Description:

The popular 2000 Series provides torque up to 850 Nm. [7,500 lb-in]. This proven design is reliable and durable. Danfoss has added options that make the motor more flexible to use in a wide variety of applications. The expanded displacement range using patented "Drive in Drive" technology is the latest innovation in the 2000 series of motors.



2000 Series

Geroler element	13 Displacements
Flow l/min [GPM]	75 [20] Continuous**
	115 [30] Intermittent*
Speed RPM	1215 Cont.**
	1215 Inter.*
Pressure bar [PSI]	205 [3000] Cont.**
	310 [4500] Inter.*
Torque Nm [lb-in]	845 [7470] Cont.**
	930 [8225] Inter.*

** Continuous— (Cont.) Continuous rating, motor may be run continuously at these ratings.

* Intermittent— (Inter.) Intermittent operation, 10% of every minute.

Features:

- Three zone design for longer life and true bi-directionality
- Bearings that meet the highest standards of the industry
- Options to optimize performance in every application
- Integrated cross-over relief valve option

Benefits:

- Easy to design in a system
- Proven reliability and performance in tough applications
- Compact design that maximizes power density

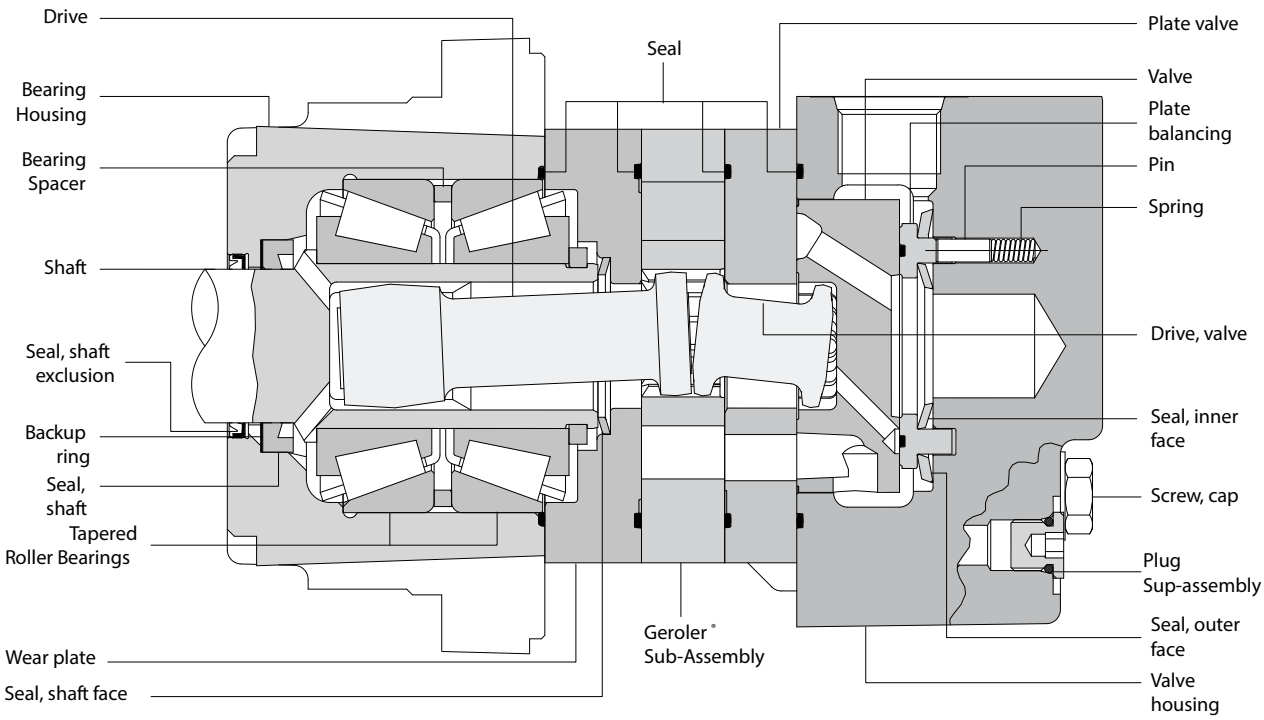
Applications:

- Skid steer attachments
- Swing motor
- Brush cutters & mowers
- Harvesting equipment
- Directional Boring any place pressure relief protection is optimal for system or motor performance and life
- Turf equipment

C-1

2000 Series

Specifications



C-1

Specification data — 2000 series motors

Displ. cm³/r [in³/r]		34 [2.1]	41 [2.5]	66 [4.0]	80 [4.9]	90 [5.5]	100 [6.2]	130 [8.0]	160 [9.6]	195 [11.9]	245 [14.9]	305 [18.7]	395 [24.0]	490 [29.8]
Max. Speed (RPM) @ Flow	Continuous	1215	1104	1075	908	836	742	576	477	385	308	246	191	153
	Intermittent	1215	1216	1214	908	1042	924	720	713	577	462	365	335	230
Flow l/min [GPM]	Continuous	42 [11]	45 [12]	72 [19]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]
	Intermittent	42 [11]	53 [14]	87 [23]	75 [20]	95 [25]	95 [25]	95 [25]	115 [30]	115 [30]	115 [30]	115 [30]	115 [30]	115 [30]
Torque* Nm [lb - in]	Continuous	98 [864]	112 [988]	186 [1643]	235 [2065]	265 [2326]	295 [2630]	385 [3420]	455 [4040]	540 [4780]	660 [5850]	765 [6750]	775 [6840]	845 [7470]
	Intermittent	142 [1261]	169 [1497]	276 [2446]	345 [3035]	390 [3458]	445 [3950]	560 [4970]	570 [5040]	665 [5890]	820 [7250]	885 [7820]	925 [8170]	930 [8225]
Pressure Δ bar [Δ PSI]	Continuous	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	155 [2250]	120 [1750]
	Intermittent	310 [4500]	310 [4500]	310 [4500]	310 [4500]	310 [4500]	310 [4500]	310 [4500]	260 [3750]	260 [3750]	260 [3750]	240 [3500]	190 [2750]	140 [2000]
	Peak	310 [4500]	310 [4500]	310 [4500]	310 [4500]	310 [4500]	310 [4500]	310 [4500]	310 [4500]	310 [4500]	310 [4500]	310 [4500]	225 [3250]	170 [2500]
Weight kg [lb]	Standard or Wheel mount	8.8 [19.4]	8.8 [19.4]	8.8 [19.4]	9.3 [20.5]	9.3 [20.5]	9.5 [21.0]	9.8 [21.5]	10.0 [22.0]	10.4 [23.0]	11.3 [25.0]	11.3 [25.0]	11.8 [26.0]	12.2 [27.0]
	Bearingless	6.8 [15.0]	6.8 [15.0]	6.8 [15.0]	7.3 [16.0]	7.3 [16.0]	7.5 [16.5]	7.7 [17.0]	7.9 [17.5]	8.4 [18.5]	9.3 [20.5]	9.3 [20.5]	9.8 [21.5]	10.2 [22.5]

Maximum case pressure: See case pressure seal limitation graph. *See shaft torque ratings for limitations.

Note: To assure best motor life, run motor in low speed high torque mode at approximately 30% of continuous pressure and 50% of continuous flow for 30 minutes in each direction before application of full load. Ensure that motor is filled with fluid prior to operation.

Maximum inlet pressure:
310 bar [4500 PSI]

Do not exceed Δ pressure rating (see chart above).

Maximum return pressure:
310 bar [4500 PSI] with case drain line installed.

Do not exceed Δ pressure rating (see chart above).

Δ bar [Δ PSI]
The true pressure difference between inlet port and outlet port

Continuous rating:
Motor may be run continuously at these ratings

Intermittent operation:
10% of every minute

Peak operation:
1% of every minute

Recommended fluids:
Premium quality, anti-wear type hydraulic oil with a viscosity of not less than 13 cSt [70 SUS] at operating temperature.

Recommended system operating temp:
-34°C to 82°C [-30°F to 180°F]

Recommended filtration:
per ISO Cleanliness Code, 4406: 20/18/13

Thermal shock warning:
Do not operate the motor with fluid that is 70F or more above the motor temperature.

Minimum delta pressure warning:
Motors must not run with equal inlet and outlet pressure 50 PSID minimum delta pressure between motor ports is required at all times (expect when switching direction of rotation)

2000 Series

Performance data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 25 cSt [120 SUS]. Actual data may vary slightly from unit to unit in production.

Continuous

Peak

Intermittent

No operation

C-1

Δ Pressure bar [PSI]
34 cm ³/r [2.1 in ³/r]

Flow LPM [GPM]

	[500] 34	[1000] 69	[1500] 103	[2000] 138	[2500] 172	[3000] 207	[3500] 241	[4000] 276	[4500] 310
[2]	[114]	[262]	[405]	[549]					
	13	30	46	62					
8	210	189	178	162					
[4]	[110]	[256]	[404]	[552]	[704]	[828]	[962]		
	12	29	46	62	80	94	109		
15	432	416	393	363	347	313	284		
[6]	[115]	[249]	[400]	[550]	[708]	[864]	[996]	[1099]	[1250]
	13	28	45	62	80	98	113	124	141
23	651	636	613	580	546	518	467	425	404
[8]	[126]	[232]	[393]	[548]	[702]	[856]	[1003]	[1135]	[1244]
	14	26	44	62	79	97	113	128	141
30	856	856	830	795	759	712	657	578	549
[10]	[114]	[239]	[386]	[541]	[697]	[850]	[995]	[1136]	[1261]
	13	27	44	61	79	96	112	128	142
38	1105	1077	1049	1015	975	923	859	775	707
[11]	[99]	[231]	[380]	[533]	[679]	[834]	[987]	[1133]	[1245]
	11	26	43	60	77	94	112	128	141
42	1215	1191	1160	1117	1073	1023	945	854	819

[231] Torque [lb-in]
26 Nm
1191 Speed RPM

Δ Pressure bar [PSI]
66 cm ³/r [4.0 in ³/r]

Flow LPM [GPM]

	[500] 34	[1000] 69	[1500] 103	[2000] 138	[2500] 172	[3000] 207	[3500] 241	[4000] 276	[4500] 310
[2]	[226]	[503]	[746]	[987]					
	26	57	84	112					
8	103	102	93	88					
[4]	[226]	[508]	[791]	[1072]	[1342]	[1609]	[1810]	[2012]	[2220]
	26	57	89	121	152	182	204	227	251
15	214	208	194	188	181	172	158	136	134
[6]	[216]	[503]	[792]	[1075]	[1353]	[1629]	[1890]	[2123]	[2332]
	24	57	89	121	153	184	214	240	264
23	329	318	305	290	284	270	257	235	228
[8]	[208]	[495]	[781]	[1070]	[1352]	[1633]	[1910]	[2186]	[2405]
	23	56	88	121	153	184	216	247	272
30	444	430	415	401	387	372	355	339	320
[10]	[195]	[486]	[777]	[1070]	[1359]	[1643]	[1920]	[2191]	[2446]
	22	55	88	121	154	186	217	248	276
38	560	544	529	513	497	480	461	440	419
[12]	[182]	[472]	[757]	[1052]	[1345]	[1627]	[1912]	[2189]	[2444]
	21	53	86	119	152	184	216	247	276
45	672	658	643	623	606	586	565	547	528
[14]	[187]	[459]	[750]	[1045]	[1339]	[1633]	[1926]	[2198]	[2443]
	21	52	85	118	151	184	218	248	276
53	788	776	758	738	720	701	680	654	640
[16]	[182]	[436]	[724]	[1019]	[1313]	[1604]	[1915]	[2181]	[2443]
	21	49	82	115	148	181	216	246	276
61	901	887	870	849	829	808	785	753	734
[19]	[167]	[407]	[702]	[996]	[1283]	[1588]	[1866]	[2157]	[2441]
	19	46	79	113	145	179	211	244	276
72	1075	1061	1040	1017	996	967	950	919	876
[21]	[162]	[391]	[679]	[967]	[1255]	[1556]	[1840]	[2268]	[2432]
	18	44	77	109	142	176	208	256	275
79	1188	1175	1152	1129	1105	1075	1052	987	988
[23]					[1226]	[1523]	[1814]	[1985]	[2387]
					139	172	205	224	270
87					1214	1185	1155	1125	1107

Δ Pressure bar [PSI]
41 cm ³/r [2.5 in ³/r]

Flow LPM [GPM]

	[500] 34	[1000] 69	[1500] 103	[2000] 138	[2500] 172	[3000] 207	[3500] 241	[4000] 276	[4500] 310
[2]	[138]	[306]	[468]	[659]					
	16	35	53	74					
8	171	160	156	135					
[4]	[129]	[296]	[466]	[552]	[807]	[966]	[1110]	[1316]	[1421]
	15	33	53	62	91	109	125	149	161
15	364	352	336	363	295	272	248	235	217
[6]	[135]	[300]	[473]	[550]	[818]	[985]	[1147]	[1292]	[1495]
	15	34	53	62	92	111	130	146	169
23	550	535	516	491	465	437	406	352	326
[8]	[130]	[285]	[461]	[548]	[816]	[988]	[1150]	[1320]	[1477]
	15	32	52	62	92	112	130	149	167
30	734	722	699	670	641	616	568	519	470
[10]	[137]	[276]	[455]	[541]	[802]	[979]	[1153]	[1329]	[1497]
	15	31	51	61	91	111	130	150	169
38	921	909	884	855	825	784	743	687	635
[12]	[119]	[268]	[441]	[618]	[794]	[969]	[1141]	[1321]	[1494]
	13	30	50	70	90	109	129	149	169
45	1104	1093	1068	1036	1003	972	902	833	785
[14]				[597]	[787]	[953]	[1124]	[1309]	[1479]
				67	89	108	127	148	167
53				1216	1184	1144	1073	997	921

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 25 cSt [120 SUS]. Actual data may vary slightly from unit to unit in production.

Continuous

Peak

Intermittent

No operation

Δ Pressure bar [PSI]
80 cm ³/r [4.9 in ³/r]

Flow LPM [GPM]

	[500] 34	[1000] 69	[1500] 103	[2000] 138	[2500] 172	[3000] 207	[3500] 241	[4000] 276	[4500] 310
[0.25]	[210] 25	[420] 45							
0.95	3	1							
[0.5]	[250] 30	[500] 56	[740] 85						
1.9	17	8	3						
[1]	[330] 35	[670] 75	[990] 110	[1300] 145	[1550] 175	[1800] 205	[1950] 220	[2110] 240	
4	44	40	37	34	28	22	14	2	
[2]	[330] 35	[670] 75	[995] 110	[1310] 150	[1580] 180	[1840] 210	[2100] 235	[2365] 265	[2630] 295
8	90	85	81	78	72	65	57	49	42
[4]	[325] 35	[670] 75	[1005] 115	[1330] 150	[1620] 185	[1920] 215	[2200] 250	[2480] 280	[2765] 310
15	182	176	170	166	159	152	140	128	117
[6]	[320] 35	[665] 75	[1010] 115	[1340] 150	[1655] 185	[1975] 225	[2270] 255	[2570] 290	[2880] 325
23	273	267	259	254	246	238	223	207	192
[8]	[310] 35	[660] 75	[1015] 115	[1345] 150	[1685] 190	[2020] 230	[2330] 265	[2640] 300	[2960] 335
0	365	375	349	341	333	325	306	286	266
[10]	[300] 35	[650] 75	[1010] 115	[1350] 155	[1700] 190	[2050] 230	[2370] 270	[2690] 305	[3010] 340
38	456	448	439	429	420	411	388	364	341
[12]	[285] 30	[640] 70	[1005] 115	[1350] 155	[1705] 195	[2065] 235	[2390] 270	[2715] 305	[3035] 345
45	547	537	530	516	507	497	470	442	415
[14]	[270] 30	[625] 70	[990] 110	[1340] 150	[1705] 195	[2065] 235	[2395] 270	[2720] 305	[3030] 340
53	638	629	622	603	593	584	553	521	490
[16]	[255] 30	[610] 70	[975] 110	[1330] 150	[1690] 190	[2055] 230	[2385] 270	[2700] 305	[2995] 340
61	729	720	714	689	679	670	635	599	564
[18]	[230] 25	[590] 65	[955] 110	[1310] 150	[1680] 190	[2025] 230	[2355] 265	[2660] 300	[2935] 330
68	818	810	795	775	765	756	717	677	638
[20]	[210] 25	[570] 65	[930] 105	[1290] 145	[1645] 185	[1985] 225	[2305] 260	[2600] 295	[2845] 320
76	908	901	880	861	851	842	799	755	712

[570] 65 1901 } Torque [lb-in] Nm Speed RPM

Δ Pressure bar [PSI]
90 cm ³/r [5.5 in ³/r]

Flow LPM [GPM]

	[250] 17	[500] 34	[1000] 69	[1500] 103	[2000] 138	[2500] 172	[3000] 207	[3500] 241	[4000] 276	[4500] 310
[0.25]	[124] 14	[233] 26	[471] 53							
0.95	5	2	1							
[0.5]	[133] 15	[273] 31	[555] 63	[832] 94						
.9	15	13	6	2						
[1]	[151] 17	[358] 40	[744] 84	[1091] 123	[1424] 161	[1697] 192	[1952] 221	[2189] 247	[2368] 268	
4	39	39	35	32	28	21	13	12	2	
[2]	[151] 17	[358] 40	[744] 84	[1099] 124	[1439] 163	[1737] 196	[2015] 228	[2293] 259	[2570] 290	[2855] 323
8	82	80	76	72	68	61	50	38	29	20
[4]	[151] 17	[350] 40	[732] 83	[1113] 126	[1473] 166	[1800] 203	[2132] 241	[2454] 277	[2775] 314	[3100] 350
15	167	163	158	152	148	139	126	115	102	90
[6]	[142] 16	[348] 39	[736] 83	[1114] 126	[1492] 169	[1851] 209	[2208] 249	[2552] 288	[2898] 327	[3249] 367
23	250	245	240	233	227	218	203	191	176	161
[8]	[133] 15	[338] 38	[729] 82	[1128] 127	[1509] 170	[1890] 214	[2269] 256	[2635] 298	[3000] 339	[3367] 380
30	335	328	329	314	306	295	281	266	249	231
[10]	[124] 14	[331] 37	[724] 82	[1130] 128	[1521] 172	[1912] 216	[2309] 261	[2670] 302	[3036] 343	[3398] 384
38	418	410	404	395	385	373	361	342	322	302
[12]	[106] 12	[315] 36	[714] 81	[1127] 127	[1525] 172	[1924] 217	[2326] 263	[2704] 306	[3082] 348	[3458] 391
45	502	493	485	477	464	451	441	417	394	372
[14]	[98] 11	[298] 34	[706] 80	[1115] 126	[1525] 172	[1924] 217	[2326] 263	[2707] 306	[3080] 348	[3450] 390
53	585	575	567	559	543	529	521	493	467	431
[16]	[80] 9	[285] 32	[688] 78	[1107] 125	[1510] 171	[1907] 215	[2311] 261	[2697] 305	[3070] 347	[3432] 388
61	670	658	650	641	622	607	610	568	541	513
[18]	[62] 7	[262] 30	[673] 76	[1087] 123	[1490] 168	[1892] 214	[2281] 258	[2662] 301	[3030] 342	[3381] 382
68	753	740	732	719	701	685	680	643	613	583
[20]	[53] 6	[242] 27	[644] 73	[1045] 118	[1447] 163	[1850] 209	[2246] 254	[2617] 296	[2988] 338	[3301] 373
76	836	822	814	796	780	765	748	719	686	653
[22]	[35] 4	[231] 26	[639] 72	[1047] 118	[1437] 162	[1836] 207	[2218] 251	[2599] 294	[2981] 337	
83	920	916	907	895	876	854	749	803	774	
[24]	[18] 2	[204] 23	[612] 69	[1011] 114	[1366] 154	[1792] 202	[2182] 247	[2573] 291	[2963] 335	
91	1003	1000	991	978	960	940	918	882	850	
[25]		[195] 22	[594] 67	[994] 112	[1384] 156	[1765] 199	[2173] 246	[2564] 290		
95		1042	1033	1020	1003	984	954	921		

C-1

2000 Series

Performance data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 25 cSt [120 SUS]. Actual data may vary slightly from unit to unit in production.

Continuous

Peak

Intermittent

No operation

C-1

Δ Pressure bar [PSI]
100 cm ³/r [6.2 in ³/r]

Flow LPM [GPM]

	[250] 17	[500] 34	[1000] 69	[1500] 103	[2000] 138	[2500] 172	[3000] 207	[3500] 241	[4000] 276	[4500] 310
[0.25]	[140] 15	[260] 30								
0.95	4	2								
[0.5]	[150] 15	[300] 35	[620] 70	[940] 105						
1.9	13	9	5	2						
[1]	[170] 20	[390] 45	[830] 95	[1210] 135	[1570] 175	[1870] 210	[2130] 240			
4	35	34	31	28	23	15	6			
[2]	[170] 20	[390] 45	[830] 95	[1220] 140	[1590] 180	[1920] 215	[2220] 250	[2520] 285	[2810] 315	[3120] 355
8	73	71	68	63	59	51	38	24	14	4
[4]	[170] 20	[380] 45	[820] 90	[1240] 140	[1640] 185	[2010] 225	[2380] 270	[2750] 310	[3120] 355	[3490] 395
15	148	145	141	136	131	121	104	94	80	69
[6]	[160] 20	[380] 45	[820] 90	[1260] 140	[1670] 190	[2080] 235	[2480] 280	[2880] 325	[3280] 370	[3680] 415
23	222	219	215	209	202	192	172	163	149	134
[8]	[150] 15	[370] 40	[810] 90	[1260] 140	[1700] 190	[2130] 240	[2560] 290	[2990] 340	[3420] 385	[3840] 435
30	297	294	288	281	273	261	243	231	216	200
[10]	[140] 15	[368] 40	[810] 90	[1270] 145	[1720] 195	[2160] 245	[2610] 295	[3020] 340	[3440] 390	[3850] 435
38	371	367	362	354	344	330	316	300	283	266
[12]	[120] 15	[350] 40	[800] 90	[1270] 145	[1730] 195	[2180] 245	[2630] 295	[3070] 345	[3510] 395	[3950] 445
45	445	442	436	427	415	399	389	369	350	332
[14]	[110] 10	[330] 35	[800] 90	[1260] 140	[1740] 195	[2180] 245	[2630] 295	[3070] 345	[3500] 395	[3940] 445
53	519	516	509	500	486	469	463	437	417	378
[16]	[90] 10	[320] 35	[780] 90	[1260] 140	[1720] 195	[2160] 245	[2610] 295	[3060] 345	[3500] 395	[3940] 445
61	594	591	583	573	558	540	537	506	485	463
[18]	[70] 10	[300] 35	[770] 85	[1240] 140	[1700] 190	[2140] 240	[2580] 290	[3020] 340	[3460] 390	[3900] 440
68	668	665	657	646	630	611	609	574	552	529
[20]	[60] 5	[280] 30	[730] 80	[1180] 135	[1630] 185	[2090] 235	[2550] 290	[2980] 335	[3440] 390	[3830] 435
76	742	739	731	715	703	684	662	643	619	595
[22]	[40] 5	[260] 30	[720] 80	[1180] 135	[1620] 185	[2070] 235	[2500] 280	[2930] 330	[3360] 380	
83	816	813	805	794	777	758	749	712	687	
[24]	[20] 1	[230] 23	[690] 80	[1140] 130	[1540] 175	[2020] 230	[2460] 280	[2900] 330	[3340] 375	
91	890	887	879	868	852	834	814	782	754	
[25]		[220] 25	[670] 75	[1120] 125	[1560] 175	[1990] 225	[2450] 275	[2890] 325		
95		924	916	905	890	873	846	817		

[1560] 175 890 } Torque [lb-in] Nm Speed RPM

Δ Pressure bar [PSI]
130 cm ³/r [8.0 in ³/r]

Flow LPM [GPM]

	[250] 17	[500] 34	[1000] 69	[1500] 103	[2000] 138	[2500] 172	[3000] 207	[3500] 241	[4000] 276	[4500] 310
[0.25]	[170] 20									
0.95	3									
[0.5]	[190] 20	[410] 45	[870] 100							
1.9	12	8	2							
[1]	[230] 25	[510] 60	[1070] 120	[1580] 180	[2050] 230	[2520] 285	[2920] 309	[3310] 375		
4	28	27	23	19	16	13	9	3		
[2]	[230] 25	[510] 60	[1080] 120	[1600] 180	[2090] 235	[2580] 290	[2930] 330	[3320] 375	[3640] 410	[3990] 450
8	56	56	53	47	42	39	36	28	21	13
[4]	[220] 25	[500] 55	[1080] 120	[1620] 185	[2150] 245	[2660] 300	[3100] 350	[3540] 400	[3980] 450	[4420] 500
15	114	113	111	104	97	95	92	85	77	70
[6]	[220] 25	[490] 55	[1080] 120	[1640] 185	[2190] 245	[2740] 310	[3260] 370	[3770] 425	[4280] 485	[4800] 540
23	172	171	169	161	153	149	146	132	118	104
[8]	[200] 25	[480] 55	[1080] 120	[1650] 185	[2220] 250	[2780] 315	[3310] 375	[3840] 435	[4360] 495	[4890] 550
30	230	224	222	219	210	204	201	192	184	175
[10]	[180] 20	[470] 55	[1070] 120	[1650] 185	[2230] 250	[2800] 315	[3420] 385	[3940] 445	[4450] 505	[4970] 560
38	287	286	282	276	269	261	255	243	231	219
[12]	[160] 20	[460] 50	[1060] 120	[1640] 185	[2230] 250	[2800] 315	[3350] 380	[3910] 440	[4440] 500	[4960] 560
45	345	344	338	333	327	317	307	295	284	272
[14]	[150] 15	[440] 50	[1030] 115	[1620] 185	[2220] 250	[3000] 340	[3350] 380	[3910] 440	[4440] 500	
53	403	402	395	391	385	373	360	348	336	
[16]	[130] 15	[420] 45	[1010] 115	[1600] 180	[2200] 250	[2780] 315	[3330] 375	[3890] 440	[4440] 500	
61	461	460	452	447	443	430	411	397	384	
[18]	[110] 10	[400] 45	[990] 110	[1580] 180	[2160] 245	[2750] 310	[3300] 375	[3860] 435	[4410] 500	
68	518	517	509	504	500	484	471	456	440	
[20]	[90] 10	[380] 45	[960] 110	[1550] 175	[2130] 240	[2710] 305	[3280] 370	[3840] 435		
76	576	575	568	560	551	539	524	508		
[22]	[60] 5	[350] 40	[940] 105	[1520] 170	[2100] 235	[2680] 305	[3250] 365	[3820] 430		
83	634	633	624	619	604	597	579	560		
[24]	[40] 5	[325] 35	[920] 105	[1490] 170	[2070] 235	[2650] 300	[3220] 365	[3780] 425		
91	692	691	682	676	665	651	633	616		
[25]	[20] 1	[310] 35	[900] 100	[1480] 165	[2050] 230	[2630] 295	[3200] 360	[3700] 420		
95	720	719	712	705	692	679	682	656		

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 25 cSt [120 SUS]. Actual data may vary slightly from unit to unit in production.

Continuous

Peak

Intermittent

No operation

Δ Pressure bar [PSI]
160 cm³/r [9.6 in³/r]

Flow LPM [GPM]

	[250] 17	[500] 34	[1000] 69	[1500] 103	[2000] 138	[2500] 172	[3000] 207	[3500] 241	[3750] 259
[0.25] 0.95	[200] 25 3								
[0.5] 1.9	[240] 25 9	[490] 55 7	[990] 110 5	[1570] 175 3	[2140] 240 1				
[1] 4	[280] 30 23	[590] 65 21	[1170] 130 19	[1730] 195 17	[2290] 260 13	[2830] 320 8	[3330] 375 3	[3820] 430 2	[4070] 460 1
[2] 8	[300] 35 46	[610] 70 45	[1210] 135 42	[1790] 200 39	[2350] 265 35	[2920] 330 34	[3480] 395 33	[4050] 460 28	[4330] 490 22
[4] 15	[320] 35 93	[630] 70 92	[1260] 140 89	[1890] 215 85	[2530] 285 79	[3170] 360 77	[3820] 430 75	[4460] 505 59	[4780] 540 43
[6] 23	[320] 35 142	[650] 75 140	[1300] 145 137	[1960] 220 131	[2620] 295 124	[3280] 370 118	[3940] 445 113	[4600] 520 104	[4930] 560 96
[8] 30	[310] 35 190	[650] 75 187	[1330] 150 184	[2010] 225 178	[2670] 300 170	[3330] 375 166	[4000] 450 164	[4660] 525 153	[4990] 565 142
[10] 38	[290] 35 237	[640] 70 235	[1340] 150 231	[2030] 230 226	[2850] 320 217	[3410] 385 212	[4030] 455 209	[4700] 530 193	[5030] 570 187
[12] 45	[270] 30 286	[620] 70 283	[1320] 150 279	[2030] 230 274	[2700] 305 265	[3370] 380 254	[4040] 455 246	[4710] 530 235	[5040] 570 224
[14] 53	[240] 25 334	[590] 65 331	[1300] 145 326	[2020] 230 322	[2690] 305 312	[3360] 380 305	[4030] 455 297	[4700] 530 286	
[16] 61	[220] 25 382	[570] 65 378	[1270] 145 374	[1980] 225 369	[2660] 300 360	[3330] 375 349	[4010] 455 339	[4680] 530 326	
[18] 68	[190] 20 429	[540] 60 426	[1240] 140 422	[1960] 220 416	[2640] 300 407	[3320] 375 394	[3990] 450 387		
[20] 76	[170] 20 477	[510] 60 474	[1210] 135 469	[1920] 215 462	[2630] 300 451	[3310] 375 440	[3940] 445 430		
[22] 83	[150] 15 525	[480] 55 522	[1170] 130 517	[1880] 210 510	[2600] 295 501	[3290] 370 484	[3920] 445 473		
[24] 91	[120] 15 572	[450] 50 569	[1150] 130 564	[1860] 210 556	[2570] 290 546	[3260] 370 531	[3900] 440 522		
[25] 95	[90] 10 596	[440] 50 593	[1140] 130 587	[1840] 210 580	[2560] 290 566	[3230] 365 553	[3880] 440 544		
[30] 114		[330] 35 713	[1040] 120 706	[1750] 200 696	[2470] 280 682	[3140] 355 672	[3800] 430 658		

[330] Torque [lb-in]
35 Nm
713 Speed RPM

C-1

2000 Series

Performance data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 25 cSt [120 SUS]. Actual data may vary slightly from unit to unit in production.

Continuous

Peak

Intermittent

No operation

C-1

Δ Pressure bar [PSI]
195 cm ³/r [11.9in ³/r]

Flow LPM [GPM]

	[250] 17	[500] 34	[750] 52	[1000] 69	[1250] 86	[1500] 103	[1750] 121	[2000] 138	[2250] 155	[2500] 172	[2750] 190	[3000] 207	[3250] 224	[3500] 241	[3750] 259
[0.25] 0.95	[240] 25 4	[590] 65 2													
[0.5] 1.9	[290] 35 8	[640] 70 6	[990] 110 5	[1340] 150 2											
[1] 4	[380] 45 17	[730] 80 16	[1100] 125 15	[1430] 160 14	[1790] 200 13	[2120] 240 11	[2450] 275 9	[2720] 305 7	[2990] 340 5	[3260] 370 4	[3540] 400 3	[3810] 430 2	[4080] 460 2	[4350] 490 1	[4620] 520 1
[2] 8	[390] 45 37	[755] 85 35	[1135] 130 34	[1470] 165 33	[1860] 210 32	[2195] 250 31	[2535] 285 28	[2880] 325 26	[3120] 355 24	[3680] 415 21	[4090] 460 20	[4500] 510 19	[4800] 540 17	[5100] 575 14	[5400] 610 14
[4] 15	[405] 45 76	[795] 90 74	[1185] 135 73	[1540] 175 72	[1970] 225 71	[2310] 260 70	[2675] 300 66	[3040] 345 64	[3420] 385 62	[3790] 430 61	[4160] 470 59	[4520] 510 57	[4890] 550 55	[5260] 595 51	[5630] 635 45
[6] 23	[405] 45 115	[815] 90 113	[1220] 140 111	[1590] 180 110	[2035] 230 109	[2395] 270 108	[2780] 315 104	[3170] 360 102	[3560] 400 100	[3940] 445 99	[4320] 490 96	[4700] 530 94	[5070] 570 91	[5450] 615 87	[5830] 660 81
[8] 30	[400] 45 154	[820] 90 151	[1230] 140 149	[1625] 185 148	[2065] 235 147	[2450] 275 146	[2850] 320 143	[3260] 370 140	[3670] 415 137	[4040] 455 135	[4410] 500 132	[4780] 540 130	[5150] 580 127	[5520] 625 123	[5890] 665 117
[10] 38	[380] 45 193	[810] 95 190	[1230] 140 188	[1645] 185 187	[2095] 235 186	[2480] 280 184	[2895] 325 181	[3310] 375 177	[3730] 420 175	[4100] 465 173	[4470] 505 170	[4840] 545 168	[5210] 590 164	[5590] 630 160	
[12] 45	[355] 40 231	[790] 90 229	[1215] 135 227	[1650] 185 226	[2100] 235 224	[2485] 280 221	[2915] 330 219	[3340] 375 218	[3760] 425 215	[4120] 465 211	[4480] 505 208	[4850] 550 204			
[14] 53	[320] 35 269	[765] 85 267	[1190] 135 267	[1645] 185 264	[2090] 235 261	[2475] 280 260	[2915] 330 257	[3350] 380 254	[3770] 425 250	[4130] 465 248	[4480] 505 245	[4860] 550 241			
[16] 61	[290] 30 308	[730] 80 306	[1160] 130 305	[1625] 185 303	[2070] 235 299	[2455] 275 296	[2900] 330 294	[3340] 375 290	[3760] 425 286	[4130] 465 283	[4490] 505 279	[4860] 550 276			
[18] 68	[290] 30 346	[690] 80 345	[1120] 125 345	[1590] 180 342	[2035] 230 337	[2420] 270 334	[2870] 325 333	[3310] 375 327	[3730] 420 321	[4100] 465 315	[4480] 505 308				
[20] 76	[210] 25 385	[650] 75 384	[1080] 120 383	[1550] 175 380	[1995] 225 375	[2380] 270 372	[2830] 320 371	[3270] 370 367	[3690] 415 363	[4070] 460 359	[4450] 500 355				
[22] 83	[170] 20 424	[610] 70 423	[1040] 120 422	[1500] 170 418	[1955] 220 414	[2340] 265 410	[2785] 315 408	[3220] 365 404	[3640] 410 399	[4050] 460 395					
[24] 91	[135] 15 462	[570] 65 461	[1000] 115 460	[1440] 165 457	[1910] 215 453	[2300] 260 449	[2735] 304 441	[3170] 353 436	[3600] 402 432	[4020] 451 432					
[25] 95	[120] 15 484	[550] 60 482	[980] 110 479	[1410] 160 476	[1890] 215 473	[2280] 260 469	[2695] 286 459	[3120] 332 454	[3560] 384 449	[3990] 384 449					
[30] 114		[420] 45 577	[860] 95 575	[1290] 145 571	[1700] 190 567	[2120] 240 562	[2530] 285 556	[2940] 330 550	[3400] 385 542						

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 25 cSt [120 SUS]. Actual data may vary slightly from unit to unit in production.

Continuous

Peak

Intermittent

No operation

Δ Pressure bar [PSI]
245 cm ³/r [14.9 in ³/r]

Flow LPM [GPM]

	[250]	[500]	[750]	[1000]	[1250]	[1500]	[1750]	[2000]	[2250]	[2500]	[2750]	[3000]	[3250]	[3500]	[3750]
	17	34	52	69	86	103	121	138	155	172	190	207	224	241	259
[0.5]	410	850													
	45	95													
1.9	4	2													
[1]	450	930	1420	1850	2320	2780	3250	3650	4100	4540	4980	5430	5870	6310	
	50	105	160	210	260	315	365	410	465	515	560	615	665	715	
4	14	13	12	11	10	9	8	6	5	4	4	3	2	1	
[2]	460	960	1460	1900	2400	2860	3340	3780	4320	4770	5210	5660	6110	6570	6950
	50	110	165	215	270	325	375	425	490	540	590	640	690	740	785
8	29	28	27	26	25	23	22	20	19	18	17	15	14	12	10
[4]	470	1000	1540	1980	2510	3010	3480	3980	4450	4910	5380	5850	6320	6780	7250
	55	115	175	225	285	340	395	450	505	555	610	660	715	765	820
15	60	59	58	56	54	53	51	49	48	47	47	46	45	44	42
[6]	460	1020	1550	2040	2580	3110	3590	4120	4580	5050	5520	5980	6440	6910	
	50	115	175	230	290	350	405	465	515	570	625	675	730	780	
23	91	90	89	87	84	83	81	78	76	73	71	69	67	65	
[8]	460	1010	1560	2080	2630	3170	3670	4210	4680	5160	5630	6110	6590		
	50	115	175	235	295	360	415	475	530	585	635	690	745		
30	122	121	120	118	115	113	111	108	106	104	102	101	99		
[10]	440	1000	1550	2110	2650	3200	3730	4250	4730	5210	5720	6230			
	50	115	175	240	300	360	420	480	535	589	645	705			
38	153	152	150	148	146	144	142	139	137	135	133	130			
[12]	410	960	1530	2100	2640	3190	3760	4260	4740	5220	5730				
	45	110	175	235	300	360	425	480	535	590	645				
45	184	183	182	180	177	175	173	170	168	165	162				
[14]	380	910	1500	2080	2600	3160	3760	4230	4710	5190					
	40	105	170	235	295	355	425	480	530	585					
53	215	214	213	211	209	207	204	201	198	195					
[16]	340	860	1460	2040	2570	3120	3740	4180	4660	5140					
	40	95	165	230	290	355	425	470	525	580					
61	246	245	244	242	240	238	235	232	227	223					
[18]	290	810	1420	2000	2520	3060	3700	4130	4610	5090					
	30	90	160	225	285	345	420	465	520	575					
68	277	276	275	273	271	269	266	263	258	253					
[20]	250	800	1350	1910	2460	3010	3630	4110	4610						
	30	90	155	215	280	340	410	465	520						
76	308	306	304	302	300	298	295	291	288						
[22]	200	710	1300	1870	2390	2940	3560	4010	4510						
	25	80	145	210	270	330	400	455	510						
83	339	337	337	334	332	330	327	323	318						
[24]	150	670	1240	1790	2330	2880	3460	3960	4460						
	15	75	140	200	265	325	390	445	505						
91	370	369	367	364	362	360	357	353	344						
[25]	120	660	1210	1750	2300	2860	3410	3950	4470						
	15	75	135	200	260	325	385	445	505						
95	385	384	382	379	377	375	372	367	363						
[30]		520	1080	1620	2180	2720	3260	3790							
		60	120	185	245	305	370	430							
114		462	460	458	456	453	450	447							

[3790] Torque [lb-in]
430 } Nm
447 Speed RPM

C-1

2000 Series

Performance data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 25 cSt [120 SUS]. Actual data may vary slightly from unit to unit in production.

Continuous

Peak

Intermittent

No operation

C-1

Δ Pressure bar [PSI]
305 cm ³/r [18.7in ³/r]

Flow LPM [GPM]

	[250] 17	[500] 34	[750] 52	[1000] 69	[1250] 86	[1500] 103	[1750] 121	[2000] 138	[2250] 155	[2500] 172	[2750] 190	[3000] 207	[3250] 224	[3500] 241
[0.5] 1.9	[500] 55 4	[1050] 120 2												
[1] 4	[610] 70 12	[1180] 135 11	[1750] 200 11	[2330] 260 10	[2870] 325 10	[3440] 390 9	[3930] 445 8	[4410] 500 6	[4900] 555 3	[5380] 610 1				
[2] 8	[620] 70 24	[1210] 135 24	[1800] 205 23	[2400] 270 22	[2970] 335 22	[3510] 395 20	[4050] 460 19	[4600] 520 18	[5140] 580 17	[5680] 640 15	[6220] 705 13	[6750] 765 11	[7290] 825 8	[7820] 885 6
[4] 15	[680] 75 49	[1250] 140 49	[1880] 210 48	[2500] 280 47	[3120] 355 47	[3690] 415 45	[4260] 480 43	[4840] 545 42	[5410] 610 40	[5980] 675 38	[6550] 740 36	[7120] 805 34	[7690] 870 33	
[6] 23	[620] 70 74	[1270] 145 74	[1920] 215 72	[2560] 290 72	[3230] 365 71	[3810] 430 69	[4390] 495 66	[4970] 560 64	[5560] 630 61	[6130] 695 58	[6710] 760 55	[7290] 825 52		
[8] 30	[600] 70 98	[1270] 145 98	[1940] 220 97	[2600] 295 96	[3290] 370 95	[3880] 440 93	[4470] 505 90	[5070] 575 86	[5660] 640 83	[6250] 705 80	[6840] 775 77			
[10] 38	[570] 65 123	[1250] 140 122	[1940] 220 121	[2610] 295 120	[3310] 375 119	[3920] 440 117	[4530] 510 113	[5150] 580 110	[5760] 650 106	[6370] 720 102				
[12] 45	[530] 60 148	[1220] 140 147	[1920] 215 145	[2600] 295 144	[3300] 375 143	[3920] 440 142	[4530] 510 138	[5150] 580 133	[5760] 650 128	[6370] 720 124				
[14] 53	[480] 55 172	[1180] 135 172	[1870] 210 170	[2560] 290 168	[3260] 370 167	[3900] 440 165	[4510] 510 160	[5120] 580 156	[5730] 645 152					
[16] 61	[430] 50 196	[1120] 125 196	[1820] 205 194	[2500] 280 192	[3210] 365 191	[3870] 440 188	[4480] 505 183	[5080] 575 178	[5690] 645 174					
[18] 68	[370] 40 221	[1060] 120 221	[1760] 200 218	[2440] 275 217	[3140] 355 215	[3800] 440 212	[4420] 500 207	[5050] 570 202						
[20] 76	[320] 35 246	[980] 110 245	[1680] 190 243	[2360] 265 241	[3050] 345 239	[3710] 420 236	[4370] 495 231	[5020] 565 226						
[22] 83	[240] 25 271	[920] 105 270	[1620] 185 268	[2300] 260 266	[2990] 340 263	[3560] 400 260	[4190] 475 258	[4820] 545 255						
[24] 91	[180] 20 296	[870] 100 294	[1550] 175 293	[2240] 255 290	[2920] 330 288	[3420] 385 285	[4020] 455 283	[4630] 525 280						
[25] 95	[150] 15 308	[840] 95 307	[1520] 170 305	[2200] 250 303	[2890] 325 300	[3340] 375 298	[3930] 445 295	[4520] 510 293						
[30] 114		[680] 75 365	[1360] 155 362	[2040] 230 360	[2720] 305 357	[3140] 355 356	[3810] 430 352							

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 25 cSt [120 SUS]. Actual data may vary slightly from unit to unit in production.

Continuous

Peak

Intermittent

No operation

Δ Pressure bar [PSI]
395 cm ³/r [24.0 in ³/r]

Flow LPM [GPM]

	[250] 17	[500] 34	[750] 52	[1000] 69	[1250] 86	[1500] 103	[1750] 121	[2000] 138	[2250] 155	[2500] 172	[2750] 190
[0.5]	[560] 65 1.9 4	[1310] 150 3									
[1]	[770] 85 4 9	[1540] 175 9	[2290] 260 9	[3080] 350 8	[3780] 430 8	[4480] 505 7	[5170] 585 7	[5880] 665 6	[6580] 745 5	[7270] 820 4	[7980] 900 3
[2]	[790] 90 8 18	[1580] 180 18	[2360] 265 18	[3180] 360 17	[3930] 445 17	[4680] 530 16	[5430] 615 15	[6180] 700 14	[6840] 775 13	[7500] 845 11	[8170] 925 10
[4]	[810] 90 15 37	[1660] 190 37	[2480] 280 37	[3320] 375 36	[4130] 465 36	[4940] 560 35	[5740] 650 34	[6550] 740 33	[7230] 815 31	[7880] 890 28	
[6]	[820] 90 23 57	[1700] 190 56	[2550] 290 56	[3420] 385 55	[4250] 480 54	[5080] 575 52	[5920] 670 50	[6750] 765 49	[7420] 840 47	[8000] 905 45	
[8]	[820] 90 30 76	[1700] 190 75	[2580] 290 75	[3460] 390 74	[4300] 485 73	[5130] 580 71	[5960] 675 69	[6800] 770 68			
[10]	[800] 90 38 95	[1700] 190 94	[2590] 295 94	[3480] 395 93	[4320] 490 92	[5160] 585 90	[6000] 680 88	[6840] 775 86			
[12]	[770] 85 45 114	[1680] 190 113	[2570] 290 113	[3470] 390 112	[4310] 485 111	[5150] 580 109	[5990] 675 106	[6830] 770 103			
[14]	[740] 85 53 133	[1640] 185 132	[2530] 285 132	[3430] 390 131	[4280] 485 129	[5120] 580 127	[5960] 675 124				
[16]	[690] 80 61 153	[1590] 180 152	[2480] 280 152	[3370] 380 150	[4220] 475 149	[5060] 570 146	[5910] 670 144				
[18]	[640] 70 68 172	[1530] 170 171	[2420] 275 171	[3310] 375 170	[4160] 470 169	[5010] 565 167	[5870] 665 164				
[20]	[580] 65 76 191	[1470] 165 190	[2370] 270 190	[3260] 370 189	[4110] 465 188	[4960] 560 186	[5820] 660 184				
[22]	[510] 60 83 210	[1390] 155 209	[2290] 260 209	[3170] 360 208	[4030] 455 207	[4880] 550 206					
[24]	[440] 50 91 230	[1330] 150 229	[2220] 250 228	[3100] 350 227	[3950] 445 225	[4800] 540 224					
[26]	[350] 40 98 249	[1240] 140 248	[2130] 240 247	[3020] 340 246	[3880] 440 244	[4730] 535 242					
[28]	[270] 30 106 268	[1150] 130 267	[2050] 230 265	[2930] 330 264	[3790] 430 261	[4650] 525 259					
[30]	[180] 20 114 287	[1060] 120 286	[1960] 220 284	[2850] 320 283	[3710] 420 281	[4570] 515 277					
[35]		[840] 95 132 335	[1760] 200 334	[2640] 300 333	[3480] 395 332						

[1760] 200 334 } Torque [lb-in] Nm Speed RPM

C-1

2000 Series

Performance data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 25 cSt [120 SUS]. Actual data may vary slightly from unit to unit in production.

Continuous

Peak

Intermittent

No operation

C-1

Δ Pressure bar [PSI]
490 cm ³/r [29.8in ³/r]

Flow LPM [GPM]

	[250] 17	[500] 34	[750] 52	[1000] 69	[1250] 86	[1500] 103	[1750] 121	[2000] 138
[0.5] 1.9	[670] 75 2	[1600] 180 1						
[1] 4	[920] 105 7	[2000] 225 6	[2990] 340 5	[3900] 440 4	[4880] 550 2			
[2] 8	[950] 105 14	[2060] 235 13	[3110] 350 12	[4080] 460 10	[5110] 575 9	[6320] 715 7		
[4] 15	[980] 110 30	[2130] 240 29	[3230] 365 28	[4270] 480 27	[5350] 605 26	[6370] 720 24	[7380] 835 22	[7980] 900 20
[6] 23	[980] 110 45	[2120] 240 44	[3230] 365 43	[4300] 485 42	[5370] 605 41	[6420] 725 39	[7470] 845 37	[8225] 930 35
[8] 30	[980] 110 61	[2110] 240 60	[3220] 365 59	[4330] 490 58	[5400] 610 57	[6470] 730 55	[7550] 855 52	
[10] 38	[920] 105 76	[2050] 230 75	[3170] 360 74	[4300] 485 73	[5390] 610 72	[6460] 730 70	[7550] 855 68	
[12] 45	[860] 95 91	[1990] 225 90	[3120] 355 90	[4260] 480 89	[5370] 605 87	[6460] 730 85	[7560] 855 84	
[14] 53	[790] 90 106	[1930] 220 105	[3055] 345 105	[4185] 475 104	[5300] 600 102	[6400] 725 100		
[16] 61	[720] 80 122	[1870] 210 121	[2990] 340 120	[4110] 465 119	[5230] 590 118	[6340] 715 116		
[18] 68	[630] 70 137	[1770] 200 136	[2890] 325 135	[4020] 455 134	[5140] 580 133	[6260] 705 131		
[20] 76	[550] 60 153	[1670] 190 152	[2800] 315 151	[3940] 445 150	[5060] 570 149	[6180] 700 146		
[22] 83	[450] 50 168	[1570] 175 168	[2700] 305 167	[3830] 435 165	[4960] 560 164	[6070] 685 161		
[24] 91	[360] 40 184	[1480] 165 184	[2600] 295 183	[3730] 420 181	[4860] 550 179	[5970] 675 177		
[26] 98	[270] 30 199	[1390] 155 195	[2510] 285 194	[3640] 410 192	[4770] 540 190			
[28] 106	[1260] 140 212	[2370] 270 211	[3520] 400 209	[4630] 525 207				
[30] 114	[1130] 125 230	[2240] 255 229	[3400] 385 227	[4500] 510 224				

Standard mount

Ports

7/8 -14 UNF-2B SAE O-ring staggered ports (2)
7/16 -20 UNF-2B SAE O-ring case drain port (1)

1 1/16 -12 UN-2B SAE O-ring ports (positioned 180° apart) (2)
7/16 -20 UNF-2B SAE O-ring case drain port (1)

7/8 -14 UNF-2B SAE O-ring end ports (2)
7/16 -20 UNF-2B SAE O-ring case drain port (1) or

G 1/2 (BSP) staggered ports (2)
G 1/4 (BSP) case drain port (1)

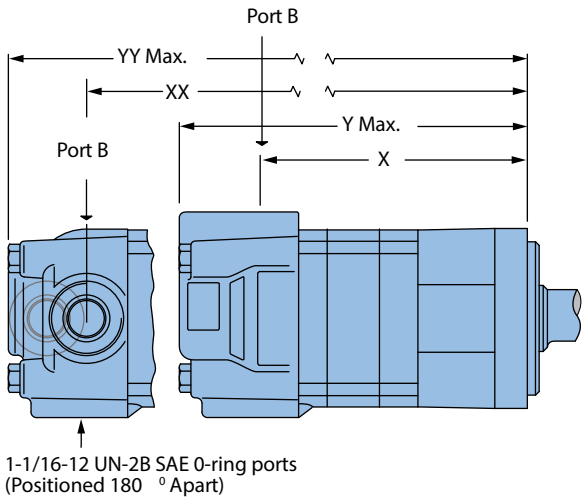
Manifold mount

7/16 -20 UNF-2B SAE O-ring case drain port (1)

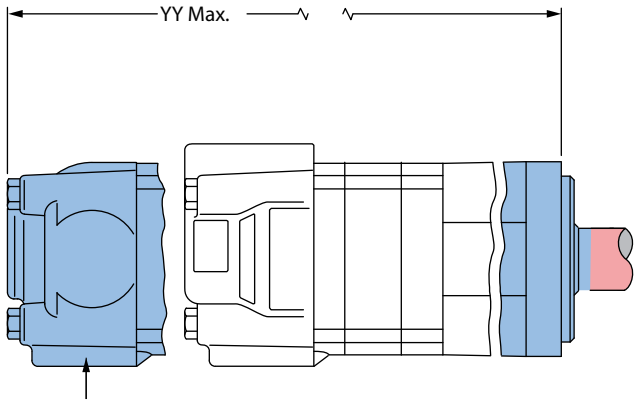
Standard rotation viewed from shaft end

Port A Pressurized — CW
Port B Pressurized — CCW

Standard mount



1-1/16-12 UN-2B SAE 0-ring ports
(Positioned 180 ⁰ Apart)



7/8-14 UNF-2B SAE 0-ring end ports

Standard mount motor dimensions

Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]	XX mm [inch]	YY mm [inch]
34 [2.1]	126.7 [4.99]	1740 [6.85]	1290 [5.08]	175.3 [6.90]
41 [2.5]	128.0 [5.04]	175.3 [6.90]	130.5 [5.14]	176.8 [6.96]
66 [4.0]	133.9 [5.27]	181.1 [7.13]	136.1 [5.36]	182.4 [7.18]
80 [4.9]	136.9 [5.39]	184.2 [7.25]	139.2 [5.48]	185.4 [7.30]
100 [6.2]	141.5 [5.57]	189.0 [7.44]	143.8 [5.66]	190.3 [7.49]
130 [8.0]	147.9 [5.83]	195.4 [7.69]	150.2 [5.92]	196.6 [7.74]
160 [9.6]	147.9 [5.83]	195.4 [7.69]	150.2 [5.92]	196.6 [7.74]
195 [11.9]	154.7 [6.09]	202.2 [7.96]	157.0 [6.18]	203.2 [8.00]
245 [14.9]	163.7 [6.45]	211.1 [8.31]	166.0 [6.54]	212.4 [8.36]
305 [18.7]	175.1 [6.90]	222.3 [8.75]	177.4 [6.99]	223.5 [8.80]
395 [24.0]	191.0 [7.52]	238.6 [9.39]	193.3 [7.61]	239.8 [9.44]
490 [29.8]	208.4 [8.21]	255.8 [10.07]	210.7 [8.30]	257.0 [10.12]

Dimensions

Standard mount with integral relief valve

Ports

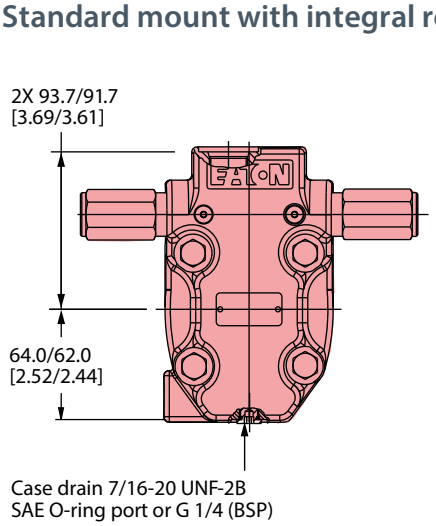
7/8 -14 UNF-2B SAE O-ring staggered ports (2)
7/16 -20 UNF-2B SAE O-ring case drain port (1) or

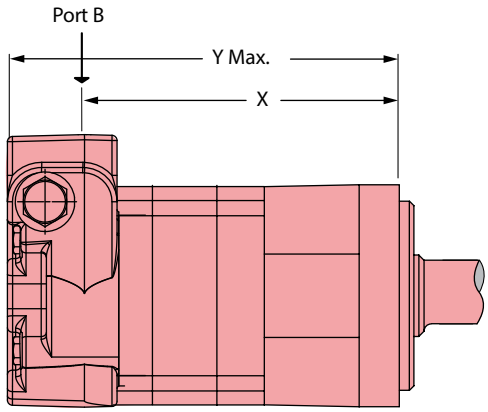
G 1/2 (BSP) staggered ports (2)
G 1/4 (BSP) case drain port (1)

Standard rotation viewed from shaft end

Port A pressurized — CW
Port B pressurized — CCW

Standard mount with integral relief valve





Standard mount motor dimensions

Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]
34 [2.1]	126.7 [4.99]	174.0 [6.85]
41 [2.5]	128.2 [5.05]	175.5 [6.91]
66 [4.0]	133.9 [5.27]	181.2 [7.13]
80 [4.9]	137.0 [5.40]	184.5 [7.26]
100 [6.2]	141.6 [5.58]	189.0 [7.44]
130 [8.0]	147.9 [5.83]	195.4 [7.69]
160 [9.6]	147.9 [5.83]	195.4 [7.69]
195 [11.9]	154.8 [6.10]	202.2 [7.96]
245 [14.9]	163.7 [6.45]	211.1 [8.31]
305 [18.7]	175.1 [6.90]	222.6 [8.76]
395 [24.0]	191.1 [7.53]	238.6 [9.39]
490 [29.8]	208.4 [8.21]	255.8 [10.07]

Wheel mount

Ports

7/8 -14 UNF-2B SAE O-ring staggered ports (2)
7/16 -20 UNF-2B SAE O-ring case drain port (1)

1 1/16 -12 UN-2B SAE O-ring ports (positioned 180° apart) (2)
7/16 -20 UNF-2B SAE O-ring case drain port (1)

7/8 -14 UNF-2B SAE O-ring end ports (2)
7/16 -20 UNF-2B SAE O-ring case drain port (1)

G 1/2 (BSP) staggered ports (2)
G 1/4 (BSP) case drain port (1)

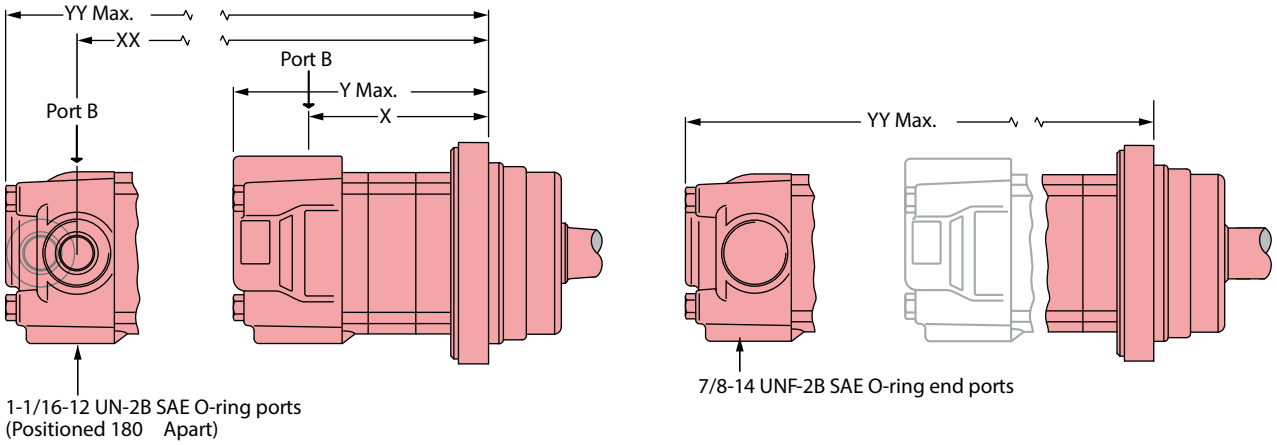
Manifold mount

7/16 -20 UNF-2B SAE O-ring case drain port (1)

Standard rotation viewed from shaft end

Port A pressurized — CW
Port B pressurized — CCW

Wheel mount



Wheel mount motor dimensions

Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]	XX mm [inch]	YY mm [inch]
34 [2.1]	86.5 [3.41]	133.8 [5.27]	88.8 [3.50]	135.1 [5.32]
41 [2.5]	88.0 [3.47]	135.3 [5.33]	90.3 [3.56]	136.6 [5.38]
66 [4.0]	93.7 [3.69]	141.0 [5.55]	96.0 [3.78]	142.3 [5.60]
80 [4.9]	96.8 [3.81]	144.0 [5.67]	99.1 [3.90]	145.3 [5.72]
100 [6.2]	101.3 [3.99]	148.9 [5.86]	103.6 [4.08]	150.2 [5.91]
130 [8.0]	107.8 [4.25]	155.2 [6.11]	110.1 [4.34]	156.5 [6.16]
160 [9.6]	107.8 [4.25]	155.2 [6.11]	110.1 [4.34]	156.5 [6.16]
195 [11.9]	114.6 [4.51]	161.8 [6.37]	116.8 [4.60]	163.1 [6.42]
245 [14.9]	123.5 [4.87]	171.0 [6.73]	125.8 [4.96]	125.8 [4.96]
305 [18.7]	135.0 [5.32]	182.1 [7.17]	137.4 [5.41]	183.4 [7.22]
395 [24.0]	150.9 [5.94]	198.4 [7.81]	153.2 [6.03]	199.7 [7.86]
490 [29.8]	168.2 [6.63]	215.7 [8.49]	170.7 [6.72]	217.0 [8.54]

2000 Series

Dimensions

Wheel mount with intergal relief valve

Ports

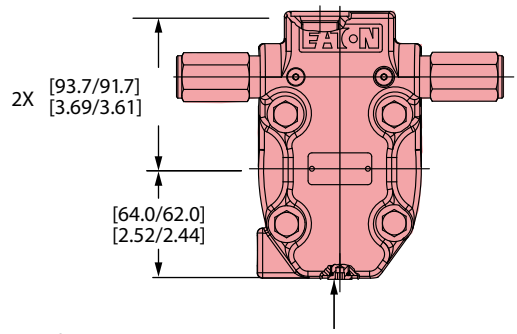
7/8 -14 UNF-2B SAE O-ring staggered ports (2)
7/16 -20 UNF-2B SAE O-ring case drain port (1)

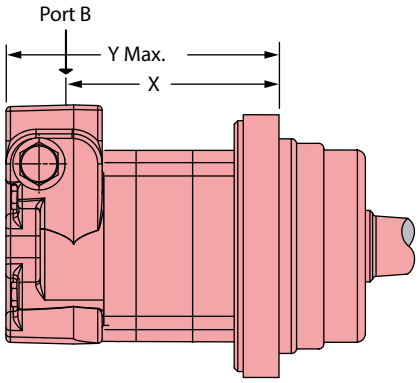
G 1/2 (BSP) staggered ports (2)
G 1/4 (BSP) case drain port (1)

Standard rotation viewed from shaft end

Port A pressurized — CW
Port B pressurized — CCW

Wheel mount with integral relief valve





Wheel mount motor dimensions

Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]
34 [2.1]	86.5 [3.41]	133.8 [5.27]
41 [2.5]	88.0 [3.47]	135.3 [5.33]
66 [4.0]	93.7 [3.69]	141.0 [5.55]
80 [4.9]	96.9 [3.82]	144.3 [5.68]
100 [6.2]	101.4 [4.00]	148.9 [5.86]
130 [8.0]	107.8 [4.25]	155.2 [6.11]
160 [9.6]	107.8 [4.25]	155.2 [6.11]
195 [11.9]	114.6 [4.52]	162.1 [6.38]
245 [14.9]	123.5 [4.87]	171.0 [6.73]
305 [18.7]	135.0 [5.32]	182.4 [7.18
395 [24.0]	151.0 [5.95]	198.4 [7.81]
490 [29.8]	168.2 [6.63]	215.7 [8.49]

Bearingless

Ports

7/8 -14 UNF-2B SAE O-ring staggered ports (2)
7/16 -20 UNF-2B SAE O-ring case drain port (1)

1 1/16 -12 UN-2B SAE O-ring ports (positioned 180° apart) (2)
7/16 -20 UNF-2B SAE O-ring case drain port (1)

7/8 -14 UNF-2B SAE O-ring end ports (2)
7/16 -20 UNF-2B SAE O-ring case drain port (1)

G 1/2 (BSP) staggered ports (2)
G 1/4 (BSP) case drain port (1)

Manifold mount

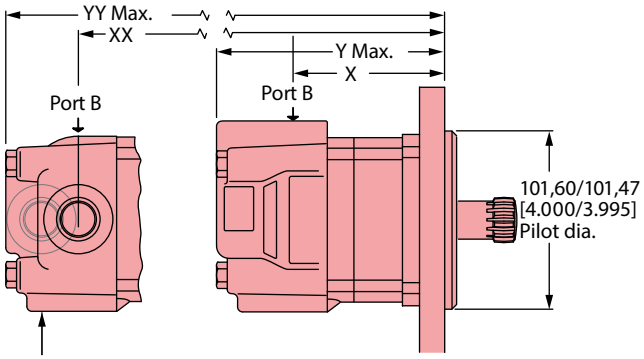
7/16 -20 UNF-2B SAE O-ring case drain port (1)

Standard rotation viewed from drive end

Port A pressurized — CW

Port B pressurized — CCW

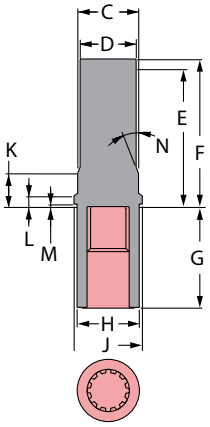
Bearingless



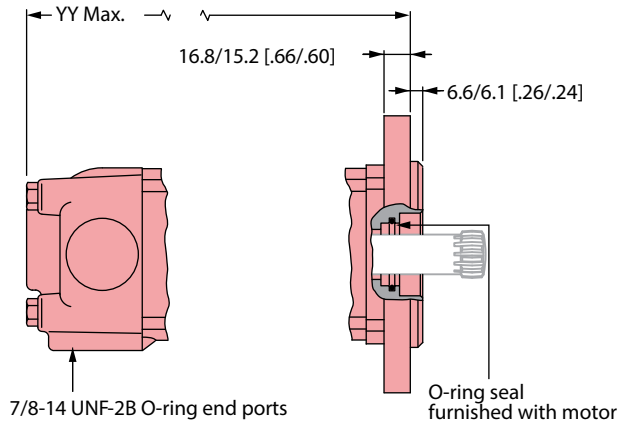
For 2000 Series bearingless motor application information contact your Danfoss representative (mating coupling blanks available from Danfoss).

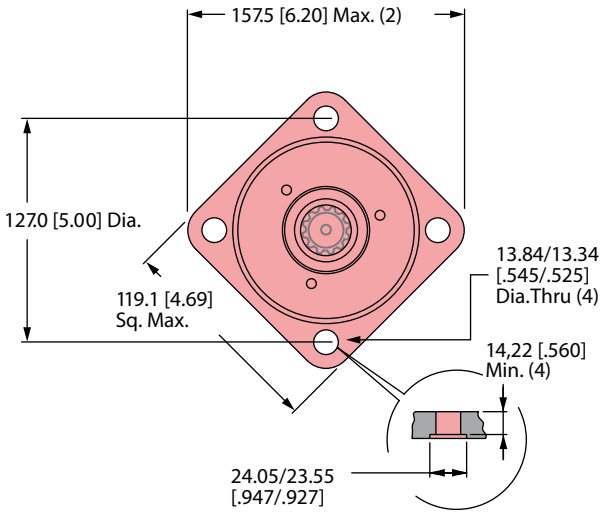
Blank Dimensions

C	35.87 [1.412] Dia.
D	34.04 [1.340] Dia.
E	81.0 [3.19] Min. Full form dia
F	86.1 [3.39] Max.
G	62.10 [2.445] full form dia.
H	38.40 [1.512] Dia.
J	43.7 [1.72] Dia.
K	725.91 [1.020]
L	8.25 [.325]
M	0.89 [.035]
N	15°



Mating coupling blank
Danfoss Part no. 13307-003





Bearingless motors dimensions

Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]	XX mm [inch]	YY mm [inch]
34 [2.1]	68.7 [2.70]	116.3 [4.58]	70.9 [2.79]	117.6 [4.63]
41 [2.5]	70.1 [2.76]	117.7 [4.63]	72.4 [2.85]	119.1 [4.69]
66 [4.0]	75.7 [2.98]	123.4 [4.86]	78.1 [3.08]	124.8 [4.91]
80 [4.9]	79.0 [3.11]	126.5 [4.98]	81.3 [3.20]	127.8 [5.03]
100 [6.2]	83.5 [3.29]	131.4 [5.17]	85.8 [3.38]	132.6 [5.22]
130 [8.0]	89.9 [3.54]	137.7 [5.42]	92.2 [3.63]	139.0 [5.47]

Bearingless motors dimensions

Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]	XX mm [inch]	YY mm [inch]
160 [9.6]	89.9 [3.54]	137.7 [5.42]	92.2 [3.63]	139.0 [5.47]
195 [11.9]	96.8 [3.81]	144.6 [5.68]	99.0 [3.90]	145.5 [5.73]
245 [14.9]	105.6 [4.16]	153.5 [6.04]	107.9 [4.25]	154.7 [6.09]
305 [18.7]	117.1 [4.61]	164.9 [6.48]	119.4 [4.70]	165.9 [6.53]
395 [24.0]	133.1 [5.24]	180.9 [7.12]	135.4 [5.33]	182.1 [7.17]
490 [29.8]	150.3 [5.92]	198.2 [7.80]	152.7 [6.01]	199.3 [7.85]

Dimensions

Bearingless with integral relief valve

Ports

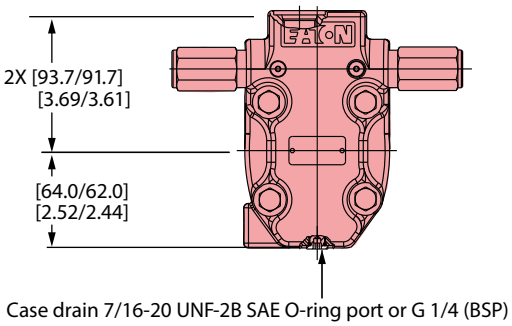
7/8 -14 UNF-2B SAE O-ring Staggered Ports (2)
7/16 -20 UNF-2B SAE O-ring Case Drain Port (1)

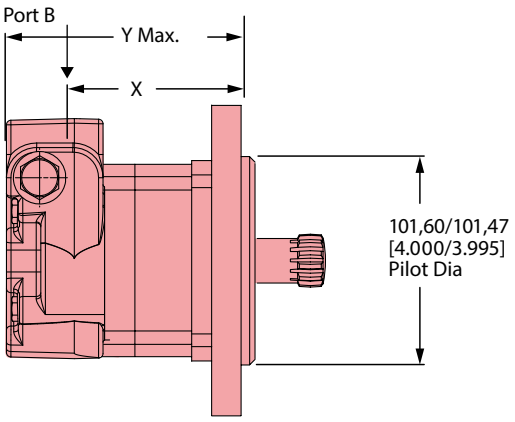
G 1/2 (BSP) Staggered Ports (2)
G 1/4 (BSP) Case Drain Port (1)

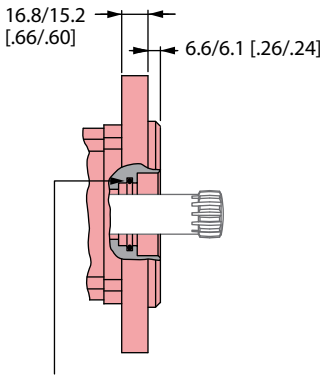
Standard rotation viewed from shaft end

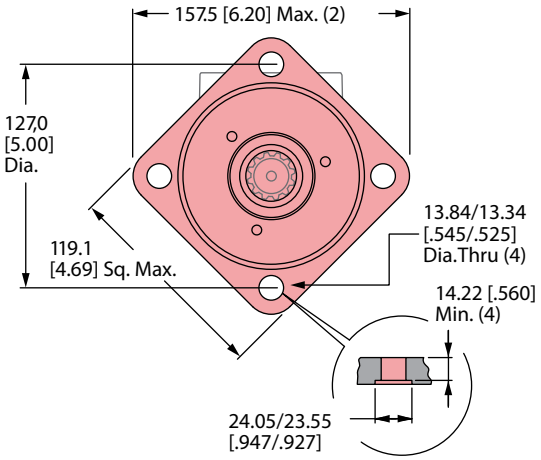
Port A Pressurized — CW
Port B Pressurized — CCW

Bearingless with integral relief valve









Bearingless motors dimensions

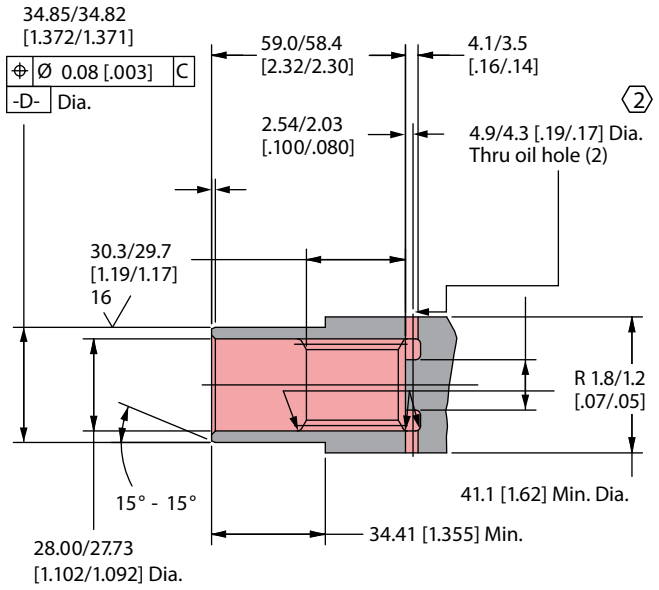
Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]
34 [2.1]	68.6 [2.70]	116.3 [4.58]
41 [2.5]	70.1 [2.76]	117.8 [4.64]
66 [4.0]	75.8 [2.99]	123.5 [4.86]
80 [4.9]	79.0 [3.11]	126.8 [4.99]
100 [6.2]	83.5 [3.29]	131.4 [5.17]
130 [8.0]	89.9 [3.54]	137.7 [5.42]

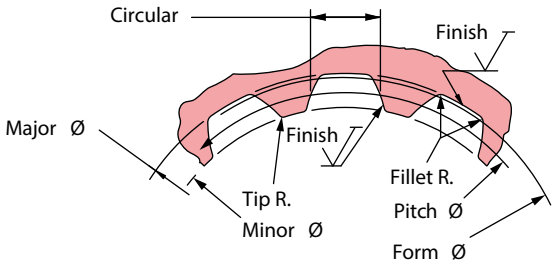
Bearingless motors dimensions

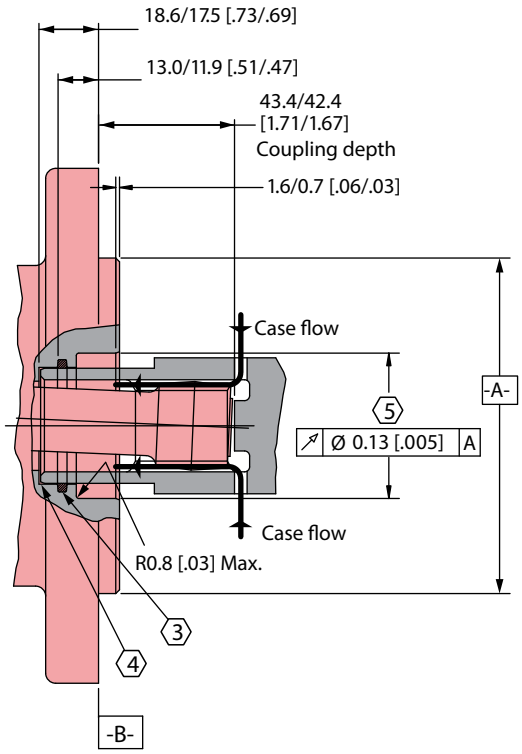
Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]
160 [9.6]	89.9 [3.54]	137.7 [5.42]
195 [11.9]	96.8 [3.81]	144.6 [5.69]
245 [14.9]	105.6 [4.16]	153.5 [6.04]
305 [18.7]	117.1 [4.61]	164.9 [6.49]
395 [24.0]	133.1 [5.24]	180.9 [7.12]
490 [29.8]	150.3 [5.92]	198.2 [7.80]

1. Internal spline in mating part to be per spline data. Specification material to be ASTM A304, 8620H vacuum degassed alloy steel carbonize to a hardness of 59-62 HRc with case depth (to 50HRc) of 0,076 -1,02 [.030 -.040]. Dimensions apply after heat treat.
2. Mating part to have critical dimensions as shown. Oil holes must be provided and open for proper oil circulation.
3. Seal to be furnished with motor for proper oil circulation thru splines.
4. Means of maintaining clearance between shaft and mounting flange must be provided.
5. Counter bore designed to adapt a standard sleeve bearing 35.010-35.040 [1.3784 -1.3795] I.D. by 44.040 - 44.070 [1.7339 -1.7350] O.D. (Oilite Bronze Sleeve Bearing AAM3544-22).

Bearingless







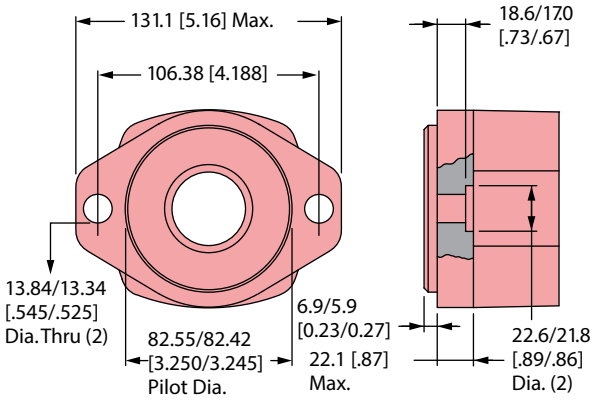
Spline pitch	12/24
Pressure angle	30°
Number of teeth	12
Class of fit	Ref. 5
Type of fit	Side
Pitch diameter	Ref. 25.400000 [1.0000000]
Base diameter	Ref. 21.997045 [.8660254] Ø 0.21 [.008] D
Major diameter	(27.74 [1.092] Max. 27.59 [1.086] Min.)
Minor diameter	23.097 - 23.224 [.9093 - .9143]
Form diameter, min	29.93 [1.060]
Fillet radius	0.64 - 0.76 [.025 - .030]
Tip radius	0.25 - 0.38 [.010 - .015]

Finish	1.6 (63)
Involute profile variation	+0.000 -0.025 [+.0000 -.0010]
Total index variation	0.038 [.0015]
Lead variation	0.013 [.0005]
Circular space width:	
Maximum actual	4.318 [.1700]
Minimum effective	4.216 [.1660]
Maximum effective	Ref. 4.270 [.1681]
Minimum actual	Ref. 4.247 [.1672]
Dimension between two pins	Ref. 19.020 - 19.190 [.7488 - .7555]
Pin diameter	4.496 [.1770] Pins to have 3.38 [.133] Wide flat for root clearance

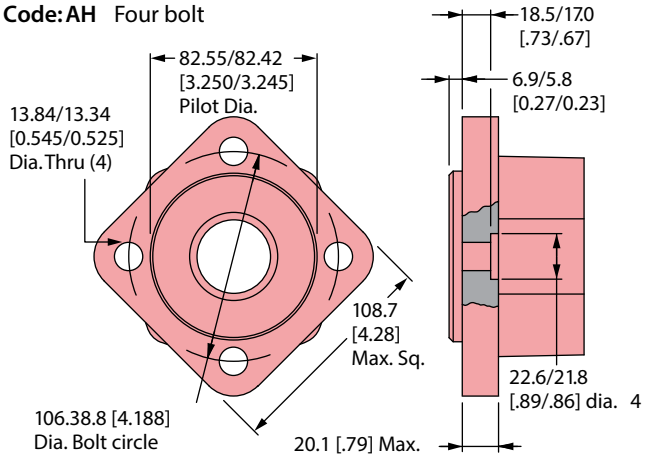
C-1

Mounting options

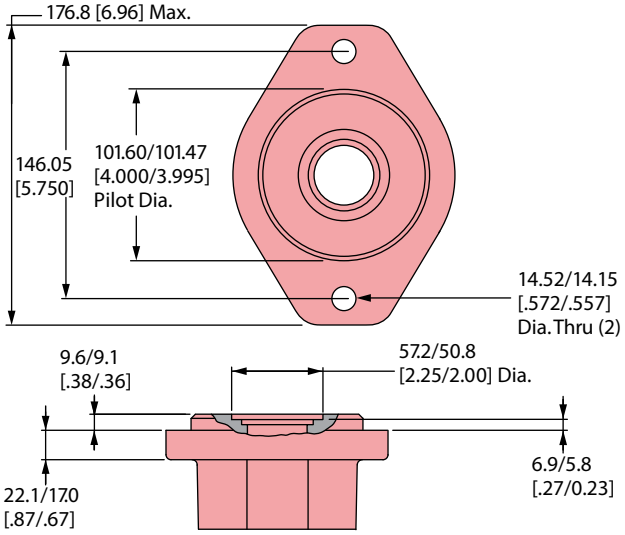
Code: AC SAE A - Two bolt (Standard motor)



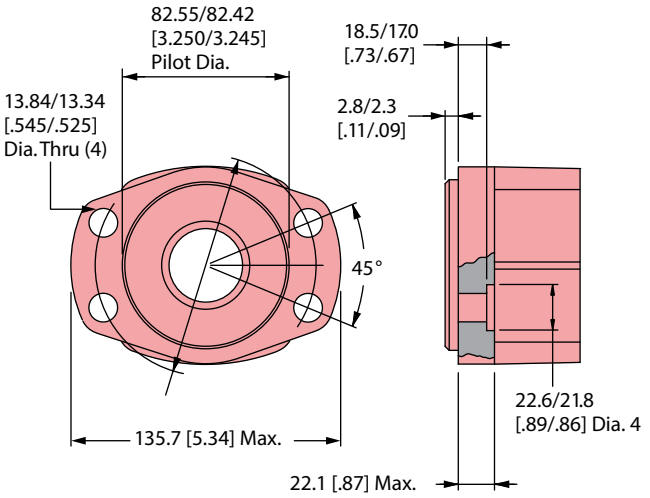
Code: AH Four bolt



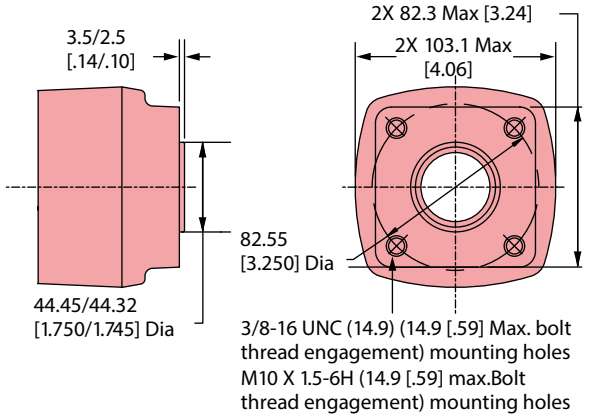
Code: AF SAE B - Two bolt



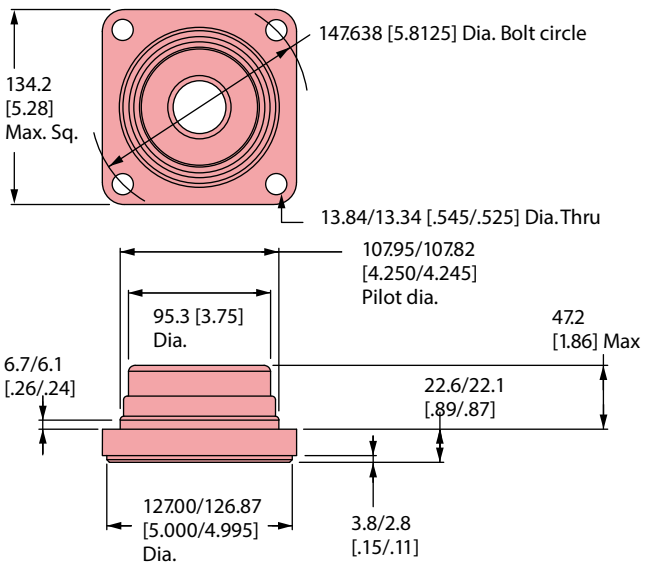
Code : AJ Four bolt magneto



Code: BY Four bolt (Standard motor)



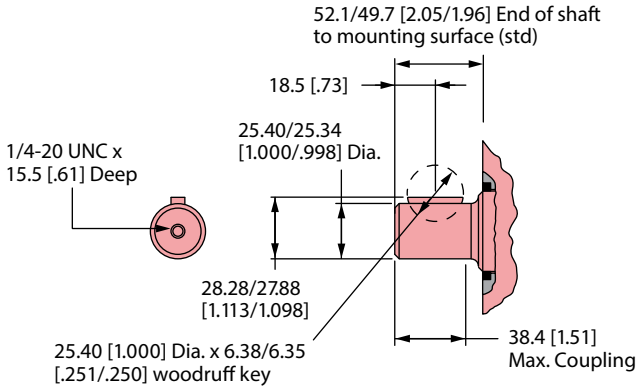
Code: AB Four bolt (Wheel motor)



Shafts

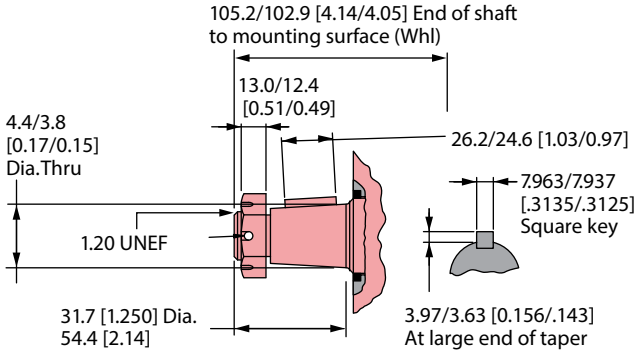
Code: 01 1 Inch straight

395 [3500] Max.Torque Nm [lb-in]

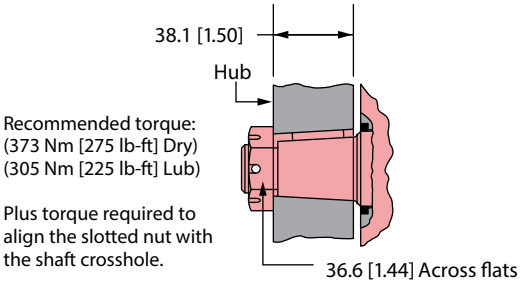


Code: 03 1 1/4 Inch tapered

768 [6800] Max.Torque Nm [lb-in]

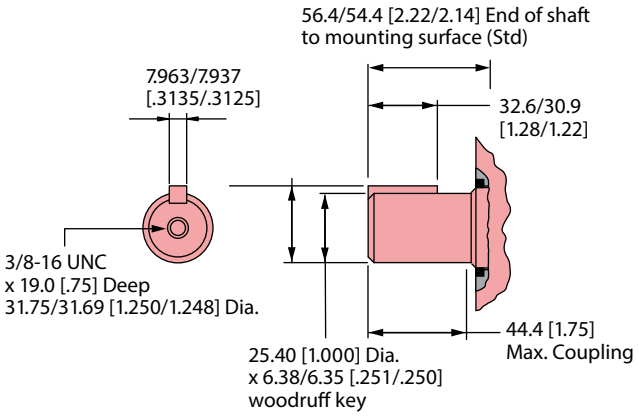


SAE J501 Standard tapered shaft 125.00±0.17Taper per meter
[1.500±.002Taper per foot]



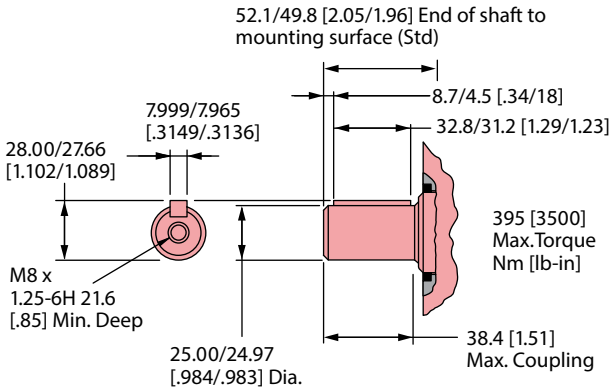
Code: 02 1 1/4 Inch straight

768 [6800] Max.Torque Nm [lb-in]



Code: 19 25 mm straight

395 [3500] Max.Torque Nm [lb-in]



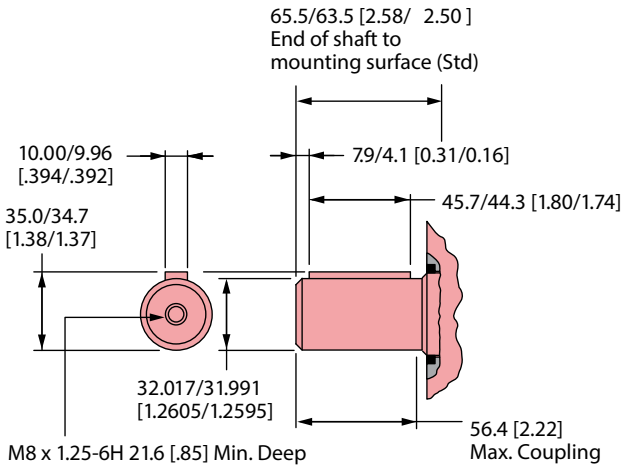
C-1

Dimensions

Shafts

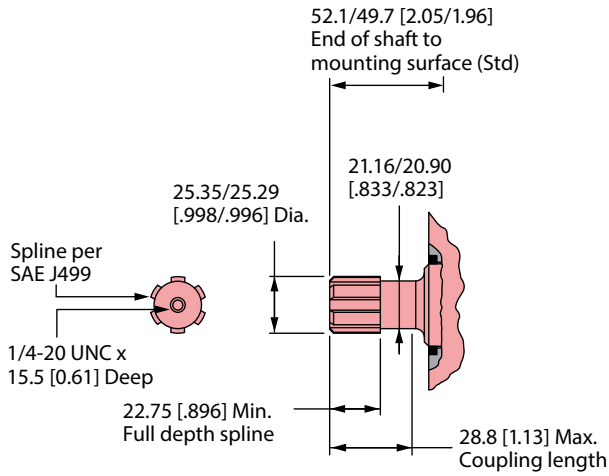
Code: 16 32 mm straight

768 [6800] Max.Torque Nm [lb-in]



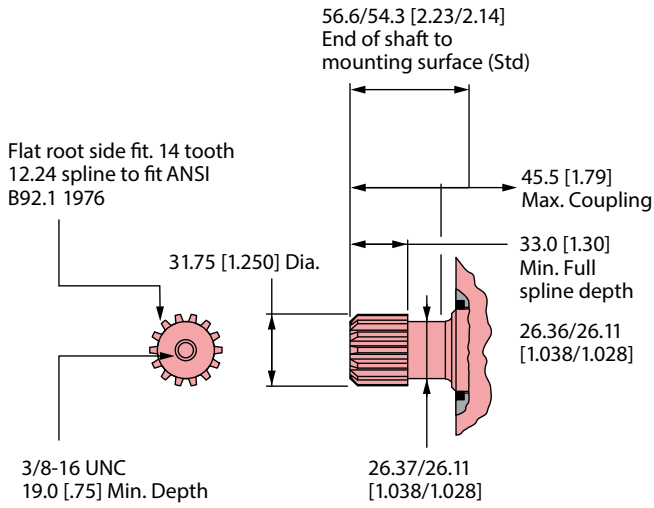
Code: 05 SAE 6B splined

395 [3500] Max.Torque Nm [lb-in]



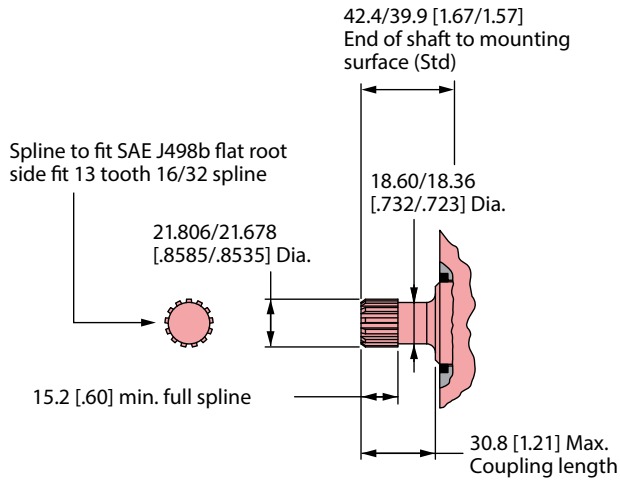
Code: 04 1 1/4 -14 Tooth splined

768 [6800] Max.Torque Nm [lb-in]



Code: 07 13 Tooth splined

141 [1250] Max.Torque Nm [lb-in]

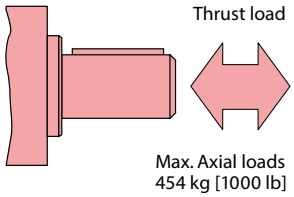


These curves indicate the radial load capacity on the motor shaft at various locations with an allowable external thrust load of 454 kg [1000 lb].

Note: Case pressure will increase the allowable inward thrust load and decrease the allowable outward thrust load. Case pressure will push outward on the shaft at 61 kg/7 Bar [135 lb/100 PSI].

Each curve is based on B 10 bearing life (2000 Hours of 12,000,000 shaft revolutions at 100 RPM) at rated output torque.

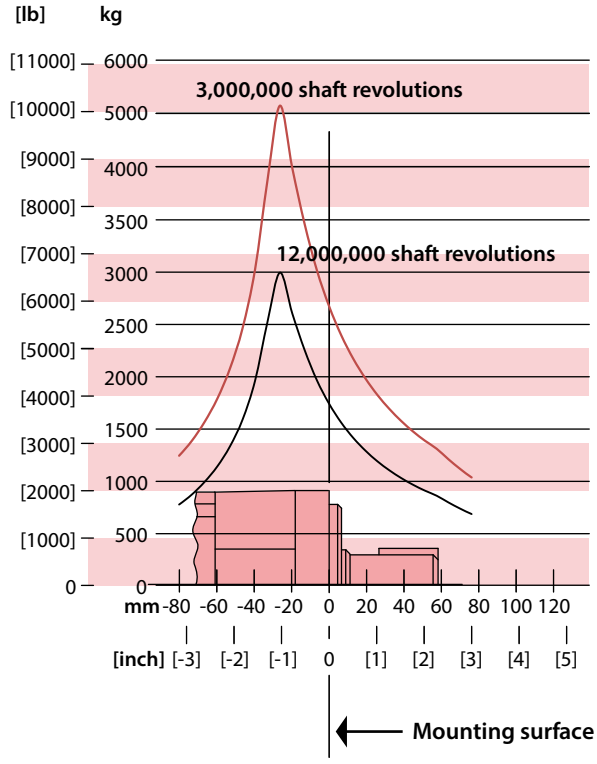
To determine radial load at speeds other than 100 RPM, multiply the load values given on the bearing curve by the factors in the chart below.



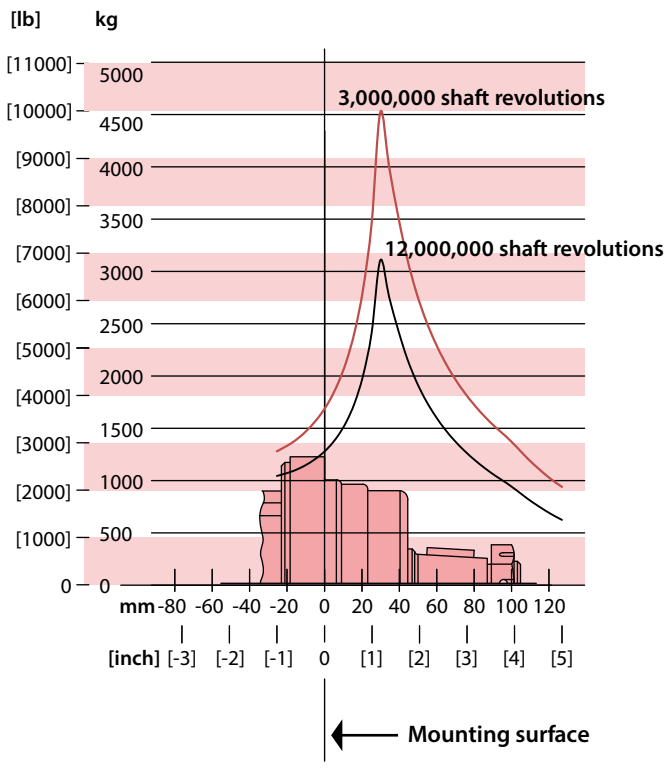
RPM	Multiplication factor
50	1.23
100	1.00
200	0.81
300	0.72
400	0.66
500	0.62
600	0.58
700	0.56
800	0.54

C-1

Standard motor straight and splined shafts



Wheel motor Tapered shaft



2000 Series

Case pressure and case porting

Char-Lynn 2000 Series motors are durable and have long life as long as the recommended case pressure is not exceeded. Allowable case pressure is highest at low shaft speeds. Consequently, motor life will be shortened if case pressure exceeds these ratings (acceptability may vary with application). Determine if an external case drain is required from the case pressure seal limitation chart.

Case porting advantages:

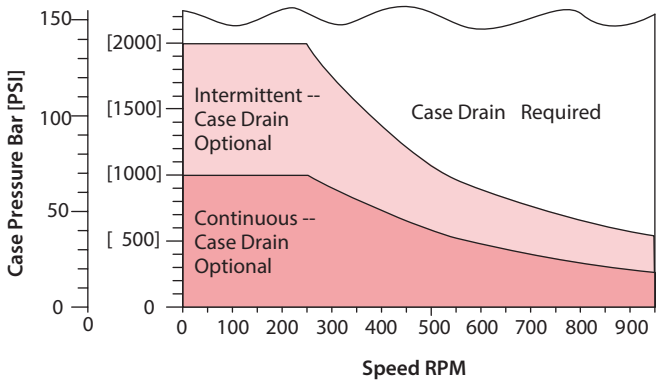
Contamination control — flushing the motor case.

Cooler motor — exiting oil draws motor heat away.

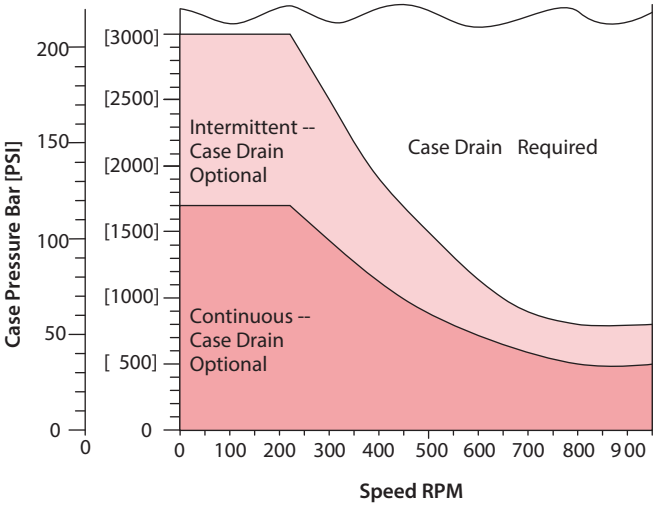
Extend motor seal life — maintain low case pressure with a preset restriction in the case drain line.

Case pressure seal limitation

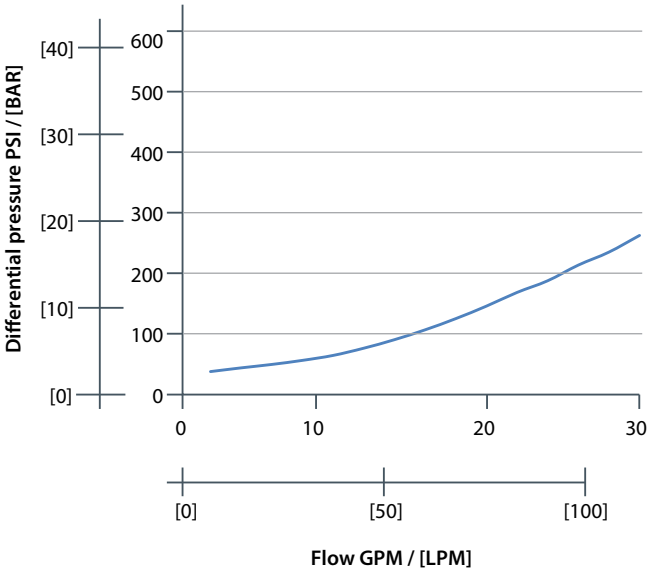
Standard shaft seal



High pressure shaft seal



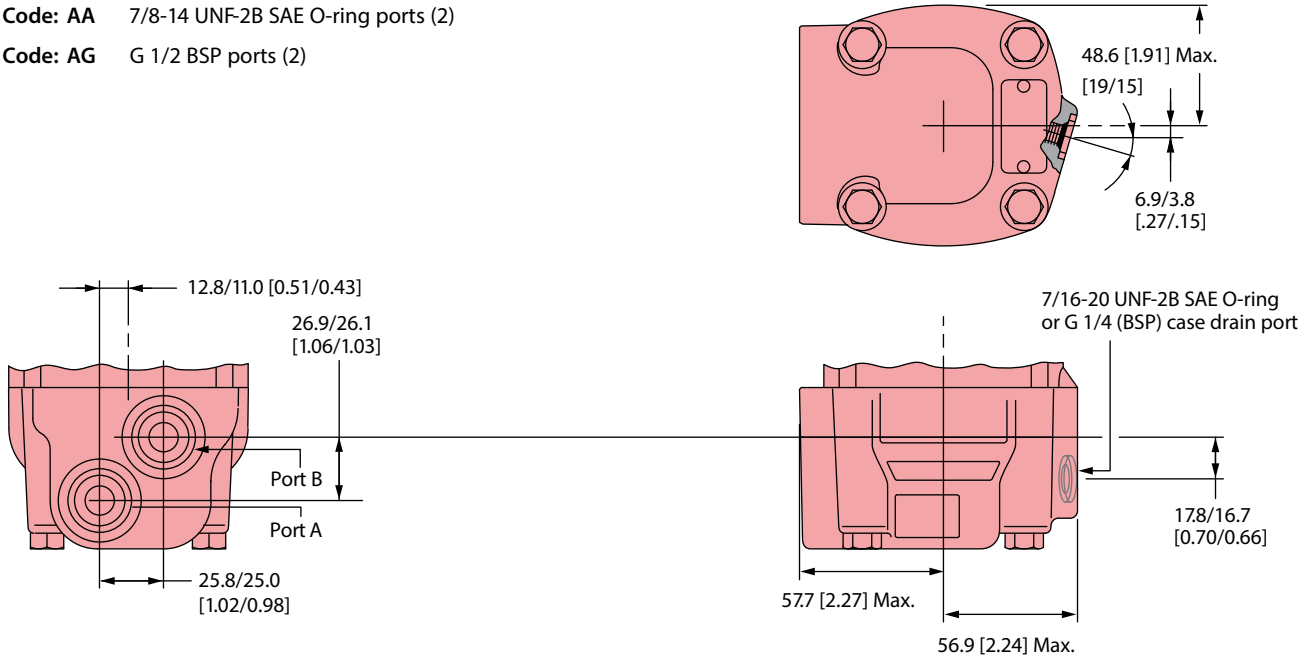
2000 Series NLPD - No Load Pressure Drop



Ports

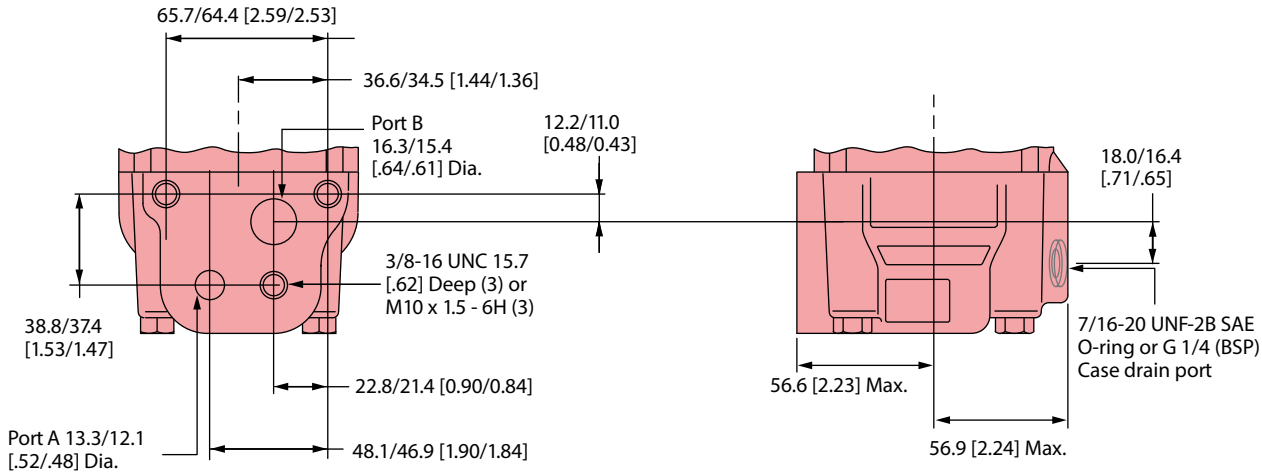
Code: AA 7/8-14 UNF-2B SAE O-ring ports (2)

Code: AG G 1/2 BSP ports (2)



Code: AB 3/8-16 UNC threaded holes

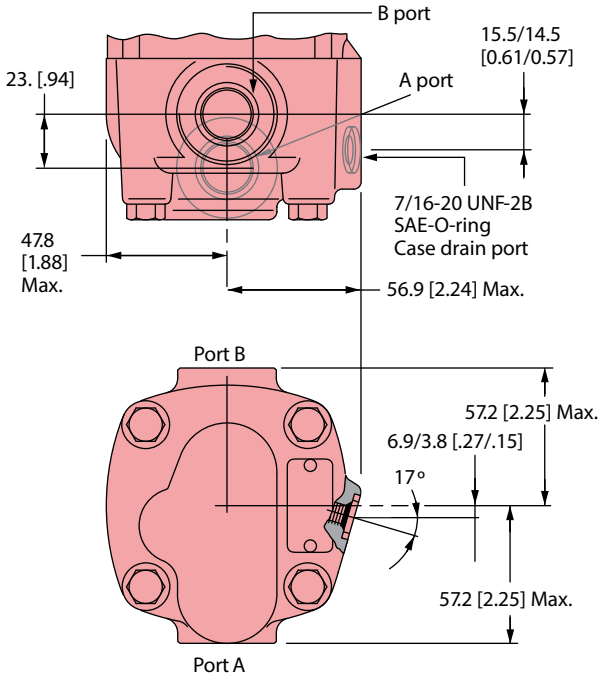
Code: AE M10x1.5 -6H threaded holes



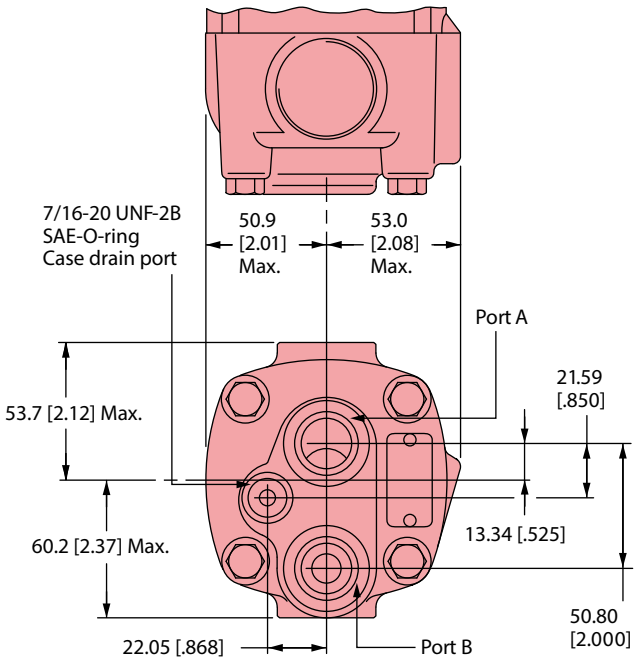
C-1

Ports

Code: AF 1-1/16-12 UN-2B SAE O-ring Ports (2) Positioned 180° Apart

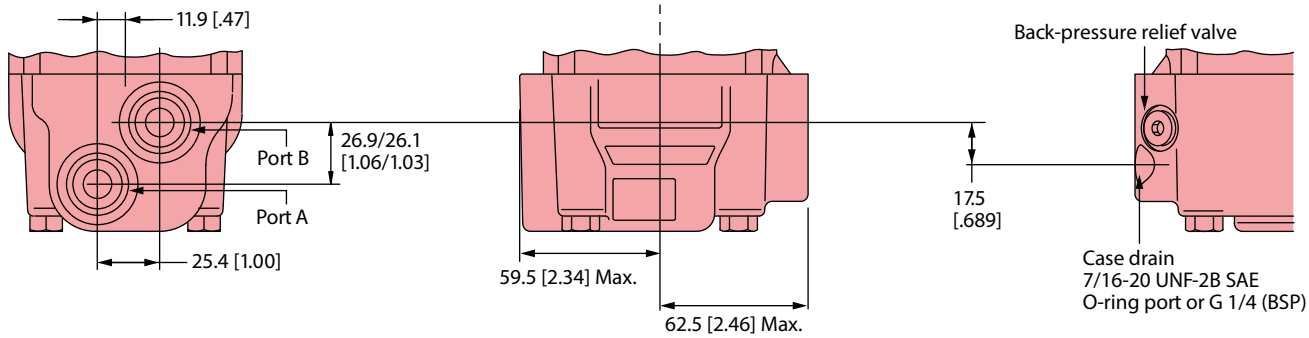


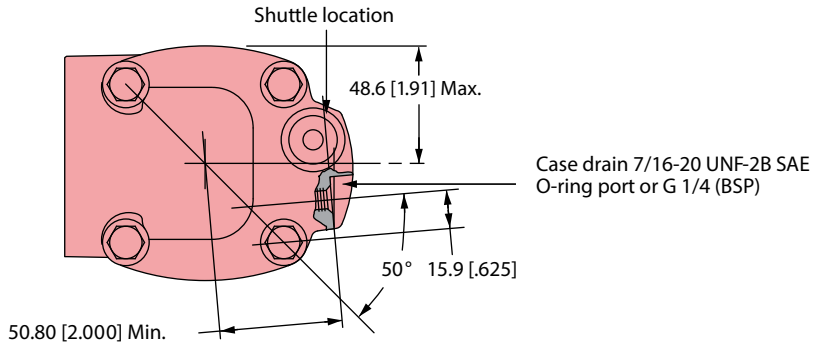
Code: AD 7/8-14 UNF-2B SAE O-ring end ports (2)



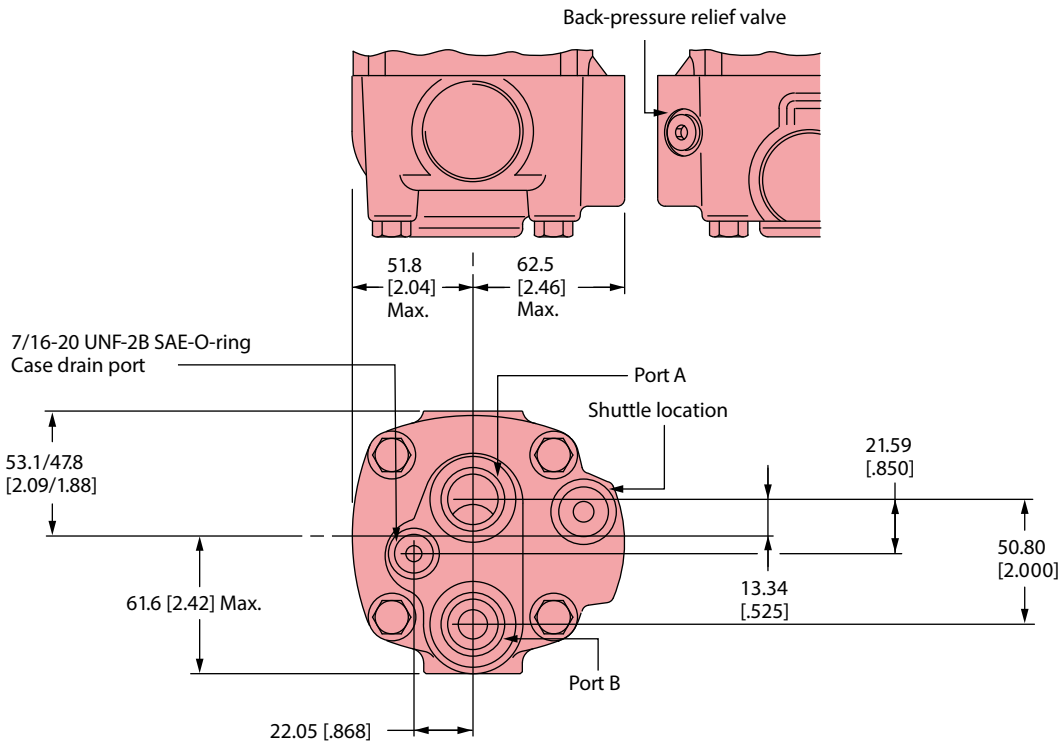
C-1

Ports with Shuttle





This port option is available with shuttle and back pressure relief valve for closed loop applications.



C-1

2000 Series

Product numbers

Note: For 2000 Series Motors with a configuration **Not Shown** in the charts below: Use model code number system on the next page to specify product in detail.

Use digit prefix — 104-, 105-, or 106- plus four digit number from charts for complete product number— Example 106-1043.

Orders will not be accepted without three digit prefix.

Mounting	Shaft	Port size	Displ. cm³/r [in³/r] / product number										
			41	80	90	100	130	160	195	245	305	395	490
			[2.5]	[4.9]	[5.5]	[6.2]	[8.0]	[9.6]	[11.9]	[14.9]	[18.7]	[24.0]	[29.8]
2 Bolt sae A flange	1 Inch straight	7/8 -14 O-ring staggered	104-4708	-1001	—	-1002	-1003	-1004	-1005	-1006	-1007	-1143	—
		1 1/16 -12 O-ring 180° apart	104-––––	-1037	—	-1038	-1039	-1040	-1041	-1042	-1043	-1044	—
	1 ¼ Inch straight	7/8 -14 O-ring staggered	104-4774	-1022	—	-1023	-1024	-1025	-1026	-1027	-1028	-1228	-1420
		1 1/16 -12 O-ring 180° apart	104-––––	-1061	—	-1062	-1063	-1064	-1065	-1066	-1067	-1068	-1421
	1 ¼ Inch - 14 T splined	7/8 -14 O-ring staggered	104-4764	-1029	—	-1030	-1031	-1032	-1033	-1034	-1035	-1229	-1422
		1 1/16 -12 O-ring 180° apart	104-––––	-1087	—	-1088	-1089	-1090	-1091	-1092	-1093	-1094	-1423
2 Bolt SAE B flange	1 ¼ Inch straight	7/8-14 O-ring staggered	104-––––	-1200	—	1201	-1202	-1203	-1204	-1205	-1206	-1207	—
	1 ¼ Inch involute SAE C splined	7/8 -14 O-ring staggered	104-––––	-1208	—	-1209	-1210	-1211	-1212	-1213	-1214	-1215	—
	1 Inch SAE 6B splined	7/8 -14 O-ring staggered	104-––––	-1193	—	-1194	-1195	-1196	-1197	-1198	-1199	—	—
	7/8 Inch SAE B splined	7/8 -14 O-ring staggered	104-––––	-1216	—	-1217	-1218	-1219	-1220	—	—	—	—
Standard with 4 bolt flange	32 mm Straight	G 1/2 (BSP))	104-4672	-1384	—	-1385	-1386	-1387	-1388	-1389	-1390	-1391	—
	1 ¼ Inch 14 T splined	G 1/2 (BSP)	104-––––	-1376	—	-1377	-1378	-1379	-1380	-1381	-1382	-1383	—
Wheel motor	1 ¼ Inch straight	7/8 -14 O-ring staggered	105-––––	—	—	—	—	—	—	—	—	—	-1148
		1 1/16 -12 O-ring 180° Apart	105-––––	—	—	—	—	—	—	—	—	—	-1149
	32 mm straight	G 1/2 (BSP)	105-––––	-1134	—	-1135	-1136	-1137	-1138	-1139	-1140	-1141	—
	1 ¼ Inch tapered	7/8 -14 O-ring staggered	105-––––	-1001	—	-1002	-1003	-1004	-1005	-1006	-1007	-1060	-1152
		1 1/16 -12 O-ring 180° apart	105-––––	-1071	—	-1072	-1073	-1074	-1075	-1076	-1077	-1078	—
	1 ¼ Inch 14 T splined	7/8 -14 O-ring staggered	105-––––	-1029	—	-1030	-1031	-1032	-1033	-1034	-1035	-1096	—
		1 1/16 -12 O-ring 180° apart	105-––––	-1079	—	—	—	-1082	-1083	-1084	-1085	-1086	—
Bearingless		7/8 -14 O-ring staggered	106-––––	-1008	—	-1009	-1010	-1011	-1012	-1013	-1014	-1015	-1047
		G 1/2 (BSP)	106-––––	-1038	—	-1039	-1040	-1041	-1042	-1043	-1044	-1045	—

106-1044

Mounting	Shaft	Port size	Displ. cm³/r [in³/r] / product number										
			41	80	90	100	130	160	195	245	305	395	490
			[2.5]	[4.9]	[5.5]	[6.2]	[8.0]	[9.6]	[11.9]	[14.9]	[18.7]	[24.0]	[29.8]
2 Bolt SAE A flange	1 Inch straight	7/8 -14 O-ring Staggered	104-––––	-1528	—	-1529	-1530	-1531	-1532	-1533	-1534	-1519	-1535
	1 1/4 Inch straight	7/8 -14 O-ring	104-––––	-3615	—	-1536	-1537	-1568	-1539	-1452	-1479	-1509	-1489

The following 30-digit coding system has been developed to identify all of the configuration options for the 2000 Series motor. Use this model code to specify a motor with the desired features. All 30 digits of the code must be present when ordering.

M	02	***	**	**	**	**	*	**	*	*	**	00	**	**	AA	F
1	2 3	4 5 6	7 8	9 10	11 12	13 14	15	16 17	18	19	20 21	22 23	24 25	26 27	28 29	30

1 Product

M	2000 Series motor

2 3 Product series

02	2000 Series Motor

4 5 6 Displacement

021	34.0 cm ^{3}/r [in^3/r]
025	40.8 cm ^{3}/r [in^3/r]
040	66.5 cm ^{3}/r [in^3/r]
049	80.6 cm ^{3}/r [4.92 in ^{3}/r]
055	90.6 cm ^{3}/r [5.53 in ^{3}/r]
062	101.6 cm ^{3}/r [6.20 in ^{3}/r]
080	130.6 cm ^{3}/r [7.97 in ^{3}/r]
096	158.1 cm ^{3}/r [9.65 in ^{3}/r]
119	194.8 cm ^{3}/r [11.89 in ^{3}/r]
149	244.3 cm ^{3}/r [14.91 in ^{3}/r]
187	306.6 cm ^{3}/r [18.71 in ^{3}/r]
240	393.8 cm ^{3}/r [24.03 in ^{3}/r
298	489.0 cm ^{3}/r [29.84 in ^{3}/r]

7 8 Mounting type

AB	Wheel, 4 Bolt: 108.0 [4.25] Pilot Dia. 13.59 [.535] Dia. Holes on 147.6 [5.81] Dia. Bolt circle. 127.0 [5.00] Dia. Rear mount pilot
AC	Standard, 2 Bolt: 82.6 [3.25] Pilot Dia. 13.59 [.535] Dia. Holes on 106.4 [4.19] Dia. Bolt circle. SAE A
AD	Bearingless (w/ leakage slots), 4 Bolt: 101.6 [4.00] Pilot Dia. 13.59 [.535] Dia. Holes on 127.0 [5.00] Dia. Bolt circle
AF	Standard, 2 Bolt: 101.6 [4.00] Pilot dia. 14.35 [.565] Dia. Holes on 146.0 [5.75] Dia. Bolt circle. SAE B
AH	Standard, 4 Bolt: 82.6 [3.25] Pilot Dia. 13.59 [.535] Dia. Holes on 106.4 [4.19] Dia. Bolt circle
AJ	Standard (Magneto), 4 Bolt: 82.6 [3.25] Pilot Dia. 13.59 [.535] Dia. Holes on 106.4 [4.19] Dia. Bolt Circle. 2.79 [.110] Pilot Length
AL	Wheel (European), 4 Bolt: 125 [4.92] Pilot Dia. 13.79 [.543] Dia. Holes on 159.99 [6.299] Dia. Bolt Circle
AP	Wheel, 4 Bolt: 108.0 [4.25] Pilot Dia. 13.59 [.535] Dia. Holes on 147.6 [5.81] Dia. Bolt Circle. 127.0 [5.00] Dia. Rear mount pilot. Spigot reduced to 88.9 [3.50] Dia. by 25.4 [1.00] Depth.
AZ	Bearingless (w/ leakage slots), 4 Bolt: 100.0 [3.94] Pilot Dia. 11.0 [.43] Dia. Holes on 125.0 [4.92] Dia bolt circle (european)

9 10 Output shaft

00	None (Bearingless)
01	25.40 [1.000] Dia. Straight shaft with 1/4-20UNC-2B Thread in End, 6.35 [.250] wide x 25.40 [1.000] Dia.Woodruff key
02	31.75 [1.250] Dia. Straight shaft with .375-16UNC-2B Thread in end, 7.938 [.3125] Sq x 31.75 [1.250] straight key
03	31.75 [1.250] Dia. 0.125:1 tapered shaft per SAE J501 with/1.000-20 UNEF-2A Threaded shaft end and slotted hex nut, 7.938 [.3125] Sq x 25.40 [1.0] straight key
04	31.75 [1.250] Dia. Flat root side fit, 14 tooth, 12/24 DP 30° involute spline w/ .375-16UNC-2B Thread in end, 33.0 [1.30] Min. Full spline length
05	25.40 [1.000] Dia. 6B spline per SAE J499 with .250- 20UNC-2B thread in end, 22.76 [.896] Min. Full spline length
07	22.22 [.875] Dia. Flat root side fit, 13 tooth, 16/32 DP 30° SAE B Involute Spline, 15.2 [.60] Min. Full Spline Length
16	32.00 [1.260] Dia. Straight Shaft with M8 x 1.25-6H Thread in End, 9.982 [.3930] W x 7.995 [.3132] H x 45.00 [1.772] L Key
17	31.75 [1.250] Dia. Straight shaft with 3/8 -16 UNC-2B Thread in end, 7.938 [.3125] Sq x 31.75 [1.250] straight key, corrosion resistant (seal area to shaft end)
19	25.00 [.984] Dia. Straight shaft with M8 x 1.25-6h thread in end, 7.982 [.3142]W x 6.954 [.2738]H x 31.82 [1.254]L key
41	35.00 [1.378] Dia. 10:1 Tapered shaft per ISO R775 with M20 x 1.5-6g threaded shaft end and slotted hex nut, 6.00 [.236] Sq. X 20.00 [.787] Key
42	35.00 [1.378] Dia. Straight shaft with M8 x 1.25-6h thread in end, 9.982 [.3930]W x 7.995 [.3132]H x 45.00 [1.772]L key

2000 Series

Model code

M	02	***	**	**	**	**	*	**	*	*	**	00	**	**	AA	F
1	2 3	4 5 6	7 8	9 10	11 12	13 14	15	16 17	18	19	20 21	22 23	24 25	26 27	28 29	30

11 12 Ports

AA	.875-14 UNF-2B SAE O-ring Ports - Staggered Ports
AB	12.70 [.500] and 15.88 [.625] Dia. Manifold ports with 3 x .375-16 UNC-2B port block mounting holes
AC	.875-14 UNF-2B SAE O-ring ports - ports oriented 180° to each other
AE	12.70 [.500] and 15.88 [.625] Dia. Manifold ports with 3 x M10 x 1.5-6H Port block mounting holes
AF	1.0625-12 UN-2B SAE O-ring ports - ports oriented 180° to each other
AG	G-1/2 BSP straight THD ports - staggered ports
AN	G-1/2 BSP Straight THD Ports - end ported
AS	G-1/2 Bsp Straight THD ports - staggered port with 2 x M10 x 1.5-6H port block mounting holes - european

13 14 Case flow options

(Shuttles available with port code AA only)

01	.4375-20 UNF-2B SAE O-Ring Port
02	G 1/4 BSP Straight THD Port
13	Reverse flow shuttle valve w/ .4375-20 UNF-2B SAE O-Ring port, .062 Dia. Shuttle flow orifice

15 Low pressure relief

0	None
A	Set at 4.5 bar [65 lbf/in ^{2}]
B	Set at 15.2 bar [220 lbf/in ^{2}]
C	Set at 20.7 bar [300 lbf/in ^{2}]
E	Set at 11.03 bar [160 lbf/in ^{2}]

16 17 Pressure/flow option

0	None
	Integral cross-over relief valve:
30	Set at 103.4 bar [1500 lbf/in ^{2}]
31	Set at 120.6 bar [1750 lbf/in ^{2}]
32	Set at 137.9 bar [2000 lbf/in ^{2}]
33	Set at 155.1 bar [2250 lbf/in ^{2}]
34	Set at 172.4 bar [2500 lbf/in ^{2}]
35	Set at 189.6 bar [2750 lbf/in ^{2}]
36	Set at 206.8 bar [3000 lbf/in ^{2}]
37	Set at 234.4 bar [3400 lbf/in ^{2}]

18 Geroler option

1	Standard
2	Free running
6	Reduced side clearance, no warranty for galling

19 Seal option

0	Standard
1	Viton
2	Viton shaft seal
3	High pressure shaft seal
4	Seal guard
5	Extreme duty seal guard
6	High pressure shaft seal, seal guard

20 21 Accessories

00	None
AA	Digital speed pickup (30 pulse), 127 [5.0] lead wire with weather pack shroud connector (A=Power, B=Signal, C=Common)
AD	Digital speed pickup (30 pulse), M12 connector (A=Power, B=Common, C=Signal)
AG	M12 connector (60 pulse per rev speed signal and one directional signal, (Pin 1=Power, Pin 2= Direction, Pin 3=Common, Pin 4=Speed)

22 23 Special features (hardware)

00	None

24 25 Special features (assembly)

00	None
AA	Flange rotated 90 degrees
AB	Reverse rotation
AE	Flange rotated 45 degrees

26 27 Paint/packaging

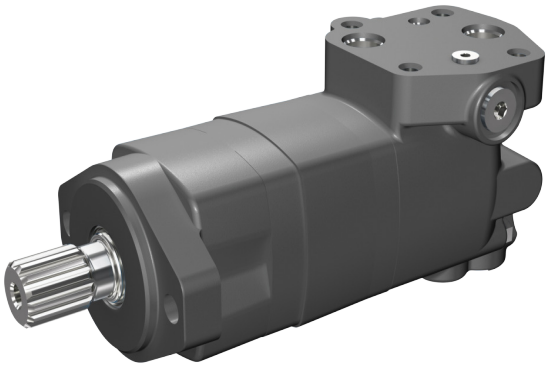
AA	No paint, indiv. Box
AB	Low gloss black primer, indiv. Box
AT	Epoxy coated black, individual box
BJ	Nickel plated motor (excluding shaft), individual box

28 29 Customer ID

AA	None

30 Design code

F	Sixth



The Danfoss 2000 Series motors are available with an integral two speed feature that changes the displacement in a ratio of 1 to 2 and shifts the motor from a low speed high torque (LSHT) mode to a high speed low torque (HSLT) mode. The open center selector valve shifts the speed mode from low to high speed when pilot pressure of 6.9 D Bar [100 D PSI] minimum is applied to the pilot port (6.9 Bar [100 PSI] higher than case pressure). In the high speed mode torque values are approximately one half with twice the speed of the conventional 2000 Series single speed motors.

An external two position three way valve is required for shifting the pilot pressure port between signal pressure (HSLT) and low pressure (LSHT) Two speed motors are available with a return line closed center shuttle for closed circuit applications. Low speed high torque mode is the normal position of the speed selector valve. When a differential pressure is supplied to the pilot port and 6.9 Bar [100 PSI] is reached, the selector valve overcomes the return spring force and the spool shifts to the high speed mode. The oil in the opposite side of the spool is drained internally. Pressure between the pilot supply and case drain or return line (depending on open or closed circuit system) must be maintained to keep the motor in the high speed mode.

When pilot pressure is removed from the pilot port the pressure in the pilot end of the spool valve is relieved and drained back through this three way valve, the spring force returns the spool valve to LSHT position. Pilot pressure may come from any source that will provide uninterrupted pressure during the high speed mode operation. Pilot pressure 6.9 Δ Bar [100 Δ PSI] minimum, up to the full operating pressure of the motor.

In normal LSHT operation the Char-Lynn two speed motor will function with equal shaft output in either direction (CW or CCW), the same as the single speed Char-Lynn disc valve motors.

However, to prevent cavitation in the HSLT mode, the preferred direction of shaft rotation is counter clockwise (port B pressurized). This unique disc valve is not symmetrical in porting the fluid for the HSLT mode. Consequently, when the pressure is reversed for HSLT CW rotation, cavitation can occur. Installing a restriction (200 psi or more depending on flow) in the hydraulic line that connects port B will prevent cavitation. If you are operating in a critical area and a restriction in the hydraulic line causes concern, these two speed motors can be ordered timed with CW preferred HSLT shaft rotation. Hence, with this option port B will have to be pressurized for CW preferred HSLT shaft rotation. The restriction recommended for the line connecting port B remains unchanged.

In closed circuit applications a hydraulic line restriction is not required. Instead, the charge pump can be used to supply and maintain a minimum pressure of 14 Bar [200 PSI].

Performance data

In the high speed mode torque values are approximately one half with twice the speed of the conventional 2000 Series single speed motors.

In the low speed mode torque and speed values are the same as the conventional 2000 Series motors.

Note: Displacements under 130 cm3/r [8.0 in3/r] have limited starting torque when started in high speed mode.

Be certain in closed loop applications that the charge pump when used for back pressure on the B port, has sufficient displacement to maintain charge pressure especially in dynamic braking or overrunning load conditions.

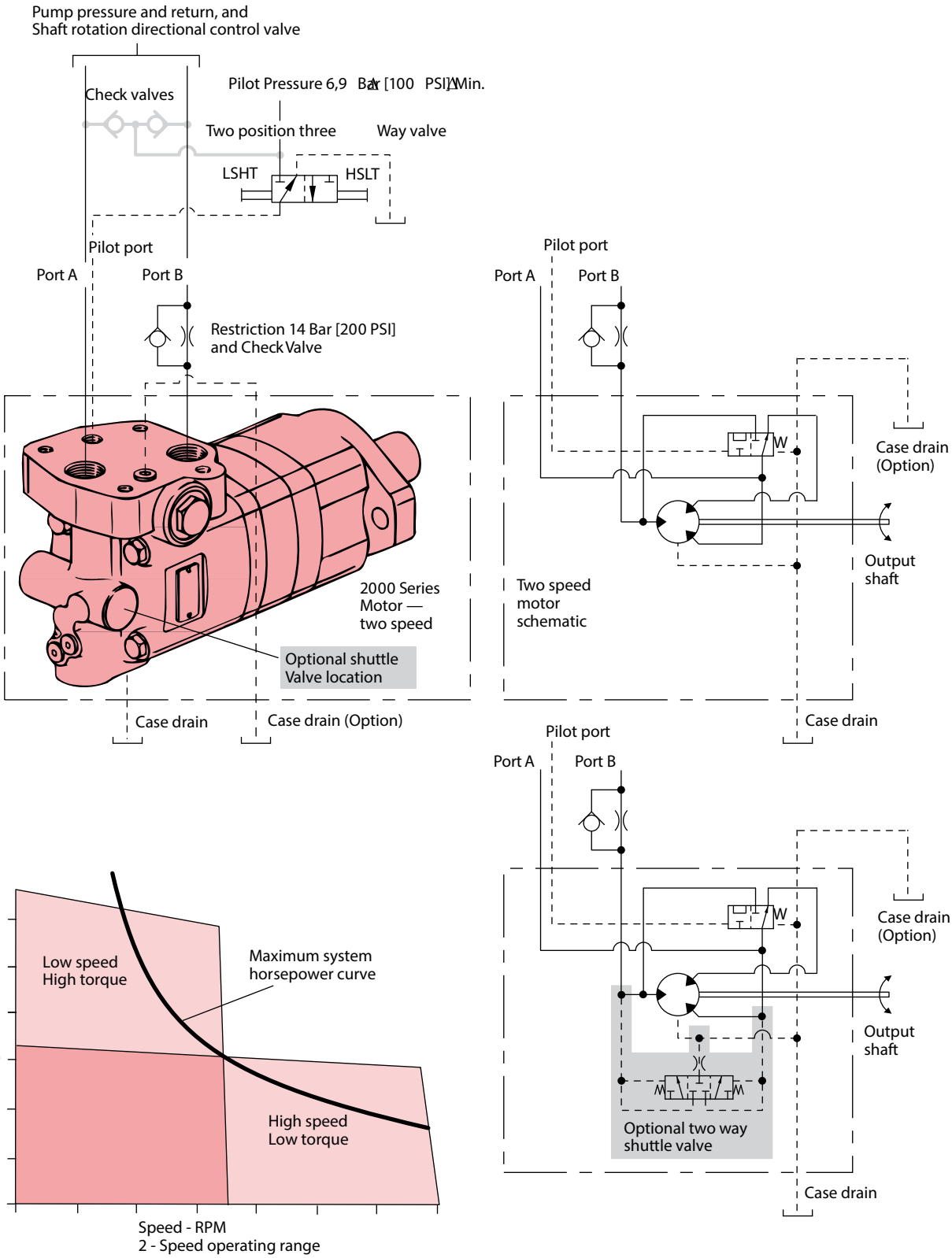
Due to potential problems in maintaining charge pump pressure at port B for uninterrupted back pressure during dynamic braking, Danfoss does not recommend the two speed motor where overrunning conditions may exist.

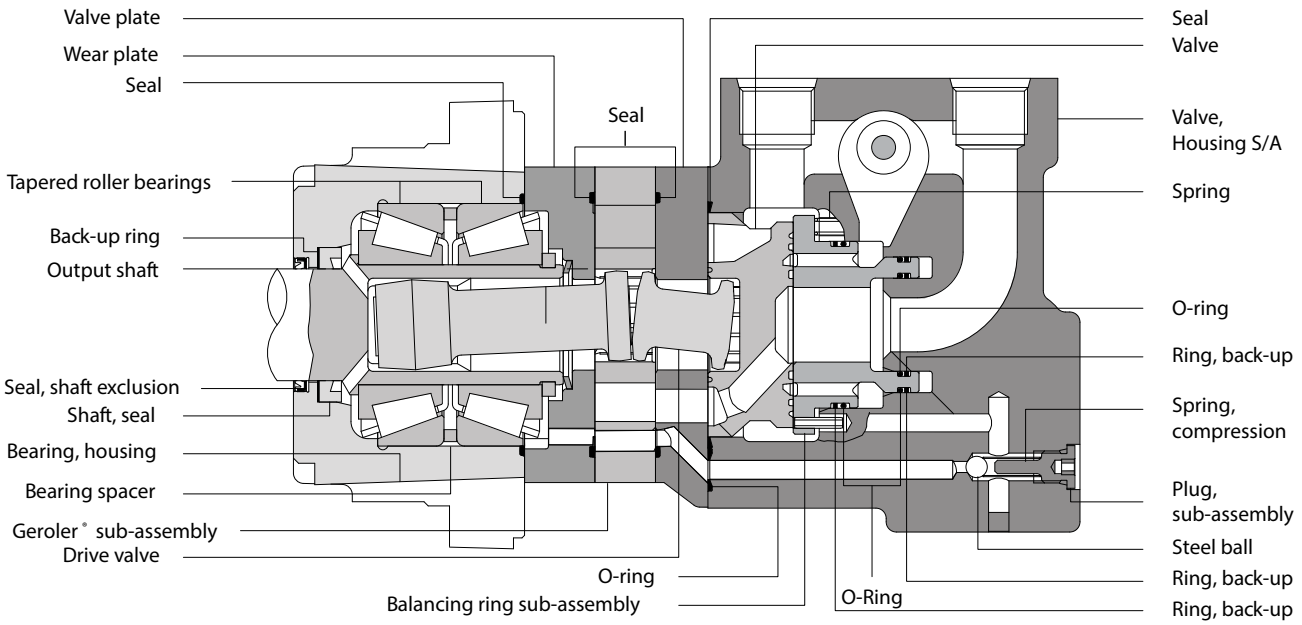
2000 Series Two-speed

Typical hydraulic circuit

Note:

This is the low speed biased motor circuit. For the high speed biased motor circuit please contact your Danfoss representative.





C-1

Specification data — 2000 series two-speed motors

Displ. cm³/r [in³/r]	**High speed mode**	**40 [2.45]**	**50 [3.1]**	**65 [4.0]**	**80 [4.8]**	**95 [5.95]**	**120 [7.45]**	**155 [9.35]**	**195 [12.0]**	**245 [14.9]**
	Low speed mode	**80 [4.9]**	**100 [6.2]**	**130 [8.0]**	**160 [9.6]**	**195 [11.9]**	**245 [14.9]**	**305 [18.7]**	**395 [24.0]**	**490 [29.8]**
Max. Speed (RPM) @ Continuous flow	High speed mode	1000	1000	990	860	700	560	450	350	230
	Low speed mode	500	500	495	430	350	280	225	175	115
Flow l/min [GPM]	High speed mode	45 [12]	55 [15]	70 [19]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]
	Low speed mode	45 [12]	55 [15]	70 [19]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]
Torque* Nm [lb - in]	High speed mode continuous intermittent	100 [880]	125 [1115]	165 [1450]	195 [1725]	240 [2150]	300 [2675]	380 [3350]	365 [3225]	448 [3970]
		145 [1300]	185 [1660]	240 [2150]	240 [2150]	300 [2650]	375 [3330]	440 [3900]	445 [3940]	486 [4300]
Torque* Nm [lb - in]	Low speed mode continuous intermittent	235 [2065]	295 [2630]	385 [3420]	455 [4040]	540 [4780]	660 [5850]	765 [6750]	775 [6840]	845 [7470]
		345 [3035]	445 [3950]	560 [4970]	570 [5040]	665 [5890]	820 [7250]	885 [7820]	925 [8170]	930 [8225]
Pressure Δ bar [Δ PSI]	Continuous intermittent	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	205 [3000]	155 [2250]	120 [1750]
		310 [4500]	310 [4500]	310 [4500]	260 [3750]	260 [3750]	260 [3750]	240 [3500]	190 [2750]	140 [2000]
Weight kg [lb]	Standard or wheel mount bearingless	13,8 [30.5]	14,1 [31.0]	14,3 [31.5]	14,5 [32.0]	15,0 [33.0]	15,4 [34.0]	15,9 [35.0]	16,3 [36.0]	16,8 [37.0]
		11.8 [26.0]	12,0 [26.5]	12,2 [27.0]	12,5 [27.5]	12.9 [28.5]	13,4 [29.5]	13,8 [30.5]	14,3 [31.5]	14,7 [32.5]

Maximum case pressure: See case pressure seal limitation graph.

*See shaft torque ratings for limitations.

Note: To assure best motor life, run motor in low speed high torque mode at approximately 30% of continuous pressure and 50% of continuous flow for 30 minutes in each direction before application of full load. Ensure that motor is filled with fluid prior to operation.

High speed mode: (Reduced motor displacement)

Low speed mode: (Full motor displacement)

Maximum inlet pressure:
310 bar [4500 PSI] Do not exceed Δ pressure rating (see chart above).

Maximum return pressure:
310 bar [4500 PSI] with case drain line installed.

Do not exceed Δ pressure rating (see chart above).

Δ bar [Δ PSI]:
The true pressure difference between inlet port and outlet port

Continuous rating:
Motor may be run continuously at these ratings

Intermittent operation: 10% of every minute

Peak operation: 1% of every minute

Recommended fluids:
Premium quality, anti-wear type hydraulic oil with a viscosity of not less than 13 cSt [70 SUS] at operating temperature.

Recommended system operating temp:
-34°C to 82°C [-30°F to 180°F]

Recommended filtration:
per ISO Cleanliness code, 4406: 20/18/13

Thermal shock warning:
Do not operate the motor with fluid that is 70F or more above the motor temperature.

Minimum delta pressure warning:
Motors must not run with equal inlet and outlet pressure 50 PSID minimum delta pressure between motor ports is required at all times (expect when switching direction of rotation)

2000 Series Two-speed

Dimensions

Standard and Wheel

Ports

7/8 -14 UNF-2B SAE O-ring staggered ports (2)
9/16 -18 UNF-2B SAE O-ring case drain port (1)
7/16 -20 UNF-2B SAE O-ring pilot control port (1)

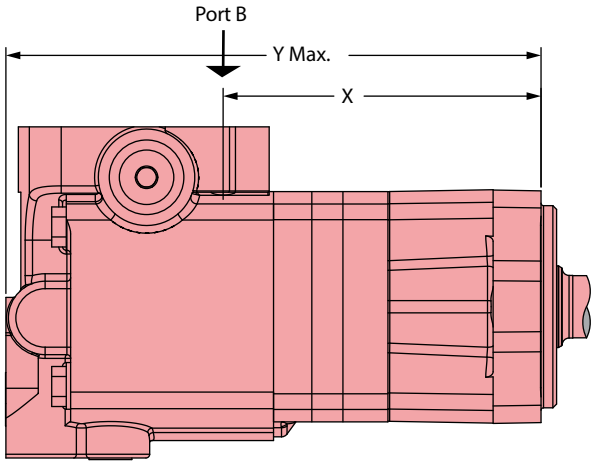
G 1/2 (BSP) staggered ports (2)
G 1/4 (BSP) case drain port (1)
G 1/4 (BSP) pilot control port (1)

Standard rotation viewed from shaft end

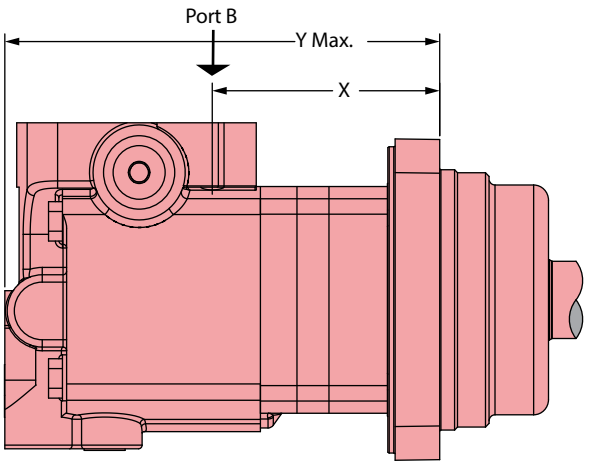
Port A pressurized — CW
Port B pressurized — CCW

C-1

Two-speed standard motors



Two-speed wheel motors



Standard mount motor dimensions

Displacement cm^3/r [in^3/r]	X mm [inch]	Y mm [inch]
80 [4.9]	137.4 [5.41]	231.6 [9.12]
100 [6.2]	142.0 [5.59]	236.5 [9.31]
130 [8.0]	148.5 [5.85]	242.9 [9.56]
160 [9.6]	148.5 [5.85]	242.9 [9.56]
195 [11.9]	155.2 [6.11]	249.4 [9.82]
245 [14.9]	164.2 [6.47]	258.6 [10.18]
305 [18.7]	175.7 [6.92]	270.1 [10.63]
395 [24.0]	191.5 [7.54]	286.1 [11.26]
490 [29.8]	209.0 [8.23]	303.3 [11.94]

Wheel mount motor dimensions

Displacement cm^3/r [in^3/r]	X mm [inch]	Y mm [inch]
80 [4.9]	97.2 [3.83]	191.5 [7.54]
100 [6.2]	101.8 [4.01]	196.4 [7.73]
130 [8.0]	108.3 [4.27]	202.7 [7.98]
160 [9.6]	108.3 [4.27]	202.7 [7.98]
195 [11.9]	115.0 [4.53]	209.3 [8.24]
245 [14.9]	124.2 [4.89]	218.5 [8.60]
305 [18.7]	135.5 [5.34]	229.9 [9.05]
395 [24.0]	151.4 [5.96]	245.9 [9.68]
490 [29.8]	168.9 [6.65]	263.1 [10.36]

Bearingless

Ports

7/8 -14 UNF-2B SAE O-ring staggered ports (2)
9/16 -18 UNF-2B SAE O-ring case drain port (1)
7/16 -20 UNF-2B SAE O-ring pilot control port (1)

G 1/2 (BSP) staggered ports (2)
G 1/4 (BSP) case drain port (1)
G 1/4 (BSP) pilot control port (1)

Standard rotation viewed from shaft end

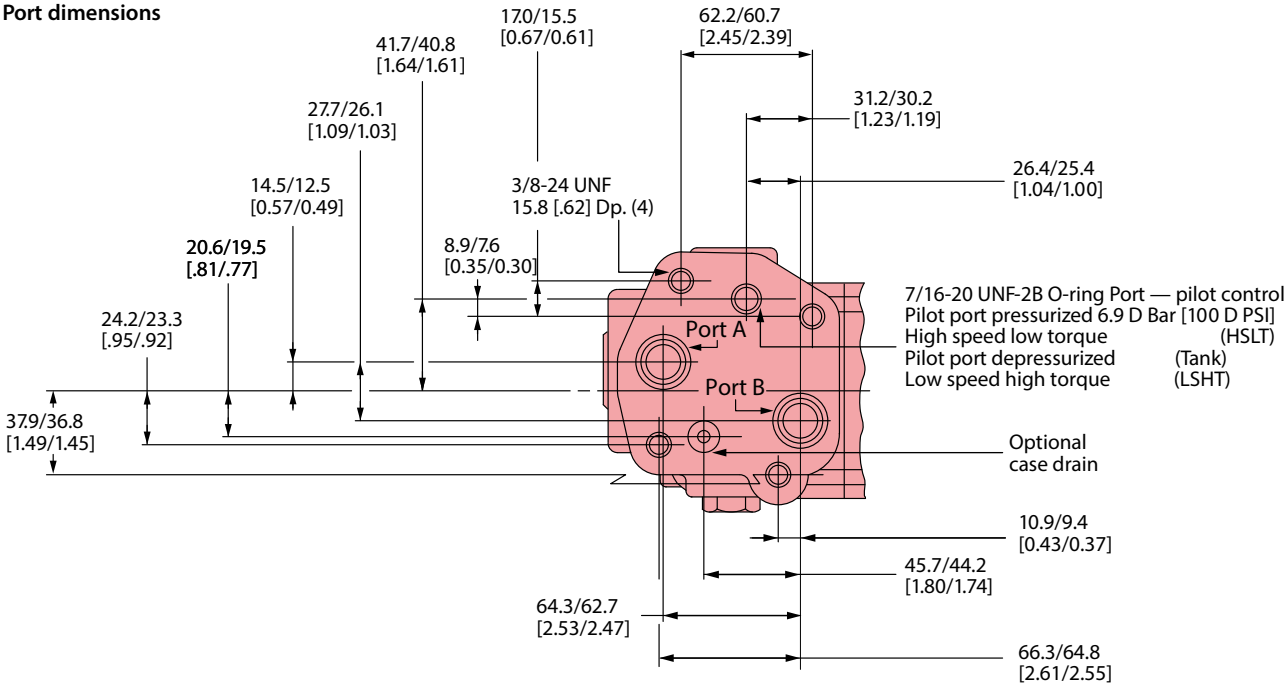
Port A pressurized — CW
Port B pressurized — CCW

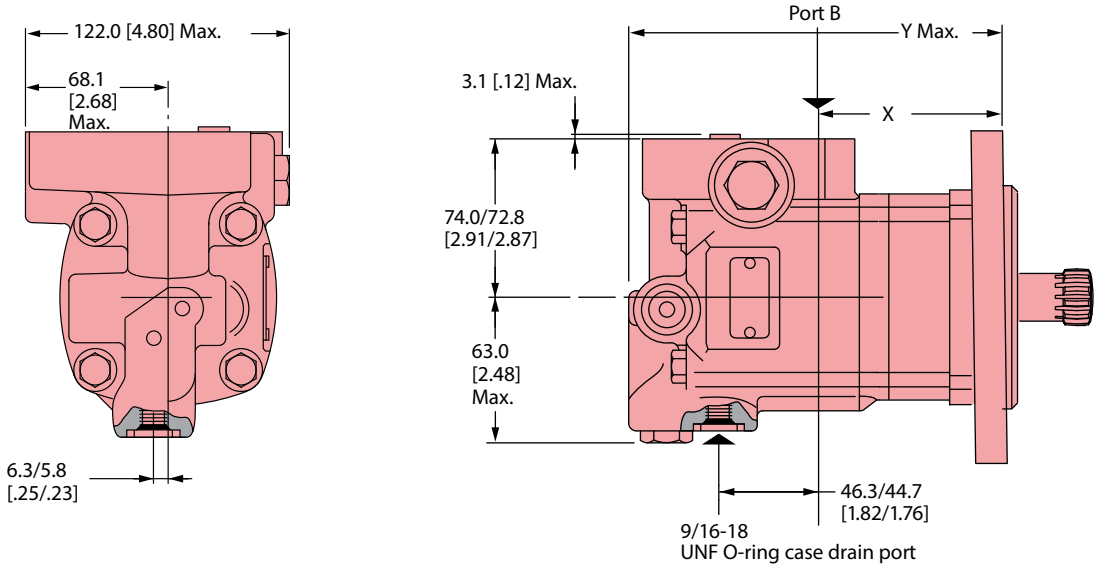
Bearingless motor dimensions

Displacement cm³/r [in³/r]	X mm [inch]	Y mm [inch]
80 [4.9]	79.3 [3.13]	174.0 [6.85]
100 [6.2]	84.1 [3.31]	178.9 [7.04]
130 [8.0]	90.7 [3.57]	185.2 [7.29]
160 [9.6]	90.7 [3.57]	185.2 [7.29]
195 [11.9]	97.3 [3.83]	191.8 [7.55]
245 [14.9]	106.4 [4.19]	201.0 [7.91]
305 [18.7]	117.8 [4.64]	212.4 [8.36]
395 [24.0]	133.6 [5.26]	228.4 [8.99]
490 [29.8]	151.1 [5.95]	245.6 [9.67]

C-1

Port dimensions





2000 Series Two-speed

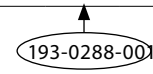
Product numbers

For 2000 Series Motors with a configuration not shown in the charts below: Use model code number system on the next page to specify product in detail.

Use digit prefix — 193- plus four digit number from charts for complete product number—Example 193-0002.

Orders will not be accepted without three digit prefix.

Mounting	Shaft	Port size	Displ. cm ^{3}/ r [in ^{3}/r] / product number								
			80	**100**	**130**	**160**	**195**	**245**	**305**	**395**	**490**
			[4.9]	**[6.2]**	**[8.0]**	**[9.6]**	**[11.9]**	**[14.9]**	**[18.7]**	**[24.0]**	**[29.8]**
2 Bolt SAE A flange	1 Inch straight	7/8 -14 O-ring staggered	193-0002-001	-0003	-0004	-0005	-0006	-0007	-0008	-0009	—
	1 1/4 Inch straight	7/8 -14 O-ring staggered	193-0010-001	-0011	-0012	-0013	-0014	-0015	-0016	-0017	-0070
	1 1/4 Inch 14 T splined	7/8 -14 O-ring staggered	193-0018-001	-0019	-0020	-0021	-0022	-0023	-0024	-0025	—
Wheel motor	1 1/4 Inch Tapered	7/8 -14 O-ring staggered	193-0222-001	—	—	-0225	-0226	-0227	-0228	-0229	—
	1 1/4 Inch 14 T splined	7/8 -14 O-ring staggered	—	—	-0232	-0257	-0234	-0235	-0236	-0237	—
Bearingless		7/8 -14 O-ring staggered	193-0282-001	-0283	-0234	-0285	-0286	-0287	-0288	-0289	—



C-1

The following 30-digit coding system has been developed to identify all of the configuration options for the 2000 Series motor. Use this model code to specify a motor with the desired features. All 30 digits of the code must be present when ordering.

M	22	**	**	**	**	**	0	00	1	*	00	00	00	**	AA	A
1	2 3	4 5 6	7 8	9 10	11 12	13 14	15	16 17	18	19	20 21	22 23	24 25	26 27	28 29	30

1 Product

M Motor

2 3 Series

22 2000 2 speed series (1:2 ratio)

4 5 6 Displacement

049 80.6 cm ³/r [4.92 in ³/r]
062 101.6 cm ³/r [6.20 in ³/r]
080 130.6 cm ³/r [7.97 in ³/r]
096 158.1 cm ³/r [9.65 in ³/r]
119 194.8 cm ³/r [11.89 in ³/r]
149 244.3 cm ³/r [14.91 in ³/r]
187 306.6 cm ³/r [18.71 in ³/r]
240 393.8 cm ³/r [24.03 in ³/r
298 489.0 cm ³/r [29.84 in ³/r]

7 8 Mounting description

AC Standard, 2 Bolt: 82.6 [3.25] Pilot Dia. 13.59 [.535] Dia. Holes on 106.4 [4.19] Dia. Bolt Circle. SAE A
AE Bearingless (w/ leakage slots), 4 bolt: 101.6 [4.00] pilot Dia. 13.59 [.535] Dia. Holes on 127.0 [5.00] Dia. Bolt circle
AF Standard, 2 Bolt: 101.6 [4.00] Pilot Dia. 14.35 [.565] Dia. Holes on 146.0 [5.75] Dia. Bolt Circle. SAE B Dia bolt circle (european)

9 10 Output shaft description

00 None (bearingless)
01 25.40 [1.000] Dia. Straight shaft with 1/4-20UNC-2B thread in end, 6.35 [.250] Wide x 25.40 [1.000] Dia. Woodruff key
02 31.75 [1.250] Dia. Straight shaft with .375-16UNC-2B Thread in end, 7.938 [.3125] Sq x 31.75 [1.250] straight key
04 31.75 [1.250] Dia. Flat root side fit, 14 tooth, 12/24 DP 30° involute spline w/ .375-16UNC-2B thread in end, 33.0 [1.30] Min. Full spline

11 12 Ports description

AA .875-14 UNF-2B SAE O-ring ports - staggered ports
AD G1/2 BSP ports - Staggered with M10x1.5-6H port block mounting holes

13 14 Case flow options/ Selector valve

01 .5625-10 UNF-2B SAE O-Ring case drain port, .4375-20 UNF-2B SAE O-Ring pilot control port, optional .4375-20 UNF-2B SAE case drain port for pilot, normally low speed
02 G1/4 Case drain port, G1/4 pilot control port, optional G1/4 case drain port for pilot, normally low speed

15 Shuttle valve/Low pressure relief

0 None

16 17 Pressure/flow option

00 None

18 Geroler option

1 Standard

19 Seal option

0 Standard
1 Viton
2 High Pressure shaft Seal
3 Seal Guard

20 21 Accessories

00 None

22 23 Special features (Hardware)

00 None

24 25 Special features (Assembly)

00 None

26 27 Paint/packaging

AA No paint, individual box
AB Low gloss black primer, individual box
BT Epoxy coated black, individual box

28 29 Customer Identification

AA None

30 Design code

A First