7611] <b>63</b>	929 [8222] <b>57</b>	998 [8832] <b>49</b>	93
	38 [10]	64 [566] <b>116</b>	150 [1328] <b>114</b>	311 [2752] <b>111</b>	480 [4248] <b>106</b>	631 [5584] <b>100</b>	709 [6275] <b>96</b>	784 [6938] <b>90</b>	861 [7620] <b>83</b>	930 [8231] <b>79</b>	1000 [8850] <b>72</b>	118
	45 [12]	59 [522] <b>138</b>	143 [1266] <b>136</b>	305 [2699] <b>133</b>	471 [4168] <b>127</b>	632 [5593] <b>119</b>	705 [6239] <b>115</b>	783 [6930] <b>110</b>	860 [7611] <b>105</b>	934 [8266] <b>98</b>	1000 [8850] <b>86</b>	140
	53 [14]	49 [434] <b>162</b>	137 [1212] <b>160</b>	297 [2628] <b>157</b>	463 [4098] <b>151</b>	627 [5549] <b>142</b>	697 [6168] <b>138</b>	778 [6885] <b>132</b>	858 [7593] <b>126</b>	937 [8292] <b>120</b>	1003 [8877] <b>113</b>	165
	61 [16]	41 [363] <b>187</b>	128 [1133] <b>185</b>	288 [2549] <b>182</b>	457 [4044] <b>175</b>	616 [5452] <b>167</b>	689 [6098] <b>161</b>	769 [6806] <b>156</b>	847 [7496] <b>150</b>			189
	68 [18]	35 [310] <b>210</b>	120 [1062] <b>208</b>	282 [2496] <b>201</b>	452 [4000] <b>192</b>	609 [5390] <b>182</b>	683 [6045] <b>176</b>	762 [6744] <b>170</b>	841 [7443] <b>163</b>			211
	76 [20]	26 [230] <b>235</b>	113 [1000] <b>230</b>	273 [2416] <b>225</b>	443 [3921] <b>216</b>	603 [5337] <b>203</b>	664 [5876] <b>199</b>	744 [6584] <b>192</b>	830 [7346] <b>184</b>			236
	83 [22]		99 [876] <b>256</b>	262 [2319] <b>247</b>	430 [3806] <b>240</b>	590 [5222] <b>225</b>	660 [5841] <b>219</b>	741 [6558] <b>212</b>	820 [7257] <b>202</b>			258
	91 [24]		85 [752] <b>282</b>	246 [2177] <b>273</b>	415 [3673] <b>267</b>	576 [5098] <b>249</b>	654 [5788] <b>242</b>	731 [6469] <b>233</b>	810 [7169] <b>225</b>			283
	95 [25]		76 [673] <b>294</b>	241 [2133] <b>286</b>	404 [3575] <b>281</b>	571 [5053] <b>261</b>	648 [5735] <b>254</b>	719 [6363] <b>246</b>	804 [7115] <b>236</b>			295
114 [30]		44 [389] <b>352</b>	204 [1805] <b>345</b>	371 [3283] <b>337</b>	538 [4761] <b>321</b>	602 [5328] <b>314</b>	685 [6062] <b>304</b>	766 [6779] <b>293</b>			354	
<b>Rotor Width</b>		Torque - Nm [lb-in], Speed rpm									Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>	
63.5 [2.501] mm [in]		87 [771]	179 [1587]	354 [3130]	533 [4717]	707 [6259]	794 [7030]	881 [7801]	974 [8618]	1061 [9389]	1148 [10160]	
		Theoretical Torque - Nm [lb-in]									Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]	

		Pressure - bar [psi]									Max. Cont.	Max. Inter.
<b>400</b>		17 [250]	35 [500]	69 [1000]	86 [1250]	104 [1500]	121 [1750]	138 [2000]	155 [2250]	172 [2500]	190 [2750]	
396 cm <sup>3</sup> [24.2 in <sup>3</sup> ] / rev		<b>Intermittent Ratings are below and to the right of the BOLD line.</b>						<b>Intermittent Ratings - 10% of Operation</b>				
Flow - lpm [gpm]	4 [1]	78 [690] <b>9</b>	180 [1593] <b>8</b>									10
	8 [2]	84 [743] <b>19</b>	185 [1637] <b>18</b>	380 [3363] <b>18</b>	460 [4071] <b>17</b>	555 [4912] <b>17</b>	640 [5664] <b>15</b>					20
	15 [4]	84 [743] <b>37</b>	185 [1637] <b>36</b>	374 [3310] <b>36</b>	468 [4142] <b>35</b>	559 [4947] <b>34</b>	648 [5735] <b>30</b>	736 [6514] <b>26</b>				38
	23 [6]	77 [681] <b>57</b>	182 [1611] <b>56</b>	374 [3310] <b>55</b>	469 [4151] <b>53</b>	567 [5018] <b>50</b>	650 [5753] <b>46</b>	747 [6611] <b>41</b>	839 [7425] <b>37</b>	920 [8142] <b>30</b>	1002 [8868] <b>24</b>	58
	30 [8]	76 [673] <b>75</b>	181 [1602] <b>74</b>	376 [3328] <b>71</b>	473 [4186] <b>69</b>	575 [5089] <b>65</b>	670 [5930] <b>61</b>	763 [6753] <b>56</b>	854 [7558] <b>50</b>	944 [8354] <b>43</b>	1043 [9231] <b>36</b>	76
	38 [10]	67 [593] <b>95</b>	175 [1549] <b>94</b>	375 [3319] <b>91</b>	473 [4186] <b>89</b>	575 [5089] <b>84</b>	671 [5938] <b>79</b>	764 [6761] <b>74</b>	858 [7593] <b>68</b>	951 [8416] <b>62</b>	1048 [9275] <b>55</b>	96
	45 [12]	57 [504] <b>113</b>	165 [1460] <b>112</b>	367 [3248] <b>109</b>	467 [4133] <b>106</b>	572 [5062] <b>102</b>	668 [5912] <b>97</b>	762 [6744] <b>90</b>	852 [7540] <b>82</b>	943 [8346] <b>77</b>	1044 [9239] <b>69</b>	114
	53 [14]	44 [389] <b>133</b>	154 [1363] <b>132</b>	355 [3142] <b>130</b>	454 [4018] <b>127</b>	560 [4956] <b>123</b>	659 [5832] <b>118</b>	756 [6691] <b>112</b>	851 [7531] <b>104</b>	943 [8346] <b>96</b>	1032 [9133] <b>84</b>	134
	61 [16]	32 [283] <b>153</b>	142 [1257] <b>153</b>	343 [3036] <b>149</b>	444 [3929] <b>146</b>	549 [4859] <b>141</b>	647 [5726] <b>135</b>	743 [6576] <b>129</b>	837 [7407] <b>123</b>	932 [8248] <b>114</b>		154
	68 [18]		123 [1089] <b>170</b>	332 [2938] <b>166</b>	432 [3823] <b>162</b>	538 [4761] <b>156</b>	635 [5620] <b>150</b>	726 [6425] <b>145</b>	827 [7319] <b>137</b>			172
	76 [20]		106 [938] <b>191</b>	316 [2797] <b>185</b>	418 [3699] <b>181</b>	523 [4629] <b>176</b>	619 [5478] <b>169</b>	717 [6345] <b>162</b>	812 [7186] <b>156</b>			192
	83 [22]		100 [885] <b>208</b>	299 [2646] <b>205</b>	402 [3558] <b>201</b>	506 [4478] <b>195</b>	601 [5319] <b>191</b>	700 [6195] <b>183</b>	797 [7053] <b>176</b>			210
	91 [24]		69 [611] <b>229</b>	277 [2451] <b>226</b>	378 [3345] <b>223</b>	479 [4239] <b>219</b>	579 [5124] <b>213</b>	676 [5983] <b>206</b>	773 [6841] <b>199</b>			230
	99 [26]		46 [407] <b>249</b>	257 [2274] <b>247</b>	353 [3124] <b>245</b>	454 [4018] <b>241</b>	555 [4912] <b>236</b>	658 [5823] <b>228</b>	752 [6655] <b>222</b>			250
114 [30]			210 [1859] <b>285</b>	307 [2717] <b>283</b>	416 [3682] <b>279</b>	517 [4575] <b>273</b>	614 [5434] <b>266</b>	710 [6284] <b>259</b>			288	
<b>Rotor Width</b>		Torque - Nm [lb-in], Speed rpm									Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>	
63.5 [2.501] mm [in]		107 [948]	221 [1952]	435 [3849]	542 [4797]	655 [5801]	763 [6749]	870 [7698]	977 [8646]	1084 [9594]	1198 [10598]	
		Theoretical Torque - Nm [lb-in]									Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]	

**WS (365/366 Series)**  
**Heavy Duty Hydraulic Motor**



**DISPLACEMENT PERFORMANCE**

► Performance data is typical. Performance of production units varies slightly from one motor to another. Operating at maximum continuous pressure and maximum continuous flow simultaneously is not recommended. For additional information on product testing please refer to page 6.

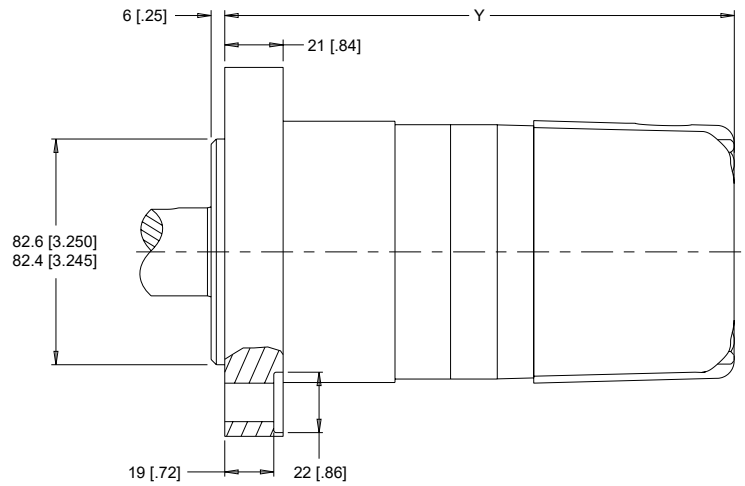
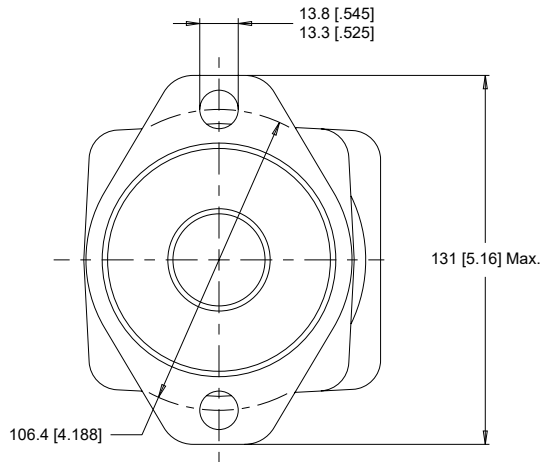
		Pressure - bar [psi]						Max. Cont.		Max. Inter.		
<b>500</b>		17 [250]	35 [500]	52 [750]	69 [1000]	86 [1250]	104 [1500]	121 [1750]	138 [2000]	155 [2250]		
495 cm <sup>3</sup> [30.2 in <sup>3</sup> ] / rev		Intermittent Ratings are below and to the right of the BOLD line.						Intermittent Ratings - 10% of Operation				
Flow - lpm [gpm]	8 [2]	110 [974] <b>15</b>	236 [2089] <b>15</b>	352 [3115] <b>15</b>	467 [4133] <b>14</b>	581 [5142] <b>14</b>	699 [6186] <b>13</b>				16	
	15 [4]	108 [956] <b>29</b>	241 [2133] <b>29</b>	365 [3230] <b>29</b>	488 [4319] <b>28</b>	605 [5354] <b>28</b>	739 [6540] <b>27</b>	836 [7399] <b>25</b>			30	
	23 [6]	106 [938] <b>45</b>	240 [2124] <b>45</b>	366 [3239] <b>45</b>	488 [4319] <b>44</b>	610 [5399] <b>44</b>	738 [6531] <b>42</b>	851 [7531] <b>37</b>	961 [8505] <b>31</b>		46	
	30 [8]	98 [867] <b>60</b>	234 [2071] <b>60</b>	359 [3177] <b>60</b>	483 [4275] <b>59</b>	604 [5345] <b>58</b>	734 [6496] <b>56</b>	849 [7514] <b>52</b>	964 [8531] <b>45</b>	1063 [9408] <b>37</b>	61	
	38 [10]	87 [770] <b>76</b>	224 [1982] <b>76</b>	348 [3080] <b>76</b>	473 [4186] <b>75</b>	595 [5266] <b>74</b>	723 [6399] <b>71</b>	840 [7434] <b>67</b>	955 [8452] <b>61</b>	1063 [9408] <b>53</b>	77	
	45 [12]	76 [673] <b>90</b>	210 [1859] <b>90</b>	336 [2974] <b>90</b>	463 [4098] <b>89</b>	586 [5186] <b>88</b>	714 [6319] <b>85</b>	835 [7390] <b>80</b>	952 [8425] <b>73</b>	1064 [9416] <b>65</b>	91	
	53 [14]	60 [531] <b>106</b>	194 [1717] <b>106</b>	319 [2823] <b>106</b>	445 [3938] <b>105</b>	570 [5045] <b>104</b>	699 [6186] <b>101</b>	819 [7248] <b>96</b>	935 [8275] <b>88</b>	1050 [9293] <b>79</b>	107	
	61 [16]	40 [354] <b>122</b>	177 [1566] <b>122</b>	303 [2682] <b>121</b>	426 [3770] <b>121</b>	550 [4868] <b>120</b>	681 [6027] <b>117</b>	805 [7124] <b>106</b>	918 [8124] <b>106</b>		123	
	68 [18]		154 [1363] <b>136</b>	284 [2513] <b>136</b>	408 [3611] <b>135</b>	535 [4735] <b>134</b>	665 [5885] <b>131</b>	785 [6947] <b>126</b>			137	
	76 [20]		128 [1133] <b>153</b>	261 [2310] <b>153</b>	386 [3416] <b>152</b>	510 [4514] <b>150</b>	638 [5646] <b>147</b>	761 [6735] <b>142</b>			154	
	83 [22]		108 [956] <b>167</b>	237 [2097] <b>167</b>	361 [3195] <b>166</b>	487 [4310] <b>165</b>	606 [5363] <b>163</b>	738 [6531] <b>157</b>			168	
	91 [24]			206 [1823] <b>183</b>	343 [3036] <b>182</b>	465 [4115] <b>180</b>	595 [5266] <b>175</b>	719 [6363] <b>170</b>			184	
99 [26]			181 [1602] <b>199</b>	317 [2805] <b>198</b>	435 [3850] <b>196</b>	574 [5080] <b>191</b>	697 [6168] <b>184</b>			200		
114 [30]			117 [1035] <b>229</b>	251 [2221] <b>229</b>	381 [3372] <b>226</b>	516 [4567] <b>221</b>	641 [5673] <b>214</b>			230		
<b>Rotor Width</b>		Torque - Nm [lb-in], Speed rpm										
78.9 [3.105]		Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>										
mm [in]		134 [1185]	276 [2440]	410 [3626]	544 [4811]	678 [5996]	819 [7251]	953 [8437]	1087 [9622]	1221 [10807]		
		Theoretical Torque - Nm [lb-in]					Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]					

**HOUSINGS**

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

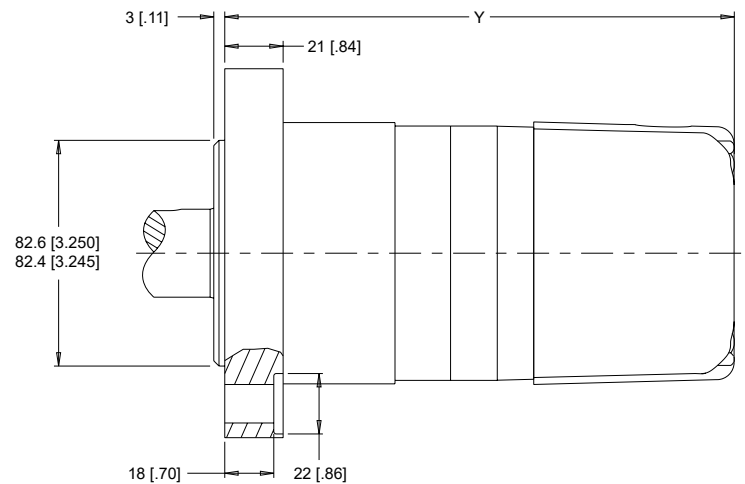
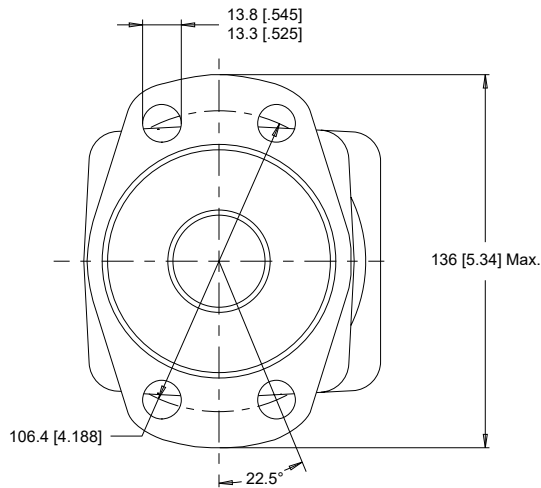
**2-HOLE, SAE A MOUNT**

**A0** End Ports    **A7** Side Ports



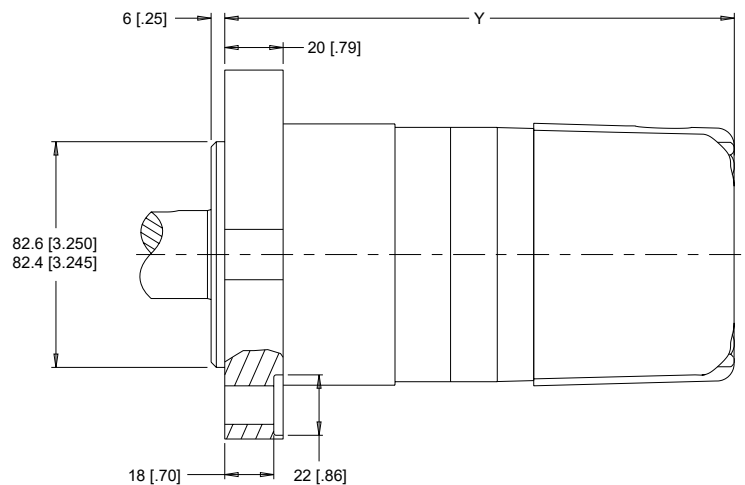
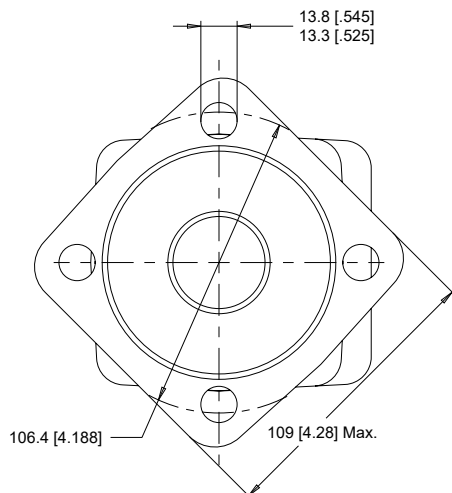
**4-HOLE, MAGNETO MOUNT**

**A2** End Ports    **A8** Side Ports



**4-HOLE, SAE A MOUNT**

**AG** End Ports    **AH** Side Ports



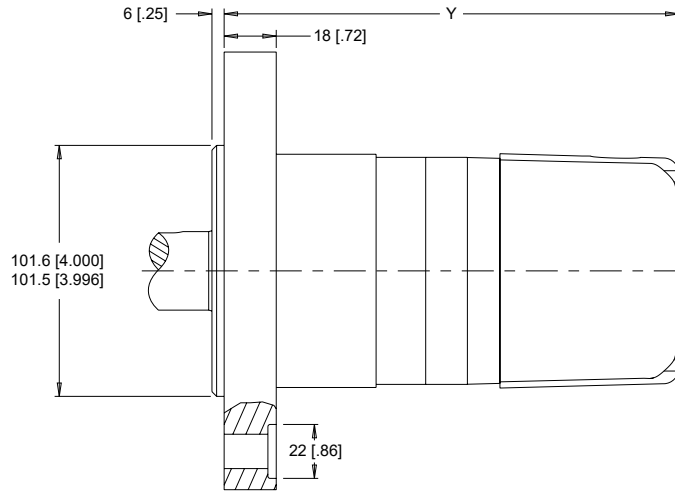
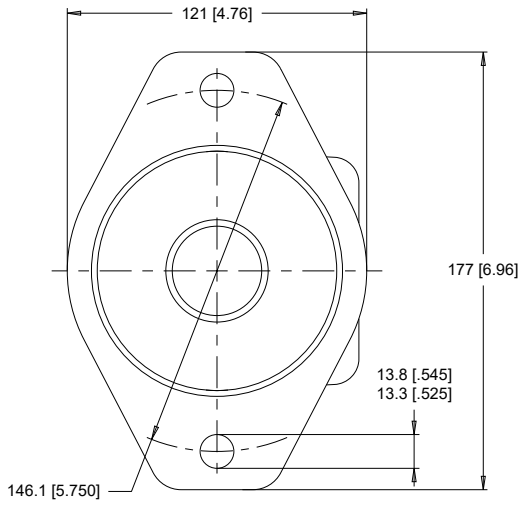
► Dimension Y is charted on page 24.

**HOUSINGS**

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

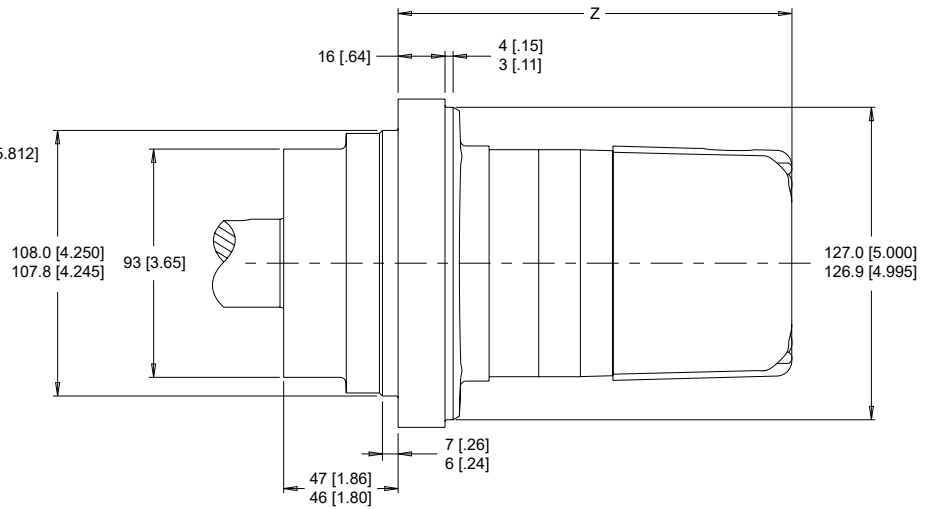
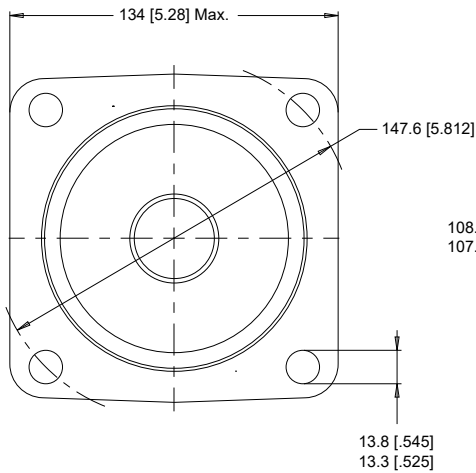
**2-HOLE, SAE B MOUNT**

**B0** End Ports    **B7** Side Ports



**4-HOLE, 4.25" WHEEL MOUNT**

**Y2** End Ports    **Y8** Side Ports



► Dimensions Y & Z are charted on page 24. Porting options listed on pages 26-27.

**LENGTH & WEIGHT CHARTS**

Dimension Y is the overall motor length from the rear of the motor to the mounting flange surface and is referenced on detailed housing drawings listed on pages 23 & 24.

Y	SAE A & B Mounts		Magneto Mounts	Weight
	#	mm [in]	mm [in]	kg [lb]
080	181 [7.12]	185 [7.27]	11.0 [24.2]	
100	185 [7.27]	189 [7.42]	11.3 [24.9]	
110	187 [7.36]	191 [7.51]	11.4 [25.1]	
130	190 [7.49]	194 [7.64]	11.5 [25.3]	
160	197 [7.74]	201 [7.89]	11.8 [26.0]	
200	204 [8.04]	208 [8.19]	12.2 [26.8]	
230	210 [8.28]	214 [8.43]	12.6 [27.7]	
250	204 [8.04]	208 [8.19]	12.2 [26.8]	
320	228 [8.99]	232 [9.14]	13.5 [29.7]	
400	228 [8.99]	232 [9.14]	13.5 [29.7]	
500	244 [9.60]	248 [9.75]	14.2 [31.2]	

► Add 1.2 kg [2.6 lb] to the weight listed to the right for SAE B mount housings.

Dimension Z is the overall motor length from the rear of the motor to the mounting flange surface and is referenced on the detailed housing drawing above.

Z	Length	Weight
	#	mm [in]
080	141 [5.55]	12.2 [26.9]
100	145 [5.69]	12.5 [27.5]
110	147 [5.78]	12.6 [27.7]
130	150 [5.91]	12.7 [27.9]
160	157 [6.16]	13.0 [28.6]
200	164 [6.46]	13.4 [29.5]
230	170 [6.70]	13.8 [30.4]
250	164 [6.46]	13.4 [29.5]
320	188 [7.41]	14.7 [32.3]
400	188 [7.41]	14.7 [32.3]
500	204 [8.02]	15.4 [33.9]

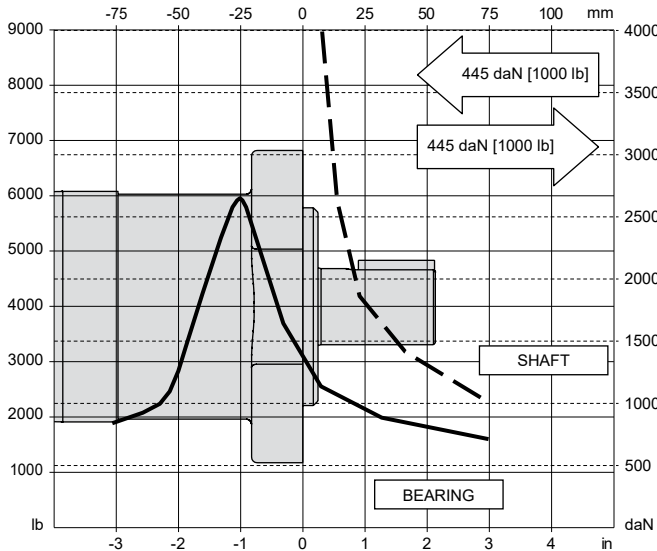
► 360 series motor weights can vary ± 1kg [2 lb] depending on model configurations such as housing, shaft, endcover, options etc.

**TECHNICAL INFORMATION**

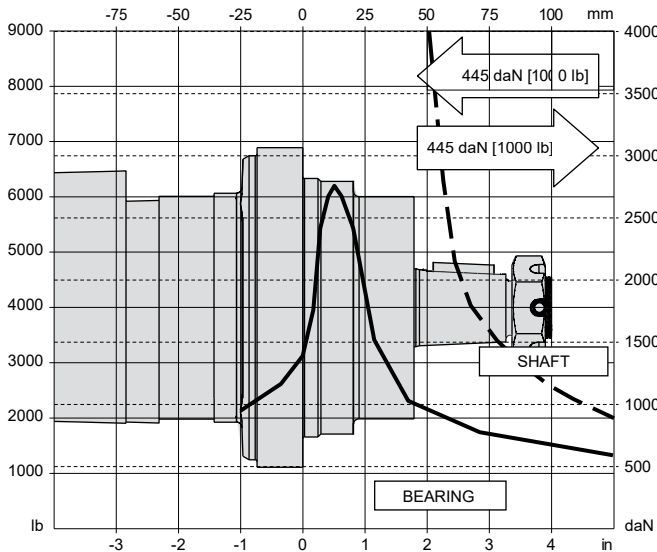
**ALLOWABLE SHAFT LOAD / BEARING CURVE**

The bearing curve represents allowable bearing loads for a B10 life of 2,000 hours at 100 rpm. The curve includes affects of 1,000 lbs inward/outward net thrust\*. Radial loads for speeds other than 100 rpm may be calculated using the multiplication factor on page 7.

**SAE A, SAE B & MAGNETO MOUNTS**

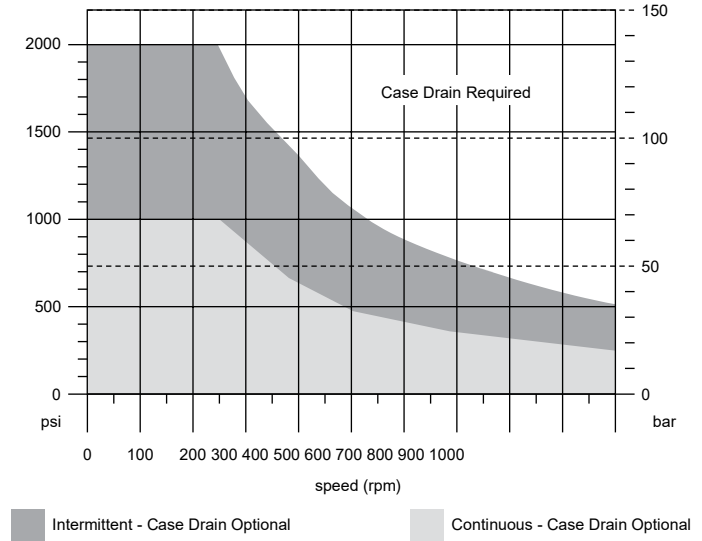


**4.25" WHEEL MOUNT**

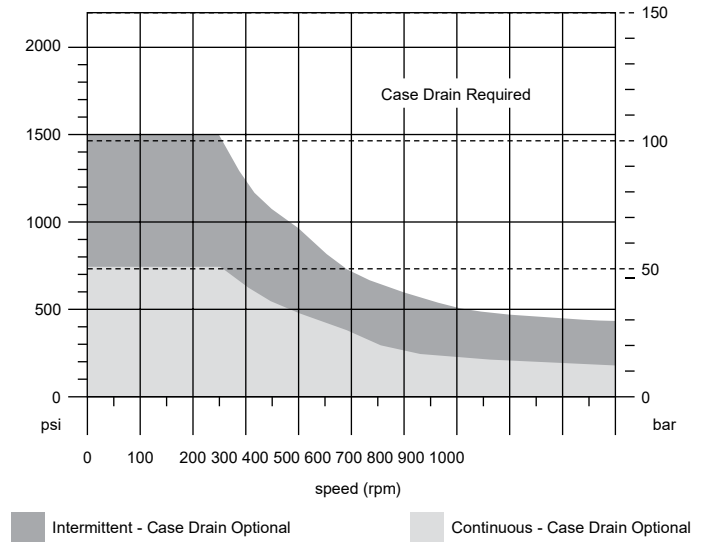


**PERMISSIBLE SHAFT SEAL PRESSURE**

**MOTORS WITH SHAFT DIAMETERS 1-1/4" OR LESS**



**MOTORS WITH SHAFT DIAMETERS LARGER THAN 1-1/4"**



\* Case pressure will push outward on the shaft. If case drain line is attached and routed directly to tank, case pressure should be negligible. If case drain line is not attached, case pressure will be nearly the same as motor return pressure. When case pressure is acting, the allowable inward axial load can be increased and the allowable outward axial load must be decreased at a rate of 59 kg / 7 bar [130 lb / 100 psi] for shaft codes 02, 10, 12, 20, 21, 22 & 23. The rate for shaft codes 28 & 31 is 78 kg / 7 bar [175 lb / 100 psi].

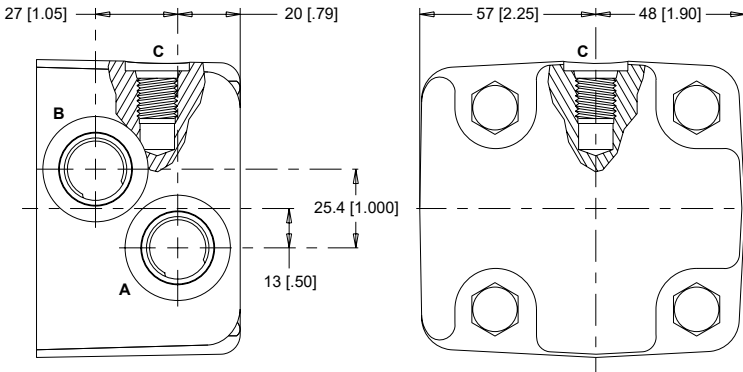
**PORTING**

**SIDE PORTED - OFFSET**

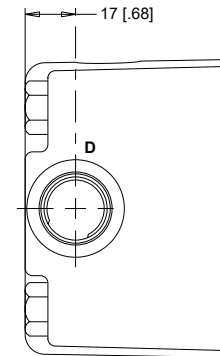
**1** Main Ports **A, B:** 7/8-14 UNF  
 Drain Port **C:** 7/16-20 UNF

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

STANDARD



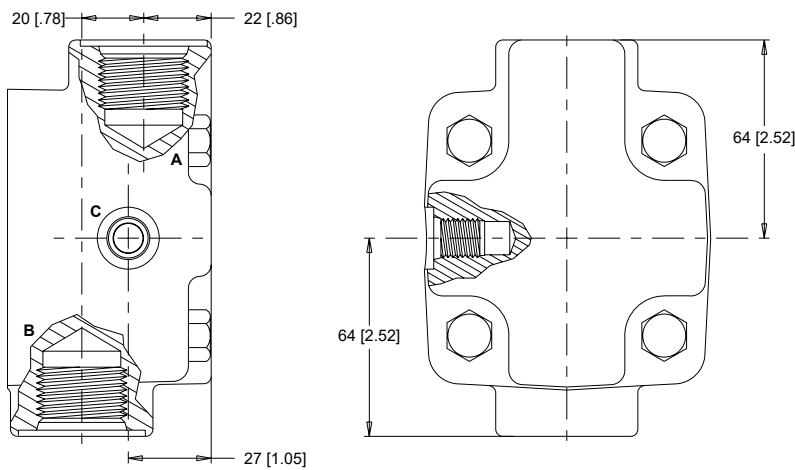
OPTIONAL



D: 10 Series/2-Way Valve Cavity 7/8-14 UNF

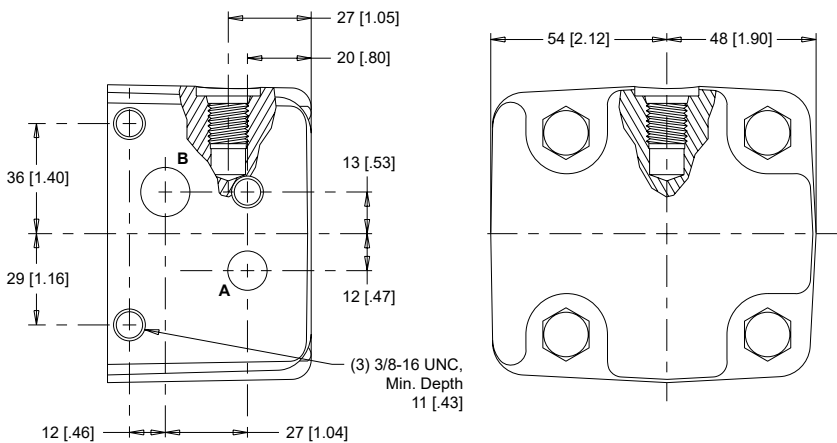
**SIDE PORTED - 180° OPPOSED**

**6** Main Ports **A, B:** 1 1/16-12 UN  
 Drain Port **C:** 7/16-20 UNF



**SIDE PORTED - OFFSET MANIFOLD**

**B** Main Ports **A:** 12.7 [.500] Drilled **B:** 15.9 [.625] Drilled  
 Drain Port **C:** 7/16-20 UNF

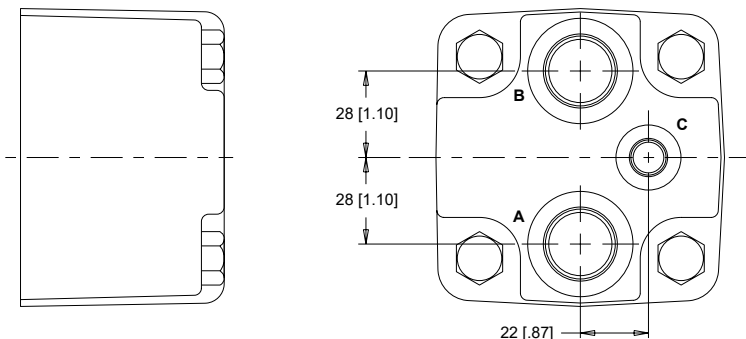


**PORTING**

**END PORTED - ALIGNED**

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

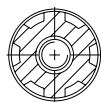
**2** Main Ports **A, B:** G 1/2  
Drain Port **C:** G 1/4



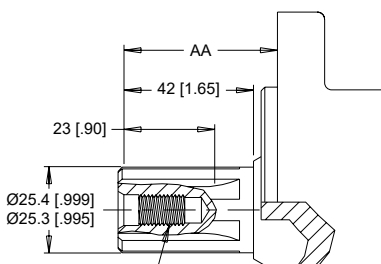
**SHAFTS**

**02** 1" 6B Spline

6B Spline  
SAE J499 Standard

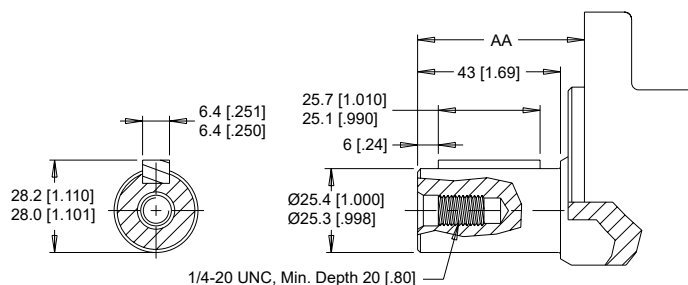


1/4-20 UNC, Min. Depth 20 [.80]



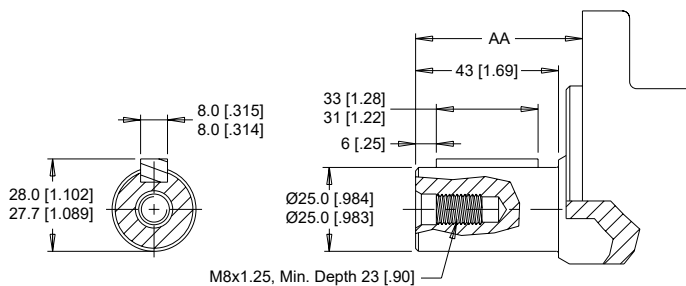
Max. Torque: 678 Nm [6000 lb-in]

**10** 1" Straight



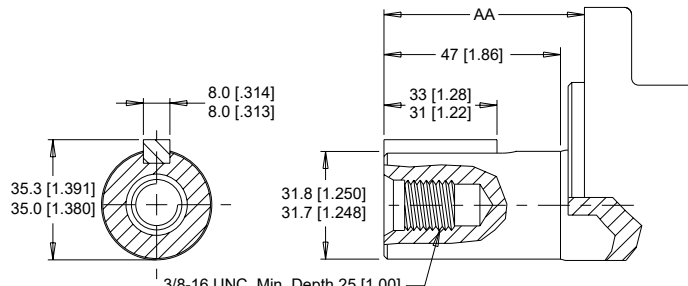
Max. Torque: 655 Nm [5800 lb-in]

**12** 25mm Straight



Max. Torque: 678 Nm [6000 lb-in]

**20** 1-1/4" Straight

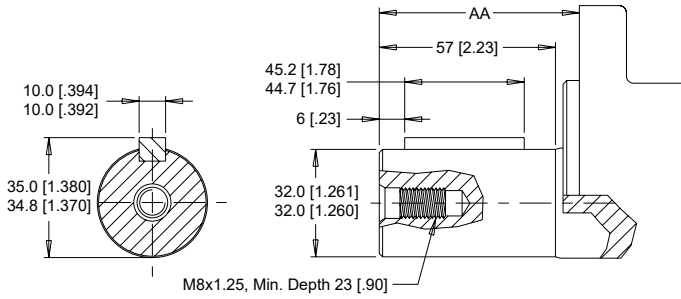


Max. Torque: 881 Nm [7800 lb-in]

► Dimension AA is charted on page 28.

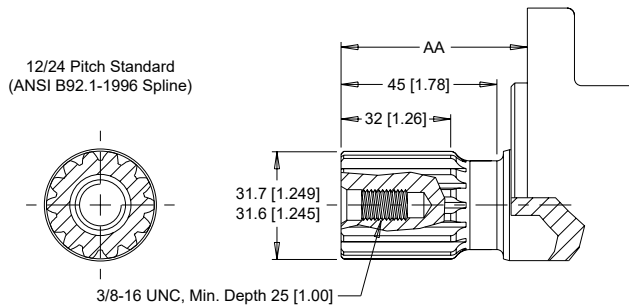
**SHAFTS**

**21** 32mm Straight



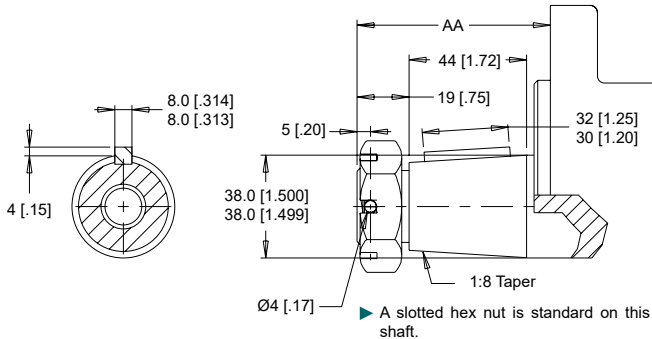
Max. Torque: 881 Nm [7800 lb-in]

**23** 14 Tooth Spline



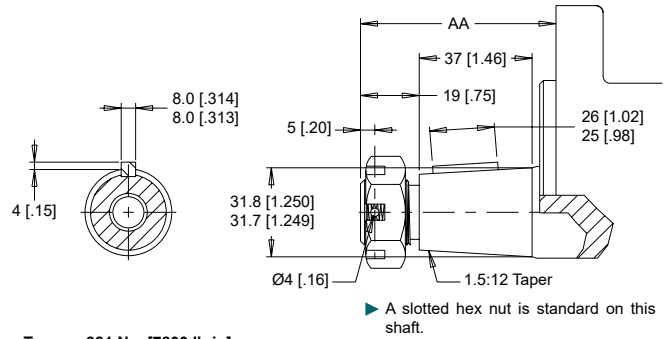
Max. Torque: 881 Nm [7800 lb-in]

**31** 1-1/2" Tapered



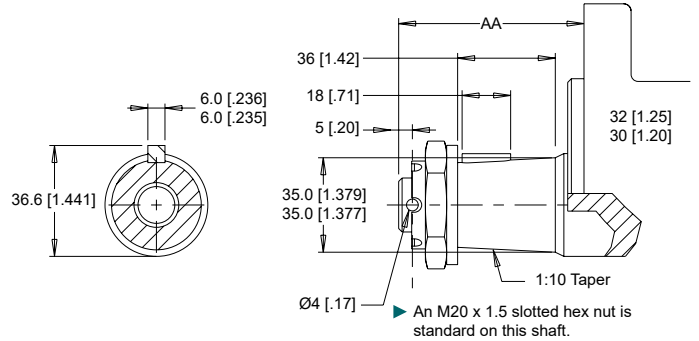
Max. Torque: 881 Nm [7800 lb-in]

**22** 1-1/4" Tapered



Max. Torque: 881 Nm [7800 lb-in]

**28** 35mm Tapered



Max. Torque: 881 Nm [7800 lb-in]

**MOUNTING / SHAFT LENGTH CHART**

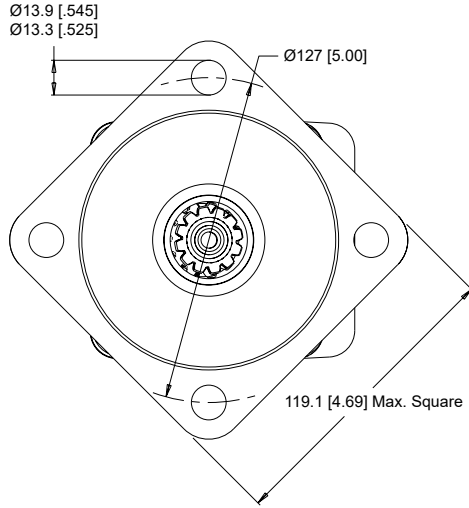
Dimension AA is the overall distance from the motor mounting surface to the end of the shaft and is referenced on detailed shaft drawings above as well as shafts on page 27.

AA	SAE A & B Mounts	Magneto Mounts	Wheel Mounts
#	mm [in]	mm [in]	mm [in]
02	51 [2.00]	47 [1.85]	91 [3.58]
10	51 [2.00]	47 [1.85]	91 [3.58]
12	51 [2.00]	47 [1.85]	91 [3.58]
20	55 [2.17]	52 [2.03]	96 [3.76]
21	65 [2.54]	61 [2.39]	105 [4.12]
22	64 [2.51]	60 [2.36]	104 [4.09]
23	55 [2.17]	52 [2.03]	96 [3.76]
28	N/A	N/A	107 [4.20]
31	N/A	N/A	123 [4.86]

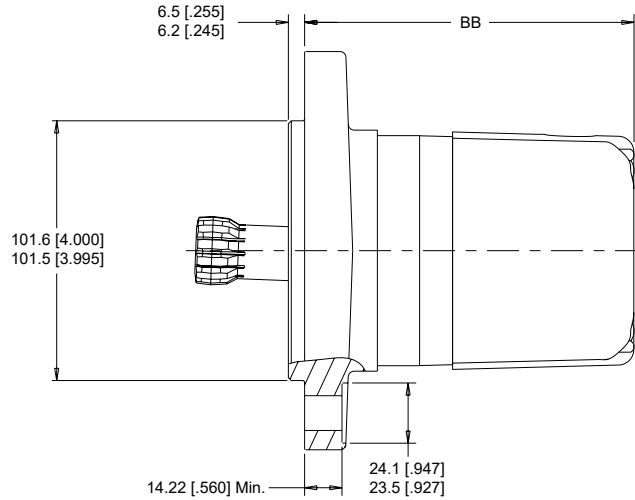
► Shaft lengths vary ± 0.8 mm [.030 in.]

**HOUSINGS**

**4-HOLE, 4.00" PILOT MOUNT**



**S2** End Ports    **S8** Side Ports

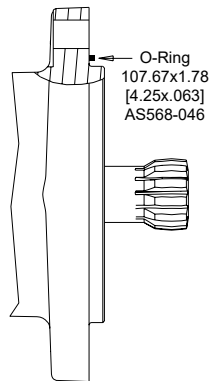


**SHAFTS**

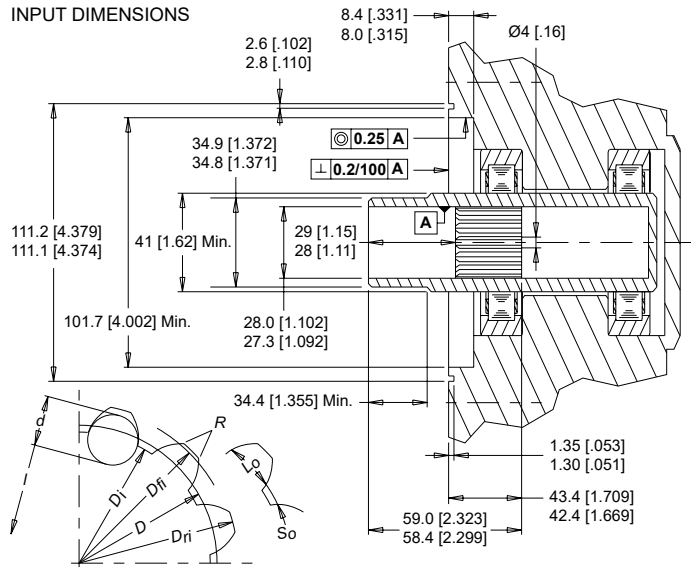
**0B** Cardan (For Use With S2 & S8 Mounts)

Fillet Root Side Fit	
Number of Teeth	12
Pitch	12/24
Pressure Angle	30°
Pitch Diameter <i>D</i>	25.4 [1.000]
Base Diameter	21.997 [8660]
Major Diameter <i>D<sub>fl</sub></i>	27.74 [1.092] - 27.59 [1.086]
Form Diameter (Min.) <i>D<sub>fl</sub></i>	26.93 [1.060]
Minor Diameter <i>D<sub>j</sub></i>	23.224 [9143] - 23.097 [9093]
Space Width (Circular) <i>L<sub>0</sub></i> *	
Max. Actual	4.318 [1700]
Min. Effective	4.216 [1660]
Fillet Radius <i>R</i>	0.76 [030] - 0.64 [025]
Max. Distance Between Pins <i>l</i> ...	19.190 [7555] - 19.020 [7488]
Pin Diameter <i>d</i>	4.496 [1770]

with 3.38 [133] Flat for Root Clearance.



**INPUT DIMENSIONS**



► The recommended shaft material is SAE 8620 or similar case hardening steel such as 20 MoCr4 (900 N/mm<sup>2</sup>) hardened to 59 - 62 HRC to a depth of 0.762 - 1.016 [030 - .040].  
\*Dimensions apply after heat treatment.

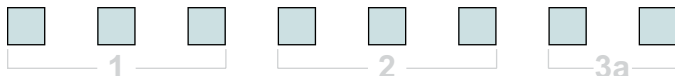
**LENGTH & WEIGHT CHART**

Dimension BB is the overall motor length from the rear of the motor to the mounting flange surface and is referenced on the detailed housing drawing above.

BB #	Length mm [in]	Weight kg [lb]
080	124 [4.88]	12.2 [26.8]
100	128 [5.04]	12.5 [27.5]
110	130 [5.14]	12.6 [27.8]
130	134 [5.27]	12.8 [28.2]
160	140 [5.52]	13.3 [29.2]
200	148 [5.82]	13.6 [29.9]
230	154 [6.06]	14.0 [30.8]
250	148 [5.82]	13.6 [29.9]
320	172 [6.77]	15.0 [32.9]
400	172 [6.77]	15.0 [32.9]
500	187 [7.37]	15.8 [34.7]

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

**ORDERING INFORMATION**



**1. CHOOSE SERIES DESIGNATION**

**365** Clockwise Rotation      **366** Counterclockwise Rotation

► The 365 & 366 series are bi-directional. Reversing the inlet hose will reverse shaft rotation.

**2. SELECT A DISPLACEMENT OPTION**

<b>080</b>	80 cm <sup>3</sup> /rev [4.9 in <sup>3</sup> /rev]	<b>230</b>	229 cm <sup>3</sup> /rev [14.0 in <sup>3</sup> /rev]
<b>100</b>	100 cm <sup>3</sup> /rev [6.1 in <sup>3</sup> /rev]	<b>250</b>	248 cm <sup>3</sup> /rev [15.1 in <sup>3</sup> /rev]
<b>110</b>	112 cm <sup>3</sup> /rev [6.8 in <sup>3</sup> /rev]	<b>320</b>	322 cm <sup>3</sup> /rev [19.6 in <sup>3</sup> /rev]
<b>130</b>	129 cm <sup>3</sup> /rev [7.9 in <sup>3</sup> /rev]	<b>400</b>	396 cm <sup>3</sup> /rev [24.2 in <sup>3</sup> /rev]
<b>160</b>	161 cm <sup>3</sup> /rev [9.8 in <sup>3</sup> /rev]	<b>500</b>	495 cm <sup>3</sup> /rev [30.2 in <sup>3</sup> /rev]
<b>200</b>	201 cm <sup>3</sup> /rev [12.3 in <sup>3</sup> /rev]		

**3a. SELECT MOUNT TYPE**

▼ **END MOUNT**

<b>A0</b>	2-Hole, SAE A Mount
<b>A2</b>	4-Hole, Magneto Mount
<b>AG</b>	4-Hole SAE A Mount
<b>B0</b>	2-Hole SAE B Mount
<b>S2</b>	4-Hole Short Motor Mount
<b>Y2</b>	4-Hole Wheel Mount

**3b. SELECT PORT SIZE**

▼ **END PORT OPTIONS**

<b>1</b>	7/8-14 UNF Aligned
<b>2</b>	G 1/2 Aligned

▼ **SIDE MOUNT**

<b>A7</b>	2-Hole, SAE A Mount
<b>A8</b>	4-Hole, Magneto Mount
<b>AH</b>	4-Hole SAE A Mount
<b>B7</b>	2-Hole SAE B Mount
<b>S8</b>	4-Hole Short Motor Mount
<b>Y8</b>	4-Hole Wheel Mount

▼ **SIDE PORT OPTIONS**

<b>1</b>	7/8-14 UNF, Offset
<b>2</b>	G 1/2, Offset
<b>6</b>	1 1/16-20 UN, 180° Opposed
<b>B</b>	Drilled Offset Manifold

► The S2 and S8 Mounts are only available with the 0B cardan shaft.



**4. SELECT A SHAFT OPTION**

<b>0B</b>	Cardan	<b>21</b>	32mm Straight
<b>02</b>	1"6B Spline	<b>22</b>	1-1/4" Tapered
<b>10</b>	1" Straight	<b>23</b>	14 Tooth Spline
<b>12</b>	25mm Straight	<b>28</b>	35mm Tapered
<b>20</b>	1-1/4" Straight	<b>31</b>	1-1/2" Tapered

► The 28 and 31 shafts are only available on the AG, AH, Y2 and Y8 mounts.

**5. SELECT A PAINT OPTION**

<b>A</b>	Black
<b>B</b>	Black, Unpainted Mounting Surface
<b>Z</b>	No Paint

► The S2 and S8 mounts are only available with no paint.

**6. SELECT A VALVE CAVITY / CARTRIDGE OPTION**

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

► Valve cavity is only available on side ports 1 & 2.

**7. SELECT AN ADD-ON OPTION**

<b>A</b>	Standard
<b>B</b>	Lock Nut
<b>C</b>	Solid Hex Nut

**8. SELECT A MISCELLANEOUS OPTION**

<b>AA</b>	None
<b>AB</b>	Internal Drain
<b>AC</b>	Freeturning Rotor
<b>MA</b>	Mounting Rotated 90°
<b>MB</b>	Freeturning Rotor With Mounting Rotated 90°

► Rotated mounting not available on the 4-Hole SAE A & wheel mounts

**OVERVIEW**

The WS targets agricultural equipment, skid steer attachments, and other applications that require greater torque under demanding conditions. Additional product features include a three zone commutator valve, heavy-duty tapered roller bearings, integral check valves, and a provision for a case drain. The WS offers numerous housing, displacement and shaft options to meet most common SAE and European requirements.

**FEATURES / BENEFITS**

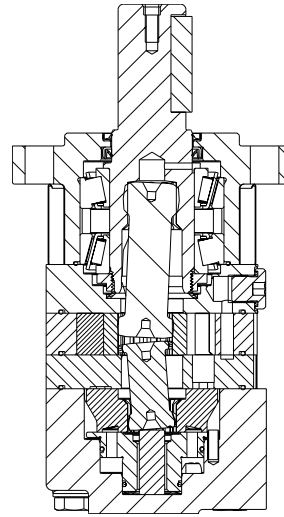
- Built-in check valves offer versatility and increased seal life.
- Twelve shaft and ten mounting options to meet the most common SAE and European requirements.
- Heavy-duty tapered roller bearings for extra side load capacity.
- Three zone commutator valve for high flow capacity.
- Standard case drain with integral internal drain for extended shaft seal life.

**TYPICAL APPLICATIONS**

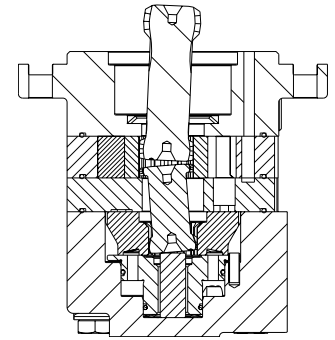
Heavy-duty wheel drives, sweepers, grain augers, spread-ers, feed rollers, brush drives, mowers, harvesting equipment gear box mounts and more

**SERIES DESCRIPTIONS**

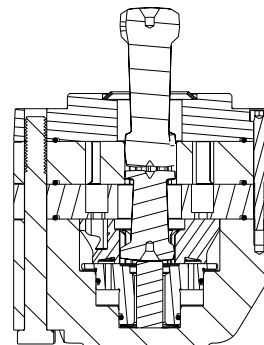
**360 - Hydraulic Motor**  
*Standard*



**360 - Hydraulic Motor**  
*Short*



**360 - Hydraulic Motor**  
*Ultra Short*



**SPECIFICATIONS**

CODE	Displacement cm <sup>3</sup> [in <sup>3</sup> /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
080	80 [4.9]	793	979	65 [17]	80 [21]	234 [2071]	306 [2708]	210 [3050]	275 [3990]	295 [4280]
100	100 [6.1]	744	887	75 [20]	90 [24]	301 [2664]	392 [3470]	210 [3050]	275 [3990]	295 [4280]
125	125 [7.6]	596	711	75 [20]	90 [24]	364 [3222]	478 [4231]	210 [3050]	275 [3990]	295 [4280]
160	160 [9.7]	471	561	75 [20]	90 [24]	466 [4125]	577 [5107]	210 [3050]	260 [3770]	280 [4060]
200	200 [12.2]	377	448	75 [20]	90 [24]	599 [5302]	705 [6240]	210 [3050]	250 [3630]	270 [3920]
230	226 [13.8]	324	389	75 [20]	90 [24]	652 [5771]	812 [7187]	200 [2900]	250 [3630]	270 [3920]
250	250 [15.2]	298	363	75 [20]	90 [24]	703 [6222]	851 [7532]	200 [2900]	250 [3630]	270 [3920]
315	305 [18.6]	240	293	75 [20]	90 [24]	872 [7718]	1024 [9063]	200 [2900]	240 [3480]	260 [3770]
400	393 [24.0]	185	225	75 [20]	90 [24]	910 [8054]	1069 [9462]	160 [2320]	190 [2760]	210 [3050]
500	493 [30.1]	149	180	75 [20]	90 [24]	848 [7506]	1001 [8860]	120 [1740]	140 [2030]	160 [2320]

► Performance data is typical. Performance of production units varies slightly from one motor to another. Running at intermittent ratings should not exceed 10% of every minute of operation.

**DISPLACEMENT PERFORMANCE**

		Pressure - bar [psi]								Max. Cont.		Max. Inter.	
<b>080</b>		30 [440]	70 [1020]	105 [1520]	140 [2030]	175 [2540]	210 [3050]	225 [3260]	250 [3630]	275 [3990]			
80 cm <sup>3</sup> [4.9 in <sup>3</sup> ] / rev		Intermittent Ratings are below and to the right of the BOLD line.								Intermittent Ratings - 10% of Operation			
Flow - lpm [gpm]	5 [1.3]	29 [257] <b>61</b>	76 [673] <b>58</b>	116 [1027] <b>55</b>	156 [1381] <b>45</b>	194 [1717] <b>36</b>	222 [1965] <b>31</b>					62	
	10 [2.6]	28 [248] <b>124</b>	73 [646] <b>118</b>	114 [1009] <b>110</b>	155 [1372] <b>99</b>	194 [1717] <b>87</b>	234 [2071] <b>73</b>	246 [2177] <b>67</b>	269 [2381] <b>60</b>			125	
	20 [5.3]	27 [239] <b>246</b>	72 [637] <b>241</b>	112 [991] <b>232</b>	152 [1345] <b>220</b>	191 [1690] <b>204</b>	232 [2053] <b>184</b>	248 [2195] <b>176</b>	278 [2460] <b>159</b>	303 [2682] <b>143</b>		250	
	30 [7.9]	24 [212] <b>368</b>	70 [620] <b>361</b>	110 [974] <b>354</b>	150 [1328] <b>342</b>	190 [1682] <b>322</b>	231 [2044] <b>302</b>	248 [2195] <b>293</b>	276 [2443] <b>277</b>	306 [2708] <b>254</b>		375	
	40 [10.6]	23 [204] <b>493</b>	68 [602] <b>483</b>	107 [947] <b>479</b>	146 [1292] <b>469</b>	189 [1673] <b>448</b>	229 [2027] <b>426</b>	247 [2186] <b>418</b>	277 [2451] <b>399</b>	303 [2682] <b>381</b>		499	
	50 [13.2]		66 [584] <b>607</b>	106 [938] <b>598</b>	146 [1292] <b>585</b>	186 [1646] <b>564</b>	227 [2009] <b>545</b>	245 [2168] <b>532</b>				624	
	65 [17.2]		62 [549] <b>793</b>	101 [894] <b>787</b>	141 [1248] <b>762</b>	182 [1611] <b>742</b>	225 [1991] <b>714</b>	238 [2106] <b>709</b>				811	
	80 [21.1]		56 [496] <b>979</b>	97 [858] <b>966</b>	140 [1239] <b>941</b>	178 [1575] <b>920</b>						999	
	Max. Max. Inter. Cont.		Torque - Nm [lb-in], Speed rpm								Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>		
Rotor Width	15.6 [6.14] mm [in]	38 [336]	89 [788]	134 [1186]	178 [1575]	223 [1974]	268 [2372]	287 [2540]	319 [2823]	351 [3107]			
		Theoretical Torque - Nm [lb-in]								Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]			

		Pressure - bar [psi]								Max. Cont.		Max. Inter.	
<b>100</b>		35 [510]	70 [1020]	105 [1520]	140 [2030]	175 [2540]	210 [3050]	225 [3260]	250 [3630]	275 [3990]			
100 cm <sup>3</sup> [6.1 in <sup>3</sup> ] / rev		Intermittent Ratings are below and to the right of the BOLD line.								Intermittent Ratings - 10% of Operation			
Flow - lpm [gpm]	5 [1.3]	47 [416] <b>49</b>	98 [867] <b>48</b>	149 [1319] <b>46</b>	198 [1752] <b>43</b>	245 [2168] <b>37</b>	284 [2513] <b>31</b>	299 [2646] <b>23</b>				50	
	10 [2.6]	46 [407] <b>99</b>	96 [850] <b>97</b>	148 [1310] <b>94</b>	199 [1761] <b>90</b>	249 [2204] <b>83</b>	297 [2628] <b>75</b>	316 [2797] <b>70</b>	349 [3089] <b>59</b>	372 [3292] <b>48</b>		100	
	20 [5.3]	45 [398] <b>197</b>	95 [841] <b>195</b>	146 [1292] <b>192</b>	198 [1752] <b>187</b>	249 [2204] <b>180</b>	301 [2664] <b>167</b>	322 [2850] <b>161</b>	357 [3159] <b>149</b>	390 [3452] <b>143</b>		200	
	30 [7.9]	43 [381] <b>297</b>	93 [823] <b>285</b>	144 [1274] <b>292</b>	195 [1726] <b>288</b>	247 [2186] <b>280</b>	297 [2628] <b>263</b>	320 [2832] <b>259</b>	356 [3151] <b>246</b>	392 [3469] <b>227</b>		300	
	40 [10.6]	40 [354] <b>395</b>	91 [805] <b>393</b>	142 [1257] <b>392</b>	193 [1708] <b>389</b>	244 [2159] <b>383</b>	295 [2611] <b>367</b>	317 [2805] <b>362</b>	354 [3133] <b>347</b>	389 [3443] <b>331</b>		400	
	50 [13.2]	37 [327] <b>495</b>	88 [779] <b>490</b>	138 [1221] <b>491</b>	191 [1690] <b>486</b>	240 [2124] <b>481</b>	295 [2611] <b>465</b>	315 [2788] <b>459</b>				500	
	60 [15.9]	35 [310] <b>594</b>	84 [743] <b>592</b>	136 [1204] <b>585</b>	187 [1655] <b>579</b>	238 [2106] <b>565</b>	289 [2558] <b>564</b>	311 [2752] <b>553</b>				600	
	75 [19.8]	28 [248] <b>744</b>	78 [690] <b>739</b>	126 [1115] <b>743</b>	183 [1620] <b>726</b>	230 [2036] <b>712</b>	286 [2531] <b>698</b>	304 [2690] <b>691</b>				750	
	90 [23.8]		70 [620] <b>887</b>	123 [1089] <b>881</b>	174 [1540] <b>874</b>	223 [1974] <b>859</b>						900	
Max. Max. Inter. Cont.		Torque - Nm [lb-in], Speed rpm								Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>			
Rotor Width	19.7 [7.76] mm [in]	55 [493]	111 [986]	167 [1479]	223 [1972]	278 [2465]	334 [2958]	358 [3170]	398 [3521]	438 [3874]			
		Theoretical Torque - Nm [lb-in]								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. Operating at maximum continuous pressure and maximum continuous flow simultaneously is not recommended. For additional information on product testing please refer to page 6.

**DISPLACEMENT PERFORMANCE**

<b>125</b>		Pressure - bar [psi]								Max. Cont.		Max. Inter.				
		35 [510]	70 [1020]	105 [1520]	140 [2030]	175 [2540]	210 [3050]	225 [3260]	250 [3630]	275 [3990]						
125 cm <sup>3</sup> [7.6 in <sup>3</sup> ] / rev		<b>Intermittent Ratings are below and to the right of the BOLD line.</b>										<b>Intermittent Ratings - 10% of Operation</b>				
Max. Max. Inter. Cont.	Flow - lpm [gpm]	5 [1.3]	51 [451] <b>39</b>	113 [1000] <b>38</b>	176 [1558] <b>35</b>	229 [2027] <b>31</b>	301 [2664] <b>26</b>	327 [2894] <b>16</b>						40	Theoretical rpm	
		10 [2.6]	50 [443] <b>79</b>	113 [1000] <b>77</b>	176 [1558] <b>74</b>	241 [2133] <b>67</b>	300 [2655] <b>60</b>	353 [3124] <b>49</b>	377 [3336] <b>46</b>	411 [3637] <b>37</b>				80		
		20 [5.3]	48 [425] <b>159</b>	109 [965] <b>157</b>	174 [1540] <b>151</b>	238 [2106] <b>146</b>	301 [2664] <b>130</b>	364 [3221] <b>115</b>	386 [3416] <b>108</b>	431 [3814] <b>95</b>	475 [4204] <b>78</b>					160
		30 [7.9]	46 [407] <b>239</b>	109 [965] <b>235</b>	172 [1522] <b>232</b>	235 [2080] <b>222</b>	298 [2637] <b>212</b>	363 [3213] <b>190</b>	391 [3460] <b>183</b>	436 [3859] <b>168</b>	478 [4230] <b>151</b>					240
		40 [10.6]	43 [381] <b>319</b>	106 [938] <b>314</b>	169 [1496] <b>311</b>	233 [2062] <b>302</b>	296 [2620] <b>291</b>	363 [3213] <b>268</b>	390 [3452] <b>260</b>	431 [3814] <b>248</b>	477 [4221] <b>229</b>					320
		50 [13.2]	40 [354] <b>399</b>	101 [894] <b>395</b>	167 [1478] <b>387</b>	233 [2062] <b>379</b>	296 [2620] <b>362</b>	363 [3213] <b>346</b>	387 [3425] <b>341</b>							400
		60 [15.9]	38 [336] <b>477</b>	100 [885] <b>472</b>	163 [1443] <b>466</b>	232 [2053] <b>457</b>	295 [2611] <b>441</b>	356 [3151] <b>433</b>	383 [3390] <b>422</b>							480
		75 [19.8]	28 [248] <b>596</b>	93 [823] <b>592</b>	155 [1372] <b>582</b>	218 [1929] <b>570</b>	283 [2505] <b>556</b>	352 [3115] <b>533</b>	376 [3328] <b>527</b>							600
		90 [23.8]		81 [717] <b>711</b>	148 [1310] <b>702</b>	214 [1894] <b>685</b>	274 [2425] <b>672</b>									720
<b>Rotor Width</b>		Torque - Nm [lb-in], Speed rpm										Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>				
19.7 [7.76] mm [in]		69 [616]	139 [1232]	208 [1849]	278 [2465]	348 [3081]	417 [3698]	447 [3962]	493 [4402]	547 [4842]						
		Theoretical Torque - Nm [lb-in]										Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]				

<b>160</b>		Pressure - bar [psi]								Max. Cont.		Max. Inter.				
		35 [510]	70 [1020]	105 [1520]	140 [2030]	160 [2320]	175 [2540]	210 [3050]	225 [3260]	260 [3770]						
160 cm <sup>3</sup> [9.7 in <sup>3</sup> ] / rev		<b>Intermittent Ratings are below and to the right of the BOLD line.</b>										<b>Intermittent Ratings - 10% of Operation</b>				
Max. Max. Inter. Cont.	Flow - lpm [gpm]	5 [1.3]	71 [628] <b>30</b>	150 [1328] <b>29</b>	232 [2053] <b>28</b>	307 [2717] <b>24</b>	356 [3151] <b>20</b>	385 [3407] <b>18</b>						31	Theoretical rpm	
		10 [2.6]	71 [628] <b>62</b>	149 [1319] <b>61</b>	230 [2036] <b>58</b>	310 [2744] <b>53</b>	355 [3142] <b>47</b>	386 [3416] <b>42</b>	459 [4062] <b>33</b>	488 [4319] <b>31</b>				62		
		20 [5.3]	69 [611] <b>123</b>	147 [1301] <b>122</b>	230 [2036] <b>119</b>	309 [2735] <b>113</b>	355 [3142] <b>107</b>	388 [3434] <b>101</b>	465 [4115] <b>84</b>	498 [4407] <b>77</b>				125		
		30 [7.9]	65 [575] <b>185</b>	143 [1266] <b>184</b>	225 [1991] <b>182</b>	307 [2717] <b>177</b>	353 [3124] <b>168</b>	387 [3425] <b>163</b>	466 [4124] <b>143</b>	500 [4425] <b>135</b>	577 [5106] <b>110</b>					187
		40 [10.6]	60 [531] <b>247</b>	138 [1221] <b>246</b>	220 [1947] <b>243</b>	303 [2682] <b>239</b>	349 [3089] <b>234</b>	383 [3390] <b>227</b>	463 [4098] <b>207</b>	497 [4398] <b>200</b>	574 [5080] <b>176</b>					250
		50 [13.2]	55 [487] <b>308</b>	133 [1177] <b>307</b>	215 [1903] <b>304</b>	296 [2620] <b>296</b>	342 [3027] <b>291</b>	376 [3328] <b>285</b>	458 [4053] <b>265</b>	490 [4337] <b>258</b>						312
		60 [15.9]	47 [416] <b>372</b>	127 [1124] <b>368</b>	207 [1832] <b>366</b>	289 [2558] <b>361</b>	336 [2974] <b>354</b>	371 [3283] <b>348</b>	452 [4000] <b>328</b>	487 [4310] <b>318</b>						375
		75 [19.8]	36 [319] <b>468</b>	114 [1009] <b>467</b>	196 [1735] <b>466</b>	279 [2469] <b>455</b>	323 [2859] <b>449</b>	361 [3195] <b>442</b>	442 [3912] <b>422</b>	472 [4177] <b>415</b>						468
		90 [23.8]	24 [212] <b>561</b>	106 [938] <b>557</b>	183 [1620] <b>549</b>	266 [2354] <b>540</b>	311 [2752] <b>533</b>									562
<b>Rotor Width</b>		Torque - Nm [lb-in], Speed rpm										Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>				
25.4 [1.000] mm [in]		89 [789]	178 [1578]	267 [2366]	359 [3156]	407 [3606]	445 [3944]	534 [4733]	573 [5071]	662 [5860]						
		Theoretical Torque - Nm [lb-in]										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. Operating at maximum continuous pressure and maximum continuous flow simultaneously is not recommended. For additional information on product testing please refer to page 6.

**DISPLACEMENT PERFORMANCE**

		Pressure - bar [psi]									Max. Cont.			Max. Inter.							
<b>200</b>		35 [510]	70 [1020]	105 [1520]	140 [2030]	160 [2320]	175 [2540]	210 [3050]	225 [3260]	250 [3630]											
200 cm <sup>3</sup> [12.2 in <sup>3</sup> ] / rev		<b>Intermittent Ratings are below and to the right of the BOLD line.</b>									<b>Intermittent Ratings - 10% of Operation</b>										
Max. Max. Inter. Cont.	Flow - lpm [gpm]	5 [1.3]	10 [2.6]	20 [5.3]	30 [7.9]	40 [10.6]	50 [13.2]	60 [15.9]	75 [19.8]	90 [23.8]	78 [690] <b>24</b>	191 [1690] <b>21</b>	289 [2558] <b>23</b>	383 [3390] <b>20</b>							25
											77 [681] <b>49</b>	191 [1690] <b>48</b>	292 [2584] <b>47</b>	382 [3381] <b>44</b>	448 [3965] <b>39</b>	487 [4310] <b>35</b>	573 [5071] <b>26</b>				50
											73 [646] <b>99</b>	189 [1673] <b>98</b>	291 [2575] <b>96</b>	393 [3478] <b>93</b>	451 [3991] <b>88</b>	494 [4372] <b>83</b>	591 [5230] <b>70</b>	632 [5593] <b>63</b>	694 [6142] <b>52</b>	100	
											71 [628] <b>149</b>	186 [1646] <b>147</b>	289 [2558] <b>146</b>	389 [3443] <b>145</b>	453 [4009] <b>137</b>	491 [4345] <b>133</b>	599 [5301] <b>119</b>	633 [5602] <b>111</b>	704 [6230] <b>95</b>	150	
											66 [584] <b>197</b>	181 [1602] <b>196</b>	283 [2505] <b>196</b>	385 [3407] <b>195</b>	443 [3921] <b>191</b>	486 [4301] <b>187</b>	591 [5230] <b>174</b>	631 [5584] <b>169</b>	705 [6239] <b>154</b>	200	
											59 [522] <b>249</b>	176 [1558] <b>247</b>	277 [2451] <b>246</b>	378 [3345] <b>244</b>	438 [3877] <b>241</b>	481 [4257] <b>237</b>	582 [5151] <b>227</b>	625 [5531] <b>220</b>		250	
											51 [451] <b>297</b>	168 [1487] <b>295</b>	269 [2381] <b>294</b>	371 [3283] <b>292</b>	428 [3788] <b>287</b>	474 [4195] <b>278</b>	571 [5053] <b>264</b>	611 [5407] <b>256</b>		300	
											40 [354] <b>371</b>	154 [1363] <b>377</b>	256 [2266] <b>375</b>	352 [3115] <b>369</b>	409 [3620] <b>362</b>	454 [4018] <b>355</b>	556 [4921] <b>338</b>	601 [5319] <b>327</b>		375	
											26 [230] <b>448</b>	139 [1230] <b>444</b>	238 [2106] <b>448</b>	338 [2991] <b>436</b>	398 [3523] <b>429</b>						450
	Rotor Width		Torque - Nm [lb-in], Speed rpm									Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>									
31.8 [1.252] mm [in]		111 [986]	222 [1972]	334 [2958]	445 [3944]	509 [4508]	557 [4930]	668 [5917]	716 [6339]	795 [7044]											
		Theoretical Torque - Nm [lb-in]									Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]										

		Pressure - bar [psi]									Max. Cont.			Max. Inter.							
<b>230</b>		35 [510]	70 [1020]	95 [1380]	125 [1810]	140 [2030]	155 [2250]	175 [2540]	200 [2900]	225 [3260]	250 [3630]										
226 cm <sup>3</sup> [13.8 in <sup>3</sup> ] / rev		<b>Intermittent Ratings are below and to the right of the BOLD line.</b>									<b>Intermittent Ratings - 10% of Operation</b>										
Max. Max. Inter. Cont.	Flow - lpm [gpm]	5 [1.3]	10 [2.6]	20 [5.3]	30 [7.9]	40 [10.6]	50 [13.2]	60 [15.9]	75 [19.8]	90 [23.8]	113 [1000] <b>21</b>	232 [2053] <b>20</b>	320 [2832] <b>19</b>							22	
											112 [991] <b>42</b>	228 [2018] <b>41</b>	321 [2841] <b>40</b>	419 [3708] <b>37</b>	465 [4115] <b>36</b>	518 [4584] <b>34</b>	569 [5036] <b>33</b>	651 [5761] <b>30</b>		44	
											111 [982] <b>86</b>	227 [2009] <b>85</b>	315 [2788] <b>83</b>	415 [3673] <b>78</b>	461 [4080] <b>75</b>	514 [4549] <b>72</b>	582 [5151] <b>69</b>	652 [5770] <b>65</b>	735 [6505] <b>61</b>	812 [7186] <b>55</b>	89
											108 [956] <b>128</b>	223 [1974] <b>126</b>	311 [2752] <b>124</b>	412 [3647] <b>119</b>	463 [4098] <b>116</b>	512 [4531] <b>113</b>	576 [5098] <b>108</b>	658 [5823] <b>102</b>	738 [6531] <b>97</b>	133	
											103 [912] <b>171</b>	220 [1947] <b>169</b>	306 [2708] <b>166</b>	410 [3629] <b>161</b>	460 [4071] <b>158</b>	510 [4514] <b>153</b>	572 [5062] <b>148</b>	651 [5761] <b>142</b>	729 [6452] <b>136</b>	177	
											97 [858] <b>216</b>	214 [1894] <b>215</b>	296 [2620] <b>213</b>	407 [3602] <b>206</b>	446 [3947] <b>203</b>	503 [4452] <b>199</b>	571 [5053] <b>192</b>			222	
											89 [788] <b>259</b>	212 [1876] <b>256</b>	290 [2567] <b>253</b>	399 [3531] <b>247</b>	440 [3894] <b>244</b>	496 [4390] <b>239</b>	554 [4903] <b>234</b>			266	
											76 [673] <b>324</b>	190 [1682] <b>321</b>	275 [2434] <b>320</b>	388 [3434] <b>310</b>	425 [3761] <b>309</b>	481 [4257] <b>304</b>	546 [4832] <b>300</b>			332	
											56 [496] <b>389</b>	174 [1540] <b>386</b>	257 [2274] <b>383</b>	361 [3195] <b>378</b>	411 [3637] <b>374</b>						399
	Rotor Width		Torque - Nm [lb-in], Speed rpm									Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>									
45.4 [1.787] mm [in]		126 [1115]	251 [2222]	341 [3018]	449 [3974]	503 [4452]	557 [4930]	628 [5558]	718 [6355]	808 [7152]	898 [7948]										
		Theoretical Torque - Nm [lb-in]									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. Operating at maximum continuous pressure and maximum continuous flow simultaneously is not recommended. For additional information on product testing please refer to page 6.

**DISPLACEMENT PERFORMANCE**

<b>250</b>		Pressure - bar [psi]								Max. Cont.	Max. Inter.			
		35 [510]	70 [1020]	95 [1380]	125 [1810]	140 [2030]	155 [2250]	175 [2540]	200 [2900]	225 [3260]	250 [3630]			
250 cm <sup>3</sup> [15.2 in <sup>3</sup> ] / rev		<b>Intermittent Ratings are below and to the right of the BOLD line.</b>								<b>Intermittent Ratings - 10% of Operation</b>				
Max. Max. Inter. Cont.	Flow - lpm [gpm]	5 [1.3]	115 [1018] <b>19</b>									20	Theoretical rpm	
		10 [2.6]	116 [1027] <b>39</b>	239 [2115] <b>38</b>	331 [2929] <b>37</b>	439 [3885] <b>35</b>	481 [4257] <b>33</b>	532 [4708] <b>31</b>	595 [5266] <b>27</b>			40		
		20 [5.3]	114 [1009] <b>79</b>	239 [2115] <b>78</b>	330 [2921] <b>76</b>	438 [3876] <b>73</b>	491 [4345] <b>70</b>	546 [4832] <b>67</b>	619 [5478] <b>62</b>	703 [6222] <b>54</b>	778 [6885] <b>45</b>	851 [7531] <b>38</b>		80
		30 [7.9]	110 [974] <b>119</b>	236 [2089] <b>118</b>	329 [2912] <b>117</b>	437 [3868] <b>115</b>	489 [4328] <b>112</b>	543 [4806] <b>109</b>	618 [5469] <b>103</b>	704 [6230] <b>93</b>	790 [6992] <b>78</b>			120
		40 [10.6]	106 [938] <b>159</b>	232 [2053] <b>158</b>	323 [2859] <b>155</b>	430 [3806] <b>154</b>	486 [4301] <b>153</b>	539 [4770] <b>150</b>	624 [5522] <b>145</b>	702 [6213] <b>133</b>	793 [7018] <b>124</b>			160
		50 [13.2]	100 [885] <b>198</b>	225 [1991] <b>197</b>	318 [2814] <b>194</b>	429 [3797] <b>195</b>	480 [4248] <b>193</b>	530 [4691] <b>191</b>	609 [5390] <b>185</b>					200
		60 [15.9]	91 [805] <b>239</b>	215 [1903] <b>237</b>	311 [2752] <b>240</b>	414 [3664] <b>235</b>	470 [4160] <b>234</b>	524 [4637] <b>233</b>	594 [5257] <b>223</b>					240
		75 [19.8]	78 [690] <b>298</b>	206 [1823] <b>295</b>	293 [2593] <b>295</b>	405 [3584] <b>292</b>	453 [4009] <b>291</b>	507 [4487] <b>285</b>	581 [5142] <b>277</b>					300
		90 [23.8]	59 [522] <b>359</b>	184 [1628] <b>357</b>	272 [2407] <b>363</b>	384 [3398] <b>353</b>	422 [3735] <b>350</b>							360
<b>Rotor Width</b>		Torque - Nm [lb-in], <b>Speed rpm</b>								Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>				
39.4 [1.551] mm [in]		139 [1232]	278 [2465]	378 [3346]	497 [4402]	557 [4930]	616 [5458]	696 [6163]	795 [7043]	895 [7924]	994 [8804]			
		Theoretical Torque - Nm [lb-in]								Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]				

<b>315</b>		Pressure - bar [psi]								Max. Cont.	Max. Inter.			
		35 [510]	70 [1020]	100 [1450]	120 [1740]	140 [2030]	160 [2320]	175 [2540]	200 [2900]	225 [3260]	240 [3480]			
305 cm <sup>3</sup> [18.6 in <sup>3</sup> ] / rev		<b>Intermittent Ratings are below and to the right of the BOLD line.</b>								<b>Intermittent Ratings - 10% of Operation</b>				
Max. Max. Inter. Cont.	Flow - lpm [gpm]	5 [1.3]	147 [1301] <b>15</b>	310 [2744] <b>14</b>	426 [3770] <b>13</b>							16	Theoretical rpm	
		10 [2.6]	153 [1354] <b>32</b>	308 [2726] <b>30</b>	441 [3903] <b>29</b>	527 [4664] <b>25</b>	600 [5310] <b>23</b>	670 [5930] <b>20</b>				33		
		20 [5.3]	151 [1336] <b>64</b>	304 [2690] <b>62</b>	441 [3903] <b>60</b>	530 [4691] <b>57</b>	610 [5399] <b>52</b>	705 [6239] <b>46</b>				66		
		30 [7.9]	146 [1292] <b>94</b>	303 [2682] <b>94</b>	439 [3885] <b>92</b>	532 [4708] <b>88</b>	617 [5460] <b>83</b>	700 [6196] <b>76</b>	764 [6761] <b>73</b>	872 [7717] <b>65</b>	980 8673] <b>64</b>	1024 [9062] <b>59</b>		98
		40 [10.6]	139 [1230] <b>127</b>	295 [2611] <b>125</b>	431 [3814] <b>124</b>	520 [4602] <b>121</b>	613 [5425] <b>117</b>	701 [6205] <b>111</b>	766 [6779] <b>105</b>	883 [7815] <b>95</b>	940 [8319] <b>94</b>			131
		50 [13.2]	130 [1151] <b>160</b>	288 [2549] <b>158</b>	423 [3744] <b>156</b>	514 [4549] <b>153</b>	604 [5345] <b>149</b>	694 [6143] <b>144</b>	759 [6717] <b>139</b>					164
		60 [15.9]	126 [1115] <b>191</b>	277 [2451] <b>191</b>	417 [3690] <b>187</b>	506 [4478] <b>186</b>	594 [5257] <b>182</b>	684 [6054] <b>174</b>	749 [6629] <b>168</b>					197
		75 [19.8]	99 [876] <b>240</b>	258 [2283] <b>237</b>	394 [3487] <b>237</b>	483 [4275] <b>234</b>	573 [5071] <b>226</b>	651 [5762] <b>222</b>						246
		90 [23.8]	74 [655] <b>293</b>	231 [2044] <b>293</b>	371 [3283] <b>284</b>	460 [4071] <b>281</b>	543 [4806] <b>276</b>							295
<b>Rotor Width</b>		Torque - Nm [lb-in], <b>Speed rpm</b>								Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>				
49.2 [1.937] mm [in]		170 [1505]	339 [3000]	485 [4293]	582 [5151]	679 [6010]	776 [6868]	848 [7506]	970 [8585]	1091 [9656]	1163 [10294]			
		Theoretical Torque - Nm [lb-in]								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. Operating at maximum continuous pressure and maximum continuous flow simultaneously is not recommended. For additional information on product testing please refer to page 6.

**DISPLACEMENT PERFORMANCE**

		Pressure - bar [psi]								Max. Cont.	Max. Inter.	
<b>400</b>		30 [440]	60 [870]	80 [1160]	105 [1520]	120 [1740]	140 [2030]	160 [2320]	175 [2540]	190 [2760]		
393 cm <sup>3</sup> [24.0 in <sup>3</sup> ] / rev		Intermittent Ratings are below and to the right of the <b>BOLD</b> line.								Intermittent Ratings - 10% of Operation		
Max. Max. Inter. Cont.	Flow - lpm [gpm]	5 [1.3]	10 [2.6]	20 [5.3]	30 [7.9]	40 [10.6]	50 [13.2]	60 [15.9]	75 [19.8]	90 [23.8]		Theoretical rpm
		167 [1478] <b>12</b>	352 [3115] <b>12</b>								13	
		176 [1531] <b>24</b>	345 [3053] <b>23</b>	461 [4080] <b>22</b>	606 [5363] <b>21</b>						25	
		170 [1505] <b>49</b>	342 [3027] <b>48</b>	463 [4098] <b>47</b>	610 [5399] <b>46</b>	695 [6151] <b>43</b>	809 [7160] <b>39</b>	910 [8054] <b>33</b>	987 [8735] <b>29</b>		51	
		163 [1443] <b>74</b>	337 [2982] <b>73</b>	456 [4036] <b>73</b>	605 [5354] <b>71</b>	691 [6115] <b>69</b>	806 [7134] <b>64</b>	916 [8107] <b>58</b>	990 [8762] <b>45</b>	1069 [9461] <b>39</b>	76	
		153 [1354] <b>98</b>	327 [2894] <b>98</b>	445 [3938] <b>98</b>	593 [5248] <b>96</b>	681 [6027] <b>95</b>	799 [7072] <b>90</b>	911 [8062] <b>82</b>	982 [8691] <b>69</b>		102	
		142 [1257] <b>123</b>	317 [2805] <b>123</b>	435 [3850] <b>122</b>	575 [5089] <b>121</b>	667 [5903] <b>120</b>	787 [6966] <b>115</b>				127	
		131 [1159] <b>149</b>	301 [2664] <b>148</b>	419 [3708] <b>147</b>	566 [5009] <b>144</b>	653 [5779] <b>144</b>	774 [6851] <b>140</b>				153	
		100 [885] <b>185</b>	276 [2443] <b>185</b>	393 [3478] <b>184</b>	541 [4788] <b>183</b>	628 [5558] <b>181</b>					191	
	72 [637] <b>224</b>	247 [2186] <b>222</b>	360 [3186] <b>221</b>	511 [4522] <b>220</b>						229		
Rotor Width		Torque - Nm [lb-in], Speed rpm										
63.5 [2.500] mm [in]		Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>										
		187 [1655]	375 [3319]	500 [4426]	656 [5806]	750 [6638]	875 [7745]	1000 [8851]	1093 [9674]	1187 [10506]		
		Theoretical Torque - Nm [lb-in] Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]										

		Pressure - bar [psi]						Max. Cont.	Max. Inter.	
<b>500</b>		25 [360]	50 [730]	80 [1160]	90 [1300]	105 [1520]	120 [1740]	140 [2030]		
493 cm <sup>3</sup> [30.1 in <sup>3</sup> ] / rev		Intermittent Ratings are below and to the right of the <b>BOLD</b> line.						Intermittent Ratings - 10% of Operation		
Max. Max. Inter. Cont.	Flow - lpm [gpm]	10 [2.6]	20 [5.3]	30 [7.9]	40 [10.6]	50 [13.2]	60 [15.9]	75 [19.8]	90 [23.8]	
		191 [1690] <b>19</b>	355 [3142] <b>18</b>							20
		175 [1549] <b>39</b>	354 [3133] <b>39</b>	571 [5053] <b>36</b>	646 [5717] <b>34</b>	760 [6726] <b>31</b>				41
		164 [1451] <b>59</b>	344 [3044] <b>58</b>	565 [5000] <b>56</b>	637 [5637] <b>55</b>	743 [6576] <b>52</b>	848 [7506] <b>48</b>	1001 [8859] <b>38</b>		61
		147 [1301] <b>79</b>	333 [2947] <b>78</b>	551 [4876] <b>77</b>	623 [5514] <b>76</b>	730 [6461] <b>74</b>	833 [7373] <b>70</b>			81
		136 [1204] <b>99</b>	317 [2805] <b>99</b>	537 [4752] <b>96</b>	610 [5399] <b>95</b>	717 [6345] <b>93</b>	830 [7346] <b>86</b>			102
		118 [1044] <b>119</b>	302 [2673] <b>118</b>	523 [4629] <b>116</b>	597 [5283] <b>114</b>	704 [6230] <b>110</b>				122
		94 [832] <b>148</b>	270 [2390] <b>149</b>	490 [4337] <b>145</b>	566 [5009] <b>143</b>	674 [5965] <b>141</b>				152
		55 [487] <b>179</b>	237 [2097] <b>180</b>	457 [4044] <b>175</b>	530 [4691] <b>174</b>					183
Rotor Width		Torque - Nm [lb-in], Speed rpm								
78.8 [3.102] mm [in]		Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>								
		196 [1735]	392 [3470]	627 [5550]	706 [6249]	823 [7284]	941 [8329]	1098 [9718]		
		Theoretical Torque - Nm [lb-in] Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]								

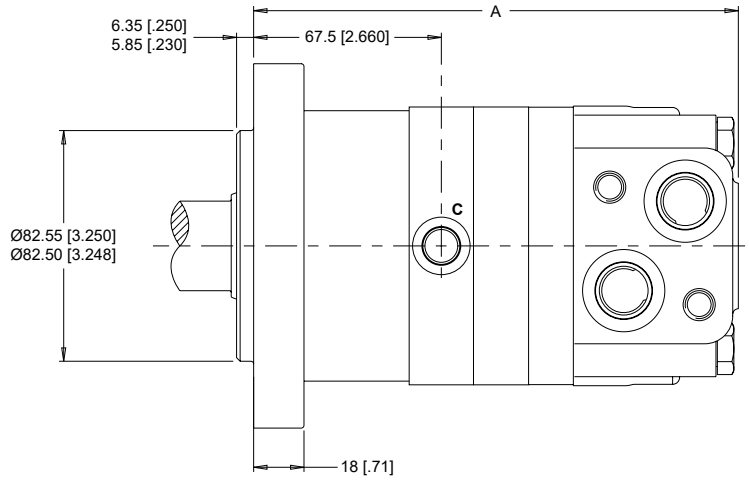
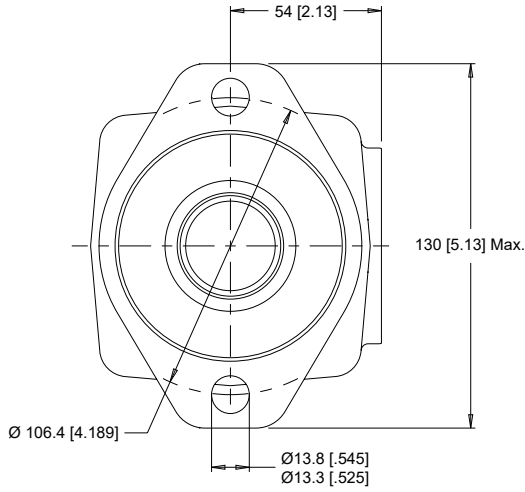
► Performance data is typical. Performance of production units varies slightly from one motor to another. Operating at maximum continuous pressure and maximum continuous flow simultaneously is not recommended. For additional information on product testing please refer to page 6.

**HOUSINGS**

► Dimensions shown are without paint. Paint thickness can be up to 0.13 [0.005].

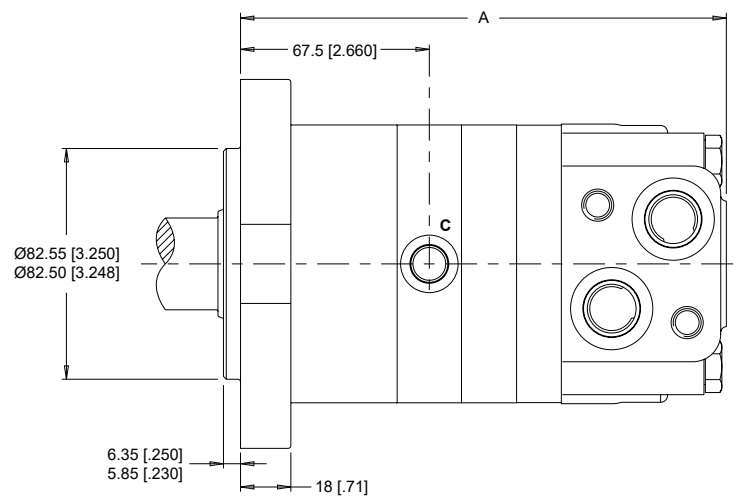
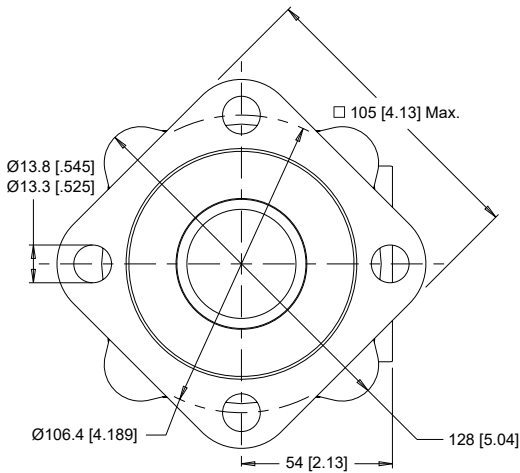
**2-HOLE, SAE A MOUNT**

**A7** Side Ports



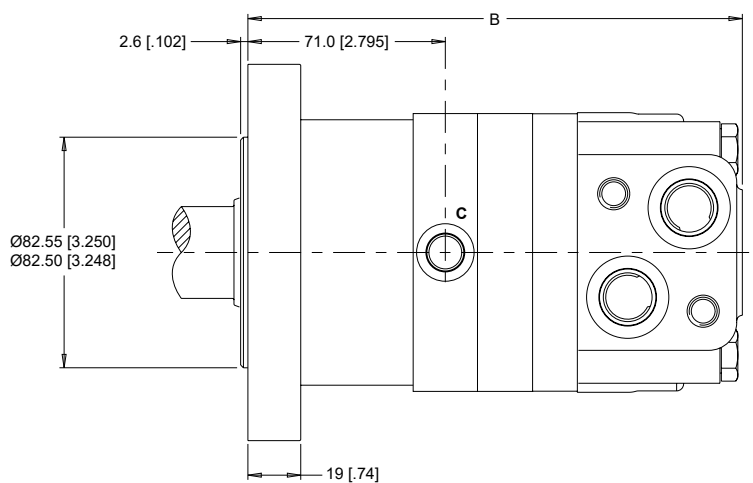
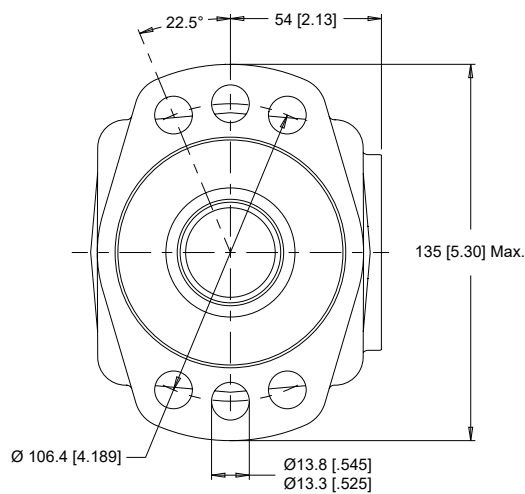
**4-HOLE, SAE A MOUNT**

**AH** Side Ports



**6-HOLE, MAGNETO MOUNT**

**AT** Side Ports



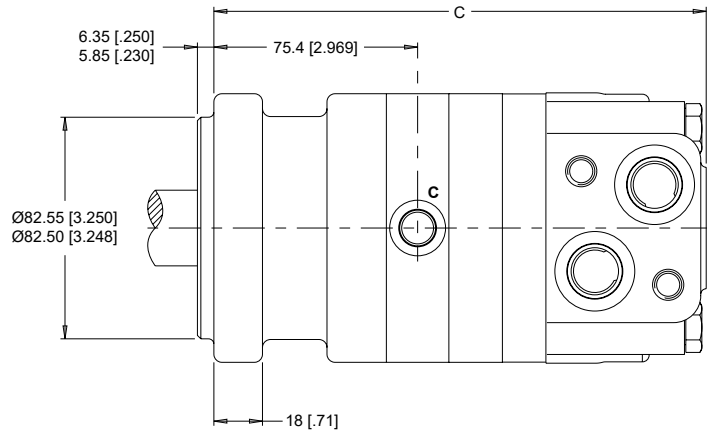
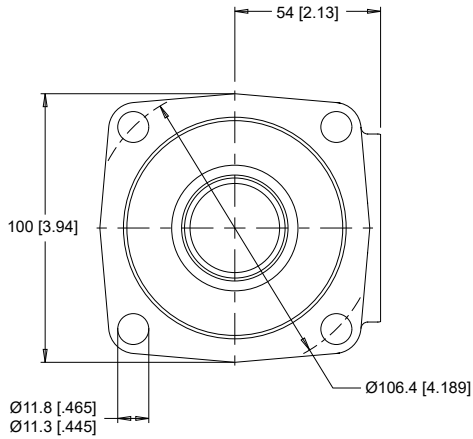
► Dimension A & B are charted on page 40.

**HOUSINGS**

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

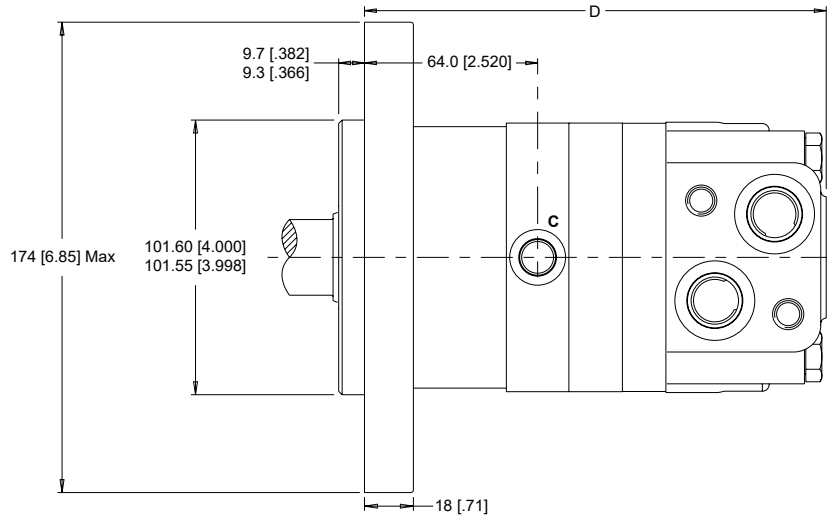
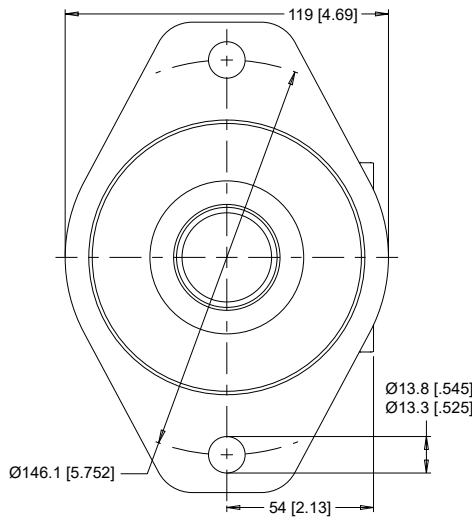
**4-HOLE, SQUARE EURO MOUNT**

**AU** Side Ports



**2-HOLE, SAE B MOUNT**

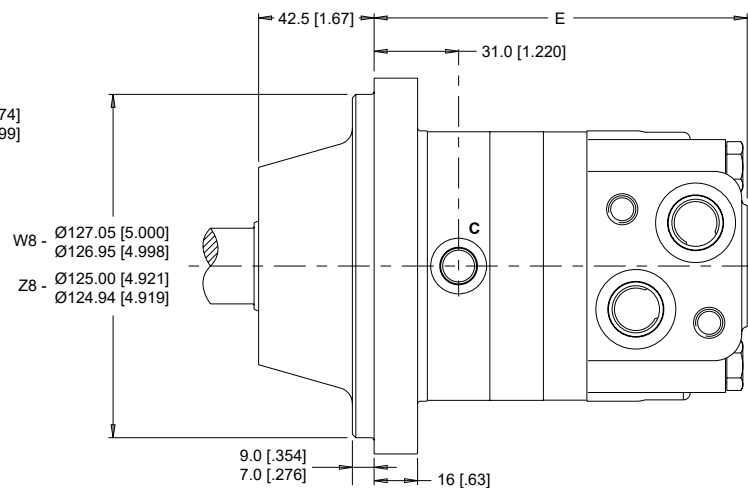
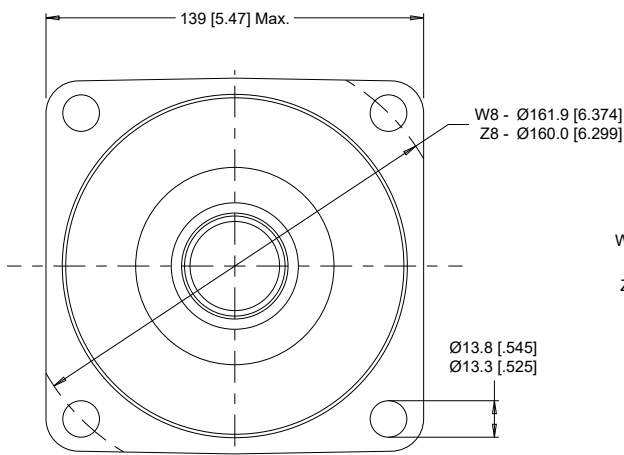
**B7** Side Ports



**4-HOLE, WHEEL MOUNT**

**W8** Side Ports - 5" Pilot

**Z8** Side Ports - 125mm Pilot



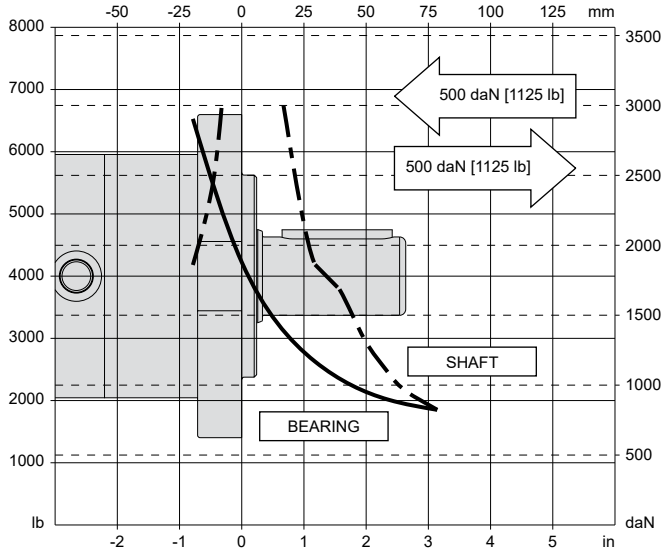
► Dimension C, D & E are charted on page 40.

**TECHNICAL INFORMATION**

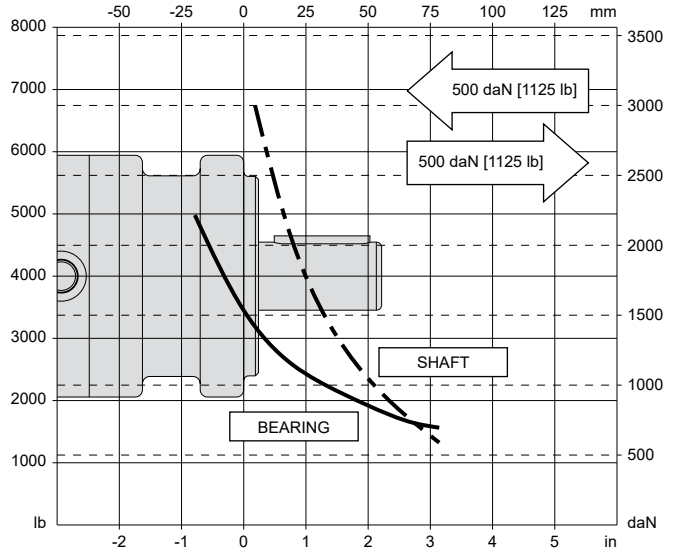
**ALLOWABLE SHAFT LOAD / BEARING CURVE**

The bearing curve represents allowable bearing loads for a B10 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 7.

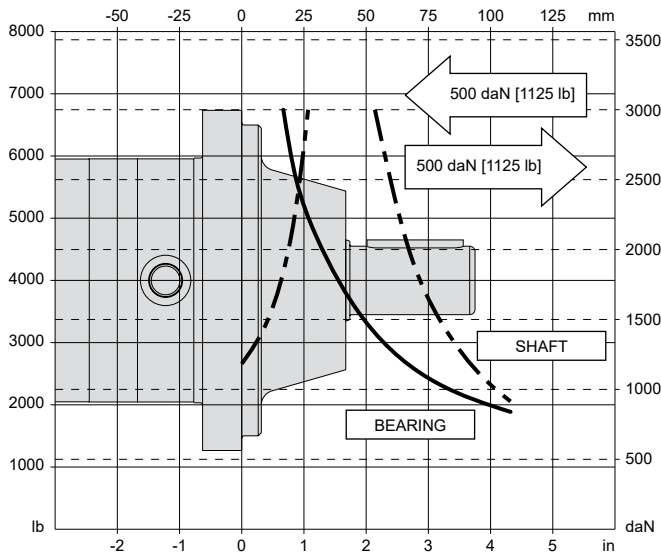
**SAE A, SAE B & MAGNETO MOUNTS**



**SQUARE EURO MOUNT**



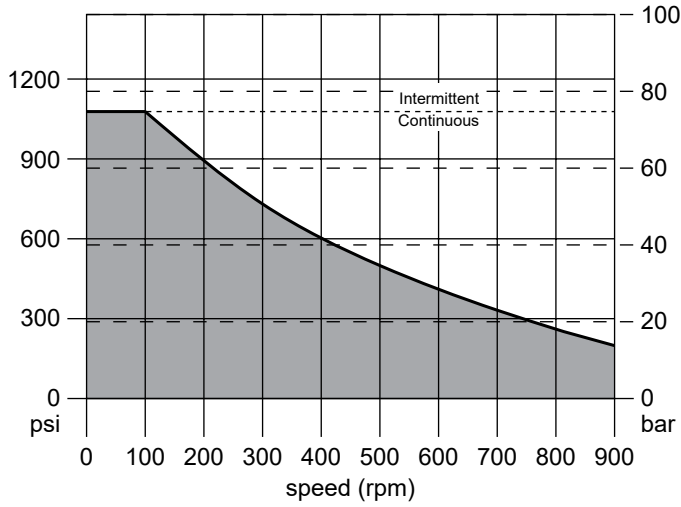
**WHEEL MOUNTS**



► Case pressure will push outward on the shaft. If case drain line is attached and routed directly to tank, case pressure should be negligible. If case drain line is not attached, case pressure will be nearly the same as motor return pressure. When case pressure is acting, the allowable inward axial load can be increased and the allowable outward axial load must be decreased at a rate of 88 kg / 7 bar [194 lb / 100 psi].

**TECHNICAL INFORMATION**

**PERMISSIBLE SHAFT SEAL PRESSURE**



**LENGTH & WEIGHT CHARTS**

The following charts list the overall motor length from the rear of the motor to the mounting flange surface and are referenced on detailed housing drawings listed on pages 37 & 38.

#	Length [mm [in]]	Weight [kg [lb]]
080	170 [6.69]	10.2 [22.5]
100	174 [6.85]	10.5 [23.2]
125	174 [6.85]	10.5 [23.2]
160	180 [7.09]	11.0 [24.3]
200	186 [7.32]	11.4 [25.1]
230	200 [7.87]	12.2 [26.9]
250	193 [7.60]	11.9 [26.2]
315	203 [8.00]	12.4 [27.3]
400	218 [8.58]	13.3 [29.3]
500	233 [9.17]	14.2 [31.3]

#	Length [mm [in]]	Weight [kg [lb]]
080	173 [6.81]	10.2 [22.5]
100	177 [6.97]	10.5 [23.2]
125	177 [6.97]	10.5 [23.2]
160	183 [7.20]	11.0 [24.3]
200	189 [7.44]	11.4 [25.1]
230	203 [7.99]	12.2 [26.9]
250	197 [7.76]	11.9 [26.2]
315	207 [8.15]	12.4 [27.3]
400	221 [8.70]	13.3 [29.3]
500	236 [9.29]	14.2 [31.3]

#	Length [mm [in]]	Weight [kg [lb]]
080	178 [7.01]	10.1 [22.3]
100	182 [7.17]	10.4 [22.9]
125	182 [7.17]	10.4 [22.9]
160	187 [7.36]	10.9 [24.0]
200	194 [7.64]	11.3 [24.9]
230	208 [8.19]	12.1 [26.7]
250	201 [7.91]	11.8 [26.0]
315	211 [8.31]	12.3 [27.1]
400	225 [8.86]	13.2 [29.1]
500	240 [9.45]	14.1 [31.1]

#	Length [mm [in]]	Weight [kg [lb]]
080	166 [6.54]	11.2 [24.7]
100	170 [6.69]	11.5 [25.4]
125	170 [6.69]	11.5 [25.4]
160	176 [6.93]	12.0 [26.5]
200	182 [7.17]	12.4 [27.3]
230	196 [7.72]	13.2 [29.1]
250	190 [7.48]	12.9 [28.4]
315	200 [7.87]	13.4 [29.5]
400	214 [8.43]	14.3 [31.5]
500	229 [9.02]	15.2 [33.5]

#	Length [mm [in]]	Weight [kg [lb]]
080	133 [5.24]	11.0 [24.3]
100	137 [5.39]	11.3 [24.9]
125	137 [5.39]	11.3 [24.9]
160	143 [5.63]	11.8 [26.0]
200	149 [5.87]	12.2 [26.9]
230	163 [6.42]	13.0 [28.7]
250	157 [6.18]	12.7 [28.0]
315	167 [6.57]	13.2 [29.1]
400	181 [7.13]	14.1 [31.1]
500	196 [7.72]	15.0 [33.1]

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

**PORTING**

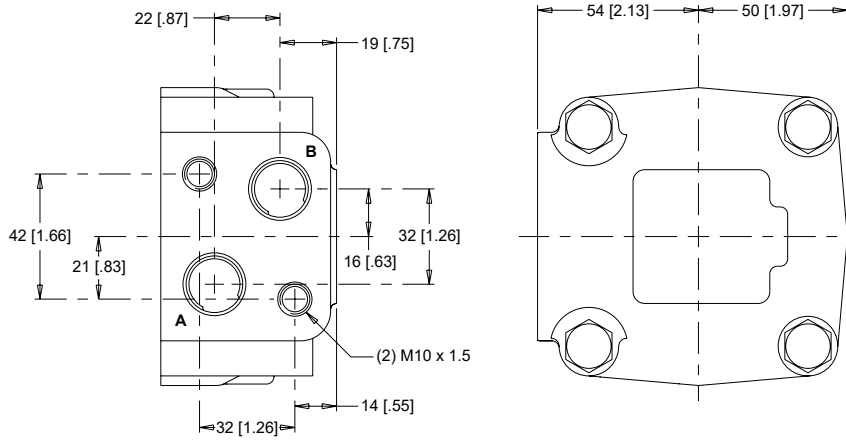
**SIDE PORTED -  
OFFSET MANIFOLD**

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

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

**4** Main Ports **A, B:** M22x1.5  
Drain Port **C:** M14x1.5

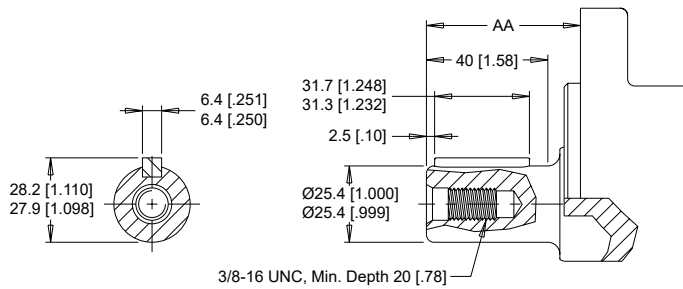
**STANDARD**



► Drain port C is referenced on housing drawings listed on pages 37, 38 and 44.

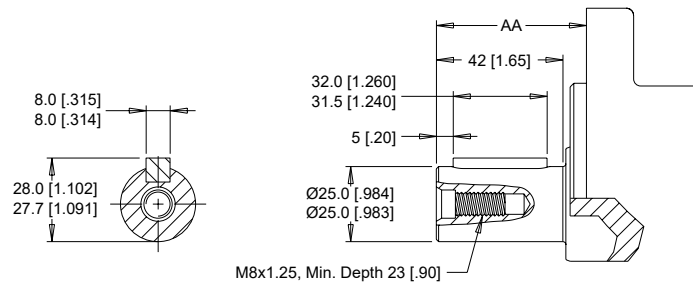
**SHAFTS**

**10** 1" Straight



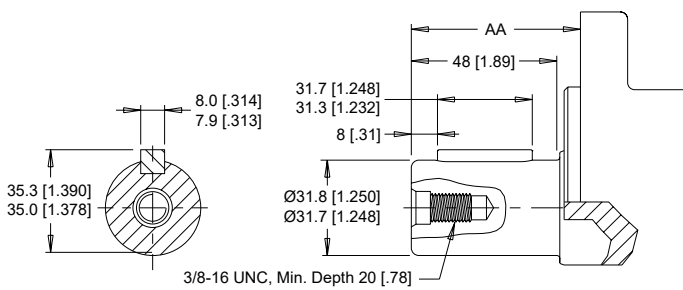
Max. Torque: 655 Nm [5800 lb-in]

**12** 25mm Straight



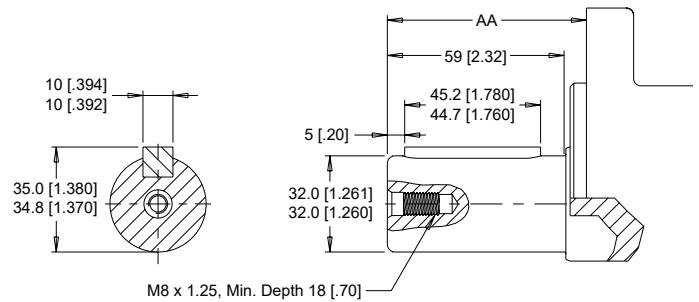
Max. Torque: 678 Nm [6000 lb-in]

**20** 1-1/4" Straight



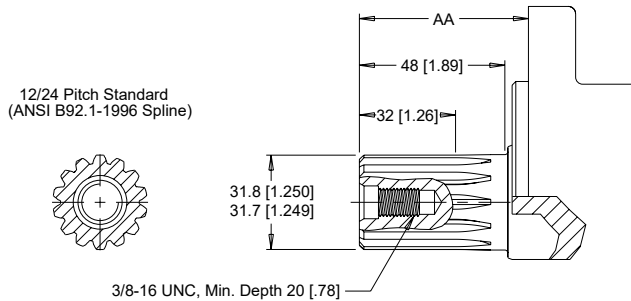
Max. Torque: 881 Nm [7800 lb-in]

**21** 32mm Straight



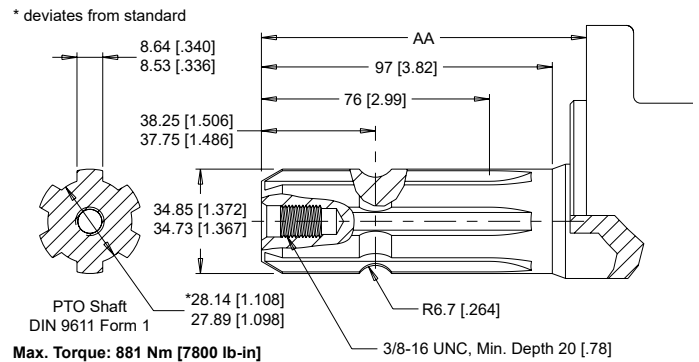
Max. Torque: 881 Nm [7800 lb-in]

**23** 14 Tooth Spline



Max. Torque: 881 Nm [7800 lb-in]

**78** 1-3/8" 6B Spline PTO

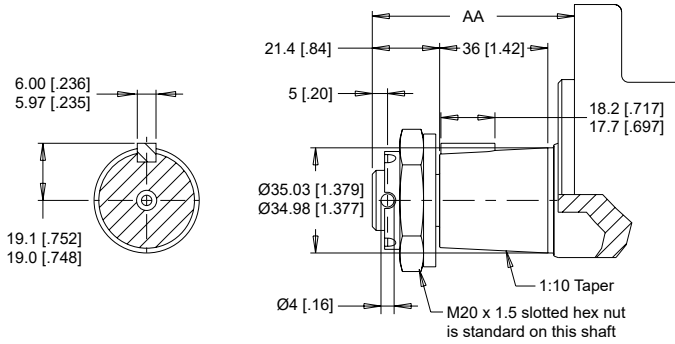


Max. Torque: 881 Nm [7800 lb-in]

► Dimension AA is charted on page 43.

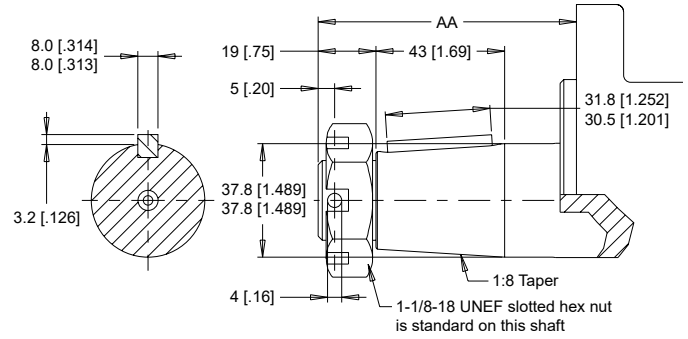
**SHAFTS**

**N4** 35mm Tapered



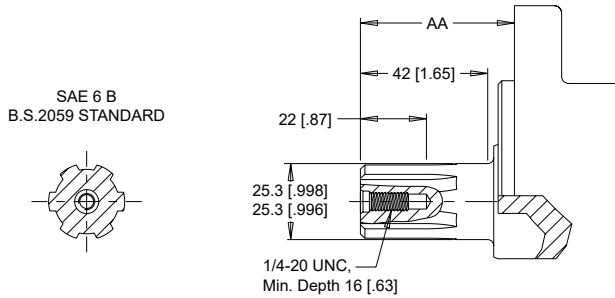
Max. Torque: 881 Nm [7800 lb-in]

**31** 1-1/2" Tapered



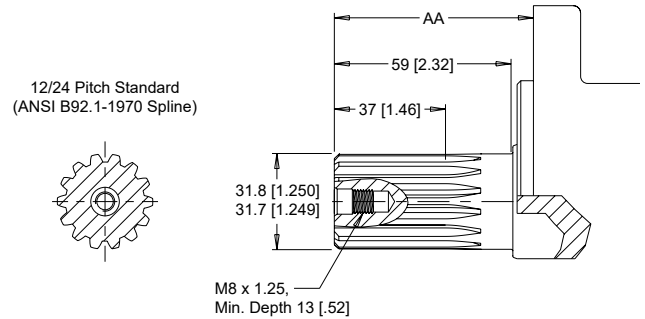
Max. Torque: 881 Nm [7800 lb-in]

**G4** 1" 6B Spline



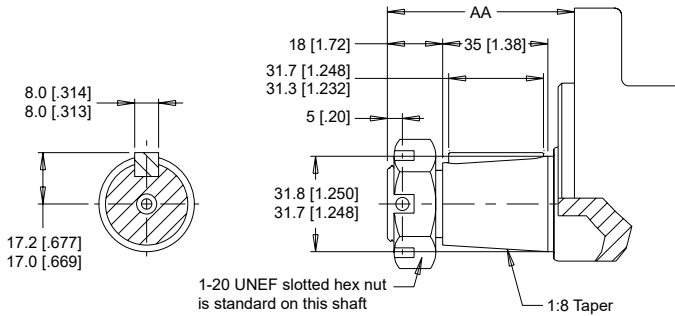
Max. Torque: 678 Nm [6000 lb-in]

**N3** 1-1/4" 14 Tooth Spline



Max. Torque: 881 Nm [7800 lb-in]

**N5** 1-1/4" Tapered



Max. Torque: 881 Nm [7800 lb-in]

**MOUNTING / SHAFT LENGTH CHART**

Dimension AA is the overall distance from the motor mounting surface to the end of the shaft and is referenced on detailed shaft drawings above as well as shafts on page 42.

AA	SAE A Mounts	Magneto Mounts	Sq. Euro Mounts	SAE B Mounts	Wheel Mounts
#	mm [in]	mm [in]	mm [in]	mm [in]	mm [in]
10	52 [2.05]	48 [1.89]	44 [1.73]	55 [2.17]	88 [3.46]
12	51 [2.01]	47 [1.85]	43 [1.69]	54 [2.13]	87 [3.43]
20	57 [2.24]	53 [2.09]	49 [1.93]	60 [2.36]	93 [3.66]
21	67 [2.63]	63 [2.48]	59 [2.32]	70 [2.76]	103 [4.06]
23	57 [2.24]	53 [2.09]	49 [1.93]	60 [2.36]	93 [3.66]
31	86 [3.39]	83 [3.27]	79 [3.11]	90 [3.54]	123 [4.84]
78	109 [4.29]	105 [4.13]	101 [3.98]	112 [4.41]	145 [5.71]
G4	52 [2.05]	48 [1.89]	44 [1.73]	55 [2.17]	88 [3.46]
N3	67 [2.63]	63 [2.48]	59 [2.32]	70 [2.76]	103 [4.06]
N4	67 [2.63]	63 [2.48]	59 [2.32]	70 [2.76]	103 [4.06]
N5	63 [2.48]	59 [2.32]	55 [2.17]	66 [2.60]	99 [3.90]

▶ Shaft lengths vary ± 0.8 mm [0.030 in.]

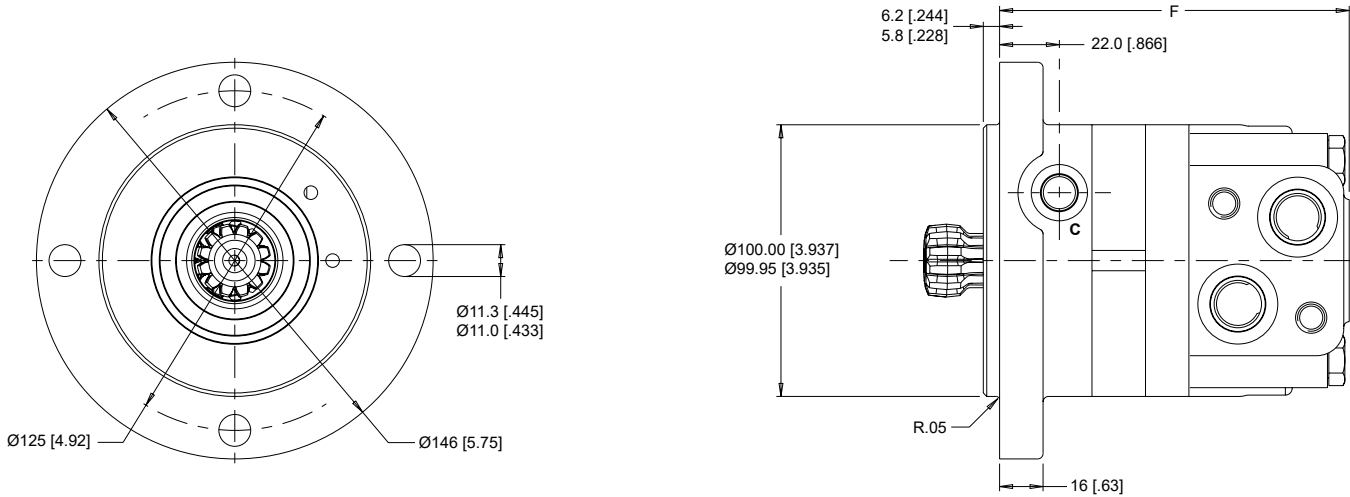
# WS (360 Series)

## Heavy Duty Hydraulic Short Motor

### HOUSINGS

#### 4-HOLE, SHORT MOTOR MOUNT

**SH** Side Ports

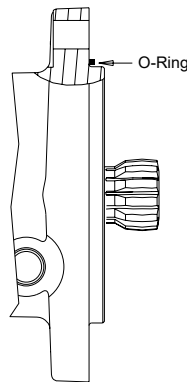


► Porting options listed on page 41.

### SHAFTS

#### 00 Cardan (For Use With The SH Mount)

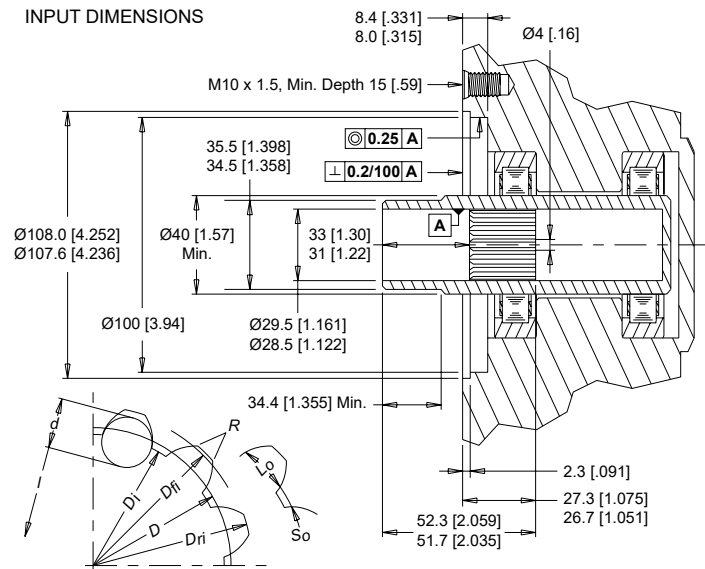
Fillet Root Side Fit	
Number of Teeth	12
Pitch	12/24
Pressure Angle	30°
Pitch Diameter <i>D</i>	25.4 [1.000]
Major Diameter <i>D<sub>ri</sub></i>	28.0 [1.10] - 27.9 [1.096]
Form Diameter (Min.) <i>D<sub>fi</sub></i>	27.6 [1.09]
Minor Diameter <i>D<sub>i</sub></i>	23.033 [.9068] - 23.0 [.9055]
Space Width (Circular) <i>L<sub>o</sub>*</i>	4.328 [.1704] - 4.288 [.1688]
Tooth Thickness (Circular) <i>S<sub>o</sub></i>	2.341 [.09217]
Fillet Radius <i>R</i> min	0.2 [.008]
Max. Distance Between Pins <i>l</i>	17.77 [.700] - 17.62 [.694]
Pin Diameter <i>d</i>	4.836 [.19034] - 4.834 [.19026]



Internal involute spline data per ANSI B92.1-1970, class 5 (corrected  $m \cdot X = 0.8$ ;  $m = 2.1166$ )

► The recommended shaft material is SAE 8620 or similar case hardening steel such as 20 MoCr4 (900 N/mm<sup>2</sup>) hardened to 59 - 62 HRC to a depth of 0.762 - 1.016 [.030 - .040].  
\*Dimensions apply after heat treatment.

#### INPUT DIMENSIONS



### LENGTH & WEIGHT CHART

Dimension F is the overall motor length from the rear of the motor to the mounting flange surface and is referenced on the detailed housing drawing listed above.

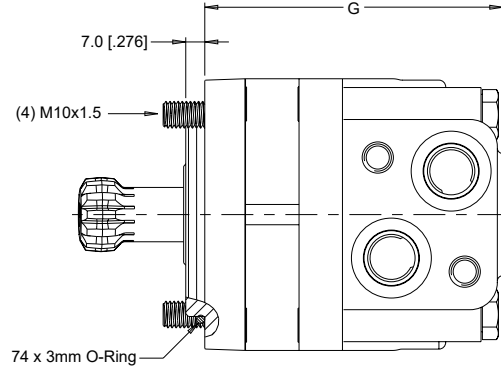
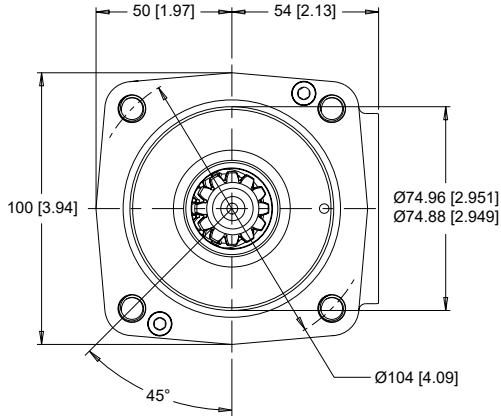
F	Length	Weight
#	mm [in]	kg [lb]
080	125 [4.92]	7.8 [17.2]
100	129 [5.08]	8.1 [17.9]
125	129 [5.08]	8.1 [17.9]
160	134 [5.28]	8.6 [19.0]
200	141 [5.55]	9.0 [19.8]
230	155 [6.10]	9.8 [21.6]
250	148 [5.83]	9.5 [20.9]
315	158 [6.22]	10.0 [22.0]
400	173 [6.81]	10.9 [24.0]
500	188 [7.40]	11.8 [26.0]

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

**HOUSINGS**

**4-HOLE, ULTRA SHORT MOTOR MOUNT**

**U8** Side Ports



► Porting options listed on page 41.

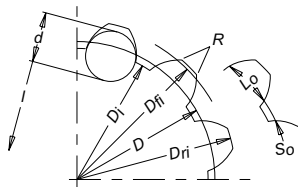
**SHAFTS**

**00** Cardan (For Use With The U8 Mount)

Fillet Root Side Fit	
Number of Teeth	12
Pitch	12/24
Pressure Angle	30°
Pitch Diameter <i>D</i>	25.4 [1.000]
Major Diameter <i>D<sub>ri</sub></i>	28.0 [1.10] - 27.9 [1.096]
Form Diameter (Min.) <i>D<sub>fi</sub></i>	27.6 [1.09]
Minor Diameter <i>D<sub>i</sub></i>	23.033 [0.9068] - 23.0 [0.9055]
Space Width (Circular) <i>L<sub>o</sub></i>	4.328 [0.1704] - 4.288 [0.1688]
Tooth Thickness (Circular) <i>S<sub>o</sub></i>	2.341 [0.09217]
Fillet Radius <i>R</i> min	0.2 [0.008]
Max. Distance Between Pins <i>l</i>	17.77 [0.700] - 17.62 [0.694]
Pin Diameter <i>d</i>	4.836 [0.19034] - 4.834 [0.19026]

Internal involute spline data per ANSI B92.1-1970, class 5 (corrected  $m \cdot X = 0.8$ ;  $m = 2.1166$ )

► The recommended shaft material is SAE 8620 or similar case hardening steel such as 20 MoCr4 (900 N/mm<sup>2</sup>) hardened to 59 - 62 HRC to a depth of 0.762 - 1.016 [0.030 - .040].  
\*Dimensions apply after heat treatment.



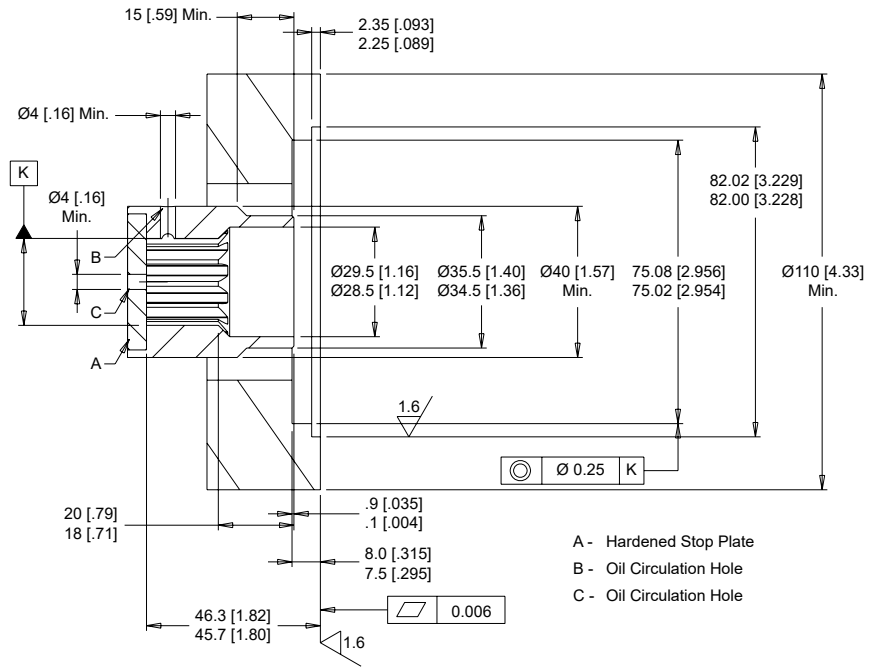
**LENGTH & WEIGHT CHART**

Dimension G is the overall motor length from the rear of the motor to the mounting flange surface and is referenced on the detailed housing drawing listed above.

G	Length	Weight
#	mm [in]	kg [lb]
080	106 [4.16]	6.3 [13.9]
100	110 [4.32]	6.6 [14.6]
125	110 [4.32]	6.6 [14.6]
160	115 [4.54]	7.1 [15.7]
200	122 [4.79]	7.5 [16.5]
250	129 [5.09]	8.0 [17.6]

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

**INPUT DIMENSIONS**



- A - Hardened Stop Plate
- B - Oil Circulation Hole
- C - Oil Circulation Hole

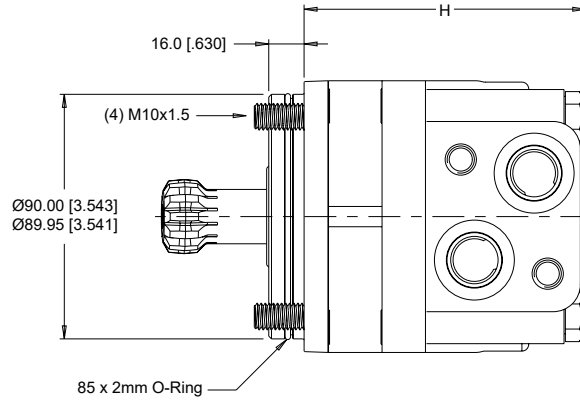
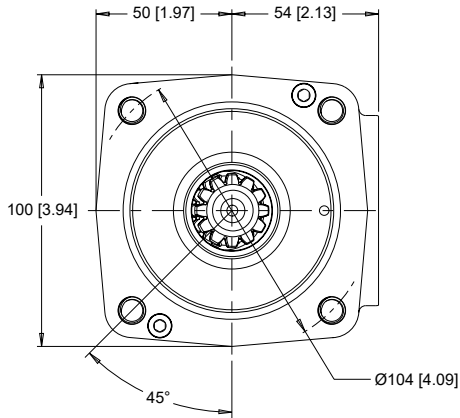
# WS (360 Series)

## Heavy Duty Hydraulic Ultra Short Motor

### HOUSINGS

#### 4-HOLE, ULTRA SHORT MOTOR MOUNT

**V8** Side Ports



► Porting options listed on page 41.

### SHAFTS

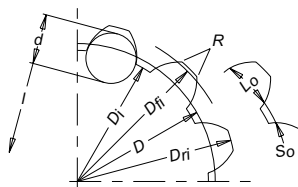
#### 00 Cardan (For Use With The V8 Mount)

Fillet Root Side Fit

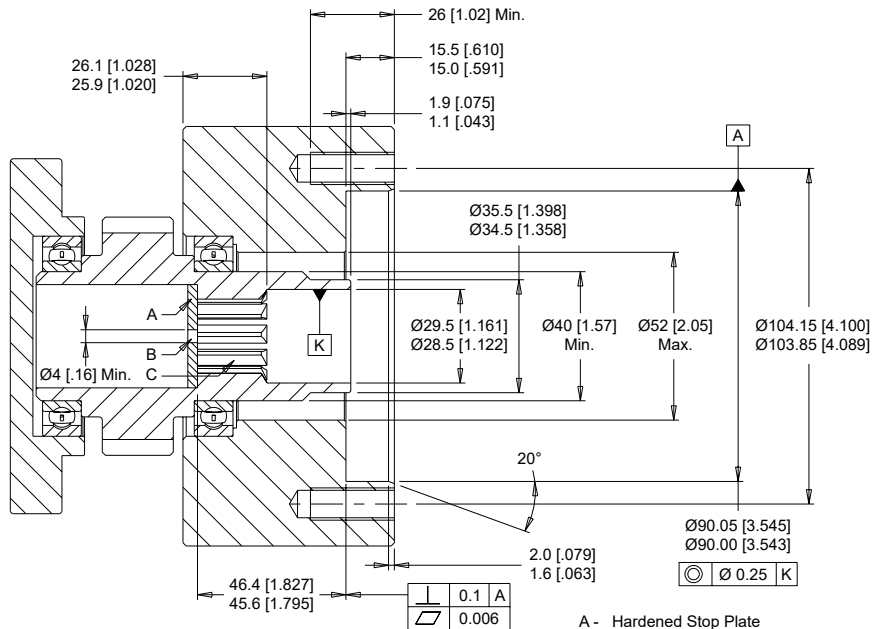
Number of Teeth	12
Pitch	12/24
Pressure Angle	30°
Pitch Diameter $D$	25.4 [1.000]
Major Diameter $D_{rj}$	28.0 [1.10] - 27.9 [1.096]
Form Diameter (Min.) $D_{fi}$	27.6 [1.09]
Minor Diameter $D_i$	23.033 [9068] - 23.0 [9055]
Space Width (Circular) $L_o^*$	4.328 [1.704] - 4.288 [1.688]
Tooth Thickness (Circular) $S_o$	2.341 [0.9217]
Fillet Radius $R$ min	0.2 [0.008]
Max. Distance Between Pins $l$	17.77 [700] - 17.62 [694]
Pin Diameter $d$	4.836 [1.9034] - 4.834 [1.9026]

Internal involute spline data per ANSI B92.1-1970, class 5 (corrected  $m \cdot X = 0.8$ ;  $m = 2.1166$ )

► The recommended shaft material is SAE 8620 or similar case hardening steel such as 20 MoCr4 (900 N/mm<sup>2</sup>) hardened to 59 - 62 HRC to a depth of 0.762 - 1.016 [.030 - .040].  
\*Dimensions apply after heat treatment.



#### INPUT DIMENSIONS



- A - Hardened Stop Plate
- B - Oil Circulation Hole
- C - Internal Spline  
Dp 12/24 ANSI B92.1-76

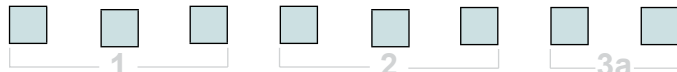
### LENGTH & WEIGHT CHART

Dimension H is the overall motor length from the rear of the motor to the mounting flange surface and is referenced on the detailed housing drawing listed above.

H	Length	Weight
#	mm [in]	kg [lb]
080	100 [3.92]	6.3 [13.9]
100	104 [4.08]	6.6 [14.6]
125	104 [4.08]	6.6 [14.6]
160	109 [4.31]	7.1 [15.7]
200	116 [4.56]	7.5 [16.5]
250	123 [4.86]	8.0 [17.6]

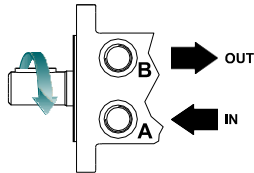
► 360 series ultra short motor weights can vary  $\pm$  1kg [2 lb] depending on model configurations such as housing, shaft, endcover, options etc.

**ORDERING INFORMATION**



**1. CHOOSE SERIES DESIGNATION**

**360** Clockwise Rotation



► The 360 series is bi-directional. Reversing the inlet hose will reverse shaft rotation.

**2. SELECT A DISPLACEMENT OPTION**

<b>080</b>	80 cm <sup>3</sup> /rev [4.9 in <sup>3</sup> /rev]	<b>230</b>	226 cm <sup>3</sup> /rev [13.8 in <sup>3</sup> /rev]
<b>100</b>	100 cm <sup>3</sup> /rev [6.1 in <sup>3</sup> /rev]	<b>250</b>	250 cm <sup>3</sup> /rev [15.2 in <sup>3</sup> /rev]
<b>125</b>	125 cm <sup>3</sup> /rev [7.6 in <sup>3</sup> /rev]	<b>315</b>	305 cm <sup>3</sup> /rev [18.6 in <sup>3</sup> /rev]
<b>160</b>	160 cm <sup>3</sup> /rev [9.7 in <sup>3</sup> /rev]	<b>400</b>	393 cm <sup>3</sup> /rev [24.0 in <sup>3</sup> /rev]
<b>200</b>	200 cm <sup>3</sup> /rev [12.2 in <sup>3</sup> /rev]	<b>500</b>	493 cm <sup>3</sup> /rev [30.1 in <sup>3</sup> /rev]

**3a. SELECT MOUNT TYPE**      **3b. SELECT PORT SIZE**

▼ SIDE MOUNT		▼ SIDE PORT OPTIONS	
<b>A7</b>	2-Hole, SAE A Mount	<b>1</b>	7/8-14 UNF Offset Manifold
<b>AT</b>	6-Hole, Magneto Mount	<b>3</b>	G 1/2 Offset Manifold
<b>AH</b>	4-Hole, SAE A Mount	<b>4</b>	M22x1.5 Offset Manifold
<b>AU</b>	4-Hole, Square Euro Mount		
<b>B7</b>	2-Hole, SAE B Mount		
<b>SH</b>	4-Hole, Short Motor Mount		
<b>U8</b>	4-Hole, Ultra Short (75mm Pilot)		
<b>V8</b>	4-Hole, Ultra Short (90mm Pilot)		
<b>W8</b>	4-Hole, Wheel Mount (5" Pilot)		
<b>Z8</b>	4-Hole, Wheel Mount (125mm Pilot)		

► The SH, U8 and V8 Mounts are only available with the 00 cardan shaft



**4. SELECT A SHAFT OPTION**

<b>00</b>	Cardan	<b>31</b>	1-1/2" Tapered
<b>10</b>	1" Straight	<b>78</b>	1-3/8" 6B Spline PTO
<b>12</b>	25mm Straight	<b>G4</b>	1" 6B Spline
<b>20</b>	1-1/4" Straight	<b>N3</b>	14 Tooth Spline, M8 Tap
<b>21</b>	32mm Straight	<b>N4</b>	35mm Tapered
<b>23</b>	14 Tooth Spline, 3/8" Tap	<b>N5</b>	1-1/4" Tapered

► The cardan shaft is only available with the SH, U8 and V8 Mounts.

**5. SELECT A PAINT OPTION**

<b>A</b>	Black
<b>B</b>	Black, Unpainted Mounting Surface
<b>Z</b>	No Paint

► The SH, U8 and V8 mounts are only available with no paint.

**6. SELECT A VALVE CAVITY / CARTRIDGE OPTION**

<b>A</b>	None
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**7. SELECT AN ADD-ON OPTION**

<b>A</b>	Standard
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**8. SELECT A MISCELLANEOUS OPTION**

<b>AA</b>	None
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