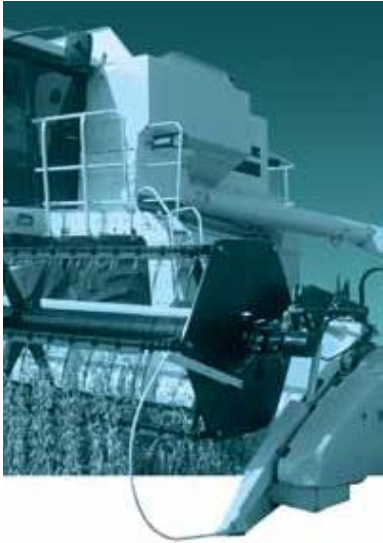




whitedriveproducts



SERIES

- 350 -
- 351 -
- 355 -
- 356 -
- 357 -
- 358 -



MEDIUM DUTY
Hydraulic Motor

WS

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*. The WS offers numerous housing, displacement and shaft options to meet most common SAE and European requirements.

FEATURES / BENEFITS

- Nine shaft and seven 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

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

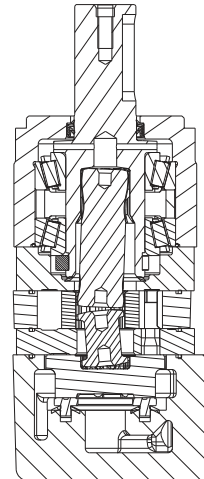
SPECIFICATIONS

CODE	Displacement cm ³ [in ³ /rev]	Max. Speed rpm		Max. Flow lpm [gpm]		Max. Torque Nm [lb-in]		Max. Pressure bar [psi]		
		cont.	inter.	cont.	inter.	cont.	inter.	cont.	inter.	peak
080	79 [4.78]	870	1060	61 [16]	68 [18]	207 [1832]	286 [2528]	207 [3000]	276 [4000]	276 [4000]
100	100 [6.10]	745	880	76 [20]	95 [25]	280 [2475]	416 [3680]	207 [3000]	310 [4500]	310 [4500]
110	112 [6.85]	675	840	76 [20]	95 [25]	307 [2715]	468 [4145]	207 [3000]	310 [4500]	310 [4500]
130	129 [7.86]	580	730	76 [20]	95 [25]	370 [3275]	550 [4865]	207 [3000]	310 [4500]	310 [4500]
160	162 [9.90]	465	700	76 [20]	114 [30]	462 [4090]	618 [5465]	207 [3000]	276 [4000]	310 [4500]
200	202 [12.31]	375	560	76 [20]	114 [30]	576 [5100]	768 [6795]	207 [3000]	276 [4000]	310 [4500]
230	228 [13.92]	325	490	76 [20]	114 [30]	642 [5685]	806 [7135]	207 [3000]	276 [4000]	310 [4500]
320	325 [19.81]	235	350	76 [20]	114 [30]	789 [6980]	1029 [9105]	190 [2750]	224 [3250]	259 [3750]
400	399 [24.36]	190	280	76 [20]	114 [30]	816 [7225]	1034 [9150]	155 [2250]	190 [2750]	224 [3250]
500	496 [30.29]	155	230	76 [20]	114 [30]	824 [7295]	1041 [9210]	121 [1750]	155 [2250]	172 [2500]

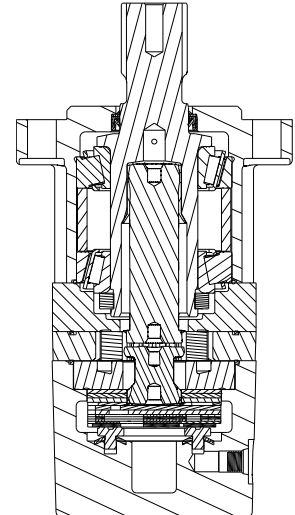
► Performance data is typical. Performance of production units varies slightly from one motor to another. Running at intermittent ratings should not exceed 10% of every minute of operation. * See page 14 for allowable back pressure when using the internal drain.

SERIES DESCRIPTIONS

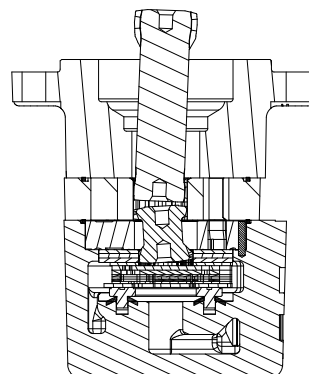
350/351 - Hydraulic Motor
Compact



355/356 - Hydraulic Motor
Standard



357/358 - Hydraulic Motor
Short Motor



DISPLACEMENT PERFORMANCE

		Pressure - bar [psi]								Max. Cont.	Max. Inter.		
080		17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	207 [3000]	242 [3500]	276 [4000]			
80 cm ³ [4.9 in ³] / rev		Intermittent Ratings are below and to the right of the BOLD line.								Intermittent Ratings - 10% of Operation			
Flow - lpm [gpm]	2 [0.5]											25	
	4 [1]	7 [61] 47	23 [201] 47									49	
	8 [2]	9 [79] 97	28 [244] 95	64 [568] 90	100 [887] 85	135 [1192] 78						97	
	15 [4]	9 [79] 194	27 [242] 192	64 [567] 186	101 [896] 178	137 [1216] 167	174 [1536] 157	207 [1832] 142				194	
	23 [6]	7 [58] 291	25 [224] 289	62 [550] 282	99 [875] 271	136 [1202] 258	172 [1519] 242	207 [1830] 222	242 [2141] 198			291	
	30 [8]	3 [29] 388	22 [196] 388	59 [524] 380	95 [841] 367	131 [1162] 349	167 [1479] 328	203 [1795] 305	240 [2123] 279	281 [2484] 221		388	
	38 [10]		19 [171] 484	56 [495] 477	92 [814] 464	128 [1129] 444	164 [1447] 420	200 [1766] 393	236 [2092] 361	279 [2470] 306		484	
	45 [12]		14 [127] 581	53 [465] 575	88 [781] 562	125 [1102] 540	159 [1411] 513	195 [1730] 481	233 [2062] 441	278 [2456] 381		581	
	53 [14]		9 [80] 678	48 [422] 674	79 [704] 658	119 [1055] 635	155 [1373] 606	191 [1689] 571	229 [2028] 527			678	
	61 [16]		2 [14] 775	38 [336] 771	75 [662] 757	111 [985] 736	151 [1337] 704	182 [1611] 664	238 [2109] 608	282 [2499] 540		775	
68 [18]			34 [298] 871	68 [602] 858	101 [896] 833	141 [1244] 806	188 [1661] 750	238 [2104] 680	283 [2507] 605		871		
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"/>	
19.7 [776]		22 [194]	44 [388]	88 [777]	132 [1165]	176 [1553]	219 [1942]	263 [2330]	307 [2718]	351 [3107]			
mm [in]		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.		
100		17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	207 [3000]	242 [3500]	276 [4000]	310 [4500]		
100 cm ³ [6.1 in ³] / 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 [120] 11	35 [313] 8	77 [681] 6	116 [1025] 4							19	
	4 [1]	15 [129] 37	38 [337] 35	80 [710] 10	122 [1079] 7	162 [1436] 5						38	
	8 [2]	16 [138] 75	40 [354] 74	88 [781] 71	136 [1205] 68	181 [1602] 58	227 [2007] 44	267 [2364] 43	315 [2791] 42	352 [3119] 41	383 [3386] 33	76	
	15 [4]	16 [138] 151	40 [354] 149	89 [790] 146	138 [1222] 143	187 [1654] 137	235 [2079] 129	282 [2495] 119	324 [2871] 110	370 [3277] 101	411 [3636] 87	152	
	23 [6]	14 [127] 226	39 [344] 225	88 [779] 221	137 [1214] 217	186 [1647] 210	234 [2071] 200	282 [2494] 188	324 [2869] 174	371 [3279] 162	415 [3676] 147	228	
	30 [8]	12 [109] 302	37 [326] 300	86 [765] 297	136 [1200] 292	184 [1625] 284	232 [2049] 273	280 [2474] 258	323 [2859] 240	369 [3268] 224	416 [3682] 206	303	
	38 [10]	10 [88] 378	34 [305] 376	83 [738] 372	133 [1174] 366	181 [1601] 357	229 [2026] 343	276 [2446] 326	318 [2810] 300	366 [3235] 281	415 [3672] 261	379	
	45 [12]	7 [65] 453	32 [282] 451	81 [713] 447	129 [1145] 441	178 [1574] 430	226 [2002] 415	274 [2423] 396	316 [2793] 367	364 [3220] 345	413 [3653] 324	455	
	53 [14]	4 [39] 528	29 [254] 527	77 [686] 522	126 [1116] 515	175 [1546] 504	222 [1968] 486	266 [2351] 455	315 [2791] 433	362 [3203] 407	411 [3637] 384	531	
	61 [16]	2 [15] 604	25 [221] 602	74 [652] 597	122 [1084] 590	171 [1513] 578	219 [1941] 559	264 [2340] 527	312 [2760] 502	360 [3182] 475	409 [3616] 447	606	
68 [18]		21 [186] 678	69 [614] 672	118 [1047] 664	167 [1481] 651	216 [1910] 632	260 [2300] 596	309 [2735] 570	356 [3152] 541	407 [3601] 513	682		
76 [20]		16 [144] 754	65 [573] 747	114 [1009] 739	163 [1441] 725	211 [1872] 704	257 [2278] 677	307 [2712] 652	353 [3121] 624	403 [3568] 595	758		
83 [22]					156 [1379] 801	205 [1814] 782	253 [2239] 758	300 [2653] 730	347 [3075] 698	398 [3526] 668	834		
91 [24]						199 [1762] 850	246 [2179] 826	294 [2604] 799	343 [3037] 768	395 [3495] 733	909		
95 [25]						196 [1737] 883	246 [2176] 863	294 [2605] 835	342 [3028] 800	392 [3472] 770	947		
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"/>	
19.7 [776]		27 [243]	55 [485]	110 [971]	165 [1456]	219 [1942]	274 [2427]	329 [2913]	384 [3398]	439 [3883]	494 [4369]		
mm [in]		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.



DISPLACEMENT PERFORMANCE

		Pressure - bar [psi]										Max. Cont.			Max. Inter.	
110		17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	207 [3000]	242 [3500]	276 [4000]	310 [4500]					
112 cm ³ [6.9 in ³] / rev		Intermittent Ratings are below and to the right of the BOLD line.										Intermittent Ratings - 10% of Operation				
Flow - lpm [gpm]	2 [0.5]	12 [106] 9	38 [334] 8	86 [757] 6	132 [1166] 4											17
	4 [1]	12 [110] 17	38 [334] 10	89 [788] 8	137 [1213] 6	184 [1624] 5										34
	8 [2]	15 [129] 67	42 [373] 67	98 [863] 65	152 [1341] 62	206 [1823] 58	255 [2257] 45	297 [2629] 40	341 [3015] 36	377 [3334] 22	396 [3502] 9					68
	15 [4]	15 [134] 135	43 [378] 135	97 [863] 133	152 [1350] 130	208 [1838] 125	261 [2314] 118	314 [2776] 107	357 [3158] 88	402 [3558] 71	438 [3879] 49					135
	23 [6]	15 [128] 203	42 [373] 203	97 [856] 200	151 [1337] 196	206 [1826] 190	260 [2302] 182	313 [2770] 170	359 [3179] 143	411 [3633] 124	458 [4054] 103					203
	30 [8]	12 [108] 269	40 [351] 269	94 [833] 265	148 [1313] 262	203 [1798] 258	258 [2281] 248	311 [2753] 234	359 [3177] 201	413 [3656] 178	466 [4122] 155					270
	38 [10]	9 [80] 337	36 [322] 335	91 [803] 333	145 [1280] 331	199 [1761] 325	253 [2236] 313	307 [2715] 296	358 [3165] 255	413 [3652] 232	468 [4144] 206					338
	45 [12]	8 [69] 404	33 [293] 403	87 [770] 401	141 [1247] 399	194 [1716] 391	249 [2205] 378	303 [2684] 360	353 [3124] 313	408 [3613] 289	467 [4133] 259					405
	53 [14]	4 [38] 473	29 [254] 471	82 [728] 470	136 [1202] 465	189 [1676] 457	243 [2152] 442	294 [2605] 403	351 [3108] 376	407 [3601] 347	464 [4109] 316					473
	61 [16]		24 [210] 540	78 [687] 538	131 [1162] 532	185 [1635] 523	239 [2114] 508	290 [2564] 467	346 [3058] 438	402 [3553] 406	462 [4092] 372					540
	68 [18]		18 [163] 608	72 [639] 605	126 [1116] 599	180 [1594] 589	234 [2068] 573	286 [2534] 530	341 [3016] 502	397 [3515] 467	458 [4051] 432					608
	76 [20]		13 [117] 675	68 [598] 673	121 [1068] 667	174 [1541] 656	228 [2017] 639	282 [2494] 594	336 [2977] 565	393 [3481] 528	454 [4017] 492					675
	83 [22]			67 [596] 742	115 [1015] 735	169 [1500] 722	221 [1960] 699	276 [2445] 672	332 [2942] 637	388 [3436] 598	447 [3953] 557					742
	91 [24]			62 [549] 808	109 [967] 801	164 [1452] 787	218 [1926] 767	272 [2403] 737	326 [2885] 702	383 [3385] 659	441 [3906] 620					810
	95 [25]			60 [528] 841	105 [939] 834	161 [1425] 818	215 [1901] 800	270 [2389] 771	323 [2861] 736	380 [3361] 693	439 [3886] 648					844
	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"/>			
22.1 [.871]		31 [273]	62 [545]	123 [1090]	185 [1635]	246 [2180]	308 [2726]	370 [3271]	431 [3816]	493 [4361]	554 [4906]					
mm [in]		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.	
130		17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	207 [3000]	242 [3500]	276 [4000]	310 [4500]					
129 cm ³ [7.9 in ³] / rev		Intermittent Ratings are below and to the right of the BOLD line.										Intermittent Ratings - 10% of Operation				
Flow - lpm [gpm]	2 [0.5]	13 [114] 8	41 [367] 6	94 [830] 3												15
	4 [1]	16 [144] 17	45 [400] 9	101 [890] 6	151 [1334] 4	201 [1780] 3	256 [2264] 3	306 [2706] 2								30
	8 [2]	19 [172] 58	52 [456] 57	115 [1022] 55	180 [1592] 52	235 [2081] 50	294 [2600] 38	348 [3084] 35	402 [3560] 31	448 [3962] 22	477 [4219] 9					59
	15 [4]	21 [182] 117	53 [469] 116	117 [1037] 114	182 [1609] 111	246 [2175] 107	309 [2735] 101	369 [3265] 92	424 [3749] 80	480 [4249] 68	528 [4671] 53					118
	23 [6]	20 [174] 175	52 [460] 174	116 [1026] 172	180 [1591] 169	244 [2163] 165	308 [2730] 158	371 [3285] 148	427 [3783] 132	489 [4330] 117	547 [4837] 99					177
	30 [8]	17 [150] 234	49 [436] 233	113 [1004] 230	178 [1571] 227	242 [2143] 223	307 [2714] 215	370 [3276] 202	426 [3767] 186	488 [4322] 168	550 [4866] 147					236
	38 [10]	14 [120] 293	46 [403] 291	110 [974] 289	174 [1537] 285	238 [2109] 280	303 [2677] 272	367 [3246] 260	423 [3741] 240	486 [4305] 220	549 [4860] 197					294
	45 [12]	10 [86] 351	42 [367] 350	106 [935] 347	169 [1499] 343	234 [2069] 337	298 [2633] 329	362 [3204] 315	417 [3688] 289	482 [4264] 266	547 [4837] 243					353
	53 [14]	6 [53] 410	37 [329] 408	101 [891] 405	165 [1458] 401	229 [2027] 395	294 [2600] 385	349 [3092] 361	414 [3661] 341	478 [4230] 317	544 [4818] 289					412
	61 [16]		33 [289] 467	96 [853] 464	160 [1415] 460	224 [1979] 453	287 [2543] 442	344 [3048] 415	409 [3620] 392	474 [4195] 367	539 [4773] 338					471
	68 [18]			91 [803] 522	155 [1369] 518	219 [1934] 510	282 [2498] 499	340 [3007] 471	404 [3571] 448	469 [4147] 421	536 [4744] 389					530
	76 [20]			85 [753] 580	148 [1314] 575	212 [1879] 568	277 [2447] 556	335 [2960] 526	399 [3528] 503	464 [4108] 474	533 [4714] 441					588
	83 [22]			77 [681] 641	140 [1242] 637	204 [1805] 627	267 [2362] 613	332 [2938] 592	397 [3510] 567	461 [4076] 536	526 [4651] 504					647
	91 [24]			71 [625] 701	134 [1185] 696	198 [1751] 686	261 [2307] 672	325 [2872] 651	389 [3442] 625	453 [4011] 594	520 [4599] 563					706
	95 [25]			68 [601] 730	131 [1158] 726	195 [1722] 717	258 [2285] 703	322 [2849] 683	384 [3399] 657	450 [3986] 625	519 [4594] 589					735
	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"/>			
25.4 [1.001]		35 [313]	71 [625]	141 [1251]	212 [1876]	283 [2502]	353 [3127]	424 [3753]	495 [4378]	565 [5004]	636 [5629]					
mm [in]		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.

DISPLACEMENT PERFORMANCE

► Performance data is typical. Performance of production units varies slightly from one motor to another.

		Pressure - bar [psi]										Max. Cont.			Max. Inter.		
160		17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	207 [3000]	242 [3500]	259 [3750]	276 [4000]						
161 cm ³ [9.8 in ³] / rev		Intermittent Ratings are below and to the right of the BOLD line.										Intermittent Ratings - 10% of Operation					
Flow - lpm [gpm]	2 [0.5]	20 [173] 11	55 [485] 10	125 [1102] 8	190 [1679] 6	255 [2258] 5											12
	4 [1]	22 [199] 23	59 [523] 22	135 [1194] 20	207 [1831] 18	274 [2425] 15	338 [2989] 13	397 [3511] 9									24
	8 [2]	32 [283] 47	63 [554] 45	144 [1273] 43	223 [1974] 41	298 [2635] 37	368 [3255] 34	433 [3830] 29	480 [4251] 21	504 [4459] 16	527 [4664] 10						47
	15 [4]	31 [278] 94	69 [609] 94	145 [1287] 91	228 [2014] 88	308 [2728] 84	388 [3416] 79	460 [4071] 71	526 [4654] 59	557 [4931] 53	583 [5163] 45						94
	23 [6]	29 [257] 140	69 [615] 138	143 [1265] 136	225 [1990] 135	306 [2711] 130	386 [3412] 124	464 [4108] 116	535 [4737] 100	573 [5074] 93	607 [5370] 83						140
	30 [8]	26 [226] 186	66 [583] 185	138 [1225] 184	221 [1958] 182	303 [2678] 177	383 [3387] 170	462 [4088] 160	538 [4761] 144	578 [5116] 135	617 [5463] 125						187
	38 [10]	21 [188] 234	62 [547] 233	133 [1180] 232	216 [1914] 230	298 [2633] 224	379 [3353] 217	458 [4055] 206	534 [4730] 189	575 [5085] 180	616 [5451] 180						234
	45 [12]	16 [145] 280	57 [509] 278	135 [1192] 276	210 [1861] 274	292 [2581] 270	372 [3289] 261	452 [4000] 250	530 [4688] 234	570 [5046] 224	613 [5423] 212						280
	53 [14]	11 [97] 327	51 [455] 326	133 [1178] 325	205 [1817] 323	286 [2530] 316	365 [3231] 307	441 [3905] 293	523 [4627] 274	563 [4986] 264	606 [5363] 251						327
	61 [16]	5 [44] 374	45 [402] 372	125 [1110] 371	199 [1761] 370	280 [2474] 363	359 [3173] 353	436 [3857] 338	517 [4572] 319	557 [4934] 308	599 [5301] 295						374
	68 [18]		37 [331] 420	118 [1048] 419	192 [1697] 417	272 [2408] 410	351 [3104] 400	427 [3779] 383	508 [4498] 363	548 [4853] 353	592 [5240] 339						420
	76 [20]		30 [265] 467	111 [980] 466	183 [1616] 465	264 [2337] 457	343 [3036] 446	419 [3712] 428	500 [4424] 408	540 [4777] 396	584 [5167] 382						467
	83 [22]		22 [193] 514	103 [913] 512	176 [1557] 510	256 [2264] 503	335 [2965] 491	413 [3658] 476	492 [4358] 454	533 [4721] 441	575 [5093] 427						514
	91 [24]				175 [1553] 558	246 [2180] 550	327 [2890] 538	405 [3587] 522	484 [4286] 500	524 [4639] 484	568 [5027] 473						560
95 [25]				163 [1443] 581	241 [2134] 573	321 [2843] 561	400 [3543] 545	481 [4253] 522	521 [4611] 511	561 [4968] 496						584	
Max. Inter.	114 [30]			138 [1222] 699	217 [1917] 691	296 [2618] 679	376 [3324] 661	456 [4034] 645	495 [4383] 625	534 [4729] 609						700	
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 [1.251]		45 [394]	89 [788]	178 [1576]	267 [2363]	356 [3151]	445 [3939]	534 [4727]	623 [5515]	668 [5909]	712 [6303]						
mm [in]		Theoretical Torque - Nm [lb-in]										Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]					
200		17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	190 [2750]	207 [3000]	242 [3500]	276 [4000]						
200 cm ³ [12.2 in ³] / rev		Intermittent Ratings are below and to the right of the BOLD line.										Intermittent Ratings - 10% of Operation					
Flow - lpm [gpm]	2 [0.5]	28 [249] 8	72 [638] 7	157 [1388] 5													10
	4 [1]	33 [291] 18	81 [713] 17	170 [1508] 14	254 [2250] 12	335 [2961] 9	411 [3636] 5	454 [4019] 4	508 [4498] 6							19	
	8 [2]	39 [343] 37	85 [757] 36	185 [1637] 34	280 [2474] 31	365 [3232] 27	446 [3948] 23	483 [4279] 20	521 [4609] 17	568 [5024] 3						38	
	15 [4]	40 [354] 75	87 [773] 74	187 [1654] 72	289 [2554] 69	388 [3430] 65	481 [4254] 59	523 [4627] 56	564 [4995] 51	627 [5548] 38	696 [6156] 25						76
	23 [6]	38 [334] 112	89 [789] 111	184 [1624] 110	285 [2524] 106	387 [3425] 102	486 [4299] 95	533 [4721] 90	579 [5128] 84	654 [5790] 67	732 [6478] 54						113
	30 [8]	34 [298] 150	85 [752] 149	180 [1593] 148	281 [2488] 144	384 [3394] 138	484 [4285] 131	534 [4722] 126	582 [5149] 120	670 [5931] 99	755 [6685] 85						151
	38 [10]	29 [255] 188	80 [709] 187	174 [1544] 186	276 [2446] 182	378 [3345] 176	479 [4240] 167	529 [4683] 161	576 [5098] 150	674 [5965] 134	768 [6793] 116						188
	45 [12]	22 [197] 226	74 [651] 225	168 [1491] 224	270 [2385] 220	371 [3284] 213	473 [4190] 204	520 [4600] 194	572 [5064] 185	670 [5930] 169	767 [6789] 150						226
	53 [14]	16 [139] 263	67 [593] 262	163 [1439] 261	263 [2324] 257	363 [3216] 251	465 [4111] 241	513 [4537] 229	563 [4980] 222	664 [5880] 205	764 [6765] 186						263
	61 [16]	8 [70] 301	60 [530] 300	159 [1409] 299	255 [2260] 296	355 [3145] 289	454 [4022] 273	506 [4477] 266	557 [4929] 257	656 [5809] 238	756 [6688] 219						301
	68 [18]		50 [446] 338	153 [1358] 336	246 [2181] 334	347 [3067] 327	447 [3955] 310	493 [4363] 302	547 [4838] 294	648 [5731] 274	747 [6612] 253						338
	76 [20]		41 [363] 376	144 [1277] 374	237 [2100] 372	336 [2977] 365	437 [3868] 348	487 [4305] 340	537 [4754] 331	637 [5639] 311	740 [6584] 288						376
	83 [22]		31 [276] 413	134 [1186] 411	227 [2007] 410	326 [2888] 403	427 [3783] 385	478 [4230] 377	527 [4665] 368	628 [5555] 347	730 [6463] 324						413
	91 [24]				216 [1908] 449	315 [2790] 441	417 [3693] 423	467 [4137] 414	518 [4581] 405	618 [5466] 383	723 [6395] 360						451
95 [25]				210 [1856] 468	309 [2737] 461	413 [3656] 440	464 [4107] 432	513 [4543] 422	614 [5436] 401	718 [6353] 378						470	
Max. Inter.	114 [30]			181 [1598] 561	281 [2486] 552	382 [3380] 539	433 [3831] 530	482 [4267] 521	580 [5136] 495	689 [6100] 467						563	
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"/>					
39.4 [1.552]		55 [490]	111 [980]	221 [1959]	332 [2939]	443 [3918]	553 [4898]	609 [5388]	664 [5878]	775 [6857]	886 [7837]						
mm [in]		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.

		Pressure - bar [psi]										Max. Cont.		Max. Inter.		
230		17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	172 [2500]	190 [2750]	207 [3000]	242 [3500]	276 [4000]					
229 cm ³ [14.0 in ³] / rev		Intermittent Ratings are below and to the right of the BOLD line.										Intermittent Ratings - 10% of Operation				
Flow - lpm (gpm)	2 [0.5]	40 [353] 7	90 [798] 7	189 [1673] 6												9
	4 [1]	49 [435] 16	97 [856] 15	199 [1764] 14	293 [2592] 12	391 [3457] 10	483 [4272] 7	530 [4692] 5	576 [5094] 4							17
	8 [2]	43 [378] 32	100 [889] 31	212 [1878] 30	316 [2798] 28	414 [3664] 25	507 [4491] 21	552 [4881] 19	596 [5271] 16							34
	15 [4]	49 [433] 65	100 [884] 65	217 [1918] 63	333 [2943] 61	442 [3909] 57	542 [4801] 51	589 [5215] 48	642 [5685] 43	724 [6407] 33	806 [7135] 21					67
	23 [6]	45 [402] 98	97 [861] 98	214 [1897] 97	331 [2929] 93	446 [3950] 89	556 [4925] 81	609 [5393] 76	651 [5762] 68	747 [6610] 56	833 [7371] 43					100
	30 [8]	41 [360] 131	98 [871] 130	209 [1852] 130	327 [2896] 126	444 [3928] 121	557 [4933] 113	607 [5370] 102	662 [5863] 96	766 [6781] 82	858 [7595] 67					133
	38 [10]	34 [302] 164	94 [829] 163	204 [1804] 162	321 [2841] 159	439 [3881] 154	550 [4868] 139	608 [5380] 133	665 [5882] 126	775 [6857] 110	875 [7743] 92					166
	45 [12]	27 [235] 197	86 [763] 196	196 [1734] 195	313 [2772] 192	431 [3815] 186	545 [4819] 171	603 [5334] 164	660 [5837] 157	772 [6829] 140	882 [7803] 119					200
	53 [14]	19 [167] 229	78 [690] 229	188 [1660] 228	305 [2698] 225	422 [3734] 219	538 [4757] 204	595 [5269] 197	653 [5778] 189	766 [6781] 170	878 [7772] 146					233
	61 [16]	11 [100] 262	69 [612] 261	178 [1576] 262	295 [2614] 258	413 [3657] 252	528 [4677] 235	586 [5188] 227	644 [5697] 219	700 [6198] 210	815 [7214] 190					266
	68 [18]		60 [527] 294	168 [1487] 295	286 [2514] 292	402 [3559] 280	519 [4592] 268	577 [5106] 260	634 [5611] 251	748 [6617] 229	862 [7632] 204					299
	76 [20]		49 [430] 328	155 [1375] 328	272 [2408] 325	391 [3457] 314	506 [4482] 302	565 [5001] 294	623 [5514] 285	739 [6537] 262	850 [7525] 235					332
	83 [22]		40 [352] 360	149 [1319] 360	262 [2321] 357	379 [3357] 350	495 [4382] 338	553 [4894] 330	611 [5409] 320	724 [6409] 298	839 [7423] 270					366
	91 [24]		30 [268] 392	138 [1220] 392	251 [2217] 389	368 [3253] 382	482 [4268] 369	540 [4781] 361	598 [5295] 351	713 [6309] 328	829 [7333] 301					399
95 [25]			131 [1161] 408	245 [2167] 405	362 [3202] 397	478 [4227] 384	537 [4755] 376	592 [5237] 365	708 [6263] 343	823 [7283] 316					415	
Max. Inter.	114 [30]		92 [816] 492	208 [1837] 487	325 [2876] 480	442 [3908] 467	499 [4419] 458	557 [4928] 448	617 [5942] 423	790 [6991] 394					498	
Rotor Width		Torque - Nm [lb-in], Speed rpm														
45.5 [1.791]		Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>														
mm [in]		63 [554]	125 [1108]	250 [2215]	376 [3323]	501 [4431]	626 [5539]	688 [6092]	751 [6646]	876 [7754]	1001 [8862]					
		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.		
320		17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	155 [2250]	172 [2500]	190 [2750]	207 [3000]	224 [3250]					
322 cm ³ [19.7 in ³] / rev		Intermittent Ratings are below and to the right of the BOLD line.										Intermittent Ratings - 10% of Operation				
Flow - lpm (gpm)	2 [0.5]	65 [571] 5	135 [1196] 4	272 [2406] 3	398 [3524] 1											6
	4 [1]	67 [595] 11	146 [1291] 10	290 [2568] 9	425 [3764] 7	558 [4937] 6	623 [5514] 4	689 [6101] 3	746 [6599] 1							12
	8 [2]	67 [597] 22	150 [1328] 22	311 [2751] 20	461 [4083] 18	596 [5277] 16	659 [5834] 14	723 [6396] 12	788 [6977] 11	849 [7510] 9						24
	15 [4]	64 [565] 46	147 [1299] 46	312 [2761] 44	474 [4197] 41	627 [5547] 36	698 [6173] 33	762 [6747] 30	821 [7261] 26	880 [7785] 20	942 [8337] 19					47
	23 [6]	77 [677] 70	154 [1367] 69	320 [2834] 67	484 [4283] 64	642 [5679] 57	717 [6347] 52	791 [7004] 48	853 [7548] 42	917 [8116] 37	977 [8646] 32					70
	30 [8]	72 [641] 93	147 [1299] 93	313 [2766] 91	477 [4221] 91	637 [5640] 80	715 [6329] 75	786 [6959] 65	861 [7617] 59	937 [8236] 53	996 [8816] 49					94
	38 [10]	64 [566] 117	137 [1217] 117	303 [2683] 114	468 [4142] 110	629 [5568] 103	705 [6241] 94	784 [6935] 87	859 [7603] 80	934 [8265] 74	1005 [8895] 68					117
	45 [12]	53 [473] 140	131 [1155] 139	292 [2587] 138	458 [4049] 134	619 [5479] 125	695 [6151] 116	774 [6850] 109	850 [7523] 103	926 [8197] 96	1001 [8861] 89					140
	53 [14]	30 [262] 164	122 [1076] 164	281 [2483] 161	446 [3943] 157	606 [5367] 146	687 [6078] 139	764 [6764] 132	840 [7434] 124	915 [8099] 116	990 [8761] 109					164
	61 [16]	18 [161] 187	112 [994] 186	267 [2359] 185	431 [3818] 181	594 [5253] 169	674 [5966] 163	753 [6660] 155	824 [7290] 149							187
	68 [18]	18 [160] 209	113 [997] 209	265 [2344] 206	430 [3805] 204	593 [5244] 192	673 [5953] 185	751 [6649] 178	811 [7178] 174							210
	76 [20]	3 [25] 234	97 [863] 233	248 [2198] 232	415 [3673] 227	578 [5114] 216	658 [5821] 202	736 [6515] 202	797 [7052] 197							234
	83 [22]		84 [747] 257	236 [2091] 255	400 [3540] 249	562 [4973] 240	641 [5676] 234	720 [6368] 227	781 [6913] 222							257
	91 [24]		75 [667] 280	215 [1900] 279	380 [3365] 273	543 [4804] 264	623 [5510] 258	701 [6202] 251	763 [6756] 246							280
95 [25]		70 [616] 292	207 [1828] 290	370 [3272] 285	533 [4716] 276	613 [5423] 270	698 [6175] 261	758 [6711] 257							292	
Max. Inter.	114 [30]		153 [1353] 350	315 [2789] 344	478 [4230] 335	559 [4943] 329	639 [5653] 322	704 [6233] 318							350	
Rotor Width		Torque - Nm [lb-in], Speed rpm														
63.5 [2.501]		Overall Efficiency - 70 - 100% <input type="checkbox"/> 40 - 69% <input type="checkbox"/> 0 - 39% <input type="checkbox"/>														
mm [in]		89 [788]	178 [1576]	356 [3153]	534 [4729]	713 [6306]	802 [7094]	891 [7882]	980 [8670]	1069 [9459]	1158 [10247]					
		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.

		Pressure - bar [psi]										Max. Cont.		Max. Inter.	
400		17 [250]	35 [500]	69 [1000]	86 [1250]	104 [1500]	121 [1750]	138 [2000]	155 [2250]	172 [2500]	190 [2750]				
409 cm ³ [25.0 in ³] / rev		Intermittent Ratings are below and to the right of the BOLD line.										Intermittent Ratings - 10% of Operation			
Flow - lpm [gpm]	2 [0.5]	81 [717] 4	173 [1534] 4	356 [3148] 2											5
	4 [1]	85 [752] 9	181 [1605] 8	369 [3263] 7	460 [4074] 6	550 [4865] 5	638 [5648] 4	724 [6404] 3	816 [7222] 2					10	
	8 [2]	86 [762] 18	187 [1654] 18	387 [3422] 16	483 [4274] 15	575 [5090] 13	662 [5861] 11	747 [6613] 10	826 [7310] 7					19	
	15 [4]	82 [724] 38	185 [1635] 37	391 [3460] 35	493 [4361] 34	592 [5240] 31	688 [6086] 27	776 [6871] 23	866 [7667] 17	942 [8337] 12				38	
	23 [6]	75 [663] 57	178 [1573] 56	383 [3393] 54	486 [4301] 52	588 [5201] 50	686 [6074] 46	783 [6926] 40	876 [7750] 33	963 [8524] 27	1056 [9345] 24			57	
	30 [8]	66 [585] 76	168 [1490] 75	374 [3306] 73	476 [4216] 72	578 [5119] 69	679 [6007] 65	776 [6868] 57	872 [7716] 50	966 [8545] 43	1055 [9341] 36			76	
	38 [10]		154 [1365] 95	361 [3197] 93	464 [4110] 91	567 [5015] 88	664 [5880] 82	764 [6764] 76	862 [7626] 69	956 [8463] 61	1050 [9289] 52			95	
	45 [12]		140 [1237] 114	346 [3066] 112	450 [3978] 110	551 [4880] 107	649 [5744] 101	750 [6638] 95	848 [7503] 88	945 [8361] 80	1039 [9195] 71			114	
	53 [14]		125 [1104] 133	330 [2924] 131	434 [3838] 129	536 [4745] 126	634 [5609] 119	735 [6504] 112	833 [7369] 102	929 [8217] 97	1024 [9058] 88			133	
	61 [16]		106 [934] 151	311 [2755] 150	415 [3672] 148	518 [4580] 145	617 [5456] 138	718 [6357] 131	817 [7228] 123	913 [8079] 114	1007 [8913] 104			152	
	68 [18]			291 [2578] 169	395 [3493] 167	498 [4405] 165	597 [5279] 158	699 [6185] 151	798 [7065] 143	896 [7931] 134	991 [8774] 122			171	
	76 [20]			269 [2379] 189	371 [3286] 187	475 [4205] 184	575 [5084] 177	678 [5997] 171	777 [6879] 163	876 [7754] 154	972 [8606] 143			190	
	83 [22]			246 [2174] 207	348 [3076] 205	451 [3987] 202	555 [4911] 198	654 [5789] 192	754 [6671] 184	852 [7543] 175	951 [8413] 165			209	
	91 [24]			226 [2000] 226	322 [2850] 224	424 [3756] 221	528 [4668] 217	629 [5571] 211	728 [6446] 204	828 [7332] 195	926 [8197] 184			228	
99 [26]			197 [1739] 246	294 [2600] 244	397 [3515] 241	500 [4421] 236	602 [5323] 231	702 [6214] 224	801 [7093] 215	900 [7963] 205			247		
114 [30]			131 [1162] 284	237 [2100] 282	338 [2991] 279	441 [3901] 275	542 [4798] 269	643 [5687] 263	743 [6574] 254	843 [7458] 245			285		
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"/>			
63.5 [2.501] mm [in]		110 [969]	219 [1939]	438 [3877]	548 [4846]	657 [5816]	767 [6785]	876 [7754]	986 [8723]	1095 [9693]	1205 [10662]	Theoretical Torque - Nm [lb-in]			
		Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]													

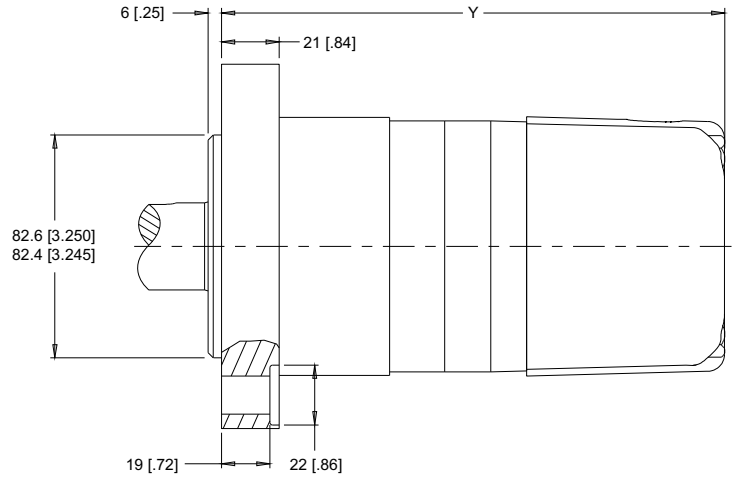
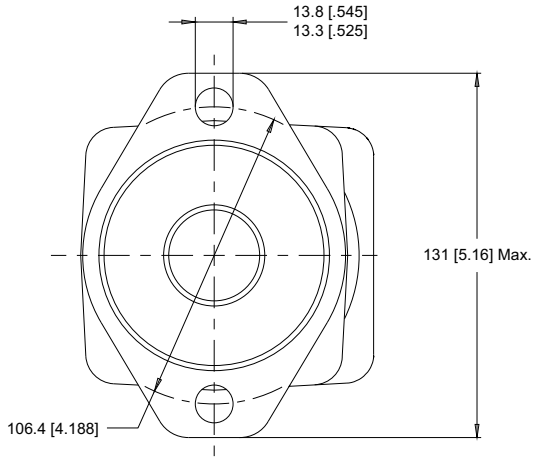
		Pressure - bar [psi]										Max. Cont.		Max. Inter.	
500		17 [250]	35 [500]	52 [750]	69 [1000]	86 [1250]	104 [1500]	121 [1750]	138 [2000]	155 [2250]					
508 cm ³ [31.0 in ³] / rev		Intermittent Ratings are below and to the right of the BOLD line.										Intermittent Ratings - 10% of Operation			
Flow - lpm [gpm]	2 [0.5]	94 [832] 3	210 [1861] 3	323 [2859] 3	435 [3853] 3									4	
	4 [1]	98 [868] 7	197 [1743] 7	314 [2781] 7	430 [3802] 6	542 [4797] 6	652 [5766] 5	777 [6876] 4					8		
	8 [2]	100 [882] 15	205 [1812] 15	328 [2905] 14	447 [3959] 14	565 [5001] 13	677 [5990] 11	780 [6900] 9	879 [7779] 7				16		
	15 [4]	95 [843] 31	204 [1803] 30	332 [2938] 30	460 [4070] 29	584 [5170] 28	703 [6225] 25	815 [7212] 21	917 [8118] 16	1012 [8956] 13			31		
	23 [6]	89 [783] 46	196 [1737] 46	324 [2869] 45	453 [4009] 44	580 [5133] 43	705 [6237] 41	824 [7296] 36	930 [8234] 28	1033 [9141] 22			46		
	30 [8]	79 [696] 62	185 [1639] 61	314 [2778] 61	443 [3918] 60	570 [5047] 58	696 [6161] 56	814 [7205] 50	930 [8231] 43	1041 [9210] 34			62		
	38 [10]	68 [600] 77	172 [1523] 77	300 [2652] 76	429 [3800] 75	557 [4929] 74	684 [6052] 71	805 [7123] 66	924 [8175] 59	1037 [9175] 50			77		
	45 [12]		177 [1568] 92	262 [2318] 92	410 [3624] 91	519 [4593] 89	644 [5696] 86	770 [6811] 82	891 [7885] 75	1008 [8916] 68			92		
	53 [14]		157 [1389] 107	286 [2533] 106	415 [3673] 105	544 [4810] 104	669 [5918] 101	794 [7027] 96	914 [8092] 89	1031 [9122] 80			107		
	61 [16]		138 [1219] 123	265 [2347] 122	394 [3486] 121	523 [4630] 120	649 [5740] 116	775 [6861] 111	897 [7936] 104	1013 [8968] 95			123		
	68 [18]		114 [1004] 138	243 [2147] 137	370 [3277] 136	500 [4424] 135	626 [5536] 132	752 [6659] 127	876 [7753] 120	995 [8806] 111			138		
	76 [20]		96 [849] 153	217 [1919] 153	344 [3047] 152	473 [4190] 151	600 [5311] 147	728 [6446] 143	852 [7537] 136	972 [8606] 127			153		
	83 [22]		78 [688] 168	154 [1360] 168	276 [2439] 167	406 [3595] 166	534 [4724] 164	660 [5839] 161	784 [6938] 155	907 [8028] 148			168		
	91 [24]			160 [1416] 184	268 [2371] 184	397 [3512] 182	524 [4633] 179	650 [5755] 175	776 [6863] 170	898 [7950] 162			184		
99 [26]			129 [1138] 199	231 [2048] 198	321 [2844] 197	451 [3988] 196	576 [5097] 193	703 [6218] 188	827 [7320] 181			199			
114 [30]			186 [1647] 229	292 [2581] 228	383 [3387] 227	508 [4494] 224	636 [5631] 219	761 [6738] 213				229			
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"/>			
78.9 [3.105] mm [in]		136 [1205]	272 [2410]	409 [3616]	545 [4821]	681 [6026]	817 [7231]	953 [8436]	1090 [9642]	1226 [10847]	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].

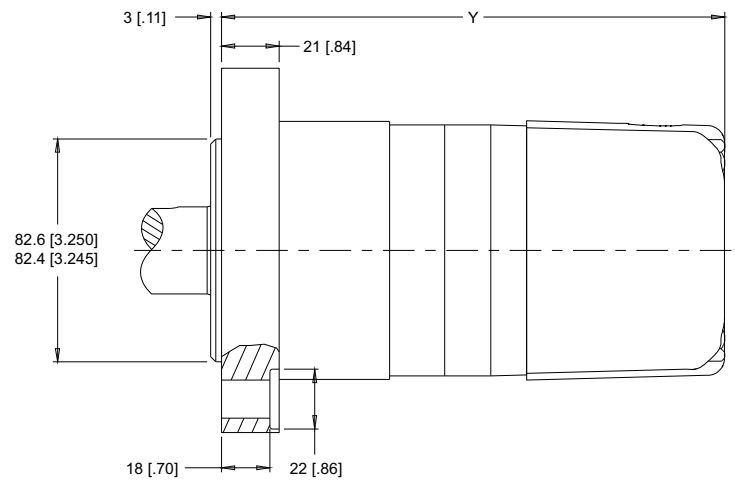
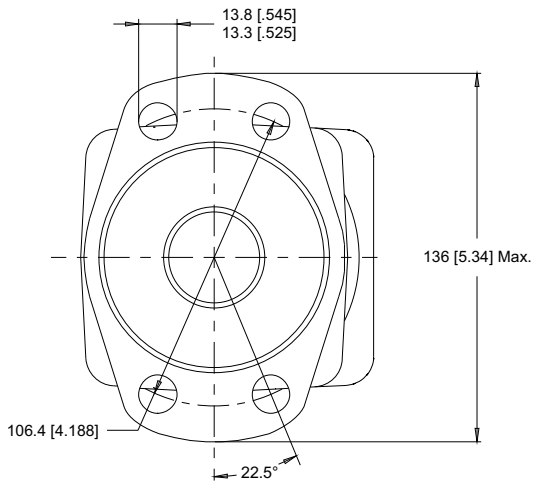
2-HOLE, SAE A MOUNT

A0 End Ports **A7** Side Ports



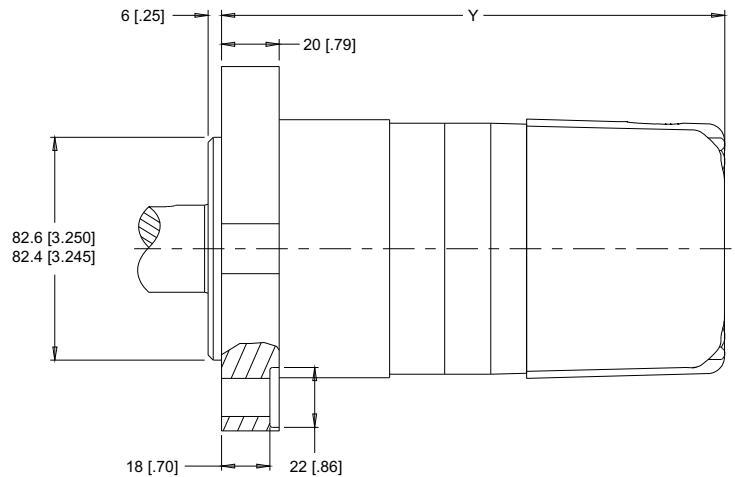
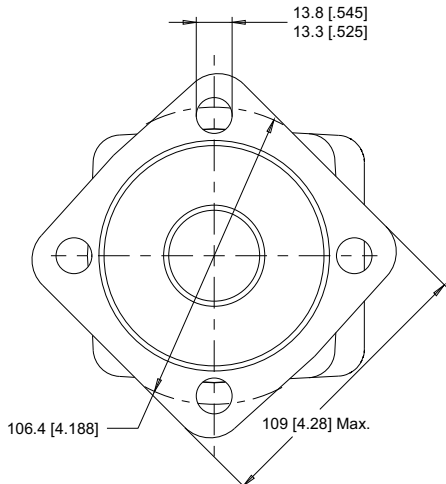
4-HOLE, MAGNETO MOUNT

A2 End Ports **A8** Side Ports



4-HOLE, SAE A MOUNT

AG End Ports **AH** Side Ports

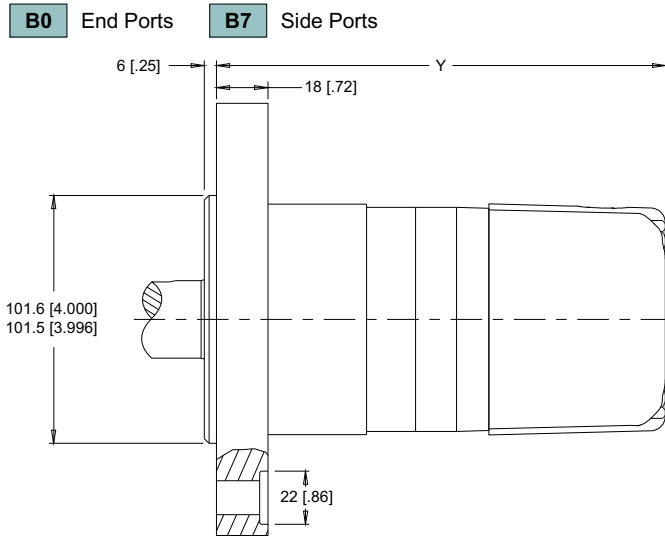
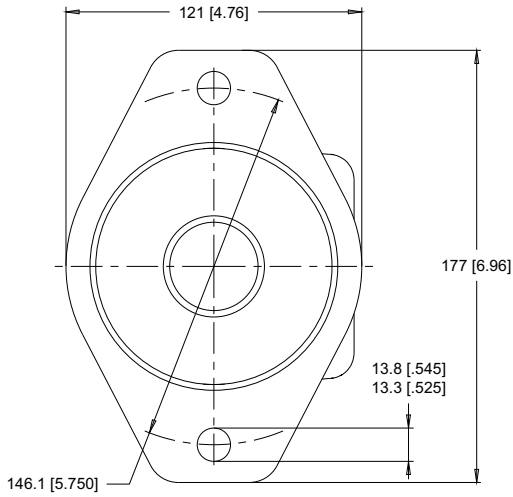


► Dimension Y is charted on page 10. Porting options listed on pages 11-12.

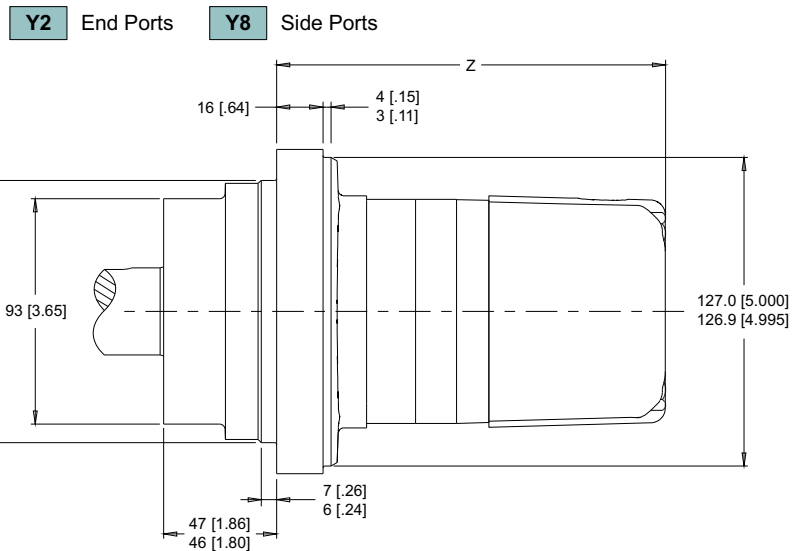
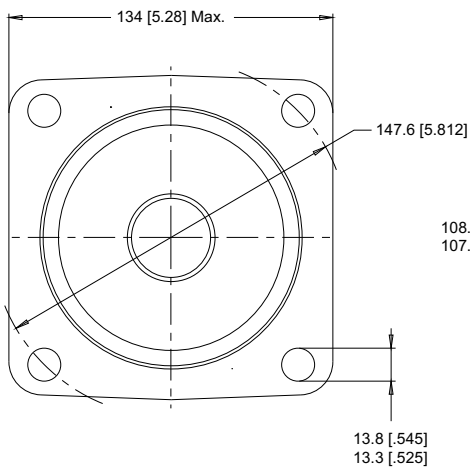
HOUSINGS

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

2-HOLE, SAE B MOUNT



4-HOLE, 4.25" WHEEL MOUNT



► Dimensions Y & Z are charted on page 10. Porting options listed on pages 11-12.

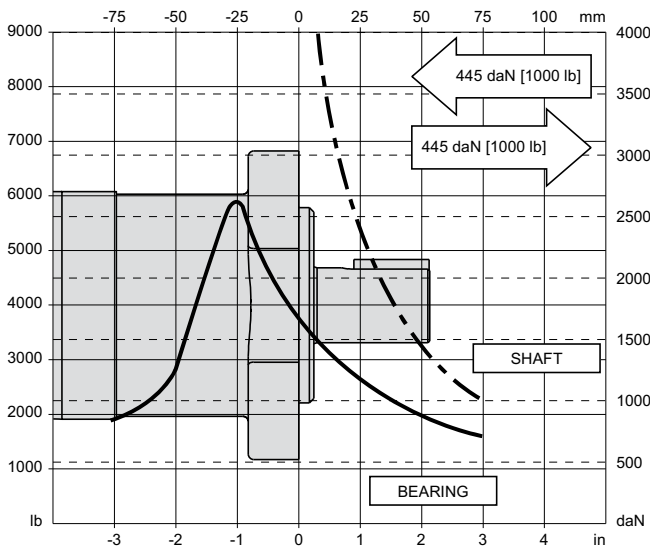
TECHNICAL INFORMATION

► Permissible shaft seal pressure information is found on page 17.

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 table below.

SAE A, SAE B & MAGNETO MOUNTS



LENGTH & WEIGHT CHART

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 8 & 9.

Y	SAE A & B Mounts	Magneto Mounts	Weight
#	mm [in]	mm [in]	kg [lb]
080	185 [7.27]	189 [7.42]	11.3 [24.9]
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]
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]

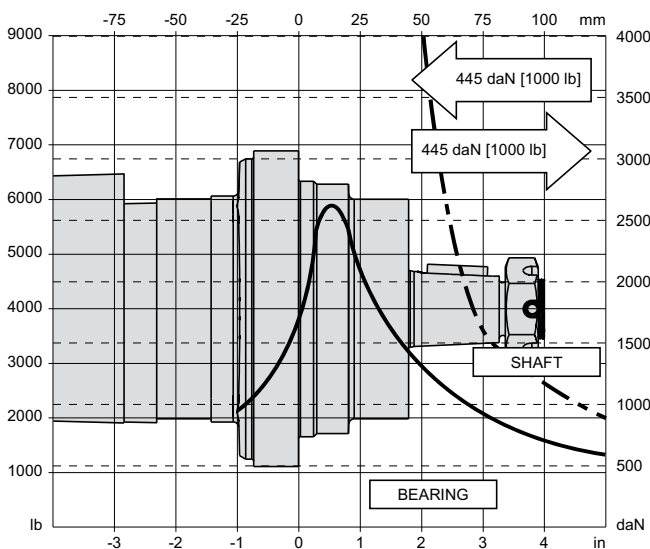
► Add 1.2 kg [2.6 lb] to the weight listed to the right for SAE B mount housings.

Dimension Z is the overall motor length from the rear of the motor to the mounting flange surface and is referenced on detailed housing drawings listed on page 9.

Z	Length	Weight
#	mm [in]	kg [lb]
080	145 [5.69]	12.5 [27.5]
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]
320	188 [7.41]	14.7 [32.3]
400	188 [7.41]	14.7 [32.3]
500	204 [8.02]	15.4 [33.9]

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

4.25" WHEEL MOUNT



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

► * 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].

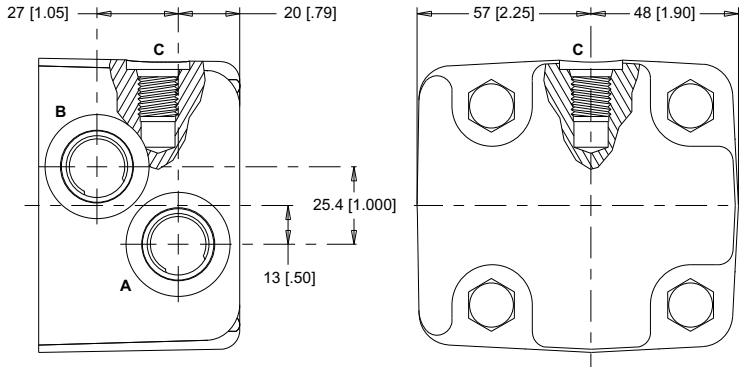
PORTING

SIDE PORTED - OFFSET

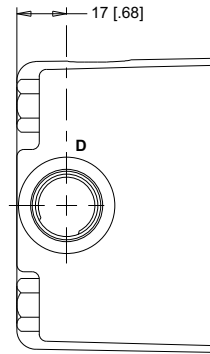
1 Main Ports **A, B:** 7/8-14 UNF
Drain Port **C:** 7/16-20 UNF

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

STANDARD



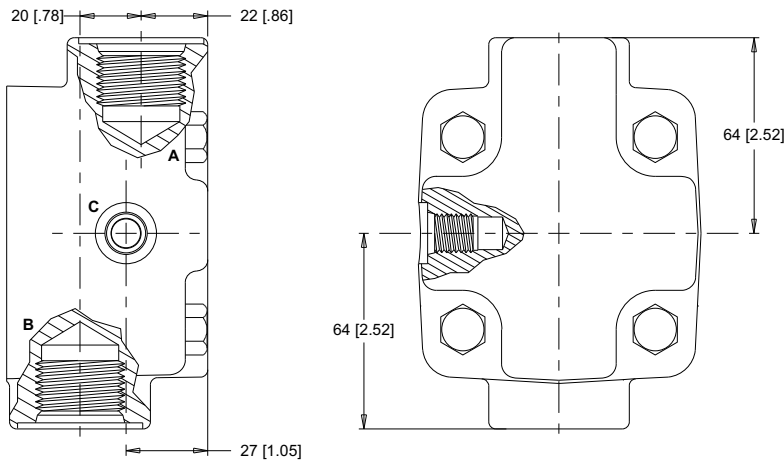
OPTIONAL



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

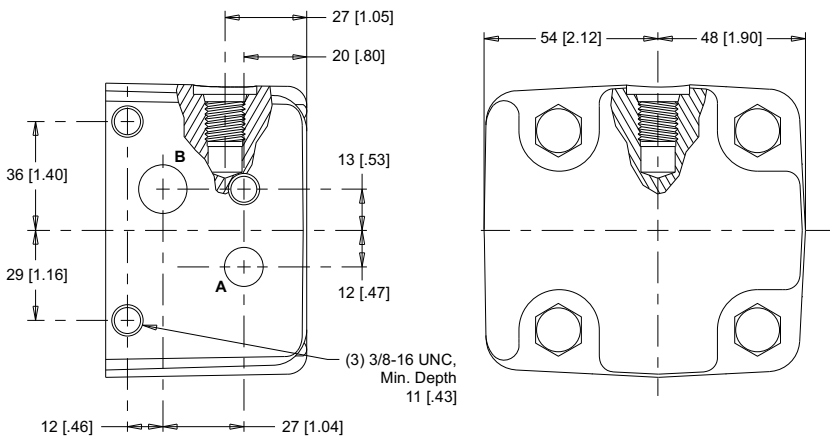
SIDE PORTED - 180° OPPOSED

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

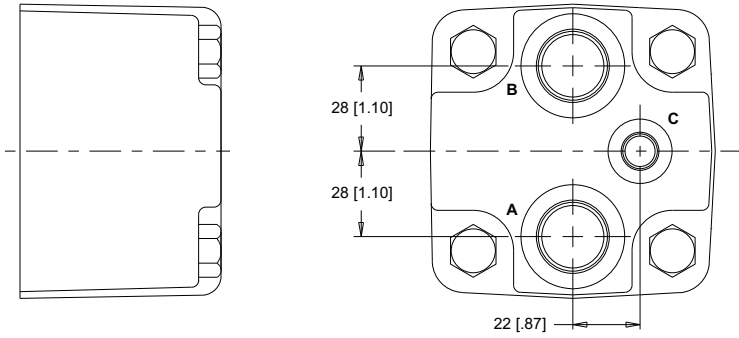


PORTING

END PORTED - ALIGNED

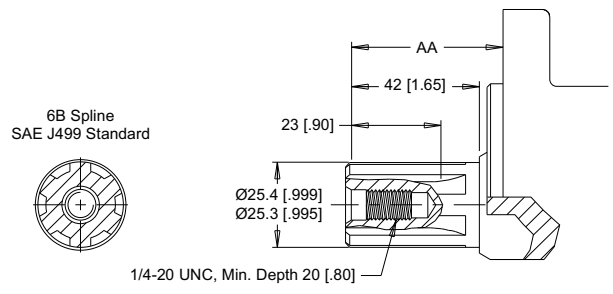
1 Main Ports **A, B:** 7/8-14 UNF
Drain Port **C:** 7/16-20 UNF

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



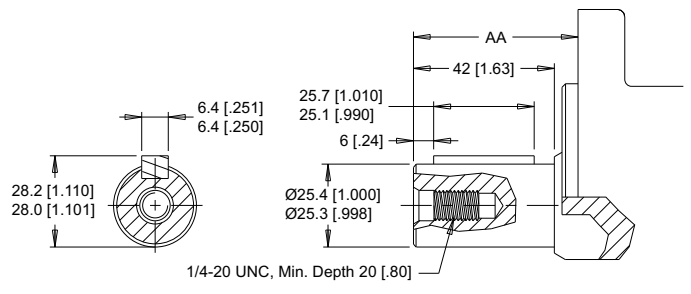
SHAFTS

02 1" 6B Spline



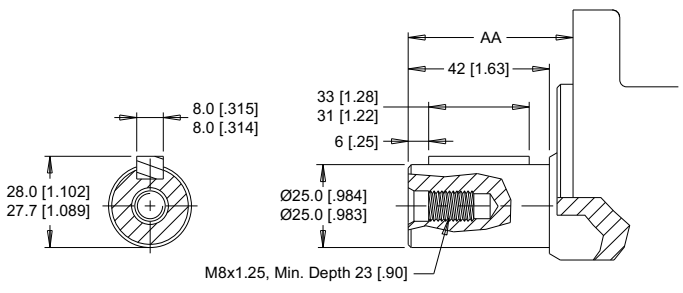
Max. Torque: 678 Nm [6000 lb-in]

10 1" Straight



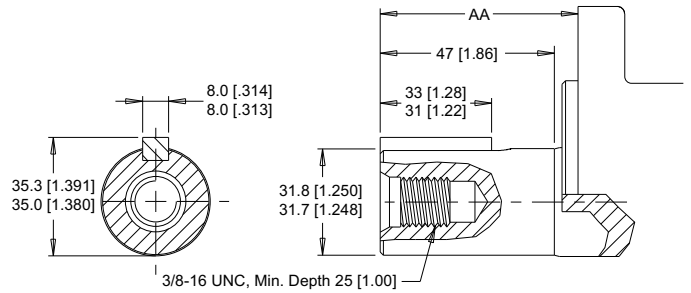
Max. Torque: 655 Nm [5800 lb-in]

12 25mm Straight



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

20 1-1/4" Straight

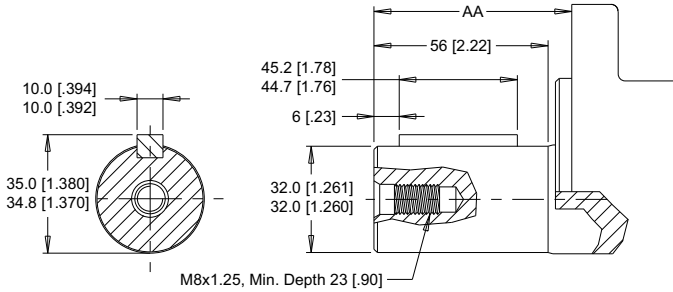


Max. Torque: 881 Nm [7800 lb-in]

► Dimension AA is charted on page 13.

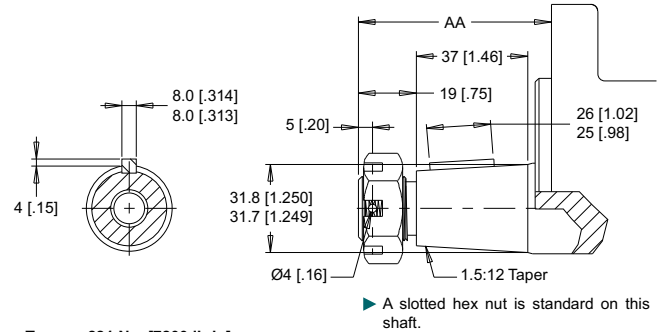
SHAFTS

21 32mm Straight



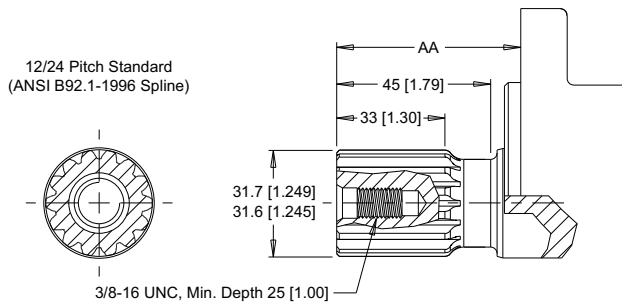
Max. Torque: 881 Nm [7800 lb-in]

22 1-1/4" Tapered



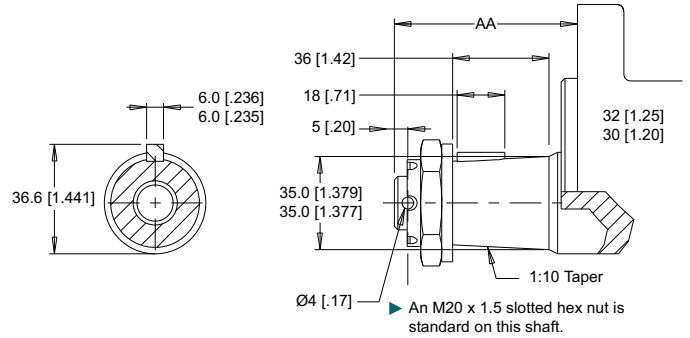
Max. Torque: 881 Nm [7800 lb-in]

23 14 Tooth Spline



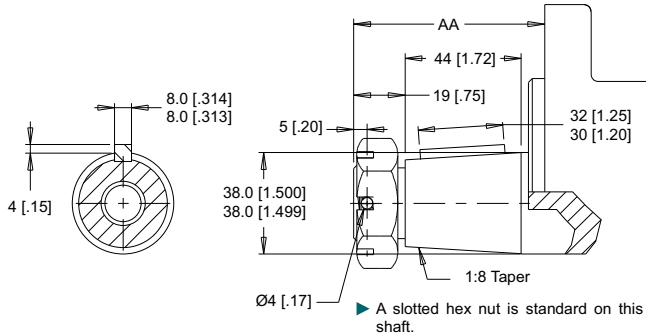
Max. Torque: 881 Nm [7800 lb-in]

28 35mm Tapered



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

31 1-1/2" 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 12.

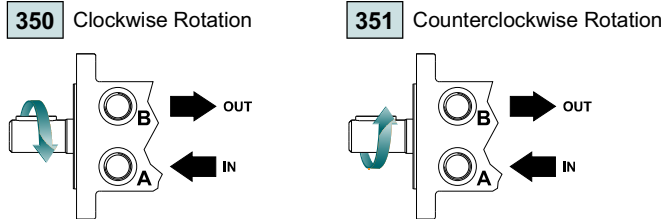
AA #	SAE A & B Mounts mm [in]	Magneto Mounts mm [in]	Wheel Mounts mm [in]
02	51 [2.00]	47 [1.85]	91 [3.58]
10	51 [2.00]	47 [1.85]	91 [3.58]
12	51 [2.00]	47 [1.85]	91 [3.58]
20	55 [2.18]	52 [2.03]	96 [3.76]
21	65 [2.54]	61 [2.39]	105 [4.12]
22	64 [2.51]	60 [2.36]	104 [4.09]
23	55 [2.18]	52 [2.03]	96 [3.76]
28	N/A	N/A	107 [4.20]
31	N/A	N/A	123 [4.86]

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

ORDERING INFORMATION



1. CHOOSE SERIES DESIGNATION



► The 350 & 351 series are bi-directional. Reversing the inlet hose will reverse shaft rotation.

2. SELECT A DISPLACEMENT OPTION

080	78 cm ³ /rev [4.8 in ³ /rev]	200	202 cm ³ /rev [12.3 in ³ /rev]
100	100 cm ³ /rev [6.1 in ³ /rev]	230	228 cm ³ /rev [13.9 in ³ /rev]
110	112 cm ³ /rev [6.9 in ³ /rev]	320	325 cm ³ /rev [19.8 in ³ /rev]
130	129 cm ³ /rev [7.9 in ³ /rev]	400	399 cm ³ /rev [24.4 in ³ /rev]
160	162 cm ³ /rev [9.9 in ³ /rev]	500	496 cm ³ /rev [30.3 in ³ /rev]

3a. SELECT MOUNT TYPE

▼ **END MOUNT**

A0	2-Hole, SAE A Mount
A2	4-Hole, Magneto Mount
AG	4-Hole SAE A Mount
B0	2-Hole SAE B Mount
Y2	4-Hole Wheel Mount

▼ **SIDE MOUNT**

A7	2-Hole, SAE A Mount
A8	4-Hole, Magneto Mount
AH	4-Hole SAE A Mount
B7	2-Hole SAE B Mount
Y8	4-Hole Wheel Mount

3b. SELECT PORT SIZE

▼ **END PORT OPTIONS**

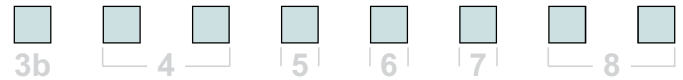
1	7/8-14 UNF Aligned
2	G 1/2 Aligned

▼ **SIDE PORT OPTIONS**

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

All WS series motors have been tested per NFPA/T2.6.1-1974 in order to establish ratings for infinite housing life. These ratings are based on pressure cycles with the case drain closed. The ratings for each housing are listed below:

Mounting Option	Rated Fatigue Pressure
4-Hole Square SAE A Mount	34 bar [500 psi]
2-Hole SAE A, B and 4-Hole Magneto Mounts	48 bar [700 psi]
4.25" Wheel Mount	117 bar [1700 psi]



4. SELECT A SHAFT OPTION

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

► The 28 and 31 shafts are not available on the SAE A, SAE B, or the Magneto mounts.

5. SELECT A PAINT OPTION

A	Black
B	Black, Unpainted Mounting Surface
Z	No Paint

6. SELECT A VALVE CAVITY / CARTRIDGE OPTION

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

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

7. SELECT AN ADD-ON OPTION

A	Standard
B	Lock Nut
C	Solid Hex Nut

8. SELECT A MISCELLANEOUS OPTION

AA	None
AC	Freeturning Rotor
MA	Mounting Rotated 90°
MB	Freeturning Rotor With Mounting Rotated 90°

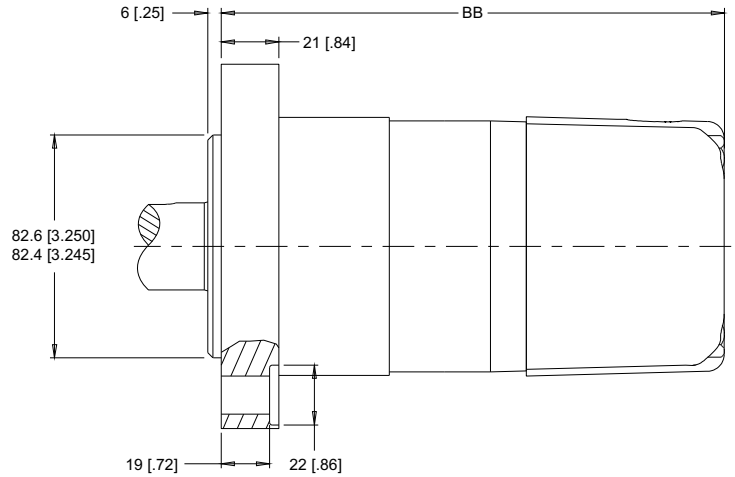
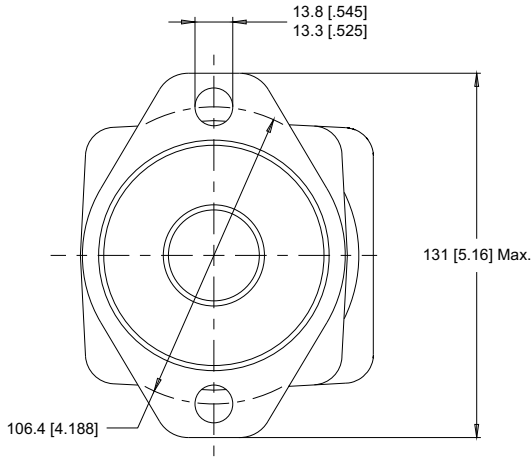
► Rotated mounting not available on the 4-Hole SAE A & wheel mounts

HOUSINGS

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

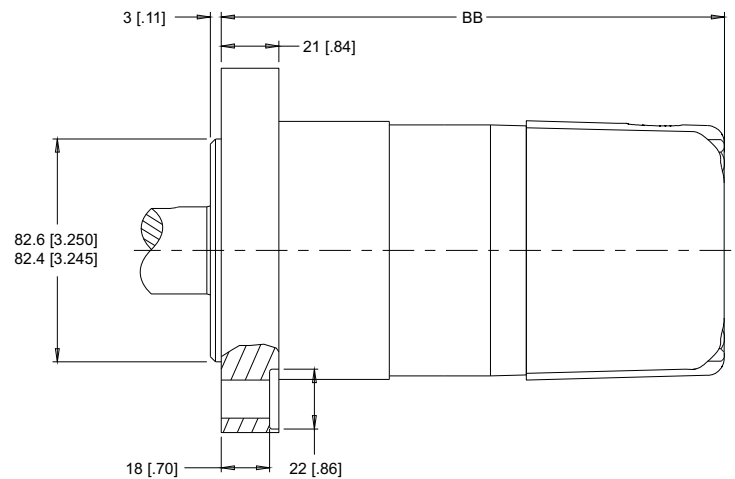
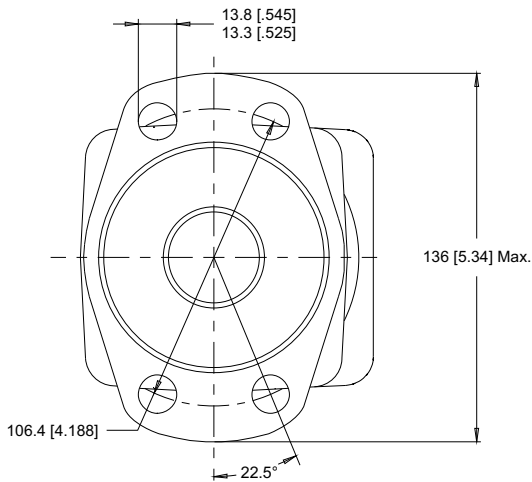
2-HOLE, SAE A MOUNT

A0 End Ports **A7** Side Ports



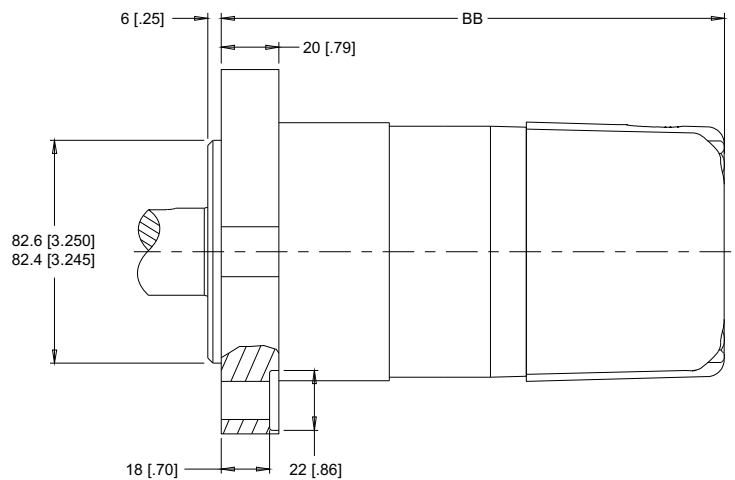
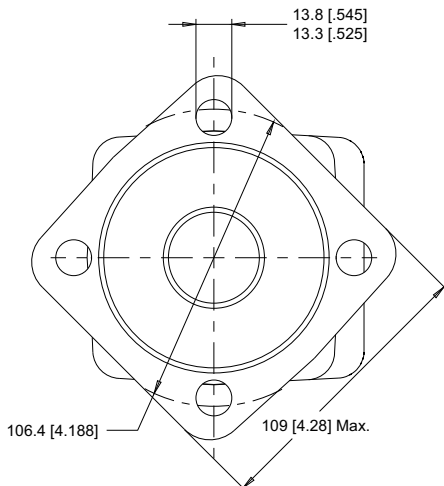
4-HOLE, MAGNETO MOUNT

A2 End Ports **A8** Side Ports



4-HOLE, SAE A MOUNT

AG End Ports **AH** Side Ports



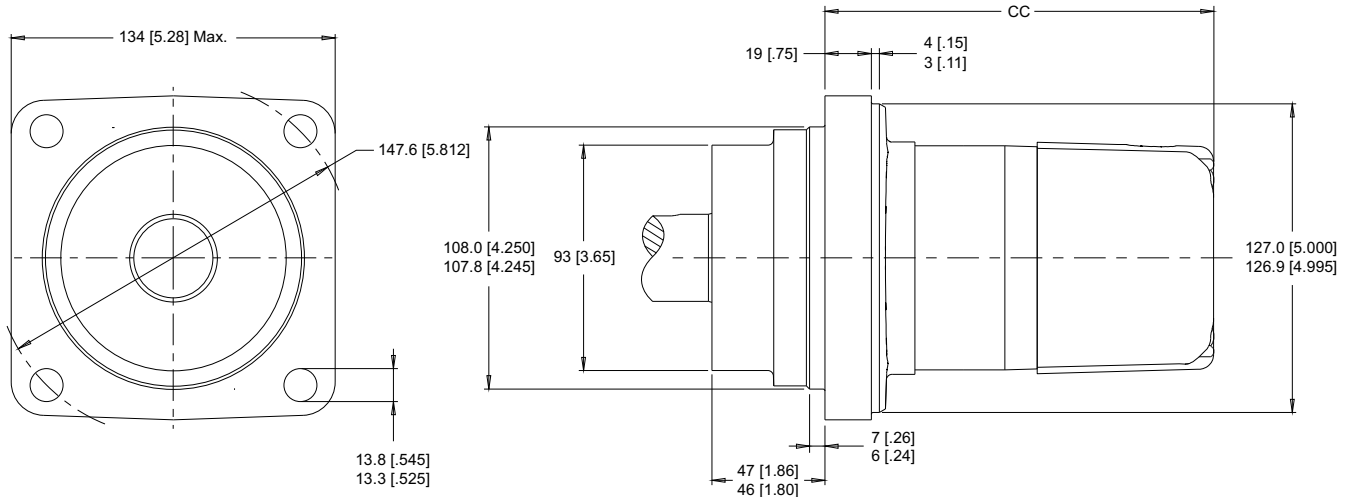
► Dimension BB is charted on page 16. Porting options listed on pages 18-19.

HOUSINGS

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

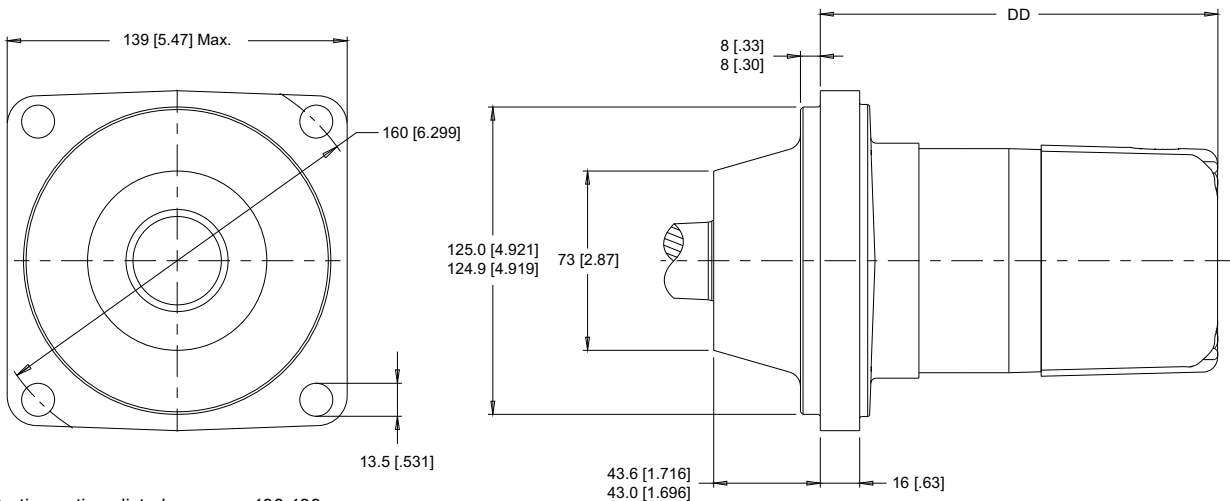
4-HOLE, 4.25" WHEEL MOUNT

Y2 End Ports **Y8** Side Ports



4-HOLE, EURO WHEEL MOUNT

Z2 End Ports **Z8** Side Ports



► Porting options listed on pages 138-139.

LENGTH & WEIGHT CHARTS

Dimensions BB, CC & DD are the overall motor lengths from the rear of the motor to the mounting flange surface and is referenced on detailed housing drawings listed above as well as page 15

BB	SAE A Mounts	Magneto Mounts	Weight
#	mm [in]	mm [in]	kg [lb]
080	193 [7.60]	197 [7.75]	10.8 [23.8]
100	193 [7.60]	197 [7.75]	10.8 [23.8]
110	196 [7.70]	200 [7.85]	11.0 [24.1]
130	199 [7.83]	203 [7.98]	11.1 [24.5]
160	205 [8.08]	209 [8.23]	11.5 [25.4]
200	213 [8.38]	217 [8.53]	11.9 [26.2]
230	219 [8.62]	223 [8.77]	12.3 [27.1]
320	237 [9.33]	241 [9.48]	13.3 [29.2]
400	237 [9.33]	241 [9.48]	13.3 [29.2]
500	252 [9.93]	256 [10.08]	14.0 [30.9]

CC	Length	Weight
#	mm [in]	kg [lb]
080	153 [6.02]	12.0 [26.5]
100	153 [6.02]	12.0 [26.5]
110	155 [6.12]	12.2 [26.8]
130	159 [6.25]	12.4 [27.2]
160	165 [6.50]	12.8 [28.1]
200	173 [6.80]	13.1 [28.9]
230	179 [7.04]	13.5 [29.8]
320	197 [7.75]	14.5 [31.9]
400	197 [7.75]	14.5 [31.9]
500	212 [8.35]	15.3 [33.6]

DD	Length	Weight
#	mm [in]	kg [lb]
080	156 [6.14]	11.8 [26.0]
100	156 [6.14]	11.8 [26.0]
110	158 [6.24]	12.0 [26.3]
130	162 [6.37]	12.2 [26.7]
160	168 [6.62]	12.5 [27.6]
200	176 [6.92]	12.9 [28.4]
230	182 [7.16]	13.3 [29.3]
320	200 [7.87]	14.3 [31.4]
400	200 [7.87]	14.3 [31.4]
500	215 [8.47]	15.0 [33.1]

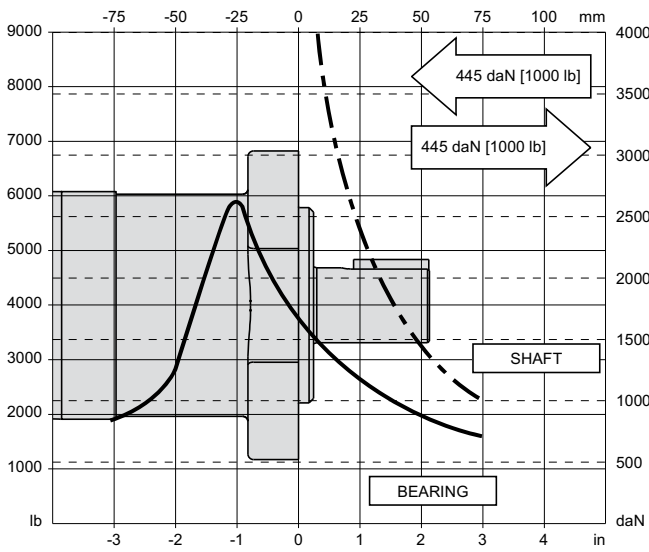
► 355/356 series motor weights can vary ± 1kg [2 lb] depending on model configurations such as housing, shaft, endcover, options etc.

TECHNICAL INFORMATION

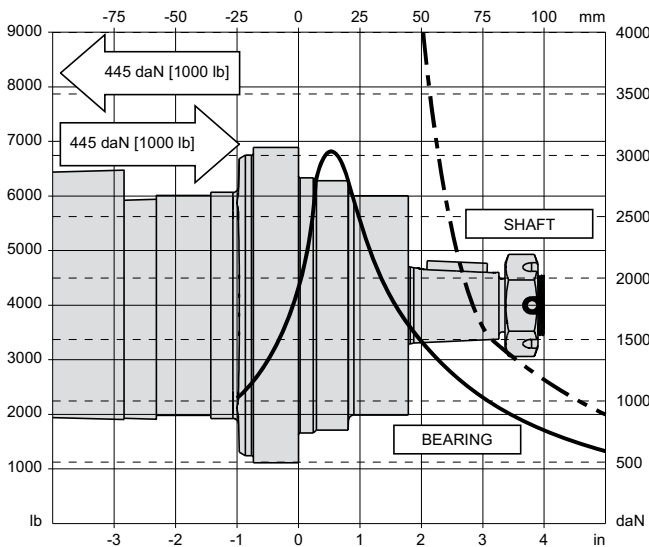
ALLOWABLE SHAFT LOAD / BEARING CURVE

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 (see page 10). Radial loads for speeds other than 100 rpm may be calculated using the multiplication factor table on page 10.

SAE A & MAGNETO MOUNTS

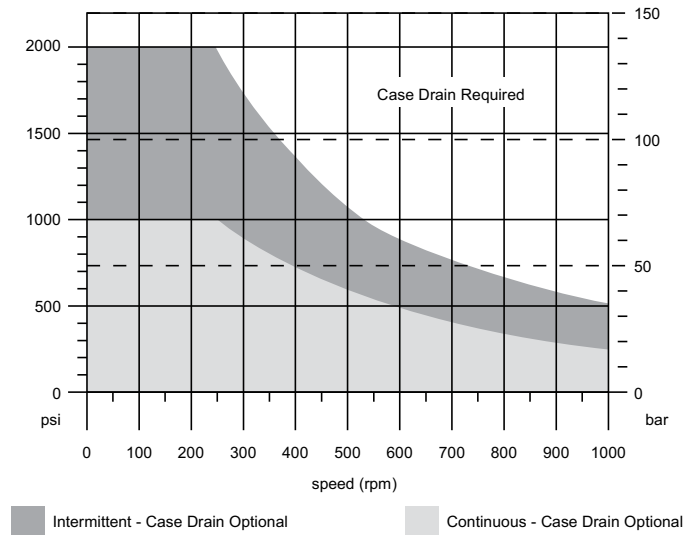


WHEEL MOUNTS

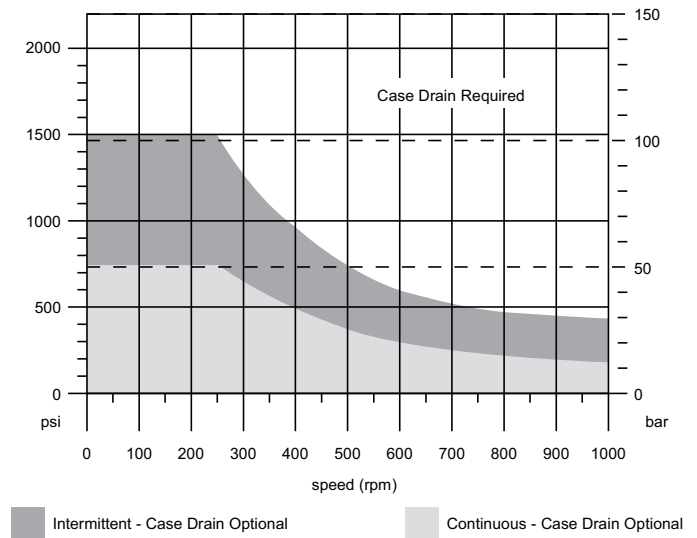


PERMISSIBLE SHAFT SEAL PRESSURE

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



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



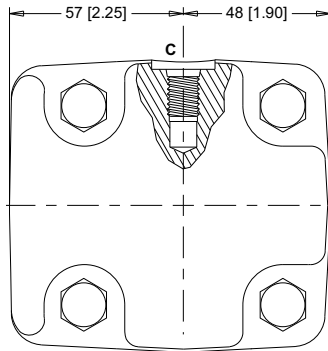
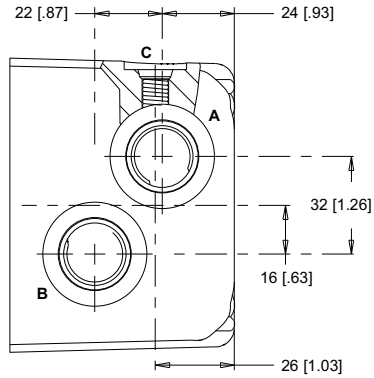
PORTING

SIDE PORTED - OFFSET

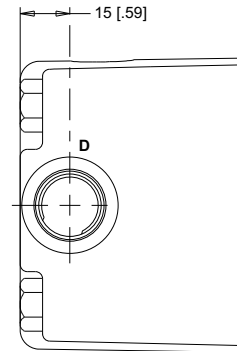
1 Main Ports **A, B:** 7/8-14 UNF
Drain Port **C:** 7/16-20 UNF

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

STANDARD



OPTIONAL

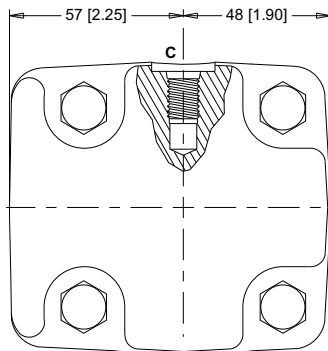
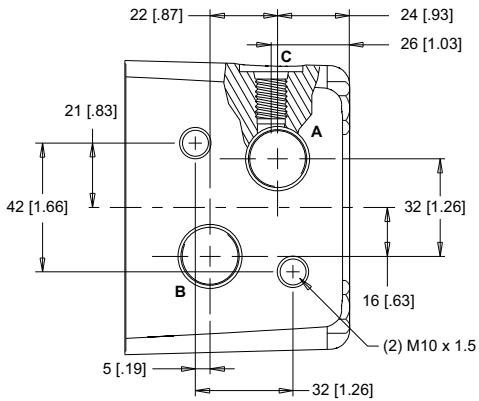


D: 10 Series/2-Way Valve Cavity 7/8-14 UNF

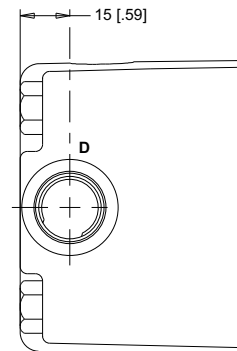
SIDE PORTED - OFFSET MANIFOLD

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

STANDARD



OPTIONAL

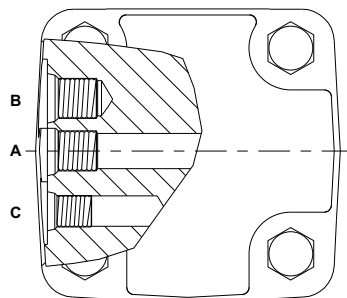
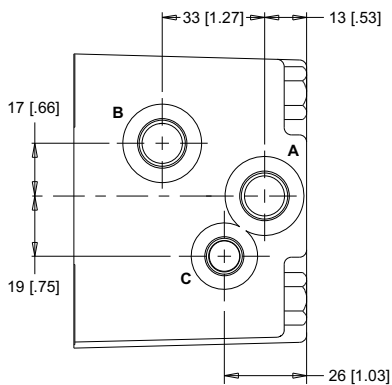


D: 10 Series/2-Way Valve Cavity 7/8-14 UNF

SIDE PORTED - OFFSET

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

9 Main Ports **A, B:** G 3/8
Drain Port **C:** G 1/4

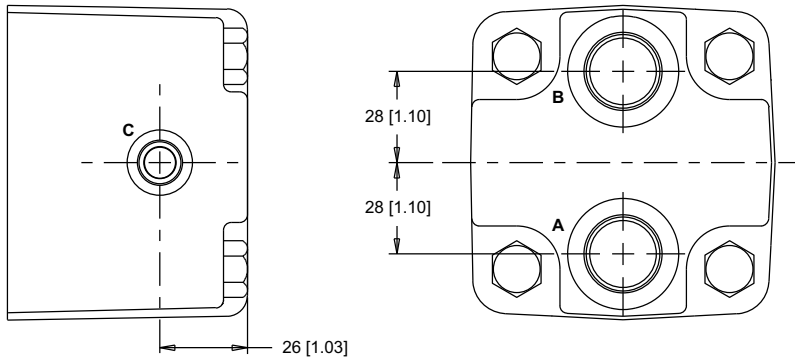


PORTING

END PORTED - ALIGNED

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

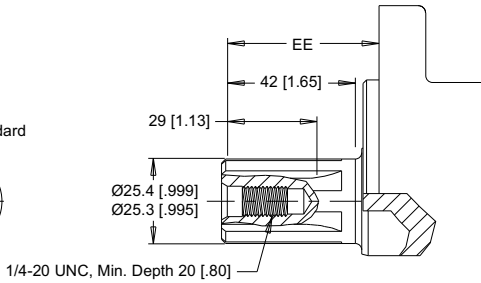
2 Main Ports **A, B:** G 1/2
Drain Port **C:** G 1/4



SHAFTS

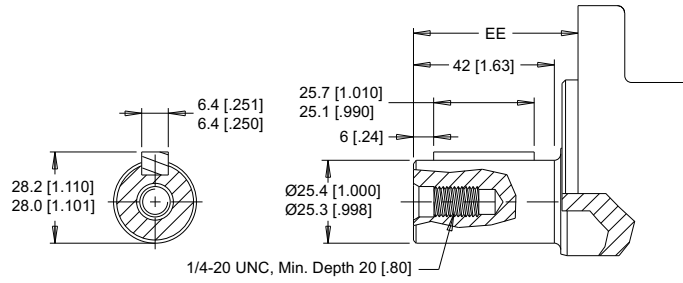
02 1" 6B Spline

6B Spline
SAE J499 Standard



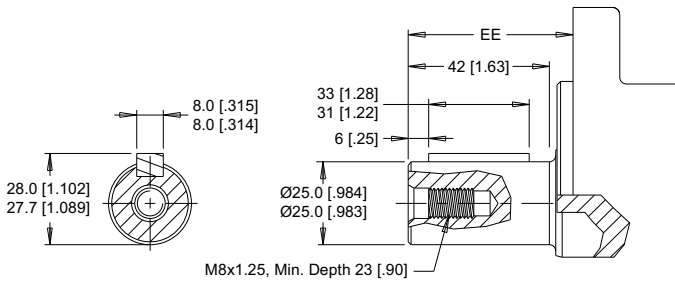
Max. Torque: 678 Nm [6000 lb-in]

10 1" Straight



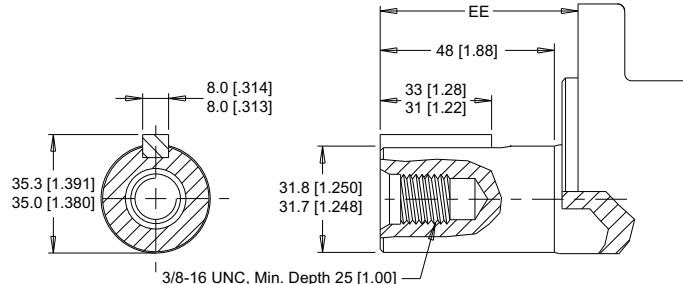
Max. Torque: 655 Nm [5800 lb-in]

12 25mm Straight



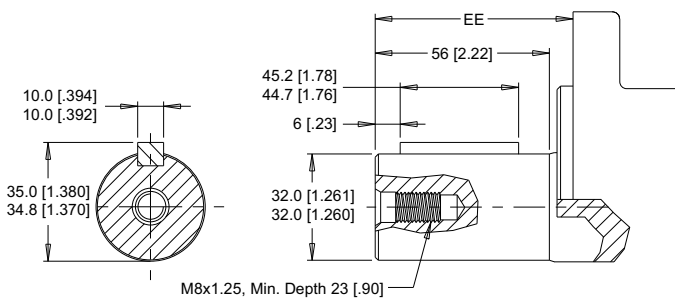
Max. Torque: 678 Nm [6000 lb-in]

20 1-1/4" Straight



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

21 32mm Straight

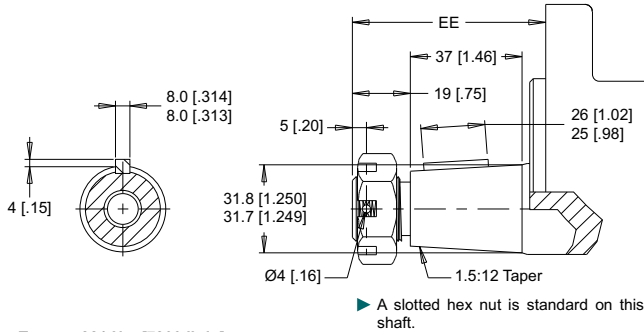


Max. Torque: 881 Nm [7800 lb-in]

► Dimension EE is charted on page 21.

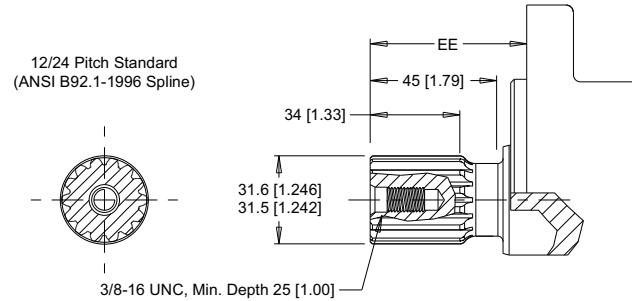
SHAFTS

22 1-1/4" Tapered



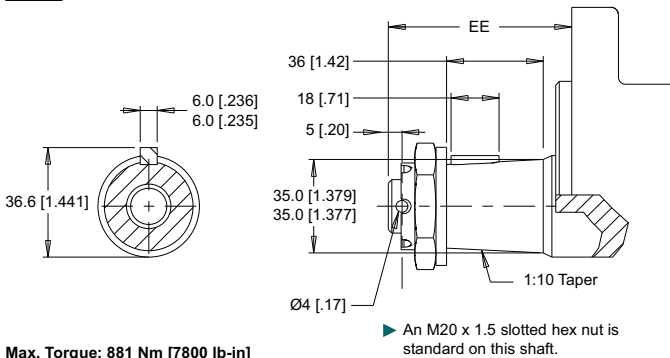
Max. Torque: 881 Nm [7800 lb-in]

23 14 Tooth Spline



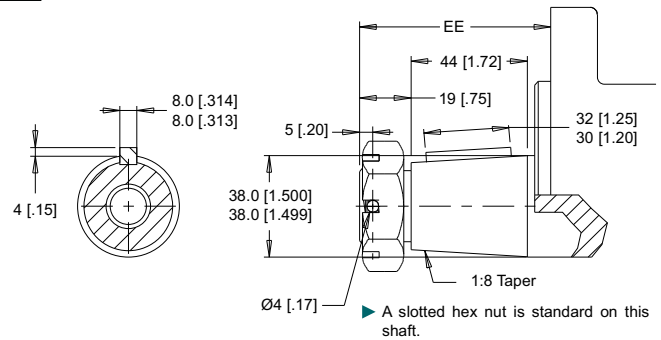
Max. Torque: 881 Nm [7800 lb-in]

28 35mm Tapered



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

31 1-1/2" Tapered



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

MOUNTING / SHAFT LENGTH CHART

Dimension EE 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 20.

EE #	SAE A* Mounts	Euro Wheel Mounts	4.25" Wheel Mounts
02	51 [2.00]	88 [3.45]	91 [3.58]
10	51 [2.00]	88 [3.45]	91 [3.58]
12	51 [2.00]	88 [3.45]	91 [3.58]
20	55 [2.18]	92 [3.63]	96 [3.76]
21	65 [2.54]	101 [3.99]	105 [4.12]
22	64 [2.51]	101 [3.96]	104 [4.09]
23	55 [2.18]	92 [3.63]	96 [3.76]
28	N/A	104 [4.08]	107 [4.20]
31	N/A	120 [4.73]	123 [4.86]

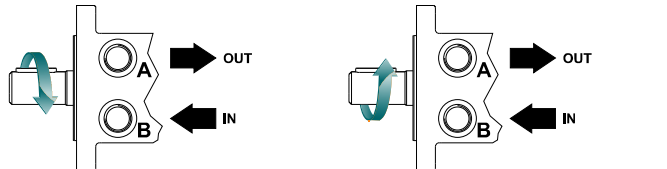
*For the magneto mount subtract 3.8 [0.15] from dimension. Shaft lengths vary ± 0.8 mm [0.030 in.]

ORDERING INFORMATION



1. CHOOSE SERIES DESIGNATION

355 Clockwise Rotation	356 Counterclockwise Rotation
-------------------------------	--------------------------------------



► The 355 & 356 series are bi-directional. Reversing the inlet hose will reverse shaft rotation.

2. SELECT A DISPLACEMENT OPTION

080 78 cm ³ /rev [4.8 in ³ /rev]	200 202 cm ³ /rev [12.3 in ³ /rev]
100 100 cm ³ /rev [6.1 in ³ /rev]	230 228 cm ³ /rev [13.9 in ³ /rev]
110 112 cm ³ /rev [6.9 in ³ /rev]	320 325 cm ³ /rev [19.8 in ³ /rev]
130 129 cm ³ /rev [7.9 in ³ /rev]	400 399 cm ³ /rev [24.4 in ³ /rev]
160 162 cm ³ /rev [9.9 in ³ /rev]	500 496 cm ³ /rev [30.3 in ³ /rev]

3a. SELECT MOUNT TYPE

▼ END MOUNT

A0 2-Hole, SAE A Mount
A2 4-Hole, Magneto Mount
AG 4-Hole SAE A Mount
B0 2-Hole SAE B Mount
Y2 4-Hole 4.25" Wheel Mount
Z2 4-Hole Euro Wheel Mount

3b. SELECT PORT SIZE

▼ END PORT OPTIONS

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

▼ SIDE MOUNT

A7 2-Hole, SAE A Mount
A8 4-Hole, Magneto Mount
AH 4-Hole SAE A Mount
B7 2-Hole SAE B Mount
Y8 4-Hole Wheel Mount
Z8 4-Hole Euro Wheel Mount

▼ SIDE PORT OPTIONS

1 7/8-14 UNF, Offset
2 G 1/2, Offset
3 G 1/2, Offset Manifold
5 9/16-18 UNF, Offset
9 G 3/8, Offset

4. SELECT A SHAFT OPTION

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

► The 28 and 31 shafts are not available on the SAE A or the Magneto mounts.

5. SELECT A PAINT OPTION

A Black
B Black, Unpainted Mounting Surface
Z No Paint

6. SELECT A VALVE CAVITY / CARTRIDGE OPTION

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

► Valve cavity is only available on side ports 1, 2 and 3.

7. SELECT AN ADD-ON OPTION

A Standard
B Lock Nut
C Solid Hex Nut

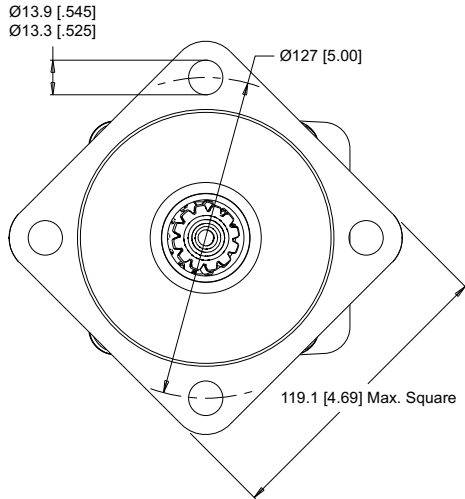
8. SELECT A MISCELLANEOUS OPTION

AA None
AC Freeturning Rotor
MA Mounting Rotated 90°
MB Freeturning Rotor With Mounting Rotated 90°

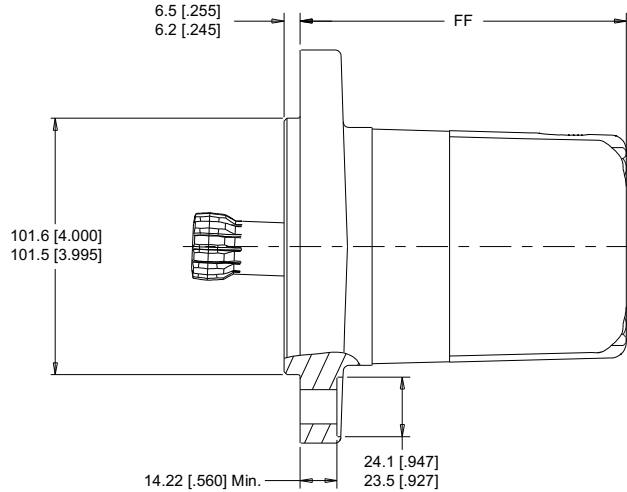
► Rotated mounting not available on the 4-Hole SAE A & wheel mounts

HOUSINGS

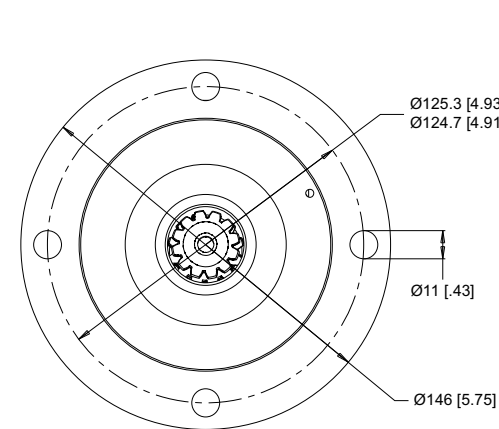
4-HOLE, 4.00" PILOT MOUNT



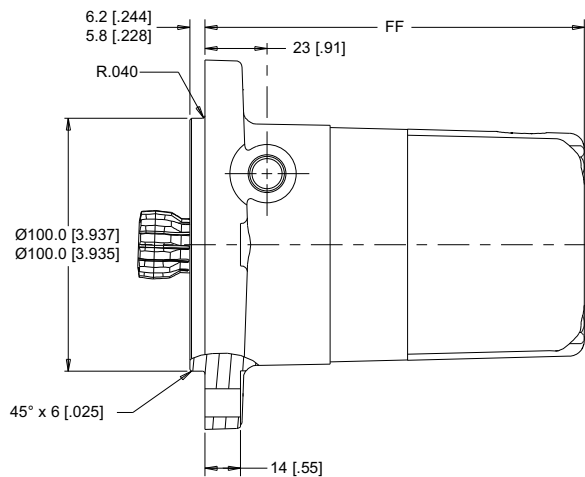
S2 End Ports **S8** Side Ports



4-HOLE, 100mm PILOT MOUNT



SG End Ports **SH** Side Ports



► Porting options listed on pages 18-19.

LENGTH & WEIGHT CHARTS

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

FF	4.00" Pilot Mounts	100mm Pilot Mounts	Weight*
#	mm [in]	mm [in]	kg [lb]
080	122 [4.80]	142 [5.60]	12.5 [27.5]
100	122 [4.80]	142 [5.60]	12.5 [27.5]
110	124 [4.89]	145 [5.70]	12.6 [27.8]
130	128 [5.02]	148 [5.83]	12.8 [28.2]
160	134 [5.27]	154 [6.08]	13.3 [29.2]
200	142 [5.57]	162 [6.38]	13.6 [29.9]
230	148 [5.81]	168 [6.62]	14.0 [30.8]
320	166 [6.52]	186 [7.33]	15.0 [32.9]
400	166 [6.52]	186 [7.33]	15.0 [32.9]
500	181 [7.12]	201 [7.93]	15.8 [34.7]

► 357/358 series motor weights can vary ± 1kg [2 lb] depending on model configurations such as housing, shaft, endcover, options etc. *For the SG and SH mounts subtract 2.9 kg [6.3 lb].

SHAFTS

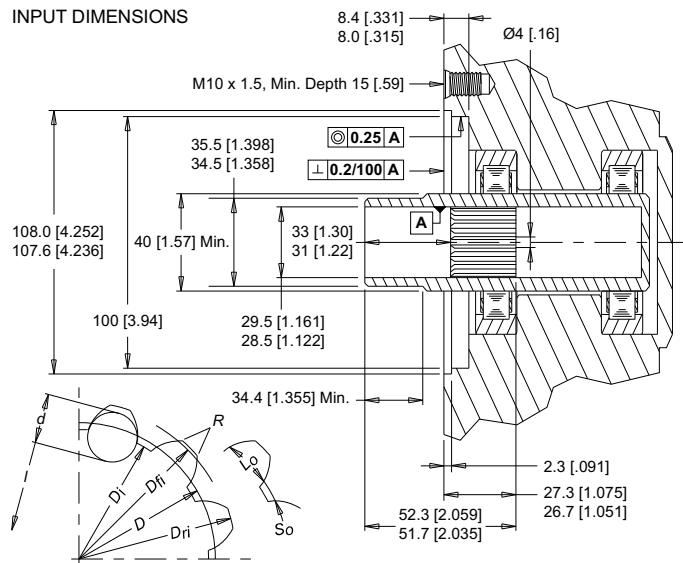
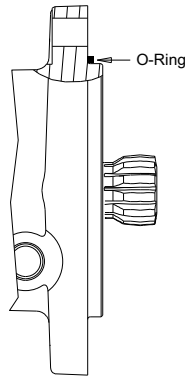
00 Cardan (For Use With SG & SH Mounts)

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_{fi}</i>	28.0 [1.10] - 27.9 [1.096]
Form Diameter (Min.) <i>D_{fi}</i>	27.6 [1.09]
Minor Diameter <i>D_f</i>	23.033 [9068] - 23.0 [9055]
Space Width (Circular) <i>L_o</i> *.....	4.328 [1.704] - 4.288 [1.688]
Tooth Thickness (Circular) <i>S_o</i>	2.341 [0.9217]
Fillet Radius <i>R</i> min.....	0.2 [0.008]
Max. Distance Between Pins <i>l</i>	17.77 [1.700] - 17.62 [0.694]
Pin Diameter <i>d</i>	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/mm²) hardened to 59 - 62 HRC to a depth of 0.762 - 1.016 [0.030 - .040].
- *Dimensions apply after heat treatment.



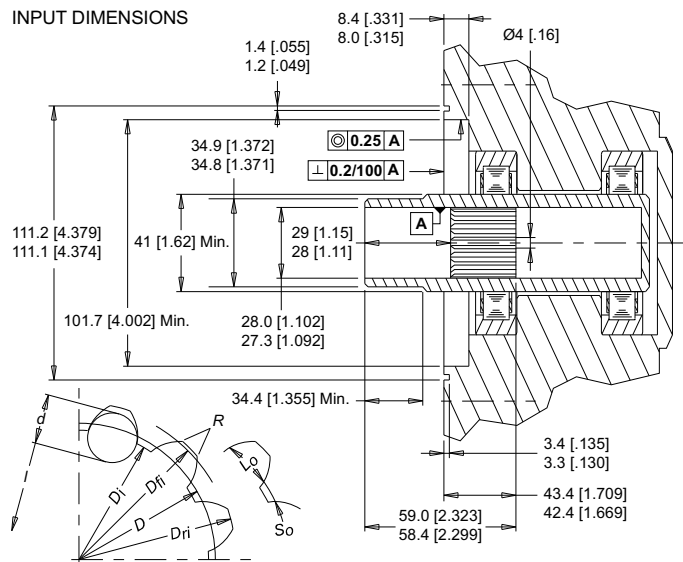
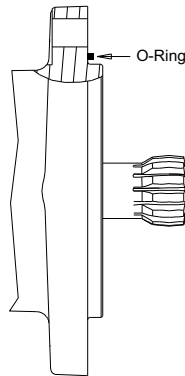
0B Cardan (For Use With S2 & S8 Mounts)

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_{fi}</i>	27.74 [1.092] - 27.59 [1.086]
Form Diameter (Min.) <i>D_{fi}</i>	26.93 [1.060]
Minor Diameter <i>D_f</i>	23.224 [9143] - 23.097 [9093]
Space Width (Circular) <i>L_o</i> *	
Max. Actual.....	4.318 [1.700]
Min. Effective.....	4.216 [1.660]
Fillet Radius <i>R</i>	0.76 [0.030] - 0.64 [0.025]
Max. Distance Between Pins <i>l</i>	19.190 [1.7555] - 19.020 [1.7488]
Pin Diameter <i>d</i>	4.496 [1.770]

with 3.38 [1.33] Flat for Root Clearance.

- ▶ The recommended shaft material is SAE 8620 or similar case hardening steel such as 20 MoCr4 (900 N/mm²) hardened to 59 - 62 HRC to a depth of 0.762 - 1.016 [0.030 - .040].
- *Dimensions apply after heat treatment.



SPECIFICATIONS (REDUCED TORQUE & PRESSURE RATINGS)*

CODE	Displacement cm ³ [in ³ /rev]	Max. Speed rpm		Max. Flow lpm [gpm]		Max. Torque Nm [lb-in]		Max. Pressure bar [psi]		
		cont.	inter.	cont.	inter.	cont.	inter.	cont.	inter.	peak
080	79 [4.78]	870	1060	61 [16]	68 [18]	207 [1832]	274 [2425]	207 [3000]	275 [3990]	276 [4000]
100	100 [6.10]	745	880	76 [20]	95 [25]	280 [2475]	390 [3450]	207 [3000]	275 [3990]	295 [4280]
110	112 [6.85]	675	840	76 [20]	95 [25]	307 [2715]	418 [3700]	207 [3000]	275 [3990]	295 [4280]
130	129 [7.86]	580	730	76 [20]	95 [25]	370 [3275]	490 [4340]	207 [3000]	275 [3990]	295 [4280]
160	162 [9.90]	465	700	76 [20]	114 [30]	462 [4090]	600 [5310]	207 [3000]	260 [3770]	280 [4060]
200	202 [12.31]	375	560	76 [20]	114 [30]	576 [5100]	720 [6370]	207 [3000]	250 [3630]	270 [3920]
230	228 [13.92]	325	490	76 [20]	114 [30]	642 [5685]	806 [7135]	207 [3000]	250 [3630]	270 [3920]
320	325 [19.81]	235	350	76 [20]	114 [30]	789 [6980]	990 [8760]	190 [2750]	224 [3250]	259 [3750]
400	399 [24.36]	190	280	76 [20]	114 [30]	816 [7225]	990 [8760]	155 [2250]	190 [2750]	210 [3050]
500	496 [30.29]	155	230	76 [20]	114 [30]	824 [7295]	990 [8760]	121 [1750]	140 [2030]	160 [2320]

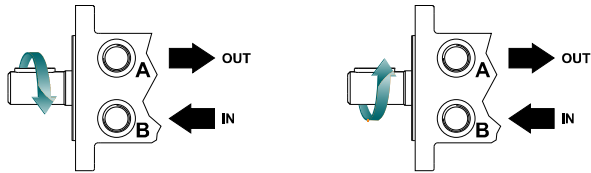
- ▶ Performance data is typical. Performance of production units varies slightly from one motor to another. Running at intermittent ratings should not exceed 10% of every minute of operation. *Derated performance values due to a smaller drive link used in the 357/358 series motors.

ORDERING INFORMATION



1. CHOOSE SERIES DESIGNATION

- 357** Clockwise Rotation
- 358** Counterclockwise Rotation



► The 357 & 358 series are bi-directional. Reversing the inlet hose will reverse shaft rotation.

2. SELECT A DISPLACEMENT OPTION

080	78 cm ³ /rev [4.8 in ³ /rev]	200	202 cm ³ /rev [12.3 in ³ /rev]
100	100 cm ³ /rev [6.1 in ³ /rev]	230	228 cm ³ /rev [13.9 in ³ /rev]
110	112 cm ³ /rev [6.9 in ³ /rev]	320	325 cm ³ /rev [19.8 in ³ /rev]
130	129 cm ³ /rev [7.9 in ³ /rev]	400	399 cm ³ /rev [24.4 in ³ /rev]
160	162 cm ³ /rev [9.9 in ³ /rev]	500	496 cm ³ /rev [30.3 in ³ /rev]

3a. SELECT MOUNT TYPE

- ▼ **END MOUNT**
- S2** 4-Hole, 4.00" Pilot Mount
 - SG** 4-Hole, 100mm Pilot Mount

- ▼ **SIDE MOUNT**
- S8** 4-Hole, 4.00" Pilot Mount
 - SH** 4-Hole, 100mm Pilot Mount

3b. SELECT PORT SIZE

- ▼ **END PORT OPTIONS**
- 1** 7/8-14 UNF Aligned
 - 2** G 1/2 Aligned

- ▼ **SIDE PORT OPTIONS**
- 1** 7/8-14 UNF, Offset
 - 2** G 1/2, Offset
 - 3** G 1/2, Offset Manifold
 - 5** 9/16-18 UNF, Offset
 - 9** G 3/8, Offset

► The 357 & 358 series using the same porting options as the 355 & 356.



4. SELECT A SHAFT OPTION

- 00** Cardan
- 0B** Cardan

► The 00 shaft is used with SG & SH mounts only and the 0B with S2 & S8 mounts only.

5. SELECT A PAINT OPTION

- Z** No Paint

6. SELECT A VALVE CAVITY / CARTRIDGE OPTION

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

► Valve cavity is only available on side ports 1, 2 and 3.

7. SELECT AN ADD-ON OPTION

- A** Standard

8. SELECT A MISCELLANEOUS OPTION

- AA** None

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