Part number:

HYDROMA
HYDRAULICKÉ SYSTÉMY

HIDROMA SISTEMS
UKŁADY HYDRAULICZNE

HYDROMA
ГИДРАВЛИЧЕСКИЕ СИСТЕМЫ

white drive products

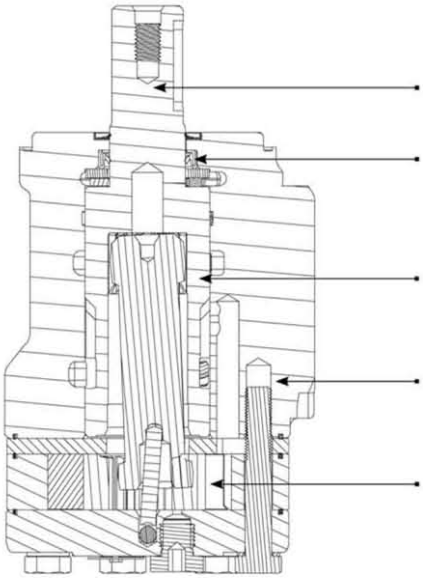
WR

SERIES HYDRAULIC MOTORS

WR

OVERVIEW

The WR Series motor incorporates the latest advances for smooth performance, efficiency and durability. It features an optimized Roller Stator® geometry with seven precision rollers to eliminate sliding friction and provide rolling contact between the rotor and stator. This increases motor efficiency. A three-zone spool valve, integral check valves and a provision for a case drain reduce pressure on internal seals to improve product life. A wide variety of mounting, shaft, motor displacement and porting options are available to meet all application needs.



KEY FEATURES

Variety of Mounts and Shafts provides flexibility in application design.

High Pressure Shaft Seal offers superior seal life and performance.

Spool Valve Design gives superior performance and smooth operation over a wide speed and torque range.

Built In Check Valves (Not Shown) in the housing offers versatility and increased seal life.

Optimized Roller Stator® geometry provides a smooth running high efficient product.

SPECIFICATIONS

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

CODE	Displacement cc [in³/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
040	40 [2.5]	1116	1515	45 [12]	61 [16]	93 [823]	123 [1088]	155 [2250]	207 [3000]	224 [3250]
060	59 [3.6]	890	1142	53 [14]	68 [18]	138 [1221]	172 [1522]	155 [2250]	207 [3000]	224 [3250]
070	71 [4.3]	865	1078	61 [16]	76 [20]	176 [1558]	207 [1832]	172 [2500]	207 [3000]	241 [3500]
090	88 [5.4]	691	864	61 [16]	76 [20]	222 [1965]	263 [2327]	172 [2500]	207 [3000]	241 [3500]
100	100 [6.1]	610	760	61 [16]	76 [20]	246 [2177]	289 [2558]	172 [2500]	207 [3000]	241 [3500]
115	113 [6.9]	539	672	61 [16]	76 [20]	284 [2513]	327 [2894]	172 [2500]	207 [3000]	241 [3500]
130	129 [7.9]	472	588	61 [16]	76 [20]	316 [2797]	375 [3319]	172 [2500]	207 [3000]	241 [3500]
160	160 [9.8]	379	469	61 [16]	76 [20]	400 [3540]	454 [4018]	172 [2500]	207 [3000]	241 [3500]
200	198 [12.1]	308	384	61 [16]	76 [20]	462 [4088]	544 [4814]	172 [2500]	207 [3000]	241 [3500]
240	236 [14.4]	249	315	61 [16]	76 [20]	548 [4850]	642 [5682]	172 [2500]	207 [3000]	224 [3250]
290	291 [17.8]	210	256	61 [16]	76 [20]	526 [4655]	664 [5876]	138 [2000]	190 [2750]	207 [3000]
320	322 [19.6]	188	235	61 [16]	76 [20]	518 [4584]	690 [6106]	121 [1750]	172 [2500]	190 [2750]
400	400 [24.4]	152	190	61 [16]	76 [20]	551 [4873]	698 [6177]	104 [1500]	138 [2000]	155 [2250]

WR
PERFORMANCE

040

40 cc [2.46 in³/rev.]

Flow - lpm [gpm]	Pressure - bars [psi] 17 [250]	35 [500]	52 [750]	69 [1000]	86 [1250]	104 [1500]	121 [1750]	138 [2000]	155 [2250] Max. Cont.	172 [2500]	207 [3000] Max. Inter.	Theoretical rpm
	Torque - Nm [lb-in], **Speed rpm**									**Intermittent Ratings -** 10% of Operation		
2 [0.5]	9 [80] **43**	20 [177] **40**	32 [283] **35**	40 [354] **29**	37 [327] **24**							50
4 [1]	10 [88] **95**	21 [186] **91**	30 [265] **82**	42 [372] **73**	52 [460] **62**	62 [549] **51**						100
8 [2]	9 [80] **188**	19 [168] **180**	28 [248] **170**	41 [363] **160**	51 [451] **144**	64 [566] **137**	72 [637] **126**	79 [699] **115**	89 [788] **102**	99 [876] **88**		199
15 [4]	7 [62] **365**	18 [159] **355**	27 [239] **343**	40 [354] **324**	49 [434] **312**	62 [549] **295**	73 [646] **293**	83 [735] **275**	93 [823] **257**	102 [903] **237**	121 [1071] **198**	373
23 [6]	6 [53] **560**	17 [150] **548**	26 [230] **532**	39 [345] **515**	48 [425] **502**	61 [540] **485**	70 [619] **471**	82 [726] **451**	90 [796] **432**	101 [894] **444**	122 [1080] **398**	572
30 [8]	6 [53] **728**	16 [142] **716**	25 [221] **706**	37 [327] **684**	47 [416] **667**	59 [522] **648**	68 [602] **634**	81 [717] **629**	88 [779] **618**	99 [876] **601**	123 [1088] **545**	746
38 [10]	5 [44] **942**	14 [124] **936**	22 [195] **927**	35 [310] **918**	45 [398] **904**	57 [504] **890**	68 [602] **874**	78 [690] **852**	86 [761] **835**	97 [858] **812**	118 [1044] **743**	945
45 [12] Max. Cont.	3 [27] **1116**	13 [115] **1113**	21 [186] **1100**	34 [301] **1082**	43 [381] **1056**	55 [487] **1028**	67 [593] **1004**	77 [681] **976**	84 [743] **952**	95 [841] **916**	116 [1027] **870**	1119
53 [14]		10 [88] **1316**	20 [177] **1301**	31 [274] **1278**	39 [345] **1253**	52 [460] **1230**	63 [558] **1206**	75 [664] **1184**	82 [726] **1154**	93 [823] **1116**	115 [1018] **1078**	1318
61 [16] Max. Inter.		8 [71] **1515**	19 [168] **1497**	29 [257] **1469**	38 [336] **1442**	49 [434] **1415**	60 [531] **1399**	74 [655] **1378**	80 [708] **1355**	90 [796] **1330**	113 [1000] **1298**	1517

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

Theoretical Torque - Nm [lb-in]

11 [97]	22 [195]	34 [301]	45 [398]	56 [496]	67 [593]	78 [690]	90 [796]	101 [894]	112 [991]	132 [1167]

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

060

59 cc [3.6 in³/rev.]

Flow - lpm [gpm]	Pressure - bars [psi] 17 [250]	35 [500]	52 [750]	69 [1000]	86 [1250]	104 [1500]	121 [1750]	138 [2000]	155 [2250] Max. Cont.	172 [2500]	207 [3000] Max. Inter.	Theoretical rpm
	Torque - Nm [lb-in], **Speed rpm**									**Intermittent Ratings -** 10% of Operation		
2 [0.5]	12 [106] **28**	26 [230] **22**	34 [301] **15**	45 [398] **12**								34
4 [1]	13 [115] **60**	29 [257] **56**	42 [372] **50**	56 [496] **44**	62 [549] **33**	68 [602] **16**						67
8 [2]	14 [124] **134**	31 [274] **129**	46 [407] **125**	58 [513] **118**	74 [655] **113**	94 [832] **107**	110 [974] **97**	121 [1071] **87**	137 [1212] **73**	148 [1310] **58**	168 [1487] **50**	135
15 [4]	12 [106] **250**	30 [266] **245**	45 [398] **240**	60 [531] **232**	75 [664] **225**	95 [841] **217**	108 [956] **208**	122 [1080] **198**	138 [1221] **185**	150 [1328] **174**	170 [1505] **168**	253
23 [6]	11 [97] **384**	30 [266] **380**	44 [389] **376**	59 [522] **370**	74 [655] **364**	93 [823] **356**	106 [938] **345**	124 [1097] **331**	138 [1221] **318**	152 [1345] **307**	172 [1522] **298**	387
30 [8]	10 [89] **502**	29 [257] **496**	43 [381] **494**	58 [513] **490**	72 [637] **485**	92 [814] **478**	104 [920] **468**	123 [1089] **460**	135 [1195] **450**	148 [1310] **438**	170 [1505] **431**	505
38 [10]	9 [80] **635**	28 [248] **632**	42 [372] **629**	55 [487] **628**	70 [620] **619**	90 [797] **611**	102 [903] **598**	121 [1071] **589**	133 [1177] **578**	146 [1292] **561**	168 [1487] **513**	640
45 [12]	8 [71] **755**	24 [212] **748**	39 [345] **745**	52 [460] **741**	69 [611] **735**	87 [770] **729**	100 [885] **718**	118 [1044] **705**	130 [1151] **688**	145 [1283] **676**	164 [1451] **659**	758
53 [14] Max. Cont.	6 [53] **890**	23 [204] **888**	38 [336] **884**	48 [425] **880**	65 [575] **874**	84 [743] **865**	98 [867] **852**	114 [1009] **840**	127 [1124] **831**	138 [1221] **820**	162 [1434] **802**	892
61 [16]		17 [150] **1021**	29 [257] **1018**	44 [389] **1011**	62 [549] **1007**	78 [690] **1000**	90 [797] **993**	106 [938] **984**	121 [1071] **974**	136 [1204] **962**	160 [1416] **956**	1026
68 [18] Max. Inter.		10 [89] **1142**	26 [230] **1140**	40 [354] **1129**	57 [504] **1112**	73 [646] **1097**	86 [761] **1085**	102 [903] **1074**	115 [1018] **1060**	130 [1151] **1044**	158 [1398] **1020**	1145

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

Theoretical Torque - Nm [lb-in]

16 [142]	33 [292]	49 [434]	65 [575]	81 [717]	98 [867]	114 [1009]	131 [1150]	147 [1292]	164 [1442]	179 [1584]

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

WR

PERFORMANCE

070

71 cc [4.3 in^3/rev.]

Flow - lpm [gpm]	Pressure - bars [psi]	17 [250]	35 [500]	69 [1000]	86 [1250]	104 [1500]	121 [1750]	138 [2000]	155 [2250]	172 [2500] Max. Cont.	190 [2750]	207 [3000] Max. Inter.	Theoretical rpm
		Torque - Nm [lb-in], **Speed rpm**								**Intermittent Ratings -** 10% of Operation			
2 [0.5]		13 [115] **26**	30 [266] **23**										28
4 [1]		14 [124] **55**	32 [283] **50**	66 [584] **40**	73 [646] **34**								57
8 [2]		16 [142] **112**	34 [301] **106**	70 [620] **94**	88 [779] **89**	104 [920] **81**	120 [1062] **73**	134 [1186] **66**	149 [1319] **51**				113
15 [4]		15 [133] **211**	33 [292] **206**	71 [628] **194**	87 [770] **186**	107 [947] **178**	123 [1089] **172**	139 [1230] **163**	158 [1398] **152**	171 [1513] **143**	196 [1735] **125**	211 [1867] **110**	213
23 [6]		14 [124] **324**	31 [274] **319**	66 [584] **306**	83 [735] **298**	104 [920] **288**	124 [1097] **280**	138 [1221] **270**	157 [1389] **260**	176 [1558] **248**	192 [1699] **232**	207 [1832] **221**	326
30 [8]		13 [115] **425**	30 [266] **418**	67 [593] **403**	84 [743] **394**	104 [920] **386**	123 [1089] **376**	137 [1212] **364**	159 [1407] **350**	174 [1540] **339**	193 [1708] **326**	203 [1797] **312**	426
38 [10]		10 [89] **539**	29 [257] **537**	65 [575] **529**	82 [726] **520**	103 [903] **508**	115 [1018] **500**	135 [1195] **486**	152 [1345] **474**	172 [1522] **458**	186 [1646] **440**	204 [1805] **425**	539
45 [12]		7 [62] **638**	25 [221] **634**	63 [558] **622**	82 [726] **614**	98 [867] **604**	117 [1035] **594**	132 [1168] **578**	152 [1345] **566**	169 [1496] **552**	189 [1673] **538**	199 [1761] **522**	638
53 [14]		5 [44] **752**	21 [186] **751**	58 [513] **743**	75 [664] **736**	94 [832] **728**	115 [1018] **718**	131 [1159] **705**	147 [1301] **690**	167 [1478] **675**	187 [1655] **650**	204 [1805] **630**	752
61 [16] Max. Cont.			17 [150] **865**	54 [478] **854**	73 [646] **843**	91 [805] **831**	107 [947] **818**	128 [1133] **807**	143 [1266] **795**	160 [1416] **782**	177 [1566] **766**	194 [1717] **750**	865
68 [18]			16 [142] **965**	48 [425] **960**	70 [620] **956**	88 [779] **945**	106 [938] **932**	122 [1080] **920**	139 [1230] **902**	156 [1381] **888**	173 [1531] **876**	191 [1690] **850**	965
76 [20] Max. Inter.			12 [106] **1078**	47 [416] **1070**	65 [575] **1062**	81 [717] **1048**	100 [885] **1036**	118 [1044] **1014**	138 [1221] **1000**	152 [1345] **988**	173 [1531] **960**	189 [1673] **944**	1078

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

Theoretical Torque - Nm [lb-in]

19 [169]	39 [348]	77 [685]	97 [854]	117 [1033]	136 [1202]	155 [1371]	174 [1540]	194 [1719]	213 [1888]	232 [2056]

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

090

88 cc [5.4 in^3/rev.]

Flow - lpm [gpm]	Pressure - bars [psi]	17 [250]	35 [500]	69 [1000]	86 [1250]	104 [1500]	121 [1750]	138 [2000]	155 [2250]	172 [2500] Max. Cont.	190 [2750]	207 [3000] Max. Inter.	Theoretical rpm
		Torque - Nm [lb-in], **Speed rpm**								**Intermittent Ratings -** 10% of Operation			
2 [0.5]		18 [159] **23**	40 [354] **22**	75 [664] **17**									23
4 [1]		20 [177] **45**	44 [389] **42**	88 [779] **35**	112 [991] **31**	118 [1044] **27**	128 [1133] **21**						45
8 [2]		22 [195] **91**	44 [389] **88**	87 [770] **81**	114 [1009] **77**	134 [1186] **72**	158 [1398] **68**	175 [1549] **60**	198 [1752] **52**	216 [1912] **42**			91
15 [4]		20 [177] **169**	44 [389] **166**	88 [779] **160**	112 [991] **156**	134 [1186] **152**	154 [1363] **146**	182 [1611] **140**	204 [1805] **130**	222 [1965] **122**	242 [2142] **110**	262 [2319] **96**	170
23 [6]		19 [168] **260**	40 [354] **257**	86 [761] **250**	110 [974] **245**	131 [1159] **238**	152 [1345] **232**	176 [1558] **225**	196 [1735] **215**	218 [1929] **205**	242 [2142] **193**	263 [2327] **186**	260
30 [8]		17 [150] **339**	38 [336] **336**	83 [735] **328**	108 [956] **324**	126 [1115] **318**	150 [1327] **308**	173 [1531] **300**	194 [1717] **292**	216 [1912] **280**	238 [2106] **270**	258 [2283] **258**	340
38 [10]		14 [124] **430**	33 [292] **429**	77 [681] **426**	106 [938] **424**	122 [1080] **417**	146 [1292] **411**	170 [1504] **402**	188 [1664] **393**	210 [1858] **380**	232 [2053] **366**	253 [2239] **354**	430
45 [12]		9 [80] **510**	30 [265] **508**	73 [646] **504**	103 [912] **500**	120 [1062] **496**	145 [1283] **488**	164 [1451] **480**	184 [1628] **472**	206 [1823] **462**	228 [2018] **448**	246 [2177] **434**	510
53 [14]		5 [44] **601**	25 [221] **600**	69 [611] **596**	97 [856] **594**	114 [1009] **591**	140 [1239] **586**	160 [1416] **578**	178 [1575] **566**	202 [1788] **552**	226 [2000] **540**	244 [2159] **528**	601
61 [16] Max. Cont.			20 [177] **691**	66 [584] **688**	90 [797] **684**	109 [965] **678**	134 [1186] **670**	156 [1381] **664**	173 [1531] **654**	200 [1770] **642**	220 [1947] **630**	242 [2142] **610**	692
68 [18]			16 [142] **772**	63 [558] **770**	84 [743] **768**	105 [929] **766**	128 [1133] **764**	152 [1345] **754**	168 [1487] **742**	193 [1708] **722**	214 [1894] **712**	236 [2088] **700**	772
76 [20] Max. Inter.			10 [88] **864**	58 [513] **863**	79 [699] **858**	100 [885] **848**	121 [1071] **844**	148 [1310] **835**	163 [1442] **825**	186 [1646] **812**	205 [1814] **800**	226 [2000] **778**	864

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

Theoretical Torque - Nm [lb-in]

24 [215]	49 [429]	97 [859]	121 [1073]	146 [1288]	170 [1502]	194 [1717]	218 [1932]	243 [2146]	267 [2361]	291 [2576]

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

WR
PERFORMANCE

100

100 cc [6.1 in³/rev.]

Pressure - bars [psi]

17 [250]	35 [500]	69 [1000]	86 [1250]	104 [1500]	121 [1750]	138 [2000]	155 [2250]	172 [2500] Max. Cont.	190 [2750]	207 [3000] Max. Inter.

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

Intermittent Ratings - 10% of Operation

Flow - lpm [gpm]												Theoretical rpm
2 [0.5]	18 [159] **17**	37 [327] **13**	77 [681] **12**	91 [805] **11**								20
4 [1]	26 [230] **38**	49 [434] **37**	84 [743] **33**	106 [938] **31**	120 [1062] **29**	140 [1239] **15**	160 [1416] **7**					40
8 [2]	25 [221] **80**	50 [442] **78**	98 [867] **75**	125 [1106] **70**	150 [1327] **68**	175 [1549] **65**	199 [1761] **61**	189 [1673] **20**				80
15 [4]	26 [230] **150**	46 [407] **148**	97 [858] **142**	124 [1097] **139**	148 [1310] **136**	175 [1549] **131**	198 [1752] **128**	224 [1982] **122**	245 [2168] **118**	267 [2363] **111**	289 [2558] **85**	150
23 [6]	23 [203] **229**	48 [425] **226**	96 [850] **221**	123 [1088] **218**	148 [1310] **215**	173 [1531] **212**	200 [1770] **208**	223 [1973] **201**	246 [2177] **197**	269 [2381] **189**	286 [2531] **162**	230
30 [8]	21 [186] **296**	45 [398] **292**	93 [823] **285**	121 [1071] **282**	146 [1292] **280**	168 [1487] **280**	195 [1726] **274**	221 [1956] **270**	244 [2159] **265**	265 [2345] **255**	284 [2513] **208**	300
38 [10]	17 [150] **378**	41 [363] **375**	91 [805] **367**	115 [1018] **370**	141 [1248] **367**	165 [1460] **364**	189 [1673] **363**	215 [1903] **361**	238 [2106] **353**	264 [2336] **338**	282 [2496] **310**	380
45 [12]	14 [123] **450**	36 [319] **448**	89 [788] **442**	116 [1027] **438**	140 [1239] **433**	162 [1434] **426**	188 [1664] **420**	210 [1858] **412**	234 [2071] **404**	258 [2283] **390**	280 [2478] **355**	450
53 [14]	12 [106] **528**	34 [301] **526**	83 [735] **520**	109 [965] **518**	134 [1186] **514**	158 [1389] **508**	181 [1602] **500**	205 [1814] **490**	228 [2017] **480**	256 [2265] **468**	278 [2460] **440**	530
Max. Cont. 61 [16]	10 [88] **610**	28 [248] **608**	79 [699] **600**	103 [912] **596**	129 [1142] **590**	152 [1345] **582**	172 [1522] **576**	198 [1752] **568**	223 [1973] **556**	254 [2248] **542**	276 [2443] **525**	610
68 [18]	6 [53] **680**	21 [186] **677**	71 [628] **666**	94 [832] **660**	121 [1071] **653**	146 [1292] **645**	169 [1496] **635**	192 [1699] **624**	215 [1903] **610**	251 [2221] **594**	272 [2407] **574**	680
Max. Inter. 76 [20]		15 [133] **760**	63 [558] **754**	85 [752] **750**	112 [991] **742**	133 [1177] **730**	160 [1416] **715**	185 [1637] **702**	202 [1788] **688**	248 [2195] **666**	267 [2363] **636**	760

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

Theoretical Torque - Nm [lb-in]

27 [239]	56 [496]	110 [974]	137 [1212]	166 [1469]	193 [1708]	220 [1947]	247 [2186]	275 [2434]	303 [2682]	330 [2921]

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

115

113 cc [6.9 in³/rev.]

Pressure - bars [psi]

17 [250]	35 [500]	69 [1000]	86 [1250]	104 [1500]	121 [1750]	138 [2000]	155 [2250]	172 [2500] Max. Cont.	190 [2750]	207 [3000] Max. Inter.

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

Intermittent Ratings - 10% of Operation

Flow - lpm [gpm]												Theoretical rpm
2 [0.5]	23 [204] **17**	53 [469] **12**										18
4 [1]	25 [221] **35**	56 [496] **34**	95 [841] **30**	118 [1044] **19**								35
8 [2]	25 [221] **70**	59 [522] **69**	117 [1035] **65**	144 [1274] **62**	172 [1522] **60**	202 [1788] **56**						71
15 [4]	24 [212] **130**	58 [513] **129**	112 [991] **127**	144 [1274] **125**	173 [1531] **122**	202 [1788] **117**	225 [1991] **114**	251 [2221] **108**				133
23 [6]	22 [195] **200**	51 [451] **199**	111 [982] **197**	140 [1239] **194**	171 [1513] **191**	201 [1779] **186**	224 [1982] **183**	251 [2221] **176**	284 [2513] **170**	307 [2717] **153**		204
30 [8]	21 [186] **264**	53 [469] **262**	108 [956] **258**	134 [1186] **256**	167 [1478] **254**	196 [1735] **251**	222 [1965] **248**	251 [2221] **240**	278 [2460] **232**	305 [2699] **226**	327 [2894] **210**	265
38 [10]	16 [142] **336**	46 [407] **334**	105 [929] **330**	131 [1159] **326**	164 [1451] **323**	191 [1690] **318**	217 [1920] **312**	247 [2186] **306**	271 [2398] **300**	299 [2646] **292**	327 [2894] **281**	336
45 [12]	12 [106] **397**	43 [381] **396**	101 [894] **390**	132 [1168] **387**	161 [1425] **382**	187 [1655] **379**	218 [1929] **371**	239 [2115] **363**	269 [2381] **355**	290 [2566] **344**	319 [2823] **339**	398
53 [14]	6 [53] **468**	35 [310] **464**	97 [858] **456**	125 [1106] **452**	157 [1389] **448**	179 [1584] **444**	207 [1832] **442**	237 [2097] **436**	259 [2292] **430**	289 [2558] **422**	315 [2788] **415**	469
Max. Cont. 61 [16]		34 [301] **539**	90 [796] **534**	118 [1044] **531**	149 [1319] **524**	174 [1540] **521**	200 [1770] **518**	233 [2062] **506**	254 [2248] **498**	285 [2522] **495**	314 [2779] **479**	540
68 [18]		29 [257] **601**	84 [743] **596**	114 [1009] **594**	140 [1239] **589**	172 [1522] **583**	202 [1788] **572**	221 [1956] **566**	253 [2239] **557**	282 [2496] **547**	299 [2646] **544**	602
Max. Inter. 76 [20]		17 [150] **672**	73 [646] **668**	103 [912] **664**	132 [1168] **658**	161 [1425] **655**	186 [1646] **648**	214 [1894] **638**	240 [2124] **627**	266 [2354] **621**	293 [2593] **607**	673

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

Theoretical Torque - Nm [lb-in]

31 [274]	62 [549]	124 [1097]	155 [1372]	186 [1646]	217 [1920]	248 [2195]	279 [2469]	310 [2743]	341 [3018]	372 [3292]

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

WR

PERFORMANCE

130

129 cc [7.9 in³/rev.]

Flow - lpm [gpm]	Pressure - bars [psi]	17 [250]	35 [500]	69 [1000]	86 [1250]	104 [1500]	121 [1750]	138 [2000]	155 [2250]	172 [2500] Max. Cont.	190 [2750]	207 [3000] Max. Inter.	Theoretical rpm
	Torque - Nm [lb-in], **Speed rpm**										**Intermittent Ratings -** 10% of Operation		
2 [0.5]		34 [301] **15**	60 [531] **6**										15
4 [1]		32 [283] **30**	64 [566] **29**	124 [1097] **18**	140 [1239] **10**	185 [1637] **6**							30
8 [2]		31 [274] **59**	65 [575] **58**	126 [1115] **51**	144 [1274] **46**	198 [1752] **38**	223 [1974] **24**	248 [2195] **10**					59
15 [4]		31 [274] **115**	66 [584] **112**	130 [1151] **106**	164 [1451] **102**	195 [1726] **97**	221 [1956] **92**	255 [2257] **86**	285 [2522] **80**	312 [2761] **74**	345 [3053] **66**		118
23 [6]		30 [266] **177**	65 [575] **175**	130 [1151] **167**	162 [1434] **163**	196 [1735] **157**	230 [2036] **152**	265 [2345] **142**	289 [2558] **138**	316 [2797] **132**	352 [3115] **121**	375 [3319] **114**	177
30 [8]		28 [248] **232**	64 [566] **227**	128 [1133] **218**	157 [1389] **213**	192 [1699] **208**	223 [1974] **200**	259 [2292] **189**	284 [2513] **184**	313 [2770] **176**	343 [3036] **168**	374 [3310] **162**	235
38 [10]		20 [177] **294**	60 [531] **289**	125 [1106] **280**	157 [1389] **275**	188 [1664] **268**	222 [1965] **260**	254 [2248] **251**	282 [2496] **243**	313 [2770] **234**	349 [3089] **221**	370 [3275] **214**	294
45 [12]		15 [133] **353**	55 [487] **351**	120 [1062] **343**	152 [1345] **338**	186 [1646] **331**	216 [1912] **321**	244 [2159] **311**	281 [2487] **299**	307 [2717] **289**	341 [3018] **277**	369 [3266] **264**	353
53 [14]		13 [115] **411**	47 [416] **408**	117 [1035] **398**	150 [1328] **392**	181 [1602] **386**	212 [1876] **378**	247 [2186] **366**	273 [2416] **357**	310 [2744] **347**	335 [2965] **335**	363 [3213] **325**	411
61 [16] Max. Cont.		7 [62] **472**	42 [372] **470**	106 [938] **465**	140 [1239] **462**	170 [1505] **456**	207 [1832] **447**	239 [2115] **435**	265 [2345] **426**	296 [2620] **409**	328 [2903] **396**	361 [3195] **388**	472
68 [18]			36 [319] **529**	102 [903] **522**	132 [1168] **517**	166 [1469] **507**	198 [1752] **500**	224 [1982] **489**	262 [2319] **482**	292 [2584] **468**	323 [2859] **445**	351 [3106] **430**	529
76 [20] Max. Inter.			32 [283] **588**	94 [832] **585**	123 [1089] **580**	158 [1398] **570**	190 [1682] **562**	219 [1938] **550**	254 [2248] **535**	282 [2496] **520**	308 [2726] **510**	347 [3071] **490**	588

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

Theoretical Torque - Nm [lb-in]

35 [310]	71 [628]	142 [1257]	177 [1566]	212 [1876]	248 [2195]	283 [2504]	318 [2814]	354 [3133]	389 [3442]	425 [3761]

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

160

160 cc [9.8 in³/rev.]

Flow - lpm [gpm]	Pressure - bars [psi]	17 [250]	35 [500]	69 [1000]	86 [1250]	104 [1500]	121 [1750]	138 [2000]	155 [2250]	172 [2500] Max. Cont.	190 [2750]	207 [3000] Max. Inter.	Theoretical rpm
	Torque - Nm [lb-in], **Speed rpm**										**Intermittent Ratings -** 10% of Operation		
2 [0.5]		30 [266] **12**	66 [584] **11**	109 [965] **5**									13
4 [1]		32 [283] **24**	70 [620] **23**	136 [1204] **21**	164 [1451] **20**	182 [1611] **14**	250 [2213] **6**						25
8 [2]		38 [336] **48**	76 [673] **47**	157 [1389] **42**	181 [1602] **38**	202 [1788] **34**	265 [2345] **28**	290 [2567] **22**					50
15 [4]		39 [345] **92**	78 [690] **89**	166 [1469] **84**	205 [1814] **82**	242 [2142] **77**	275 [2434] **73**	317 [2805] **70**	358 [3169] **67**	400 [3540] **62**			94
23 [6]		40 [354] **140**	79 [699] **137**	160 [1416] **132**	203 [1797] **128**	246 [2177] **123**	290 [2567] **118**	320 [2832] **114**	354 [3133] **110**	396 [3505] **106**	404 [3575] **100**	440 [3894] **94**	144
30 [8]		34 [301] **184**	73 [646] **178**	164 [1451] **172**	200 [1770] **170**	245 [2168] **164**	288 [2549] **160**	316 [2797] **152**	350 [3098] **147**	388 [3434] **142**	428 [3788] **134**	448 [3965] **129**	188
38 [10]		32 [283] **235**	72 [637] **230**	156 [1381] **222**	196 [1735] **218**	240 [2124] **212**	282 [2496] **208**	312 [2761] **200**	347 [3071] **192**	389 [3443] **184**	422 [3735] **178**	454 [4018] **172**	238
45 [12]		24 [212] **278**	70 [620] **272**	151 [1336] **264**	192 [1699] **259**	236 [2089] **253**	278 [2460] **247**	310 [2744] **242**	344 [3044] **235**	382 [3381] **227**	419 [3708] **216**	450 [3983] **210**	281
53 [14]		20 [177] **327**	60 [531] **322**	144 [1274] **312**	186 [1646] **306**	232 [2053] **300**	266 [2354] **295**	306 [2708] **289**	338 [2991] **281**	374 [3310] **276**	420 [3717] **267**	448 [3965] **258**	331
61 [16] Max. Cont.		12 [106] **379**	52 [460] **374**	134 [1186] **360**	178 [1575] **355**	218 [1929] **350**	254 [2248] **342**	297 [2628] **338**	334 [2956] **333**	371 [3283] **323**	401 [3549] **316**	442 [3912] **308**	381
68 [18]			46 [407] **420**	130 [1151] **409**	171 [1513] **400**	215 [1903] **394**	248 [2195] **387**	291 [2575] **380**	326 [2885] **374**	361 [3195] **368**	393 [3478] **358**	428 [3788] **346**	425
76 [20] Max. Inter.			38 [336] **469**	120 [1062] **453**	162 [1434] **448**	199 [1760] **442**	240 [2124] **435**	278 [2460] **428**	324 [2867] **421**	357 [3159] **412**	390 [3452] **401**	425 [3761] **392**	475

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

Theoretical Torque - Nm [lb-in]

43 [383]	89 [789]	176 [1556]	219 [1939]	265 [2345]	308 [2728]	352 [3111]	395 [3495]	441 [3901]	484 [4284]	527 [4667]

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

WR
PERFORMANCE

200

198 cc [12.1 in³/rev.]

Flow - lpm [gpm]	Pressure - bars [psi] 17 [250]	35 [500]	69 [1000]	86 [1250]	104 [1500]	121 [1750]	138 [2000]	155 [2250]	Max. Cont. 172 [2500]	190 [2750]	Max. Inter. 207 [3000]	Theoretical rpm
	Torque - Nm [lb-in], **Speed rpm**									**Intermittent Ratings -** 10% of Operation		
2 [0.5]	38 [336] **10**	87 [770] **8**	172 [1522] **6**	201 [1779] **5**								10
4 [1]	47 [416] **20**	103 [912] **19**	164 [1451] **14**	201 [1779] **12**	244 [2159] **9**	295 [2611] **6**	328 [2903] **3**					20
8 [2]	46 [407] **39**	96 [850] **38**	192 [1699] **36**	241 [2133] **35**	286 [2531] **34**	330 [2920] **28**	372 [3292] **25**	417 [3690] **22**	428 [3788] **17**			40
15 [4]	44 [389] **75**	95 [841] **73**	194 [1717] **70**	241 [2133] **68**	286 [2531] **65**	333 [2947] **63**	376 [3319] **59**	419 [3708] **57**	461 [4080] **52**	498 [4407] **50**	544 [4814] **40**	76
23 [6]	40 [354] **113**	92 [814] **111**	192 [1699] **109**	240 [2124] **106**	288 [2549] **103**	333 [2947] **99**	375 [3319] **96**	421 [3726] **94**	461 [4080] **89**	505 [4469] **84**	544 [4814] **78**	116
30 [8]	33 [292] **150**	87 [770] **147**	187 [1655] **142**	236 [2088] **140**	284 [2513] **135**	330 [2920] **131**	374 [3327] **126**	421 [3726] **124**	462 [4088] **117**	504 [4460] **112**	542 [4796] **106**	152
38 [10]	23 [204] **192**	80 [708] **190**	180 [1593] **185**	230 [2035] **182**	278 [2460] **177**	325 [2876] **172**	371 [3283] **167**	415 [3673] **160**	459 [4062] **154**	498 [4407] **146**	540 [4779] **140**	192
45 [12]	21 [186] **227**	73 [646] **226**	173 [1531] **221**	223 [1973] **219**	271 [2398] **212**	318 [2814] **207**	364 [3221] **201**	409 [3619] **194**	453 [4009] **186**	491 [4345] **179**	533 [4717] **174**	227
53 [14]	10 [88] **268**	64 [566] **266**	165 [1460] **260**	214 [1894] **256**	262 [2319] **251**	309 [2735] **245**	356 [3150] **240**	400 [3540] **233**	444 [3929] **227**	483 [4274] **217**	525 [4646] **210**	268
Max. Cont. 61 [16]		55 [487] **308**	155 [1372] **300**	204 [1805] **298**	253 [2239] **291**	300 [2655] **286**	346 [3062] **279**	391 [3460] **271**	434 [3841] **264**	472 [4177] **255**	514 [4549] **248**	308
68 [18]		46 [407] **343**	143 [1265] **332**	191 [1690] **330**	240 [2124] **322**	287 [2540] **316**	332 [2938] **310**	377 [3336] **302**	420 [3717] **296**	457 [4044] **286**	484 [4283] **276**	343
Max. Inter. 76 [20]		30 [265] **384**	130 [1150] **374**	179 [1584] **367**	227 [2009] **363**	275 [2434] **355**	321 [2841] **349**	365 [3230] **343**	409 [3619] **333**	430 [3805] **324**	468 [4142] **314**	384

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

Theoretical Torque - Nm [lb-in]

54 [481]	109 [963]	218 [1929]	272 [2407]	326 [2888]	381 [3369]	435 [3850]	489 [4332]	544 [4813]	598 [5294]	653 [5776]

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

240

236 cc [14.4 in³/rev.]

Flow - lpm [gpm]	Pressure - bars [psi] 17 [250]	35 [500]	69 [1000]	86 [1250]	104 [1500]	121 [1750]	138 [2000]	155 [2250]	Max. Cont. 172 [2500]	190 [2750]	Max. Inter. 207 [3000]	Theoretical rpm
	Torque - Nm [lb-in], **Speed rpm**									**Intermittent Ratings -** 10% of Operation		
2 [0.5]	47 [416] **7**	98 [867] **6**	197 [1743] **3**	247 [2186] **3**								8
4 [1]	50 [443] **14**	105 [929] **13**	210 [1859] **11**	260 [2301] **9**	310 [2717] **7**	354 [3133] **4**	404 [3575] **4**					16
8 [2]	53 [469] **29**	111 [982] **28**	224 [1982] **26**	277 [2451] **24**	329 [2894] **21**	377 [3336] **19**	424 [3752] **16**	469 [4151] **11**	511 [4522] **8**	582 [5151] **8**		32
15 [4]	52 [460] **60**	114 [1000] **59**	236 [2062] **56**	290 [2575] **53**	346 [3062] **50**	399 [3531] **47**	449 [3974] **44**	496 [4390] **40**	541 [4788] **36**	598 [5292] **33**	638 [5646] **28**	63
23 [6]	47 [416] **93**	109 [956] **91**	227 [2009] **88**	285 [2522] **85**	342 [3027] **81**	397 [3513] **77**	449 [3974] **71**	500 [4425] **66**	548 [4850] **60**	595 [5266] **55**	642 [5682] **52**	95
30 [8]	42 [372] **125**	104 [903] **123**	221 [1956] **119**	280 [2469] **116**	336 [2974] **111**	391 [3460] **106**	445 [3938] **100**	497 [4398] **93**	547 [4841] **87**	592 [5248] **79**	640 [5664] **73**	126
38 [10]	35 [310] **158**	95 [832] **155**	213 [1885] **150**	272 [2398] **147**	328 [2903] **142**	384 [3398] **137**	437 [3867] **131**	489 [4328] **123**	541 [4788] **115**	587 [5195] **106**	635 [5620] **99**	158
45 [12]	23 [204] **189**	85 [752] **186**	203 [1797] **182**	262 [2319] **178**	319 [2823] **174**	375 [3319] **168**	428 [3788] **160**	480 [4248] **153**	531 [4699] **145**	575 [5089] **134**	623 [5514] **125**	189
53 [14]		75 [655] **218**	192 [1699] **214**	250 [2213] **210**	308 [2726] **205**	365 [3310] **201**	418 [3699] **191**	470 [4160] **183**	520 [4602] **174**	564 [4991] **164**	611 [5407] **154**	220
Max. Cont. 61 [16]		68 [593] **249**	180 [1593] **245**	238 [2106] **242**	295 [2611] **236**	350 [3106] **230**	405 [3584] **222**	458 [4053] **215**	510 [4496] **205**	551 [4876] **195**	600 [5310] **184**	252
68 [18]		56 [487] **279**	165 [1460] **273**	221 [1956] **270**	281 [2469] **267**	335 [2965] **260**	388 [3434] **251**	440 [3894] **241**	490 [4337] **231**	545 [4797] **221**	590 [5222] **208**	283
Max. Inter. 76 [20]		40 [354] **315**	154 [1345] **307**	210 [1841] **303**	264 [2336] **295**	320 [2832] **290**	376 [3310] **282**	428 [3770] **272**	480 [4221] **261**	530 [4691] **250**	580 [5133] **238**	315

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

Theoretical Torque - Nm [lb-in]

66 [584]	132 [1168]	265 [2345]	331 [2929]	397 [3513]	463 [4097]	529 [4681]	595 [5265]	661 [5850]	728 [6442]	794 [7027]

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

WR

PERFORMANCE

290

291 cc [17.8 in^3/rev.]

Pressure - bars [psi] (Max. Cont. / Max. Inter.)

17 [250]	35 [500]	52 [750]	69 [1000]	86 [1250]	104 [1500]	121 [1750]	138 [2000]	155 [2250]	172 [2500]	190 [2750]

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

Flow - lpm [gpm]	Torque - Nm [lb-in], Speed rpm										Theoretical rpm
2 [0.5]	60 [531] **7**	115 [1018] **6**	185 [1637] **5**	260 [2301] **4**	292 [2584] **3**						7
4 [1]	62 [549] **13**	122 [1080] **12**	187 [1655] **10**	265 [2345] **8**	304 [2690] **6**	365 [2330] **4**					14
8 [2]	60 [531] **26**	128 [1133] **24**	190 [1682] **22**	272 [2407] **20**	325 [2876] **18**	372 [3292] **15**	456 [4036] **12**	512 [4531] **8**	570 [5045] **4**		27
15 [4]	58 [513] **50**	133 [1177] **49**	195 [1726] **46**	270 [2390] **44**	328 [2903] **40**	376 [3328] **36**	458 [4053] **32**	522 [4620] **24**	574 [5080] **16**	630 [5576] **9**	664 [5876] **3**	52
23 [6]	56 [496] **76**	124 [1097] **74**	200 [1770] **71**	268 [2372] **68**	331 [2929] **64**	396 [3505] **61**	462 [4089] **57**	525 [4646] **55**	566 [5009] **52**	625 [5531] **48**	660 [5841] **40**	79
30 [8]	50 [442] **100**	120 [1062] **96**	197 [1743] **90**	264 [2336] **85**	326 [2885] **80**	394 [3487] **76**	465 [4115] **72**	526 [4655] **70**	568 [5027] **68**	620 [5487] **65**	655 [5797] **62**	103
38 [10]	45 [398] **129**	114 [1009] **126**	190 [1682] **122**	258 [2283] **118**	320 [2832] **116**	392 [3469] **112**	460 [4071] **106**	521 [4611] **100**	559 [4947] **92**	615 [5443] **82**	645 [5708] **74**	130
45 [12]	38 [336] **153**	104 [920] **150**	180 [1593] **146**	252 [2230] **142**	314 [2779] **138**	390 [3452] **133**	458 [4053] **127**	511 [4522] **120**	550 [4868] **106**	610 [5399] **100**	636 [5629] **95**	155
53 [14]	25 [221] **182**	93 [823] **174**	170 [1505] **166**	236 [2089] **158**	306 [2708] **150**	382 [3381] **142**	452 [4000] **134**	500 [4425] **128**	542 [4797] **122**	606 [5363] **118**	625 [5531] **114**	182
Max. Cont. 61 [16]	12 [106] **210**	82 [726] **202**	155 [1372] **193**	225 [1991] **184**	294 [2602] **175**	375 [3319] **166**	445 [3938] **160**	488 [4319] **152**	535 [4735] **145**	595 [5266] **140**	615 [5443] **136**	210
68 [18]		66 [581] **230**	140 [1239] **226**	218 [1929] **218**	280 [2478] **210**	365 [3230] **202**	435 [3850] **192**	479 [4239] **182**	526 [4655] **174**	588 [5204] **164**	604 [5345] **158**	234
Max. Inter. 76 [20]		55 [487] **256**	128 [1133] **246**	198 [1752] **237**	270 [2390] **226**	350 [3098] **216**	426 [3770] **206**	468 [4142] **198**	514 [4549] **190**	574 [5080] **185**	588 [5204] **180**	261

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

Theoretical Torque - Nm [lb-in]

80 [707]	160 [1415]	240 [2122]	320 [2829]	400 [3537]	480 [4244]	560 [4952]	639 [5659]	719 [6366]	799 [7074]	879 [7781]

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

320

322 cc [19.6 in^3/rev.]

Pressure - bars [psi] (Max. Cont. / Max. Inter.)

17 [250]	35 [500]	52 [750]	69 [1000]	86 [1250]	104 [1500]	121 [1750]	138 [2000]	155 [2250]	172 [2500]

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

Flow - lpm [gpm]	Torque - Nm [lb-in], Speed rpm										Theoretical rpm
2 [0.5]	60 [531] **6**	134 [1186] **5**	189 [1673] **5**	238 [2106] **4**							6
4 [1]	70 [619] **12**	140 [1239] **11**	239 [2115] **10**	276 [2442] **9**	324 [2867] **6**	393 [3478] **4**	403 [3566] **2**				12
8 [2]	73 [646] **24**	154 [1363] **22**	233 [2062] **20**	291 [2575] **19**	333 [2947] **17**	425 [3761] **16**	487 [4310] **13**	545 [4823] **11**	621 [5496] **6**	659 [5832] **2**	25
15 [4]	79 [699] **46**	152 [1345] **45**	235 [2080] **44**	311 [2752] **43**	385 [3407] **41**	452 [4000] **38**	518 [4584] **35**	555 [4912] **32**	641 [5673] **28**	690 [6106] **24**	47
23 [6]	68 [602] **70**	150 [1328] **69**	227 [2009] **68**	295 [2611] **66**	378 [3345] **63**	443 [3920] **58**	512 [4531] **53**	578 [5115] **49**	621 [5496] **47**	686 [6071] **43**	71
30 [8]	56 [496] **93**	145 [1283] **92**	218 [1929] **89**	286 [2531] **86**	356 [3150] **82**	436 [3858] **77**	506 [4478] **73**	560 [4956] **67**	614 [5434] **63**	665 [5885] **59**	93
38 [10]	54 [478] **118**	140 [1239] **117**	202 [1788] **115**	273 [2416] **113**	348 [3080] **110**	427 [3779] **104**	501 [4434] **98**	557 [4929] **91**	604 [5345] **85**	664 [5876] **77**	118
45 [12]	38 [336] **140**	134 [1186] **138**	192 [1681] **136**	260 [2301] **134**	336 [2973] **130**	409 [3619] **124**	476 [4212] **117**	542 [4796] **110**	601 [5319] **103**	642 [5681] **97**	140
53 [14]	22 [195] **165**	122 [1080] **163**	173 [1531] **161**	255 [2257] **158**	323 [2858] **154**	391 [3460] **147**	451 [3991] **141**	521 [4611] **134**	582 [5150] **126**	630 [5575] **118**	165
Max. Cont. 61 [16]	11 [97] **188**	105 [930] **186**	157 [1389] **184**	229 [2027] **182**	298 [2637] **177**	376 [3327] **170**	440 [3894] **162**	503 [4451] **155**	557 [4929] **147**	618 [5469] **138**	189
68 [18]		88 [779] **210**	144 [1274] **208**	220 [1947] **204**	285 [2522] **197**	356 [3150] **190**	424 [3752] **181**	487 [4310] **173**	549 [4858] **165**	602 [5327] **156**	211
Max. Inter. 76 [20]		70 [620] **235**	126 [1062] **233**	190 [1681] **230**	262 [2319] **226**	335 [2965] **218**	410 [3628] **209**	463 [4097] **202**	528 [4673] **193**	586 [5186] **185**	236

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

Theoretical Torque - Nm [lb-in]

87 [770]	177 [1566]	267 [2362]	354 [3132]	441 [3903]	533 [4717]	620 [5487]	708 [6265]	795 [7035]	887 [7850]

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

WR
PERFORMANCE

400

400 cc [24.4 in^3/rev.]

Pressure - bars [psi]

17 [250]	35 [500]	52 [750]	69 [1000]	86 [1250]	104 [1500] Max. Cont.	121 [1750]	138 [2000] Max. Inter.

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

Intermittent Ratings - 10% of Operation

Flow - lpm [gpm]									Theoretical rpm
	2 [0.5]	82 [723] **5**	165 [1459] **4**	250 [2213] **3**	329 [2912] **2**	418 [3699] **2**				5
	4 [1]	86 [761] **10**	175 [1549] **9**	262 [2317] **8**	345 [3053] **7**	427 [3779] **6**	497 [4398] **4**	577 [5106] **3**	660 [5841] **2**	10
	8 [2]	89 [791] **20**	191 [1690] **19**	284 [2513] **18**	364 [3219] **17**	448 [3962] **15**	502 [4443] **13**	606 [5363] **11**	682 [6036] **8**	20
	15 [4]	87 [771] **38**	189 [1673] **37**	277 [2451] **36**	378 [3346] **34**	467 [4135] **33**	529 [4679] **32**	629 [5569] **28**	698 [6177] **25**	38
	23 [6]	79 [703] **58**	185 [1637] **56**	271 [2398] **55**	373 [3305] **53**	464 [4110] **50**	551 [4873] **49**	631 [5584] **46**	696 [6159] **44**	58
	30 [8]	70 [620] **75**	176 [1558] **73**	260 [2301] **71**	364 [3217] **69**	455 [4025] **66**	550 [4868] **63**	623 [5515] **60**	676 [5982] **58**	75
	38 [10]	59 [523] **95**	159 [1407] **93**	239 [2115] **92**	351 [3106] **87**	442 [3913] **84**	541 [4787] **81**	611 [5410] **78**	663 [5864] **75**	95
	45 [12]	52 [460] **113**	145 [1283] **111**	233 [2062] **108**	335 [2968] **105**	430 [3806] **103**	529 [4684] **96**	595 [5269] **91**	645 [5705] **88**	113
	53 [14]	46 [404] **133**	138 [1221] **131**	215 [1903] **127**	318 [2813] **126**	409 [3622] **121**	513 [4543] **114**	578 [5115] **109**	624 [5522] **104**	133
Max. Cont.	61 [16]		113 [1000] **152**	191 [1690] **147**	298 [2641] **145**	390 [3448] **139**	496 [4393] **130**	560 [4959] **127**	606 [5364] **121**	153
	68 [18]		96 [850] **170**	178 [1575] **164**	263 [2328] **163**	365 [3230] **156**	478 [4228] **146**	517 [4572] **142**	580 [5133] **137**	170
Max. Inter.	76 [20]		74 [655] **190**	150 [1327] **185**	240 [2122] **180**	342 [3027] **174**	436 [3855] **165**	493 [4365] **160**	560 [4956] **156**	190

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

Theoretical Torque - Nm [lb-in]

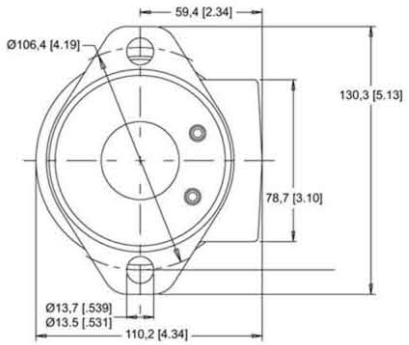
112 [992]	224 [1984]	336 [2976]	448 [3968]	560 [4960]	673 [5952]	785 [6944]	897 [7935]

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

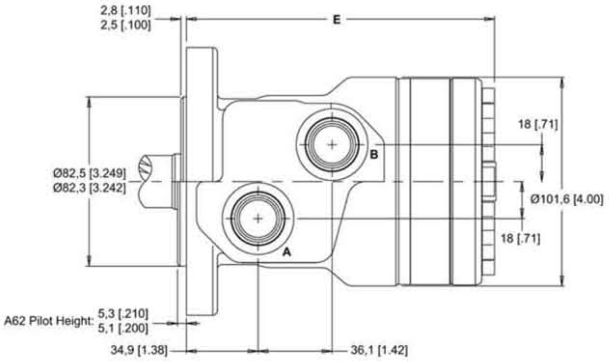
WR

255 & 256 SERIES HOUSINGS (SAE A MOUNTS)

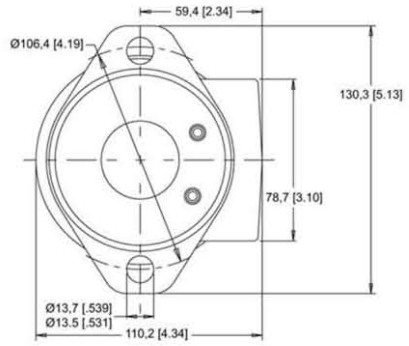
A12 2-Hole 1/2" BSP.F Offset Ports



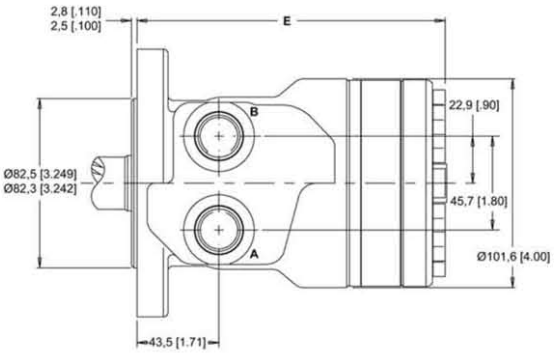
A62 2-Hole 1/2" BSP.F Offset Ports



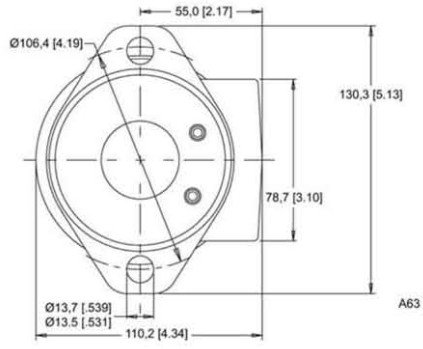
A10 2-Hole 1/2" NPT Aligned Ports



A11 2-Hole 7/8" O-Ring Aligned Ports

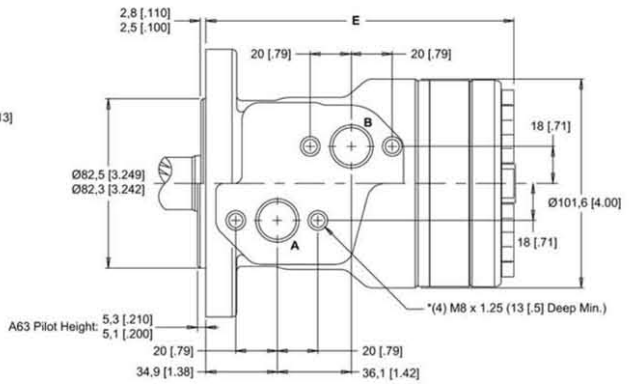


A13 2-Hole 1/2" BSP.F Offset Manifold Ports



A1D 2-Hole 7/8" O-Ring Offset Manifold Ports

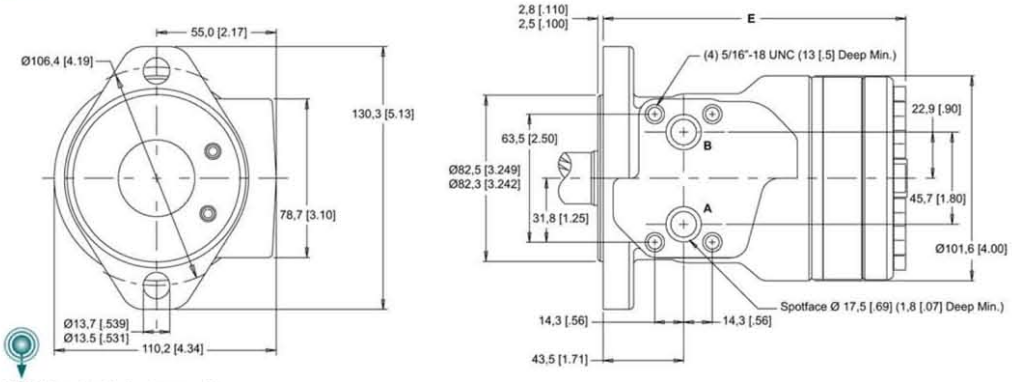
A63 2-Hole 1/2" BSP.F Offset Manifold Ports



NOTE: Dimension E is found on page 14. * For the A1D the four mounting holes are 5/16" -18 UNC at same depth.

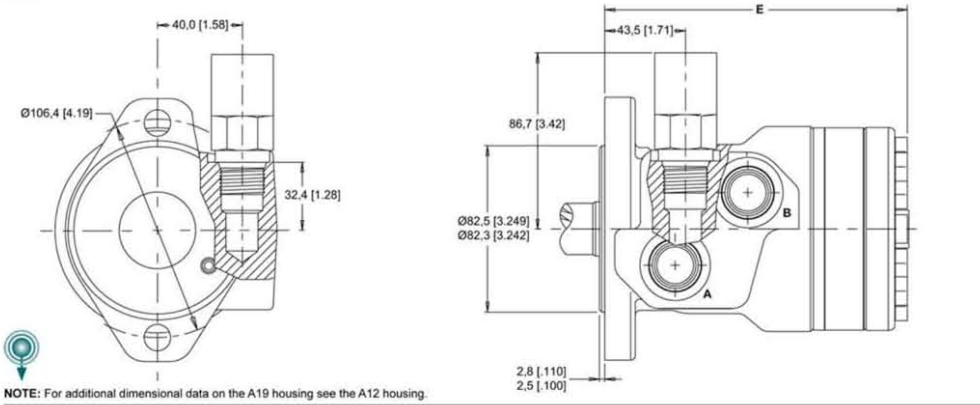
255 & 256 SERIES HOUSINGS (SAE A & MAGNETO MOUNTS)

A17 2-Hole 1/2" Drilled Manifold Ports



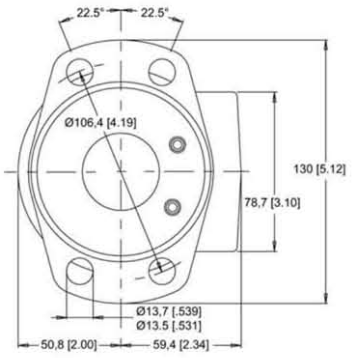
NOTE: Dimension E is found on page 14.

A19 2-Hole 7/8" O-Ring Offset Ports

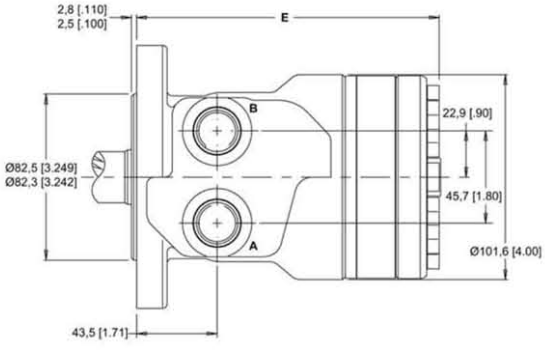


NOTE: For additional dimensional data on the A19 housing see the A12 housing.

A30 4-Hole 1/2" NPT Magneto



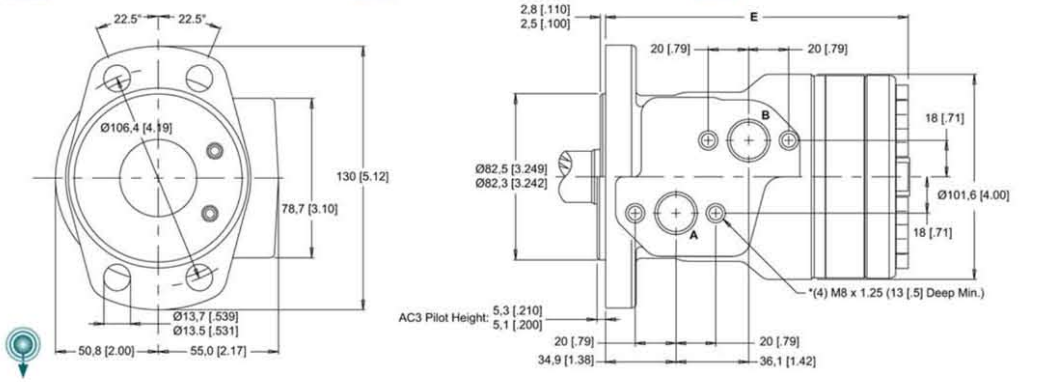
A31 4-Hole 7/8" O-Ring Magneto



WR

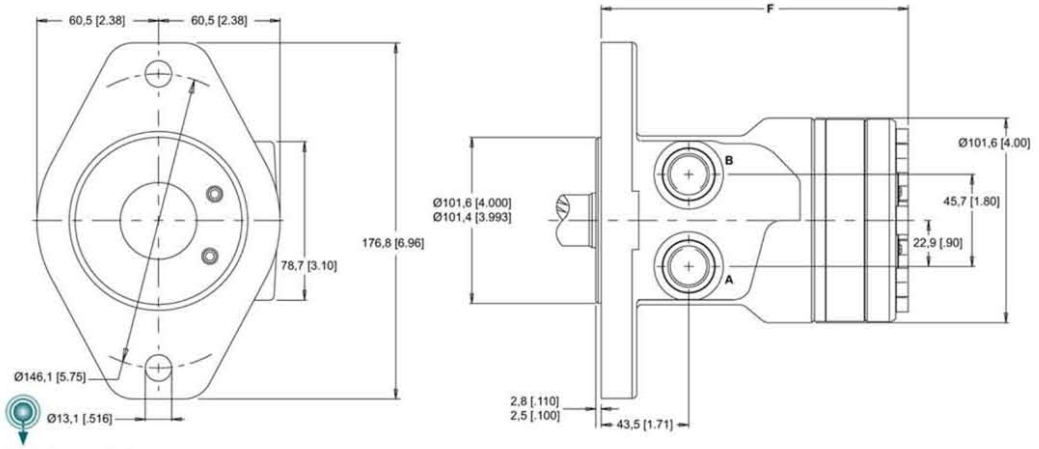
255 & 256 SERIES HOUSINGS (MAGNETO, SAE B, & 4-HOLE SQUARE MOUNTS)

AC3 4-Hole 1/2" BSP.F Offset Manifold Ports **A33** 4-Hole 1/2" BSP.F Offset Manifold Ports **A3D** 4-Hole 7/8" O-Ring Offset Manifold Ports



NOTE: Dimension E is found on page 14. * For the A3D the four mounting holes are 5/16" -18 UNC at same depth.

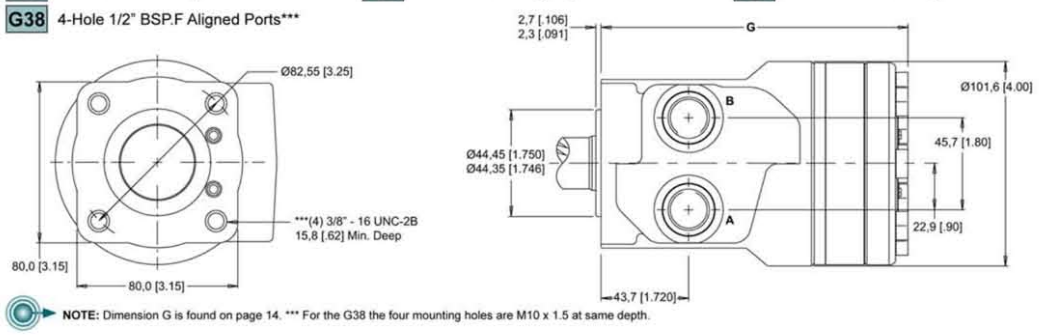
B11 2-Hole 7/8" O-Ring Aligned Ports **B18** 2-Hole 1/2" BSP.F Aligned Ports



NOTE: Dimension F is found on page 14.

F30 4-Hole 1/2" NPT Aligned Ports **F31** 4-Hole 7/8" O-Ring Aligned Ports **F38** 4-Hole 1/2" BSP.F Aligned Ports

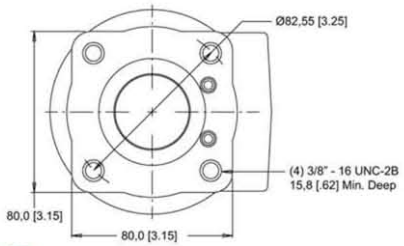
G38 4-Hole 1/2" BSP.F Aligned Ports***



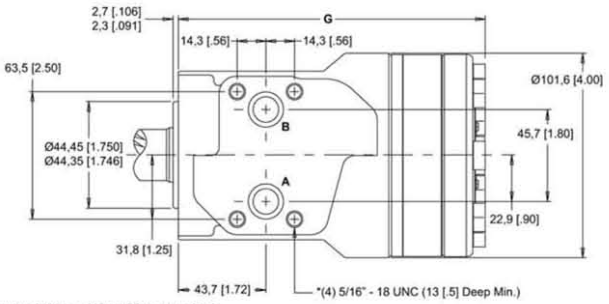
NOTE: Dimension G is found on page 14. *** For the G38 the four mounting holes are M10 x 1.5 at same depth.

255 & 256 SERIES HOUSINGS (4-HOLE SQUARE MOUNTS)

F37 4-Hole Manifold Ports

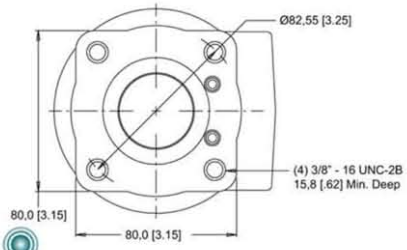


G37 4-Hole Manifold Ports

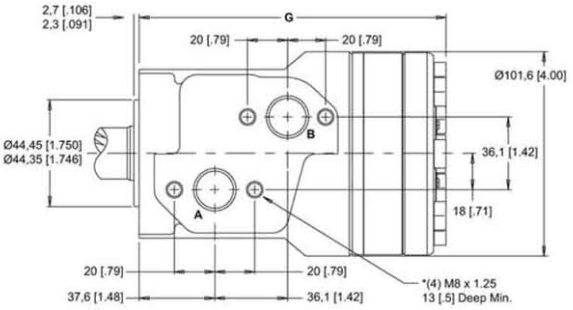


NOTE: Dimension G is found on page 14. * For the G37 the four mounting holes are M8 x 1.25 at same depth.

F33 4-Hole 1/2" BSP.F Offset Manifold Ports

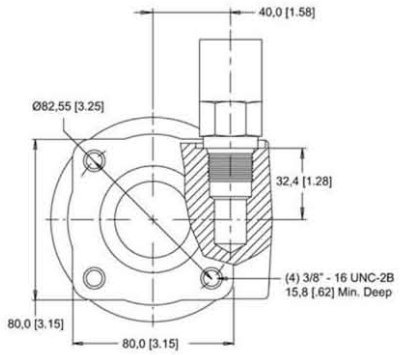


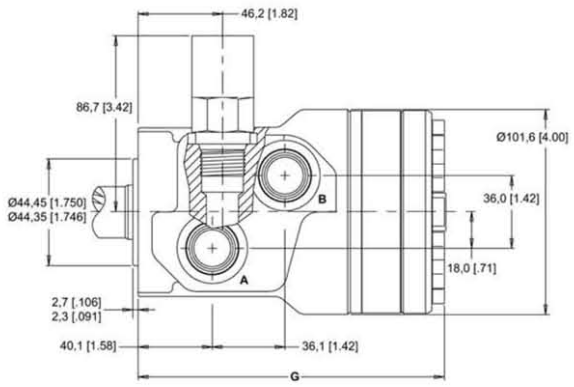
F3D 4-Hole 7/8" O-Ring Offset Manifold Ports



NOTE: * For the F3D the four mounting holes are 5/16" -18 UNC at same depth.

F39 2-Hole 7/8" O-Ring Offset Ports



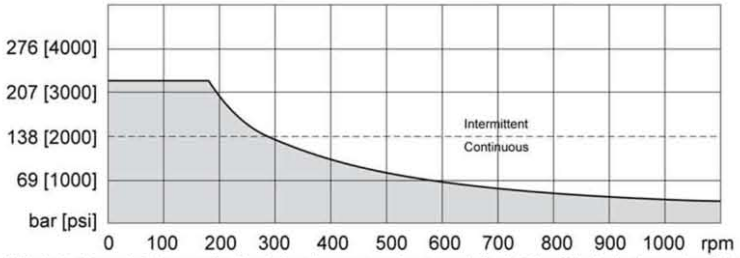


WR

255 & 256 SERIES TECHNICAL INFORMATION

PERMISSIBLE SHAFT SEAL PRESSURE

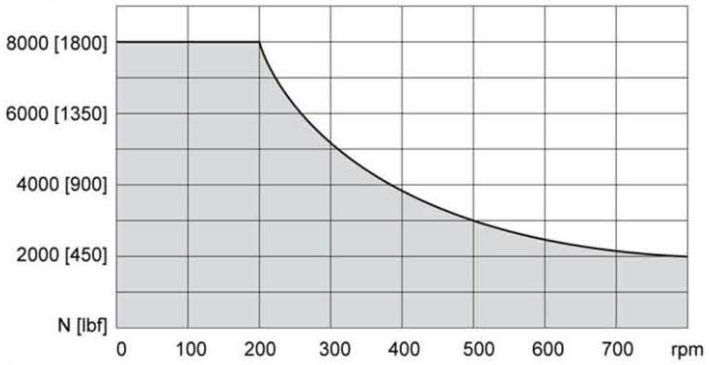
The curve below represents allowable seal pressure at various speeds. Operation in the gray area results in maintaining the rated life of the shaft seal. Actual shaft seal pressure depends on motor configuration (see below).



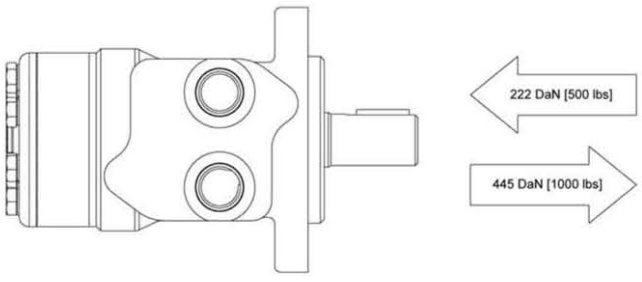
With check valves and drain connection, the shaft seal pressure equals pressure in the drain line. With check valves and no drain connection, shaft seal pressure is identical to output pressure. No check valves and no drain connection, the shaft seal pressure is identical to the average value of input and output pressure.

ALLOWABLE SHAFT LOAD / BEARING CURVE

The bearing curve below represents the side load capacity of the motor at the centerline of the key for various motor speeds. Operating conditions within the shaded area will maintain acceptable oil film lubrication with recommended fluids. Operating conditions outside the shaded area are susceptible to motor failure due to oil starvation and/or excessive heat generation. Fluids with low lubricity or low viscosity may require the maximum load and speed ratings to be derated to provide acceptable motor life and performance.



THRUST LOAD



LENGTH / WEIGHT CHART
SAE A Mount - Dimension **E**

Code	mm [in]	kg [lb]
040	142 [5.60]	6,6 [14.5]
060	146 [5.74]	6,7 [14.7]
070	147 [5.80]	6,7 [14.7]
090	151 [5.96]	6,8 [15.0]
100	154 [6.06]	6,9 [15.2]
115	156 [6.15]	7,1 [15.6]
130	160 [6.28]	7,3 [16.0]
160	166 [6.53]	7,5 [16.5]
200	173 [6.83]	8,0 [17.6]
240	182 [7.15]	8,5 [18.7]
290	192 [7.56]	8,8 [19.4]
320	198 [7.78]	9,0 [19.8]
400	213 [8.39]	9,8 [21.6]

LENGTH / WEIGHT CHART
SAE B Mount - Dimension **F**

Code	mm [in]	kg [lb]
040	142 [5.60]	7,8 [17.2]
060	146 [5.74]	7,9 [17.4]
070	147 [5.80]	7,9 [17.4]
090	151 [5.96]	8,0 [17.6]
100	154 [6.06]	8,1 [17.8]
115	156 [6.15]	8,3 [18.3]
130	160 [6.28]	8,5 [18.7]
160	166 [6.53]	8,7 [19.1]
200	173 [6.83]	9,2 [20.2]
240	182 [7.15]	9,7 [21.3]
290	192 [7.56]	10,0 [22.0]
320	198 [7.78]	10,2 [22.4]
400	213 [8.39]	11,0 [24.2]

LENGTH / WEIGHT CHART
4-Hole Mount - Dimension **G**

Code	mm [in]	kg [lb]
040	142 [5.60]	5,3 [11.8]
060	146 [5.74]	5,4 [11.9]
070	147 [5.80]	5,4 [11.9]
090	151 [5.96]	5,5 [12.1]
100	154 [6.06]	5,6 [12.3]
115	156 [6.15]	5,8 [12.8]
130	160 [6.28]	6,0 [13.2]
160	166 [6.53]	6,2 [13.7]
200	173 [6.83]	6,7 [14.8]
240	182 [7.15]	7,2 [15.9]
290	192 [7.56]	7,5 [16.5]
320	198 [7.78]	7,7 [17.0]
400	213 [8.39]	8,5 [18.7]

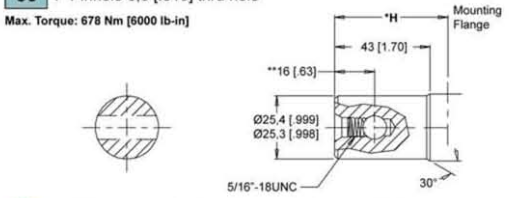
NOTE:
WR motor weights vary ± 0,5 kg [1 lb] depending upon motor configuration.

WR

255 & 256 SERIES SHAFTS

05 1" Pinhole 9,5 [.375] thru hole
53 1" Pinhole 10,3 [.406] thru hole
66 1" Pinhole 8,0 [.315] thru hole

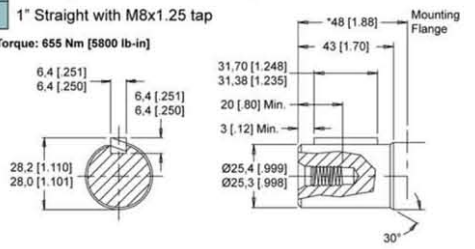
Max. Torque: 678 Nm [6000 lb-in]



NOTE: Dimension H is 48 [1.88] for the 05 & 53 shaft & 51 [2.00] for the 66 shaft.
**For the 66 shaft substract 4,7 [.19] from dimension.

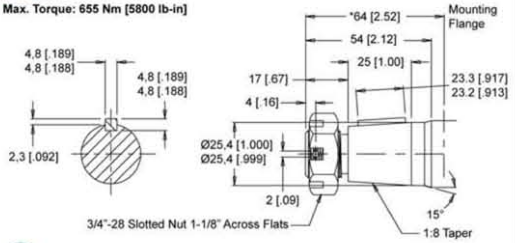
10 1" Straight with 5/16" - 18 UNC tap
11 1" Straight with M8x1.25 tap

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



13 1" Tapered

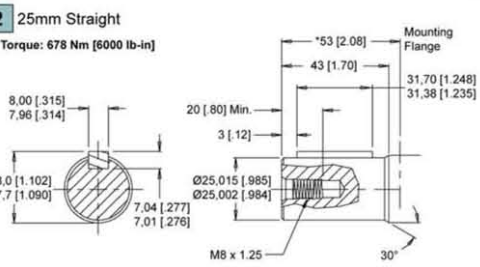
Max. Torque: 655 Nm [5800 lb-in]



NOTE: A slotted nut is standard on this shaft.

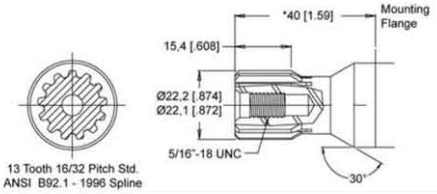
12 25mm Straight

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



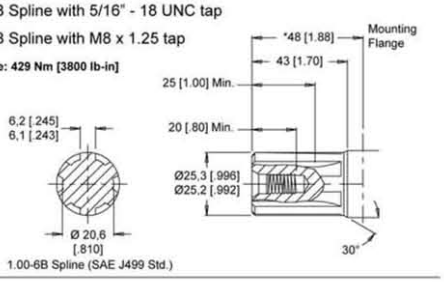
01 13 Tooth Spline

Max. Torque: 170 Nm [1500 lb-in]



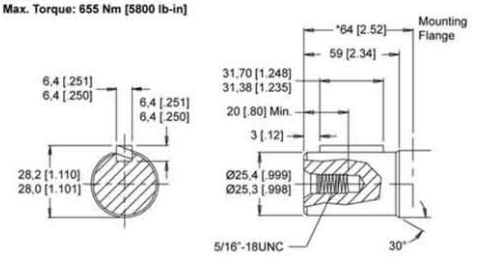
02 6B Spline with 5/16" - 18 UNC tap
04 6B Spline with M8 x 1.25 tap

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



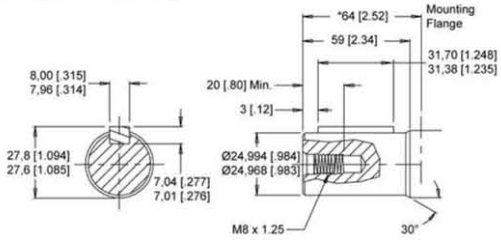
15 1" Straight Extended

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



16 25mm Straight Extended

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



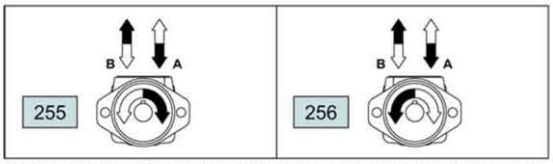
WR

255 & 256 SERIES MODEL CODE BUILDER

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

STEP 1 - Select a series

255	Clockwise Rotation
256	Counterclockwise Rotation



NOTE: To obtain the desired direction of shaft rotation, use the graphic above to determine the rotation code for the motor.

STEP 2 - Select a displacement option

040	40 cc	[2.5 in^3/rev]	160	160 cc	[9.8 in^3/rev]
060	59 cc	[3.6 in^3/rev]	200	198 cc	[12.1 in^3/rev]
070	71 cc	[4.3 in^3/rev]	240	236 cc	[14.4 in^3/rev]
090	88 cc	[5.4 in^3/rev]	290	291 cc	[17.8 in^3/rev]
100	100 cc	[6.1 in^3/rev]	320	322 cc	[19.6 in^3/rev]
115	113 cc	[6.9 in^3/rev]	400	400 cc	[24.4 in^3/rev]
130	129 cc	[7.9 in^3/rev]			

STEP 3 - Select a housing option

A10	2-Hole 1/2" NPT Aligned Ports (S)
A11	2-Hole 7/8" O-ring Aligned Ports (S)
A12	2-Hole 1/2" BSP.F Offset Ports (S)
A13	2-Hole 1/2" BSP.F Offset Manifold (S)
A17	2-Hole 1/2" Drilled Manifold Ports (S)
A1D	2-Hole 7/8" O-Ring Offset Manifold (S)
A19	2-Hole 7/8" O-Ring With Valve Cavity (S)
A62	2-Hole 1/2" BSP.F Offset w/5,1mm Pilot
A63	2-Hole 1/2" BSP.F Offset Manifold w/5,1mm Pilot
AC3	4-Hole 1/2" BSP.F Magneto Offset Manifold w/5,1mm Pilot
A30	4-Hole 1/2" NPT Magneto
A31	4-Hole 7/8" O-Ring Magneto
A33	4-Hole 1/2" BSP.F Magneto Offset Manifold Ports
A3D	4-Hole 7/8" O-Ring Magneto Offset Manifold Ports
B11	2-Hole SAE B Flange 7/8" O-ring Aligned
B18	2-Hole SAE B Flange 1/2" BSP.F Aligned
F30	4-Hole 1/2" NPT Aligned Ports (S)
F31	4-Hole 7/8" O-Ring Aligned Ports (S)
F33	4-Hole 1/2" BSP.F Offset Manifold Ports (S)
F37	4-Hole Manifold Ports (S)
F38	4-Hole 1/2" BSP.F Aligned Ports (S)

STEP 3 (Continued) - Select a housing option

F39	4-Hole 7/8" O-Ring With Valve Cavity (S)
F3D	4-Hole 7/8" O-Ring Offset Manifold Ports (S)
G37	4-Hole Manifold Ports (S)
G38	4-Hole 1/2" BSP.F Aligned Ports (S)

STEP 4 - Select a shaft option

01	7/8" 13 Tooth Spline	12	25mm Straight
02	1" 6-B Spline 5/16" Tap	13	1" Tapered
04	1" 6-B Spline M8 Tap	15	1" Straight Ext. (S)
05	1" Pinhole (9,5 [.375])	16	25mm Straight Ext. (S)
10	1" Straight 5/16" Tap	53	1" Pinhole (10,3 [.406])
11	1" Straight M8 Tap	66	1" Pinhole (8,0 [.315])

STEP 5 - Select a paint option

A	Black
B	Black (unpainted flange face)

STEP 6 - Select a valve cavity option and installed valve

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

NOTE: Valve cavity is only available on the A19 & F39 housings. The B option will not have a valve cartridge listed above installed.

STEP 7 - Select an add on option

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

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

STEP 8 - Select a miscellaneous option

AA	None
EG	Viton Shaft Seal