

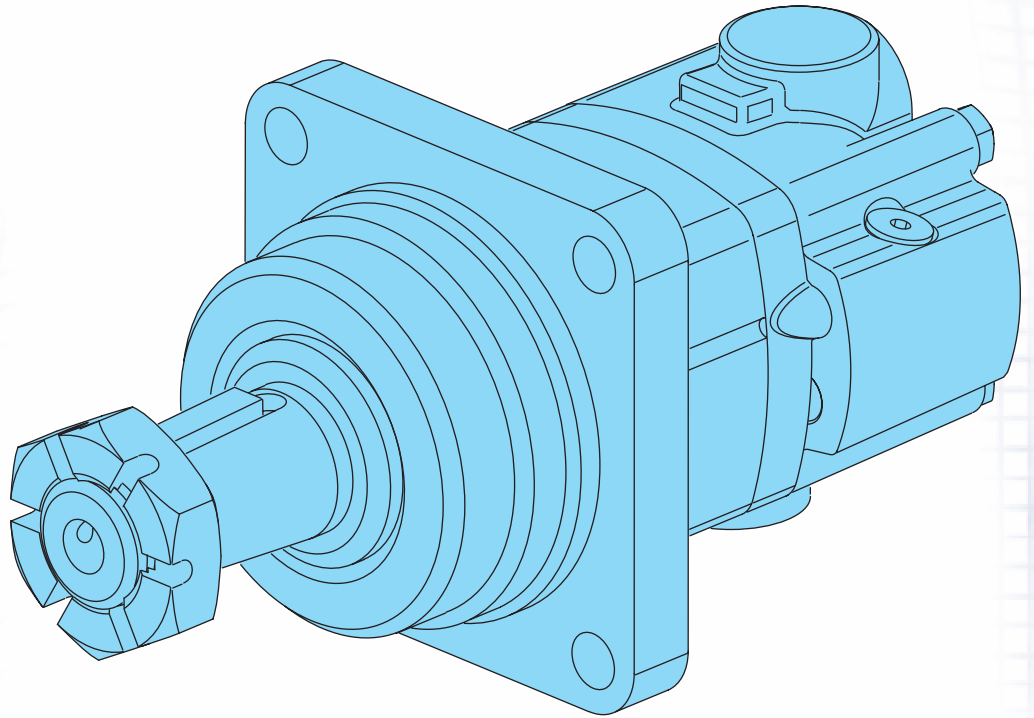
Hydraulics

Char-Lynn Hydraulic Solutions

Char-Lynn®

Disc Valve Hydraulic Motors

11-01-113
EN-0400



4000 Compact Series — Standard,
Wheel, and Bearingless Hydraulic Motors

We Manufacture

Solutions

4000 Compact Series

This new compact edition in a family of disc valve hydraulic motors produces the same amount of torque as the current 4000 Series. Yet, it is housed in an envelope similar to its smaller counterpart, the 2000 Series. The unit's intermittent torque rating is 1,166 Nm [10320 lb-in]. A variety of mounting options include two 2 bolt mounts (SAE A, SAE B), and four 4-bolt mounts (magneto, standard, and wheel mounts). For added flexibility, the motor can be specified with either the larger size shafts of the 2000 Series or standard output shaft sizes of the 4000 Series, plus one new 1-1/2 inch straight (the small envelope and optional shaft sizes make this motor ideal for vehicles like skid-steer loaders whose hallmark is high power and productivity in a small frame). Moreover, the 4000 Compact Series' small envelope provides flexibility for designs that demand economies in size and weight.

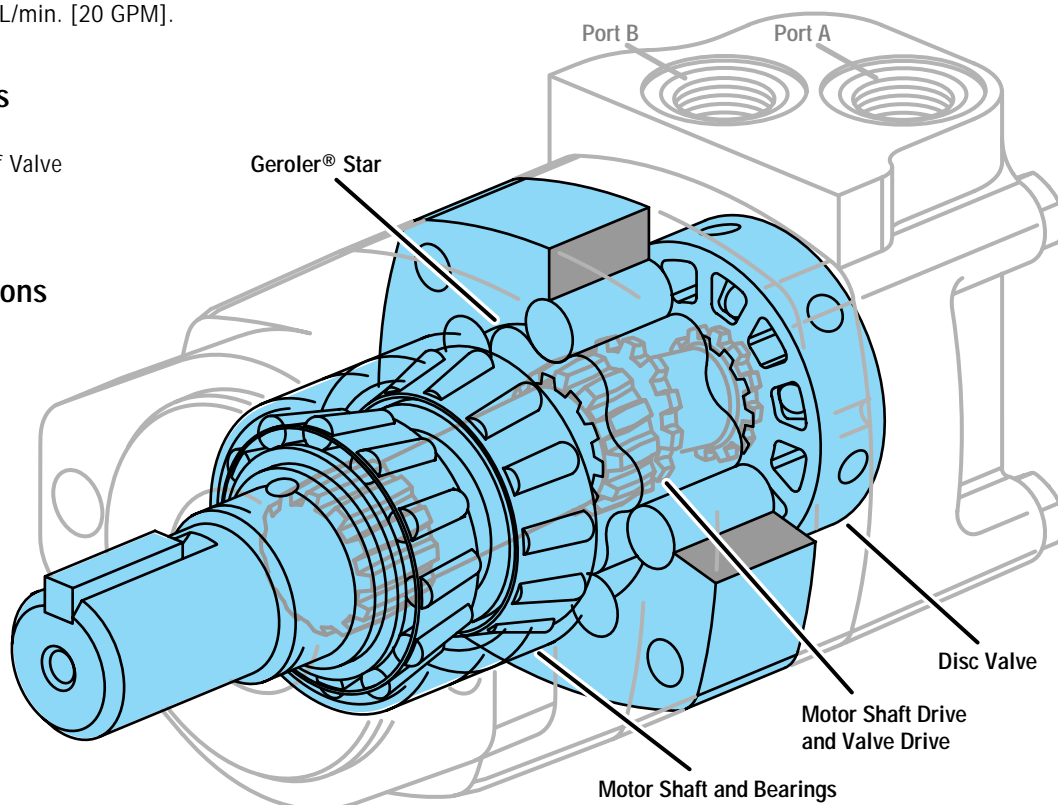
To achieve enhanced power density, Eaton redesigned the internal components of the 2000 Series. The redesign allowed Eaton to achieve a small hydraulic motor with the power density of a larger unit. The unit's patented Geroler® contributes to a high degree of volumetric efficiency. This allows the motor to run at higher pressures, thereby delivering greater power. The motor's high efficiency makes it especially suitable for fairway mowers which are susceptible to speed drop on steep grades. When used with a case drain the 4000 Compact Series features a non-pressurized shaft seal. The seal minimizes the occurrence of external leakage which is a concern in grounds-keeping applications. The 4000 Compact is available in six displacements that range from 160 to 490 cm³/r [9.8 to 29.8 in³/r]. Continuous torque can range from 460 to 932 Nm [4070 to 8250 lb-in]. Continuous pressure values range from 138 to 205 bar [2000 to 3000 PSI]. Maximum continuous flow is 75 L/min. [20 GPM].

Optional features

- Shuttle Valve with Back-Pressure Relief Valve
- Speed Sensors
- End Ports.

Typical applications

- Skid Steer Loaders
- Fairway Mowers
- Harvesters
- Vehicles where space may be at a premium.

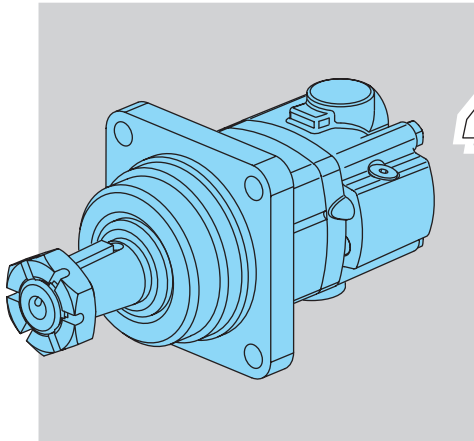


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* Contact your Eaton Representative for special orders.

4000 Compact Series



4000 Compact Series

4000 Compact Series

Geroler® Element.....	6 Displacements
Flow LPM [GPM]	75 [20] Continuous**
	115 [30] Intermittent*
Speed	Up to 707 RPM
Pressure Bar [PSI] ...	200 [3000] Cont.
	300 [4500] Inter.
Torque Nm [lb-in]	932 [8250] Cont.
	1166 [10320] Inter.

4000 Compact Series Displacement Size = cubic centimeter per shaft revolution (cm³/r)
= cubic inch per shaft revolution ([in³/r])

- 160 [9.8]
- 200 [12.3]
- 250 [15.4]
- 325 [19.8]
- 395 [24.0]
- 490 [29.8]

Mounting Flange

- 4 Bolt (Bearingless) 101,6 [4.00] Pilot Dia. and 13,59 [.535] Dia. Mounting Holes on 127,0 [5.00] Dia. B.C.
- 2 Bolt (SAE A) (Standard) 82,5 [3.25] Pilot Dia. and 13,59 [.535] Mounting Holes on 106,4 [4.19] Dia. B.C.
- 4 Bolt (Wheel) 107,9 [4.25] Pilot Dia. and 13,59 [.535] Dia. Mounting Holes on 147,6 [5.81] Dia. B.C.
- 4 Bolt (Standard) 82,5 [3.25] Pilot Dia. and 13,59 [.535] Dia. Mounting Holes on 106,4 [4.19] Dia. B.C.
- 4 Bolt Magneto 82,5 [3.25] Pilot Dia. and 13,59 [.535] Dia. Mounting Holes on 106,4 [4.19] Dia. B.C.
- 2 Bolt (SAE B) 101,6 [4.00] Pilot Dia. and 14,27 [.562] Dia. Mounting Holes on 146,0 [5.75] Dia. B.C.

Output Shaft

- Bearingless
- 1-1/4 inch Dia. Straight with Straight Key, 3/8-16 Threaded Hole and 47,3 [1.86] Max. Coupling Length
- 1-1/2 inch Dia. Straight with Straight Key, 3/8-16 Threaded Hole and 67,8 [2.67] Max. Coupling Length
- 32 mm Dia. Straight with Straight Key, M 8 x 1,25 -6H Threaded Hole and 56,4 [2.22] Max. Coupling Length
- 40 mm Dia. Straight with Straight Key, M12 x 1,75 -6H Threaded Hole and 79,6 [3.13] Max. Coupling Length
- 1-1/4 inch Dia. Splined 14 T, 3/8-16 Threaded Hole and 38,1 [1.50] Min. Full Spline Length and 53,1 [2.09] Max. Coupling Length
- 1-1/2 inch Dia. Splined 17 T, 31,2 [1.23] Min. Full Spline Length and 51,8 [2.04] Max. Coupling Length
- 1-1/4 inch Dia. Tapered with Straight Key and Nut
- 1-5/8 inch Dia. Tapered with Straight Key and Nut

Port Type

- 7/8-14 O-ring (Staggered) with 7/16-20 O-ring Case Drain
- G 1/2 (BSP) (Staggered) with G 1/4 (BSP) Case Drain
- Manifold Mount with 3/8-16 UNC Mounting Threads (3)
- Manifold Mount with M10 x 1,5 -6H Mounting Threads (3)
- 1-1/16-12 O-ring (Positioned 180° Apart)
- 7/8-14 O-ring (End Ports) with 7/16-20 O-ring Case Drain (Rear)

Case Flow

- 7/16-20 UNF 2-B O-ring Port
- G 1/4 (BSP) Straight Thread Port
- Shuttle Valve with 7/16-20 UNF 2-B O-ring Port
- Shuttle Valve with G 1/4 (BSP) Straight Thread Port

Back-Pressure Relief Valve

- Set at 4,5 bar [65 PSI]

Special Features

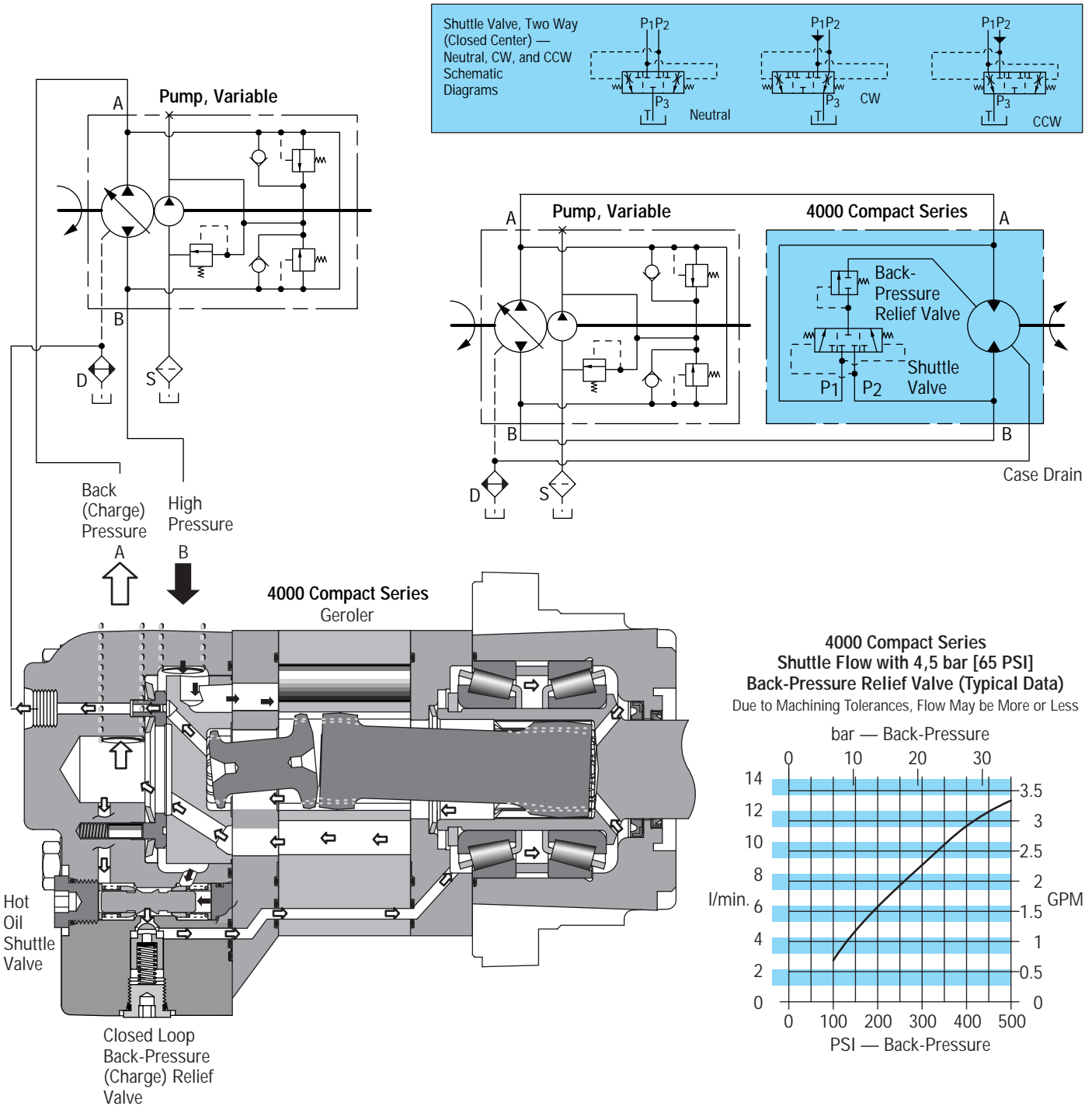
- Viton® Seal
- Speed Sensor
- Corrosion Protected
- Seal Guard Package

Viton® is a Registered Trade Name of Dupont Corp.

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

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

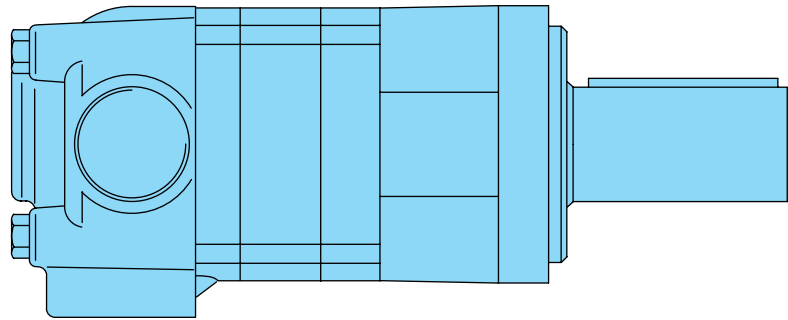
Typical (closed Loop) Hydraulic Circuit Shuttle Flow — 4000 Compact Series



4000 Compact Series with shuttle valve must have a case drain to tank, without this drain line the internal drive splines will not have adequate lubrication.

Low Speed High Torque Hydraulic Motors with Shuttle and Charge Pressure Relief Valve — Patent No. U.S. 4,645,438

Specifications — 4000 Compact Series



Specification Data — 4000 Compact Series

Displ. cm ³ /r [in ³ /r]		160 [9.8]	200 [12.3]	250 [15.4]	325 [19.8]	395 [24.0]	490 [29.8]	
Max. Speed (RPM) @ Flow	Continuous	471	375	300	233	191	153	
	Intermittent	707	563	450	350	288	230	
Flow L/min [GPM]	Continuous	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	75 [20]	
	Intermittent	115 [30]	115 [30]	115 [30]	115 [30]	115 [30]	115 [30]	
Torque Nm [lb-in]	☆ 1-1/2 Inch or larger Dia. Shaft	Continuous	460 [4070]	577 [5110]	723 [6400]	930 [8230]	939 [8310]	932 [8250]
		Intermittent	690 [6110]	866 [7660]	904 [8000]	1162 [10280]	1128 [9980]	1166 [10320]
Pressure Δ bar [Δ PSI]	☆ 1-1/2 Inch or larger Dia. Shaft	Continuous	205 [3000]	205 [3000]	205 [3000]	205 [3000]	172 [2500]	138 [2000]
		Intermittent	310 [4500]	310 [4500]	260 [3750]	259 [3750]	207 [3000]	172 [2500]
		Peak	310 [4500]	310 [4500]	310 [4500]	310 [4500]	276 [4000]	259 [3750]

Maximum Case Pressure - without Case Drain * — 140 bar [2000 PSI] for 1-1/4 inch and 32 mm Shafts

Maximum Case Pressure - without Case Drain * — 103 bar [1500 PSI] for 1-1/2 inch, 1-5/8 inch, and 40 mm Shafts

A simultaneous maximum torque and maximum speed NOT recommended. For permissible continuous and intermittent operating combinations of pressure and flow refer to performance data on pages 6-11.

☆ **Maximum torque for 1-1/4 inch shaft** — 770 Nm [6800 lb-in] Continuous and 960 Nm [8500 lb-in] intermittent.

* For continuous back pressure over 140 bar [2000 PSI] (or 103 bar [1500 PSI] on 1-1/2, 1-5/8 inch and 40 mm shafts) use an external case drain. Install case drain lines so that the motor case remains filled at all times.

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

* **Maximum return pressure** — 310 bar [4500 PSI]. Do not exceed Δ pressure rating (see chart above)

Δ Bar [Δ PSI] — 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 70 SUS at operating temperature (see fluid recommendations — Disc Valve Motor Catalog 11-878).

Recommended Maximum System Operating Temp. — Is 82° C [180° F]

Recommended Filtration — per ISO Cleanliness Code, level 18/13

To assure best motor life, run motor for approximately one hour at 30% of rated pressure before application to full load. Be sure motor is filled with fluid prior to any load applications.

Performance Data — 4000 Compact Series

Motors run with high efficiency in all areas designated with a number for torque and speed, *however for best motor life select a motor to run with a torque and speed range printed in the white background area.*

	Continuous
	Intermittent

160 cm³/r [9.8 in³/r]

Δ Pressure

PSI
bar

Flow GPM l/min	Δ Pressure																	
	250 15	500 35	750 50	1000 70	1250 85	1500 105	1750 120	2000 140	2250 155	2500 170	2750 190	3000 205	3250 225	3500 240	3750 260	4000 275	4250 295	4500 310
0.3	200 25	455 50																
.95	6	6																
0.5	240 25	525 60	815 90	1105 125														
1.9	12	10	9	9														
1	315 35	600 70	900 100	1180 135	1475 165	1745 195	2015 230	2240 250	2465 280	2685 305	2915 330	3140 355	3360 380	3580 405				
3.8	23	23	23	22	22	21	20	19	18	16	15	14	13	12				
2	300 35	655 75	995 110	1335 150	1675 190	2010 225	2335 265	2655 300	2945 335	3265 370	3540 400	3765 425	4005 450	4285 485	4550 515			
7.5	46	45	45	44	43	41	38	35	32	27	26	24	21	19	16			
4	300 35	695 80	1050 120	1410 160	1750 200	2080 235	2425 275	2775 315	3090 350	3420 385	3740 425	4030 455	4320 490	4640 525	4925 555	5045 570	5235 590	
15	91	92	91	89	87	85	80	77	75	73	70	63	59	51	39	24	13	
6	290 35	665 75	1040 115	1395 160	1750 200	2090 235	2440 275	2775 315	3115 350	3470 390	3775 425	4120 465	4425 500	4750 535	5050 570	5340 600	5615 635	5850 660
23	138	137	135	133	130	128	123	119	109	108	107	105	102	97	92	87	80	75
8	280 30	650 75	1010 115	1385 155	1745 195	2095 235	2440 275	2785 315	3125 355	3460 390	3795 430	4140 470	4455 505	4785 540	5140 580	5415 610	5700 645	6000 680
30	185	183	181	178	169	167	164	161	157	156	153	151	144	139	134	131	123	102
10	260 30	630 70	995 110	1350 155	1710 195	2100 235	2430 275	2790 315	3120 350	3465 390	3820 430	4145 470	4470 505	4810 545	5100 575	5440 615	5670 640	
38	232	230	227	225	222	213	210	207	205	202	198	195	190	185	178	173	165	
12	240 25	605 70	965 110	1330 150	1695 190	2045 230	2415 275	2765 310	3120 350	3445 390	3790 430	4140 470	4455 505	4765 540	5095 575	5395 610		
45	277	276	274	271	267	263	252	247	246	245	241	237	231	227	221	212		
14	215 25	575 65	945 105	1305 145	1660 190	2020 230	2375 270	2720 305	3085 350	3425 385	3780 425	4125 465	4410 500	4760 540	5090 575	5365 605		
53	325	322	319	316	308	304	301	299	295	291	286	281	275	267	261	251		
16	180 20	550 60	910 105	1270 145	1635 185	1985 225	2345 265	2695 305	3045 345	3420 385	3765 425	4120 465	4385 495	4730 535	5030 570			
61	371	368	366	363	354	351	348	345	340	335	330	325	319	309	302			
18	140 15	510 60	865 100	1235 140	1590 180	1945 220	2310 260	2665 300	3020 340	3370 380	3715 420	4040 455	4380 495	4730 535				
68	417	415	412	410	400	398	394	395	385	380	374	368	361	352				
20	120 15	470 55	835 95	1190 135	1545 175	1905 215	2265 255	2610 295	2960 335	3300 375	3655 415	3970 450	4315 490					
76	464	462	458	451	447	446	442	439	434	429	423	415	408					
22		435 50	795 90	1155 130	1515 170	1880 210	2235 255	2585 290	2935 330	3280 407	3600 405	3935 445						
83		509	505	501	496	491	487	484	478	473	466	458						
24		390 45	760 85	1115 125	1480 165	1840 210	2195 250	2540 285	2900 330	3255 403	3570 405	3920 440						
91		566	564	558	553	546	540	533	523	514	497	487						
25		375 40	735 85	1090 125	1450 165	1810 205	2175 245	2530 285	2875 325	3225 400	3540 400							
95		578	574	570	565	559	552	551	546	541	532							
30		245 30	600 70	970 110	1320 150	1690 190	2050 230	2400 270	2750 310	3105 390	3455 390							
114		696	692	687	681	674	665	660	654	649	639							

3455 Torque [lb-in]
390 Torque (Nm)
639 Speed (RPM)

Performance Data is Typical at 120 SUS. Actual data may vary slightly from unit to unit in production

Performance Data — 4000 Compact Series

Motors run with high efficiency in all areas designated with a number for torque and speed, *however for best motor life select a motor to run with a torque and speed range printed in the white background area.*



200 cm³/r [12.3 in³/r]

Δ Pressure

Flow
GPM
l/min

	250	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3250	3500	3750	4000	4250	4500
	15	35	50	70	85	105	120	140	155	170	190	205	225	240	260	275	295	310
0.3	250	570																
.95	30	65																
	5	5																
0.5	300	660	1025	1385														
1.9	35	75	115	155														
	9	8	7	7														
1	395	755	1130	1480	1850	2190	2530	2800	3090	3370	3660	3940	4220	4495				
3.8	45	85	130	165	210	245	285	320	350	380	415	445	475	510				
	18	18	18	18	17	17	16	15	14	13	12	12	11	10				
2	380	825	1250	1675	2100	2525	2930	3330	3700	4100	4440	4725	5025	5380	5710			
7.5	45	95	140	190	235	285	330	375	420	465	500	535	570	610	645			
	37	36	36	35	34	33	30	28	26	22	21	19	17	15	13			
4	380	870	1325	1770	2195	2610	3045	3485	3880	4290	4695	5055	5420	5825	6180	6330	6575	
15	45	100	150	200	250	295	345	395	440	485	530	570	610	660	700	715	745	
	73	73	72	71	69	68	64	62	60	58	56	50	47	41	31	19	10	
6	365	835	1305	1750	2195	2625	3065	3485	3915	4350	4740	5170	5555	5960	6335	6705	7045	7345
23	40	95	150	200	250	295	345	395	440	490	535	585	630	675	715	760	795	830
	110	109	108	106	103	102	98	94	87	86	85	84	81	77	73	69	64	60
8	350	820	1270	1740	2190	2630	3065	3500	3925	4340	4764	5195	5590	6005	6455	6795		
30	40	90	145	195	245	295	345	395	445	490	540	585	630	680	730	770		
	148	146	144	142	135	133	131	128	125	124	122	120	115	111	107	104		
10	326	790	1245	1695	2145	2635	3050	3500	3915	4345	4795	5205	5610	6040	6400	6830		
38	35	90	140	190	245	290	345	395	445	490	540	590	635	680	725	770		
	185	183	181	179	177	170	167	165	163	161	158	155	151	147	142	138		
12	300	760	1215	1670	2125	2565	3035	3470	3920	4325	4760	5195	5595	5980				
45	35	85	135	190	240	290	345	390	440	490	540	585	630	675				
	221	220	218	216	213	210	201	197	196	195	192	189	184	181				
14	270	725	1185	1640	2080	2535	2979	3415	3875	4300	4745	5180	5535					
53	30	80	135	185	235	285	335	385	430	485	535	585	625					
	259	257	254	252	245	242	240	238	235	232	228	224	219					
16	225	690	1140	1595	2050	2495	2940	3380	3820	4295	4725	5170	5505					
61	25	80	130	180	230	280	330	380	430	485	535	585	620					
	296	294	291	289	282	280	277	275	271	267	263	259	254					
18	170	640	1090	1555	2000	2440	2895	3345	3790	4230	4660	5070	5500					
68	20	70	125	175	225	275	325	375	430	475	525	575	620					
	333	331	328	326	319	317	314	315	307	303	298	293	288					
20	150	590	1050	1495	1940	2390	2840	3275	3715	4145	4585	4980	5420					
76	15	65	120	170	220	270	320	370	420	470	520	565	610					
	370	368	365	359	356	355	352	350	346	342	337	331	325					
22		545	1000	1450	1900	2360	2810	3245	3685	4120	4515	4940						
83		60	115	165	215	265	315	365	415	465	510	560						
		405	403	399	395	391	388	386	381	377	371	365						
24		490	955	1400	1860	2310	2760	3190	3640	4085	4480							
91		55	110	160	210	260	310	360	410	460	505							
		451	449	445	440	435	430	424	417	410	396							
25		470	925	1370	1820	2270	2725	3175	3610	4050	4445							
95		55	105	155	205	255	310	360	410	460	500							
		460	457	454	450	445	440	439	435	431	424							
30		305	755	1215	1655	2120	2575	3010	3455	3895	4335							
114		35	85	135	185	240	290	340	390	440	490							
		555	551	547	543	537	530	526	521	517	509							

4335 Torque [lb-in]
490 Torque (Nm)
509 Speed (RPM)

Performance Data is Typical at 120 SUS. Actual data may vary slightly from unit to unit in production

Performance Data — 4000 Compact Series

Motors run with high efficiency in all areas designated with a number for torque and speed, *however for best motor life select a motor to run with a torque and speed range printed in the white background area.*

Continuous
 Intermittent

250 cm³/r [15.4 in³/r]

Δ Pressure

PSI

bar

Flow GPM l/min	Δ Pressure															
	250 15	500 35	750 50	1000 70	1250 85	1500 105	1750 120	2000 140	2250 155	2500 170	2750 190	3000 205	3250 225	3500 240	3750 260	
0.5	425 48 1,9	880 100 2														
1	465 55 3,8	960 110 12	1465 165 11	1910 215 10	2400 270 9	2875 325 8	2260 380 7	3775 425 5	4235 480 4	4695 530 3	5150 580 3	5610 635 2	6070 685 1			
2	500 55 7,5	1060 120 26	1600 180 25	2140 240 24	2675 300 23	3195 360 22	3720 420 21	4220 475 18	4675 530 17	5105 580 16	5480 620 15	5875 665 12	6340 715 11	6800 770 9	7230 820 7	
4	500 55 15	1075 120 56	1630 185 55	2180 245 53	2705 305 51	3235 365 50	3790 430 48	4310 490 44	4805 545 43	5315 600 43	5825 660 43	6335 715 39	6765 765 38	7130 805 37	7545 850 35	
6	485 55 23	1040 120 85	1600 180 84	2150 245 82	2715 305 79	3250 365 78	3790 430 76	4325 490 71	4860 550 69	5380 610 66	5870 665 64	6380 720 58	6890 780 56	7385 835 54	7825 885 52	
8	455 50 30	1045 120 115	1595 180 113	2145 240 111	2710 305 108	3245 365 106	3785 425 104	4340 490 99	4855 550 97	5385 610 95	5910 670 87	6405 725 86	6925 780 84	7400 835 73	7890 890 71	
10	430 50 38	1005 115 143	1580 180 141	2135 240 140	2695 305 138	3265 365 136	3785 425 134	4330 490 127	4860 550 125	5400 610 123	5940 670 121	6445 730 98	6935 785 98	7410 835 92		
12	405 45 45	975 110 173	1545 175 172	2120 240 170	2675 300 167	3215 365 165	3765 425 163	4320 490 156	4840 545 154	5375 605 151	5905 665 148	6435 730 117	6900 780 117			
14	355 40 53	935 105 203	1505 170 202	2075 235 199	2640 300 197	3200 360 195	3760 425 192	4295 485 184	4840 545 152	5370 605 177	5900 665 175	6410 725 153				
16	310 35 61	880 100 232	1460 165 230	2025 230 228	2590 285 226	3160 360 224	3720 420 222	4255 480 213	4830 545 208	5345 605 204	5880 665 203	6415 725 180				
18	260 30 68	830 95 260	1415 160 260	1975 225 258	2545 290 256	3115 350 254	3665 415 251	4205 475 241	4755 535 236	5305 600 231	5835 660 231	6345 715 208				
20	210 25 76	775 85 289	1345 150 287	1915 215 285	2490 280 283	3055 345 281	3610 410 278	4175 470 267	4715 535 264	5250 595 263	5770 650 260					
22		705 80 83	1290 145 321	1850 210 318	2420 275 316	2990 340 315	3550 400 312	4165 470 308	4650 525 298	5155 580 295	5670 635 292					
24		630 70 91	1215 135 352	1780 200 350	2350 265 347	2910 330 345	3485 395 343	4035 455 340	4590 520 336	5130 580 321	5620 635 322					
25		600 70 95	1185 135 366	1770 200 364	2320 260 361	2885 325 359	3440 390 357	3990 450 355	4500 510 350	5000 565 340						
30		390 45 114	990 115 441	1560 175 439	2125 240 437	2710 305 435	3255 370 432	3810 430 429	4370 495 426	4840 545 416						

5000 Torque [lb-in]
 565 Torque (Nm)
 403 Speed (RPM)

Performance Data is Typical at 120 SUS. Actual data may vary slightly from unit to unit in production

Performance Data — 4000 Compact Series

Motors run with high efficiency in all areas designated with a number for torque and speed, *however for best motor life select a motor to run with a torque and speed range printed in the white background area.*

	Continuous
	Intermittent

325 cm³/r [19.8 in³/r]

Δ Pressure

PSI

bar

	250	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3250	3500
	15	35	50	70	85	105	120	140	155	170	190	205	225	240
0.5	545	1130												
1,9	60	130												
1	600	1235	1885	2460	3085	3695	4320	4855	5445	6035				
3,8	70	140	215	280	350	420	490	550	615	680				
2	640	1365	2060	2750	3435	4105	4780	5425	6015	6565	7050	7555	8150	
7,5	75	155	230	310	390	465	540	615	680	740	795	855	920	
4	645	1385	2100	2805	3480	4160	4870	5540	6175	6835	7485	8145	8700	9165
15	75	155	235	315	395	470	550	625	700	770	845	920	985	1035
6	620	1335	2060	2765	3490	4175	4875	5565	6250	6915	7550	8205		
23	70	150	230	310	395	470	550	630	705	780	855	925		
8	585	1335	2055	2755	3485	4170	4865	5580	6240	6925	7600			
30	65	150	230	310	395	475	550	630	705	780	860			
10	555	1290	2030	2745	3465	4195	4865	5565	6240	6940	7635			
38	65	145	230	310	390	470	550	630	705	785	865			
12	525	1255	1990	2725	3440	4135	4845	5555	6225	6910				
46	60	140	225	310	390	465	545	630	705	780				
14	455	1200	1935	2670	3395	4110	4835	5520	6220	6900				
53	50	135	220	300	385	465	545	625	700	780				
16	400	1130	1875	2600	3330	4065	4785	5470	6205					
61	45	130	210	295	375	460	540	620	700					
18	335	1065	1820	2540	3270	4005	4710	5410	6110					
68	40	120	205	285	370	455	530	610	690					
20	270	995	1730	2465	3200	3925	4640	5365						
76	30	110	195	280	360	445	525	605						
22	190	910	1660	2380	3110	3845	4565	5355						
83	20	105	185	270	350	435	515	605						
24		810	1560	2290	3025	3740	4480	5185						
91		90	175	260	340	425	505	585						
25		775	1525	2280	2985	3710	4425	5130						
95		85	170	255	335	420	500	580						
30		500	1275	2010	2730	3480	4185							
114		55	145	225	310	395	475							

4185 Torque [lb-in]
 475 Torque (Nm)
 329 Speed (RPM)

Performance Data is Typical at 120 SUS. Actual data may vary slightly from unit to unit in production

Performance Data — 4000 Compact Series

Motors run with high efficiency in all areas designated with a number for torque and speed, *however for best motor life select a motor to run with a torque and speed range printed in the white background area.*

	Continuous
	Intermittent

395 cm³/r [24.0 in³/r]

Δ Pressure

PSI
bar

	250	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000
	15	35	50	70	85	105	120	140	155	170	190	205
0.5	120	1095										
1,9	15	125										
	5	2										
1	335	1225	2320	3110	3830	4670	5400	6115	7120	7525	8430	
3,8	30	140	250	350	435	525	610	690	790	850	955	
	9	9	9	9	9	9	9	9	7	3		
2	355	1320	2380	3200	3950	4750	5560	6325	7015	7690	8385	9055
7,5	30	140	250	350	445	535	630	715	790	870	945	1025
	19	19	19	18	18	17	17	15	14	11	8	6
4	425	1465	2420	3315	4145	5010	5805	6565	7300	8055	8695	
15	50	165	275	375	470	565	655	740	825	910	980	
	38	37	37	36	35	34	32	28	25	21	24	
6	600	1570	2490	3365	4225	5095	5905	6700	7450	8155		
23	70	180	280	380	475	575	665	755	840	920		
	57	56	55	55	53	52	48	45	41	37		
8	620	1570	2530	3395	4280	5155	5965	6570	7535			
30	70	180	285	385	485	580	675	745	850			
	76	75	75	73	72	69	67	63	59			
10	575	1570	2490	3380	4265	5120	5970	6800	7595			
38	65	180	280	380	480	580	675	770	860			
	95	95	94	92	91	88	84	80	76			
12	550	1520	2470	3365	4245	5080	5935	6745				
46	60	170	280	380	480	575	670	760				
	114	113	112	111	109	106	103	98				
14	505	1470	2410	3290	4185	5065	5935	6735				
53	60	165	270	370	475	570	670	760				
	133	132	132	130	128	125	120	115				
16	430	1375	2325	3230	4135	5075	5895					
61	50	155	260	365	465	570	665					
	152	151	150	149	147	143	139					
18	365	1250	2245	3140	4060	4910	5785					
68	40	140	255	355	460	555	655					
	171	171	169	168	166	163	158					
20	280	1150	2075	3075	3980	4855	5725					
76	30	130	253	350	450	550	645					
	190	190	189	187	185	180	176					
22		1050	1960	2985	3865	4760	5625					
83		120	220	335	435	540	635					
		209	209	205	204	201	196					
24		905	1840	2755	3755	4690	5540					
91		100	210	310	425	530	625					
		228	227	226	223	219	213					
26		820	1715	2615	3585	4575						
98		95	195	295	405	520						
		247	246	246	243	237						
28		710	1620	2495	3420	4435						
106		80	185	280	385	500						
		266	266	265	264	258						
30		555	1470	2355	3260	4135						
114		65	165	265	370	465						
		285	285	284	283	282						
35			1310	2125	2990							
132			150	240	340							
			332	331	330							

Flow
GPM
l/min

2990 Torque [lb-in]
340 Torque (Nm)
330 Speed (RPM)

Performance Data is Typical at 120 SUS. Actual data may vary slightly from unit to unit in production

Performance Data — 4000 Compact Series

Motors run with high efficiency in all areas designated with a number for torque and speed, *however for best motor life select a motor to run with a torque and speed range printed in the white background area.*

Continuous
 Intermittent

490 cm³/r [29.8 in³/r]

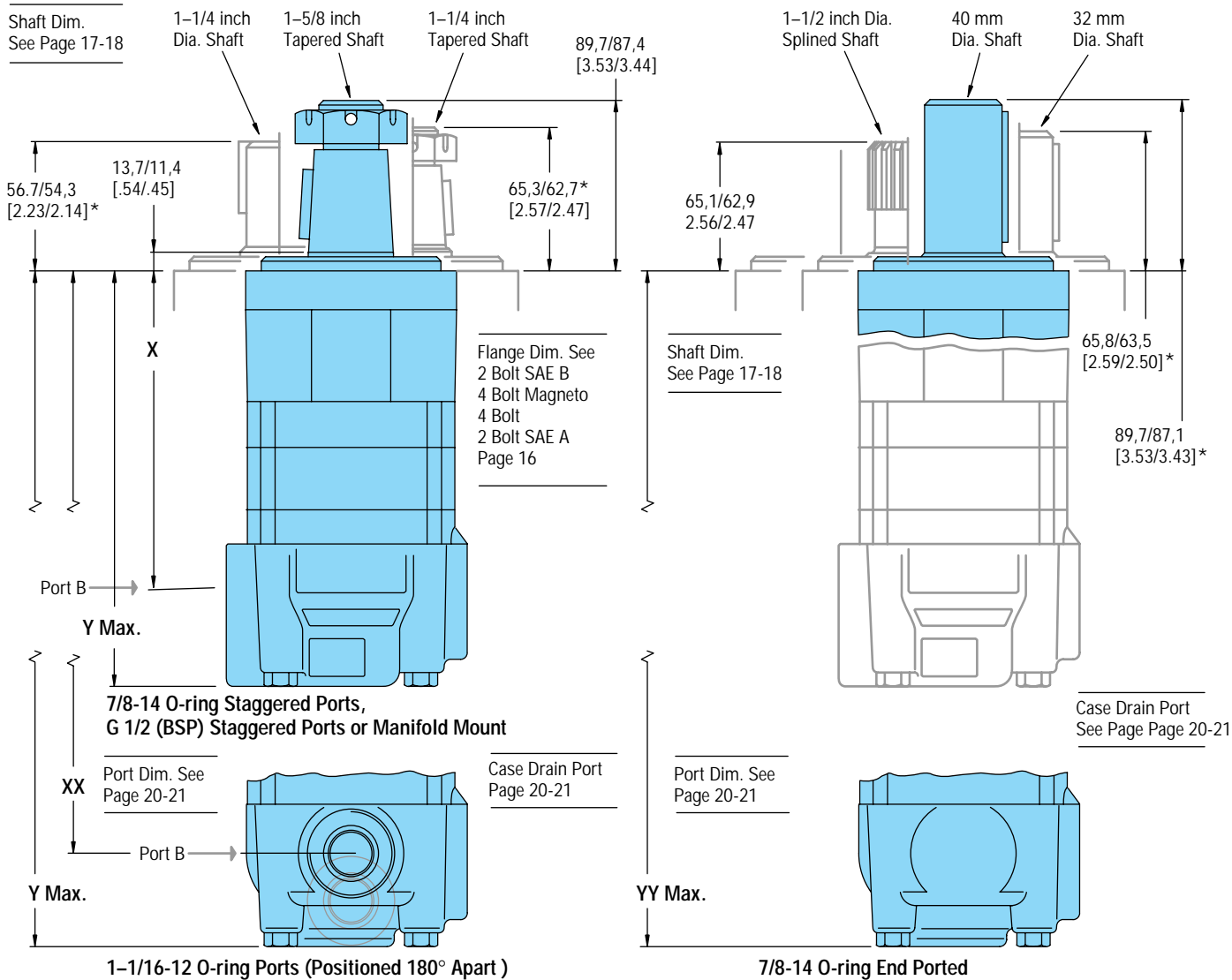
Δ Pressure

	PSI									
	250	500	750	1000	1250	1500	1750	2000	2250	2500
	15	35	50	70	85	105	120	140	155	170
0.5	150	1360								
	15	155								
1,9	2	1								
1	415	1520	2880	3865	4755	5800	6705	7600		
	45	170	325	435	535	655	760	860		
3,8	7	6	5	4	3	2	2	1		
2	600	1815	2920	3930	4950	5895	6870	7780	8550	
	68	205	330	445	560	665	775	880	965	
7,5	15	14	14	13	11	11	10	10	8	
4	800	1985	3120	4165	5175	6185	7200	8090	8975	9850
	90	225	350	470	585	700	815	915	1015	1115
15	30	29	29	28	27	25	23	20	16	13
6	865	2025	3150	4240	5300	6335	7355	8355	9310	
	100	230	355	480	600	715	830	945	1050	
23	46	45	44	43	41	39	36	33	29	
8	870	2010	3160	4250	5305	6353	7340	8330		
	100	225	355	480	600	720	830	940		
30	60	60	59	58	56	54	51	46		
10	830	1970	3105	4220	5275	6320	7340	8355		
	95	225	350	475	595	715	830	940		
38	76	76	74	73	72	69	65	61		
12	735	1925	3050	4145	5225	6275	7320			
	85	215	345	470	590	710	825			
45	91	91	90	89	86	83	80			
14	710	1850	2960	4085	5160	6195	7225			
	80	210	335	460	585	700	815			
53	107	107	105	104	102	98	94			
16	570	1755	2890	4060	5100	6155	7190			
	65	200	325	460	575	695	810			
61	122	122	120	119	116	112	108			
18	480	1630	2785	3895	4990	6095	7110			
	55	185	315	440	565	690	805			
68	137	137	136	134	132	127	122			
20	375	1495	2665	3790	4905	5975				
	40	170	300	430	555	675				
76	152	152	151	149	147	143				
22	225	1330	2545	3660	4785	5895				
	25	150	290	415	540	665				
83	167	167	167	165	162	157				
24	115	1170	2435	3540	4655	5750				
	15	130	275	400	525	650				
91	184	183	182	179	177	172				
26		1030	2205	3415	4525	5620				
		115	250	385	510	635				
98		198	197	195	192	190				
28		890	2025	3295	4380	5455				
		100	230	370	495	615				
106		214	213	210	207	203				
30		715	1855	3005	4215					
		80	210	340	475					
114		229	229	227	223					

4215 Torque [lb-in]
475 Torque (Nm)
223 Speed (RPM)

Performance Data is Typical at 120 SUS. Actual data may vary slightly from unit to unit in production

Dimensions — 4000 Compact Series Standard Motor



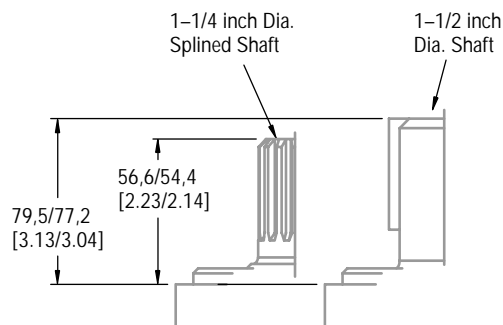
4000 Compact Series Standard Motor with 7/8-14 O-ring Staggered Ports, G 1/2 (BSP) Staggered Ports or Manifold Mount

Displ. cm ³ /r [in ³ /r]	160 [9.8]	200 [12.3]	250 [15.4]	325 [19.8]	395 [24.0]	490 [29.8]
Dim. mm	154,8	163,7	175,1	191,1	191,1	208,4
X [inch]	[6.10]	[6.45]	[6.90]	[7.53]	[7.53]	[8.21]
Dim. mm	202,2	211,1	222,6	238,6	238,6	255,8
Y [inch]	[7.96]	[8.31]	[8.76]	[9.39]	[9.39]	[10.07]

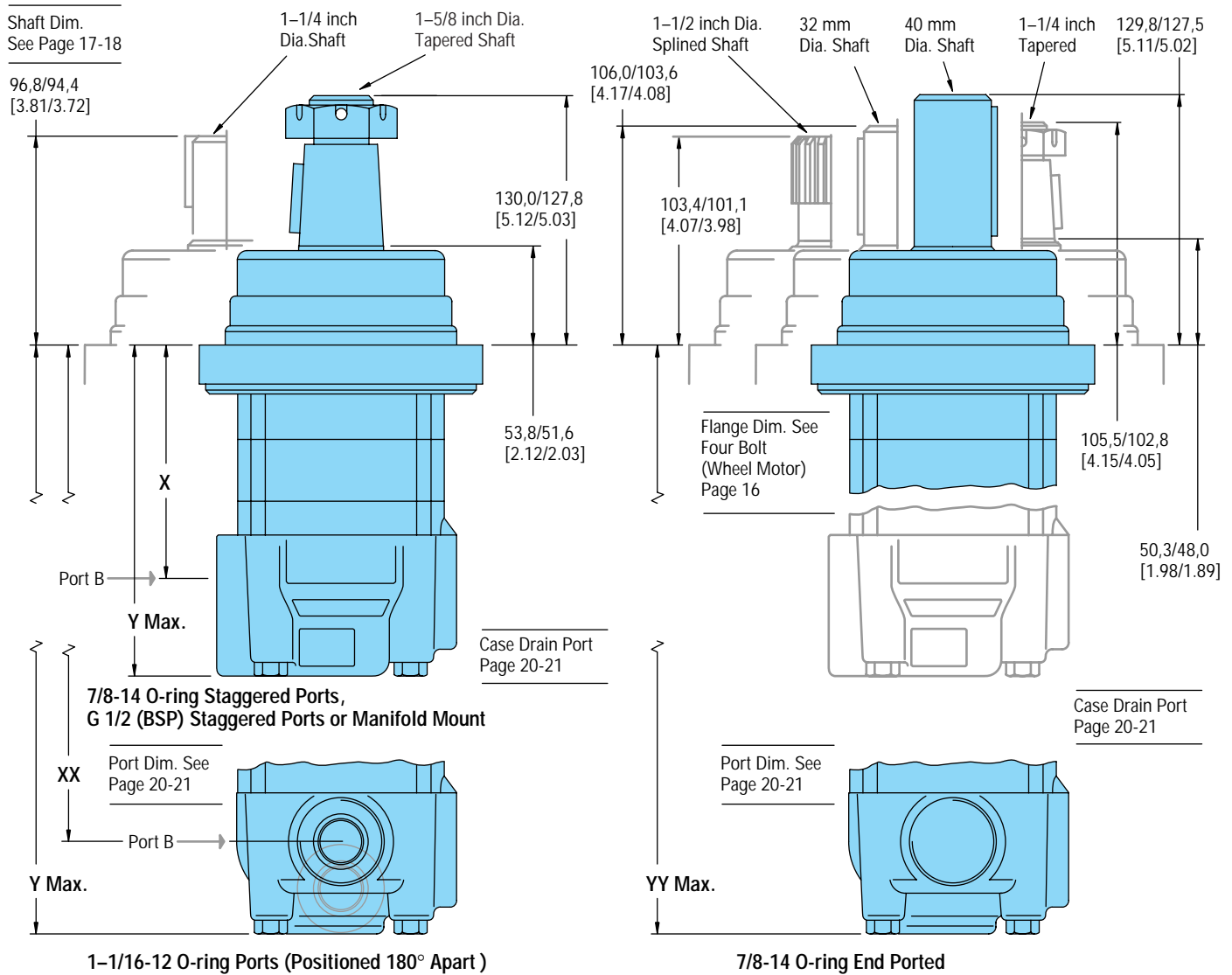
4000 Compact Series Standard Motor with — 1-1/16-12 O-ring Ports (positioned 180° apart) Dimension YY for 7/8-14 O-ring End Ported Motors

Dim. mm	157,1	166,0	177,4	193,4	193,4	210,7
XX [inch]	[6.19]	[6.54]	[6.99]	[7.62]	[7.62]	[8.30]
Dim. mm	202,2	211,1	222,6	238,6	238,6	255,8
Y [inch]	[7.96]	[8.31]	[8.76]	[9.39]	[9.39]	[10.07]
Dim. mm	203,5	212,4	223,8	239,8	239,8	270,1
YY [inch]	[8.01]	[8.36]	[8.81]	[9.44]	[9.44]	[10.12]

Standard Rotation
Viewed from Shaft End
Port A Pressurized — CW
Port B Pressurized — CCW



Dimensions — 4000 Compact Series Wheel Motor



4000 Compact Series Wheel Motor with 7/8-14 O-ring Staggered Ports, G 1/2 (BSP) Staggered Ports or Manifold Mount

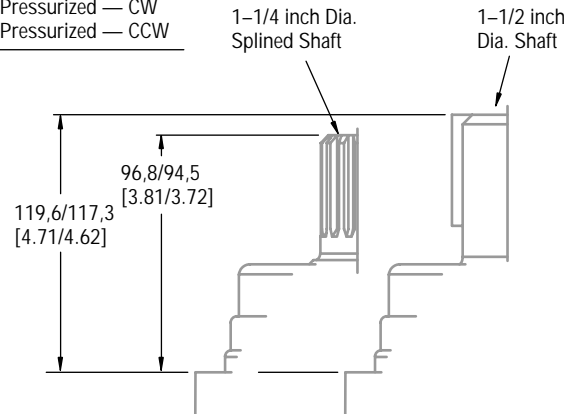
Displ. cm ³ /r [in ³ /r]	160 [9.8]	200 [12.3]	250 [15.4]	325 [19.8]	395 [24.0]	490 [29.8]
Dim. mm	114,6	123,5	135,0	151,0	151,0	168,2
X [inch]	[4.52]	[4.87]	[5.32]	[5.95]	[5.95]	[6.63]
Dim. mm	162,1	171,0	182,4	198,4	198,4	215,7
Y [inch]	[6.38]	[6.73]	[7.18]	[7.81]	[7.81]	[8.49]

4000 Compact Series Wheel Motor with — 1-1/16-12 O-ring Ports (Positioned 180° Apart). Dimensions YY for 7/8-14 O-ring End Ported Wheel Motors

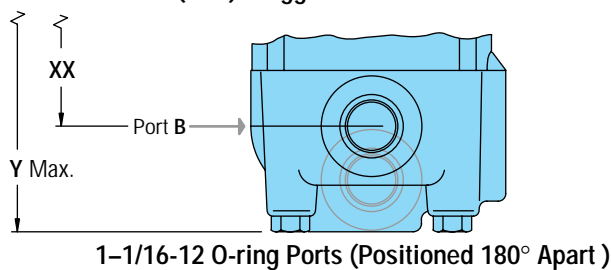
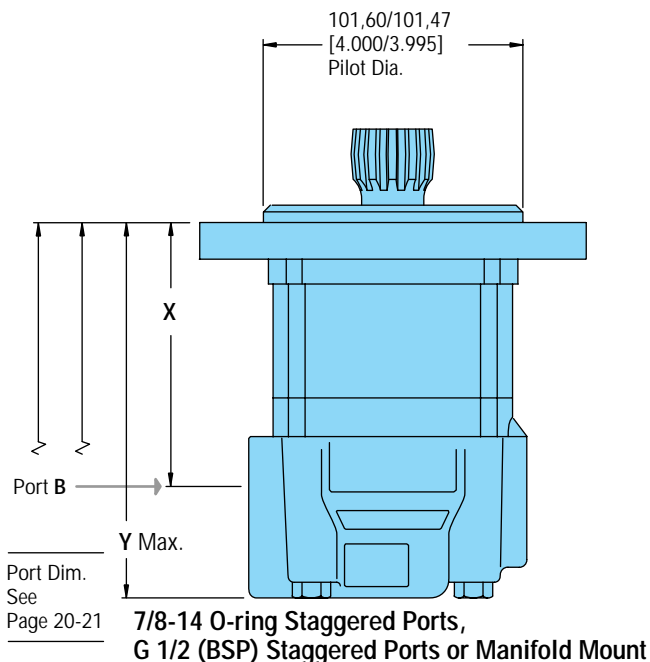
Dim. mm	116,9	125,8	161,1	177,1	177,1	194,4
XX [inch]	[4.61]	[4.96]	[5.41]	[6.98]	[6.98]	[7.66]
Dim. mm	162,1	171,0	182,4	198,4	198,4	215,7
Y [inch]	[6.38]	[6.73]	[7.18]	[7.81]	[7.81]	[8.49]
Dim. mm	163,4	172,3	183,7	199,7	199,7	217,0
YY [inch]	[6.43]	[6.78]	[7.23]	[7.86]	[7.86]	[8.54]

Standard Rotation

Viewed from Shaft End
 Port A Pressurized — CW
 Port B Pressurized — CCW



Dimensions — 4000 Compact Series Bearingless Motor

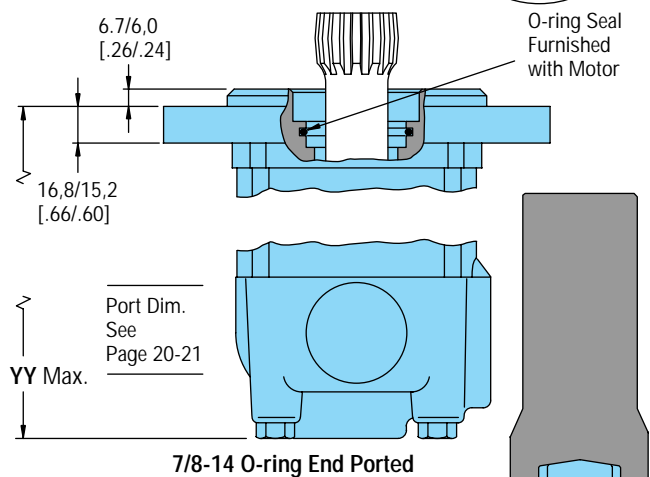
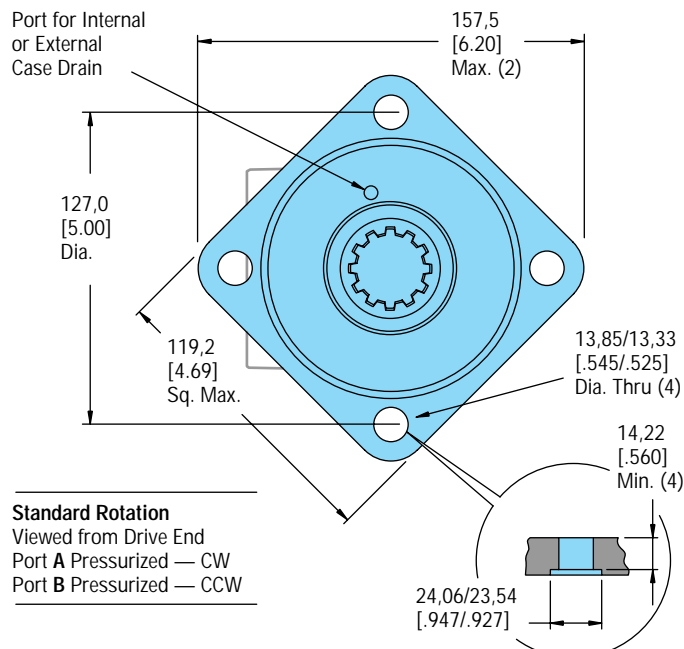


4000 Compact Series Bearingless Motor with —
7/8-14 O-ring Staggered Ports,
G 1/2 (BSP) Staggered Ports or Manifold Mount

Displ. cm ³ /r [in ³ /r]	160	200	250	325	395	490
Dim. mm	96,8	105,6	117,1	133,1	133,1	150,3
X [inch]	[3.81]	[4.16]	[4.61]	[4.24]	[4.24]	[5.92]
Dim. mm	144,6	153,5	164,9	180,9	180,9	198,2
Y [inch]	[5.69]	[6.04]	[6.49]	[7.12]	[7.12]	[7.80]

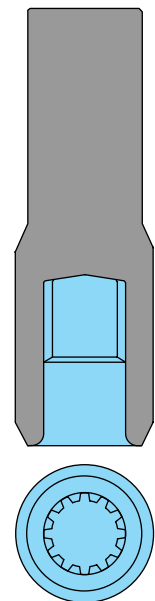
4020 Series Bearingless Motor with —
1-1/16-12 O-ring Ports (Positioned 180° Apart).
Dimensions YY for 7/8-14 O-ring End Ported Wheel Motors

Dim. mm	99,0	107,9	119,4	135,4	135,4	152,5
XX [inch]	[3.90]	[4.25]	[4.70]	[5.33]	[5.33]	[6.00]
Dim. mm	144,6	153,5	164,9	180,9	180,9	198,2
Y [inch]	[5.69]	[6.04]	[6.49]	[7.12]	[7.12]	[7.80]
Dim. mm	145,8	154,7	166,1	182,1	182,1	199,3
YY [inch]	[5.74]	[6.09]	[6.54]	[7.17]	[7.17]	[7.85]

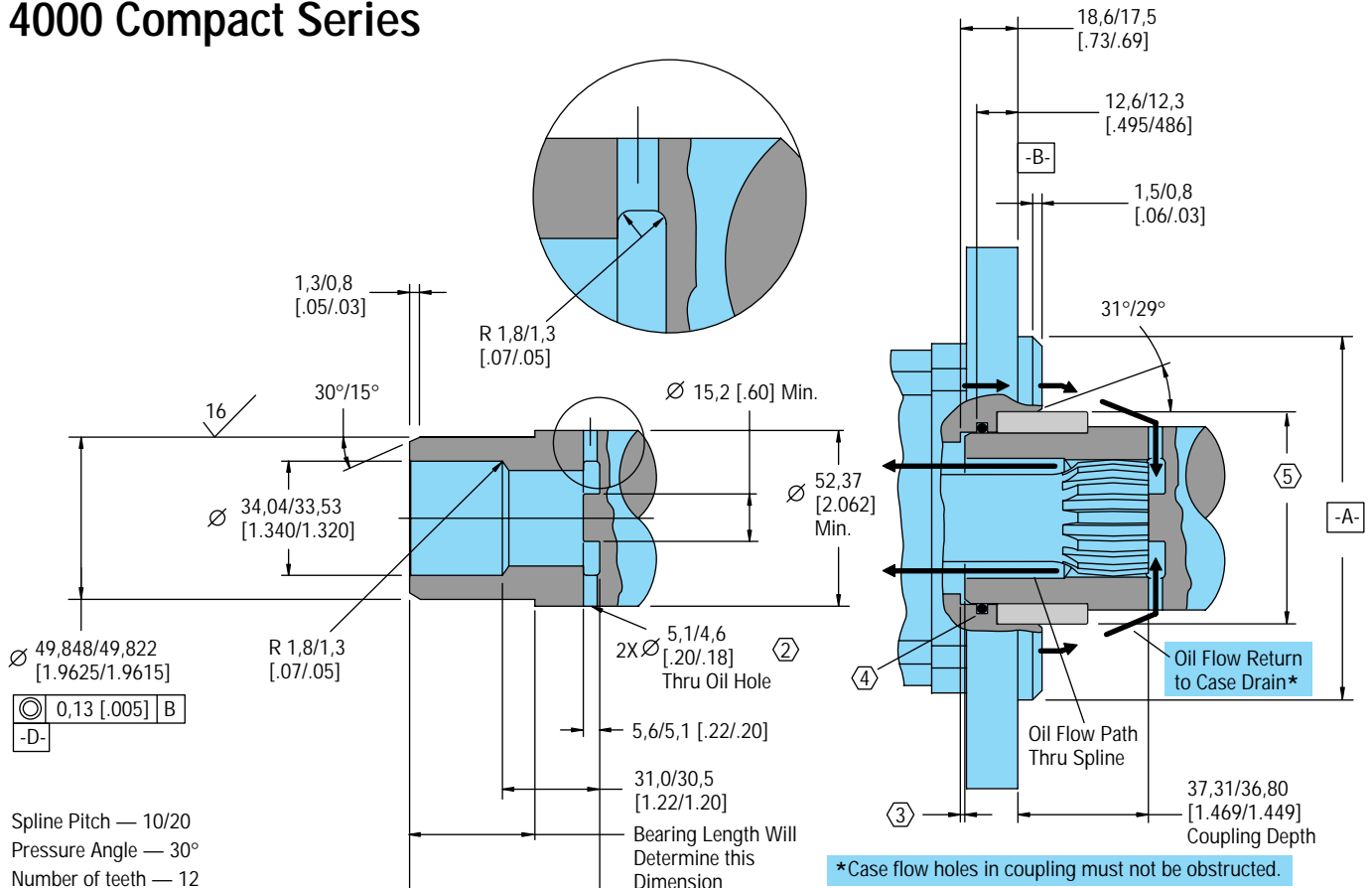


**For 4000 Compact Series Bearingless Motor
Application Information Contact Your Eaton
Representative (Mating Coupling Blanks
Available from Eaton Hydraulics).
Note: After Machining Blank, Part Must
be Hardened Per Eaton
Specification.**

Mating Coupling Blank
Eaton Part No. 12745-003



Bearingless Installation — 4000 Compact Series



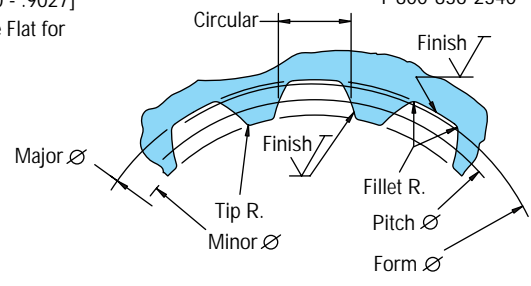
Spline Pitch — 10/20
 Pressure Angle — 30°
 Number of teeth — 12
 Class of Fit — Ref. 5
 Type of Fit — Side
 Pitch Diameter — Ref. 30,480000 [1.2000000] $\sqrt{0,20 [0.008] D}$
 Base Diameter — Ref. 26,396455 [1.0392305]
 Major Diameter — (33,43 [1.316] Max. 33,23 [1.308] Min.)
 Minor Diameter — 28,40 - 25,58 [1.118 - 1.125]
 Form Diameter, Min. — 32,59 [1.283]
 Fillet Radius — 0,63 - 0,76 [0.025 - .030]
 Tip Radius — 0,26 - 0,51 [0.010 - .020]
 Finish — (63)
 Involute Profile Variation — +0,000 -0,025 [+0.0000 -0.0010]
 Total Index Variation — 0,038 [0.0015]
 Lead Variation — 0,013 [0.0005]
 Circular Space Width:
 Maximum Actual — 5,045 [1.986]
 Minimum Effective — 4,995 [1.951]
 Maximum Effective — Ref. 5,009 [1.972]
 Minimum Actual — Ref. 4,986 [1.963]
 Dimension Between Two Pins — Ref. 22,783 - 22,929 [0.8970 - .9027]
 Pin Diameter — 5,334 [0.2100] Pins to Have 3,73 [0.147] Wide Flat for Root Clearance

Installation Information

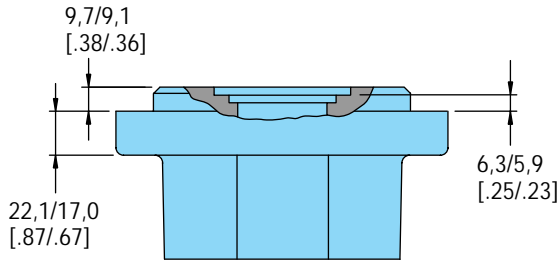
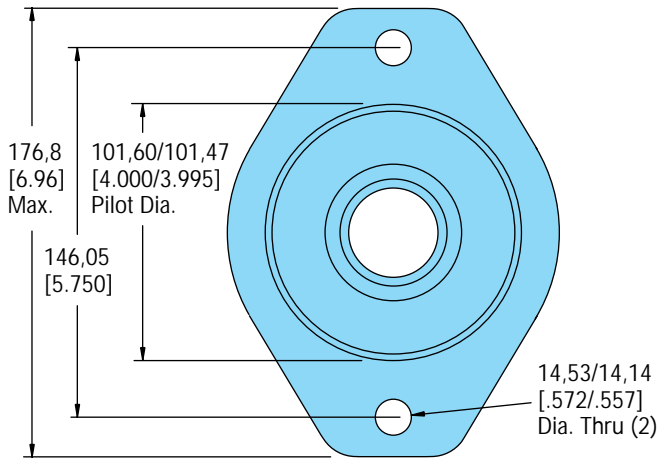
- 1 Internal spline in mating part to be per spline data specification. Material to be ASTM A304, 8620H vacuum degassed alloy steel carburize to a hardness of 59-62 HRC with case depth (to 50HRC) of 0,76 - 1,02 [0.030 - .040] dimensions apply after heat treat.
- ② Mating part to have critical dimensions as shown. Oil holes must be provided and open for proper oil circulation.
- ③ Some means of creating clearance between shaft and mounting flange must be provided.
- ④ Seal to be furnished with motor for proper oil circulation thru splines.
- ⑤ Counterbore designed to adapt a standard sleeve bearing 50,010 - 50,040 [1.9689 - 1.9700] I.D. by 60,050 - 60,080 [2.3642 - 2.3653] Oilite Bronze Sleeve Bearing. Source: Beemer Precision Inc.

www.oilite.com
 1-800-836-2340

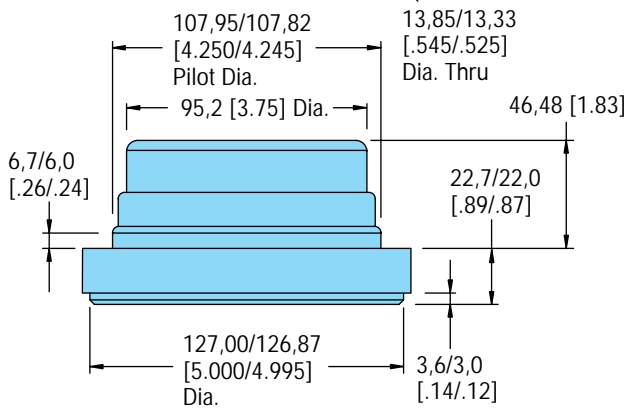
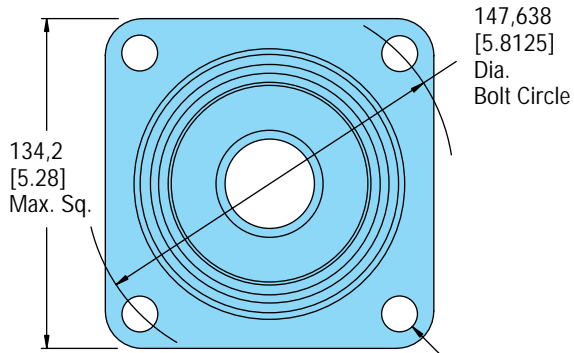
AAM 50 mm ID - 60 mm OD
 Length Determined by the Customer
 Stock Bearing Lengths:
 35 mm
 50 mm
 60 mm
 70 mm
 75 mm



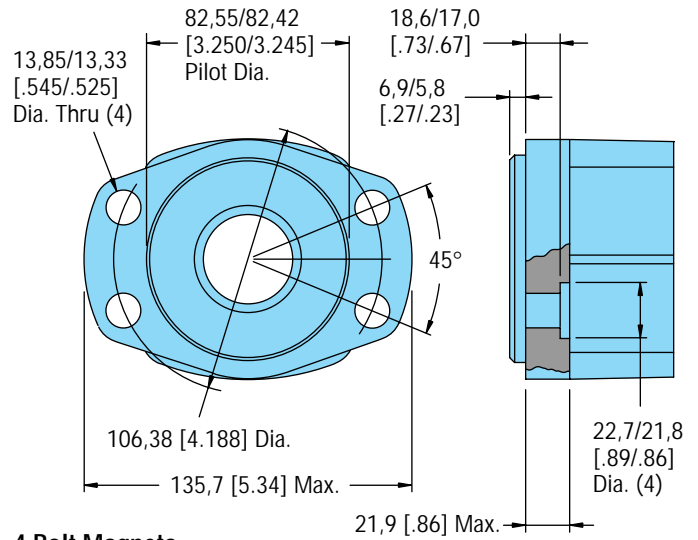
Mounting Flanges — 4000 Compact Series



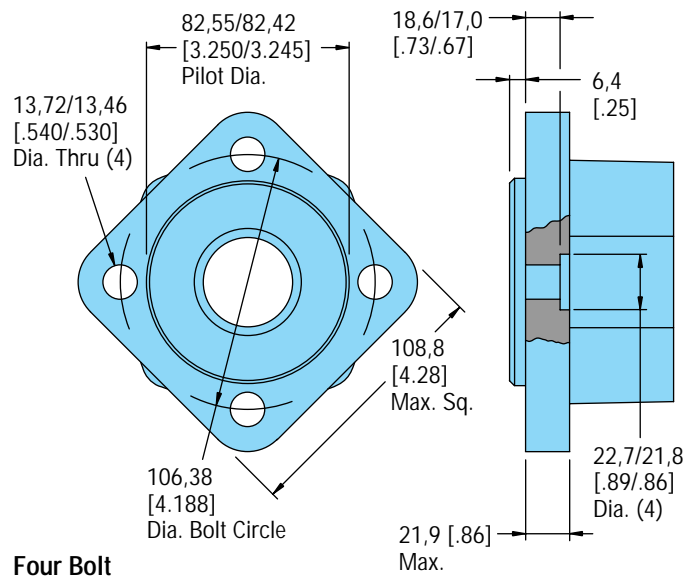
2 Bolt SAE B



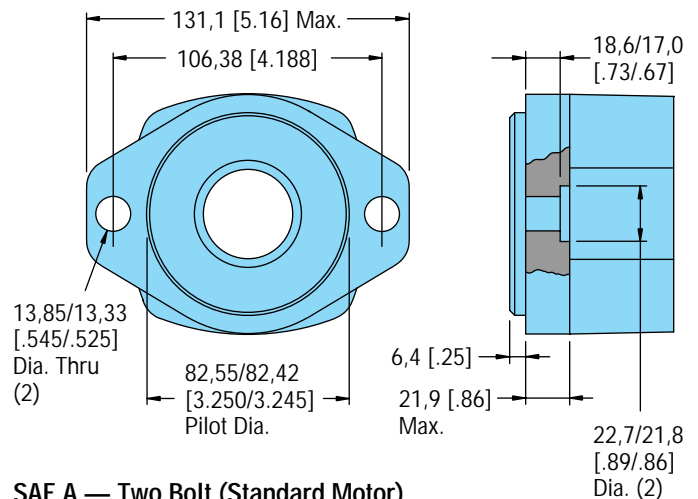
Four Bolt (Wheel Motor)



4 Bolt Magneto

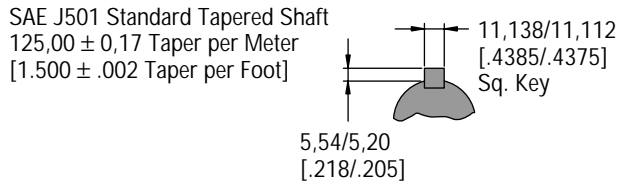
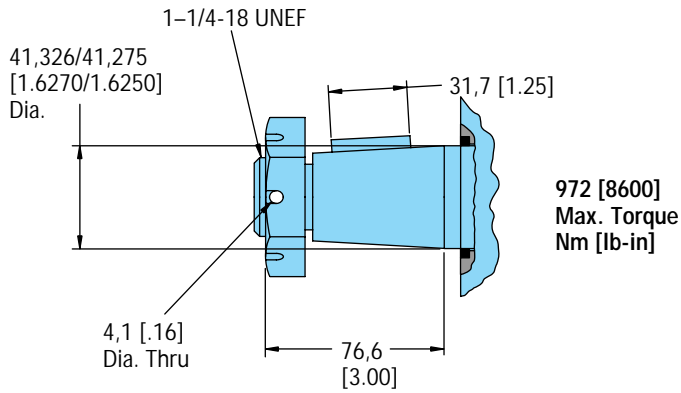


Four Bolt

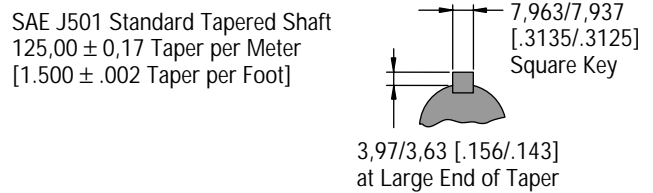
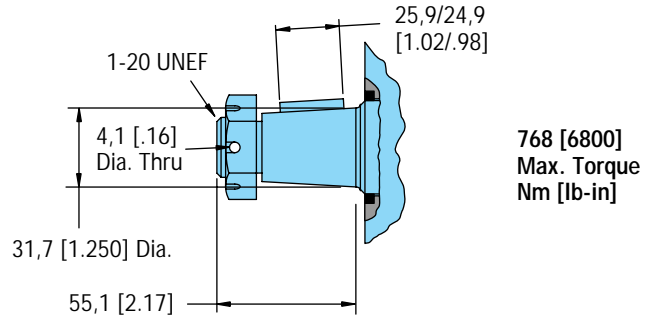


SAE A — Two Bolt (Standard Motor)

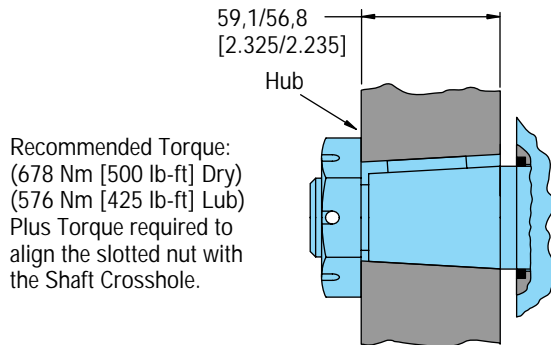
Shafts — 4000 Compact Series



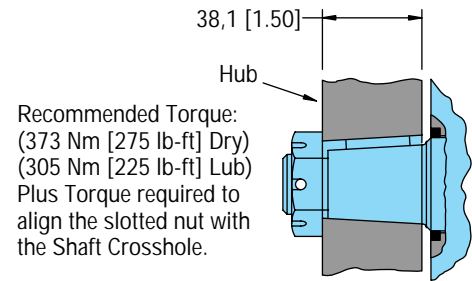
1-5/8 Inch Tapered



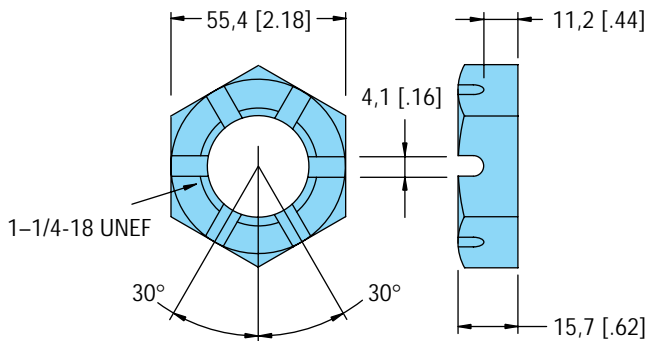
1-1/4 Inch Tapered



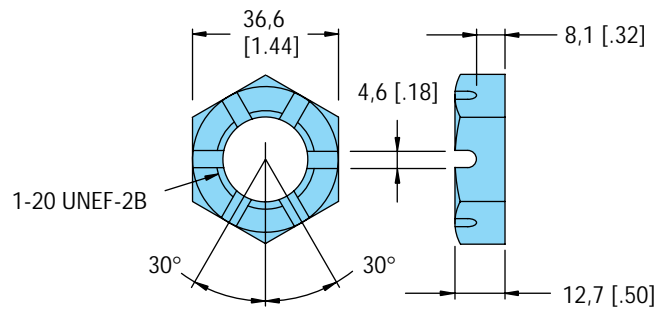
Tapered Shaft Hub Data



Tapered Shaft Hub Data



Slotted Hexagon Nut

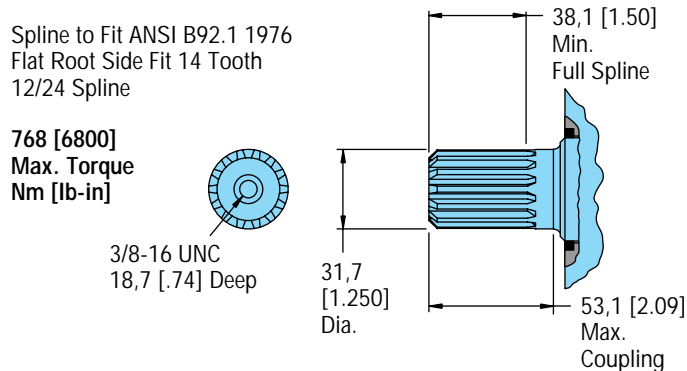
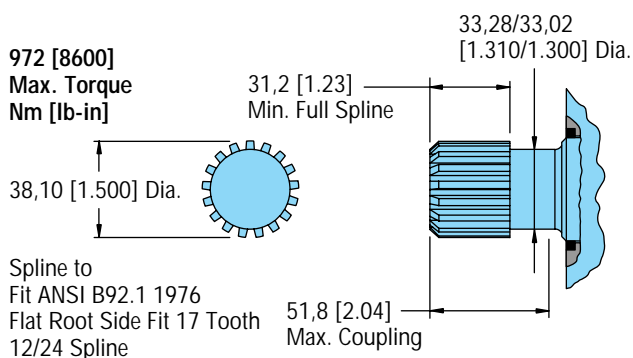
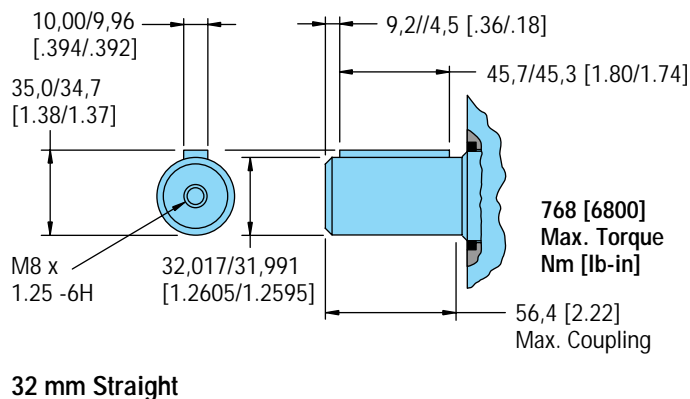
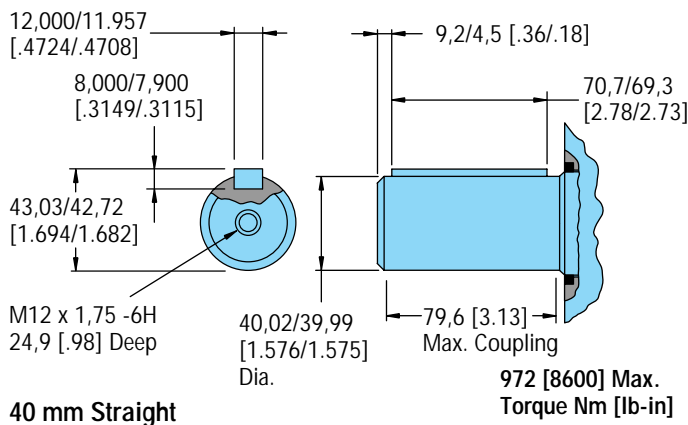
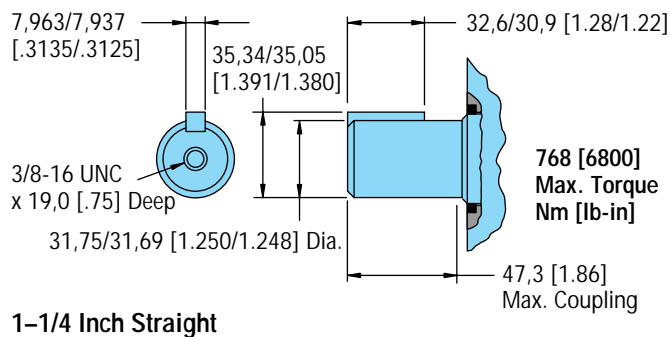
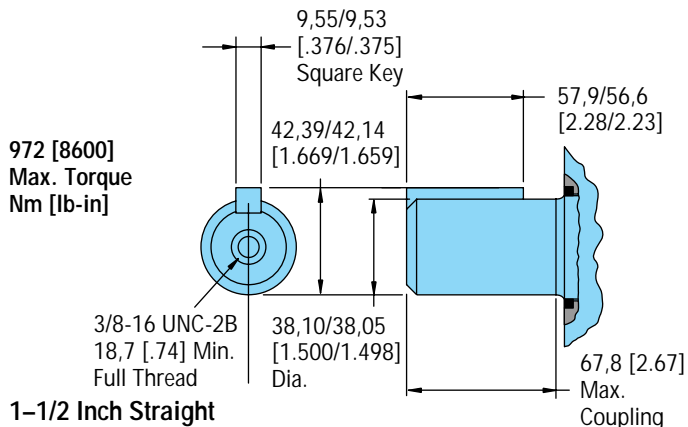


Slotted Hexagon Nut

(shaft dimensions continued on next page)

Shafts — (Continued from page 17)

4000 Compact Series



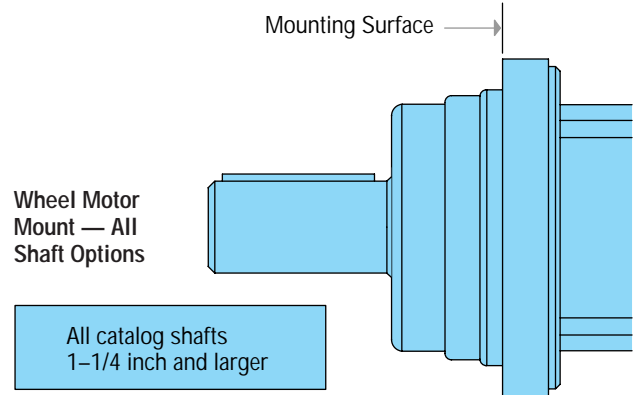
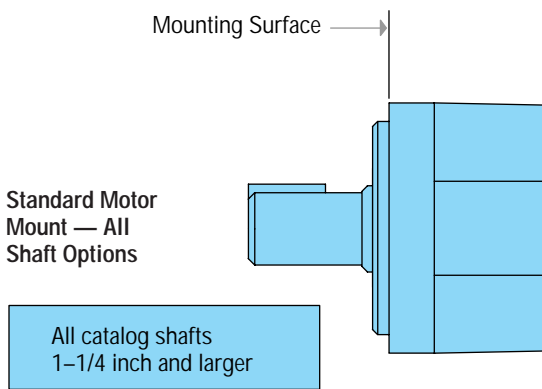
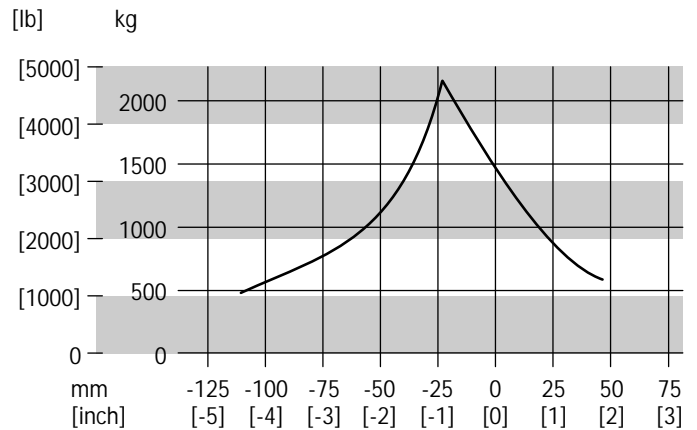
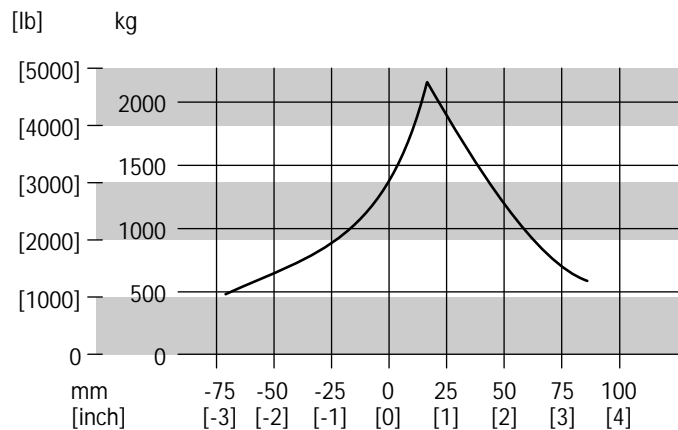
Shaft Side Load — 4000 Compact Series

These curves indicate the radial load capacity on the motor shaft(s) at various locations.

The curve is based on B 10 Bearing life (2000 hours or 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	.81
300	.72
400	.66
500	.62
600	.58
700	.56
800	.54

For 3,000,000 Shaft revolutions or 500 hours — Increase these shaft loads 52%.



Shaft Dimensions:
 Flange Mounting Surface to End of Shaft — see pages 12-13
 Optional Shaft Dimensions (no reference to mounting mounting type) — see page 17-18

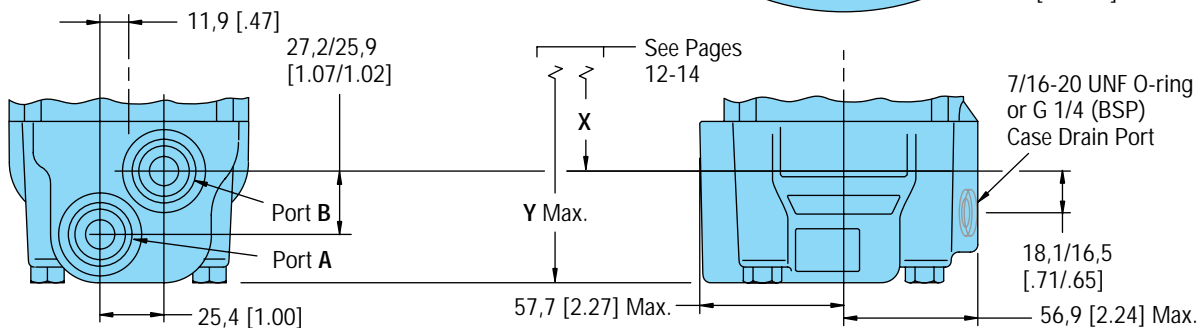
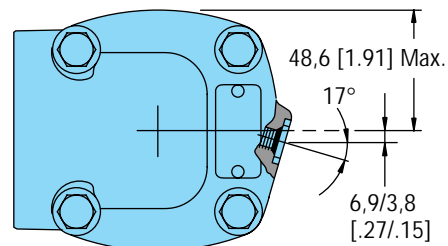
Ports — 4000 Compact Series

Standard Rotation

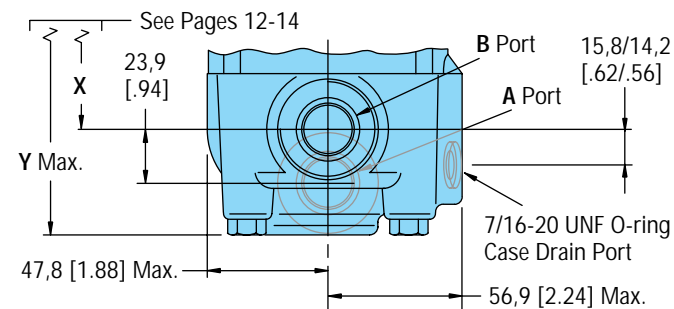
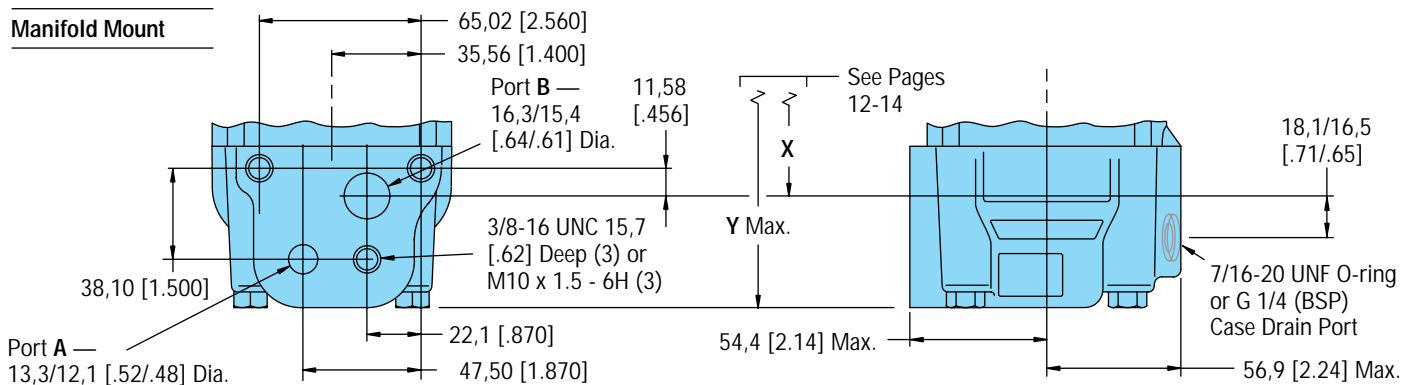
Viewed from Shaft End
 Port A Pressurized — CW
 Port B Pressurized — CCW

7/8-14 O-ring Ports (2)
 or G 1/2 (BSP) Ports (2)

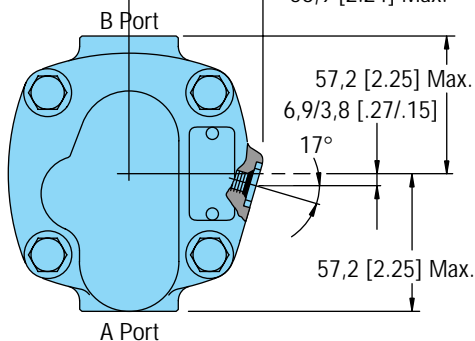
Case Drain Location — Staggered Ports (Including Manifold Mount)



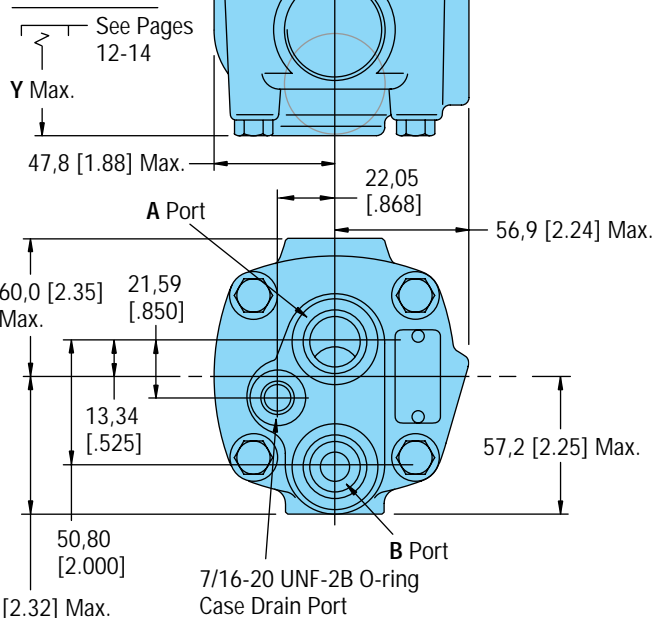
Manifold Mount



1-1/16-12 O-ring Ports (2)
 Positioned 180° Apart



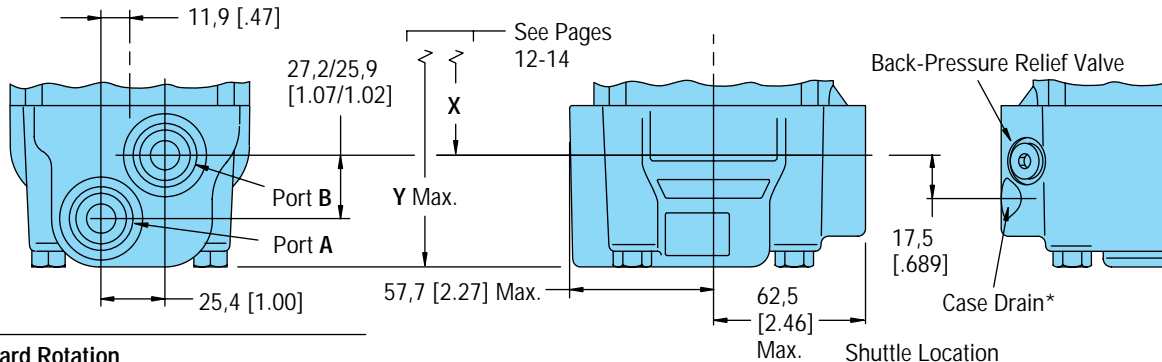
7/8-14 O-ring End Ported



(port dimensions continued on next page)

Ports — (continued from page 20)

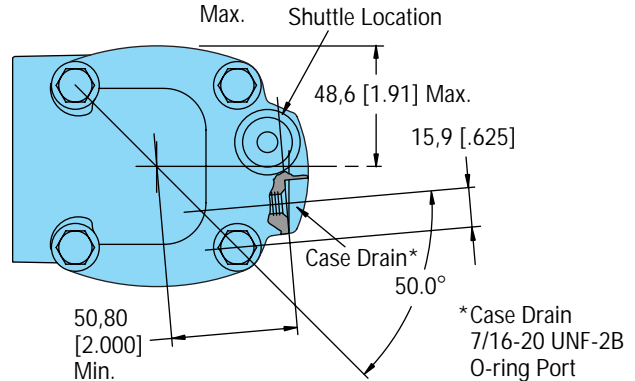
4000 Compact Series



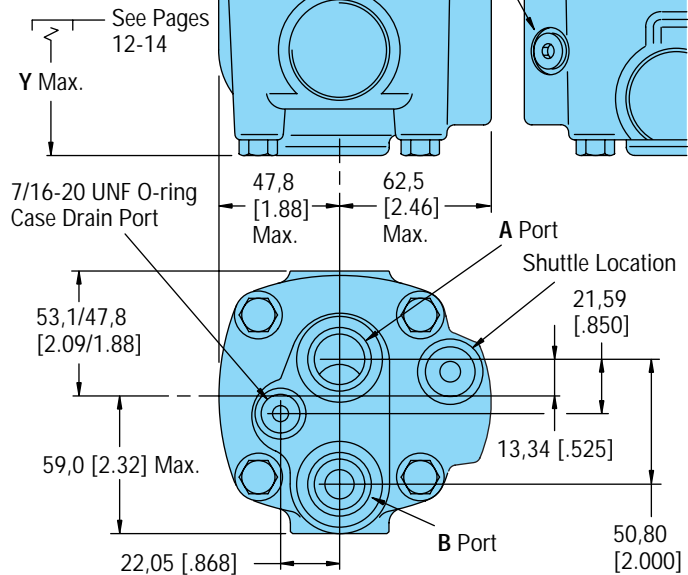
Standard Rotation
 Viewed from Shaft End
 Port A Pressurized — CW
 Port B Pressurized — CCW

7/8-14 O-ring Ports (2)
 or G 1/2 (BSP) Ports (2)

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



7/8-14 O-ring End Ports (2)



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

Speed Sensor — 4000 Compact Series

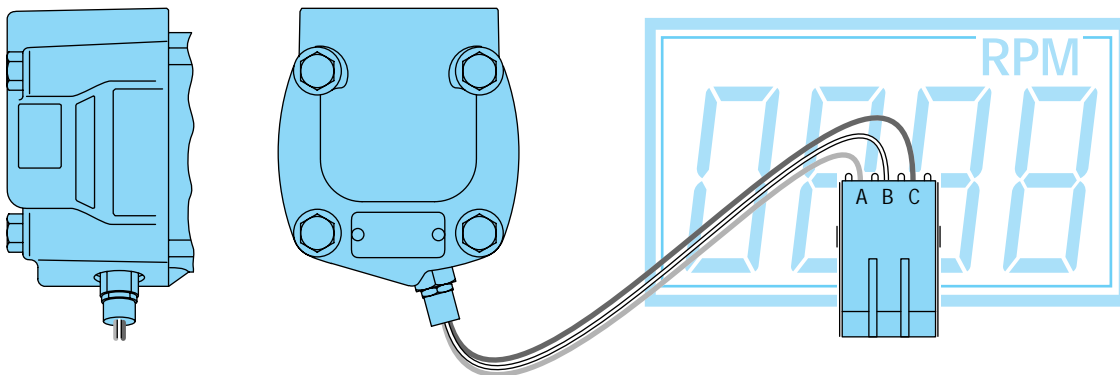
Eaton has developed a speed sensor specifically designed for LSHT motors. The design is rugged and fully protected against accidental reverse polarity or short circuit hook up. A built in pull up resistor simplifies installation with control systems.

This sensor is fully compatible with mobile vehicle electrical systems and gives a reliable digital on/off signal over a wide speed range and temperature range. The sensor is field-serviceable; no factory setting or shimming is required.

- Supply Voltage:** 8 to 24 Vdc (compatible with 12V vehicle systems)
- Supply Current:** 20 mA max. (Vs) (including internal pull-up resistor)
- Output Voltage:** Low < .5 Vdc @ 10 mA; output is open collector with 10kΩ pull-up resistor.

Connection — standard 3 prong Weatherpack connector with 18 AWG (american wire gage) cables:
 Position A (red) = power supply
 Position B (white) = signal output
 Position C (black) = common

Output — digital on/off signal from a Hall Effect switch; 30 pulses/revolution



Note: The speed sensor option does **NOT** include read-out display. Possible source for read-out display.

Eaton Corporation
Durant Products
 901 South 12th Street
 Watertown, WI 57094
 1-800-289-3866

Quadrature Speed Sensor — 4000 Compact Series

Eaton has developed a new **speed** and **direction** sensor, based on the field proven technology of our standard sensor, designed for off road environments. The new sensor is based on the principle of quadrature and has two output versions.

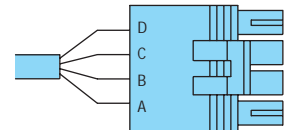
- The first version has two output signals 90° out of phase. Each output provides one pulse per target tooth.
- The second version has a speed signal that is twice the output pulses per revolution and it also has a direction signal. This version provides 60 symmetrical pulses per revolution with the 30-tooth target.

Outputs — Digital signals from NPN transistors (open collector output with internal 10K pull-up resistors).

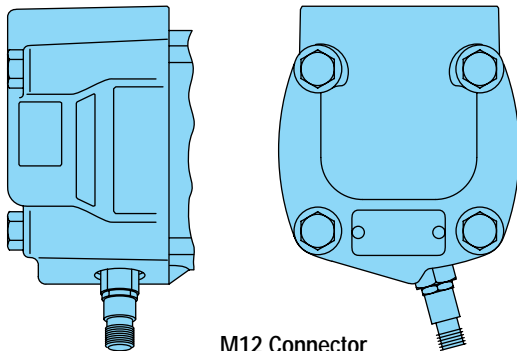
- Supply Voltage:** 8 to 24 Vdc* (Compatible with 12V vehicle conditions)
- Supply Current:** 40 mA max. (Including internal pull-up resistors)
- Output Low Voltage:** 0.5 Vdc maximum @ 10 mA

The sensor has reverse polarity protection, short circuit protection, load dump protection and EMC (Electricalmagnetic Compatibility) protection (the customer should qualify the EMC protection in their specific application).

* **Note:** The sensor will operate at lower regulated voltages (5 Vdc ±10%), but the EMC protection will be reduced.



Weatherpack Tower Connector



M12 Connector

Connections —

Standard 4 prong Weatherpack connector with 18 AWG (American Wire Gage) cables or M12 threaded connector:

Weatherpack (Version 1)

- Position A (red) = power supply
- Position B (black) = common
- Position C (orange) = output one
- Position D (yellow) = output two

M12 Connector (Version 1)

- Pin 1 = power supply
- Pin 2 = output one
- Pin 3 = common
- Pin 4 = output two

Weatherpack (Version 2)

- Position A (red) = power supply
- Position B (black) = common
- Position C (blue) = speed signal
- Position D (white) = direction

M12 Connector (Version 2)

- Pin 1 = power supply
- Pin 2 = direction
- Pin 3 = common
- Pin 4 = speed signal



Note: The speed sensor option does **NOT** include read-out display. Possible source for read-out display.

Eaton Corporation
Durant Products
 901 South 12th Street
 Watertown, WI 57094
 1-800-289-3866

Hayes M15WM Brake System 4000 Compact Series Wheel Motors

Hayes Industrial Brakes, Inc. supplies its Model M15WM mechanical parking/service brake for use with 4000 Compact Series wheel motors on commercial turf and specialty-vehicle applications. Basic packages available are:

M15WM for 203,2 [8.0] wheels (152,4 [6.0] rotor diameter)
— see dimensions this page

M15WM for 254 [10.0] wheels (209,6 [8.25] rotor diameter)
— see dimensions next page

Features

- Up to 1450 lb. of clamping force available
- Simple single-piece caliper bridge design
- Fewer moving parts
- Comprehensive braking system design includes:
 - Aluminum caliper
 - Ductile cast iron bracket
 - Ductile cast iron hub/disc
- Several shaft sizes and hub mounting hole options available.

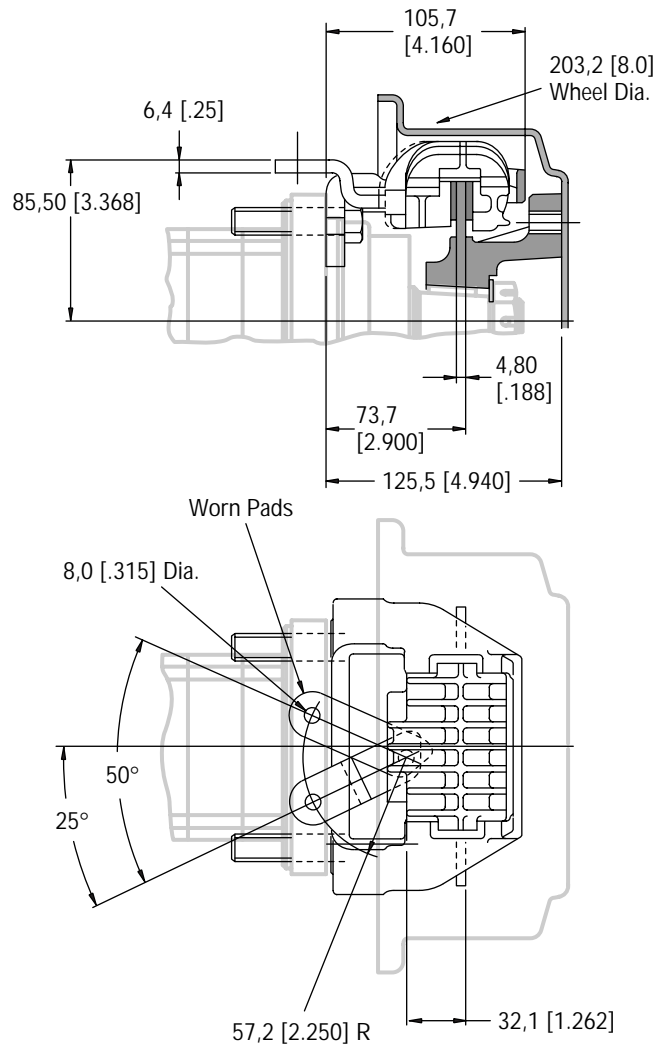
Note: Brake systems must be purchased directly from Hayes Industrial Brake. Eaton does not sell the brake nor does it install on motors. For more information, contact:

Hayes Industrial Brake, Inc.
5800 West Donges Bay Road
Mequon, WI 57092
Phone: (262) 242-4300; Fax: (262) 242-0524

Dimensions — Mounting

**8-Inch Wheel
305 Nm (2700 lb-in) Max. Torque**

Note: Requires special 4000 Compact Series Wheel Mounting Flange — code "AP".



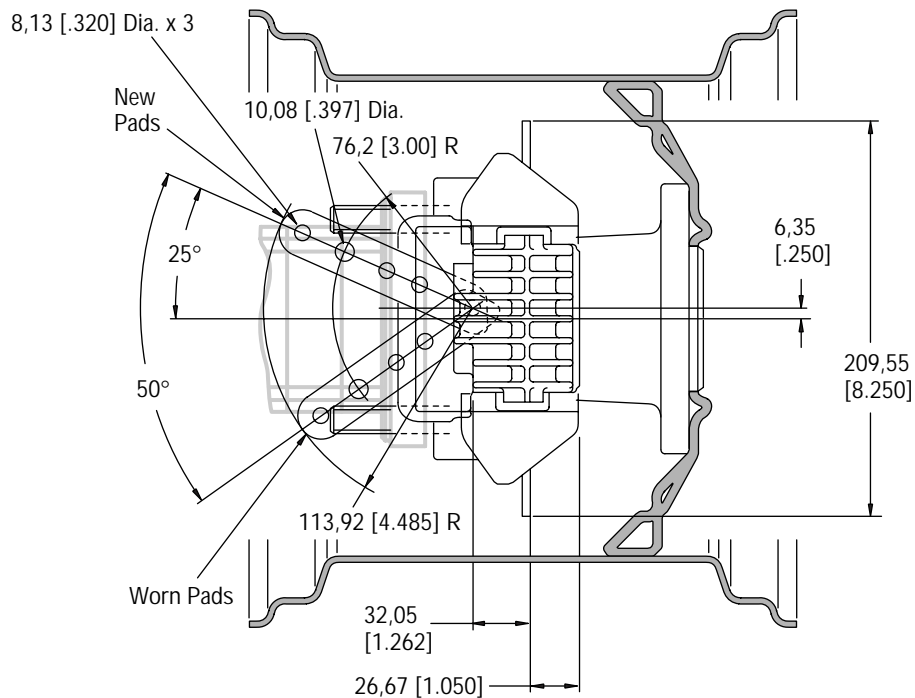
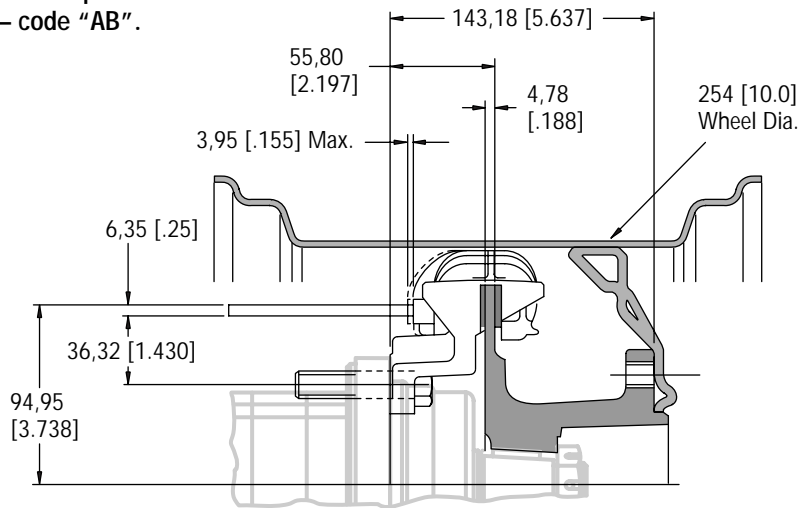
(10 inch wheel continued on next page)

Hayes M15WM Brake System 4000 Compact Series Wheel Motors (continued from page 24)

Dimensions — Mounting

10-Inch Wheel
429,4 Nm (3800 lb-in) Max. Torque

Note: Compatible with 4000 Compact Series
Wheel Mounting Flange — code "AB".



Model Code for 4000 Compact Series Motors

The following 24-digit coding system has been developed to identify all of the configuration options for the 4000 Compact Series motor. Use this model code to specify a motor with the desired features. All 24-digits of the code must be present when ordering. You may want to photocopy the matrix below to ensure that each number is entered in the correct box.

Model Code — 4000 Compact Series Disc Valve Motor

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
A	D	K																					0	A

Position 1, 2, 3 Product Series

ADK 4000 Compact Series Motor

Position 4, 5 Displacement cm³/r [in³/r]

- 10** 160 [9.6]
- 12** 200 [12.3]
- 15** 250 [15.4]
- 20** 325 [19.8]
- 24** 395 [24.0]
- 30** 490 [29.8]

Position 6, 7 Mounting Flange

- AE** 4 Bolt (Bearingless) 101,6 [4.00] Pilot Dia. and 13,59 [.535] Dia. Mounting Holes on 127,0 [5.00] Dia. B.C.
- AB** 4 Bolt (Wheel) 108,0 [4.25] Pilot Dia. and 13,59 [.535] Dia. Mounting Holes on 147,6 [5.81] Dia. B.C. 127,0 [5.00] Dia. Rear Mount Pilot
- AC** 2 Bolt SAE A (Std.) 82,5 [3.25] Pilot Dia and 13,59 [.535] Dia. Mtg. Holes on 106,4 [4.19] Dia. B.C.
- AF** 2 Bolt SAE B (Std.) 101,6 [4.00] Pilot Dia. and 14,35 [.565] Dia. Mtg. Holes on 146,0 [5.75] Dia. B.C.
- AH** 4 Bolt (Standard) 82,5 [3.25] Pilot Dia. and 14,59 [.535] Dia. Mounting Holes on 106,4 [4.19] Dia. B.C.
- AJ** 4 Bolt Magneto (Std.) 82,6 [3.25] Pilot Dia. and 13,59 [.535] Dia. Mtg. Holes on 106,4 [4.19] Dia. B.C. 2,79 [.110] Pilot Length
- AP** 4 Bolt (wheel compatible for HAYES BRAKE) 107,9 [4.25] Pilot Dia. and 13,59 [.535] Dia. Mounting Holes on 147,6 [5.81] Dia. B.C. with Turned Down Housing to 88,9 [3.50] Dia.

Position 8, 9 Output Shaft

- 00** Bearingless
- 02** 1-1/4 inch Dia. Straight with 3/8-16 Thread in end, 7,938 [.3125] Sq. x 31,75 [1.250] Straight Key
- 03** 1-1/4 inch Dia. .125 : 1 Tapered Shaft Per SAE J501 with 1-20 UNEF -2A Threaded Shaft end, and slotted Hex Nut, 7,938 [.3125] Sq. x 25,40 [1.000] Straight Key
- 98** 1-5/8 inch Dia. Tapered with Straight Key and 1-1/4 - 18 UNEF Slotted Hex. Nut
- 06** 1-1/4 inch Dia. Splined 14T with 38,1 [1.50] Min. Full Spline Length and 53,1 [2.09] Max. Coupling Length
- 99** 1-1/2 inch Dia. Splined 17T with 31,2 [1.23] Min. Full Spline Length
- 08** 40 mm Dia. Straight (with Straight Key) M12 x 1,75 - 6H Thread in end
- 10** 32 mm dia. Straight (with Straight Key) M8 x 1,25 -6H Thread in end, and 56,4 [2.22] Max. Coupling Length
- 11** 1-1/2 inch Dia. Straight (with Straight Key) 3/8-16 Thread in end

Position 10, 11 Port Type

- AA** 7/8-14 UNF -2B SAE O-ring Ports (Staggered)
- AB** 12,70 [.500] and 15,88 [.625] Dia. Ports (Manifold) and 3x 3/8-16 UNC Port Block Mounting Holes
- AD** 7/8-14 UNF -2B SAE O-ring Ports (End Ported)
- AE** 12,70 [.500] and 15,88 [.625] Dia. Ports (Manifold) and 3x M10 x 1,5-6H Port Block Mounting Holes
- AG** G 1/2 (BSP) Straight Thread Ports (Staggered)
- AH** 1-1/16-12 UNF -2B O-ring Ports (Positioned 180° Apart)

(continued on next page)

Model Code for 4000 Compact Series Motors (continued from page 26)

Position 12, 13 **Case Flow**

- 00 None
- 01 7/16-20 UNF 2-B O-ring Port (Case Drain)
- 02 G 1/4 (BSP) Straight Thread Port (Case Drain)
- 13 Reverse Flow Shuttle Valve with 7/16-20 UNF 2-B O-ring Port (Case Drain)
- 14 Reverse Flow Shuttle Valve with G 1/4 (BSP) Straight Thread Port (Case Drain)

Position 14 **Back-Pressure Relief Valve**

- 0 None
- A Set at 4,5 bar [65 PSI] (This option available on end ported motors and motors with staggered ports)

Position 15, 16 **Valve Option**

- 00 None

Position 17, 18 **Accessories**

- 00 None
- AA Seal Guard
- AB Digital Speed Sensor (30 Pulse) with Packard Weather Pac Shroud Connector
- AD Digital Speed Sensor (Two 30 Pulse per rev. signals in quadrature) 610 mm [24 in.] lead wire with Packard Weather Pac Tower Connector
- AE Digital Speed Sensor (One 60 Pulse per rev. speed signal and one directional signal) 610 mm [24 in.] lead wire with Packard Weather Pac Tower Connector
- AF M12 Threaded Connector Digital Speed Sensor (Two 30 Pulse per rev. signals in quadrature)
- AG M12 Threaded Connector Digital Speed Sensor (One 60 Pulse per rev. speed signal and one directional signal)

Position 19, 20 **Special Features (Hardware)**

- 00 None
- 01 Viton Seals

Position 21 **Special Features (Assembly)**

- 0 None
- A Flange Rotated 90°
- B Reverse Rotation

Position 22 **Paint/Special Packaging**

- 0 No Paint
- A Painted Low Gloss Black
- B Corrosion Protected

Position 23 **Eaton Assigned Code when Applicable**

- 0 Assigned Code when Applicable

Position 24 **Eaton Assigned Design Code**

- A Assigned Design Code



Eaton Corporation is a global manufacturer of highly engineered products that serve industrial, vehicle, construction, commercial, aerospace and semiconductor markets. Principal products include hydraulic products and fluid connectors, electrical power distribution and control equipment, truck drivetrain systems, engine components, ion implanters and a wide variety of controls. Headquartered in Cleveland, Ohio, the company has 63,000 employees and 195 manufacturing sites in 23 countries around the world. Eaton's sales for 1999 were \$8.4 billion.

Information contained in this catalog is accurate as of the publication date and is subject to change without notice. Performance values are typical values. Customers are responsible for selecting products for their applications using normal engineering methods.

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