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# LSHT Torqmotors™ and Nichols™ Motors

Catalog No. HY13-1590-009/US,EU



ENGINEERING YOUR SUCCESS.



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**Parker Hannifin Corporation**  
Hydraulic Pump/Motor Division  
Greeneville, Tennessee, USA

Wherever in the world machinery is designed, manufactured, or used, Parker is there to meet your hydraulic application requirements—with complete hydraulic component selection, worldwide availability, and technical assistance.

This catalog contains the information you need to order hydraulic motor products. It contains complete specifications, dimensions, and ordering information on the complete line of Parker hydraulic motor products, including technical data and

reference material for designers, builders, and users of motion control machinery. No more shuffling through dozens of separate catalogs from dozens of separate suppliers.

And when you're ready to order, call your local Parker hydraulic distributor for fast delivery and service. Or call your Parker Hydraulic Sales Office (see listing at the back of this catalog).

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In line with our policy of continuing product improvement, specifications and information contained in this catalog are subject to change.

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## Introduction

### Excellence of Design

The producers of Parker Hannifin's **Torqmotor™** Series motors have a history of manufacturing reliable, precision parts that stretches back over a century. Milestones include the first patent on roller vane rotor sets for low speed, high torque hydraulic motors. That was forty years ago. Today the technological advances continue.

In the Development Laboratory, engineers continuously measure and analyze motor data to move existing products to even higher levels of performance and to develop new products to serve the ever changing needs of our customers. Design integrity is assured by exhaustive testing on endurance stands. To be sure that this translates into superior performance, advanced manufacturing techniques are employed as well.

### Excellence of Manufacturing

Central to manufacturing excellence is the understanding that quality parts make quality motors. The instrumentation in our Quality Assurance laboratory includes devices such as coordinate measuring machines, to accurately measure the parts that we manufacture as well as those that we purchase. Quality cannot be inspected in, however. It must be manufactured. Each machine operator is responsible for the quality of the part that comes off that machine. Efficiency is enhanced by our cellular manufacturing techniques. Accuracy is assured by statistical process control methods. Micrometers and specialized gages are at the disposal of the operator. As a final check, every motor is tested before shipment to our customer. Parker understands that our customers cannot produce quality products unless we do.

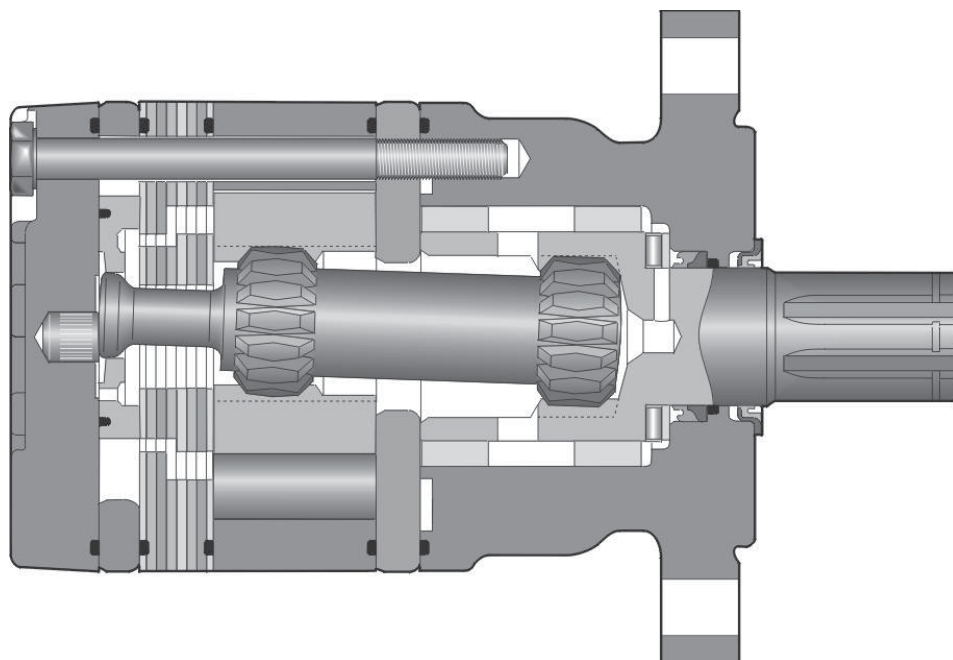


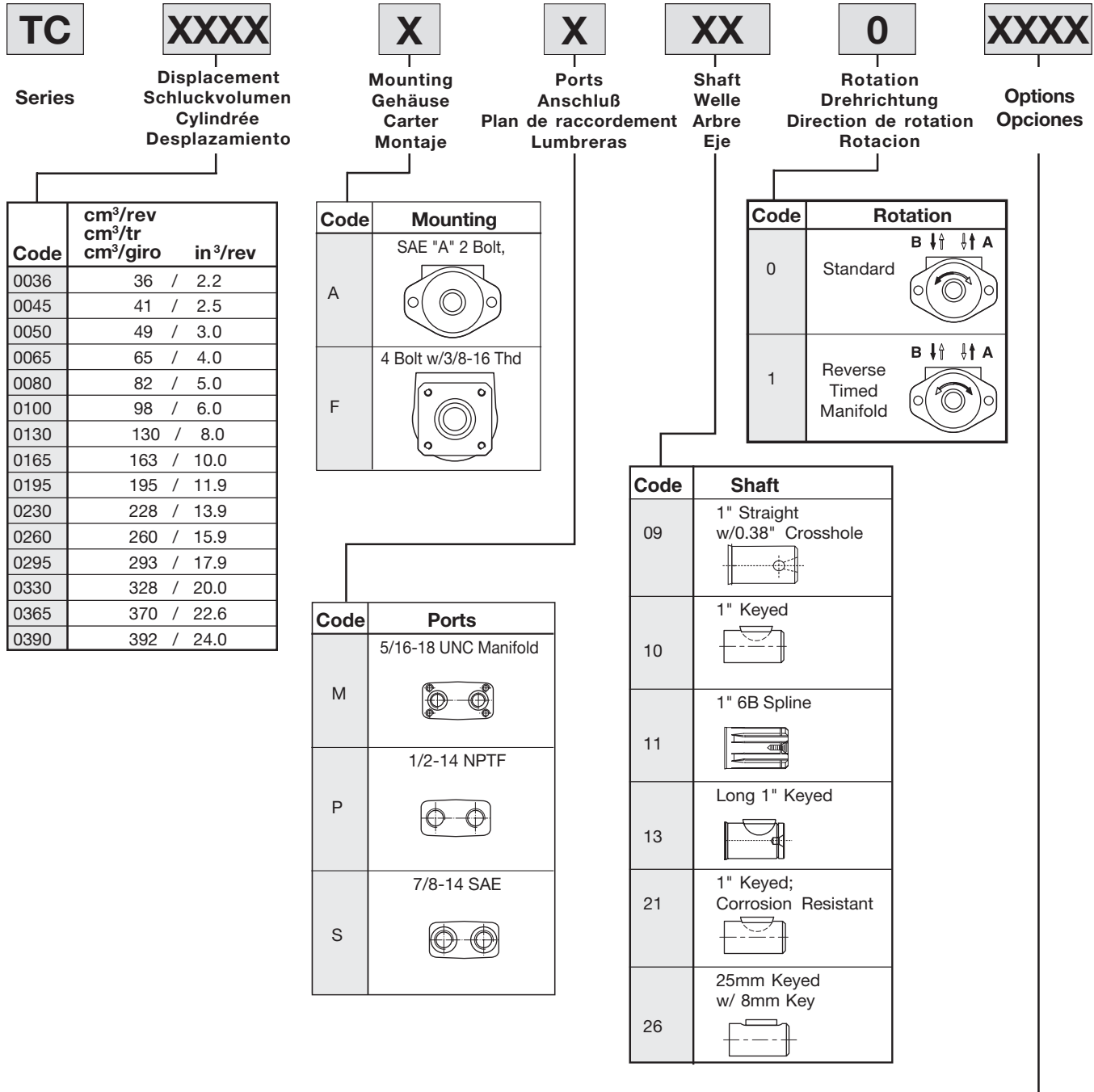


15 Displacements	(2.2 - 24.0 in <sup>3</sup> /rev)	
15 Schluckvolumen	36 . . . 390 cm <sup>3</sup> /rev	
15 Cylindrée		
15 Desplazamientos		
	<b>Cont</b>	<b>Int</b>
Maximum Pressure	(1250 psid)	(1750 psid)
Max. Druckgefalle	. . .86 bar	. . .121 bar
Chaute de pression max.		
Presion Maxima		
Maximum Oil Flow	(15 gpm)	
Schluckstrom	. . . 57 lpm	
Débit d'huile		
Caudal Maximo de Aceite		
Maximum Speed	(902 rpm)	
Drehzahl	902 rpm	
Vitesse de rotation		
Velocidad Maxima		
	<b>Cont</b>	<b>Int</b>
Maximum Torque	(1905 lb in)	(2709 lb in)
Max Drehmoment	215.2 Nm	306.1 Nm
Couple Maxi		
Torque Maximo		
Maximum Side Load	(788 lb)	
Seitenlast	. . . 3505 N	
Charges latérales		
Carga Maxima Lateral		

## Big Performance In A Small Package

High Performance and long life in a reduced space envelope describe Parker's TC Series motors. High volume fluid flow continually washes across splines and seals to extend their life. Roller vanes and sealed commutation assure high volumetric efficiency and smooth low speed operation.

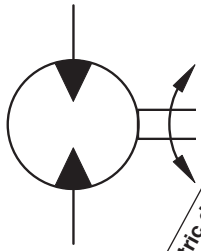




TC Series are not available rear ported.  
 For other available options, see pages 102-103.

\*Not applicable to TC0365 or TC0390 displacements





Geometric displacement  
Geom. Schluckvolumen  
Cylindrée  
Desplazamientos  
Max. speed @ Max. intermittent flow  
Max. Drehzahl Intermittierender Betrieb:  
Vitesse de rotation maxi  
Velocidad maxima a caudal intermitente maximo  
Max. oil flow  
Max. Schluckstrom  
Débit d'huile maxi  
Caudal Maximo de Aceite  
Max. Differential Pressure  
Max. Druckgefälle  
Chute de pression maxi  
Presion diferencial maxima  
Max. supply pressure  
Max. Eingangsdruck  
Presion maxi entrada  
Presion maxima de alimentacion  
Max. torque  
Max. Drehmoment  
Couple maxi  
Torque Maximo  
Max. performance  
Max. Leistungabgabe  
Maximo redinimiento  
Min. starting torque  
Min. Anlaufmoment  
Couple min. fourni au dé manrage  
Torque minimo de arranque

Motor Series TC	cm <sup>3</sup> /rev in <sup>3</sup> /rev	rev/min	cont / int* l/min g/min		cont / int* bar psid		max bar psig	cont / int* Nm lb-in		max KW HP	cont / int* Nm lb-in	
TC 0036	36 2.2	902	34 9	34 9	86 1250	121 1750	134 1950	31 272	44 393	4.2 5.6	16 138	27 236
TC 0045	41 2.5	794	34 9	34 9	86 1250	121 1750	134 1950	40 351	56 496	4.5 6.1	20 174	33 295
TC 0050	49 3.0	688	34 9	34 9	86 1250	121 1750	134 1950	48 423	67 589	4.7 6.3	27 235	39 349
TC 0065	65 4.0	517	34 9	34 9	86 1250	121 1750	134 1950	66 582	92 810	4.8 6.5	41 361	67 590
TC 0080	82 5.0	413	34 9	34 9	86 1250	121 1750	134 1950	96 753	119 1050	4.9 6.6	61 539	86 758
TC 0100	98 6.0	460	45 12	45 12	86 1250	121 1750	134 1950	100 888	140 1240	6.1 8.2	78 691	106 934
TC 0130	130 8.0	429	45 12	57 15	86 1250	121 1750	134 1950	138 1218	192 1697	7.5 10.1	111 986	169 1492
TC 0165	163 10.0	346	45 12	57 15	86 1250	121 1750	134 1950	173 1529	238 2110	7.5 10.0	139 1232	209 1846
TC 0195	195 11.9	287	45 12	57 15	86 1250	121 1750	134 1950	205 1815	286 2532	7.3 9.8	195 1724	264 2332
TC 0230	228 13.9	246	45 12	57 15	76 1100	107 1550	134 1950	215 1905	298 2637	6.3 8.4	195 1722	261 2310
TC 0260	260 15.9	217	45 12	57 15	66 950	97 1400	134 1950	211 1870	306 2709	5.4 7.3	183 1618	265 2344
TC 0295	293 17.9	193	45 12	57 15	59 850	86 1250	134 1950	208 1843	300 2657	4.7 6.3	189 1675	269 2379
TC 0330	328 20.0	173	45 12	57 15	52 750	76 1100	134 1950	206 1819	296 2621	4.0 5.3	187 1655	262 2318
TC 0365	370 22.6	152	45 12	57 15	45 650	66 950	134 1950	206 1825	296 2622	3.4 4.6	186 1648	276 2443
TC 0390	392 24.0	144	45 12	57 15	45 650	66 950	134 1950	207 1832	296 2622	3.2 4.3	192 1698	286 2527

Performance data based on testing using 10W40 oil with a viscosity of 43,1 cSt. (200 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

\* Intermittent operation rating applies to 10% of every minute.  
Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

TC 0036

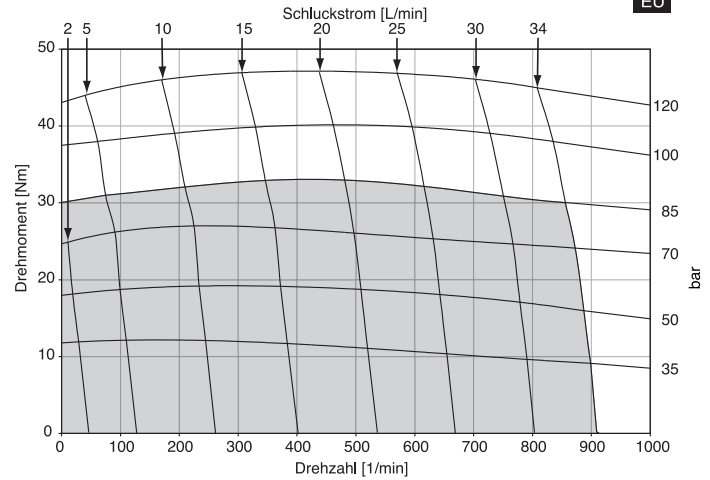
2.2 cu in / rev PRESSURE (PSID)

	500	750	1000	1250	1500	1750
<b>.5</b>	104 27	160 18	214 8			
<b>1</b>	108 78	167 67	222 57	277 45	328 28	380 12
<b>2</b>	109 179	169 170	229 160	287 147	344 130	396 111
<b>3</b>	107 283	172 272	235 262	293 248	351 229	405 208
<b>4</b>	105 387	168 375	236 365	295 350	353 332	410 311
<b>5</b>	103 490	166 478	233 468	295 451	354 434	412 410
<b>7</b>	90 695	156 685	220 673	286 656	348 635	410 610
<b>9</b>	76 903	142 889	208 876	272 860	332 839	393 812

Flow (GPM)

TORQUE (LB IN) 272  
SPEED (RPM) 860

36 cm<sup>3</sup>/rev



TC 0045

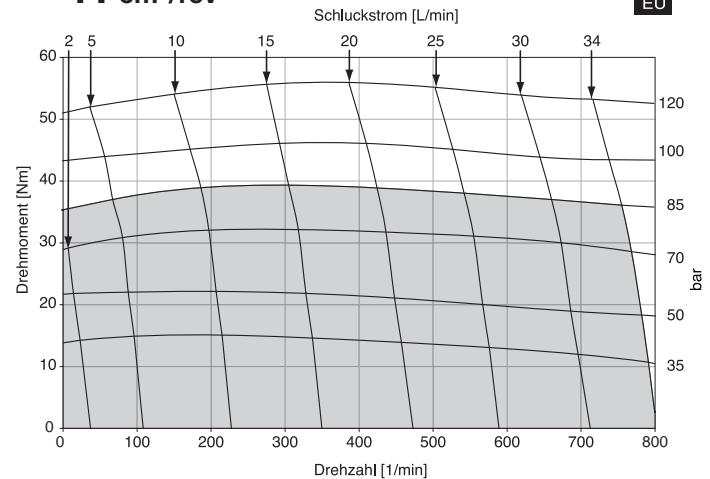
2.5 cu in / rev PRESSURE (PSID)

	500	750	1000	1250	1500	1750
<b>.5</b>	124 22	200 13	254 7			
<b>1</b>	131 73	202 67	270 61	332 51	403 42	
<b>2</b>	131 163	201 157	279 149	350 141	412 130	481 114
<b>3</b>	127 255	201 248	279 241	352 231	424 221	496 208
<b>4</b>	122 346	192 339	279 330	350 321	421 310	498 292
<b>5</b>	113 436	183 429	270 420	341 410	412 399	489 381
<b>7</b>	105 615	174 606	262 594	332 583	403 569	481 547
<b>9</b>	93 793	168 784	249 770	324 757	397 739	473 717

Flow (GPM)

TORQUE (LB IN) 324  
SPEED (RPM) 757

41 cm<sup>3</sup>/rev



■ Cont. □ Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TC 0050

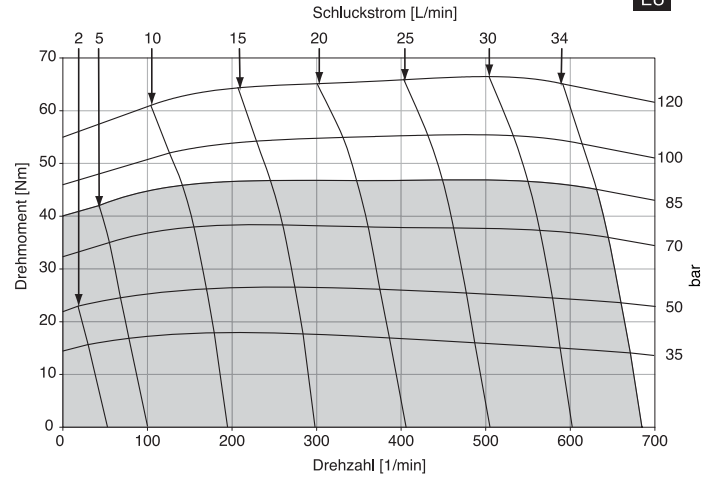
3.0 cu in / rev PRESSURE (PSID)

	500	750	1000	1250	1500	1750
<b>.5</b>	136 28	210 17				
<b>1</b>	148 59	226 51	305 42	377 33		
<b>2</b>	155 136	238 129	331 117	413 107	476 95	543 79
<b>3</b>	154 215	245 207	334 197	417 186	496 173	573 157
<b>4</b>	148 292	238 284	331 273	422 263	503 251	578 228
<b>5</b>	139 369	233 361	330 350	420 340	506 327	587 305
<b>7</b>	131 519	224 511	325 498	418 486	506 470	591 445
<b>9</b>	123 672	216 661	314 646	405 632	492 615	579 592

Flow (GPM)

TORQUE (LB IN) 405  
SPEED (RPM) 632

49 cm³/rev



TC 0065

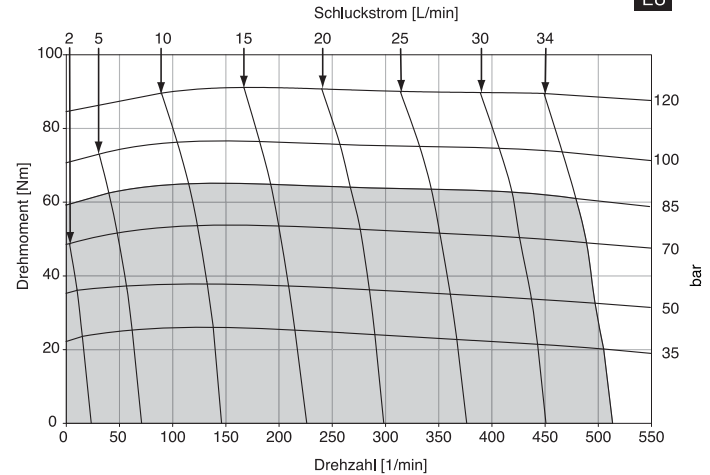
4.0 cu in / rev PRESSURE (PSID)

	500	750	1000	1250	1500	1750
<b>.5</b>	207 14	333 9	425 3			
<b>1</b>	218 47	334 43	449 36	561 30	668 23	
<b>2</b>	231 104	352 100	471 93	583 87	700 79	797 68
<b>3</b>	218 163	341 158	463 151	582 145	697 138	811 126
<b>4</b>	209 220	330 216	462 209	574 202	695 195	808 182
<b>5</b>	201 278	320 273	449 266	571 260	688 251	801 238
<b>7</b>	186 391	311 386	439 376	563 370	682 359	799 344
<b>9</b>	176 506	297 498	427 490	547 480	675 467	796 450

Flow (GPM)

TORQUE (LB IN) 547  
SPEED (RPM) 480

65 cm³/rev



■ Cont. □ Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrian tener una pequeña variacion entre distintos motores.

TC 0080

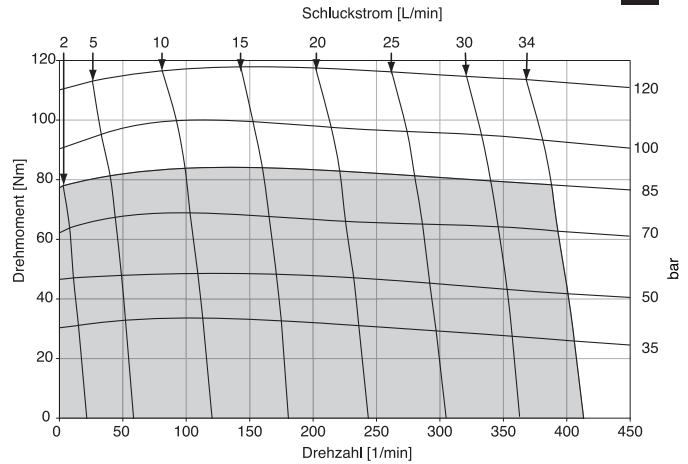
5.0 cu in / rev PRESSURE (PSID)

	500	750	1000	1250	1500	1750
<b>.5</b>	270 14	431 10	558 8	700 3		
<b>1</b>	289 39	438 37	585 33	730 30	871 25	
<b>2</b>	291 86	445 83	599 78	753 75	918 70	1037 61
<b>3</b>	284 132	442 129	600 125	753 121	903 116	1049 108
<b>4</b>	272 179	431 176	563 171	745 167	897 162	1046 153
<b>5</b>	255 225	414 221	574 217	730 212	882 207	1033 198
<b>7</b>	239 315	396 312	559 306	714 300	867 294	1021 284
<b>9</b>	226 407	382 402	547 394	703 389	855 382	1011 369

Flow (GPM)

TORQUE (LB IN) 703  
SPEED (RPM) 389

82 cm³/rev



TC 0100

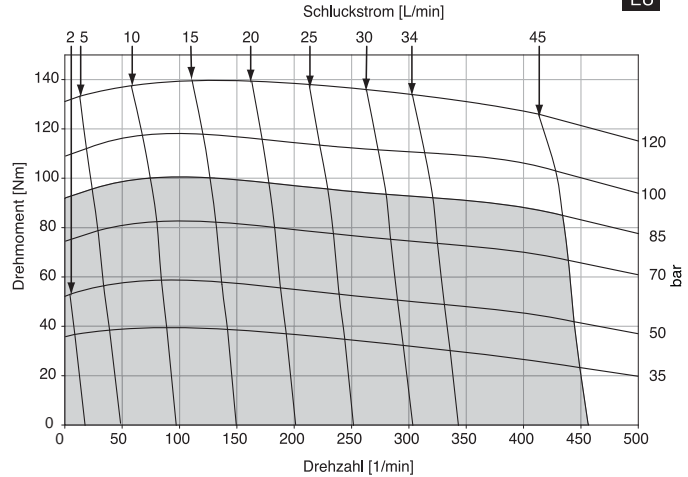
6.0 cu in / rev PRESSURE (PSID)

	500	750	1000	1250	1500	1750
<b>.5</b>	319 8	485 4				
<b>1</b>	337 30	514 26	684 22	855 18	1022 14	
<b>2</b>	345 67	546 64	728 61	909 56	1087 51	1222 44
<b>3</b>	335 108	522 104	707 100	888 96	1065 92	1243 84
<b>4</b>	323 146	508 142	697 139	879 135	1059 130	1241 123
<b>5</b>	305 185	490 181	681 177	864 173	1044 168	1227 161
<b>7</b>	282 261	465 256	658 251	842 247	1024 241	1209 232
<b>9</b>	262 337	444 332	638 326	822 322	1005 315	1193 304
<b>12</b>	203 448	384 443	582 438	763 433	943 427	1121 412

Flow (GPM)

TORQUE (LB IN) 763  
SPEED (RPM) 433

98 cm³/rev



■ Cont. □ Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TC 0130

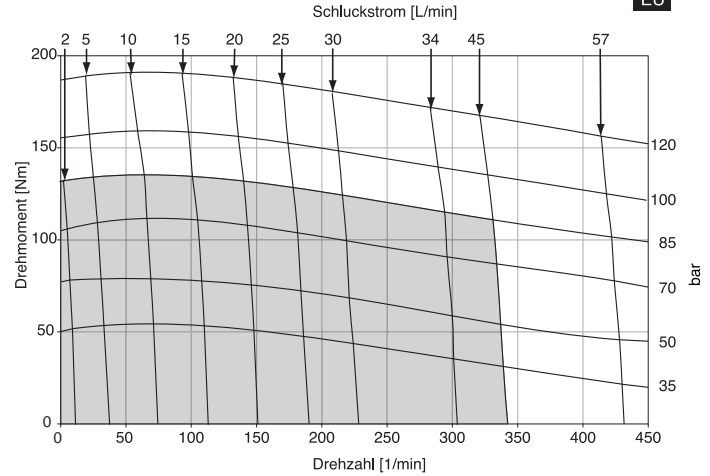
8.0 cu in / rev PRESSURE (PSID)

	500	750	1000	1250	1500	1750
.5	447 9	718 7	921 5	1188 2		
1	472 25	717 23	960 21	1201 19	1442 17	
2	476 54	726 52	970 50	1213 48	1455 45	1698 40
3	461 83	710 82	961 79	1204 76	1448 74	1693 70
4	440 112	689 111	942 108	1188 106	1432 103	1677 100
5	417 141	663 139	918 137	1164 135	1408 132	1654 129
7	384 198	629 195	857 193	1102 191	1346 188	1597 184
9	308 256	533 256	792 252	1034 250	1279 246	1533 241
12	270 342	499 340	758 337	998 334	1239 330	1492 324
15	188 428	418 426	677 422	911 420	1144 416	1391 412

Flow (GPM)

TORQUE (LB IN) 1533  
SPEED (RPM) 241

130 cm<sup>3</sup>/rev



TC 0165

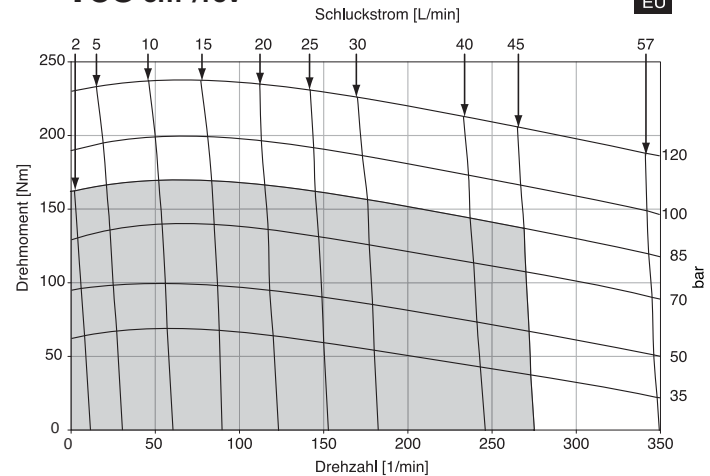
10.0 cu in / rev PRESSURE (PSID)

	500	750	1000	1250	1500	1750
.5	554 8	881 6	1130 4	1457 2		
1	594 20	898 19	1197 17	1492 16	1785 14	
2	605 43	914 42	1220 41	1526 39	1819 38	2114 35
3	584 67	899 66	1211 64	1518 63	1833 61	2109 58
4	554 91	866 89	1183 89	1491 87	1791 86	2092 85
5	519 114	827 113	1146 111	1455 110	1755 109	2057 108
7	477 159	782 158	1102 156	1408 155	1707 153	2011 150
9	376 207	671 205	991 204	1290 202	1587 201	1894 198
12	323 248	613 247	933 245	1229 244	1519 243	1833 241
15	194 347	467 345	786 344	1073 342	1363 341	1673 340

Flow (GPM)

TORQUE (LB IN) 1894  
SPEED (RPM) 198

163 cm<sup>3</sup>/rev



■ Cont. □ Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54°C (130°F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrian tener una pequeña variacion entre distintos motores.

TC 0195

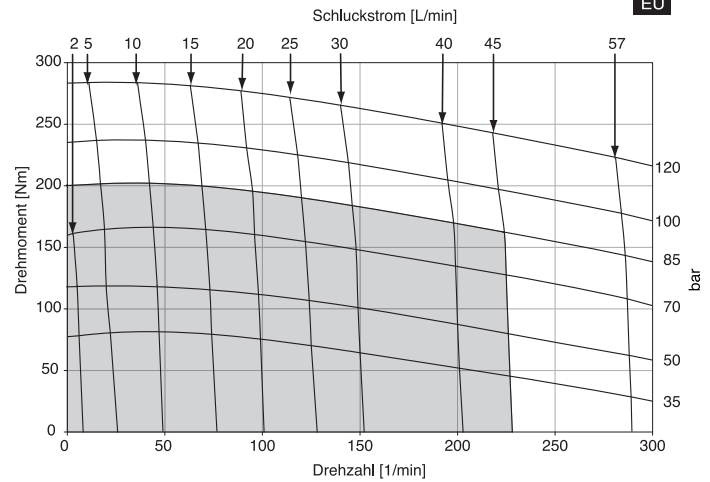
11.9 cu in / rev PRESSURE (PSID)

	500	750	1000	1250	1500	1750
<b>.5</b>	678 6	1089 5	1402 3			
<b>1</b>	704 17	1070 15	1439 14	1805 13	2166 11	
<b>2</b>	717 36	1089 35	1459 33	1824 32	2176 30	2523 27
<b>3</b>	687 56	1061 55	1427 54	1789 52	2148 51	2508 48
<b>4</b>	650 75	1019 74	1389 73	1749 72	2105 70	2463 67
<b>5</b>	614 95	978 94	1350 92	1708 91	2061 89	2418 86
<b>7</b>	567 132	925 132	1301 131	1656 129	2007 127	2365 124
<b>9</b>	452 201	799 200	1177 199	1526 198	1873 195	2232 192
<b>12</b>	392 227	732 226	1107 225	1454 224	1803 221	2163 218
<b>15</b>	249 290	569 289	944 288	1288 287	1627 285	1985 282

Flow (GPM)

TORQUE (LB IN) 2232  
SPEED (RPM) 192

195 cm<sup>3</sup>/rev



TC 0230

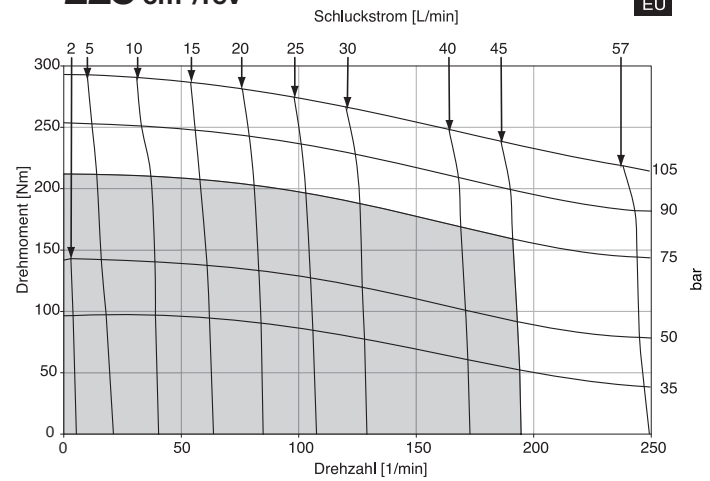
13.9 cu in / rev PRESSURE (PSID)

	500	750	1100	1300	1550
<b>.5</b>	837 4	1313 3			
<b>1</b>	856 14	1293 12	1892 11	2226 9	2637 8
<b>2</b>	846 30	1291 29	1888 28	2221 25	2621 23
<b>3</b>	820 47	1258 46	1853 44	2179 42	2581 41
<b>4</b>	784 64	1217 63	1809 61	2134 60	2531 58
<b>5</b>	741 80	1168 79	1760 78	2086 76	2475 74
<b>7</b>	683 113	1101 112	1692 111	2019 110	2405 106
<b>9</b>	518 146	908 146	1497 144	1833 143	2231 140
<b>12</b>	462 176	851 175	1432 174	1763 173	2153 169
<b>15</b>	337 246	720 244	1291 243	1604 242	1969 237

Flow (GPM)

TORQUE (LB IN) 2231  
SPEED (RPM) 140

228 cm<sup>3</sup>/rev



■ Cont. □ Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54°C (130°F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TC 0260

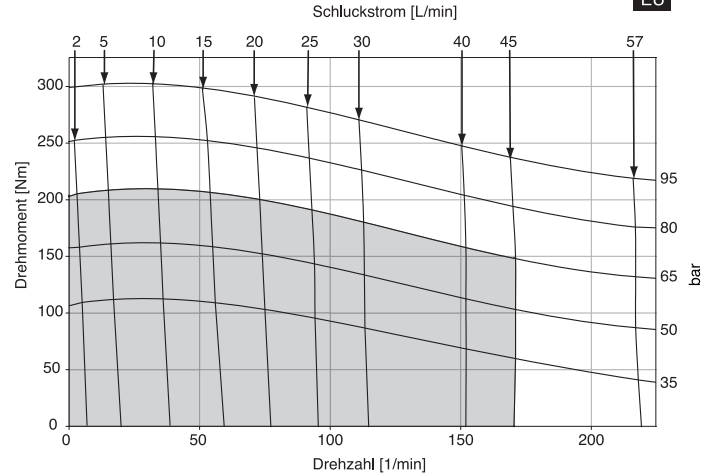
15.9 cu in / rev PRESSURE (PSID)

	500	750	950	1200	1400
<b>.5</b>	950 5	1446 4	1828 3	2307 2	
<b>1</b>	978 13	1473 12	1860 11	2335 11	2713 10
<b>2</b>	989 27	1489 26	1880 26	2353 25	2728 24
<b>3</b>	946 42	1449 42	1837 41	2307 40	2689 39
<b>4</b>	889 57	1382 56	1775 55	2233 55	2608 54
<b>5</b>	837 71	1316 71	1704 70	2169 70	2536 69
<b>7</b>	765 100	1235 100	1623 100	2078 99	2437 98
<b>9</b>	588 130	1016 129	1391 129	1876 129	2230 128
<b>12</b>	523 155	952 155	1329 155	1767 154	2131 154
<b>15</b>	357 217	796 216	1177 216	1611 216	1969 215

Flow (GPM)

TORQUE (LB IN) 2230  
SPEED (RPM) 128

260 cm<sup>3</sup>/rev



TC 0295

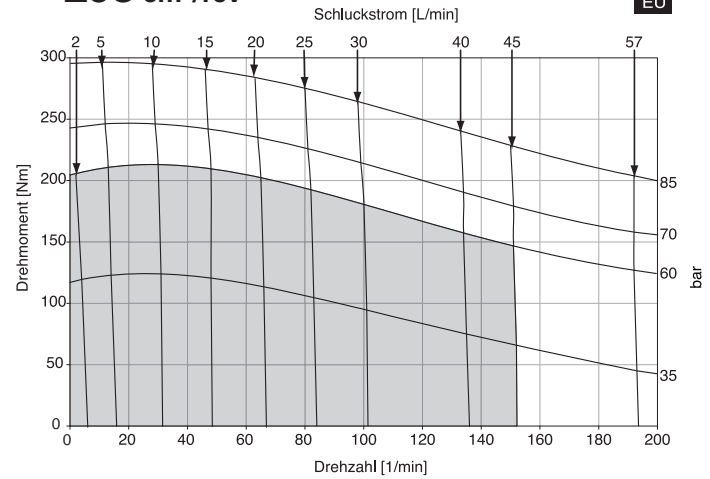
17.9 cu in / rev PRESSURE (PSID)

	500	850	1000	1250
<b>.5</b>	1037 4	1769 2		
<b>1</b>	1075 11	1834 10	2145 9	2656 8
<b>2</b>	1090 23	1850 23	2153 22	2656 21
<b>3</b>	1046 36	1807 36	2110 36	2611 35
<b>4</b>	976 50	1729 49	2040 48	2540 48
<b>5</b>	915 63	1668 62	1970 61	2468 61
<b>7</b>	837 89	1582 88	1883 87	2378 87
<b>9</b>	645 115	1349 114	1648 114	2163 113
<b>12</b>	575 138	1271 137	1569 137	2046 136
<b>15</b>	392 192	1098 191	1377 191	1831 191

Flow (GPM)

TORQUE (LB IN) 2163  
SPEED (RPM) 113

293 cm<sup>3</sup>/rev



■ Cont. □ Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TC 0330

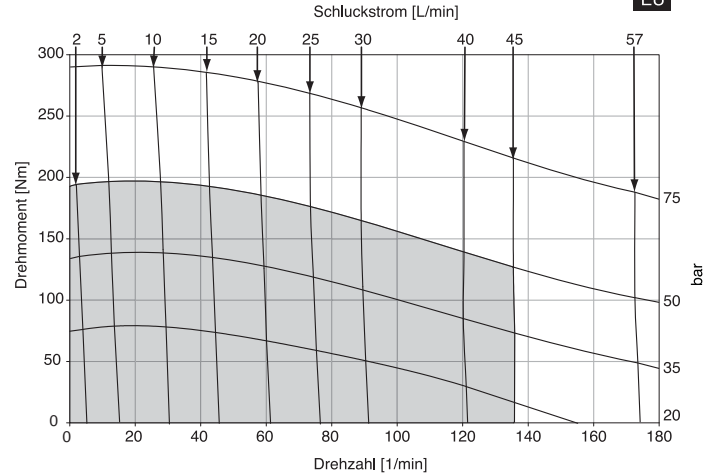
20.0 cu in / rev PRESSURE (PSID)

	250	500	750	1100
.5	580 4	1177 3		
1	603 10	1207 10	1803 9	2298 7
2	598 22	1232 22	1803 21	2298 19
3	558 34	1158 33	1757 32	2251 32
4	507 46	1098 45	1693 44	2195 44
5	458 57	1033 56	1620 56	2124 55
7	381 80	968 79	1510 79	2030 79
9	226 103	733 102	1272 103	1808 103
12		636 123	1163 123	1706 123
15		426 173	934 172	1485 172

Flow (GPM)

TORQUE (LB IN) 1808  
SPEED (RPM) 103

328 cm<sup>3</sup>/rev



TC 0365

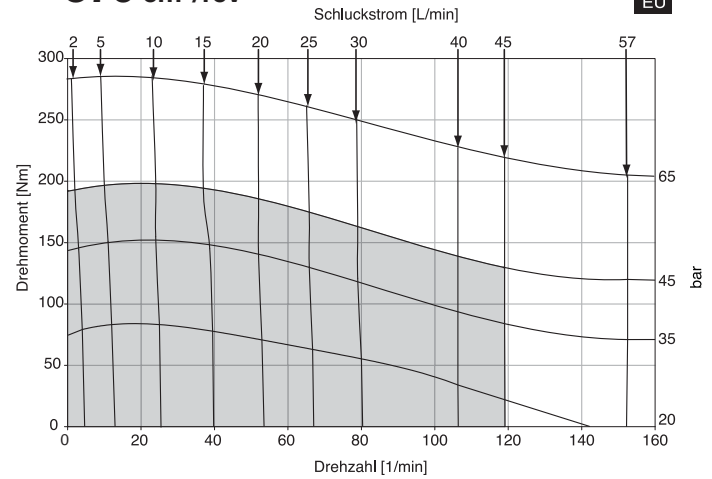
22.6 cu in / rev PRESSURE (PSID)

	250	500	650	950
.5	603 4	1260 3	1689 2	2529 1
1	636 9	1316 8	1745 8	2542 7
2	637 19	1351 18	1772 18	2551 17
3	587 30	1264 29	1684 28	2479 28
4	542 40	1212 39	1622 39	2408 39
5	484 50	1138 50	1550 50	2331 49
7	419 71	1055 70	1463 70	2239 70
9	259 91	793 91	1199 91	2025 91
12		741 108	1155 108	1962 108
15		619 152	1058 152	1828 152

Flow (GPM)

TORQUE (LB IN) 2025  
SPEED (RPM) 91

370 cm<sup>3</sup>/rev



■ Cont. □ Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.



TC 0390

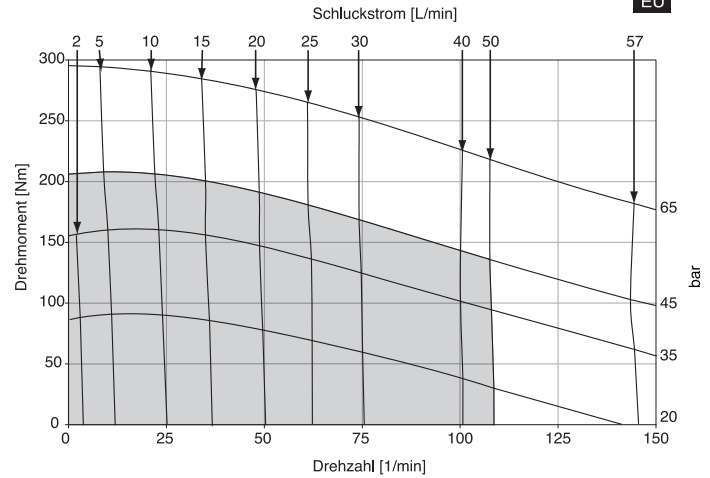
24.0 cu in / rev PRESSURE (PSID)

	250	500	650	950
<b>.5</b>	671 3	1356 2		
<b>1</b>	694 8	1404 8	1825 7	2622 6
<b>2</b>	694 18	1421 17	1842 17	2604 16
<b>3</b>	648 27	1343 26	1754 26	2533 26
<b>4</b>	587 38	1264 37	1675 37	2453 36
<b>5</b>	534 47	1194 47	1595 46	2363 46
<b>7</b>	458 66	1107 66	1498 66	2265 66
<b>9</b>	282 86	880 85	1260 85	2016 86
<b>12</b>		819 98	1195 98	1942 98
<b>15</b>		540 144	908 143	1623 144

Flow (GPM)

TORQUE (LB IN) 2016  
SPEED (RPM) 86

392 cm<sup>3</sup>/rev



■ Cont. □ Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

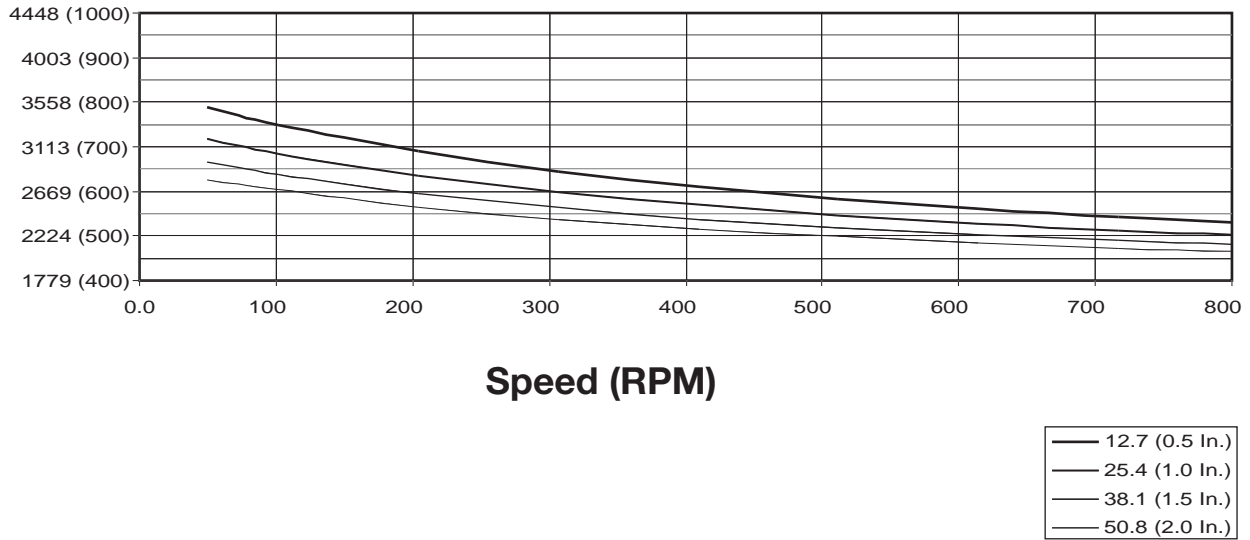
Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

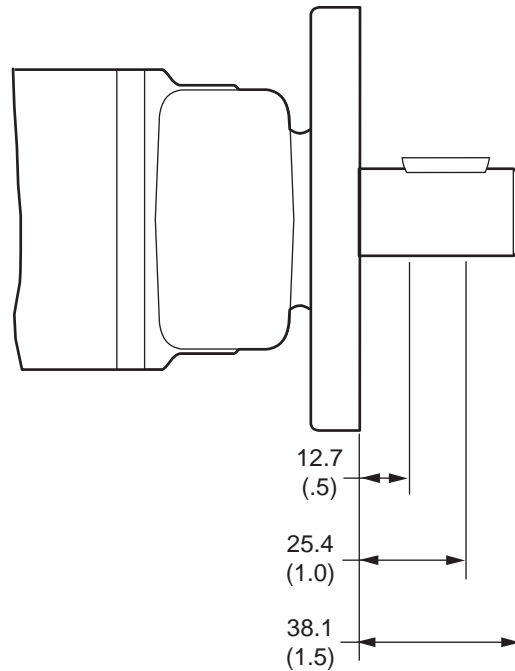
Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

Shaft Side Load Capacity N (lb)



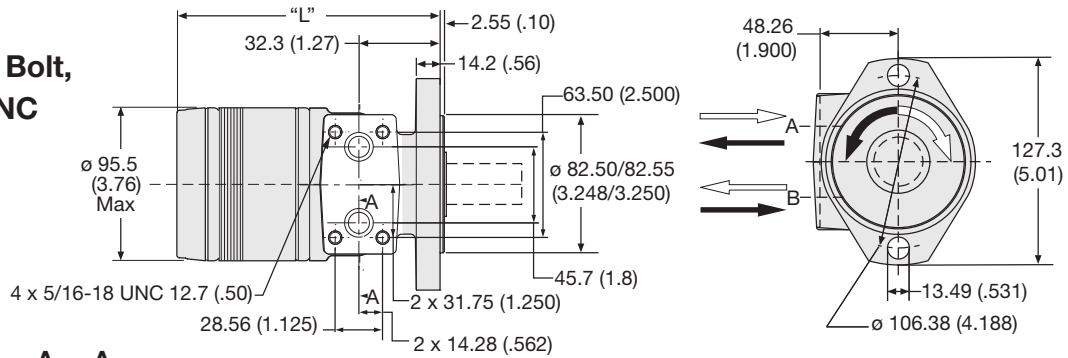
The allowable side load curve is based on bushing life of  $2.5 \times 10^6$  revolutions.  
 Die zulaessige radiale Wellenbelastung bezieht sich auf die Lager-Lebensdauer  $2,5 \times 10^6$  Umdrehungen.  
 L'effort radial admissible sur l'arbre depend a une duree de vie  $2,5 \times 10^6$  de rotation.  
 La curva de carga lateral admisible se basa en vida util de cojinete de  $2.5 \times 10^6$  revoluciones.



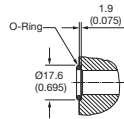
English equivalents for metric specifications are shown in ( ).

**Code: AM**

**SAE "A" 2 Bolt,  
 5/16-18 UNC  
 Manifold**



**A - - A**

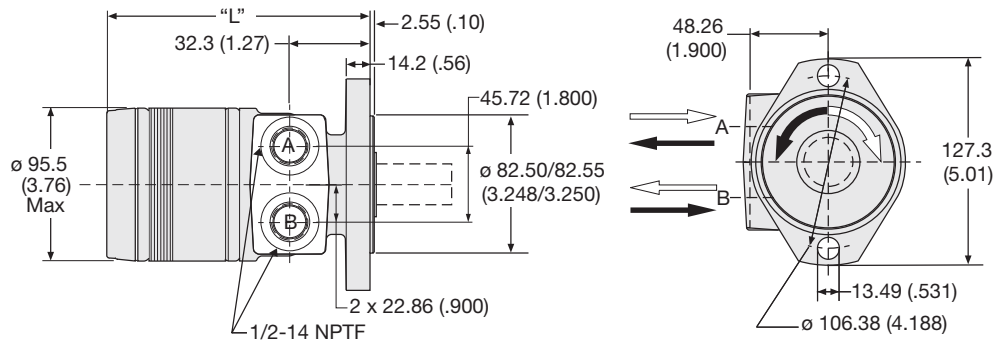


Motor with manifold mount is supplied with 2 O-rings.  
 Zum Motor mit Universalanschluß werden 2 O-Ringe geliefert.  
 Deux joints toriques sont livrés avec les moteurs a plan de raccordement universel.  
 Il blocchetto connessioni è corredato da 2 OR.

Code AP	disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
<b>Weight/Gewicht</b>	<b>kg</b>	<b>5.38</b>	<b>5.46</b>	<b>5.54</b>	<b>5.67</b>	<b>5.81</b>	<b>5.88</b>	<b>6.19</b>	<b>6.45</b>	<b>6.74</b>	<b>6.93</b>	<b>7.23</b>	<b>7.39</b>	<b>7.71</b>	<b>8.09</b>	<b>8.21</b>
Poids/Peso	(lb)	(11.8)	(12.0)	(12.2)	(12.5)	(12.8)	(13.0)	(13.6)	(14.2)	(14.9)	(15.3)	(15.9)	(16.3)	(17.0)	(17.8)	(18.1)
<b>Length</b>	<b>"L" mm</b>	<b>119.1</b>	<b>120.1</b>	<b>121.6</b>	<b>124.8</b>	<b>127.9</b>	<b>131.1</b>	<b>137.5</b>	<b>143.8</b>	<b>150.2</b>	<b>156.5</b>	<b>162.9</b>	<b>169.2</b>	<b>175.6</b>	<b>184.2</b>	<b>188.3</b>
	"L" (in)	(4.69)	(4.73)	(4.79)	(4.91)	(5.04)	(5.16)	(5.41)	(5.66)	(5.91)	(6.16)	(6.41)	(6.66)	(6.91)	(7.25)	(7.41)

**Code: AP**

**SAE "A" 2 Bolt,  
 1/2-14 NPTF**

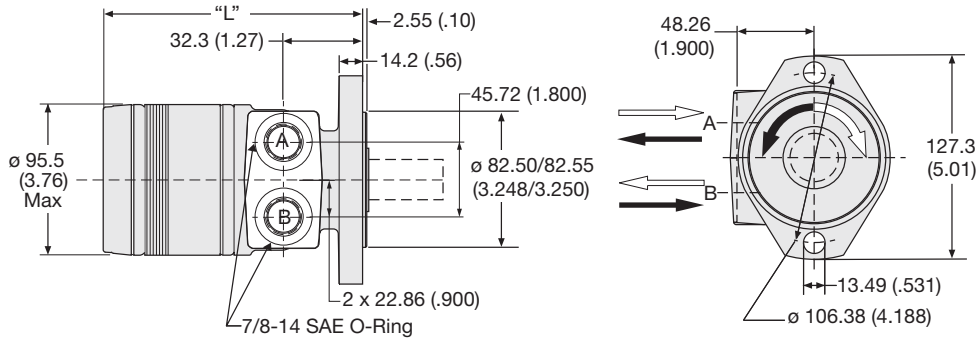


Code AP	disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
<b>Weight/Gewicht</b>	<b>kg</b>	<b>5.38</b>	<b>5.46</b>	<b>5.54</b>	<b>5.67</b>	<b>5.81</b>	<b>5.88</b>	<b>6.19</b>	<b>6.45</b>	<b>6.74</b>	<b>6.93</b>	<b>7.23</b>	<b>7.39</b>	<b>7.71</b>	<b>8.09</b>	<b>8.21</b>
Poids/Peso	(lb)	(11.8)	(12.0)	(12.2)	(12.5)	(12.8)	(13.0)	(13.6)	(14.2)	(14.9)	(15.3)	(15.9)	(16.3)	(17.0)	(17.8)	(18.1)
<b>Length</b>	<b>"L" mm</b>	<b>119.1</b>	<b>120.1</b>	<b>121.6</b>	<b>124.8</b>	<b>127.9</b>	<b>131.1</b>	<b>137.5</b>	<b>143.8</b>	<b>150.2</b>	<b>156.5</b>	<b>162.9</b>	<b>169.2</b>	<b>175.6</b>	<b>184.2</b>	<b>188.3</b>
	"L" (in)	(4.69)	(4.73)	(4.79)	(4.91)	(5.04)	(5.16)	(5.41)	(5.66)	(5.91)	(6.16)	(6.41)	(6.66)	(6.91)	(7.25)	(7.41)

English equivalents for metric specifications are shown in ( ).

**Code: AS**

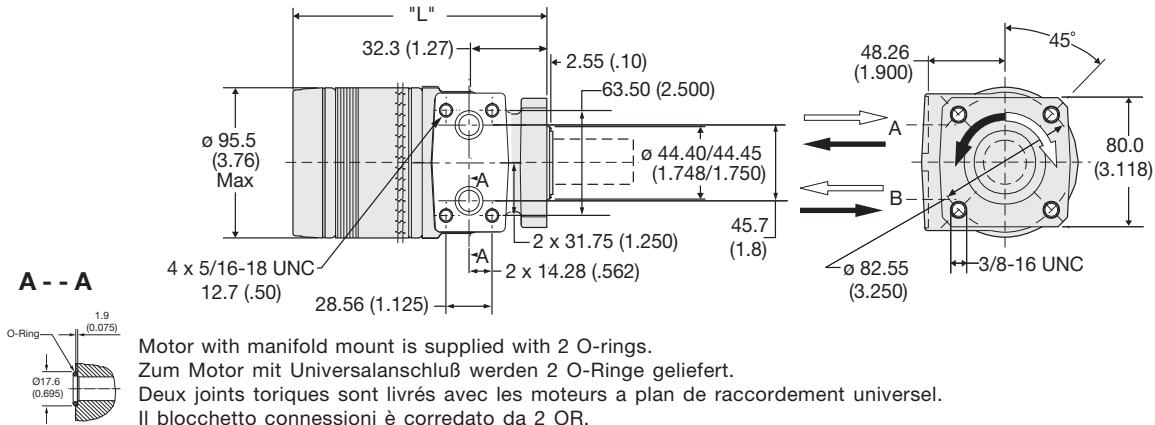
**SAE "A" 2 Bolt,  
 7/8-14 SAE**



Code AP	disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
<b>Weight/Gewicht</b>	<b>kg</b>	<b>5.38</b>	<b>5.46</b>	<b>5.54</b>	<b>5.67</b>	<b>5.81</b>	<b>5.88</b>	<b>6.19</b>	<b>6.45</b>	<b>6.74</b>	<b>6.93</b>	<b>7.23</b>	<b>7.39</b>	<b>7.71</b>	<b>8.09</b>	<b>8.21</b>
Poids/Peso	(lb)	(11.8)	(12.0)	(12.2)	(12.5)	(12.8)	(13.0)	(13.6)	(14.2)	(14.9)	(15.3)	(15.9)	(16.3)	(17.0)	(17.8)	(18.1)
<b>Length</b>	<b>"L" mm</b>	<b>119.1</b>	<b>120.1</b>	<b>121.6</b>	<b>124.8</b>	<b>127.9</b>	<b>131.1</b>	<b>137.5</b>	<b>143.8</b>	<b>150.2</b>	<b>156.5</b>	<b>162.9</b>	<b>169.2</b>	<b>175.6</b>	<b>184.2</b>	<b>188.3</b>
	"L" (in)	(4.69)	(4.73)	(4.79)	(4.91)	(5.04)	(5.16)	(5.41)	(5.66)	(5.91)	(6.16)	(6.41)	(6.66)	(6.91)	(7.25)	(7.41)

**Code: FM**

**4 Bolt w/3/8-16 Thd,  
 5/16-18 UNC Manifold**

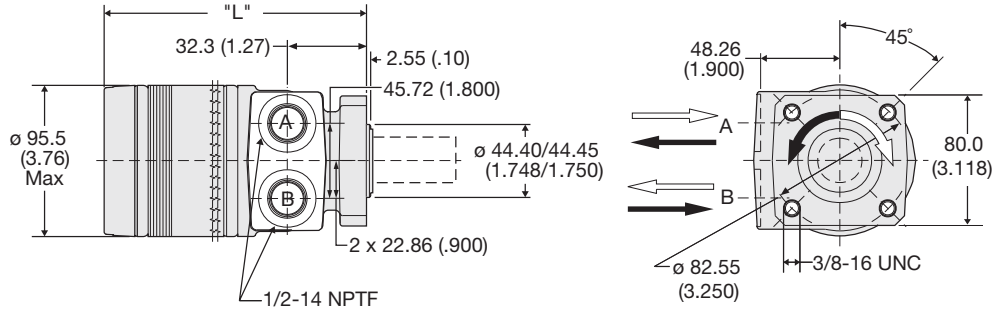


Code FM	disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
<b>Weight/Gewicht</b>	<b>kg</b>	<b>5.91</b>	<b>6.03</b>	<b>6.12</b>	<b>6.26</b>	<b>6.35</b>	<b>6.49</b>	<b>6.76</b>	<b>7.03</b>	<b>7.35</b>	<b>7.58</b>	<b>7.80</b>	<b>8.07</b>	<b>8.35</b>	<b>8.66</b>	<b>8.80</b>
Poids/Peso	(lb)	(13.1)	(13.3)	(13.5)	(13.8)	(14.0)	(14.3)	(14.9)	(15.5)	(16.2)	(16.7)	(17.2)	(17.8)	(18.4)	(19.1)	(19.4)
<b>Length</b>	<b>"L" mm</b>	<b>119.1</b>	<b>120.1</b>	<b>121.6</b>	<b>124.8</b>	<b>127.9</b>	<b>131.1</b>	<b>137.5</b>	<b>143.8</b>	<b>150.2</b>	<b>156.5</b>	<b>162.9</b>	<b>169.2</b>	<b>175.6</b>	<b>184.2</b>	<b>188.3</b>
	"L" (in)	(4.69)	(4.73)	(4.79)	(4.91)	(5.04)	(5.16)	(5.41)	(5.66)	(5.91)	(6.16)	(6.41)	(6.66)	(6.91)	(7.25)	(7.41)

English equivalents for metric specifications are shown in ( ).

**Code: FP**

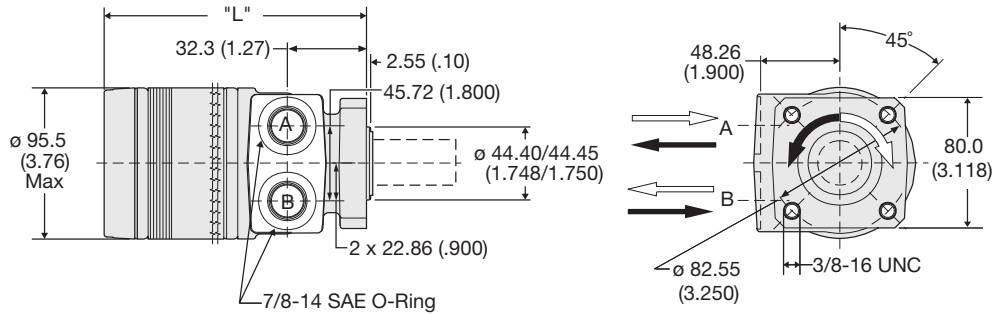
**4 Bolt w/3/8-16 Thd,  
 1/2-14 NPTF**



Code FP	disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
<b>Weight/Gewichtkg</b>	<b>5.91</b>	<b>6.03</b>	<b>6.12</b>	<b>6.26</b>	<b>6.35</b>	<b>6.49</b>	<b>6.76</b>	<b>7.03</b>	<b>7.35</b>	<b>7.58</b>	<b>7.80</b>	<b>8.07</b>	<b>8.35</b>	<b>8.66</b>	<b>8.80</b>	
Poids/Peso (lb)	(13.1)	(13.3)	(13.5)	(13.8)	(14.0)	(14.3)	(14.9)	(15.5)	(16.2)	(16.7)	(17.2)	(17.8)	(18.4)	(19.1)	(19.4)	
<b>Length</b>	<b>"L" mm</b>	<b>119.1</b>	<b>120.1</b>	<b>121.6</b>	<b>124.8</b>	<b>127.9</b>	<b>131.1</b>	<b>137.5</b>	<b>143.8</b>	<b>150.2</b>	<b>156.5</b>	<b>162.9</b>	<b>169.2</b>	<b>175.6</b>	<b>184.2</b>	<b>188.3</b>
"L" (in)	(4.69)	(4.73)	(4.79)	(4.91)	(5.04)	(5.16)	(5.41)	(5.66)	(5.91)	(6.16)	(6.41)	(6.66)	(6.91)	(7.25)	(7.41)	

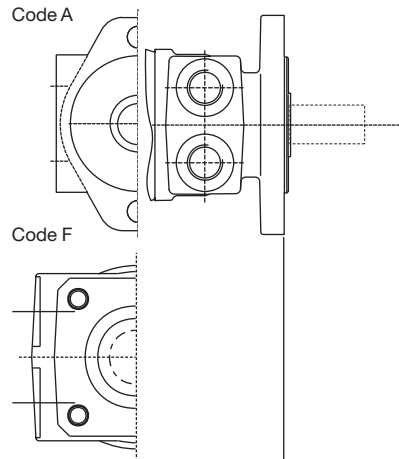
**Code: FS**

**4 Bolt w/3/8-16 Thd,  
 7/8-14 SAE**



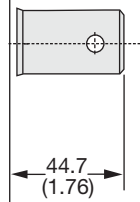
Code FP	disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
<b>Weight/Gewichtkg</b>	<b>5.91</b>	<b>6.03</b>	<b>6.12</b>	<b>6.26</b>	<b>6.35</b>	<b>6.49</b>	<b>6.76</b>	<b>7.03</b>	<b>7.35</b>	<b>7.58</b>	<b>7.80</b>	<b>8.07</b>	<b>8.35</b>	<b>8.66</b>	<b>8.80</b>	
Poids/Peso (lb)	(13.1)	(13.3)	(13.5)	(13.8)	(14.0)	(14.3)	(14.9)	(15.5)	(16.2)	(16.7)	(17.2)	(17.8)	(18.4)	(19.1)	(19.4)	
<b>Length</b>	<b>"L" mm</b>	<b>119.1</b>	<b>120.1</b>	<b>121.6</b>	<b>124.8</b>	<b>127.9</b>	<b>131.1</b>	<b>137.5</b>	<b>143.8</b>	<b>150.2</b>	<b>156.5</b>	<b>162.9</b>	<b>169.2</b>	<b>175.6</b>	<b>184.2</b>	<b>188.3</b>
"L" (in)	(4.69)	(4.73)	(4.79)	(4.91)	(5.04)	(5.16)	(5.41)	(5.66)	(5.91)	(6.16)	(6.41)	(6.66)	(6.91)	(7.25)	(7.41)	

English equivalents for metric specifications are shown in ( ).



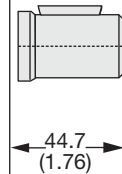
**Code: 09**

**1" Straight with  
 0.38" Crosshole**



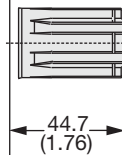
**Code: 10**

**1" Keyed**



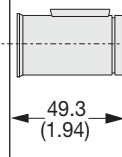
**Code: 11**

**1" 6B Spline**



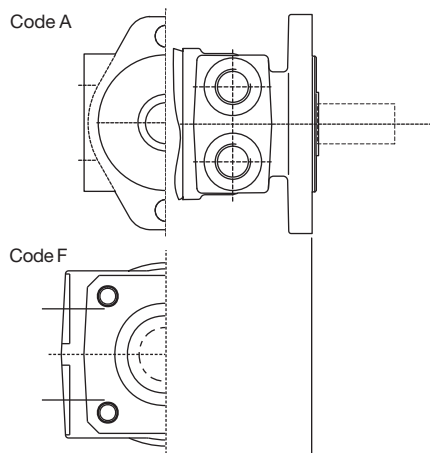
**Code: 13**

**Long 1" Keyed**

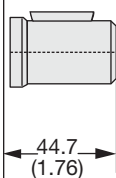


English equivalents for metric specifications are shown in ( ).

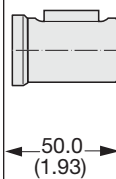
001 TC.indd.js



**Code: 21**  
**Corrosion Resistant**



**Code: 26**  
**25mm Keyed**  
**with 8mm Key**



English equivalents for metric specifications are shown in ( ).

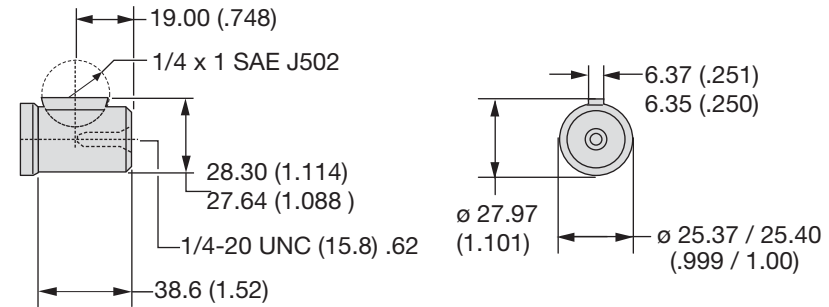
Code: 09

1" Straight with  
0.38" Crosshole



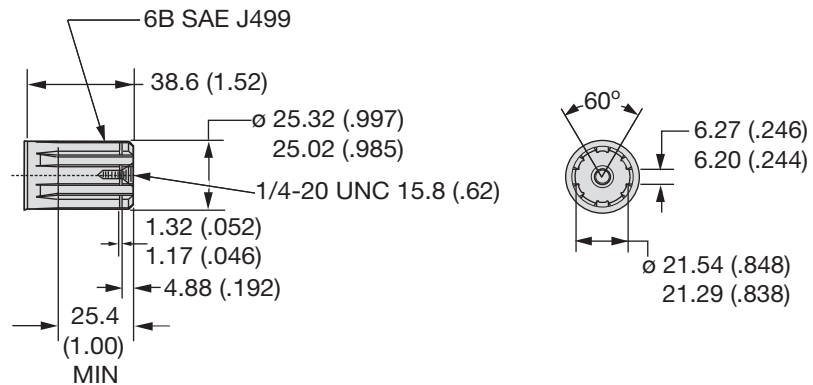
Code: 10

1" Keyed



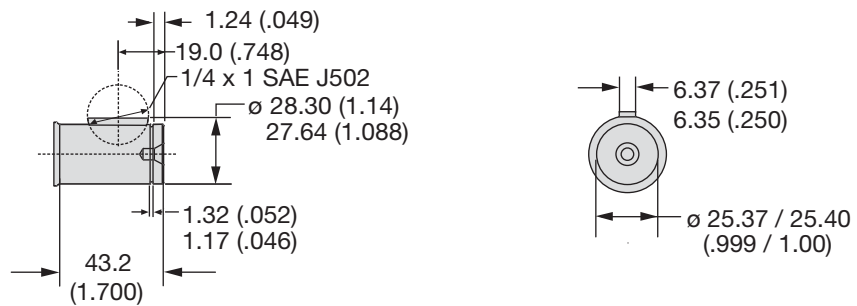
Code: 11

1" 6B Spline



Code: 13

Long 1" Keyed



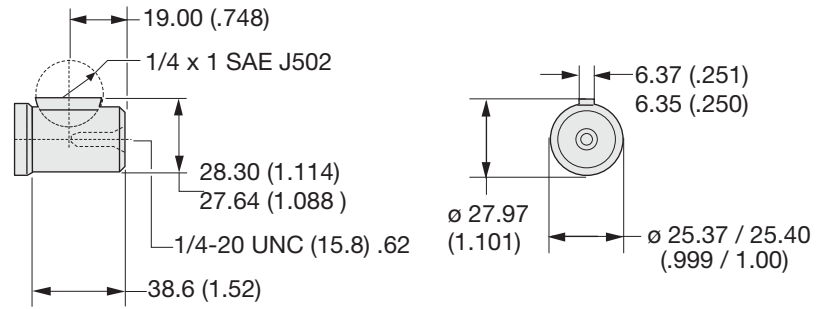
English equivalents for metric specifications are shown in ( ).

001 TC.indd, js



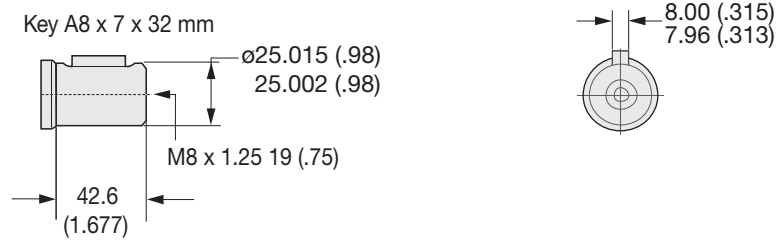
**Code: 21**

**Corrosion Resistant**



**Code: 26**

**25mm Keyed  
with 8mm Key**



English equivalents for metric specifications are shown in ( ).

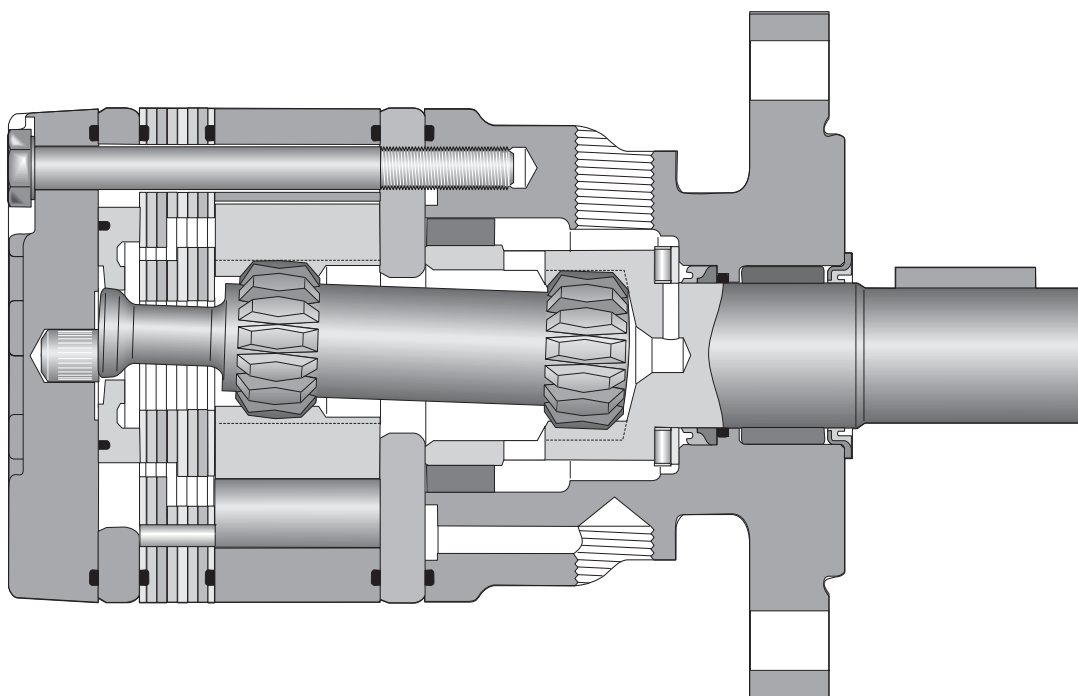
001 TC.indd, js



15 Displacements	(2.2 – 24.0 in <sup>3</sup> /rev)	
15 Schluckvolumen	36 . . . 390 cm <sup>3</sup> /rev	
15 Cylindrée		
15 Desplazamientos		
	<b>Cont</b>	<b>Int</b>
Maximum Pressure	(1800 psid)	(2400 psid)
Eingangsdruck	. . .125 bar	. . .165 bar
Chaute de pression max.		
Presion Maxima		
Maximum Oil Flow	(15 gpm)	
Schluckstrom	. . . 57 lpm	
Débit d'huile		
Caudal Maximo de Aceite		
Maximum Speed	(932 rpm)	
Drehzahl	932 rpm	
Vitesse de rotation		
Velocidad Maxima		
	<b>Cont</b>	<b>Int</b>
Maximum Torque	(3897 lb in)	(4783 lb in)
Max Drehmoment	440 Nm	540 Nm
Couple Maxi		
Torque Maximo		
Maximum Side Load at Key	(1100 lb)	
Seitenlast	. . . 4900 N	
Charges latérales		
Carga Maxima Lateral		

## A Light to Medium Duty Low Speed, High Torque Motor

This light to medium duty motor incorporates all the features of heavy duty motors. Design features include a high pressure shaft seal so external drains are never required, roller vane technology for automatic wear compensation, and full flow internal cooling and flushing. This is a very economical motor for most light to medium duty applications.



**TB**

Series


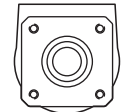


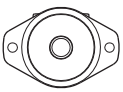
**XXXX**

Displacement  
Schluckvolumen  
Cylindrée  
Desplazamiento

Code	cm <sup>3</sup> /U cm <sup>3</sup> /tr cm <sup>3</sup> /giro	in <sup>3</sup> /rev
0036	36 / 2.2	
0045	41 / 2.5	
0050	49 / 3.0	
0065	65 / 4.0	
0080	82 / 5.0	
0100	98 / 6.0	
0130	130 / 8.0	
0165	163 / 10.0	
0195	195 / 11.9	
0230	228 / 13.9	
0260	260 / 15.9	
0295	293 / 17.9	
0330	328 / 20.0	
0365	370 / 22.6	
0390	392 / 24.0	





**X**

Mounting  
Gehäuse  
Carter  
Montaje


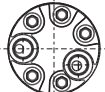
Code	Mounting
A	SAE "A" 2 Bolt 
F	4 Bolt w/3/8-16 UNC 
M	Magneto 
C	SAE "A" 2 Bolt, Long Pilot 
B	SAE "B" 2 Bolt 

**X**

Ports  
Anschluß  
Plan de raccordement  
Lumbreras

Code	Ports
M	5/16-18 UNC Manifold 
P	1/2-14 NPTF 
S	7/8-14 SAE 
W	G 1/2 BSPP 










Rear Ports  
Endanschluß  
Alimentazione Laterale  
Orifices arriér

Code	Rear Ports
R	3/4-16 SAE O-ring Axial 
Y	G 1/2 BSPP Axial 

For other available options, see pages 102–103.

**XX**



Shaft  
Welle  
Arbre  
Eje

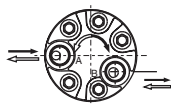
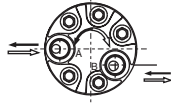
Code	Shaft
09	1" Straight w/0.38" Crosshole 
10	1" Keyed 
11	1" 6B Spline 
13	Long 1" Keyed 
21	1" Keyed; Corrosion Resistant 
25	1" Tapered 
26	25mm Keyed w/ 8mm Key 
28	7/8" 13 Tooth Spline 
59*	7/8" 13 Tooth Spline SAE 

\* Conforms to SAE B recommended length

**0**

Rotation  
Drehrichtung  
Direction de rotation  
Rotacion

Code	Rotation
0	Standard 
1	Reverse Timed Manifold 

Code	Rear Port Rotation
0	Standard 
1	Reverse Timed Manifold 

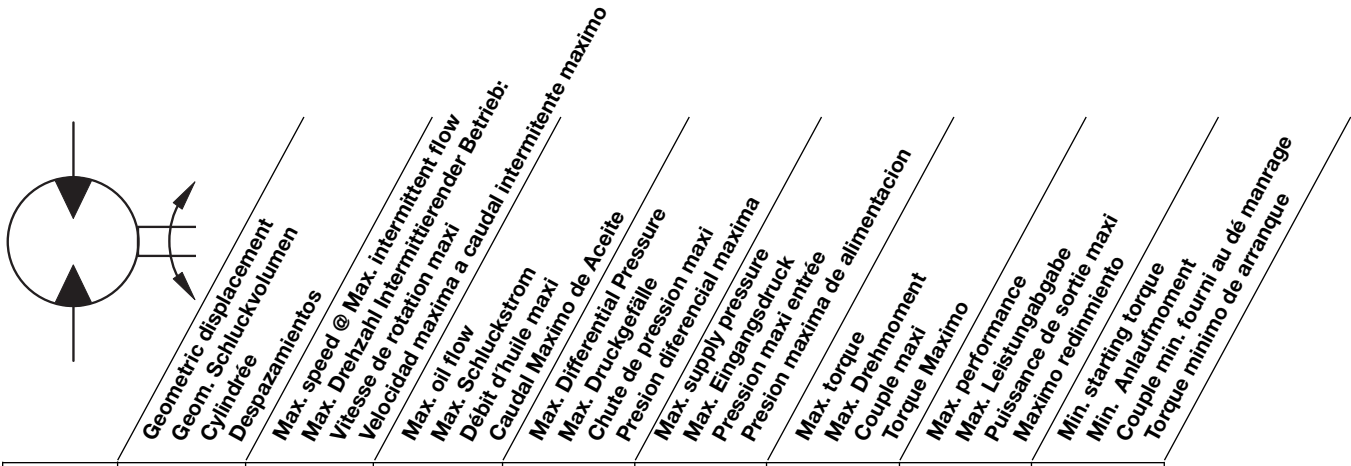
Rotation viewed from shaft end.

**XXXX**

Options  
Opciones

Code	Options
AAAA	Black Paint
AAAB	No Paint
AAAC	Double Paint
AAAF	Castle Nut, Black Paint
AABP	Castle Nut, No Paint
AAAG	Fluorocarbon Seals, Black Paint
AAAH	Fluorocarbon Seals, No Paint
AAAJ	High Temperature Commutator Seal, Black Paint
AAFG	High Temperature Commutator Seal, No Paint
AABJ*	Free Running Rotorset, Black Paint
AABK*	Free Running Rotorset, No Paint

\*Not applicable to TB0365 or TB0390 displacements



Motor Series TB	cm <sup>3</sup> /rev in <sup>3</sup> /rev	rev/min	cont / int* l/min g/min		cont / int* bar psid		max bar psig		cont / int* Nm lb-in		max KW HP		cont / int* Nm lb-in	
TB 0036	36 2.2	932	34 9	34 9	125 1800	165 2400	190 2750	48 427	67 596	6.6 8.8	44 385	50 440		
TB 0045	41 2.5	805	34 9	34 9	125 1800	165 2400	190 2750	64 526	88 731	7.2 9.7	39 341	52 461		
TB 0050	49 3.0	678	34 9	34 9	125 1800	165 2400	190 2750	78 693	107 946	7.5 10.1	36 319	70 619		
TB 0065	65 4.0	511	34 9	34 9	125 1800	165 2400	190 2750	107 946	145 1284	7.8 10.4	66 582	99 977		
TB 0080	82 5.0	409	34 9	34 9	125 1800	165 2400	190 2750	135 1193	184 1624	7.8 10.5	92 816	139 1226		
TB 0100	98 6.0	454	45 12	45 12	125 1800	165 2400	190 2750	159 1411	217 1917	10.2 13.8	119 1050	158 1400		
TB 0130	130 8.0	430	45 12	57 15	125 1800	165 2400	190 2750	220 1951	297 2632	13.4 18.0	167 1482	229 2024		
TB 0165	163 10.0	343	45 12	57 15	125 1800	155 2250	190 2750	273 2418	346 3062	12.4 16.7	199 1760	263 2331		
TB 0195	195 11.9	287	45 12	57 15	125 1800	145 2100	190 2750	340 3011	400 3537	12.0 16.1	270 2388	325 2872		
TB 0230	228 13.9	246	45 12	57 15	103 1500	138 2000	190 2750	316 2797	427 3782	11.0 14.8	261 2354	353 3121		
TB 0260	260 15.9	216	45 12	57 15	100 1450	131 1900	190 2750	350 3096	465 4117	10.5 14.1	291 2573	395 3498		
TB 0295	293 17.9	191	45 12	57 15	97 1400	125 1800	190 2750	383 3391	499 4415	10.0 13.4	308 2724	400 3544		
TB 0330	328 20.0	171	45 12	57 15	93 1350	114 1650	190 2750	413 3657	509 4505	9.1 12.2	332 2942	406 3590		
TB 0365	370 22.6	151	45 12	57 15	86 1250	105 1525	190 2750	440 3897	540 4783	8.7 11.6	372 3296	454 4021		
TB 0390	392 24.0	143	45 12	57 15	83 1200	100 1450	190 2750	428 3792	525 4642	7.8 10.5	339 3003	434 3845		

Performance data based on testing using 10W40 oil with a viscosity of 43.1 cSt. (200 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

\* Intermittent operation rating applies to 10% of every minute.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

**TB 0036**

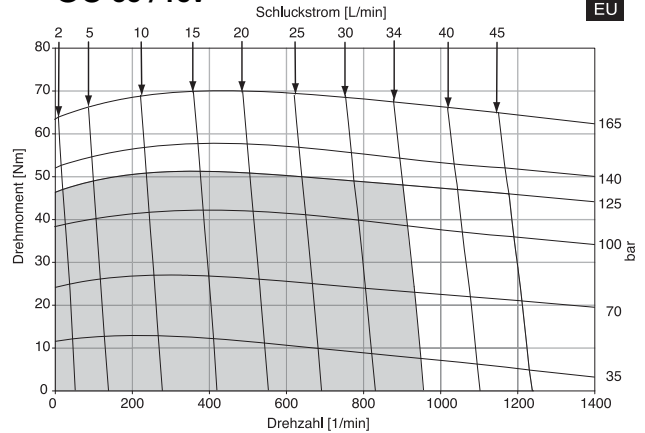
**2.2 cu in / rev** PRESSURE (PSID)

	500	1000	1500	1800	2000	2400
<b>.5</b>	108 45	223 37	343 26	418 19	468 15	570 8
<b>1</b>	114 97	234 88	357 77	431 70	481 66	581 57
<b>2</b>	112 202	235 191	361 179	440 172	492 168	598 158
<b>3</b>	113 307	241 295	370 282	450 274	503 269	610 258
<b>4</b>	109 411	241 398	373 384	455 376	509 370	620 358
<b>5</b>	104 515	237 501	371 486	453 477	509 471	621 459
<b>7</b>	87 724	225 708	360 691	443 681	498 674	613 660
<b>9</b>	71 932	208 915	344 896	427 884	483 876	598 860

Flow (GPM)

TORQUE (LB IN) 427  
SPEED (RPM) 884

**36 cc / rev**



**TB 0045**

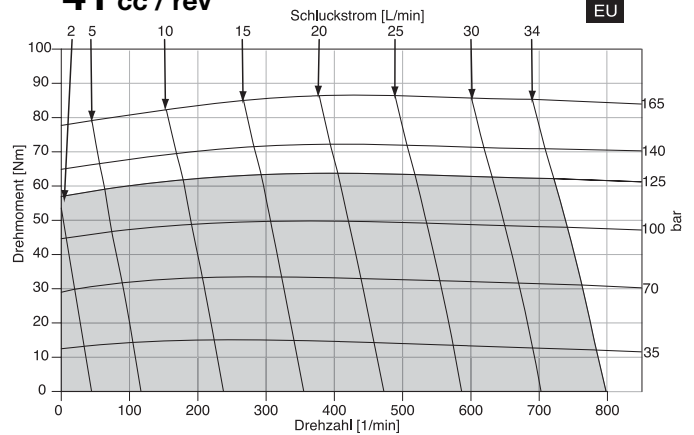
**2.5 cu in / rev** PRESSURE (PSID)

	500	1000	1500	1800	2000	2400
<b>.5</b>	116 31	263 17				
<b>1</b>	124 76	276 61	427 43	518 36	579 29	706 18
<b>2</b>	134 167	294 149	453 131	547 121	609 113	723 97
<b>3</b>	132 256	293 239	455 220	553 210	617 200	746 183
<b>4</b>	132 344	296 326	465 307	567 295	635 285	769 268
<b>5</b>	128 433	294 414	465 393	569 380	639 370	779 352
<b>7</b>	117 609	284 589	458 566	564 551	635 540	779 520
<b>9</b>	107 785	275 764	449 739	555 722	627 710	770 689

Flow (GPM)

TORQUE (LB IN) 555  
SPEED (RPM) 722

**41 cc / rev**



■ Cont. □ Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.  
Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.  
Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.  
Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.  
Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

**TB 0050**

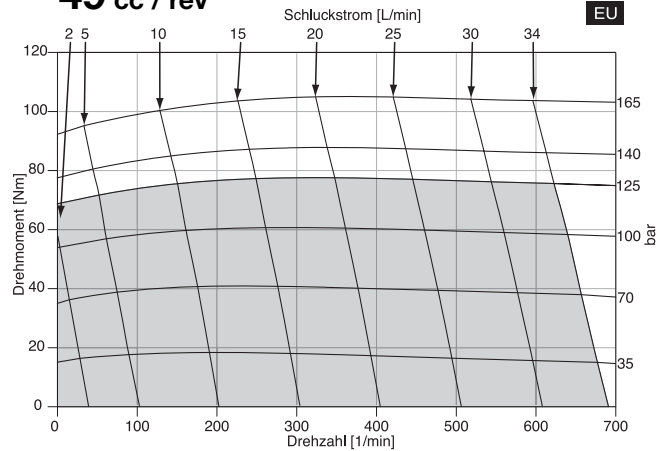
**3.0 cu in / rev** PRESSURE (PSID)

	500	1000	1500	1800	2000	2400
<b>.5</b>	144 26	319 13				
<b>1</b>	154 65	338 50	518 35	625 28	697 21	840 9
<b>2</b>	163 141	360 127	555 110	671 102	746 94	875 80
<b>3</b>	161 218	358 203	557 186	675 177	753 169	907 153
<b>4</b>	160 295	361 279	567 261	691 251	774 243	931 227
<b>5</b>	155 371	358 355	566 337	693 326	777 317	946 301
<b>7</b>	143 525	346 507	558 487	686 474	772 466	946 448
<b>9</b>	133 678	336 658	546 638	675 623	761 614	936 595

Flow (GPM)

TORQUE (LB IN) 675  
SPEED (RPM) 623

**49 cc / rev**



**TB 0065**

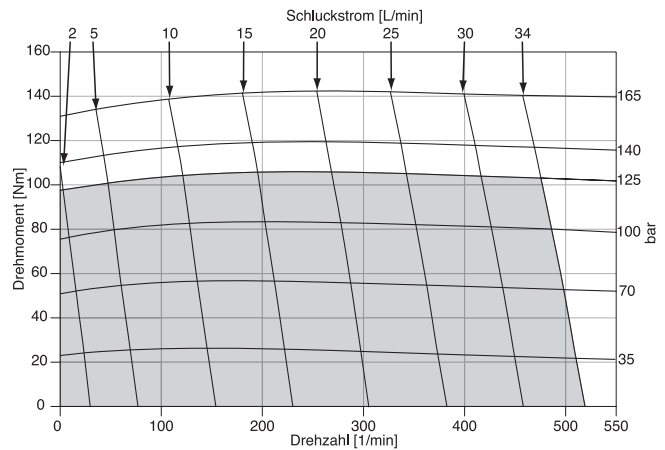
**4.0 cu in / rev** PRESSURE (PSID)

	500	1000	1500	1800	2000	2400
<b>.5</b>	213 22	459 14	709 6			
<b>1</b>	224 51	479 42	734 34	887 29	989 25	1193 17
<b>2</b>	233 108	500 99	767 90	926 85	1033 81	1228 71
<b>3</b>	231 166	498 156	769 147	932 141	1039 136	1252 126
<b>4</b>	229 224	501 214	778 203	945 197	1056 192	1272 181
<b>5</b>	223 281	497 271	777 260	946 252	1058 247	1284 237
<b>7</b>	206 396	481 385	764 372	936 364	1050 359	1280 347
<b>9</b>	192 511	467 499	749 485	920 476	1035 470	1267 457

Flow (GPM)

TORQUE (LB IN) 920  
SPEED (RPM) 476

**65 cc / rev**



■ Cont. □ Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.



**TB 0080**

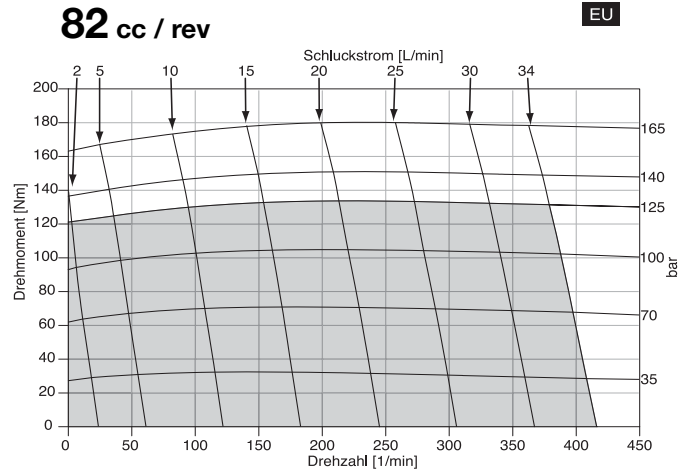
**5.0 cu in / rev** PRESSURE (PSID)

	500	1000	1500	1800	2000	2400
<b>.5</b>	256 17	562 10	877 4			
<b>1</b>	269 40	585 33	905 26	1097 21	1226 18	1487 10
<b>2</b>	285 86	616 78	950 70	1150 66	1283 62	1527 53
<b>3</b>	285 132	619 124	959 116	1163 110	1298 106	1566 97
<b>4</b>	286 178	628 170	976 161	1187 155	1327 151	1600 141
<b>5</b>	282 225	627 216	979 206	1193 200	1335 196	1621 185
<b>7</b>	267 317	615 307	972 296	1189 290	1333 285	1624 274
<b>9</b>	252 409	600 398	956 387	1173 379	1318 374	1609 362

Flow (GPM)

TORQUE (LB IN) 1173  
SPEED (RPM) 379

**82 cc / rev**



EU

**TB 0100**

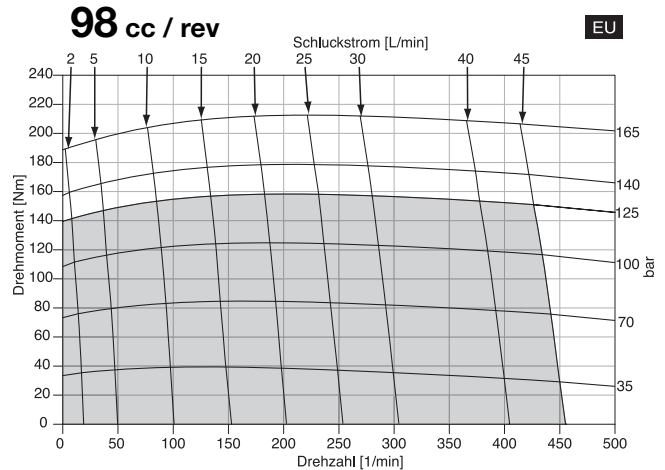
**6.0 cu in / rev** PRESSURE (PSID)

	500	1000	1500	1800	2000	2400
<b>.5</b>	310 16	669 13	1035 9	1258 7	1408 5	
<b>1</b>	330 35	697 32	1073 27	1298 25	1448 23	1737 18
<b>2</b>	346 73	732 69	1121 64	1353 61	1509 59	1800 53
<b>3</b>	345 111	735 107	1134 102	1371 98	1530 95	1844 89
<b>4</b>	347 149	747 144	1158 139	1403 135	1569 132	1885 126
<b>5</b>	343 187	750 182	1164 176	1411 172	1578 169	1909 162
<b>7</b>	327 264	738 257	1159 250	1411 246	1580 242	1917 235
<b>9</b>	301 340	715 333	1139 325	1395 319	1566 316	1909 307
<b>12</b>	257 454	669 446	1091 437	1347 430	1518 426	1863 417

Flow (GPM)

TORQUE (LB IN) 1347  
SPEED (RPM) 430

**98 cc / rev**



EU

■ Cont. □ Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement intermitt. 10% max. de chaque minute d'utilisation.  
Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.  
Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.  
Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.  
Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

**TB 0130**

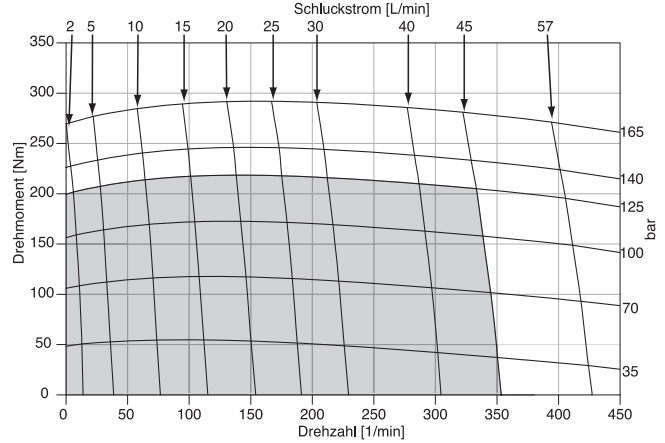
**8.0 cu in / rev** PRESSURE (PSID)

	500	1000	1500	1800	2000	2400
<b>.5</b>	446 12	955 10	1479 7	1797 5	2011 3	
<b>1</b>	465 27	989 24	1515 21	1831 19	2043 17	2469 13
<b>2</b>	481 55	1023 52	1571 49	1901 46	2120 44	2520 40
<b>3</b>	482 84	1029 81	1581 77	1912 74	2133 72	2570 67
<b>4</b>	483 113	1042 109	1605 105	1940 102	2164 100	2608 95
<b>5</b>	478 142	1041 138	1610 133	1951 130	2179 128	2628 122
<b>7</b>	450 199	1019 195	1597 190	1943 186	2174 184	2632 177
<b>9</b>	414 257	984 252	1563 246	1911 242	2145 239	2612 233
<b>12</b>	335 343	907 338	1489 331	1842 327	2076 323	2550 316
<b>15</b>	253 430	818 424	1393 416	1740 411	1974 407	2443 399

Flow (GPM)

TORQUE (LB IN) 2612  
SPEED (RPM) 233

**130 cc / rev**



**TB 0165**

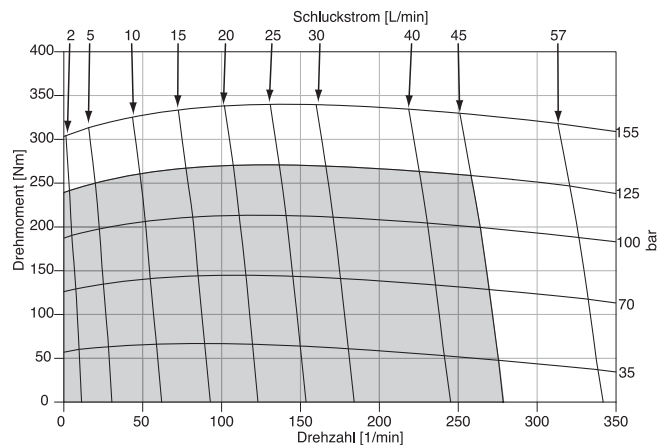
**10.0 cu in / rev** PRESSURE (PSID)

	500	1000	1500	1800	2250
<b>.5</b>	529 9	1137 7	1769 4	2149 3	
<b>1</b>	556 21	1181 18	1819 15	2201 13	2776 9
<b>2</b>	580 44	1238 40	1909 37	2314 34	2876 29
<b>3</b>	584 67	1248 63	1926 59	2332 56	2934 51
<b>4</b>	592 90	1276 86	1968 82	2382 78	3000 73
<b>5</b>	588 113	1283 109	1988 104	2412 101	3046 95
<b>7</b>	560 159	1268 154	1987 149	2418 145	3062 139
<b>9</b>	517 205	1230 200	1957 194	2393 190	3047 183
<b>12</b>	425 274	1141 268	1874 262	2317 257	2980 250
<b>15</b>	321 343	1033 337	1759 330	2197 325	2859 317

Flow (GPM)

TORQUE (LB IN) 3047  
SPEED (RPM) 183

**163 cc / rev**



Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

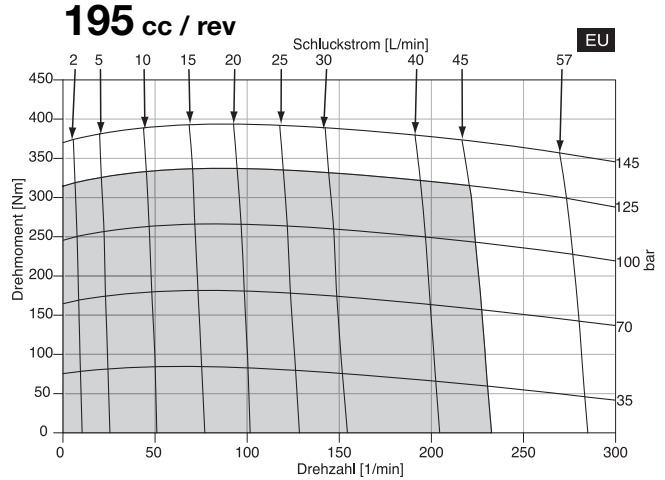
**TB 0195**

**11.9 cu in / rev** PRESSURE (PSID)

	500	1000	1500	1800	2100
<b>.5</b>	688 9	1490 8	2329 7	2841 6	3353 5
<b>1</b>	718 18	1537 17	2380 16	2890 15	3373 14
<b>2</b>	746 38	1580 36	2443 35	2962 33	3442 32
<b>3</b>	745 57	1592 55	2452 53	2973 52	3494 50
<b>4</b>	746 76	1607 74	2482 72	3008 71	3528 69
<b>5</b>	737 95	1601 93	2480 91	3011 89	3537 87
<b>7</b>	697 134	1572 131	2455 129	2986 127	3514 125
<b>9</b>	641 172	1510 169	2398 167	2934 164	3472 162
<b>12</b>	530 230	1391 227	2283 223	2821 221	3360 217
<b>15</b>	399 287	1252 284	2130 280	2662 277	3200 273

Flow (GPM)

TORQUE (LB IN) 3472  
SPEED (RPM) 162



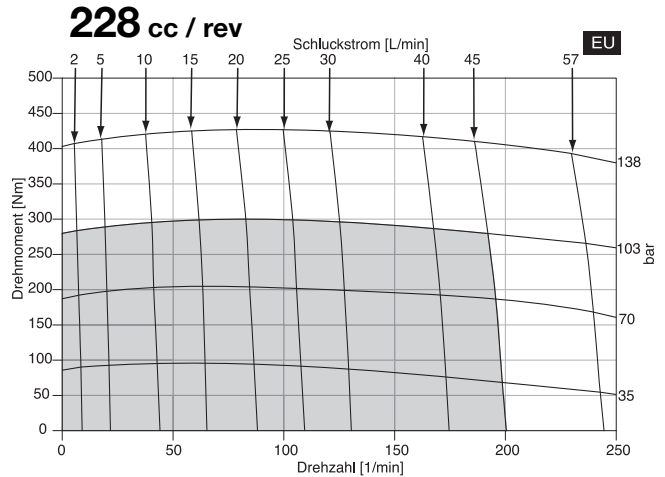
**TB 0230**

**13.9 cu in / rev** PRESSURE (PSID)

	500	1000	1500	2000
<b>.5</b>	796 8	1704 7	2640 6	3597 5
<b>1</b>	818 16	1733 15	2681 14	3623 13
<b>2</b>	840 32	1775 31	2732 30	3700 28
<b>3</b>	845 49	1789 47	2750 46	3725 43
<b>4</b>	848 65	1815 64	2789 62	3762 59
<b>5</b>	840 82	1813 80	2797 78	3782 74
<b>7</b>	799 114	1790 112	2785 110	3776 106
<b>9</b>	741 147	1738 145	2738 142	3741 138
<b>12</b>	613 197	1615 194	2626 190	3645 185
<b>15</b>	473 246	1531 243	2457 239	3467 233

Flow (GPM)

TORQUE (LB IN) 3776  
SPEED (RPM) 106



■ Cont. □ Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.  
Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.  
Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.  
Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.  
Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

**TB 0260**

**15.9 cu in / rev** PRESSURE (PSID)

	500	1000	1450	1900
<b>.5</b>	906 7	1947 6	2910 5	3896 4
<b>1</b>	932 14	1984 13	2964 12	3919 11
<b>2</b>	958 28	2032 27	3025 26	4000 24
<b>3</b>	961 43	2047 41	3045 40	4052 38
<b>4</b>	963 57	2074 56	3086 54	4098 52
<b>5</b>	954 71	2074 70	3096 68	4117 65
<b>7</b>	909 100	2049 99	3084 96	4112 93
<b>9</b>	844 129	1991 127	3032 125	4070 121
<b>12</b>	696 172	1851 170	2903 167	3953 162
<b>15</b>	540 216	1683 213	2711 209	3753 204

TORQUE (LB IN) 4112  
SPEED (RPM) 93

Flow (GPM)

**TB 0295**

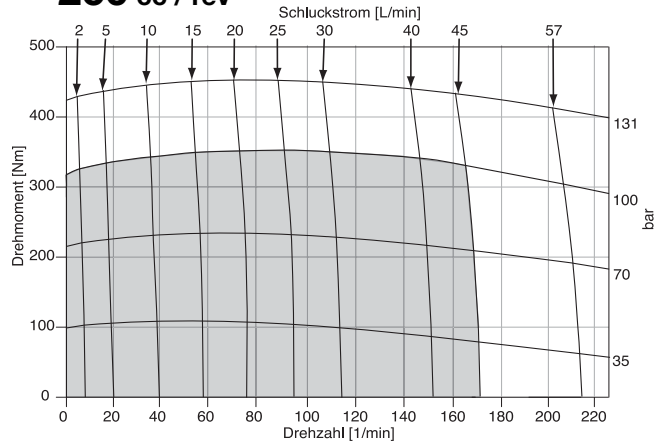
**17.9 cu in / rev** PRESSURE (PSID)

	500	1000	1400	1800
<b>.5</b>	1039 6	2229 5	3208 4	4200 3
<b>1</b>	1069 12	2281 11	3265 10	4248 9
<b>2</b>	1098 25	2332 24	3337 22	4290 20
<b>3</b>	1100 38	2344 36	3353 35	4356 32
<b>4</b>	1098 50	2366 49	3386 47	4398 44
<b>5</b>	1086 63	2361 61	3391 60	4415 57
<b>7</b>	1034 89	2325 87	3361 85	4394 81
<b>9</b>	955 114	2250 112	3295 109	4337 106
<b>12</b>	792 153	2085 150	3141 147	4194 142
<b>15</b>	606 191	1879 188	2908 185	3955 180

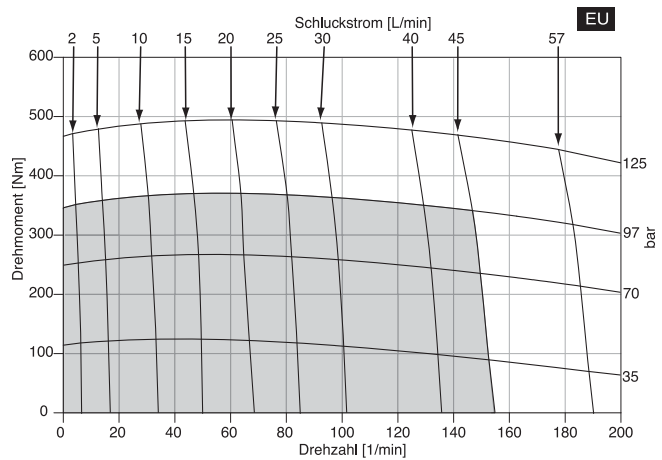
TORQUE (LB IN) 4337  
SPEED (RPM) 106

Flow (GPM)

**260 cc / rev**



**293 cc / rev**



■ Cont. □ Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

**TB 0330**

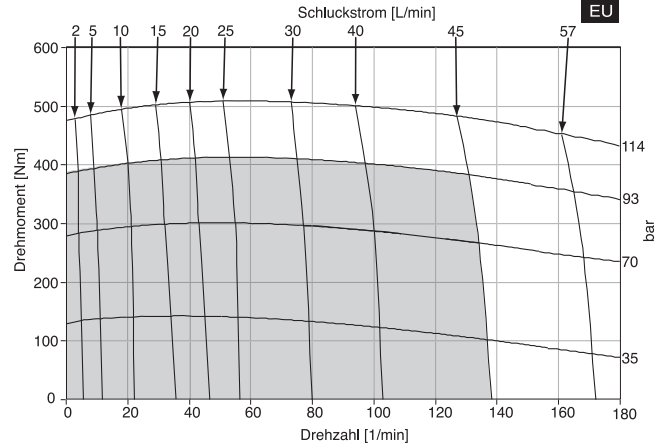
**20.0 cu in / rev** PRESSURE (PSID)

	500	1000	1350	1650
<b>.5</b>	1192 5	2498 4	3425 4	4227 3
<b>1</b>	1224 11	2555 10	3495 9	4250 8
<b>2</b>	1255 22	2620 21	3581 20	4350 18
<b>3</b>	1259 34	2633 32	3597 31	4424 29
<b>4</b>	1258 45	2666 43	3645 42	4480 40
<b>5</b>	1243 56	2665 55	3657 53	4505 51
<b>7</b>	1186 79	2627 77	3634 75	4492 73
<b>9</b>	1092 102	2544 100	3563 97	4431 94
<b>12</b>	905 137	2363 134	3391 131	4269 127
<b>15</b>	692 171	2129 168	3136 165	4001 161

Flow (GPM)

TORQUE (LB IN) 4431  
SPEED (RPM) 94

**328 cc / rev**



**TB 0365**

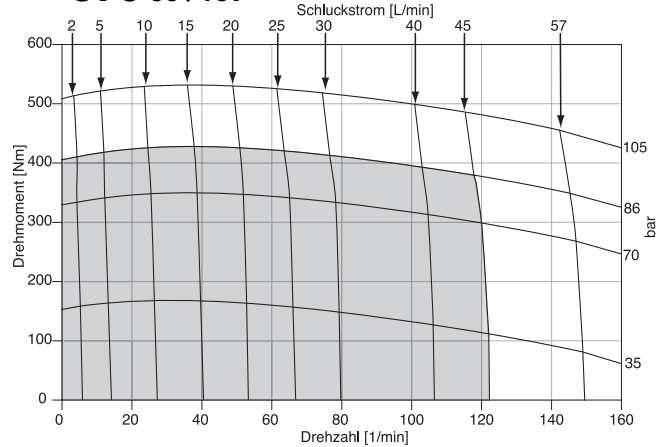
**22.6 cu in / rev** PRESSURE (PSID)

	500	1000	1250	1525
<b>.5</b>	1393 5	2942 4	3734 4	4617 3
<b>1</b>	1444 10	3005 9	3796 9	4672 8
<b>2</b>	1494 20	3090 19	3890 18	4710 17
<b>3</b>	1485 30	3082 29	3883 28	4765 27
<b>4</b>	1477 40	3089 39	3897 38	4783 36
<b>5</b>	1452 50	3075 49	3887 48	4775 46
<b>7</b>	1371 70	3009 69	3826 67	4719 65
<b>9</b>	1260 90	2899 89	3721 87	4621 85
<b>12</b>	1002 121	2658 119	3488 117	4393 115
<b>15</b>	700 151	2355 149	3190 147	4095 144

Flow (GPM)

TORQUE (LB IN) 4621  
SPEED (RPM) 85

**370 cc / rev**



■ Cont. □ Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.  
Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.  
Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.  
Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.  
Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

**TB 0390**

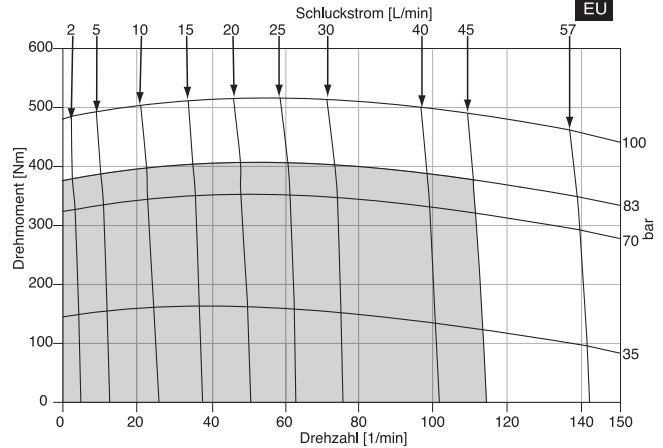
**24.0 cu in / rev** PRESSURE (PSID)

	500	1000	1200	1450
<b>.5</b>	1309 4	2885 3	3534 2	4359 2
<b>1</b>	1368 9	2948 8	3589 7	4394 6
<b>2</b>	1417 18	3028 17	3683 16	4460 15
<b>3</b>	1427 28	3058 26	3714 26	4540 24
<b>4</b>	1443 37	3102 36	3764 35	4595 34
<b>5</b>	1439 47	3120 45	3790 45	4630 43
<b>7</b>	1392 66	3110 65	3792 64	4642 62
<b>9</b>	1297 85	3040 84	3732 83	4597 81
<b>12</b>	1087 114	2835 112	3541 111	4418 110
<b>15</b>	831 143	2571 141	3272 140	4145 138

Flow (GPM)

TORQUE (LB IN) 4597  
SPEED (RPM) 81

**392 cc / rev**



Cont.  Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

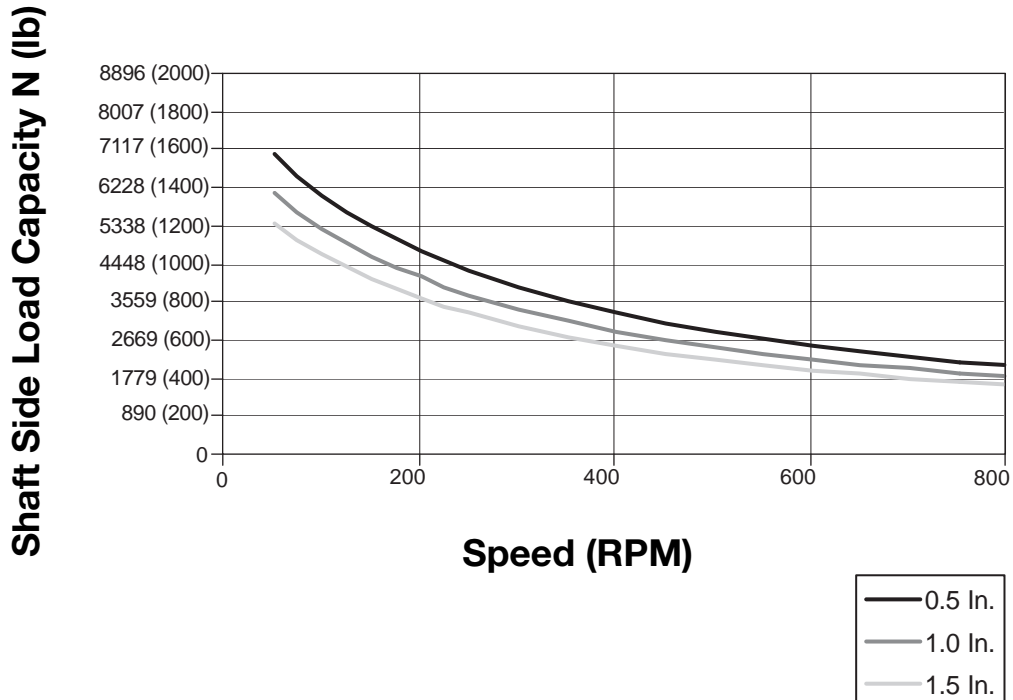
Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

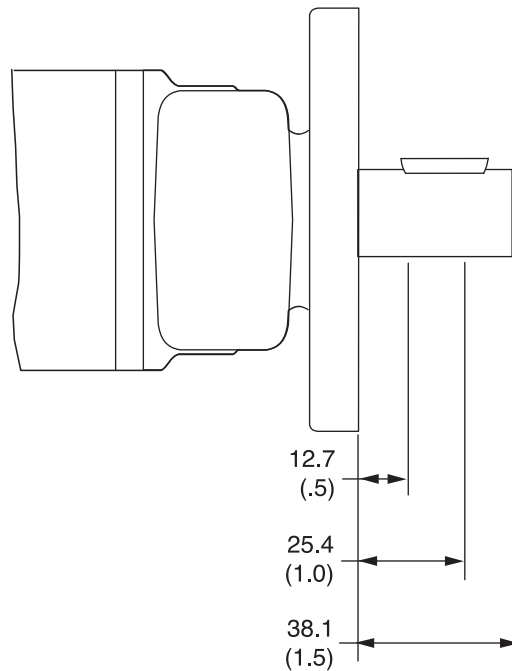
Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.



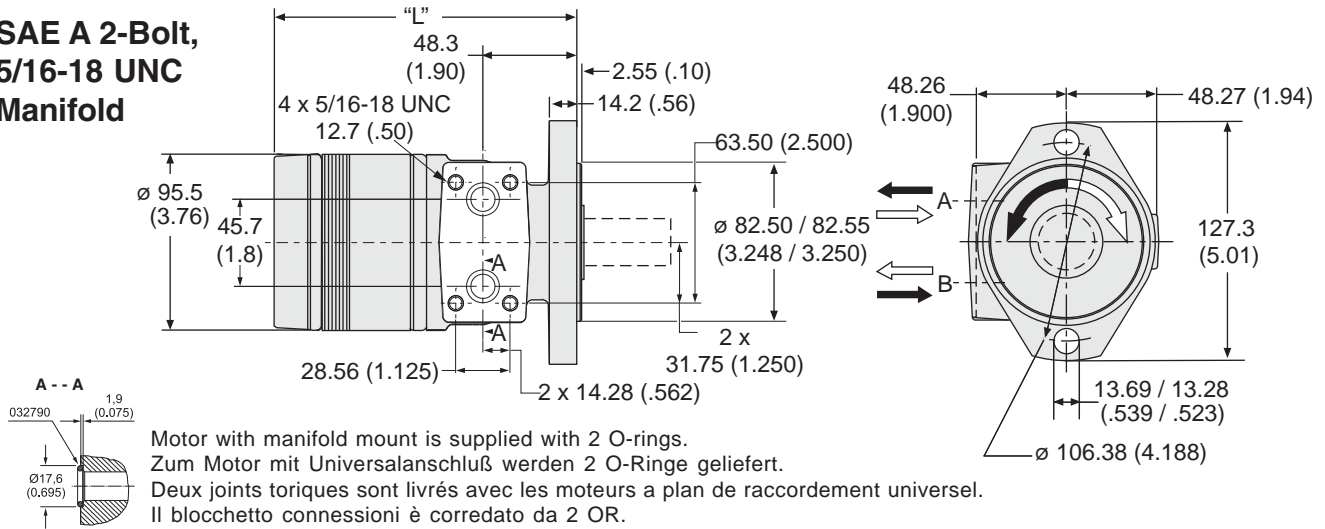
The allowable side load curve is based on bushing life of  $2.5 \times 10^6$  revolutions.  
 Die zulaessige radiale Wellenbelastung bezieht sich auf die Lager-Lebensdauer  $2,5 \times 10^6$  Umdrehungen.  
 L'effort radial admissible sur l'arbre depend a une duree de vie  $2,5 \times 10^6$  de rotation.  
 La curva de carga lateral admisible se basa en vida util de cojinete de  $2.5 \times 10$  revoluciones.



English equivalents for metric specifications are shown in ( ).

**Code: AM**

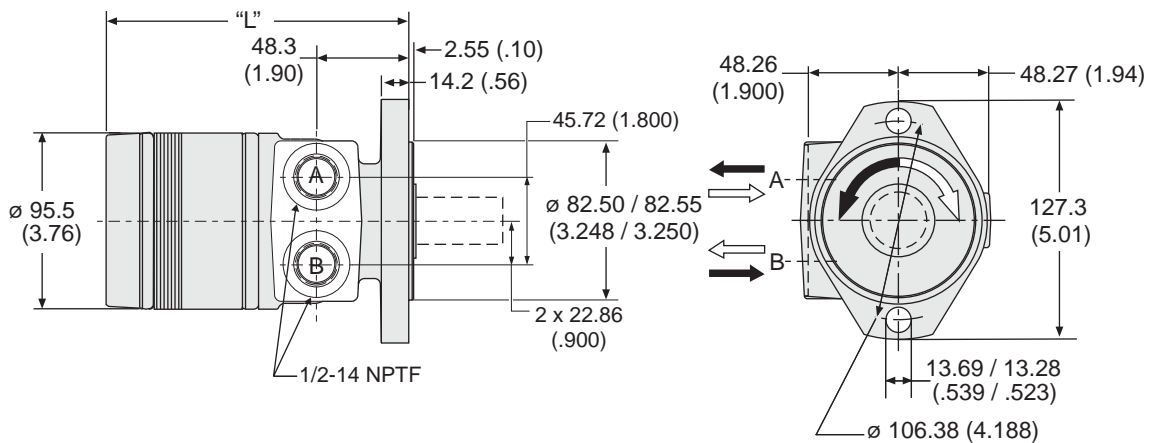
**SAE A 2-Bolt,  
5/16-18 UNC  
Manifold**



Code AM disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht kg	5.87	6.03	6.12	6.26	6.35	6.49	6.76	7.03	7.35	7.58	7.80	8.07	8.35	8.66	8.80
Poids/Peso (lb)	(12.9)	(13.3)	(13.5)	(13.8)	(14.0)	(14.3)	(14.9)	(15.5)	(16.2)	(16.7)	(17.2)	(17.8)	(18.4)	(19.1)	(19.4)
Length "L" mm	132.4	136	138	141	144	147	154	160	166	173	179	185	192	200	205
"L" (in)	(5.22)	(5.36)	(5.42)	(5.54)	(5.67)	(5.79)	(6.04)	(6.29)	(6.54)	6.79	7.04	7.29	7.54	7.88	8.04

**Code: AP**

**SAE A 2-Bolt,  
1/2-14 NPTF**



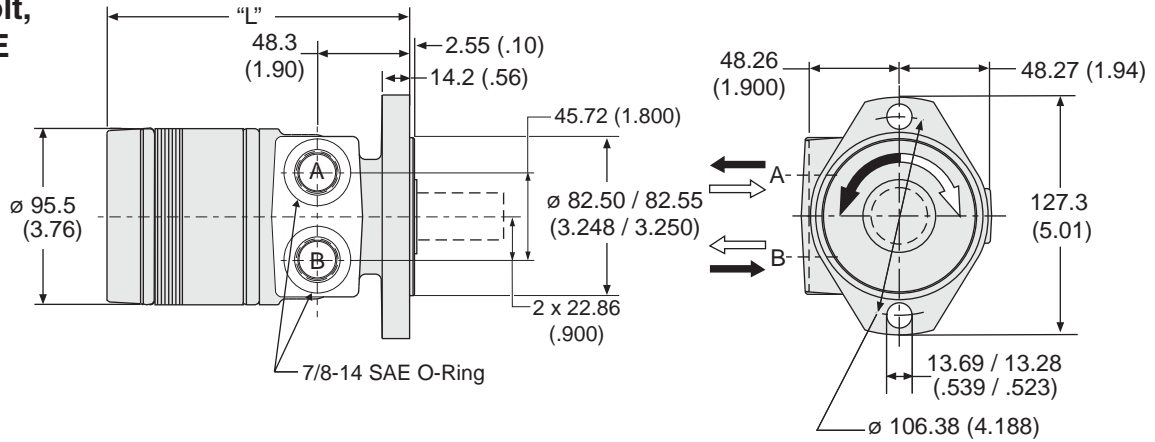
Code AP disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht kg	5.87	6.03	6.12	6.26	6.35	6.49	6.76	7.03	7.35	7.58	7.80	8.07	8.35	8.66	8.80
Poids/Peso (lb)	(12.9)	(13.3)	(13.5)	(13.8)	(14.0)	(14.3)	(14.9)	(15.5)	(16.2)	(16.7)	(17.2)	(17.8)	(18.4)	(19.1)	(19.4)
Length "L" mm	132.4	136	138	141	144	147	154	160	166	173	179	185	192	200	205
"L" (in)	(5.22)	(5.36)	(5.42)	(5.54)	(5.67)	(5.79)	(6.04)	(6.29)	(6.54)	6.79	7.04	7.29	7.54	7.88	8.04

English equivalents for metric specifications are shown in ( ).



**Code: AS**

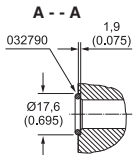
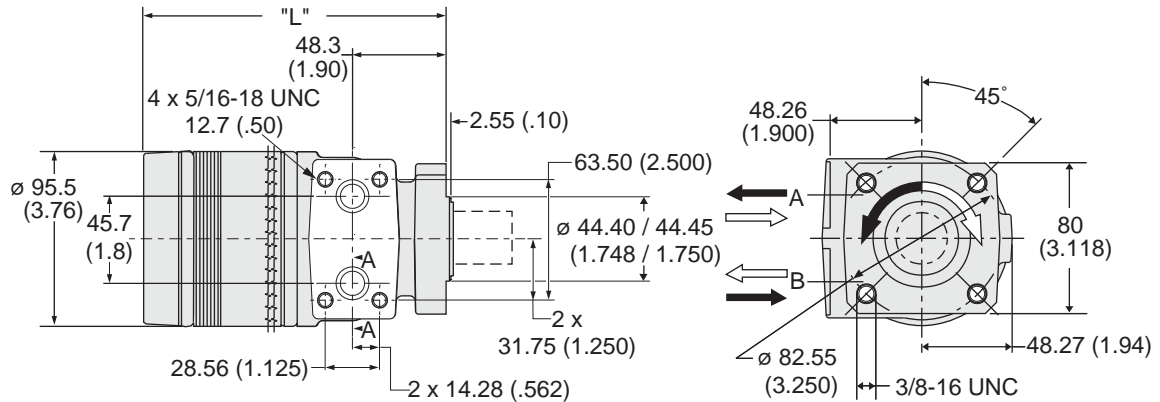
**SAE A 2-Bolt,  
 7/8"-14 SAE  
 O-Ring**



Code AS disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht kg	5.87	6.03	6.12	6.26	6.35	6.49	6.76	7.03	7.35	7.58	7.80	8.07	8.35	8.66	8.80
Poids/Peso (lb)	(12.9)	(13.3)	(13.5)	(13.8)	(14.0)	(14.3)	(14.9)	(15.5)	(16.2)	(16.7)	(17.2)	(17.8)	(18.4)	(19.1)	(19.4)
Length "L" mm	132.4	136	138	141	144	147	154	160	166	173	179	185	192	200	205
"L" (in)	(5.22)	(5.36)	(5.42)	(5.54)	(5.67)	(5.79)	(6.04)	(6.29)	(6.54)	6.79	7.04	7.29	7.54	7.88	8.04

**Code: FM**

**4-Bolt,  
 5/16-18 UNC  
 Manifold**



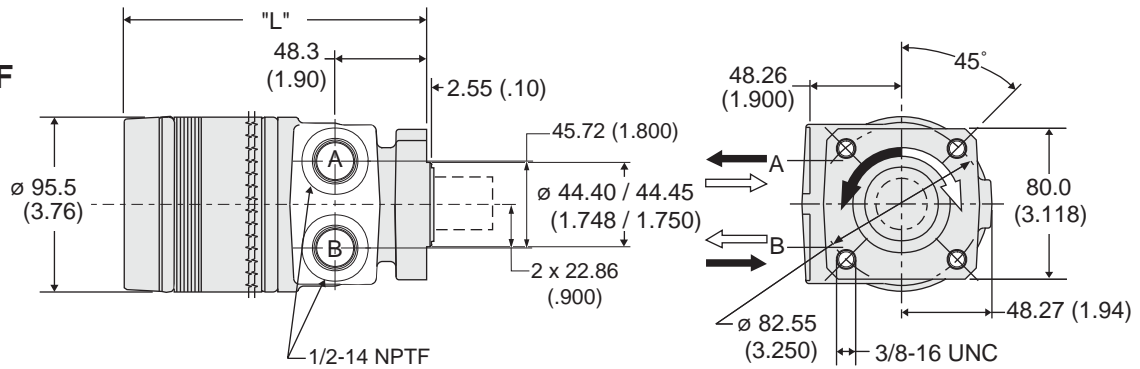
Motor with manifold mount is supplied with 2 O-rings.  
 Zum Motor mit Universalanschluß werden 2 O-Ringe geliefert.  
 Deux joints toriques sont livrés avec les moteurs a plan de raccordement universel.  
 Il blocchetto connessioni è corredato da 2 OR.

Code FM disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht kg	5.58	5.62	5.67	5.80	5.94	6.08	6.31	6.62	7.03	7.17	7.39	7.62	7.94	8.26	8.39
Poids/Peso (lb)	(12.3)	(12.4)	(12.5)	(12.8)	(13.1)	(13.4)	(13.9)	(14.6)	(15.5)	(15.8)	(16.3)	(16.8)	(17.5)	(18.2)	(18.5)
Length "L" mm	132.4	136	138	141	144	147	154	160	166	173	179	185	192	200	205
"L" (in)	(5.22)	(5.36)	(5.42)	(5.54)	(5.67)	(5.79)	(6.04)	(6.29)	(6.54)	(6.79)	(7.04)	(7.29)	(7.54)	(7.88)	(8.04)

English equivalents for metric specifications are shown in ( ).

**Code: FP**

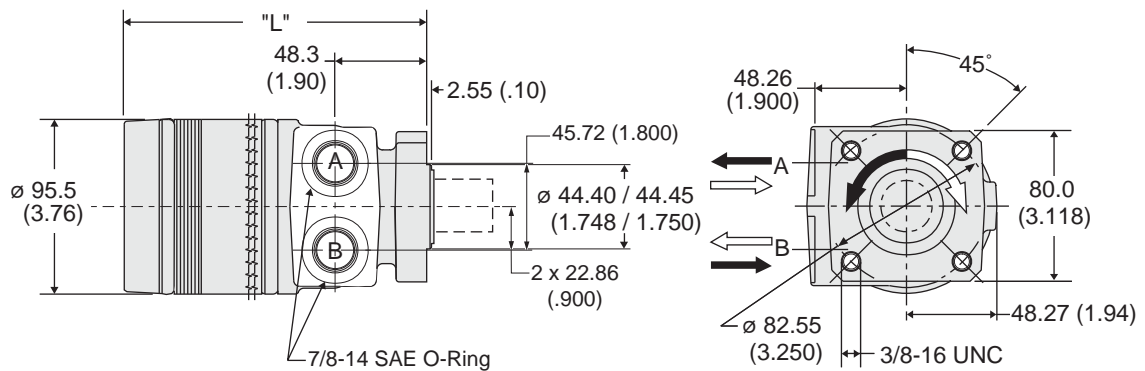
**4 Bolt,  
 1/2-14 NPTF**



Code FP disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht kg	5.58	5.62	5.67	5.80	5.94	6.08	6.31	6.62	7.03	7.17	7.39	7.62	7.94	8.26	8.39
Poids/Peso (lb)	(12.3)	(12.4)	(12.5)	(12.8)	(13.1)	(13.4)	(13.9)	(14.6)	(15.5)	(15.8)	(16.3)	(16.8)	(17.5)	(18.2)	(18.5)
Length "L" mm	132.4	136	138	141	144	147	154	160	166	173	179	185	192	200	205
"L" (in)	(5.22)	(5.36)	(5.42)	(5.54)	(5.67)	(5.79)	(6.04)	(6.29)	(6.54)	(6.79)	(7.04)	(7.29)	(7.54)	(7.88)	(8.04)

**Code: FS**

**4 Bolt,  
 7/8"-14 SAE  
 O-Ring**



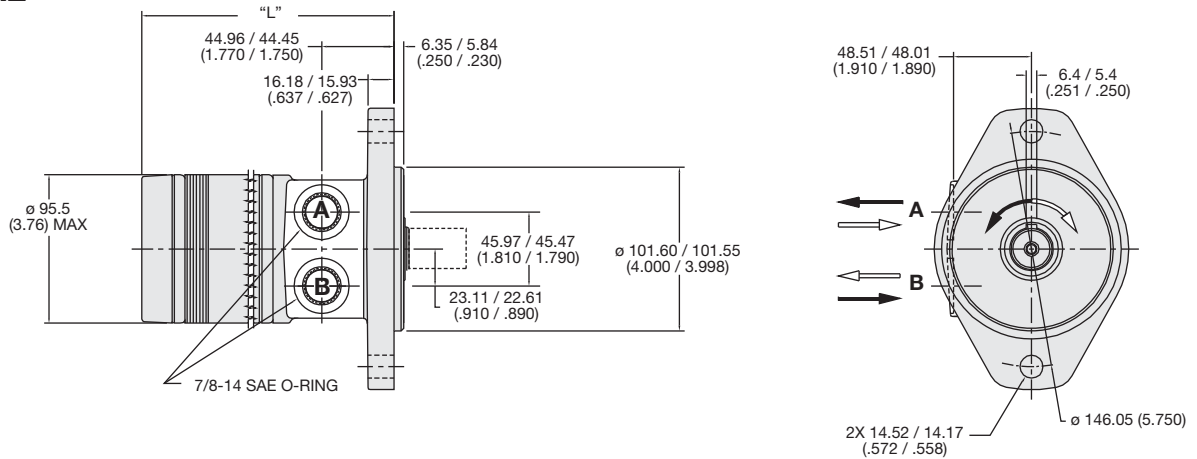
Code FS disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht kg	5.58	5.62	5.67	5.80	5.94	6.08	6.31	6.62	7.03	7.17	7.39	7.62	7.94	8.26	8.39
Poids/Peso (lb)	(12.3)	(12.4)	(12.5)	(12.8)	(13.1)	(13.4)	(13.9)	(14.6)	(15.5)	(15.8)	(16.3)	(16.8)	(17.5)	(18.2)	(18.5)
Length "L" mm	132.4	136	138	141	144	147	154	160	166	173	179	185	192	200	205
"L" (in)	(5.22)	(5.36)	(5.42)	(5.54)	(5.67)	(5.79)	(6.04)	(6.29)	(6.54)	(6.79)	(7.04)	(7.29)	(7.54)	(7.88)	(8.04)

English equivalents for metric specifications are shown in ( ).

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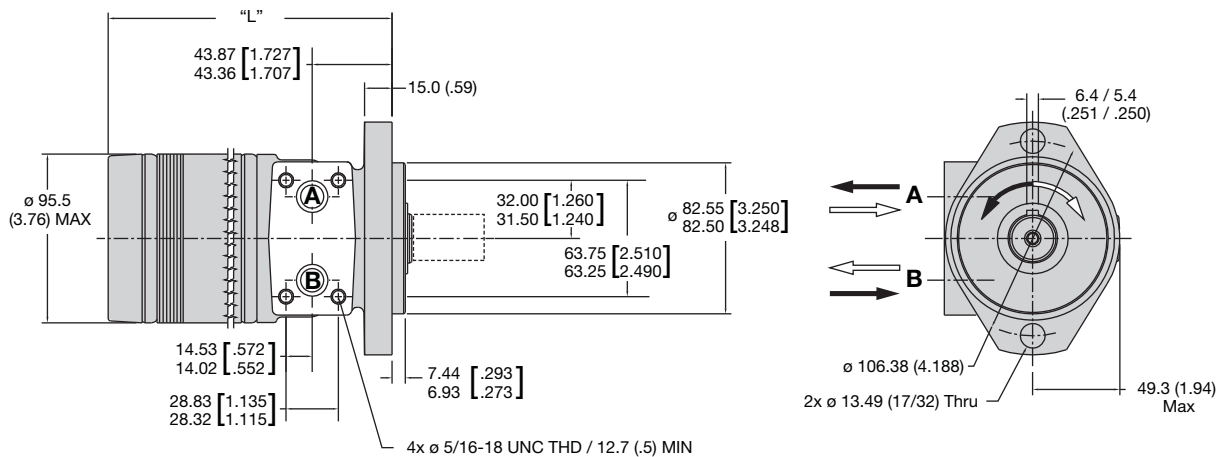


**Code: BS**  
**SAE B 2-Bolt**  
**7/8-14 SAE**



Code BS disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht kg	7.27	7.34	7.48	7.62	7.71	7.84	8.11	8.39	8.70	8.93	9.16	9.43	9.70	9.97	10.1
Poids/Peso (lb)	(15.9)	(16.3)	(16.5)	(16.8)	(17.0)	(17.3)	(17.9)	(18.5)	(19.2)	(19.7)	(20.2)	(20.8)	(21.4)	(22.0)	(22.4)
Length "L" mm	131.5	132.5	134.1	137.1	140.4	143.5	149.8	156.2	162.5	168.9	175.2	181.6	187.9	196.5	200.9
"L" (in)	(5.18)	(5.22)	(5.28)	(5.40)	(5.53)	(5.65)	(5.90)	(6.15)	(6.40)	(6.65)	(6.90)	(7.15)	(7.40)	(7.74)	(7.91)

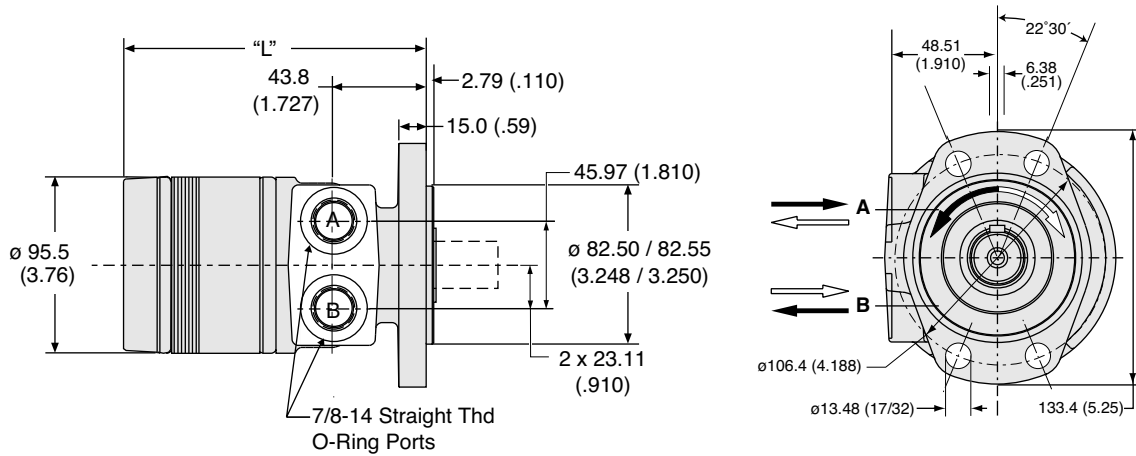
**Code: CM**  
**SAE A 2 Bolt, Long Pilot**  
**5/16-18 UNC Manifold**



Code CM disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht kg	6.17	6.35	6.44	6.58	6.67	6.80	7.07	7.35	7.66	7.84	8.11	8.39	8.66	8.94	9.11
Poids/Peso (lb)	(13.6)	(14.0)	(14.2)	(14.5)	(14.7)	(15.0)	(15.6)	(16.2)	(16.9)	(17.4)	(17.9)	(18.5)	(19.1)	(19.7)	(20.1)
Length "L" mm	130.4	131.5	132.9	136.1	139.3	142.5	148.8	155.2	161.5	167.9	174.2	180.6	186.9	195.6	199.7
"L" (in)	(5.13)	(5.18)	(5.23)	(5.36)	(5.48)	(5.61)	(5.86)	(6.11)	(6.36)	(6.61)	(6.86)	(7.11)	(7.36)	(7.70)	(7.86)

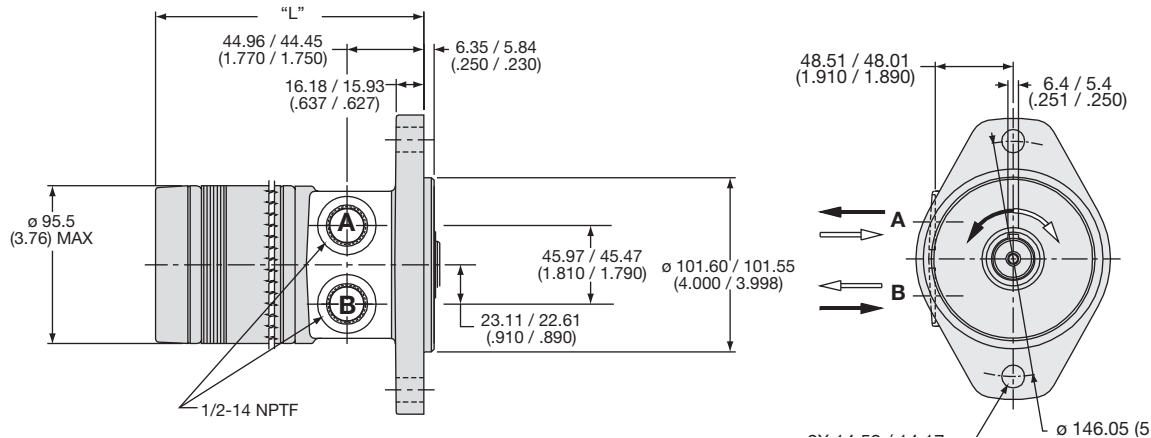
English equivalents for metric specifications are shown in ( ).

**Code: MS**  
**Magneto**  
**7/8-14 SAE**



Code MS	disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht	kg	6.16	6.30	6.40	6.53	6.62	6.76	7.03	7.30	7.62	7.85	8.12	8.35	8.62	8.94	9.07
Poids/Peso	(lb)	(13.6)	(13.9)	(14.1)	(14.4)	(14.6)	(14.9)	(15.5)	(16.1)	(16.8)	(17.3)	(17.9)	(18.4)	(19.0)	(19.7)	(20.0)
Length	"L" mm	135.1	136.1	137.6	140.8	144.0	147.1	153.5	159.8	166.2	172.5	178.9	185.2	191.6	200.2	204.3
	"L" (in)	(5.32)	(5.36)	(5.42)	(5.54)	(5.67)	(5.79)	(6.04)	(6.29)	(6.54)	(6.79)	(7.04)	(7.29)	(7.54)	(7.88)	(8.04)

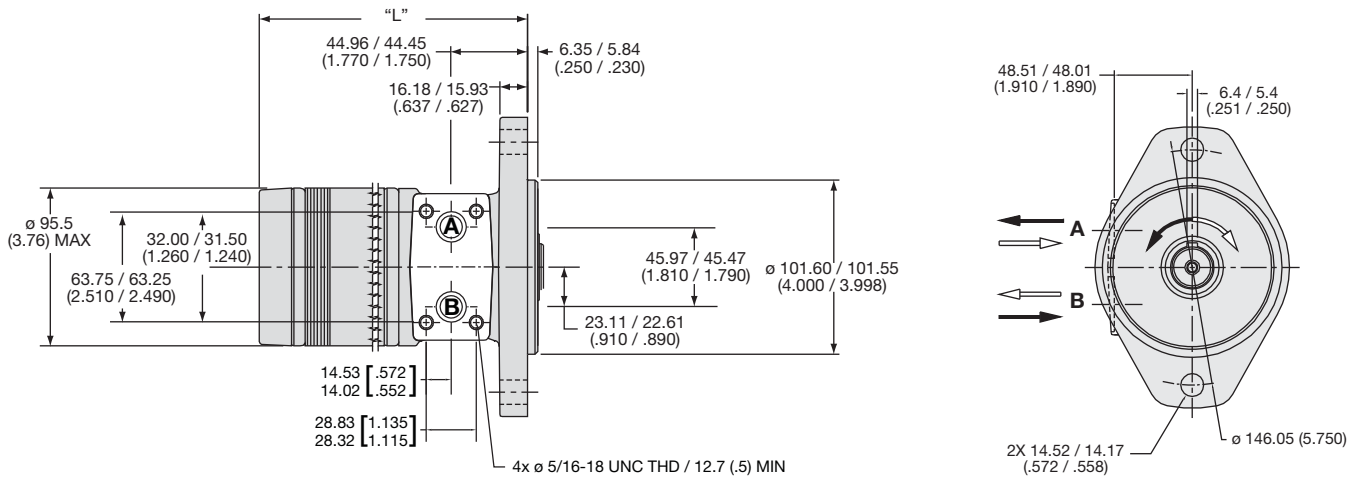
**Code: BP**  
**SAE B 2-Bolt**  
**1/2-14 NPTF**



Code BP	disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht	kg	7.27	7.34	7.48	7.62	7.71	7.84	8.11	8.39	8.70	8.93	9.16	9.43	9.70	9.97	10.1
Poids/Peso	(lb)	(15.9)	(16.3)	(16.5)	(16.8)	(17.0)	(17.3)	(17.9)	(18.5)	(19.2)	(19.7)	(20.2)	(20.8)	(21.4)	(22.0)	(22.4)
Length	"L" mm	131.4	132.5	134.0	137.2	140.4	143.6	149.9	156.3	162.6	169.0	175.3	181.7	188.0	196.7	200.8
	"L" (in)	(5.18)	(5.22)	(5.28)	(5.40)	(5.53)	(5.65)	(5.90)	(6.15)	(6.40)	(6.65)	(6.90)	(7.15)	(7.40)	(7.74)	(7.90)

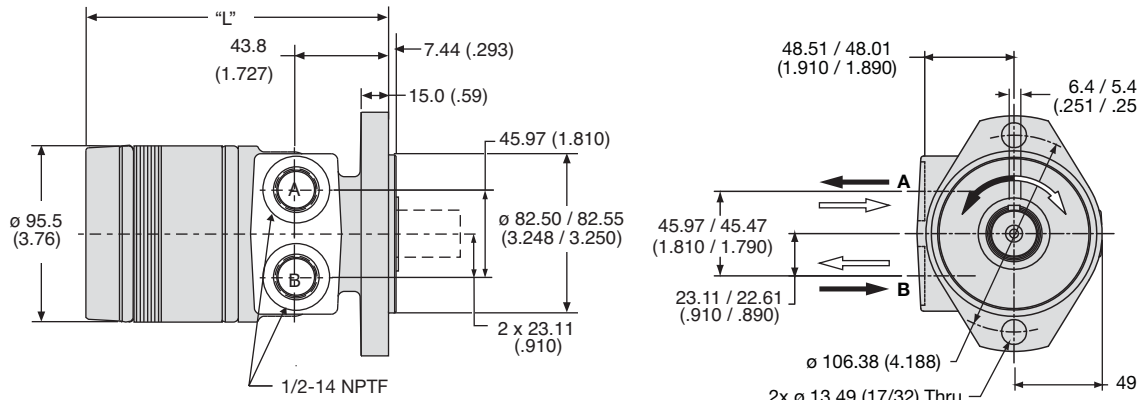
English equivalents for metric specifications are shown in ( ).

**Code: BM**  
**SAE B 2-Bolt**  
**5/16-18 UNC Manifold**



Code BM	disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht	kg	7.27	7.34	7.48	7.62	7.71	7.84	8.11	8.39	8.70	8.93	9.16	9.43	9.70	9.97	10.1
Poids/Peso	(lb)	(15.9)	(16.3)	(16.5)	(16.8)	(17.0)	(17.3)	(17.9)	(18.5)	(19.2)	(19.7)	(20.2)	(20.8)	(21.4)	(22.0)	(22.4)
Length	"L" mm	131.4	132.5	134.0	137.2	140.4	143.6	149.9	156.3	162.6	169.0	175.3	181.7	188.0	196.7	200.8
	"L" (in)	(5.18)	(5.22)	(5.28)	(5.40)	(5.53)	(5.65)	(5.90)	(6.15)	(6.40)	(6.65)	(6.90)	(7.15)	(7.40)	(7.74)	(7.90)

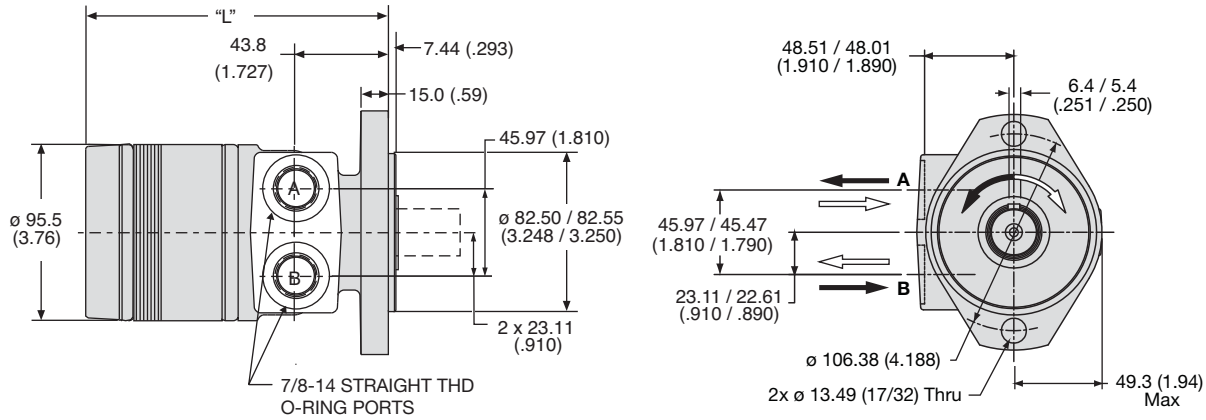
**Code: CP**  
**SAE A 2 Bolt, Long Pilot**  
**1/2-14 NPTF**



Code CP	disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht	kg	6.17	6.35	6.44	6.58	6.67	6.80	7.07	7.35	7.66	7.84	8.11	8.39	8.66	8.94	9.11
Poids/Peso	(lb)	(13.6)	(14.0)	(14.2)	(14.5)	(14.7)	(15.0)	(15.6)	(16.2)	(16.9)	(17.4)	(17.9)	(18.5)	(19.1)	(19.7)	(20.1)
Length	"L" mm	130.4	131.5	132.9	136.1	139.3	142.5	148.8	155.2	161.5	167.9	174.2	180.6	186.9	195.6	199.7
	"L" (in)	(5.13)	(5.18)	(5.23)	(5.36)	(5.48)	(5.61)	(5.86)	(6.11)	(6.36)	(6.61)	(6.86)	(7.11)	(7.36)	(7.70)	(7.86)

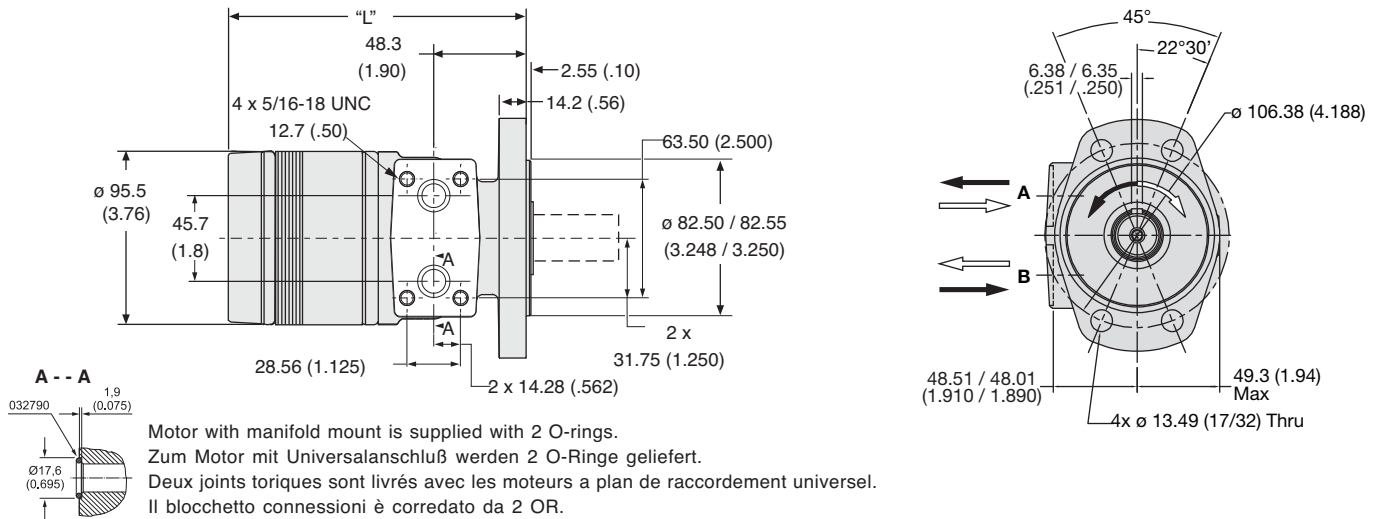
English equivalents for metric specifications are shown in ( ).

**Code: CS**  
**SAE A 2 Bolt, Long Pilot**  
**7/8-14 SAE**



Code CS	disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
<b>Weight/Gewicht</b>	<b>kg</b>	<b>6.17</b>	<b>6.35</b>	<b>6.44</b>	<b>6.58</b>	<b>6.67</b>	<b>6.80</b>	<b>7.07</b>	<b>7.35</b>	<b>7.66</b>	<b>7.84</b>	<b>8.11</b>	<b>8.39</b>	<b>8.66</b>	<b>8.94</b>	<b>9.11</b>
Poids/Peso	(lb)	(13.6)	(14.0)	(14.2)	(14.5)	(14.7)	(15.0)	(15.6)	(16.2)	(16.9)	(17.4)	(17.9)	(18.5)	(19.1)	(19.7)	(20.1)
<b>Length</b>	<b>"L" mm</b>	<b>130.4</b>	<b>131.5</b>	<b>132.9</b>	<b>136.1</b>	<b>139.3</b>	<b>142.5</b>	<b>148.8</b>	<b>155.2</b>	<b>161.5</b>	<b>167.9</b>	<b>174.2</b>	<b>180.6</b>	<b>186.9</b>	<b>195.6</b>	<b>199.7</b>
	"L" (in)	(5.13)	(5.18)	(5.23)	(5.36)	(5.48)	(5.61)	(5.86)	(6.11)	(6.36)	(6.61)	(6.86)	(7.11)	(7.36)	(7.70)	(7.86)

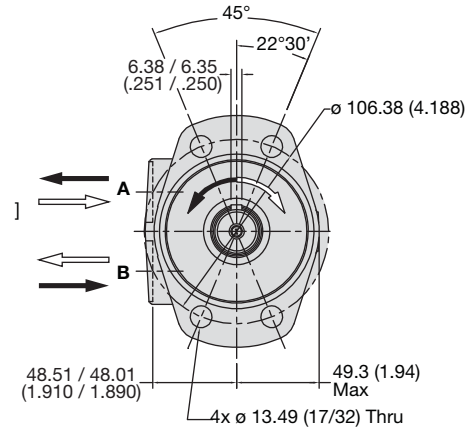
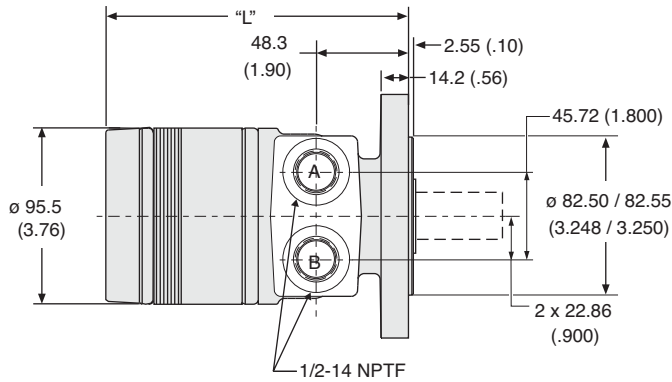
**Code: MM**  
**Magneto**  
**5/16-18 UNC Manifold**



Code MM	disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
<b>Weight/Gewicht</b>	<b>kg</b>	<b>6.16</b>	<b>6.30</b>	<b>6.40</b>	<b>6.53</b>	<b>6.62</b>	<b>6.76</b>	<b>7.03</b>	<b>7.30</b>	<b>7.62</b>	<b>7.85</b>	<b>8.12</b>	<b>8.35</b>	<b>8.62</b>	<b>8.94</b>	<b>9.07</b>
Poids/Peso	(lb)	(13.6)	(13.9)	(14.1)	(14.4)	(14.6)	(14.9)	(15.5)	(16.1)	(16.8)	(17.3)	(17.9)	(18.4)	(19.0)	(19.7)	(20.0)
<b>Length</b>	<b>"L" mm</b>	<b>135.0</b>	<b>136.1</b>	<b>137.6</b>	<b>140.8</b>	<b>144.0</b>	<b>147.1</b>	<b>153.5</b>	<b>159.8</b>	<b>166.2</b>	<b>172.5</b>	<b>178.9</b>	<b>185.2</b>	<b>191.6</b>	<b>200.2</b>	<b>204.3</b>
	"L" (in)	(5.32)	(5.36)	(5.42)	(5.54)	(5.67)	(5.79)	(6.04)	(6.29)	(6.54)	(6.79)	(7.04)	(7.29)	(7.54)	(7.88)	(8.04)

English equivalents for metric specifications are shown in ( ).

**Code: MP**  
**Magneto**  
**1/2-14 NPTF**

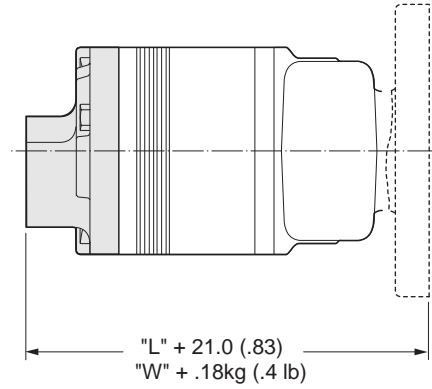
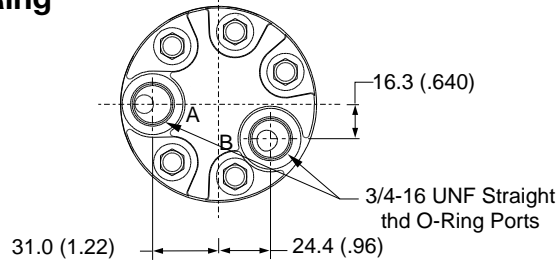


Code MP	disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
<b>Weight/Gewicht</b>	<b>kg</b>	<b>6.16</b>	<b>6.30</b>	<b>6.40</b>	<b>6.53</b>	<b>6.62</b>	<b>6.76</b>	<b>7.03</b>	<b>7.30</b>	<b>7.62</b>	<b>7.85</b>	<b>8.12</b>	<b>8.35</b>	<b>8.62</b>	<b>8.94</b>	<b>9.07</b>
Poids/Peso	(lb)	(13.6)	(13.9)	(14.1)	(14.4)	(14.6)	(14.9)	(15.5)	(16.1)	(16.8)	(17.3)	(17.9)	(18.4)	(19.0)	(19.7)	(20.0)
<b>Length</b>	<b>"L" mm</b>	<b>135.1</b>	<b>136.1</b>	<b>137.6</b>	<b>140.8</b>	<b>144.0</b>	<b>147.1</b>	<b>153.5</b>	<b>159.8</b>	<b>166.2</b>	<b>172.5</b>	<b>178.9</b>	<b>185.2</b>	<b>191.6</b>	<b>200.2</b>	<b>204.3</b>
	"L" (in)	(5.32)	(5.36)	(5.42)	(5.54)	(5.67)	(5.79)	(6.04)	(6.29)	(6.54)	(6.79)	(7.04)	(7.29)	(7.54)	(7.88)	(8.04)

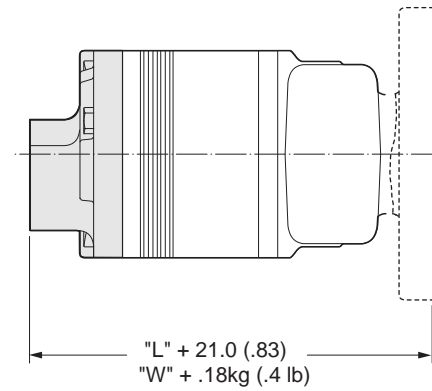
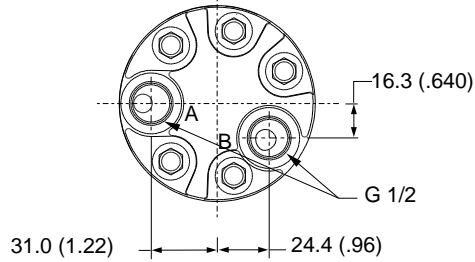
English equivalents for metric specifications are shown in ( ).

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**Code: R**  
**Rear Port**  
**3/4"-16 SAE O-Ring**

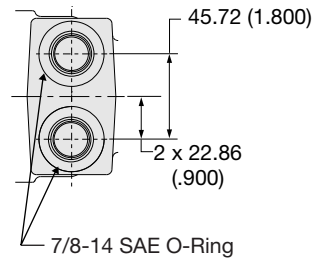


**Code: Y**  
**Rear Port**  
**G 1/2 BSPP**

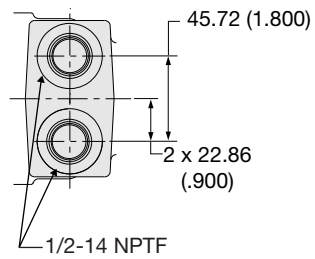




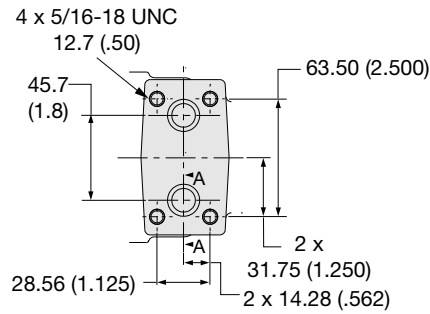
**Code: S**  
**7/8"-14 SAE O-Ring**



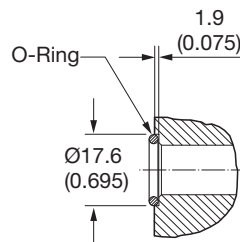
**Code: P**  
**1/2"-14 NPTF**



Code: M  
Manifold



**A - - A**



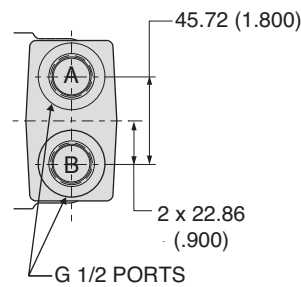
Motor with manifold mount is supplied with 2 o-rings (P/N 032790).

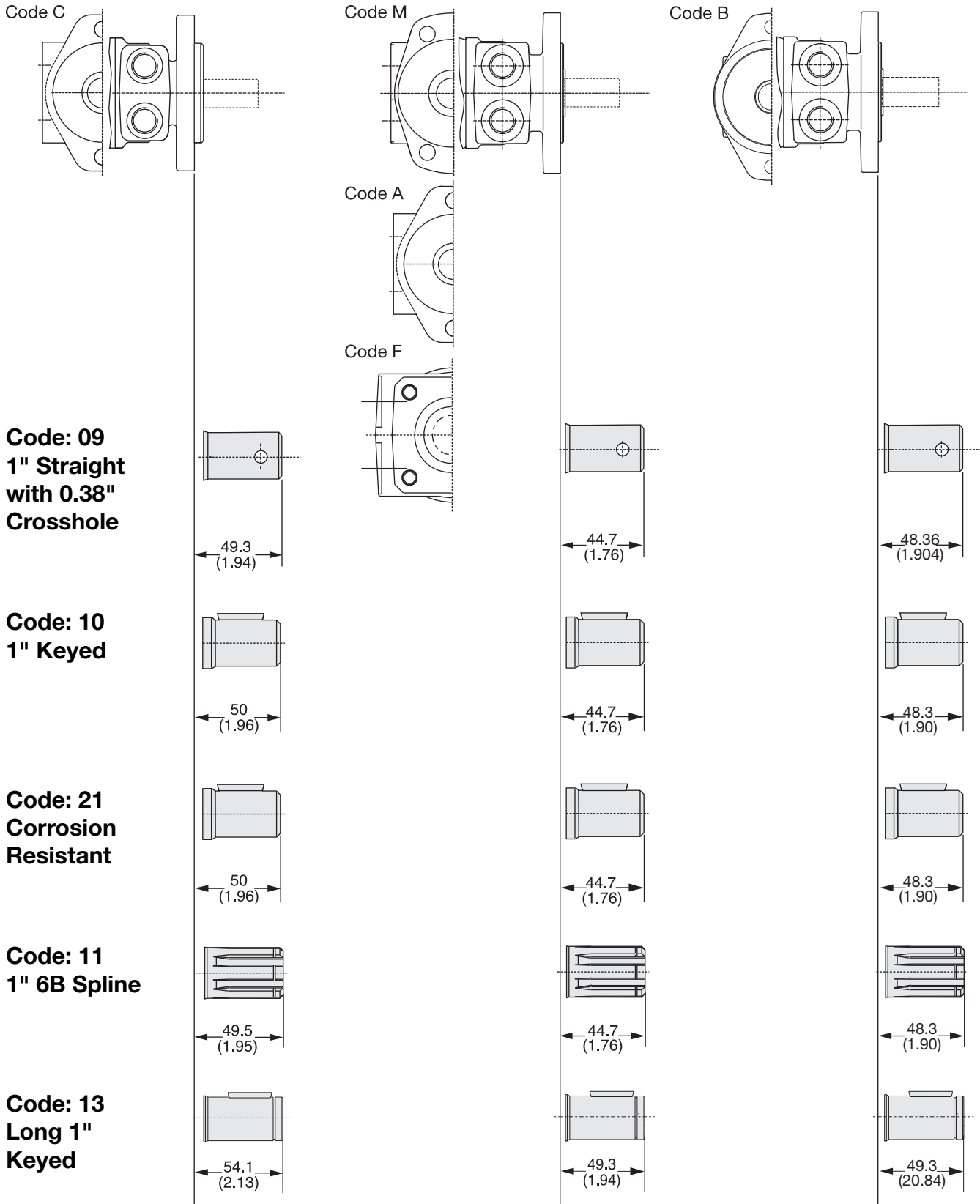
Zum Motor mit Universalanschluß werden 2 o-ringe geliefert.

Deux joints toriques sont livrés avec les moteurs a plan de raccordement universel.

Il blocchetto connessioni è corredato da 2 OR.

Code: W  
G 1/2 BSPP  
Milled Front



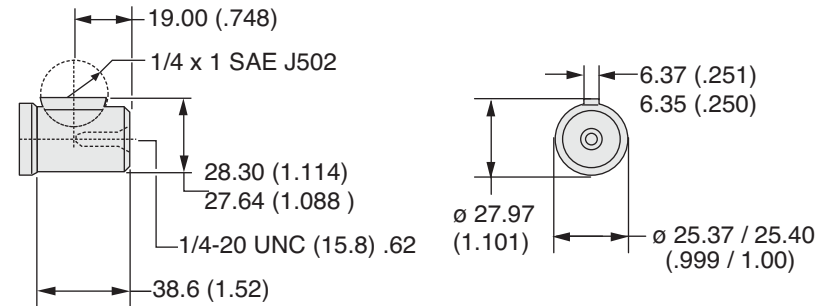


**Code: 09**  
**1" Straight**  
**with 0.38"**  
**Crosshole**

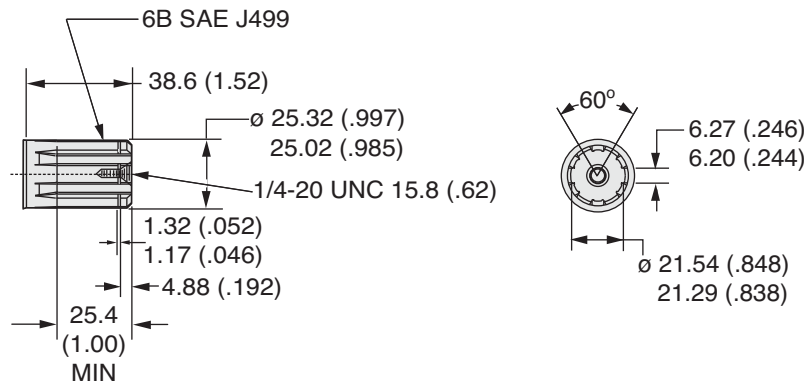


**Code: 10**  
**1" Keyed**

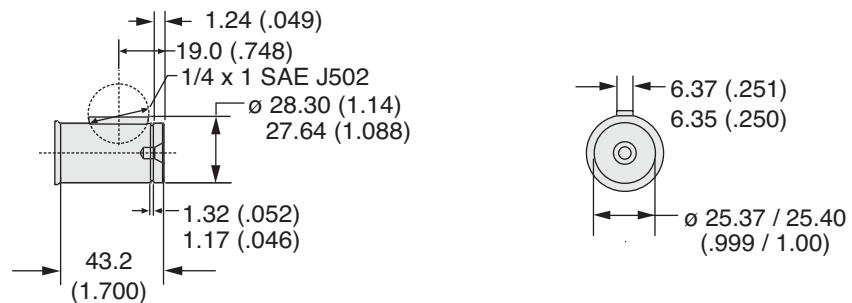
**Code: 21**  
**Corrosion**  
**Resistant**

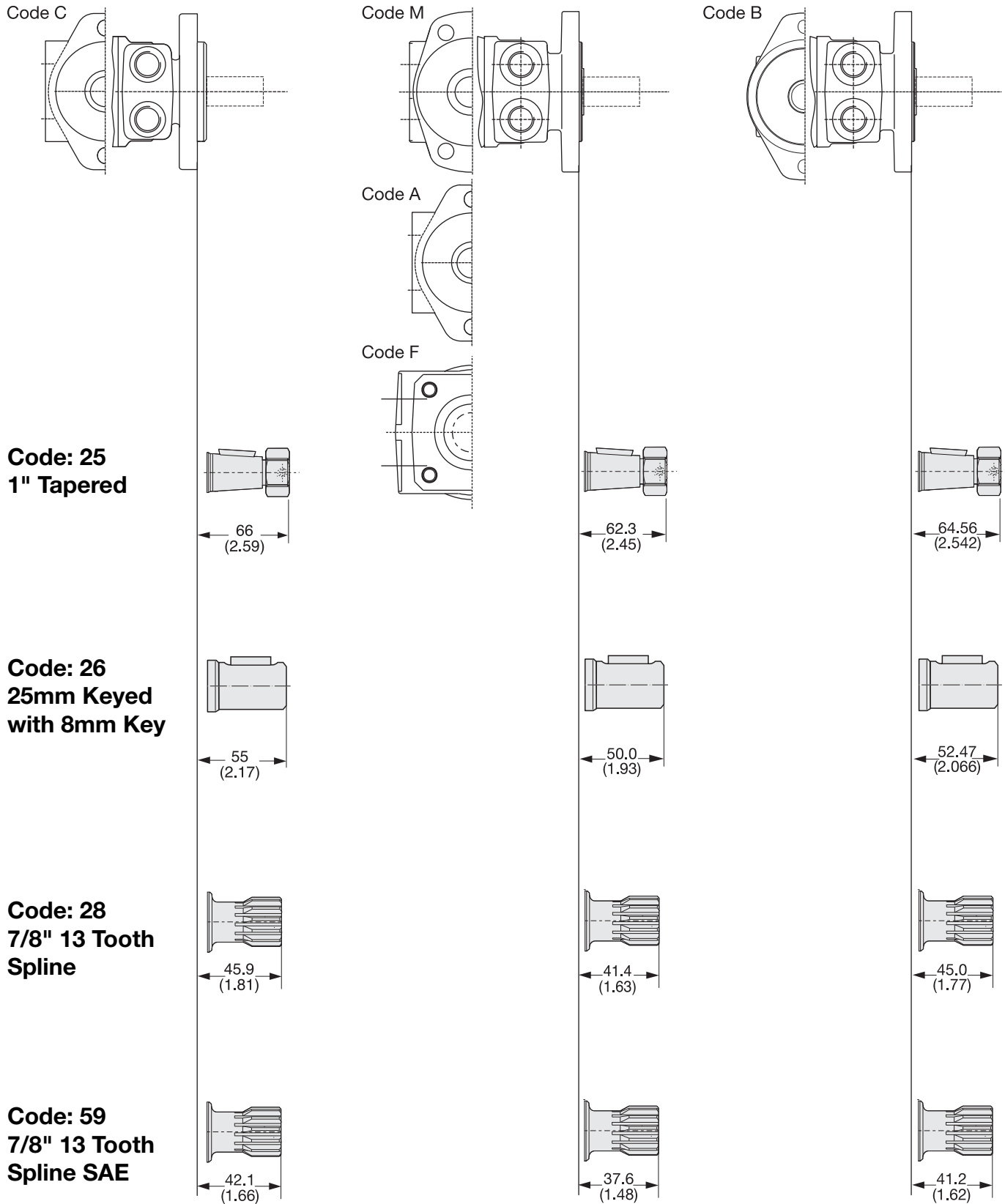


**Code: 11**  
**1" 6B Spline**

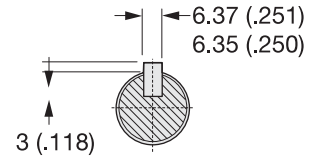
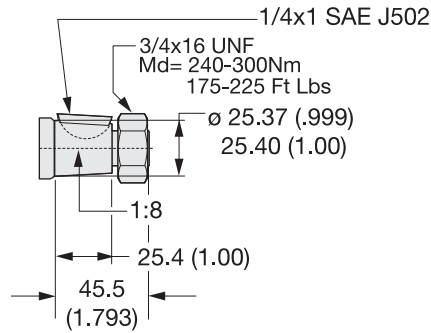


**Code: 13**  
**Long 1"**  
**Keyed**

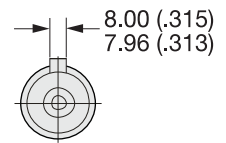
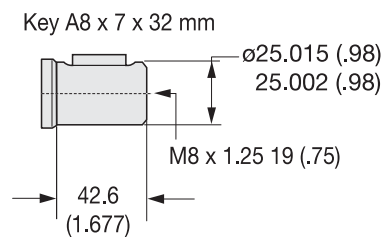




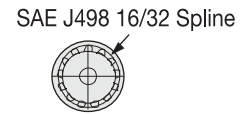
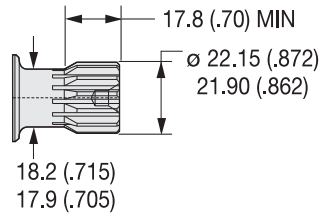
**Code: 25**  
**1" Tapered**



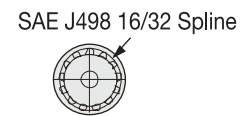
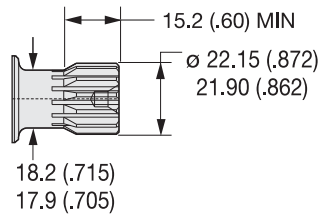
**Code: 26**  
**25mm Keyed**  
**with 8mm Key**



**Code: 28**  
**7/8" 13 Tooth**  
**Spline**



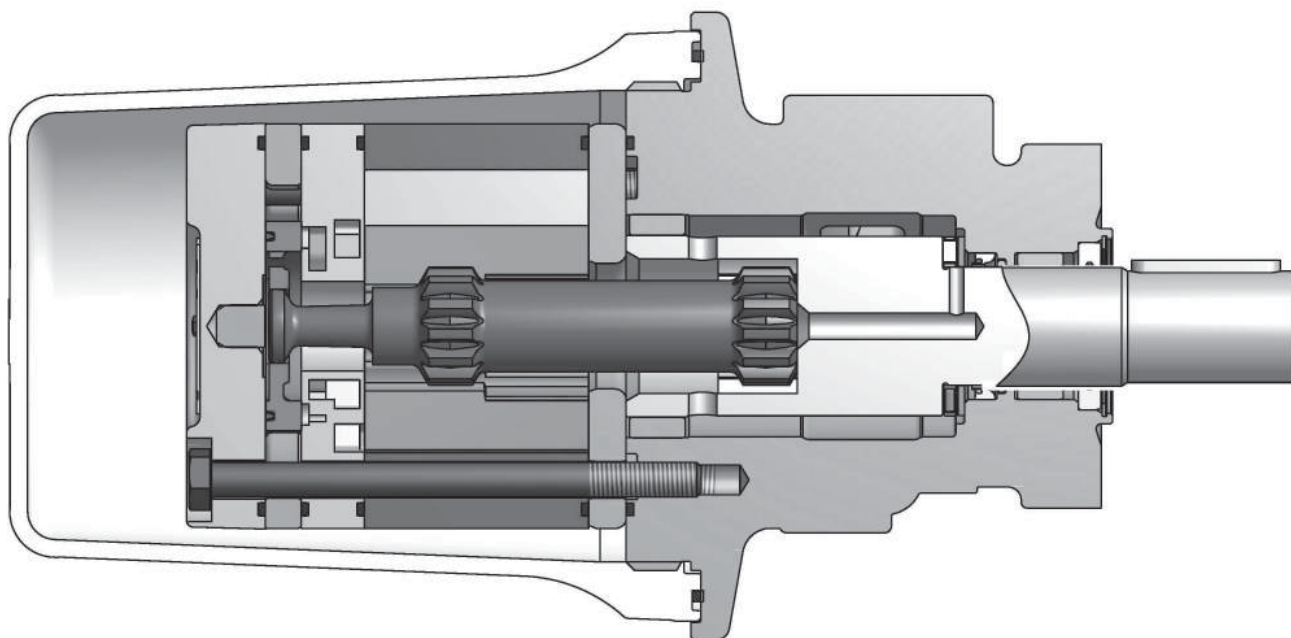
**Code: 59**  
**7/8" 13 Tooth**  
**Spline SAE**

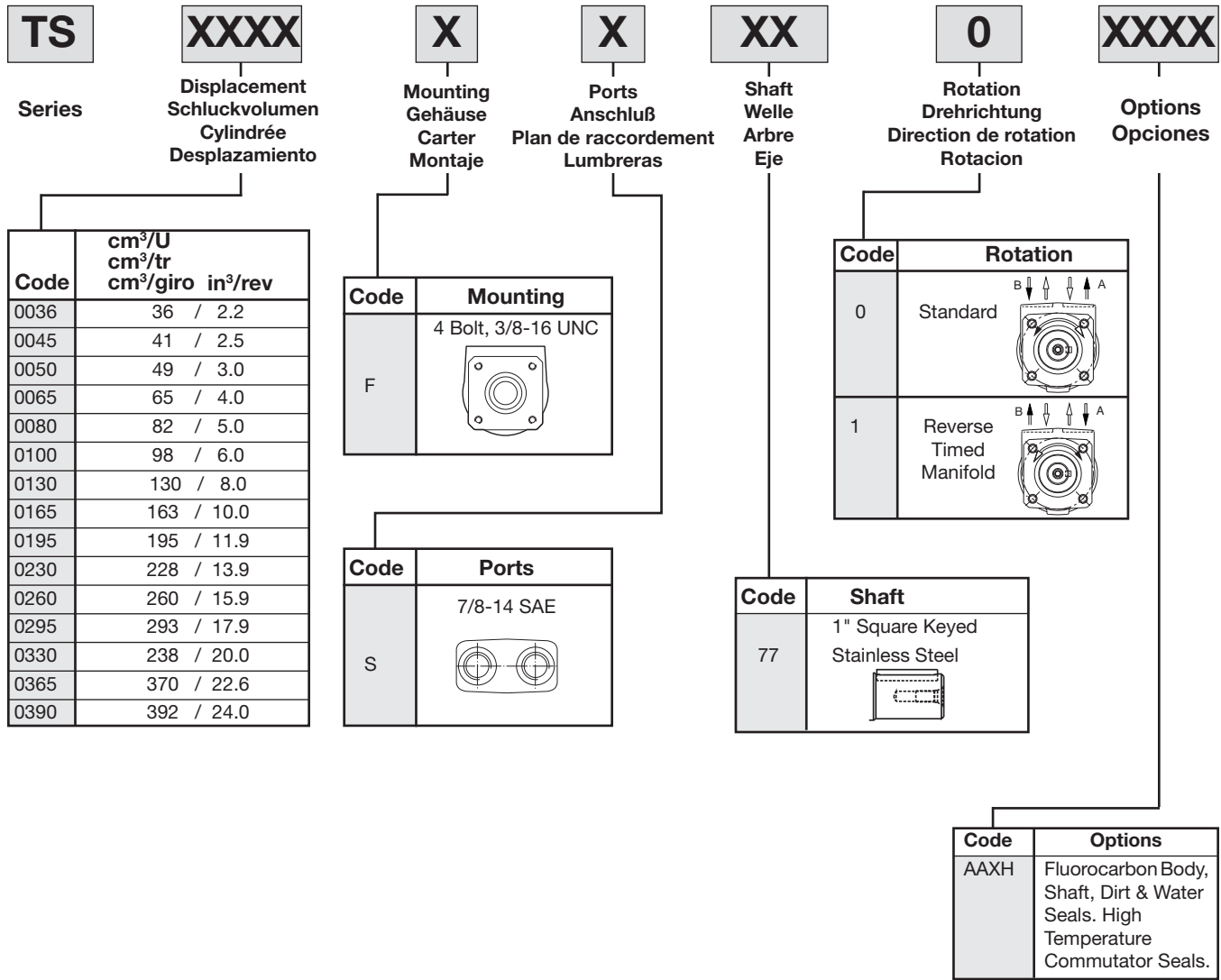


15 Displacements	(2.2 – 24.0 in <sup>3</sup> /rev)	
15 Schluckvolumen	36 . . . 390 cm <sup>3</sup> /rev	
15 Cylindrée		
15 Desplazamientos		
	<b>Cont</b>	<b>Int</b>
Maximum Pressure	(1800 psid)	(2400 psid)
Eingangsdruck	. . .125 bar	. . .165 bar
Chaute de pression max.		
Presion Maxima		
Maximum Oil Flow	(15 gpm)	
Schluckstrom	. . . 57 lpm	
Débit d'huile		
Caudal Maximo de Aceite		
Maximum Speed	(932 rpm)	
Drehzahl	932 rpm	
Vitesse de rotation		
Velocidad Maxima		
	<b>Cont</b>	<b>Int</b>
Maximum Torque	(2000 lb in)	(2000 lb in)
Max Drehmoment	226 Nm	226 Nm
Couple Maxi		
Torque Maximo		
Maximum Side Load at Key	(300 lb)	
Seitenlast	. . . 1340 N	
Charges latérales		
Carga Maxima Lateral		

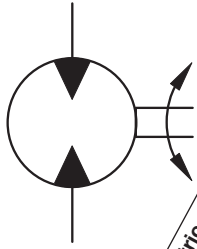
## A Stainless Steel Low Speed, High Torque Motor

This motor utilizes a stainless steel front housing and output shaft, with a glass filled polypropylene rear cover for the ultimate in corrosion protection. It is designed for use under water or in harsh environments where it will be exposed to water or corrosive chemicals. Features such as roller vanes, high pressure shaft seal and full flow spline lubrication are standard.









Geometric displacement  
Geom. Schluckvolumen  
Desplazamientos  
Cylindrée  
Max. speed @ Max. intermittent flow  
Max. Drehzahl Intermittierender Betrieb:  
Vitesse de rotation maxi  
Velocidad maxima a caudal intermitente maximo  
Max. oil flow  
Max. Schluckstrom  
Caudal Maximo  
Max. Differential Pressure  
Max. Druckgefälle  
Chute de pression maxi  
Presion diferencial maxima  
Max. supply pressure  
Max. Eingangsdruck  
Presion maxi entrée  
Presion maxima de alimentacion  
Max. torque  
Max. Drehmoment  
Couple maxi  
Torque Maximo  
Max. Performance  
Max. Leistungabgabe  
Puissance de sortie maxi  
Maximo rendimiento  
Min. starting torque  
Min. Anlaufmoment  
Couple min. fourni au démarrage  
Torque minimo de arranque

Motor Series TS	cm <sup>3</sup> /rev in <sup>3</sup> /rev	rev/min	cont / int* l/min g/min		cont / int* bar psid		max bar psig	cont / int* Nm lb-in		max KW HP	cont / int* Nm lb-in	
TS 0036	36 2.2	932	34 9	34 9	125 1800	165 2400	190 2750	48 427	67 596	6.6 8.8	44 385	50 440
TS 0045	41 2.5	805	34 9	34 9	125 1800	165 2400	190 2750	64 526	88 731	7.2 9.7	39 341	52 461
TS 0050	49 3.0	678	34 9	34 9	125 1800	165 2400	190 2750	78 693	107 946	7.5 10.1	36 319	70 619
TS 0065	65 4.0	511	34 9	34 9	125 1800	165 2400	190 2750	107 946	145 1284	7.8 10.4	66 582	99 977
TS 0080	82 5.0	409	34 9	34 9	125 1800	165 2400	190 2750	135 1193	184 1624	7.8 10.5	92 816	139 1226
TS 0100	98 6.0	454	45 12	45 12	125 1800	165 2400	190 2750	160 1411	217 1917	10.2 13.8	119 1050	158 1400
TS 0130	130 8.0	430	45 12	57 15	131 1900	131 1900	190 2750	226 2000	226 2000	10.1 13.6	172 1520	172 1520
TS 0165	163 10.0	343	45 12	57 15	103 1500	103 1500	190 2750	226 2000	226 2000	8.1 10.9	165 1460	165 1460
TS 0195	195 11.9	287	45 12	57 15	83 1200	83 1200	190 2750	226 2000	226 2000	6.8 9.1	179 1586	179 1586
TS 0230	228 13.9	246	45 12	57 15	76 1100	76 1100	190 2750	226 2000	226 2000	5.8 7.8	190 1680	190 1680
TS 0260	260 15.9	216	45 12	57 15	69 1000	69 1000	190 2750	226 2000	226 2000	5.1 6.9	188 1660	188 1660
TS 0295	293 17.9	191	45 12	57 15	62 900	62 900	190 2750	226 2000	226 2000	4.6 6.1	181 1600	181 1600
TS 0330	328 20.0	171	45 12	57 15	41 600	41 600	190 2750	226 2000	226 2000	4.0 5.4	181 1600	181 1600
TS 0365	370 22.6	151	45 12	57 15	41 600	41 600	190 2750	226 2000	226 2000	3.6 4.8	191 1690	191 1690
TS 0390	392 24.0	143	45 12	57 15	41 600	41 600	190 2750	226 2000	226 2000	3.4 4.5	179 1580	179 1580

Performance data based on testing using 10W40 oil with a viscosity of 43,1 cSt. (200 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

\* Intermittent operation rating applies to 10% of every minute.  
Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

TS 0036

2.2 cu in / rev

PRESSURE (PSID)

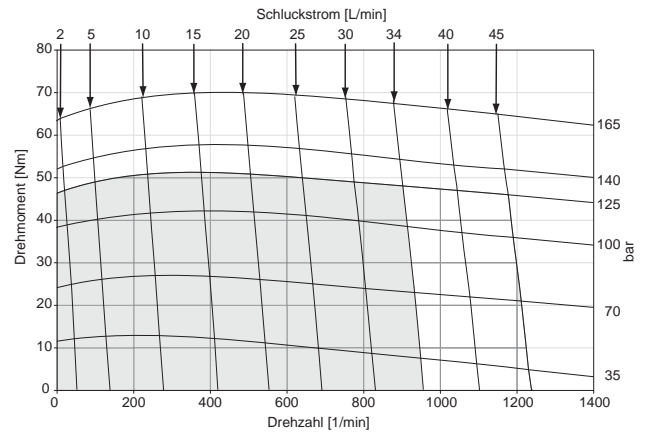
	500	1000	1500	1800	2000	2400
<b>.5</b>	109 46	225 37	344 26	419 20	470 15	567 7
<b>1</b>	111 99	230 89	351 78	429 71	478 68	579 58
<b>2</b>	112 203	236 192	363 179	442 172	493 170	598 159
<b>3</b>	112 307	241 296	369 283	449 276	503 270	609 259
<b>4</b>	108 413	241 398	372 383	452 376	508 371	619 360
<b>5</b>	104 517	238 502	370 487	454 478	507 473	621 460
<b>7</b>	88 725	225 710	360 694	444 681	500 674	615 661
<b>9</b>	71 933	207 916	344 896	425 885	483 876	599 862
<b>12</b>	48 1245	184 1225	321 1203	405 1192	459 1181	572 1163

TORQUE (LB IN) 599  
SPEED (RPM) 862

Flow (GPM)

36 cc / rev

EU



TS 0045

2.5 cu in / rev

PRESSURE (PSID)

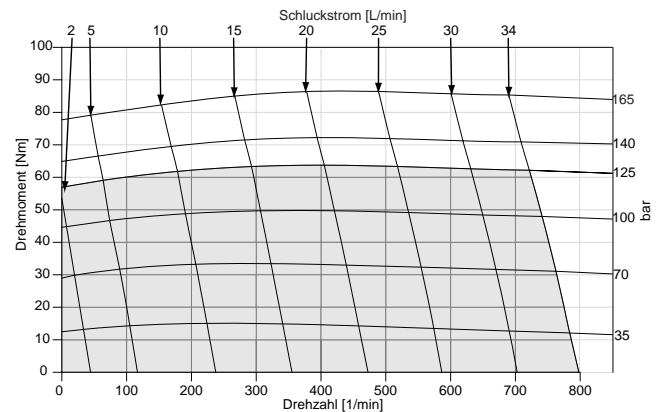
	500	1000	1500	1800	2000	2400
<b>.5</b>	119 32	263 18	413 3			
<b>1</b>	123 77	277 61	425 44	518 37	581 28	705 18
<b>2</b>	132 168	290 150	450 131	542 122	606 113	719 97
<b>3</b>	136 256	296 239	462 220	557 211	623 199	748 184
<b>4</b>	132 344	296 326	464 307	567 296	635 286	768 269
<b>5</b>	129 433	290 416	464 394	567 381	639 371	779 352
<b>7</b>	119 610	284 590	460 567	565 551	635 541	779 521
<b>9</b>	109 785	277 765	450 740	555 723	625 710	768 690

TORQUE (LB IN) 779  
SPEED (RPM) 521

Flow (GPM)

41 cc / rev

EU



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

TS 0050

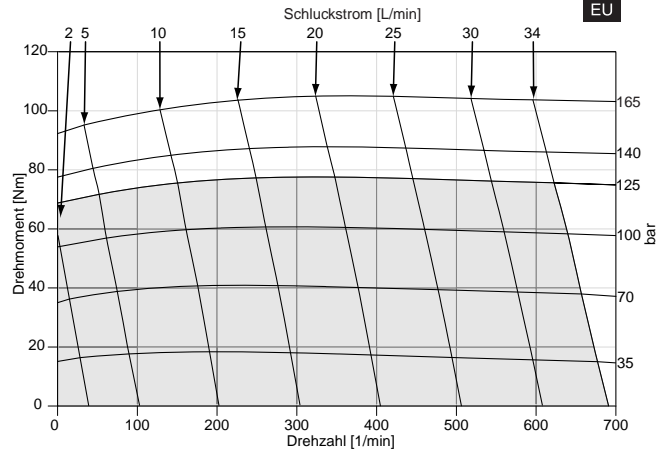
3.0 cu in / rev

	PRESSURE (PSID)					
	500	1000	1500	1800	2000	2400
<b>.5</b>	146 25	324 13	506 0			
<b>1</b>	156 66	338 50	521 35	631 28	701 20	842 9
<b>2</b>	166 141	359 127	555 110	666 102	742 94	877 80
<b>3</b>	162 218	365 203	566 186	688 176	764 168	912 153
<b>4</b>	164 295	361 279	570 261	693 251	775 242	936 227
<b>5</b>	156 372	359 355	568 337	691 327	779 317	947 302
<b>7</b>	146 525	350 506	561 486	691 474	775 466	949 448
<b>9</b>	135 678	338 659	551 638	680 623	766 615	939 596

Flow (GPM)

TORQUE (LB IN) 939  
SPEED (RPM) 596

49 cc / rev



TS 0065

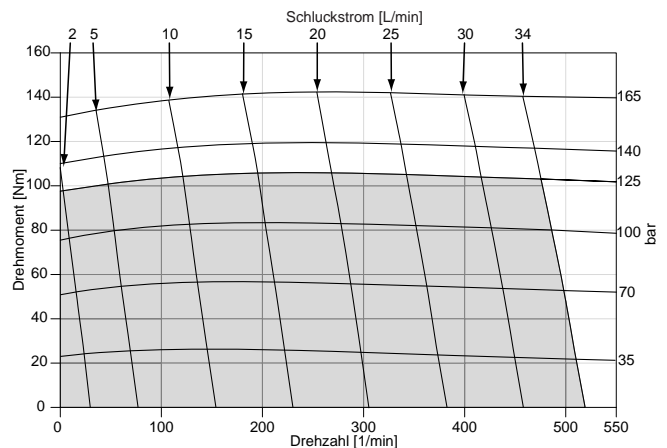
4.0 cu in / rev

	PRESSURE (PSID)					
	500	1000	1500	1800	2000	2400
<b>.5</b>	217 22	459 14	707 6	862 1		
<b>1</b>	225 51	479 42	735 34	887 29	992 24	1194 17
<b>2</b>	237 108	496 98	761 90	921 85	1028 81	1225 70
<b>3</b>	237 166	504 156	777 147	941 140	1045 136	1251 126
<b>4</b>	228 224	501 214	777 203	946 197	1054 192	1273 181
<b>5</b>	225 281	496 271	775 260	946 252	1059 247	1282 237
<b>7</b>	208 396	485 385	763 373	938 364	1051 359	1282 347
<b>9</b>	194 511	468 499	749 485	924 476	1037 470	1265 457

Flow (GPM)

TORQUE (LB IN) 1282  
SPEED (RPM) 347

65 cc / rev



Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Cont.  Int.  
Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TS 0080

5.0 cu in / rev

PRESSURE (PSID)

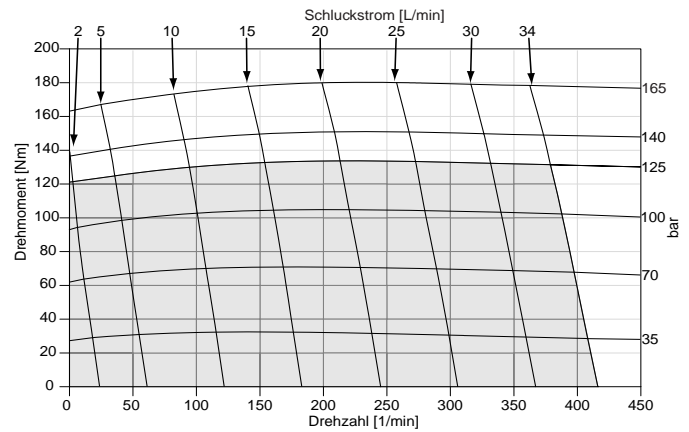
	500	1000	1500	1800	2000	2400
<b>.5</b>	259 18	563 10	881 5	1078 1		
<b>1</b>	274 40	589 33	911 26	1100 22	1230 19	1489 11
<b>2</b>	285 86	615 78	952 70	1144 67	1281 63	1530 53
<b>3</b>	293 132	630 124	970 116	1174 110	1311 106	1570 98
<b>4</b>	285 179	630 171	978 161	1185 155	1330 152	1604 142
<b>5</b>	285 226	626 216	978 206	1196 200	1341 196	1626 185
<b>7</b>	267 317	622 307	974 296	1189 290	1337 285	1626 275
<b>9</b>	256 410	604 398	959 387	1178 379	1322 375	1611 362

Flow (GPM)

TORQUE (LB IN) 1611  
SPEED (RPM) 362

82 cc / rev

EU



TS 0100

6.0 cu in / rev

PRESSURE (PSID)

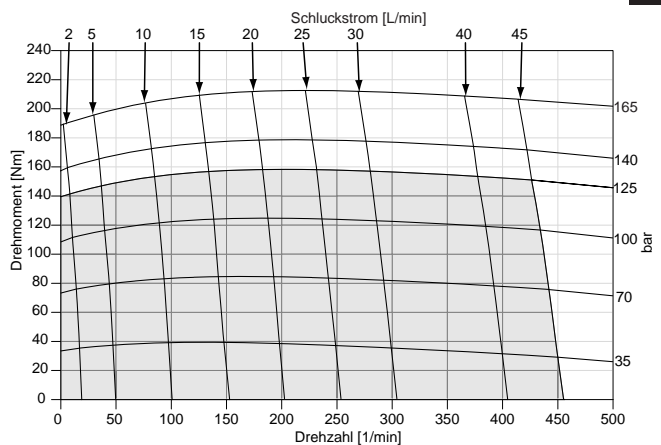
	500	1000	1500	1800	2000	2400
<b>.5</b>	316 16	674 13	1045 9	1267 7	1411 4	1708 0
<b>1</b>	327 34	698 32	1072 27	1298 25	1454 23	1743 18
<b>2</b>	339 74	725 69	1111 64	1353 61	1509 58	1805 53
<b>3</b>	351 111	741 107	1146 102	1388 98	1544 95	1852 89
<b>4</b>	351 148	752 143	1162 139	1404 135	1571 132	1887 126
<b>5</b>	347 187	749 183	1170 176	1415 172	1583 169	1910 162
<b>7</b>	320 264	737 257	1162 250	1415 246	1587 242	1926 235
<b>9</b>	308 339	721 333	1142 325	1400 319	1571 316	1910 307
<b>12</b>	257 454	674 446	1096 437	1474 430	1524 426	1864 418

Flow (GPM)

TORQUE (LB IN) 1910  
SPEED (RPM) 307

98 cc / rev

EU



Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Cont.  Int.  
Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

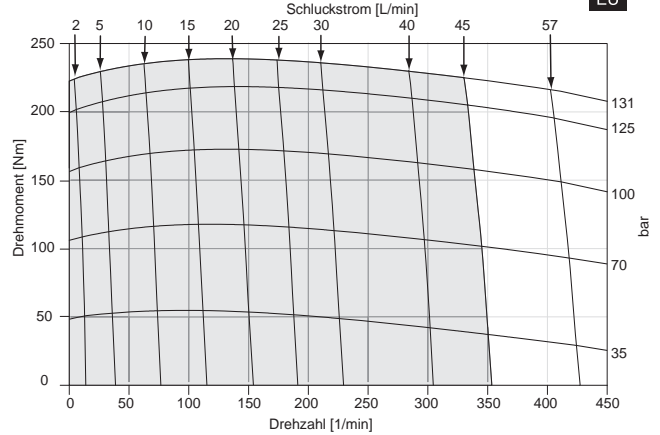
Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

TS 0130

**8.0 cu in / rev** PRESSURE (PSID)

	500	1000	1500	1800	1900
<b>.5</b>	455 11	966 10	1485 7	1802 5	1897 4
<b>1</b>	463 27	983 24	1511 21	1836 19	1931 18
<b>2</b>	476 55	1018 52	1563 49	1893 46	1988 45
<b>3</b>	485 84	1039 81	1594 77	1927 73	2027 73
<b>4</b>	489 113	1048 109	1611 105	1944 103	2044 101
<b>5</b>	481 142	1044 138	1615 133	1953 130	2057 129
<b>7</b>	459 199	1026 195	1598 190	1944 186	2044 185
<b>9</b>	411 257	983 252	1568 246	1914 242	2022 241
<b>12</b>	342 343	914 338	1494 331	1874 327	1953 325
<b>15</b>	260 430	823 424	1394 416	1745 411	1849 410

**130 cc / rev**



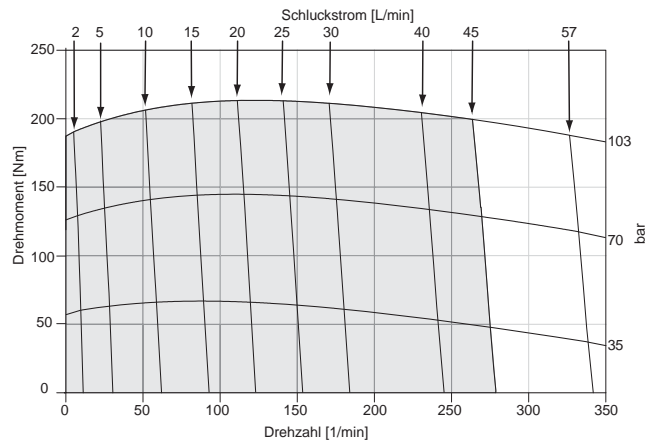
Flow (GPM)

TS 0165

**10.0 cu in / rev** PRESSURE (PSID)

	250	500	1000	1250	1500
<b>.5</b>	227 12	537 9	1148 7	1461 6	1772 4
<b>1</b>	237 23	554 21	1177 18	1496 16	1813 15
<b>2</b>	247 46	578 44	1226 40	1560 38	1891 37
<b>3</b>	254 69	591 67	1263 63	1600 61	1936 59
<b>4</b>	251 91	595 89	1276 86	1621 84	1965 82
<b>5</b>	239 115	587 113	1288 109	1634 107	1981 104
<b>7</b>	204 162	562 159	1267 154	1627 151	1985 149
<b>9</b>	155 208	517 205	1230 200	1594 197	1956 194
<b>12</b>	61 277	427 274	1140 268	1509 265	1874 261
<b>15</b>		324 343	1029 337	1394 334	1755 331

**163 cc / rev**



Flow (GPM)

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Cont.  Int.  
Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

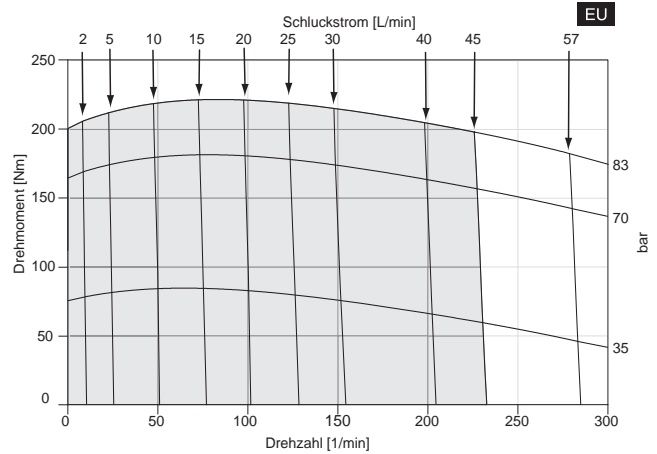
TS 0195

11.9 cu in / rev

	PRESSURE (PSID)				
	250	500	750	1000	1200
<b>.5</b>	318 9.4	701 8.9	1095 8.5	1504 7.7	1780 6.8
<b>1</b>	336 19	720 18	1119 17	1535 17	1807 17
<b>2</b>	351 38	744 38	1152 37	1579 36	1854 36
<b>3</b>	363 58	760 57	1172 56	1602 55	1882 54
<b>4</b>	355 76	756 76	1173 75	1610 74	1890 73
<b>5</b>	341 95	744 95	1166 94	1610 93	1886 92
<b>7</b>	300 135	705 134	1128 132	1575 131	1850 130
<b>9</b>	241 173	646 172	1069 170	1516 169	1791 168
<b>12</b>	142 232	543 230	961 229	1398 227	1677 226
<b>15</b>	9 288	409 287	824 286	1256 284	1539 283

Flow (GPM)

195 cc / rev



TORQUE (LB IN) 1677  
SPEED (RPM) 226

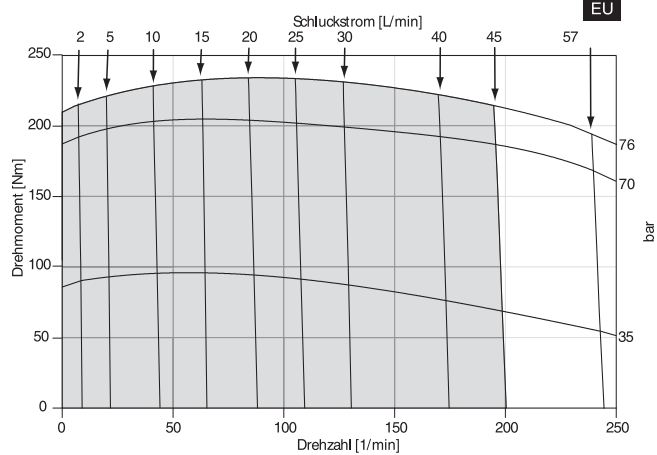
TS 0230

13.9 cu in / rev

	PRESSURE (PSID)				
	250	500	750	1000	1100
<b>.5</b>	373 8.3	806 8.2	1248 7.8	1714 7.2	1836 6.9
<b>1</b>	382 16.6	820 16.4	1267 15.8	1733 15.1	1865 14.8
<b>2</b>	409 33	850 32	1298 32	1768 31	1899 31
<b>3</b>	414 49	859 49	1316 48	1802 47	1919 47
<b>4</b>	408 66	854 65	1323 65	1816 64	1938 64
<b>5</b>	383 83	845 82	1318 81	1821 80	1943 79
<b>7</b>	338 113	811 114	1292 113	1797 112	1938 111
<b>9</b>	261 147	747 147	1237 146	1738 145	1899 144
<b>12</b>	111 199	615 199	1120 197	1626 194	1800 193
<b>15</b>	479 246	987 244	1473 241	1650 240	

Flow (GPM)

228 cc / rev



TORQUE (LB IN) 1899  
SPEED (RPM) 144

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

Cont.

Int.

TS 0260

15.9 cu in / rev

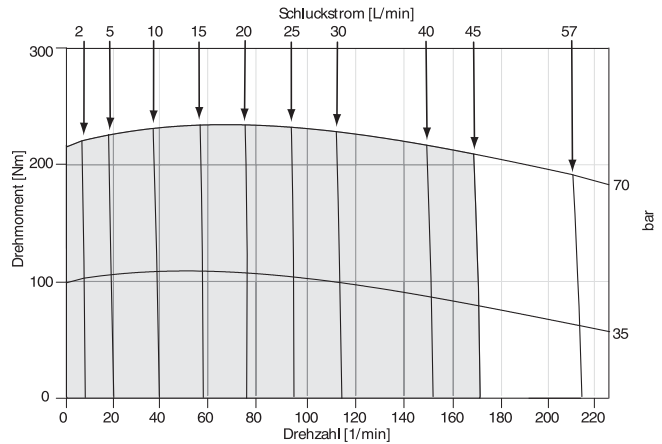
PRESSURE (PSID)

	250	500	750	1000
<b>.5</b>	399 7.2	915 6.9	1431 6.4	1948 6.0
<b>1</b>	412 14.5	936 14.0	1460 13.6	1984 13.1
<b>2</b>	419 29.0	956 28.3	1493 27.6	2030 26.8
<b>3</b>	427 43	971 43	1516 42	2060 41
<b>4</b>	412 58	966 57	1521 57	2076 56
<b>5</b>	401 71	961 71	1521 71	2081 70
<b>7</b>	348 101	915 100	1483 100	2050 99
<b>9</b>	271 130	844 129	1416 128	1989 128
<b>12</b>	133 174	706 173	1278 172	1851 171
<b>15</b>		547 216	1117 215	1687 214

Flow (GPM)

260 cc / rev

EU



TORQUE (LB IN) 1851  
SPEED (RPM) 171

TS 0295

17.9 cu in / rev

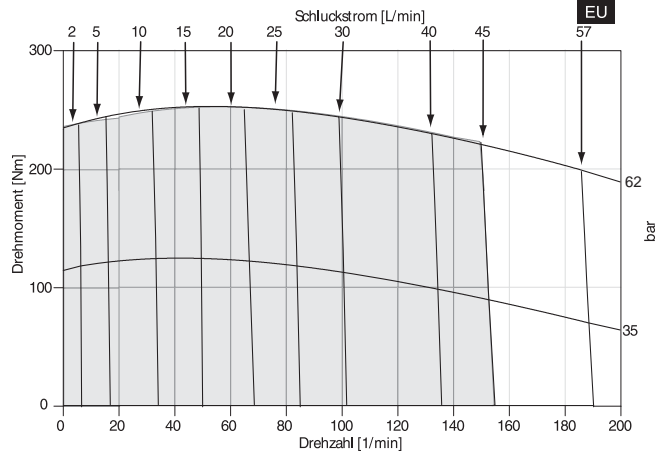
PRESSURE (PSID)

	250	500	750	900
<b>.5</b>	384 6.4	1048 6.0	1713 5.3	2111 4.9
<b>1</b>	394 12.6	1068 12.2	1742 11.7	2146 11.4
<b>2</b>	397 25.6	1093 25.1	1788 24.6	2205 24.3
<b>3</b>	406 39	1107 38	1809 37	2229 36
<b>4</b>	397 50	1107 50	1818 49	2244 49
<b>5</b>	365 64	1088 63	1810 62	2244 61
<b>7</b>	316 90	1038 89	1761 88	2195 87
<b>9</b>	223 115	955 114	1687 113	2126 112
<b>12</b>	60 154	792 153	1524 151	1964 150
<b>15</b>		605 191	1325 189	1757 188

Flow (GPM)

293 cc / rev

EU



TORQUE (LB IN) 2126  
SPEED (RPM) 112

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement intermitt. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

Cont.

Int.

TS 0330

20.0 cu in / rev

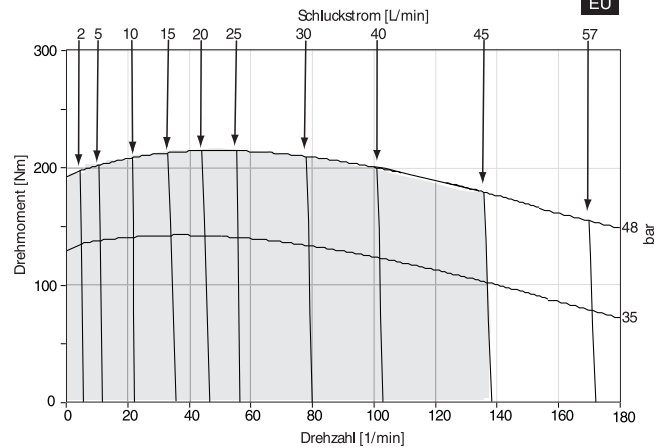
PRESSURE (PSID)

	250	500	600
<b>.5</b>	481 5.7	1201 5.1	1489 4.6
<b>1</b>	469 11.4	1229 11.1	1533 10.6
<b>2</b>	416 22.8	1258 22.5	1594 21.7
<b>3</b>	377 35	1270 34	1627 33
<b>4</b>	323 46	1266 45	1643 44
<b>5</b>	252 57	1245 56	1643 56
<b>7</b>	154 80	1189 79	1602 78
<b>9</b>	55 103	1099 102	1517 102
<b>12</b>		913 137	1331 136
<b>15</b>		706 171	1087 170

TORQUE (LB IN) 1517  
SPEED (RPM) 102

Flow (GPM)

328 cc / rev



TS 0365

22.6 cu in / rev

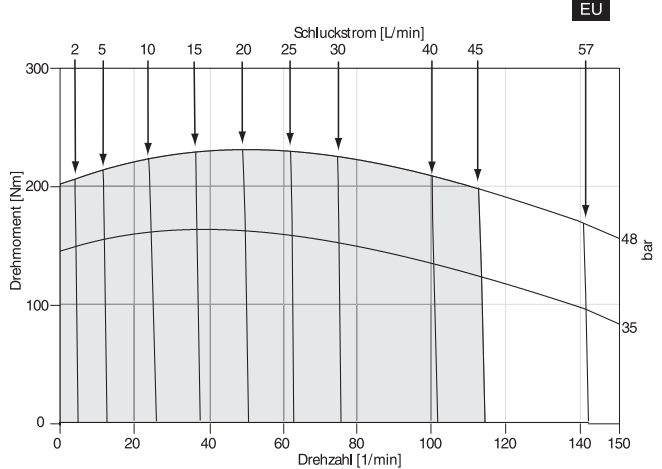
PRESSURE (PSID)

	250	500	600
<b>.5</b>	680 5.1	1405 4.9	1650 4.6
<b>1</b>	688 10.2	1438 9.8	1703 9.7
<b>2</b>	686 20.4	1479 19.8	1756 19.6
<b>3</b>	692 30.3	1495 30.2	1784 30.0
<b>4</b>	720 40.2	1487 39.9	1796 39.8
<b>5</b>	703 50.6	1466 50.0	1772 49.8
<b>7</b>	572 70.6	1373 70.1	1695 69.9
<b>9</b>	440 91.4	1251 90.3	1572 89.9
<b>12</b>	189 121.5	1014 120.9	1344 120.7
<b>15</b>		701 151.1	1022 150.9

TORQUE (LB IN) 1695  
SPEED (RPM) 69.9

Flow (GPM)

370 cc / rev



Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

Cont.

Int.



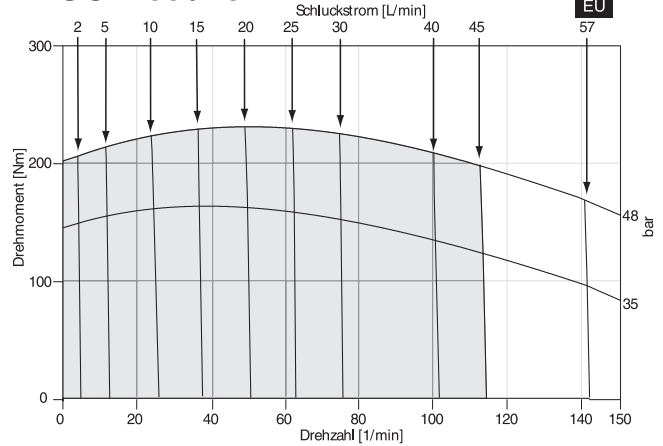
TS 0390

**24.0 cu in / rev**

	PRESSURE (PSID)		
	250	500	600
<b>.5</b>	604 4.5	1324 4.0	1492 3.8
<b>1</b>	640 9.3	1356 9.2	1540 9.0
<b>2</b>	690 18.6	1408 18.1	1608 17.9
<b>3</b>	700 28.4	1440 28.1	1664 27.7
<b>4</b>	705 37.5	1452 37.0	1692 36.8
<b>5</b>	715 48.1	1444 47.1	1712 46.8
<b>7</b>	642 67.2	1392 66.2	1692 65.8
<b>9</b>	496 85.6	1296 85.1	1616 84.9
<b>12</b>	292 115.9	1092 114.5	1412 113.9
<b>15</b>	62 144.1	832 143.1	1140 142.7

**Flow (GPM)**

**392 cc / rev**



TORQUE (LB IN) 1616  
SPEED (RPM) 84.9

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

003 TS.indd, js

Cont.

Int.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

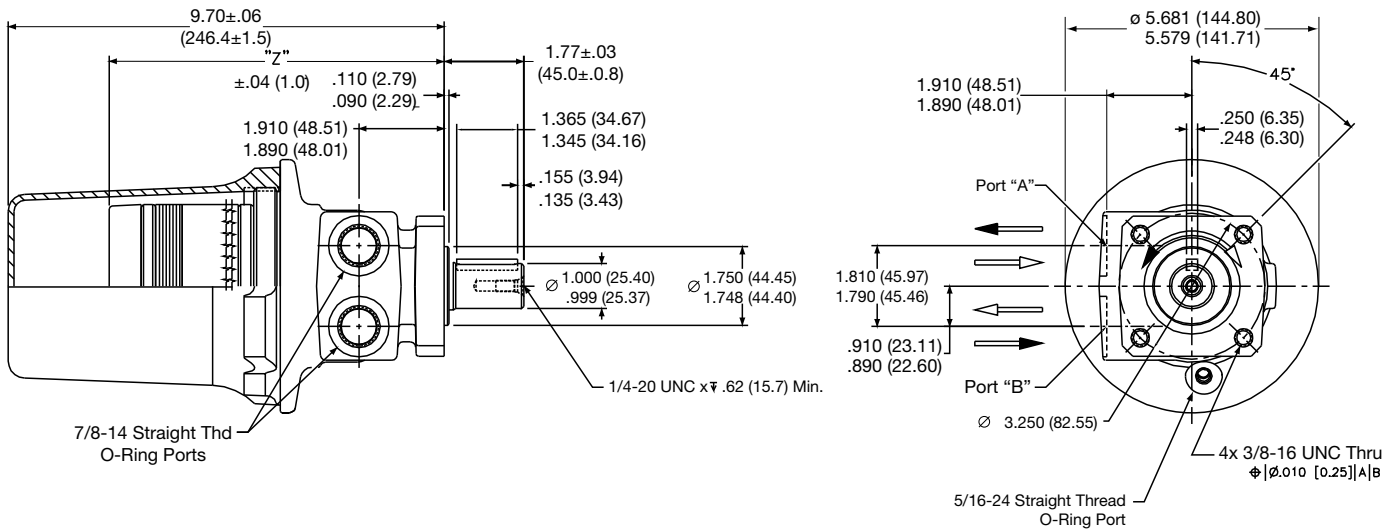
A 5/16-24 straight thread o-ring drain port is provided in the flange of the front housing. This port is to be connected to the reservoir. The purpose of this port is to relieve pressure in the polypropylene rear cover in the rare event of a motor section seal leak.

Maximum side load 300# at 1 inch from mounting face.

Shaft torque is limited to 2000 in-lbs since it is made from 316 stainless steel 1" keyed shaft. Other shaft types or shaft taper locks will increase allowable shaft torque.

**Code: FS**

**4 Bolt,  
 7/8"-14 SAE  
 O-Ring**



\* Do not plug 5/16-24 drain port

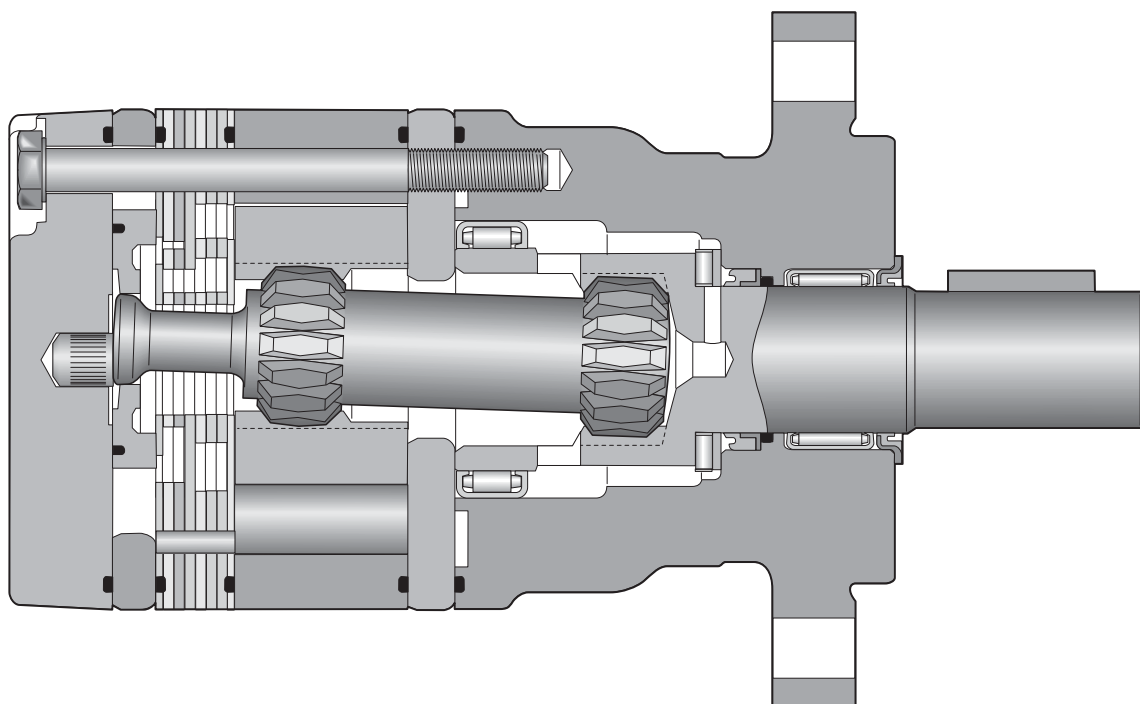
Code FS disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht kg	8.3	8.3	8.4	8.5	8.7	8.8	9.0	9.3	9.8	9.9	10.1	10.3	10.7	11.0	11.1
Poids/Peso (lb)	(18.3)	(18.4)	(18.5)	(18.8)	(19.1)	(19.4)	(19.9)	(20.6)	(21.5)	(21.8)	(22.3)	(22.8)	(23.5)	(24.2)	(24.5)
Length "Z" mm	164.4	165.5	167.0	170.2	173.3	176.5	182.9	189.2	195.6	201.9	208.3	214.6	221.0	229.6	233.7
"Z" (in)	(6.47)	(6.52)	(6.57)	(6.70)	(6.82)	(6.95)	(7.20)	(7.45)	(7.70)	(7.95)	(8.20)	(8.45)	(8.70)	(9.04)	(9.20)

English equivalents for metric specifications are shown in ( ).

15 Displacements	(2.2 – 24.0 in <sup>3</sup> /rev)	
15 Schluckvolumen	36 . . . 390 cm <sup>3</sup> /rev	
15 Cylindrée		
15 Desplazamientos		
	<b>Cont</b>	<b>Int</b>
Maximum Pressure	(2030 psid)	(2750 psid)
Eingangsdruck	. . .140 bar	. . .190 bar
Chaute de pression max.		
Presion Maxima		
Maximum Oil Flow	(20 gpm)	
Schluckstrom	. . . 75 lpm	
Débit d'huile		
Caudal Maximo de Aceite		
Maximum Speed	(1000 rpm)	
Drehzahl	1000 rpm	
Vitesse de rotation		
Velocidad Maxima		
	<b>Cont</b>	<b>Int</b>
Maximum Torque	(4139 lb in)	(5728 lb in)
Max Drehmoment	467 Nm	648 Nm
Couple Maxi		
Torque Maximo		
Maximum Side Load at Key	(1500 lb)	
Seitenlast	. . . 6650 N	
Charges latérales		
Carga Maxima Lateral		

## An Improved Medium Duty Low Speed, High Torque Motor

This medium duty motor has higher pressure ratings than the TB motor, for applications requiring higher torque. Robust roller bearings withstand higher side loads and are suitable for chain and sprocket shaft connections. It uses high pressure shaft seals, robust roller bearings and high flow shaft seal cooling.



**TE**

Series


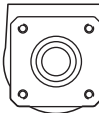


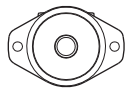



**XXXX**

Displacement  
Schluckvolumen  
Cylindrée  
Desplazamiento

Code	cm <sup>3</sup> /U cm <sup>3</sup> /tr cm <sup>3</sup> /giro	in <sup>3</sup> /rev
0036	36 / 2.2	
0045	41 / 2.5	
0050	49 / 3.0	
0065	65 / 4.0	
0080	82 / 5.0	
0100	98 / 6.0	
0130	130 / 8.0	
0165	163 / 10.0	
0195	195 / 11.9	
0230	228 / 13.9	
0260	260 / 15.9	
0295	293 / 17.9	
0330	328 / 20.0	
0365	370 / 22.6	
0390	392 / 24.0	

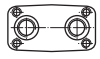
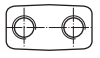
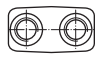

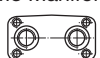
**X**

Mounting  
Gehäuse  
Carter  
Montaje

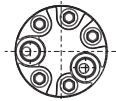
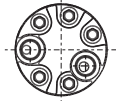
Code	Mounting
A	SAE "A" 2 Bolt, 
F	4 Bolt w/3/8-16 UNC 
M	Magneto 
C	SAE "A" 2 Bolt, Long Pilot 
B	SAE "B" 2 Bolt 
L*	Wheel Mount 
N	Midmount 
U*	Wheel Mount 7/8-14 SAE 

**X**

Ports  
Anschluß  
Plan de raccordement  
Lumbreras

Code	Ports
M	5/16-18 UNC Manifold 
P	1/2-14 NPTF 
S	7/8-14 SAE 
W	G 1/2 BSPP 
N	M8 Manifold 

Rear Ports  
Endanschluß  
Alimentazione Laterale  
Orifices arriér













Code	Rear Ports
R	3/4-16 SAE O-ring Axial 
Y	G 1/2 BSPP Axial 

\*Not available with port codes M & N

For other available options, see pages 102–103.

**XX**



Shaft  
Welle  
Arbre  
Eje

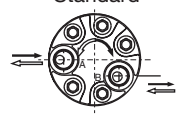
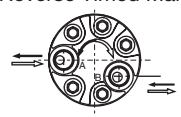
Code	Shaft
09	1" Straight w/0.38" Crosshole 
10	1" Keyed, 
11	1" 6B Spline 
12	Short 1" Tapered 
13	Long 1" Keyed 
21	1" Keyed; Corrosion Resistant 
25	1" Tapered 
26	25mm Keyed w/ 8mm Key 
28	7/8" 13 Tooth Spline 
41	Long 6B Spline 
59*	7/8" 13 Tooth Spline SAE 
70	1" Keyed; Stainless Steel 

\* Conforms to SAE B recommended length

**0**

Rotation  
Drehrichtung  
Direction de rotation  
Rotacion

Code	Rotation
0	Standard 
1	Reverse Timed Manifold 

Code	Rear Port Rotation
0	Standard 
1	Reverse Timed Manifold 

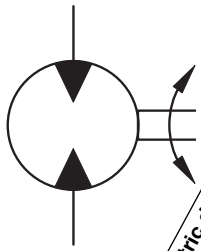
Rotation viewed from shaft end.

**XXXX**

Options  
Opciones

Code	Options
AAAA	Black Paint
AAAB	No Paint
AAAC	Double Paint
AAAF	Castle Nut, Black Paint
AABP	Castle Nut, No Paint
AAAG	Fluorocarbon Seals, Black Paint
AAAH	Fluorocarbon Seals, No Paint
AAAJ	High Temperature Commutator Seal, Black Paint
AAFG	High Temperature Commutator Seal, No Paint
AABJ*	Free Running Rotorset, Black Paint
AABK*	Free Running Rotorset, No Paint

\*Not applicable to TE0365 or TE0390 displacements



Geometric displacement  
Geom. Schluckvolumen  
Desplazamientos  
Max. speed @ Max. Intermittent flow  
Max. Drehzahl Intermittierender Betrieb:  
Velocidad maxima a caudal intermitente maximo  
Max. oil flow  
Max. Schluckstrom  
Caudal Maximo  
Max. Differential Pressure  
Max. Druckgefälle  
Chute de pression max  
Presion diferencial maxima  
Max. supply pressure  
Max. Eingangsdruck  
Presion max entrada  
Max. torque  
Max. Drehmoment  
Couple Maximo  
Max. Performance  
Max. Leistungsgabe  
Maximo rendimiento  
Min. starting torque  
Min. Anlaufmoment  
Couple min. fourni au démarrage  
Torque minimo de arranque

Motor Series TE	cm <sup>3</sup> /rev in <sup>3</sup> /rev	Int rev/min	cont / int* l/min g/min		cont / int* bar psid		max bar psig	cont / int* Nm lb-in		max KW HP	cont / int* Nm lb-in	
TE 0036	36 2.2	1141	34 9	42 11	140 2030	190 2750	200 2900	54.6 483	71.1 630	8.5 11.4	44 389	52 460
TE 0045	41 2.5	1024	34 9	42 11	140 2030	190 2750	200 2900	71 624	99 876	10.4 13.9	44 411	64 565
TE 0050	49 3.0	1020	34 9	50 13	140 2030	190 2750	200 2900	90 796	127 1120	12.8 17.2	72 637	98 871
TE 0065	65 4.0	877	45 12	57 15	140 2030	190 2750	200 2900	125 1106	176 1558	14.7 19.8	100 885	137 1211
TE 0080	82 5.0	695	45 12	57 15	140 2030	190 2750	200 2900	160 1416	220 1947	17.3 23.2	128 1133	171 1515
TE 0100	98 6.0	582	45 12	57 15	140 2030	190 2750	200 2900	190 1682	264 2337	17.4 23.4	152 1345	205 1819
TE 0130	130 8.0	438	45 12	57 15	140 2030	190 2750	200 2900	255 2257	352 3116	17.3 23.2	204 1806	274 2423
TE 0165	163 10.0	348	45 12	57 15	140 2030	190 2750	200 2900	310 2744	436 3846	17.0 22.8	248 2195	338 2992
TE 0195	195 11.9	292	45 12	57 15	140 2030	190 2750	200 2900	390 3452	528 4673	17.4 23.4	312 2762	411 3637
TE 0230	228 13.9	328	57 15	75 20	120 1740	165 2400	200 2900	380 3363	514 4554	17.7 23.8	304 2691	411 3637
TE 0260	260 15.9	287	57 15	75 20	110 1595	155 2250	200 2900	400 3540	550 4870	16.7 22.4	320 2832	449 3977
TE 0295	293 17.9	256	57 15	75 20	100 1450	145 2100	200 2900	428 3784	582 5180	15.7 21.0	328 2903	445 3939
TE 0330	328 20.0	228	57 15	75 20	100 1450	135 1950	200 2900	443 3926	600 5312	14.8 19.8	344 3045	453 4014
TE 0365	370 22.6	203	57 15	75 20	95 1378	125 1825	200 2900	467 4133	648 5728	13.6 18.2	373 3301	477 4223
TE 0390	392 24.0	191	57 15	75 20	85 1233	120 1740	200 2900	445 3935	628 5562	12.5 16.8	348 3080	462 4090

Performance data based on testing using 10W40 oil with a viscosity of 43,1 cSt. (200 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

\* Intermittent operation rating applies to 10% of every minute.  
Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

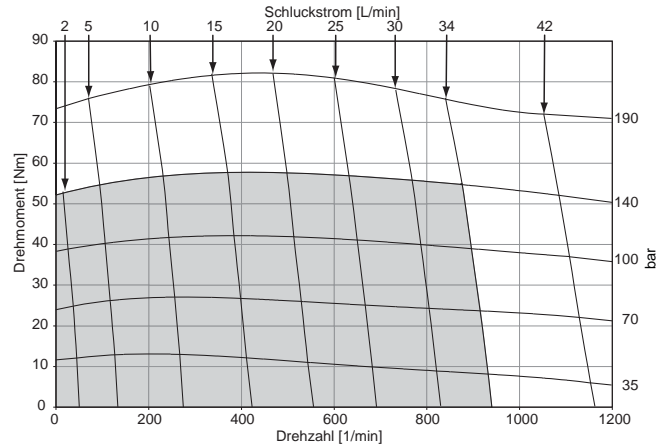
TE 0036 **2.2 cu in / rev** PRESSURE (PSID)

	500	1000	1500	2000	2750
<b>.5</b>	111 44	225 37	346 25	470 15	
<b>1</b>	113 96	231 86	353 77	480 67	670 40
<b>2</b>	115 202	239 190	365 179	495 169	691 140
<b>3</b>	113 307	241 296	371 282	505 269	709 240
<b>4</b>	109 411	241 397	373 384	509 371	722 340
<b>5</b>	103 516	237 501	371 486	509 470	726 440
<b>7</b>	87 724	225 709	361 691	501 674	711 641
<b>9</b>	72 933	208 916	344 897	482 877	672 841
<b>11</b>	54 1142	190 1117	326 1096	462 1075	629 1045

Flow (GPM)

**36 cc / rev**

EU



TORQUE (LB IN) 711  
SPEED (RPM) 641

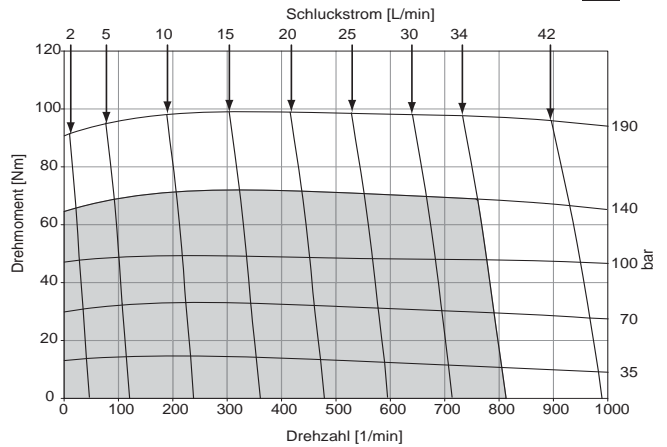
TE 0045 **2.5 cu in / rev** PRESSURE (PSID)

	500	1000	1500	2000	2750
<b>.5</b>	121 41	272 35	425 28	579 22	808 10
<b>1</b>	126 86	282 79	440 72	599 65	832 50
<b>2</b>	128 176	288 168	452 161	619 152	867 134
<b>3</b>	126 266	287 257	453 249	620 239	868 221
<b>4</b>	123 356	285 346	454 337	624 326	876 306
<b>5</b>	119 446	281 435	451 425	624 413	877 391
<b>7</b>	105 625	270 613	440 601	615 587	872 562
<b>9</b>	94 805	259 791	430 777	605 761	862 733
<b>11</b>	81 983	246 967	415 950	590 930	849 896

Flow (GPM)

**41 cc / rev**

EU



TORQUE (LB IN) 872  
SPEED (RPM) 562

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

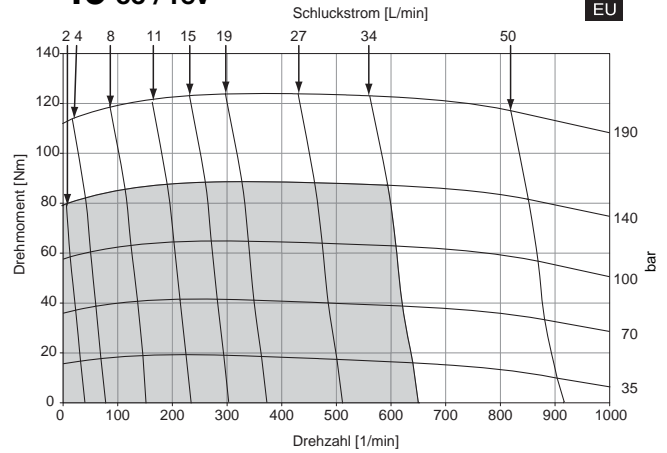
TE 0050 **3.0 cu in / rev** PRESSURE (PSID)

	500	1000	1500	2000	2750
<b>.5</b>	146 32	327 23	513 13	705 6	
<b>1</b>	159 69	345 60	537 50	727 41	1005 17
<b>2</b>	170 145	364 136	563 124	764 113	1057 85
<b>3</b>	167 225	363 214	565 203	768 191	1066 163
<b>4</b>	169 294	367 282	574 271	784 260	1092 231
<b>5</b>	165 363	365 349	574 339	785 327	1097 297
<b>7</b>	156 501	357 485	568 474	782 460	1096 430
<b>9</b>	141 640	342 621	555 609	771 594	1087 561
<b>13</b>	88 904	295 881	503 869	722 851	1036 819

Flow (GPM)

TORQUE (LB IN) 1096  
SPEED (RPM) 430

**49 cc / rev**



EU

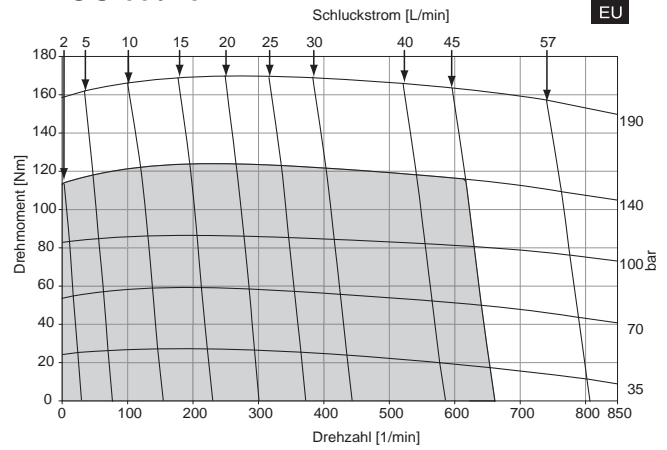
TE 0065 **4.0 cu in / rev** PRESSURE (PSID)

	500	1000	1500	2000	2750
<b>.5</b>	220 24	481 17	743 11	1004 3	
<b>1</b>	232 52	498 45	763 38	1025 31	1411 19
<b>2</b>	239 109	512 102	789 94	1066 85	1469 65
<b>3</b>	238 167	512 159	790 151	1068 141	1474 120
<b>4</b>	237 224	514 215	795 207	1078 197	1492 179
<b>5</b>	233 279	511 271	794 262	1080 252	1502 234
<b>7</b>	216 386	497 376	783 366	1072 356	1497 336
<b>9</b>	195 494	477 483	764 472	1054 460	1481 439
<b>12</b>	152 654	435 641	724 629	1017 617	1445 596
<b>15</b>	102 802	388 789	676 776	969 763	1391 740

Flow (GPM)

TORQUE (LB IN) 1497  
SPEED (RPM) 336

**65 cc / rev**



EU

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositatet von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.



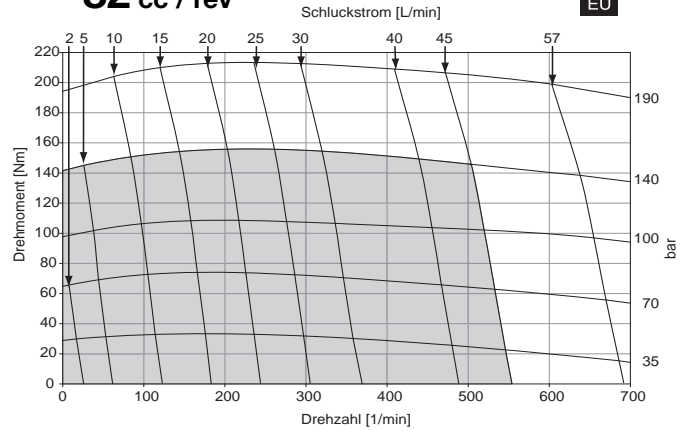
TE 0080 **5.0 cu in / rev** PRESSURE (PSID)

	500	1000	1500	2000	2750
<b>.5</b>	261 17	575 8			
<b>1</b>	276 39	596 30	918 23	1245 13	
<b>2</b>	290 85	631 76	974 68	1310 56	1784 35
<b>3</b>	291 131	633 122	978 113	1319 101	1819 79
<b>4</b>	293 177	642 167	995 158	1347 146	1854 121
<b>5</b>	290 223	641 213	999 203	1359 191	1884 165
<b>7</b>	273 316	628 304	989 293	1353 280	1890 253
<b>9</b>	249 408	603 396	966 384	1334 370	1873 340
<b>12</b>	197 546	551 533	916 504	1287 504	1827 472
<b>15</b>	136 686	494 670	857 655	1226 638	1762 603

TORQUE (LB IN) 1890  
SPEED (RPM) 253

Flow (GPM)

**82 cc / rev**



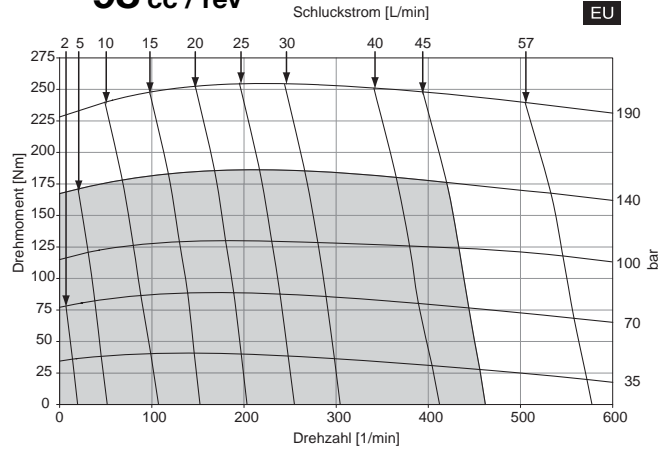
TE 0100 **6.0 cu in / rev** PRESSURE (PSID)

	500	1000	1500	2000	2750
<b>.5</b>	315 14	687 7			
<b>1</b>	332 33	710 26	1083 18	1460 9	
<b>2</b>	348 71	751 64	1152 55	1541 45	2089 27
<b>3</b>	350 109	756 102	1160 92	1556 83	2138 62
<b>4</b>	353 147	768 140	1185 130	1596 120	2189 99
<b>5</b>	349 186	771 178	1197 168	1622 158	2235 137
<b>7</b>	330 263	759 254	1191 244	1624 232	2258 209
<b>9</b>	302 340	731 330	1167 319	1606 307	2246 284
<b>12</b>	243 456	671 444	1111 433	1555 420	2198 394
<b>15</b>	176 572	606 558	1042 546	1484 533	2121 505

TORQUE (LB IN) 2258  
SPEED (RPM) 209

Flow (GPM)

**98 cc / rev**



Cont.  Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositäet von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

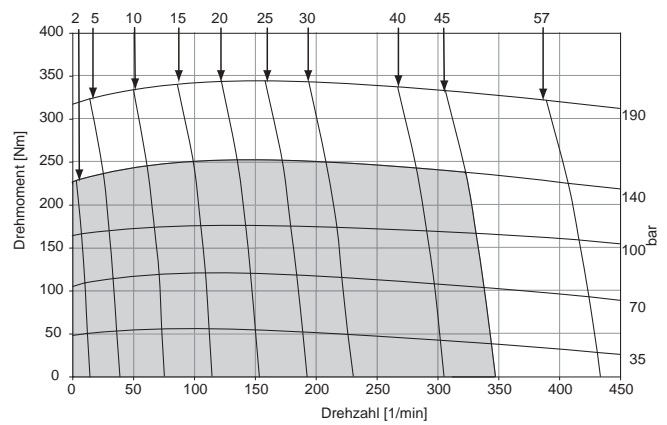
TE 0130 **8.0 cu in / rev** PRESSURE (PSID)

	500	1000	1500	2000	2750
<b>.5</b>	445 12	962 10	1488 7	2018 3	
<b>1</b>	464 27	996 24	1525 21	2051 17	2835 5
<b>2</b>	482 55	1032 53	1584 49	2136 44	2940 31
<b>3</b>	483 84	1037 81	1594 77	2150 72	2961 60
<b>4</b>	483 113	1051 110	1619 105	2184 100	3015 87
<b>5</b>	478 142	1050 138	1625 133	2201 128	3050 114
<b>7</b>	450 200	1029 195	1613 190	2195 183	3054 169
<b>9</b>	414 257	993 252	1579 247	2166 239	3030 224
<b>12</b>	338 344	915 338	1503 331	2096 323	2961 306
<b>15</b>	252 431	827 424	1408 416	1996 407	2851 389

**TORQUE (LB IN) 3054**  
**SPEED (RPM) 169**

Flow (GPM)

**130 cc / rev** Schluckstrom [L/min] **EU**



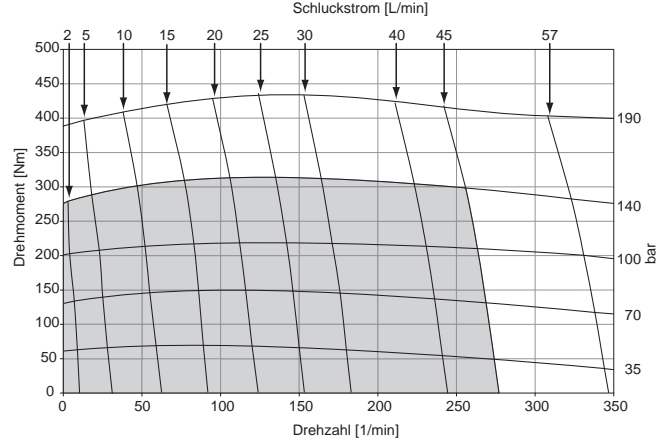
TE 0165 **10.0 cu in / rev** PRESSURE (PSID)

	500	1000	1500	2000	2750
<b>.5</b>	552 9	1175 7	1813 4	2457 3	
<b>1</b>	574 21	1213 18	1856 16	2499 12	3465 7
<b>2</b>	597 44	1263 41	1938 38	2614 33	3604 25
<b>3</b>	600 67	1273 64	1955 60	2634 55	3628 46
<b>4</b>	603 90	1299 87	1997 83	2691 78	3705 67
<b>5</b>	597 113	1302 109	2015 105	2727 100	3767 89
<b>7</b>	569 159	1286 155	2009 150	2732 144	3791 133
<b>9</b>	523 205	1244 201	1976 195	2707 189	3773 177
<b>12</b>	429 274	1152 269	1890 263	2630 256	3701 242
<b>15</b>	316 344	1039 338	1769 331	2500 323	3568 308

**TORQUE (LB IN) 3791**  
**SPEED (RPM) 133**

Flow (GPM)

**163 cc / rev** Schluckstrom [L/min] **EU**



Cont.  Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

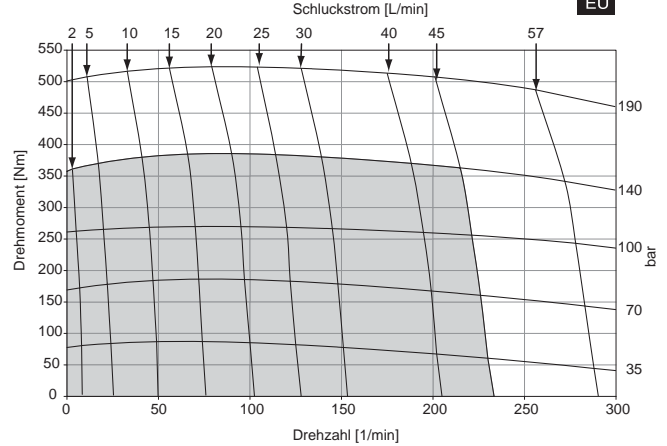
Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrian tener una pequeña variacion entre distintos motores.

TE 0195 **11.9 cu in / rev** PRESSURE (PSID)

	500	1000	1500	2000	2750
<b>.5</b>	710 8	1519 7	2344 5	3182 3	
<b>1</b>	736 18	1558 16	2387 14	3221 12	4457 6
<b>2</b>	758 37	1596 35	2445 33	3302 30	4558 22
<b>3</b>	758 56	1604 54	2459 51	3315 48	4576 39
<b>4</b>	757 75	1618 73	2482 70	3346 67	4619 56
<b>5</b>	747 95	1615 92	2488 89	3360 85	4643 74
<b>7</b>	705 133	1586 130	2467 127	3343 122	4631 111
<b>9</b>	646 172	1528 169	2415 165	3300 160	4590 147
<b>12</b>	530 230	1408 226	2303 221	3197 215	4494 201
<b>15</b>	394 288	1273 283	2147 278	3027 272	4308 256

**195 cc / rev**



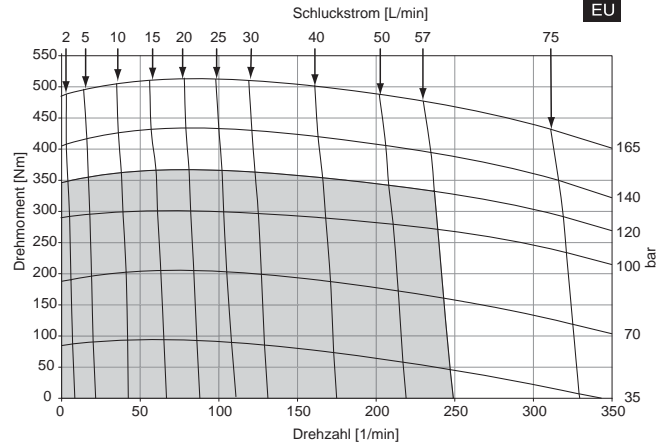
TORQUE (LB IN) 4631  
SPEED (RPM) 111

Flow (GPM)

TE 0230 **13.9 cu in / rev** PRESSURE (PSID)

	500	1000	1500	1750	2000	2400
<b>.5</b>	761 7	1673 6	2614 5	3094 4	3584 3	4331 3
<b>1</b>	791 15	1712 14	2650 13	3128 12	3615 11	4366 9
<b>2</b>	819 32	1764 30	2726 29	3208 28	3692 26	4448 24
<b>3</b>	819 48	1771 47	2737 45	3226 44	3718 42	4482 41
<b>4</b>	821 65	1787 63	2765 61	3256 60	3750 58	4520 56
<b>5</b>	808 81	1786 79	2777 77	3277 76	3778 74	4554 73
<b>7</b>	770 114	1756 112	2755 109	3255 108	3760 106	4535 104
<b>9</b>	705 147	1699 145	2710 142	3216 140	3724 138	4496 137
<b>12</b>	581 197	1582 194	2595 191	3103 189	3617 186	4382 183
<b>15</b>	400 247	1409 243	2437 239	2949 237	3466 235	4216 230
<b>20</b>	64 329	1052 325	2067 321	2580 319	3100 316	3814 311

**228 cc / rev**



TORQUE (LB IN) 1894  
SPEED (RPM) 198

Flow (GPM)

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

004 TE.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

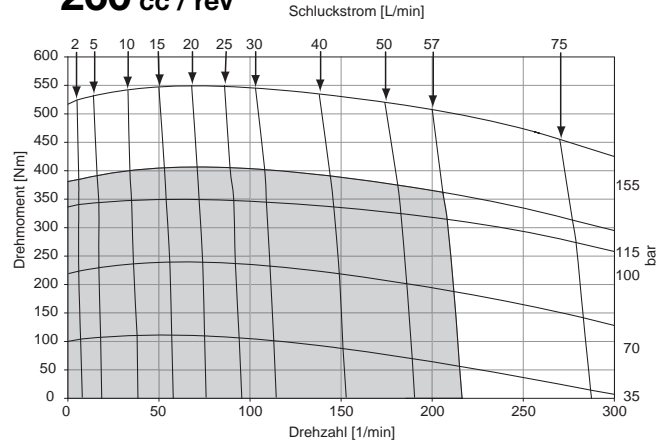
Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TE 0260 **15.9 cu in / rev** PRESSURE (PSID)

	500	1000	1500	1650	2250
<b>.5</b>	908 7	1961 6	3048 6	3380 6	4631 5
<b>1</b>	938 14	2006 13	3099 13	3433 12	4692 11
<b>2</b>	971 28	2059 27	3165 26	3501 26	4779 23
<b>3</b>	968 43	2065 42	3177 40	3514 39	4797 38
<b>4</b>	970 57	2081 56	3203 54	3541 53	4837 50
<b>5</b>	957 71	2084 70	3219 68	3561 67	4870 64
<b>7</b>	907 100	2049 98	3198 96	3542 95	4856 91
<b>9</b>	837 129	1985 127	3143 124	3489 123	4799 117
<b>12</b>	692 172	1844 169	3016 166	3367 164	4671 157
<b>15</b>	489 215	1647 212	2830 208	3188 206	4494 200
<b>20</b>	129 287	1255 283	2418 279	2773 277	4031 270

**260 cc / rev**



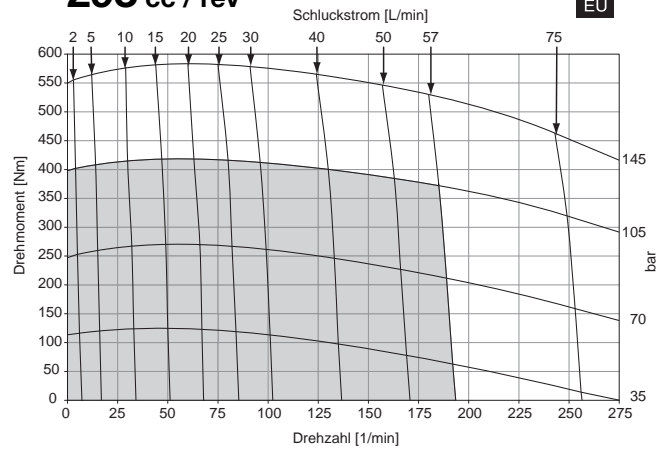
TORQUE (LB IN) 4856  
SPEED (RPM) 91

Flow (GPM)

TE 0295 **17.9 cu in / rev** PRESSURE (PSID)

	500	1000	1500	1550	2100
<b>.5</b>	1014 6	2216 5	3453 4	3576 4	4900 3
<b>1</b>	1051 12	2270 11	3509 10	3633 10	4963 8
<b>2</b>	1088 25	2334 24	3600 22	3727 22	5092 21
<b>3</b>	1085 38	2338 36	3611 35	3739 34	5110 33
<b>4</b>	1085 50	2353 49	3639 47	3769 47	5152 44
<b>5</b>	1072 63	2352 62	3654 60	3784 59	5180 57
<b>7</b>	1019 89	2311 87	3624 85	3755 84	5159 80
<b>9</b>	939 115	2237 113	3561 110	3693 110	5098 104
<b>12</b>	776 153	2074 151	3403 148	3537 147	4931 142
<b>15</b>	545 192	1853 189	3184 186	3319 185	4689 180
<b>20</b>	126 256	1408 253	2697 249	2826 249	4099 243

**293 cc / rev**



TORQUE (LB IN) 5159  
SPEED (RPM) 80

Flow (GPM)

■ Cont. □ Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

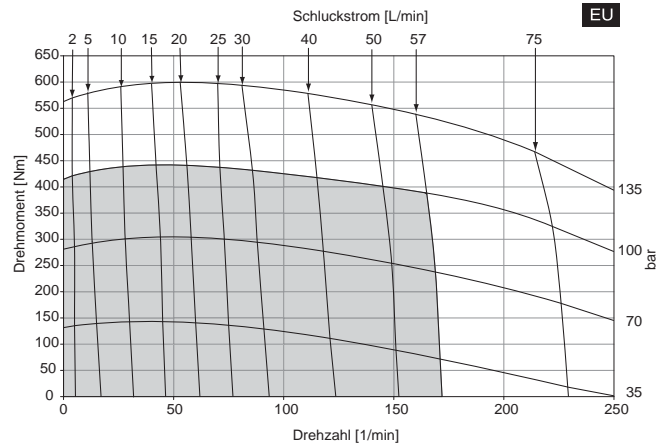
Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TE 0330 **20.0 cu in / rev** PRESSURE (PSID)

	500	1000	1500	1950
<b>.5</b>	1184 5	2507 5	3722 4	5040 3
<b>1</b>	1218 11	2558 10	3772 9	5093 8
<b>2</b>	1258 22	2632 21	3867 20	5224 19
<b>3</b>	1251 34	2633 32	3879 31	5242 30
<b>4</b>	1249 45	2649 44	3909 42	5287 40
<b>5</b>	1229 57	2648 55	3926 53	5312 50
<b>7</b>	1162 80	2600 78	3898 75	5296 71
<b>9</b>	1064 103	2518 100	3829 98	5219 93
<b>12</b>	875 137	2333 135	3657 131	5026 127
<b>15</b>	621 171	2081 169	3420 165	4770 160
<b>20</b>	163 229	1576 226	2875 222	4129 214

TORQUE (LB IN) 5219  
SPEED (RPM) 93

**328 cc / rev**



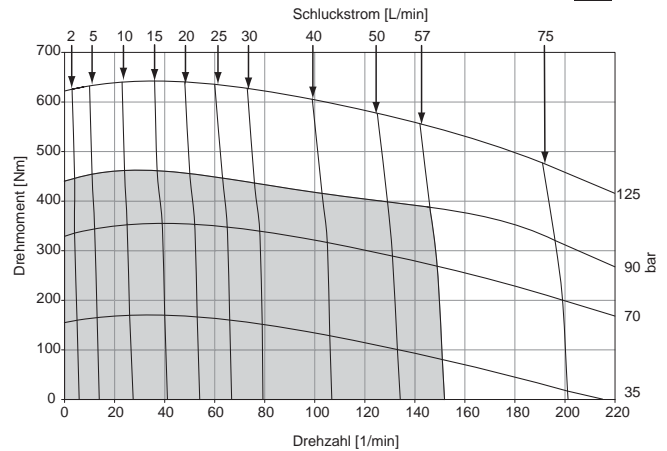
Flow (GPM)

TE 0365 **22.6 cu in / rev** PRESSURE (PSID)

	500	1000	1325	1825
<b>.5</b>	1393 5	2942 4	3974 4	5539 3
<b>1</b>	1444 10	3005 9	4036 8	5599 7
<b>2</b>	1494 20	3090 19	4131 18	5714 17
<b>3</b>	1485 30	3082 29	4125 28	5709 27
<b>4</b>	1477 40	3089 39	4139 37	5728 36
<b>5</b>	1452 50	3075 49	4130 47	5719 45
<b>7</b>	1371 70	3009 69	4071 67	5654 63
<b>9</b>	1260 90	2899 89	3669 87	5543 84
<b>12</b>	1002 121	2658 119	3737 117	5283 113
<b>15</b>	700 151	2355 149	3432 146	4937 142
<b>20</b>	152 201	1776 199	2838 196	4228 191

TORQUE (LB IN) 5543  
SPEED (RPM) 84

**370 cc / rev**



Flow (GPM)

Cont.  Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

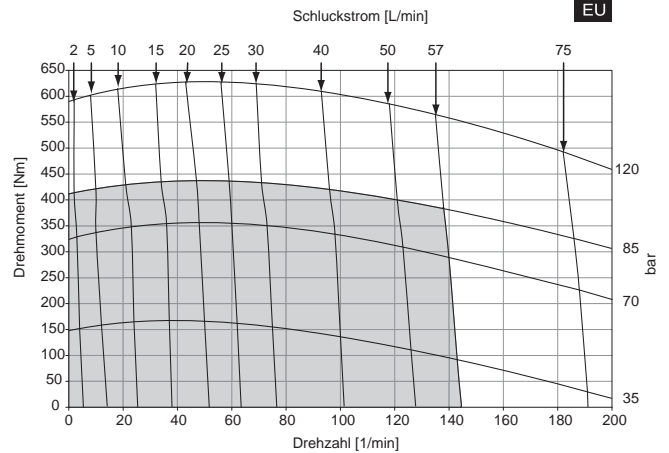
Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

**TE 0390 24.0 cu in / rev** PRESSURE (PSID)

	500	1000	1250	1750
<b>.5</b>	1326 4	2889 3	3682 2	5244 2
<b>1</b>	1380 9	2934 7	3724 7	5283 6
<b>2</b>	1443 18	3034 17	3840 15	5427 13
<b>3</b>	1442 28	3049 26	3861 25	5458 22
<b>4</b>	1454 37	3084 36	3905 34	5518 32
<b>5</b>	1447 47	3104 45	3935 44	5562 40
<b>7</b>	1393 66	3080 64	3923 62	5559 60
<b>9</b>	1297 85	3013 83	3868 81	5507 79
<b>12</b>	1088 114	2818 112	3686 110	5308 106
<b>15</b>	797 143	2539 140	3414 138	5002 135
<b>20</b>	264 191	2006 188	2880 186	4374 182

**392 cc / rev**



**TORQUE (LB IN) 5559**  
**SPEED (RPM) 60**

**Flow (GPM)**

Cont.  Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

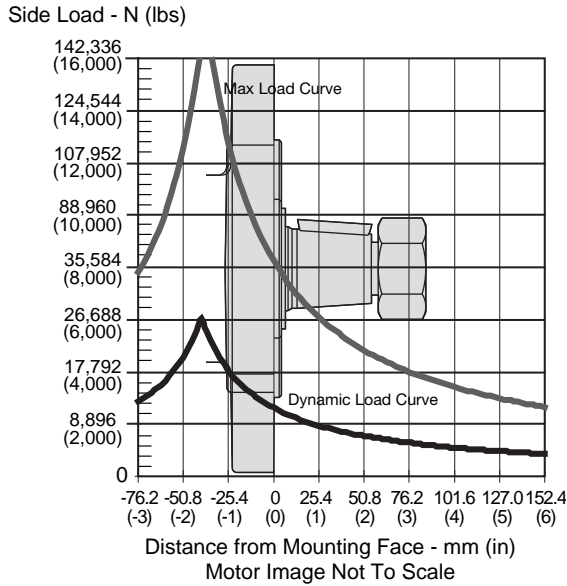
Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

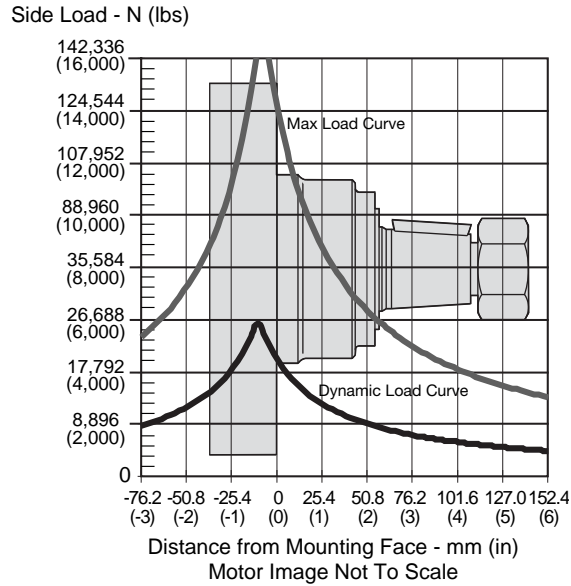
**Flange Mount / Standardgehaeuse**  
**Monture à bride(s) / Montaje de brida**



The dynamic side load curve is based on uni-directional steady state loads for  $L_{10}$  bearing life at  $3 \times 10^6$  revolutions.

Die zulässige auslegbare radiale Wellenbelastungskurve ist unter ruhenden, einseitig statisch gerichteten Lastverhältnissen auf eine  $L_{10}$  Lebensdauer mit  $3 \times 10^6$  Umdrehungen kalkuliert. La courbe de charge latérale permise se base sur des charges unidirectionnelles en régime permanent pour le roulement  $L_{10}$  à  $3 \times 10^6$  révolutions. La curva de valores admisibles de carga lateral está basada en cargas constantes para cojinetes  $L_{10}$  a  $3 \times 10^6$  revoluciones.

**Wheel Mount / Radnabengehaeuse**  
**Monture à roue / Montaje de rueda**



The maximum load curve is defined by bearing static load capacity. This curve should not be exceeded at any time including shock loads.

Die maximale radiale Wellenbelastungskurve ist definiert als maximale statische Last ohne Drehzahl. Sie gilt als Grenze und sollte keinesfalls überschritten werden. La courbe de charge maximale est définie par la capacité de charge statique portante. Cette courbe ne devrait être dépassée en aucun moment y compris pour les charges par à-coups. La curva de carga máxima queda definida por la capacidad de carga estática del cojinete. No se deben superar los valores de esta curva, ni siquiera con cargas provisorias de impacto.

## **Equation to Calculate the Expected Radial Bearing Life** **Gleichung zur Ermittlung der Lagerlebensdauer**

Equation to calculate the dynamic bearing life for a given load:  
Bestimmung der erlaubten radialen Wellenbelastung mit vorgegebener Last

Use  $F_a$ ,  $F_b$  and  $S$  in equation to determine hours of  $L_{10}$  bearing life.  
Die Lebensdauer in Stunden ergibt sich durch einsetzen von  $F_a$ ,  $F_b$ , und  $S$  in die nachstehende Formel.

$$L = \frac{3.0 \times 10^6}{60 \times S} \left\{ \frac{F_a}{F_b} \right\}^{3.33}$$

Where / Mit:

$S$  = Shaft Speed RPM / Abtriebswellendrehzahl in  $\text{min}^{-1}$

$L$  = Life In Hours / Lebensdauer in Stunden

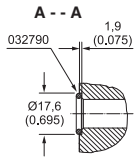
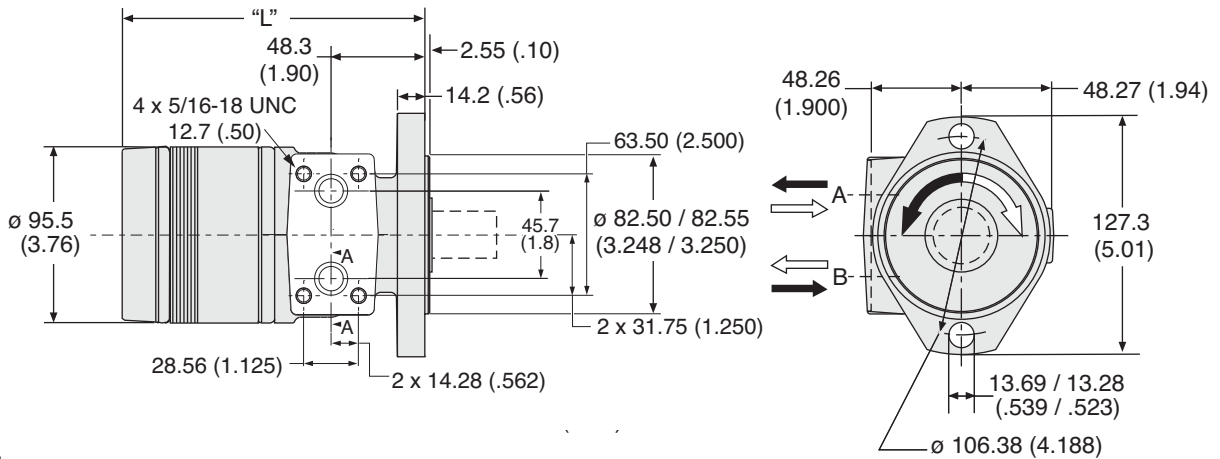
$F_a$  = Allowable side load defined by above curve at a distance from mounting flange. / Erlaubte radiale Wellenbelastung als Function der Laenge

$F_b$  = Application side load. / Anwendungsseitige Wellenbelastung

Note: Calculations are based on  $L_{10}$  bearing life per ISO 281.  
Auslegung basiert auf einer  $L_{10}$  Lebensdauer nach ISO 281



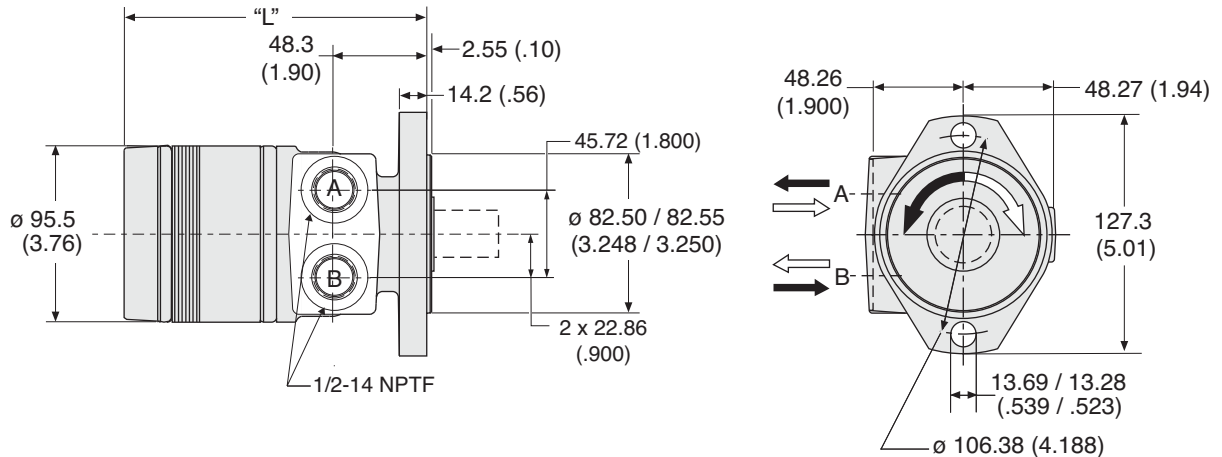
**Code: AM**  
**SAE A 2-Bolt, Manifold**



Motor with manifold mount is supplied with 2 O-rings.  
 Zum Motor mit Universalanschluß werden 2 O-Ringe geliefert.  
 Deux joints toriques sont livrés avec les moteurs a plan de raccordement universel.  
 Il blocchetto connessioni è corredato da 2 OR.

Code AM	disp.	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht	kg	6.03	6.12	6.26	6.35	6.49	6.76	7.03	7.35	7.58	7.80	8.07	8.35	8.66	8.80
Poids/Peso	(lb)	(13.3)	(13.5)	(13.8)	(14.0)	(14.3)	(14.9)	(15.5)	(16.2)	(16.7)	(17.2)	(17.8)	(18.4)	(19.1)	(19.4)
Length	"L" mm	136	138	141	144	147	154	160	166	173	179	185	192	200	205
	"L" (in)	(5.36)	(5.42)	(5.54)	(5.67)	(5.79)	(6.04)	(6.29)	(6.54)	(6.79)	(7.04)	(7.29)	(7.54)	(7.88)	(8.04)

**Code: AP**  
**SAE A 2-Bolt, 1/2-14 NPTF Pipe**

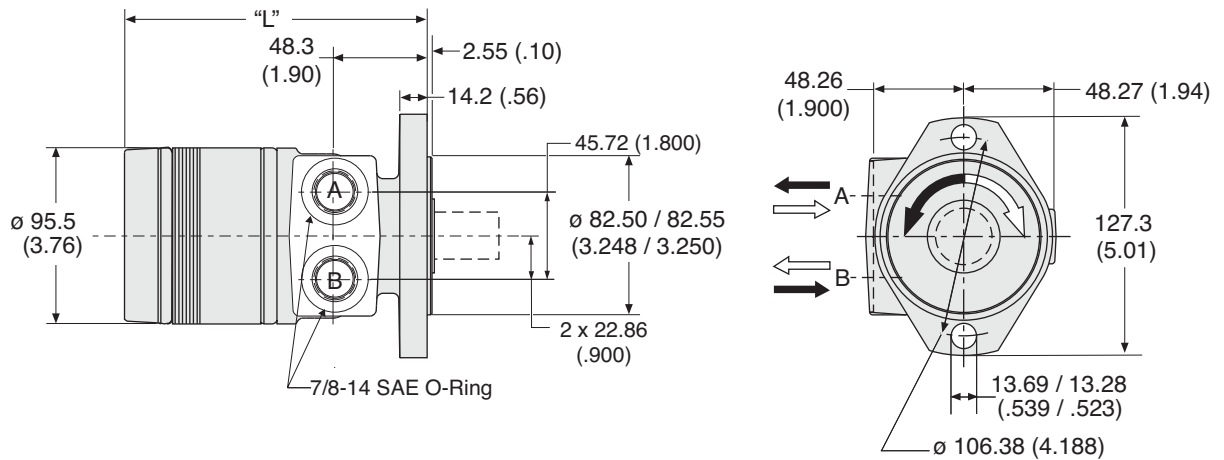


Code AP	disp.	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht	kg	6.03	6.12	6.26	6.35	6.49	6.76	7.03	7.35	7.58	7.80	8.07	8.35	8.66	8.80
Poids/Peso	(lb)	(13.3)	(13.5)	(13.8)	(14.0)	(14.3)	(14.9)	(15.5)	(16.2)	(16.7)	(17.2)	(17.8)	(18.4)	(19.1)	(19.4)
Length	"L" mm	136	138	141	144	147	154	160	166	173	179	185	192	200	205
	"L" (in)	(5.36)	(5.42)	(5.54)	(5.67)	(5.79)	(6.04)	(6.29)	(6.54)	(6.79)	(7.04)	(7.29)	(7.54)	(7.88)	(8.04)

English equivalents for metric specifications are shown in ( ).

**Code: AS**

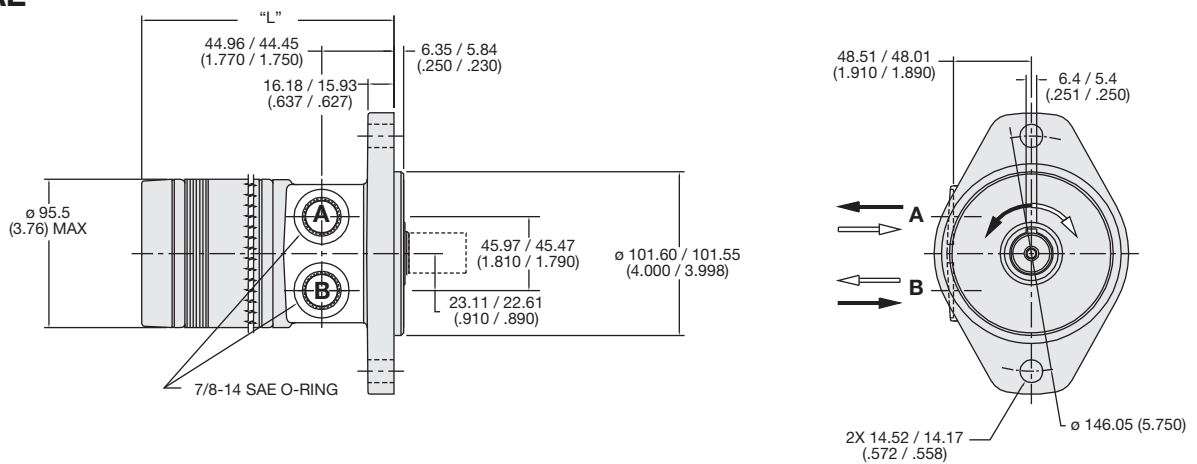
**SAE A 2-Bolt, 7/8-14 SAE O-Ring**



Code AS	disp.	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht kg	6.03	6.12	6.26	6.35	6.49	6.76	7.03	7.35	7.58	7.80	8.07	8.35	8.66	8.80	
Poids/Peso (lb)	(13.3)	(13.5)	(13.8)	(14.0)	(14.3)	(14.9)	(15.5)	(16.2)	(16.7)	(17.2)	(17.8)	(18.4)	(19.1)	(19.4)	
Length "L" mm	136	138	141	144	147	154	160	166	173	179	185	192	200	205	
	"L" (in)	(5.36)	(5.42)	(5.54)	(5.67)	(5.79)	(6.04)	(6.29)	(6.54)	(6.79)	(7.04)	(7.29)	(7.54)	(7.88)	(8.04)

**Code: BS**

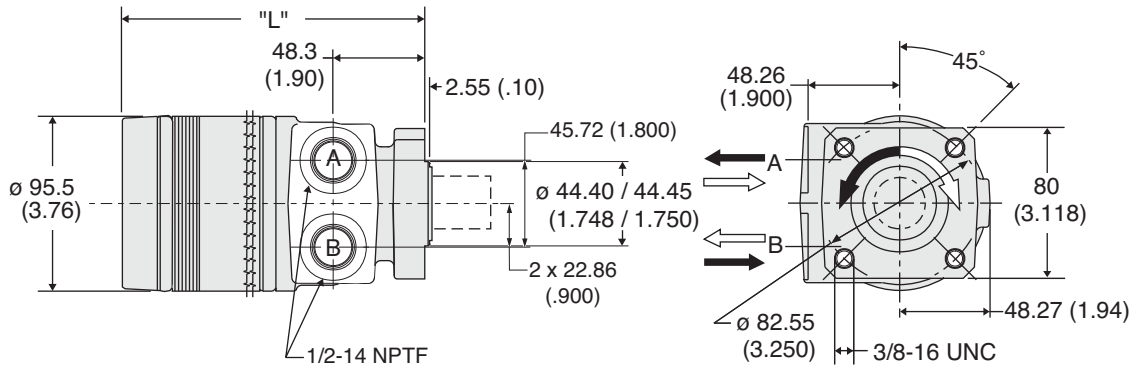
**SAE B 2-Bolt**  
**7/8-14 SAE**



Code BS disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht kg	7.27	7.34	7.48	7.62	7.71	7.84	8.11	8.39	8.70	8.93	9.16	9.43	9.70	9.97	10.1
Poids/Peso (lb)	(15.9)	(16.3)	(16.5)	(16.8)	(17.0)	(17.3)	(17.9)	(18.5)	(19.2)	(19.7)	(20.2)	(20.8)	(21.4)	(22.0)	(22.4)
Length "L" mm	131.5	132.5	134.1	137.1	140.4	143.5	149.8	156.2	162.5	168.9	175.2	181.6	187.9	196.5	200.9
	"L" (in)	(5.18)	(5.22)	(5.28)	(5.40)	(5.53)	(5.65)	(5.90)	(6.15)	(6.40)	(6.65)	(6.90)	(7.15)	(7.40)	(7.74)

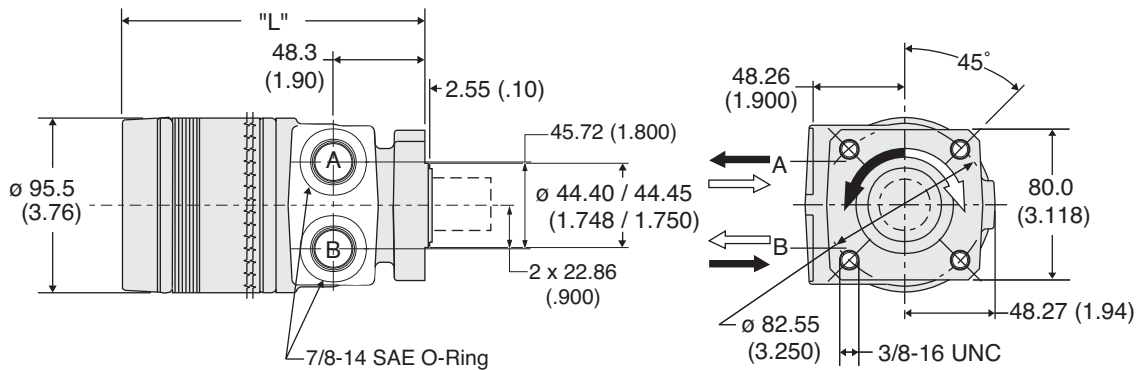
English equivalents for metric specifications are shown in ( ).

**Code: FP**  
**Four Bolt, 1/2-14 NPTF Pipe**



Code FP	disp.	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht	kg	5.62	5.67	5.80	5.94	6.08	6.31	6.62	7.03	7.17	7.39	7.62	7.94	8.26	8.39
Poids/Peso	(lb)	(12.4)	(12.5)	(12.8)	(13.1)	(13.4)	(13.9)	(14.6)	(15.5)	(15.8)	(16.3)	(16.8)	(17.5)	(18.2)	(18.5)
Length	"L" mm	136	138	141	144	147	154	160	166	173	179	185	192	200	205
	"L" (in)	(5.36)	(5.42)	(5.54)	(5.67)	(5.79)	(6.04)	(6.29)	(6.54)	(6.79)	(7.04)	(7.29)	(7.54)	(7.88)	(8.04)

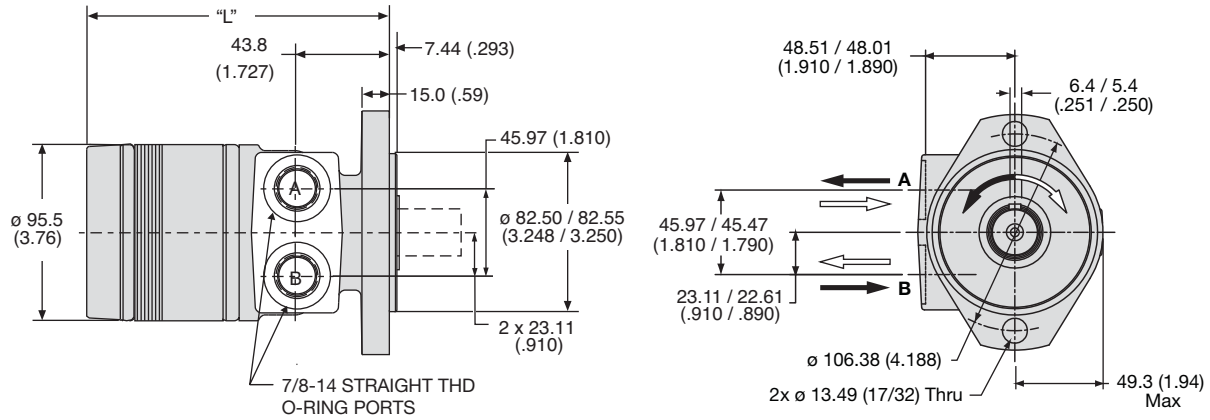
**Code: FS**  
**Four Bolt, 7/8-14 SAE O-Ring**



Code FS	disp.	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht	kg	5.62	5.67	5.80	5.94	6.08	6.31	6.62	7.03	7.17	7.39	7.62	7.94	8.26	8.39
Poids/Peso	(lb)	(12.4)	(12.5)	(12.8)	(13.1)	(13.4)	(13.9)	(14.6)	(15.5)	(15.8)	(16.3)	(16.8)	(17.5)	(18.2)	(18.5)
Length	"L" mm	136	138	141	144	147	154	160	166	173	179	185	192	200	205
	"L" (in)	(5.36)	(5.42)	(5.54)	(5.67)	(5.79)	(6.04)	(6.29)	(6.54)	(6.79)	(7.04)	(7.29)	(7.54)	(7.88)	(8.04)

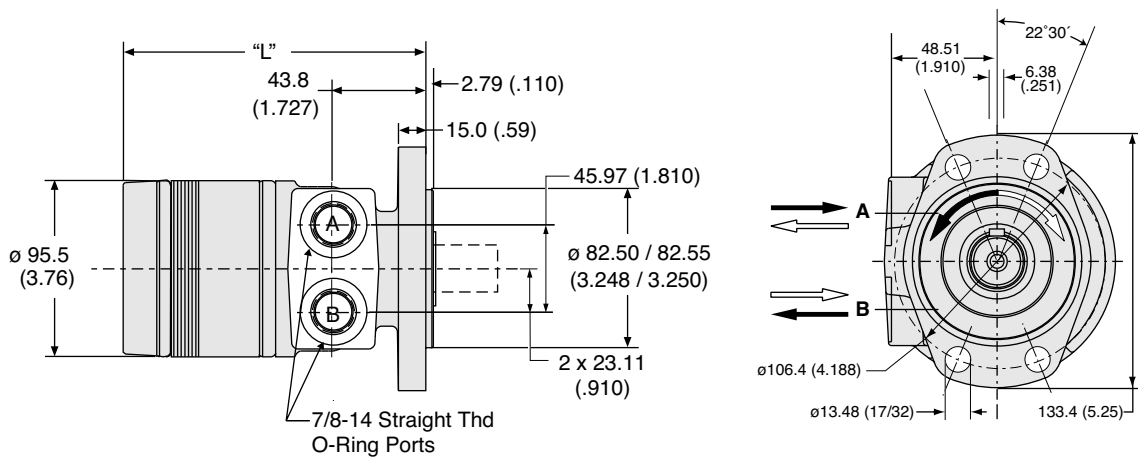
English equivalents for metric specifications are shown in ( ).

**Code: CS**  
**SAE "A" 2-Bolt Long Pilot, 7/8-14 SAE O-Ring**



Code CS	disp.	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
<b>Weight/Gewicht</b> kg			<b>6.03</b>	<b>6.12</b>	<b>6.26</b>	<b>6.35</b>	<b>6.49</b>	<b>6.76</b>	<b>7.03</b>	<b>7.35</b>	<b>7.58</b>	<b>7.80</b>	<b>8.07</b>	<b>8.35</b>	<b>8.66</b>	<b>8.80</b>
Poids/Peso (lb)			(13.3)	(13.5)	(13.8)	(14.0)	(14.3)	(14.9)	(15.5)	(16.2)	(16.7)	(17.2)	(17.8)	(18.4)	(19.1)	(19.4)
<b>Length</b> "L" mm		<b>130</b>	<b>132</b>	<b>133</b>	<b>136</b>	<b>139</b>	<b>143</b>	<b>149</b>	<b>155</b>	<b>162</b>	<b>168</b>	<b>174</b>	<b>181</b>	<b>187</b>	<b>196</b>	<b>200</b>
"L" (in)		(5.13)	(5.18)	(5.23)	(5.36)	(5.48)	(5.61)	(5.86)	(6.11)	(6.36)	(6.61)	(6.86)	(7.11)	(7.36)	(7.70)	(7.86)

**Code: MS**  
**Magneto, 7/8-14 SAE O-Ring**

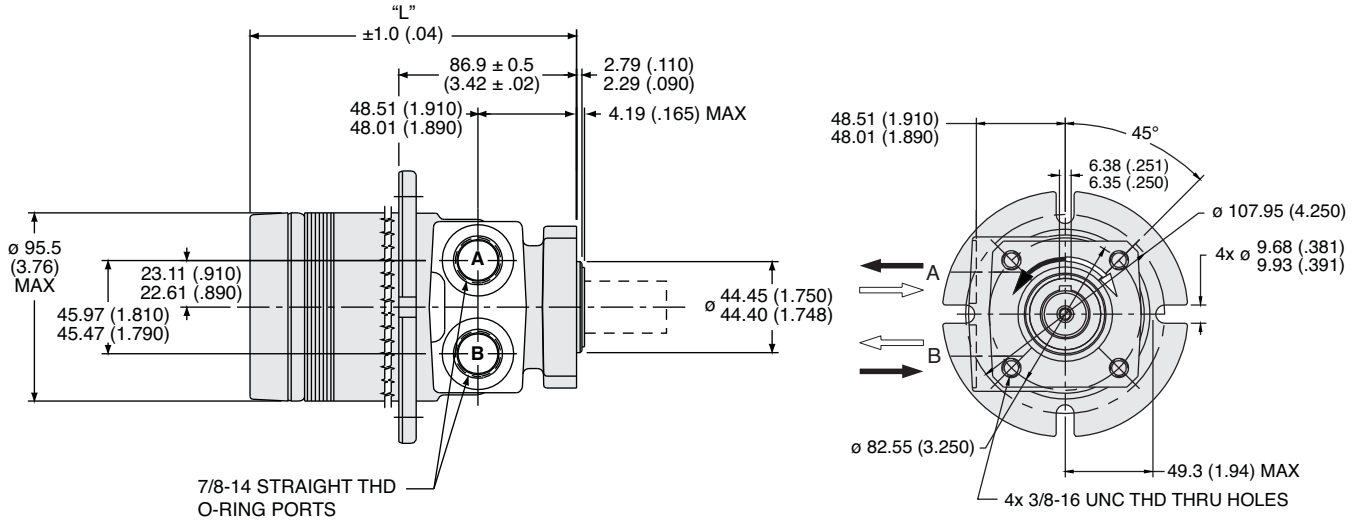


Code MS	disp.	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
<b>Weight/Gewicht</b> kg		<b>6.30</b>	<b>6.40</b>	<b>6.53</b>	<b>6.62</b>	<b>6.76</b>	<b>7.03</b>	<b>7.30</b>	<b>7.62</b>	<b>7.85</b>	<b>8.12</b>	<b>8.35</b>	<b>8.62</b>	<b>8.94</b>	<b>9.07</b>
Poids/Peso (lb)		(13.9)	(14.1)	(14.4)	(14.6)	(14.9)	(15.5)	(16.1)	(16.8)	(17.3)	(17.9)	(18.4)	(19.0)	(19.7)	(20.0)
<b>Length</b> "L" mm		<b>136</b>	<b>138</b>	<b>141</b>	<b>144</b>	<b>147</b>	<b>154</b>	<b>160</b>	<b>166</b>	<b>173</b>	<b>179</b>	<b>185</b>	<b>192</b>	<b>200</b>	<b>204</b>
"L" (in)		(5.36)	(5.42)	(5.54)	(5.67)	(5.79)	(6.04)	(6.29)	(6.54)	(6.79)	(7.04)	(7.29)	(7.54)	(7.88)	(8.04)

English equivalents for metric specifications are shown in ( ).

**Code: NS**

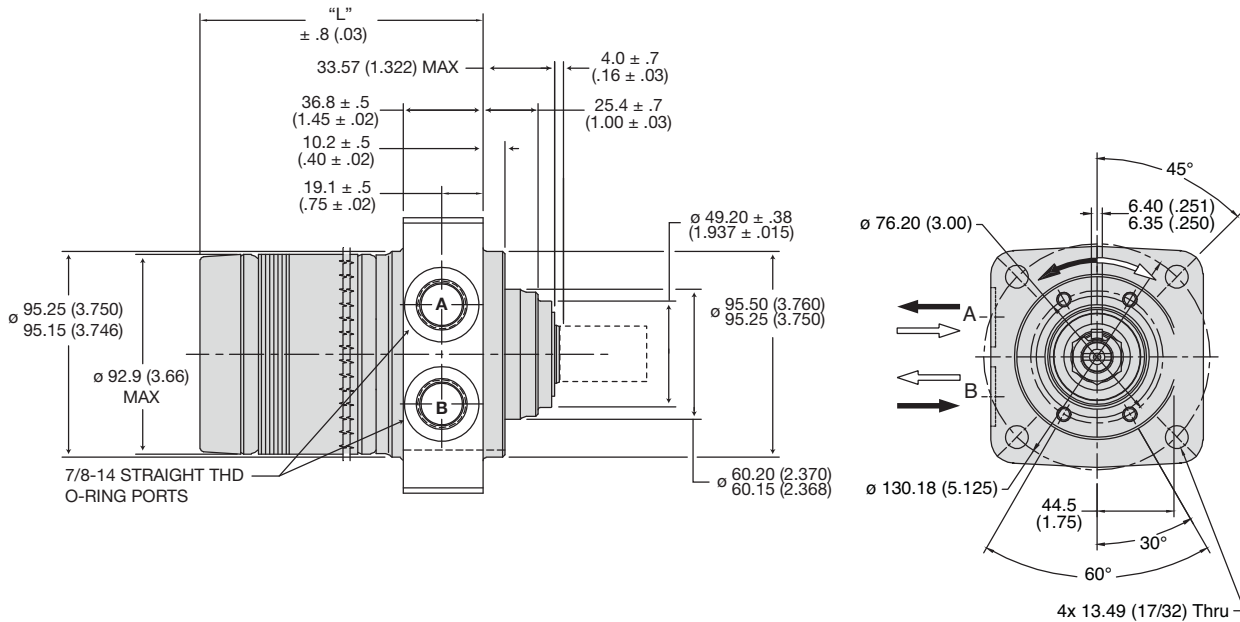
**Midmount, 7/8-14 SAE O-Ring**



Code NS	disp.	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
<b>Weight/Gewicht</b>	<b>kg</b>	<b>5.62</b>	<b>5.67</b>	<b>5.80</b>	<b>5.94</b>	<b>6.08</b>	<b>6.31</b>	<b>6.62</b>	<b>7.03</b>	<b>7.17</b>	<b>7.39</b>	<b>7.62</b>	<b>7.94</b>	<b>8.26</b>	<b>8.39</b>
	<b>(lb)</b>	<b>(12.4)</b>	<b>(12.5)</b>	<b>(12.8)</b>	<b>(13.1)</b>	<b>(13.4)</b>	<b>(13.9)</b>	<b>(14.6)</b>	<b>(15.5)</b>	<b>(15.8)</b>	<b>(16.3)</b>	<b>(16.8)</b>	<b>(17.5)</b>	<b>(18.2)</b>	<b>(18.5)</b>
<b>Length</b>	<b>"L" mm</b>	<b>136</b>	<b>138</b>	<b>141</b>	<b>144</b>	<b>147</b>	<b>154</b>	<b>160</b>	<b>166</b>	<b>173</b>	<b>179</b>	<b>185</b>	<b>192</b>	<b>200</b>	<b>204</b>
	<b>"L" (in)</b>	<b>(5.36)</b>	<b>(5.42)</b>	<b>(5.54)</b>	<b>(5.67)</b>	<b>(5.79)</b>	<b>(6.04)</b>	<b>(6.29)</b>	<b>(6.54)</b>	<b>(6.79)</b>	<b>(7.04)</b>	<b>(7.29)</b>	<b>(7.54)</b>	<b>(7.88)</b>	<b>(8.04)</b>

**Code: LS**

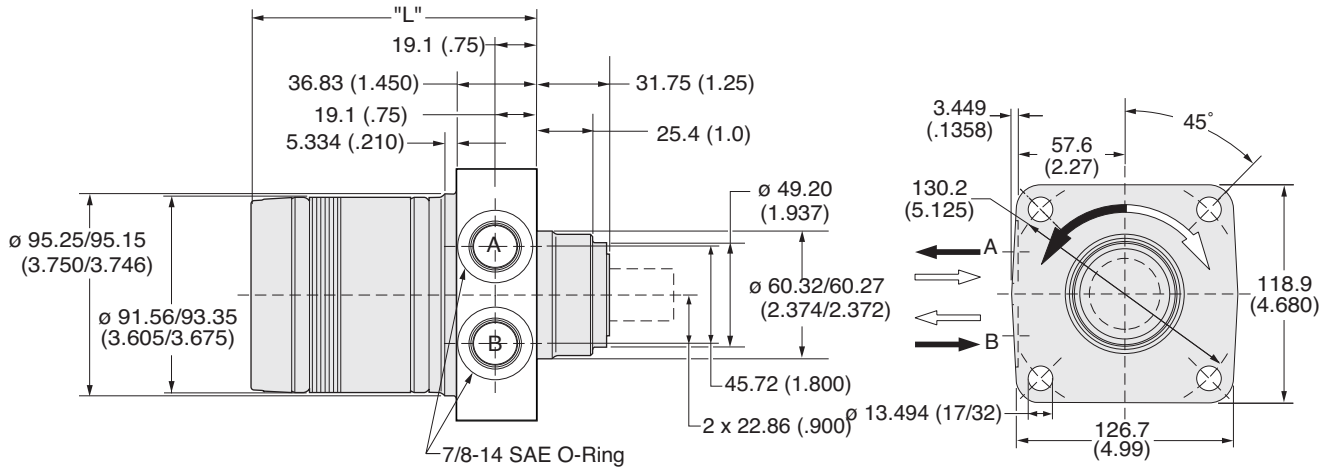
**Wheel Mount, 7/8-14 SAE O-Ring**



Code LS	disp.	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
<b>Weight/Gewicht</b>	<b>kg</b>	<b>6.80</b>	<b>6.90</b>	<b>7.00</b>	<b>7.10</b>	<b>7.20</b>	<b>7.60</b>	<b>7.80</b>	<b>8.10</b>	<b>8.30</b>	<b>8.60</b>	<b>8.80</b>	<b>9.10</b>	<b>9.40</b>	<b>9.60</b>
	<b>(lb)</b>	<b>(15.0)</b>	<b>(15.2)</b>	<b>(15.4)</b>	<b>(15.6)</b>	<b>(15.8)</b>	<b>(16.7)</b>	<b>(17.2)</b>	<b>(17.9)</b>	<b>(18.3)</b>	<b>(19.0)</b>	<b>(19.4)</b>	<b>(20.0)</b>	<b>(20.7)</b>	<b>(21.2)</b>
<b>Length</b>	<b>"L" mm</b>	<b>107</b>	<b>108</b>	<b>112</b>	<b>115</b>	<b>118</b>	<b>124</b>	<b>131</b>	<b>137</b>	<b>143</b>	<b>150</b>	<b>156</b>	<b>162</b>	<b>171</b>	<b>175</b>
	<b>"L" (in)</b>	<b>(4.21)</b>	<b>(4.27)</b>	<b>(4.39)</b>	<b>(4.52)</b>	<b>(4.64)</b>	<b>(4.89)</b>	<b>(5.14)</b>	<b>(5.39)</b>	<b>(5.64)</b>	<b>(5.89)</b>	<b>(6.14)</b>	<b>(6.39)</b>	<b>(6.37)</b>	<b>(6.89)</b>

English equivalents for metric specifications are shown in ( ).

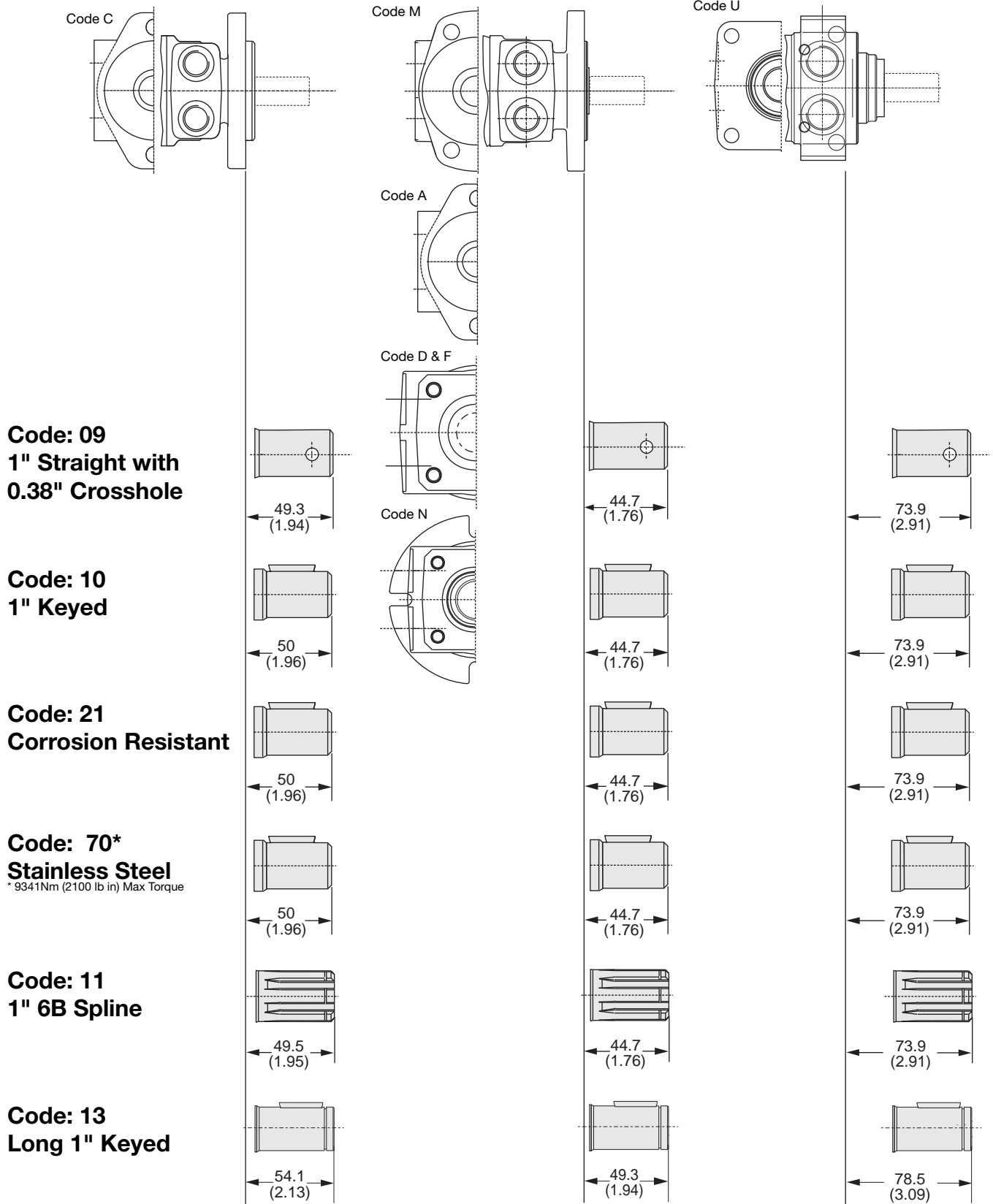
**Code: US**  
**Wheel Mount, 7/8-14 SAE O-Ring**



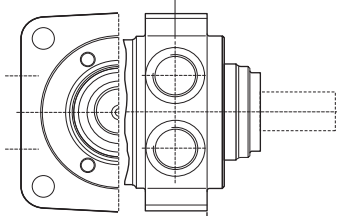
Code US	disp.	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
<b>Weight/Gewicht</b>	<b>kg</b>	<b>6.80</b>	<b>6.90</b>	<b>7.00</b>	<b>7.10</b>	<b>7.20</b>	<b>7.60</b>	<b>7.80</b>	<b>8.10</b>	<b>8.30</b>	<b>8.60</b>	<b>8.80</b>	<b>9.10</b>	<b>9.40</b>	<b>9.60</b>
Poids/Peso	(lb)	(15.0)	(15.2)	(15.4)	(15.6)	(15.8)	(16.7)	(17.2)	(17.9)	(18.3)	(19.0)	(19.4)	(20.0)	(20.7)	(21.2)
<b>Length</b>	<b>"L" mm</b>	<b>107</b>	<b>109</b>	<b>112</b>	<b>115</b>	<b>118</b>	<b>125</b>	<b>131</b>	<b>137</b>	<b>144</b>	<b>150</b>	<b>156</b>	<b>163</b>	<b>171</b>	<b>176</b>
	"L" (in)	(4.21)	(4.27)	(4.39)	(4.52)	(4.64)	(4.89)	(5.14)	(5.39)	(5.64)	(5.89)	(6.14)	(6.39)	(6.73)	(6.89)

English equivalents for metric specifications are shown in ( ).

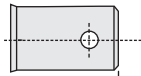
004 TE.indd, js



Code L

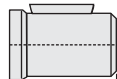


**Code: 09**  
**1" Straight with**  
**0.38" Crosshole**



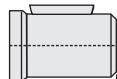
74.8  
(2.94)

**Code: 10**  
**1" Keyed**



75.5  
(2.97)

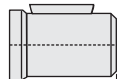
**Code: 21**  
**Corrosion Resistant**



75.5  
(2.97)

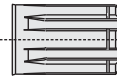
**Code: 70\***  
**1" Keyed, 1/4" Tap,**  
**Stainless Steel**

\* 9341Nm (2100 lb in) Max Torque



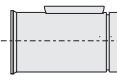
75.5  
(2.97)

**Code: 11**  
**1" 6B Spline**



75.0  
(2.95)

**Code: 13**  
**Long 1" Keyed**



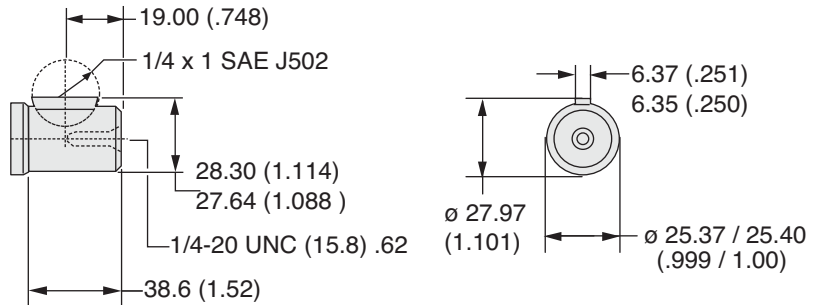
79.6  
(3.13)



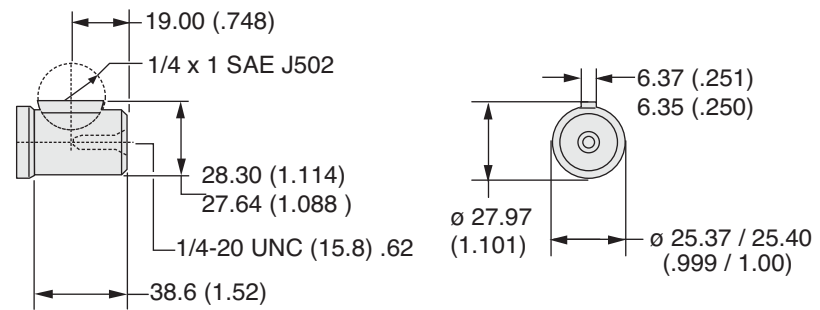
**Code: 09**  
**1" Straight with**  
**0.38" Crosshole**



**Code: 10**  
**1" Keyed**

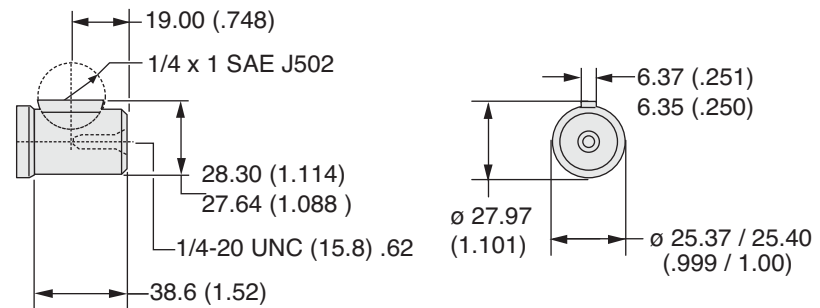


**Code: 21**  
**Corrosion Resistant**

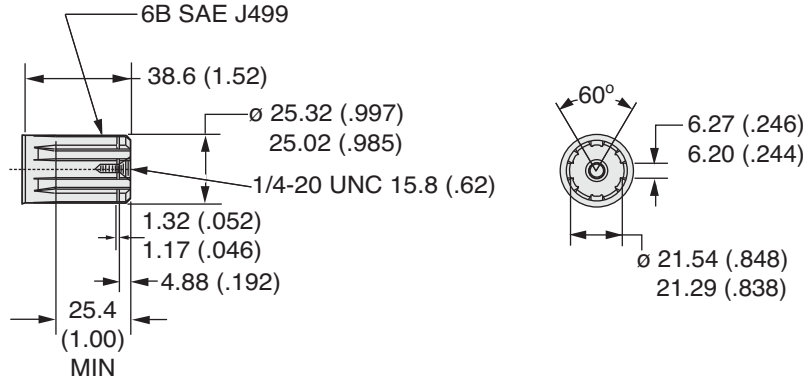


**Code: 70\***  
**1" Keyed, 1/4" Tap,**  
**Stainless Steel**

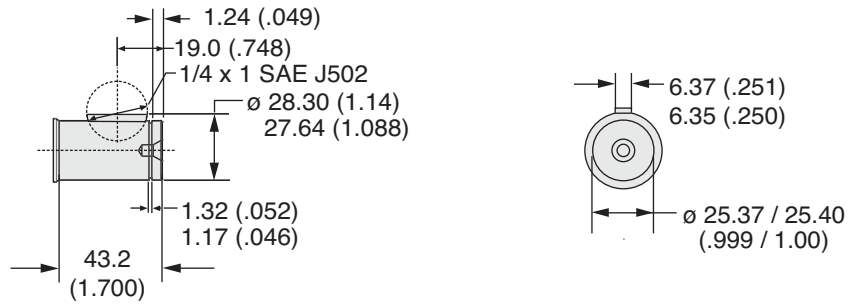
\* 9341Nm (2100 lb in) Max Torque

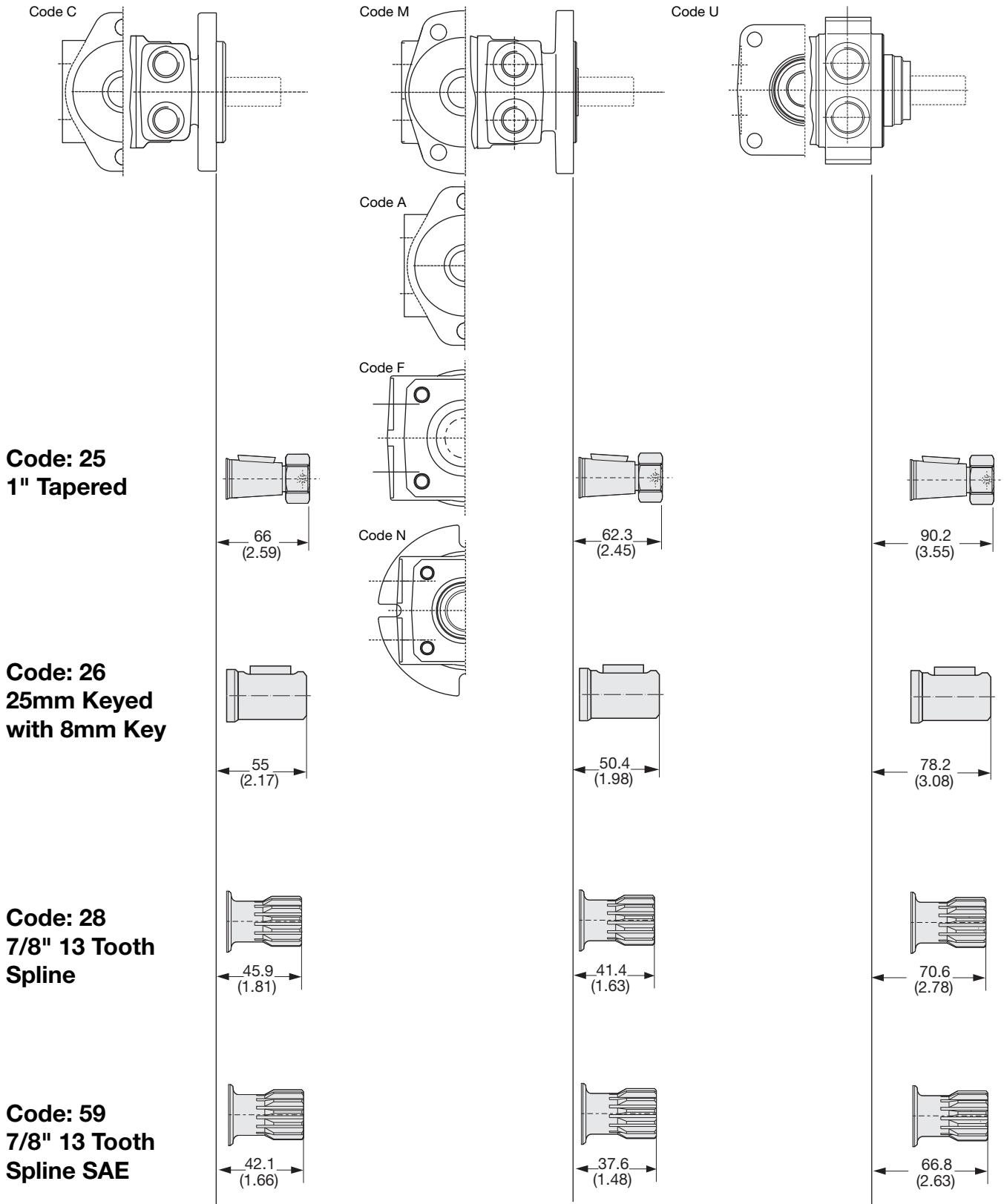


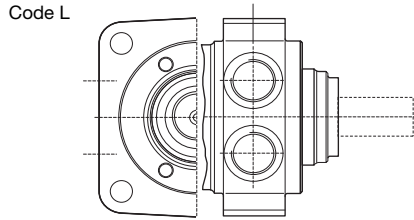
**Code: 11**  
**1" 6B Spline**



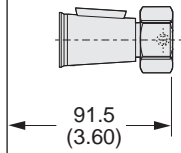
**Code: 13**  
**Long 1" Keyed**



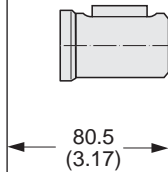




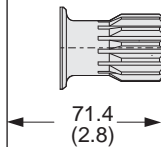
**Code: 25**  
**1" Tapered**



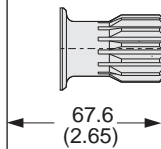
**Code: 26**  
**25mm Keyed**  
**with 8mm Key**



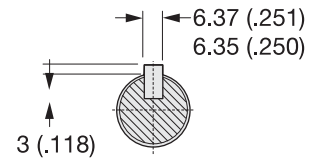
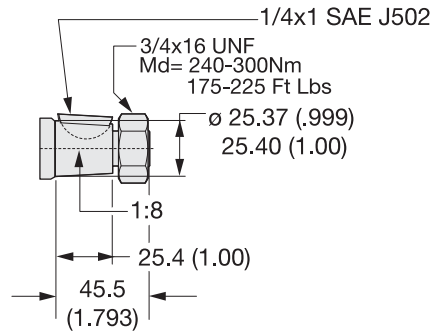
**Code: 28**  
**7/8" 13 Tooth**  
**Spline**



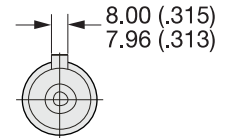
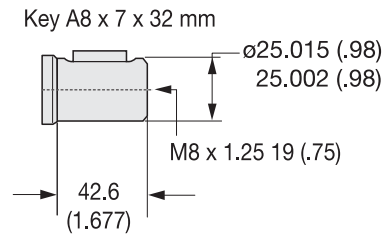
**Code: 59**  
**7/8" 13 Tooth**  
**Spline SAE**



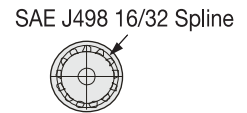
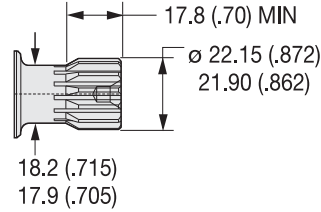
**Code: 25**  
**1" Tapered**



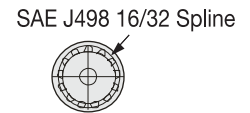
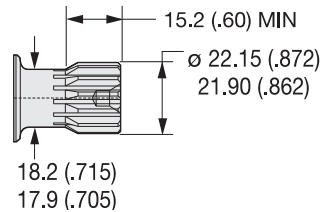
**Code: 26**  
**25mm Keyed**  
**with 8mm Key**



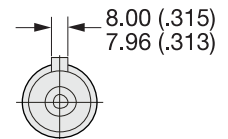
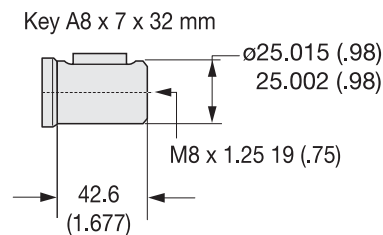
**Code: 28**  
**7/8" 13 Tooth**  
**Spline**

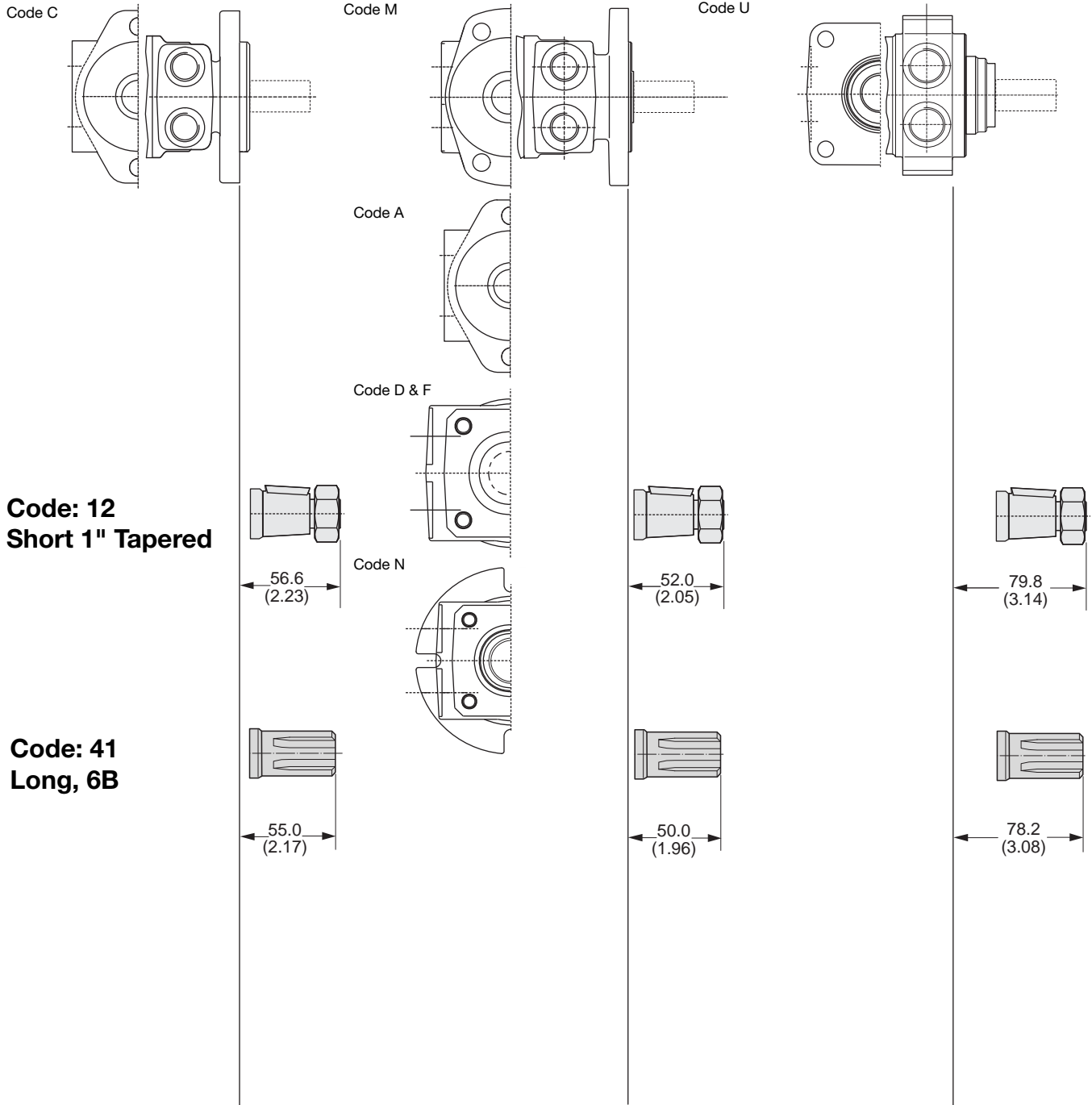


**Code: 59**  
**7/8" 13 Tooth**  
**Spline SAE**

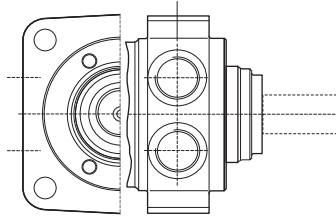


**Code: 66**  
**25mm Keyed with**  
**8mm Key, Corrosion**  
**Resistant**

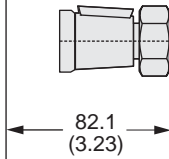




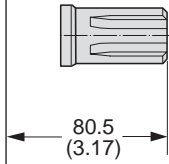
Code L



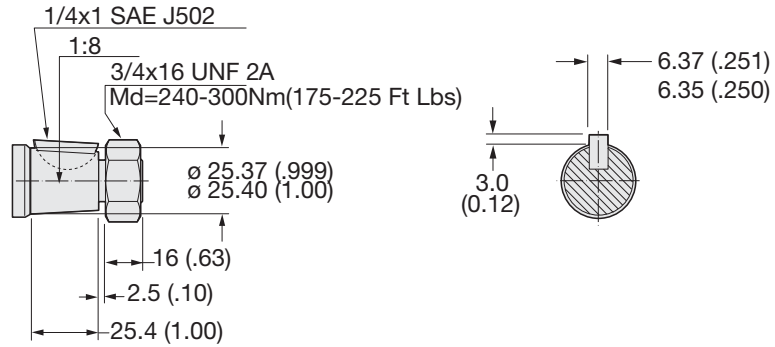
**Code: 12**  
**Short 1" Tapered**



**Code: 41**  
**Long, 6B**



**Code: 12**  
**Short 1" Tapered**



**Code: 41**  
**Long, 6B**





Code: FSAA\* or FSAB  

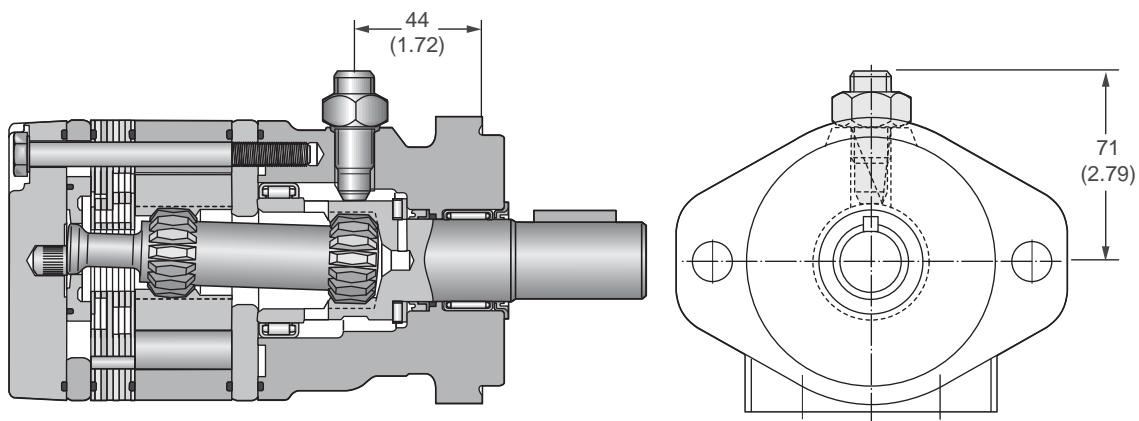
## An Economical Sensor for Speed Readout

This rugged, weather resistant design is ideal for industrial and mobile applications. Applications include salt/sand/fertilizer spreader drives, conveyer drives and injection molder compression drives. The sensor is a hall-effect type, which when externally powered outputs 30 square wave digital pulses per coupling shaft revolution. The connector is a user friendly universally available 4 pin polarized M12 connector allowing for simplified field service. The integrated design does not effect the side load capacity or performance of the torque motor.

Dieser robuste, wetterfeste Drehzahlaufnehmer arbeitet nach dem Halleffekt. Es werden 30 Rechteckimpulse pro Abtriebswellenumdrehung erzeugt. Durch Erfassung der positiven und negativen Wellenflanken sind 60 Impulse pro Umdrehung möglich. Der Sensor führt zu keiner Leistungsbeschränkung des Motors. Die volle Radiallastkapazität bleibt erhalten.

Un capteur economique pour mesure de la vitesse. Ce capteur robuste et resistant aux intemperies est a effet Hall. Alimente par une source externe, il fournit 30 ondes digitales carrees par tour. Par multiplication lelectronique on obtient 60 pulsations par tour. Son montage ne modifie pas le couple ni la charge radiale du moteur qui le recoit.

Este es un diseño de construcción reforzada, apto para uso a la intemperie e ideal para uso industrial y en equipos móviles. Entre sus aplicaciones, se puede mencionar esparcidores de sal, arena o fertilizantes, unidades motoras de transportadores y unidades motoras de compresión para moldeo a inyección. El sensor es del tipo de medio efecto, que al ser excitado externamente, genera 30 pulsos digitales de onda cuadrada por cada revolución del eje del acoplamiento. Utiliza un simple conector M12 polarizado tetrapolar, que es de uso común y facilita el mantenimiento en el lugar de instalación. El diseño integrado no afecta la capacidad de carga lateral ni la potencia del motor de torque.



**Maximum operating pressure 172 bar (2500 psi).**

US equivalents for metric specifications are shown in ( ).

\* Option code FSAA is with a single black coat of paint.

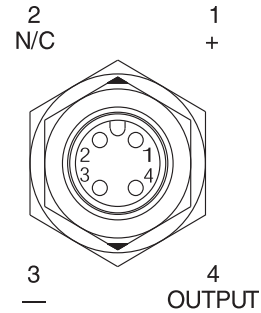
\* Code FSAA: Motor schwarz grundiert

\* Le code d'option montré correspond à une seule couche de peinture noire.

\* El código de la opción mostrado es con una sola capa de pintura negra.

005 Small Frame Options.indd, js

Operating voltage range Versorgungsspannung Gamme de tension de service Gama de voltaje de alimentacion	4.5...24 VDC
Operating temperature Arbeitstemperatur Temperature de service Temperatura de servicio	-20° to 220° F -29° ...104° C
Operating frequency range Arbeitsfrequenz Gamme de frequences de service Gama de frecuencia de servicio	0...10 KHZ
Max sink current Erforderlicher Laststrom Courant d'affaissement maxi Corriente maxima de alimentacion	0 ... 20 mA (max.)
Connection Anschluß Branchement Conexion	4 Pin Polarized (12mm)
Sensor output Sensorausgang Sortie du détecteur Salida del sensor	30 Pulses per revolution which can be doubled electronically 30 impulsions par revolution pouvant etre doublees electroniquement 30 pulsos por revolucion, que pueden duplicarse electronicamente
Output is NPN Ausgang is NPN La sortie est NPN La salida es NPN	Open Collector



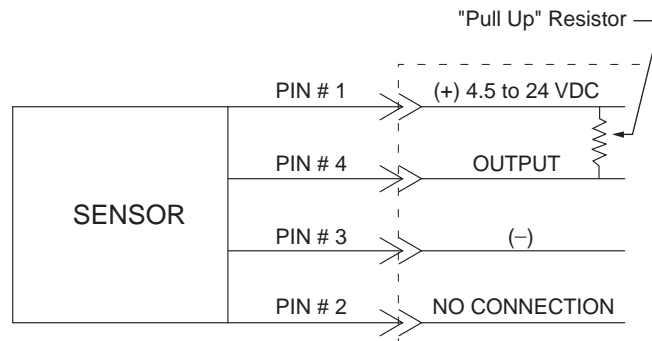
4 Pin Polarized  
M12 Connector (Male)

Cable and "Pull Up" Resistor are not supplied by factory.

Zubehör wie z.B. Kabel gehören nicht zum Lieferumfang

Le câble et la résistance "Pull Up" ne sont pas fournis par l'usine.

El cable y la resistencia de arranque no se suministran originalmente de fábrica.



**Pull-up Resistor Value Formula**

Formel zur Ermittlung des Pull-up-Widerstandes

Formule de la valeur de resistance Pull-up  
Calculo de la resistencia de carga

(0.25 Watt, 5% de tol.)  
(0.25 Watt, Tol. 5%)  
(0.25 Watt 5% Tol.)  
(0.25 Watt, toll. 5%)

**Voltage / Spannung**

Courant d'affaissement/  
Voltaje

Sink Current / Laststrom  
Resistance / Corriente de alimentacion

4.5...24 VDC

0...20 mA

Resistor

Widerstand

Resistance

Resistencia

(k Ohm)

Status: Offstate / aus

Etat: Arret / Estado: Inactivo  
(95% +V)

+ V

0 V

Status: Onstate / ein

Etat: Marche / Estado: Activo  
(max. 0.4 VDC)

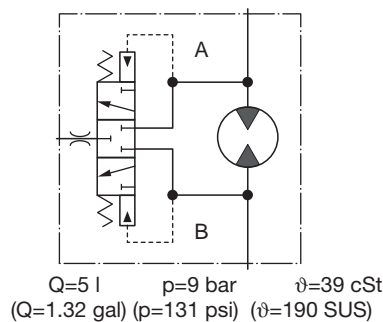
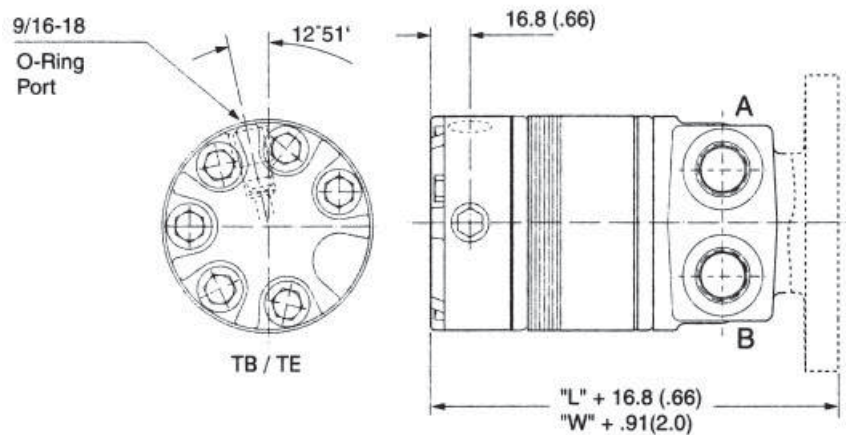
**Code: AANC or AAJV\* EU US**

A Hot Oil Shuttle is used to continuously remove a portion of the fluid in a closed loop transmission or other closed loop system. At 125 PSI pressure differential between the motor return port and the shuttle outlet, 1.5 GPM\* will exit the circuit to cool, filter and return to the reservoir. The constant loop replenishment helps to keep heat and contamination from building up in the circuit.

Spülventil für geschlossene Systeme zur Rückführung einer definierten Menge des Niederdrucköls in den Tank zur Abkühlung innerhalb desselben Kreislaufs.

Valve de rincage pour systèmes fermés pour le retour d'un volume déterminé de fluide basse pression vers le réservoir, un refroidisseur ou un filtre de réfrigération, dans le même circuit.

Un transferidor de aceite caliente actúa permanentemente para extraer una parte del fluido en una transmisión de circuito cerrado u otro sistema de circuito cerrado. Entre la entrada de retorno del motor y la salida del transferidor hay una diferencia de presión de 125 psi (libras/pulg.<sup>2</sup>), y a esta presión salen 1,5 galones por minuto del circuito para enfriarse, filtrarse y volver al depósito de fluido. El reacondicionamiento permanente de parte del fluido evita la contaminación del mismo y el incremento de temperatura en el circuito.



- \* Option code AAJV is with a single black coat of paint
- \* Code AAJV: Motor schwarz grundiert
- \* Le code d'option moneté correspond à une seule couche de peinture noire
- \* El código de la opción mostrado es con una sola capa de pintura negra

English equivalents for metric specifications are shown in ( ).

**Code: HAAA\* or HAAB** 

**Specifications**

- **Rated flow** – 20 gpm
- **Max. Operating Pressure** – adjustable up to 3500 psi, factory preset at 1750 psi.
- **Reseat Pressure** – 90% of set pressure
- **Operating Temperature Range:** -40°F to 250°F
- **Cartridge Material** – All parts steel. All operating parts hardened steel.
- **Body Material** – Steel

**Einsatzdaten**

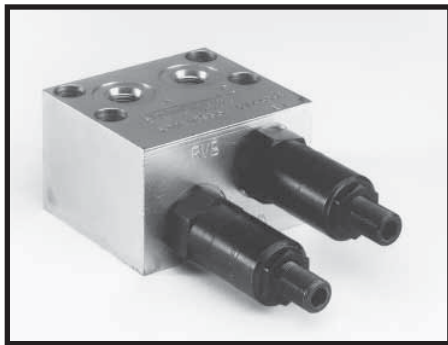
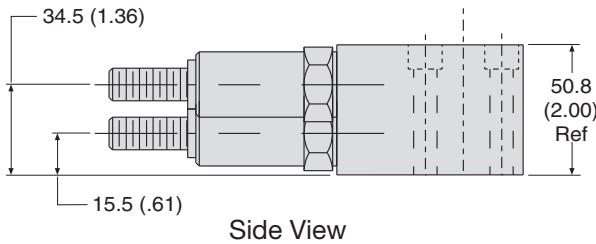
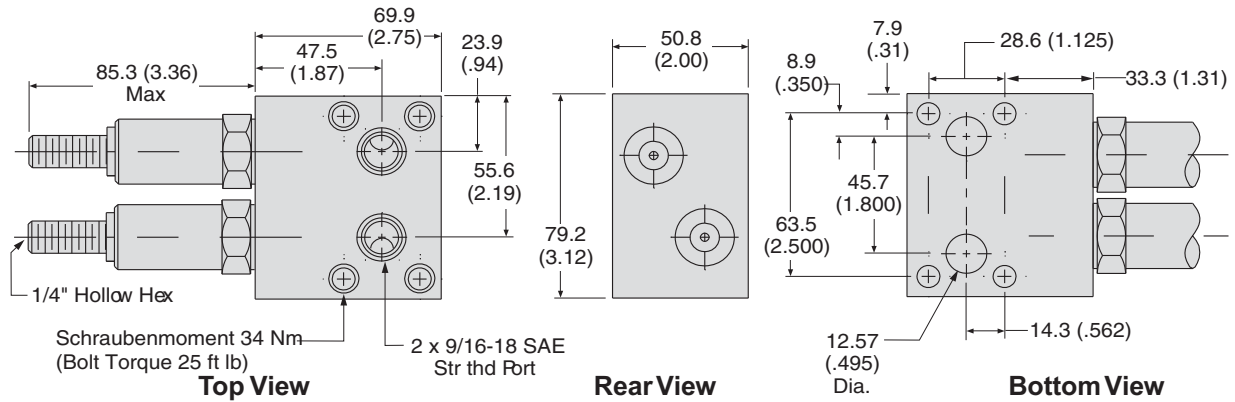
- Max. Fluß 76l/min.
- Max. Druck 240 bar (Voreinstellung 120 bar)
- Hysteresis 90% des Öffnungsdrucks
- Betriebstemperatur – 40°C bis 115°C
- Ventil in Stahlausführung
- Code für Ausführung schwarz grundiert

**Spécifications**

- **Débit nominal** – 75,7 litres/minute (20 gallons/minute)
- **Pressure de service maximale** – ajustable jusqu'à 246 kg/cm<sup>2</sup> (3 500 ppo<sup>2</sup>), préréglée à l'usine à 123 kg/cm<sup>2</sup> (1 750 ppo<sup>2</sup>).
- **Pression de rajustage** – 90% de la pression de consigne
- **Gamme des températures de service** – de -40° C à 121° C (-40° F à 250° F).
- **Matériau de la cartouche** – Entièrement en acier. Toutes les pièces de service en acier durci.
- **Matériau du corps** – Acier

**Especificaciones técnicas**

- **Caudal:** 20 galones/minuto
- **Presión máxima de servicio:** regulable hasta 3.500 libras/pulg.<sup>2</sup>. Regulada de fábrica a 1.750 libras/pulg.<sup>2</sup>.
- **Presión de reasentamiento:** 90% de la presión calibrada.
- **Gama de temperatura de servicio:** - 40° F a 250° F
- **Material del cartucho:** todas las partes son de acero. Todas las partes activas son de acero templado.
- **Material del cuerpo:** acero



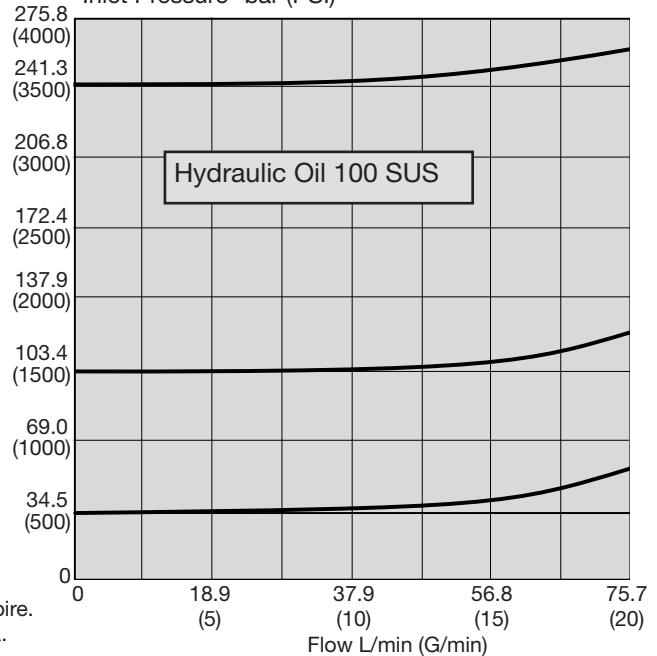
English equivalents for metric dimensions are shown in ( ).

- \* Option code shown is with a single black coat of paint.
- \* Motor schwarz grundiert
- \* Le code d'option montré correspond à une seule couche de peinture noire.
- \* El código de la opción mostrado es con una sola capa de pintura negra.

**Performance Curve**

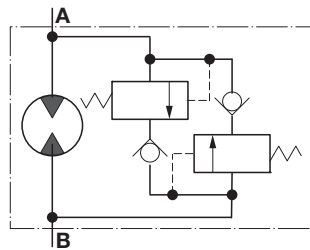
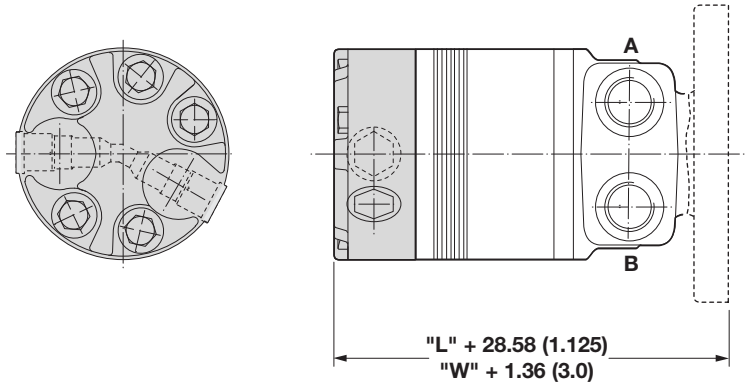
Flow vs. Pressure

Inlet Pressure- bar (PSI)



Code: **BBCK, BBCN or BBCM**  

This integrated internal relief valve is used for fixed pressure settings.  
 Internes Schockventil mit festen Einstelldrucken  
 La soupape de sécurité interne s'utilise pour des valeurs de pression fixes.  
 La valvula interna de alivio se utiliza para cablibraciones fijas de presion.



Code	Description	TB	TC	TE
<b>BBCM</b>	83 Bar / 1200 PSI Int Bidirectional Relief, No paint	x	x	x
<b>BBCN</b>	140 Bar / 2030 PSI Int Bidirectional Relief, No paint	x	x	x
<b>BBCP</b>	100 Bar / 1450 PSI Int Bidirectional Relief, No paint	x	x	x
<b>BBCR</b>	100 Bar / 1450 PSI Int Bidirectional Relief, Black paint	x	x	x
<b>BBCT</b>	108 Bar / 1560 PSI Int Bidirectional Relief, No paint	x	x	x
<b>BBCV</b>	64 Bar / 921 PSI Int Bidirectional Relief, Black paint	x	x	x
<b>BBCK</b>	120 Bar / 1740 PSI Int Bidirectional Relief, No paint	x	x	x
<b>BBCE</b>	83 Bar / 1200 PSI Int Bidirectional Relief, Flourocarbon (Viton) Seals, No Paint	x	x	x
<b>BBDE</b>	150 Bar / 2175 PSI Int Bidirectional Relief, Flourocarbon (Viton) Seals, No paint	x	x	x
<b>BBDF</b>	53 Bar / 761 PSI Int Bidirectional Relief, No paint	x	x	x
<b>BBDM</b>	53 Bar / 761 PSI Int Bidirectional Relief, No paint	x	x	x
<b>BBDT</b>	150 Bar / 2175 PSI Int Bidirectional Relief, No paint	x	x	x
<b>BBDY</b>	120 Bar / 1740 PSI Int Bidirectional Relief, No paint	x	x	x

Standard Length & Weights for TB Series on Pages 29-31 and TE Series on Pages 56-59.

Längen/Gewichte TB Serie siehe Seiten 29-31, TE Serie Seiten 56-59.

Longueurs et poids courants pour la série TB, voir les pages 29-31, et la série E, voir les pages 56-59.

Los valores estándar de longitud y peso de la Serie TB se puede ver en las Páginas 29-31, y de la Serie E en las Páginas 56-59.

English equivalents for metric specifications are shown in ( ).

**Code: AAAA**   
Black Paint



**Code: AAAA**  
Schwarz lackiert

**Code: AAAB**    
No Paint


**Code: AAAB**  
No Paint

**Code: AAAC**    
**Double Paint** — Base coat of red oxine primer and finish coat of black paint for increased corrosion resistance.



**Code: AAAC**  
Zweischichtlackierung schwarz

**Code AAAF\* or AABP**    
**Castle Nut** — All motors ordered with Tapered shafts are equipped with patch locking nuts. If desired, a castle nut may be specified.

**Code AAAF\* or AABP**  
Kronenmutter  
Selbstsichernde Mutter wird ersetzt durch Kronenmutter

**Code: AAAJ\* or AAFG**    
**High Temperature Commutator Seal** — Under conditions of high temperature, it is suggested that a high temperature commutator seal be used.

**Code: AAAJ\* or AAFG**  
**Kommutatordichtung fuer hohe Temperaturen**  
— Bei hohen Temperaturen des Hydraulikoels wird empfohlen die Kommutatordichtung fuer hohe Temperaturen einzusetzen!

**Code: AAAG\* or AAAH**    
**Fluorocarbon** — is available under various registered trademarks, including **VITON™** (a registered trademark of DuPont), **FLUOREL™** (a registered trademark of 3M) or **FPM™** (a registered trademark of DuPont).

**Code: AAAG\* or AAAH**  
Fluorocarbon Dichtungen  
Für Anwendungen im höheren/niedrigeren Temperaturbereich oder speziellen Flüssigkeiten wird der Einsatz von Fluorcarbon Dichtungen empfohlen.  
Fluorocarbon ist bekannt unter verschiedenen eingetragenen Warenzeichen  
VITON™ - DuPont, Fluorel™ - 3M, FPM™ - DuPont

**Code: AABJ\* or AABK**  
**Free Running Rotorset** — The “free running rotorset” is a specially dimensioned rotorset that allows for smooth operation at low flows and low pressure. Volumetric efficiency can be affected.

**Code: AABJ\* or AABK**  
Leichtläufer Rotorsatz  
Anlaufdruck < 5 bar

\* Option code shown is with a single black coat of paint.  
\* Code: Motor schwarz grundiert  
\* Le code d’option montré correspond à une seule couche de peinture noire.  
\* El código de la opción mostrado es con una sola capa de pintura negra.

Availability / Verfügbarkeit			Code		Description / Beschreibung
TC	TB	TE	Painted Lackiert	Unpainted UnLackiert	
US	US	US	AAAA	AAAB	Standard seals
US	US	US	AAJV	AANC	Bidirectional shuttle 3:30
	US	US	AABT	-	No nut
		US	BBDF	BBDM	52 Bar (761 PSI) Internal Bidirectional Relief
	US	US	BBCV	-	64 Bar (921 PSI) Internal Bidirectional Relief
	US	US	-	BBCE	83 Bar (1200 PSI) Internal Bidirectional Relief, Flourocarbon (Viton) shaft seals
	US	US	BBCR	BBCP	100 Bar (1450 PSI) Internal Bidirectional Relief
US	US	US	-	BBCT	108 Bar (1560 PSI) Internal Bidirectional Relief
US	US	US	AAAC	-	Double Paint / Zweischichten – Lackierung
	US	US	AAAF	AABP	Castle Nut / Kronenmutter
US	US	US	AAAG	AAAH	Fluorocarbon Seals / Fluorocarbon Dichtungen
US	US	US	AAAJ	AAFG	High Temperature Commutator Seal / Kommutatordichtung fuer hohe Temperaturen
US	US	US	AABJ*	AABK*	Free Running Rotorset / Leichtläufer-Rotorsatz
		US	FSAA	FSAB	Speed Sensor / Drehzahl-Sensor
	US	US	-	BBCN	140 Bar (2030 PSI) Internal Bidirectional Relief / Internes Schockventil
	US	US	BBDY	BBCK	120 Bar (1740 PSI) Internal Bidirectional Relief / Internes Schockventil
	US	US	-	BBCM	83 Bar (1200 PSI) Internal Bidirectional Relief / Internes Schockventil
US	US	US	HAAA	HAAB	Adjustable external Relief Valve / Schockventil (einstellbar)
Consult factory for other positions and combinations. / Weitere Optionen nach Rücksprache verfügbar					
*Not applicable to 0365 or 0390 displacements. *Nicht verfügbar für 0365 und 0390					

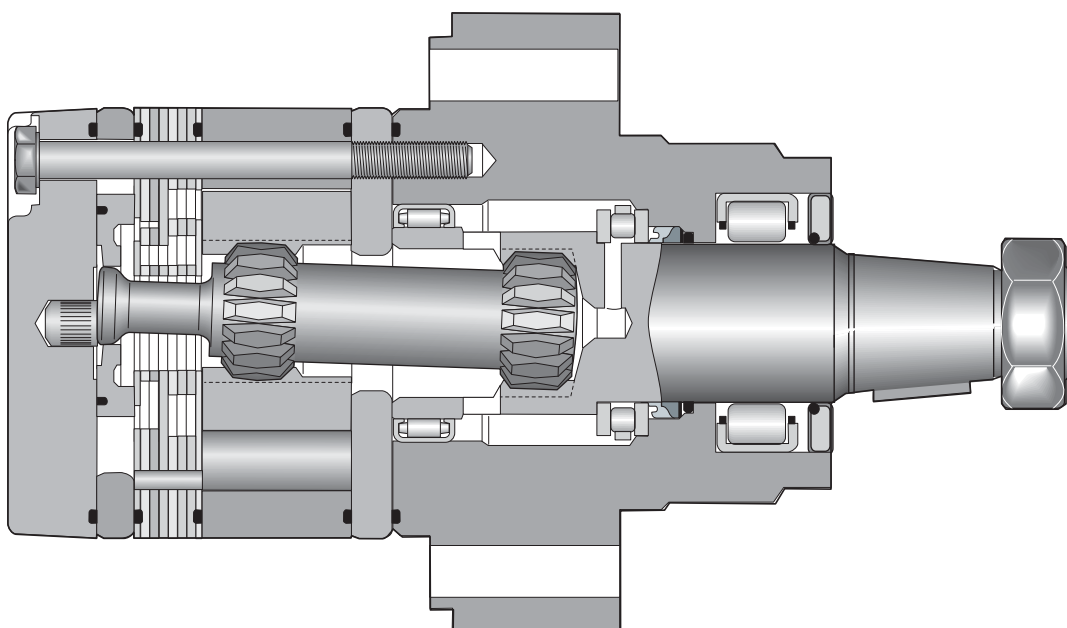
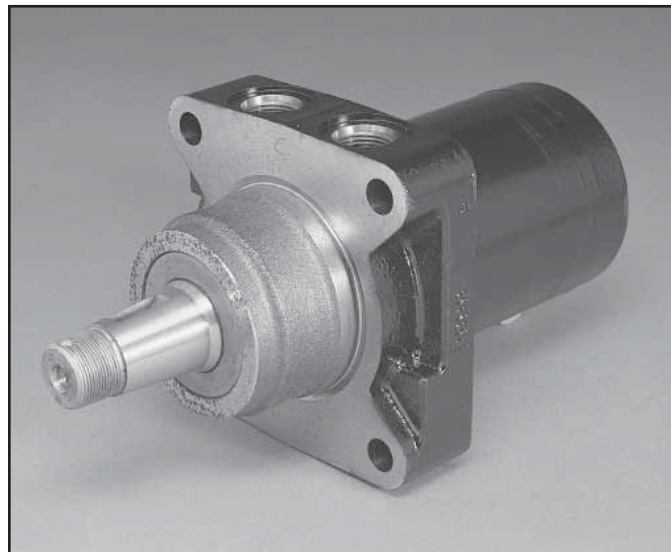


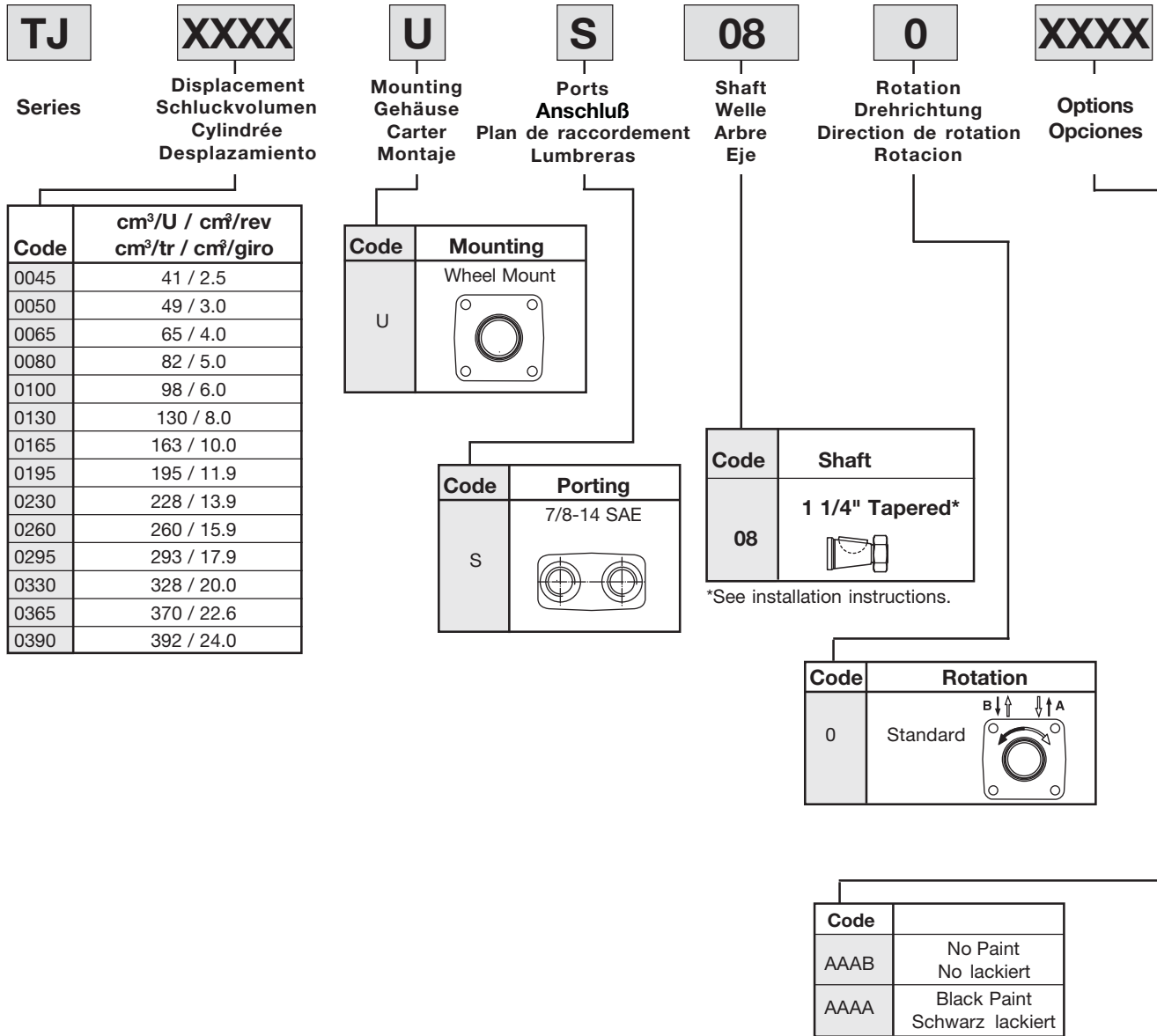


14 Displacements 14 Schluckvolumen 14 Cylindrée 14 Despazamientos	(2.5 – 24.0 in <sup>3</sup> /rev) 41 . . . 390 cm <sup>3</sup> /rev						
Maximum Pressure Eingangsdruck Pression entrée Presion Maxima	<table border="0"> <tr> <td><b>Cont</b></td> <td><b>Int</b></td> </tr> <tr> <td>(2030 psid)</td> <td>(2750 psid)</td> </tr> <tr> <td>. . .140 bar</td> <td>. . .190 bar</td> </tr> </table>	<b>Cont</b>	<b>Int</b>	(2030 psid)	(2750 psid)	. . .140 bar	. . .190 bar
<b>Cont</b>	<b>Int</b>						
(2030 psid)	(2750 psid)						
. . .140 bar	. . .190 bar						
Maximum Oil Flow Schluckstrom Débit d'huile Caudal Maximo de Aceite	(20 gpm) . . . 75 lpm						
Maximum Speed Drehzahl Vitesse de rotation Maxi Velocidad Maxima	(1024 rpm) <b>1024 rpm</b>						
Maximum Torque Max Drehmoment Couple Maxi Torque Maximo	<table border="0"> <tr> <td><b>Cont</b></td> <td><b>Int</b></td> </tr> <tr> <td>(4139 lb in)</td> <td>(5728 lb in)</td> </tr> <tr> <td>467 Nm</td> <td>648 Nm</td> </tr> </table>	<b>Cont</b>	<b>Int</b>	(4139 lb in)	(5728 lb in)	467 Nm	648 Nm
<b>Cont</b>	<b>Int</b>						
(4139 lb in)	(5728 lb in)						
467 Nm	648 Nm						
Maximum Side Load at Key Seitenlast Charges latérales Carga Maxima Lateral	(3150 lb) . . . 14000 N						

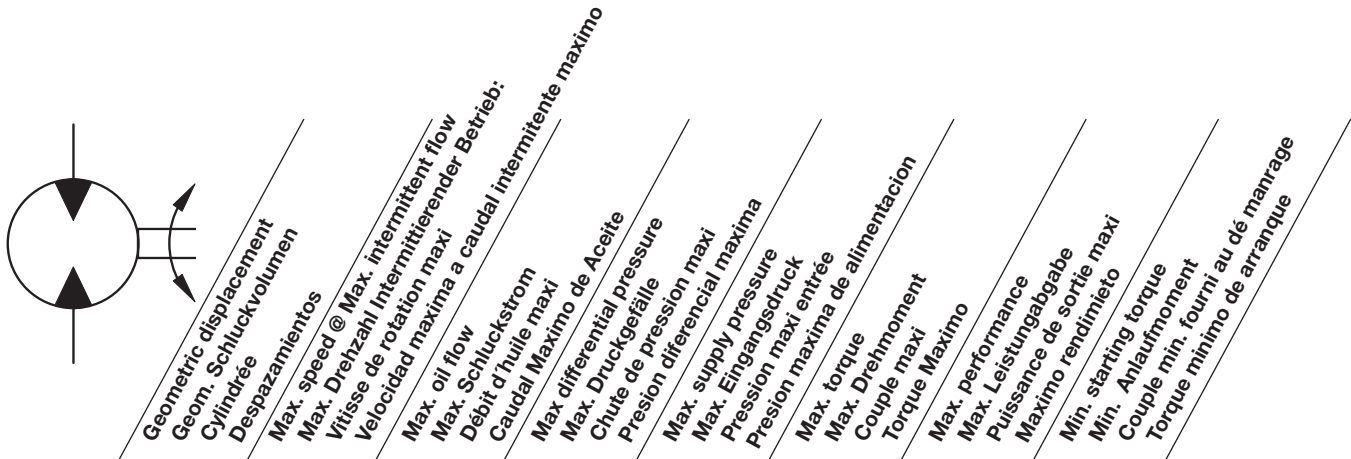
## The Ultimate in Performance from a Medium Frame Motor

Parker's TJ Series motor provides all that could be expected of a general purpose motor and more. Unique 60:40 spline geometry provides drivetrain strength for severe applications. Roller vanes and sealed orbit commutation assure high volumetric efficiency and smooth slow speed operation. Cooling fluid flow across splines and seals mean long, trouble-free life.





For other available options, see pages 119–120.



Motor Series TJ	cm³/rev in³/rev	rev/min	cont / int* l/min g/min		cont / int* bar psid		max bar psig	cont / int* Nm lb-in		max KW HP	cont / int* Nm lb-in	
TJ 0045	41 2.5	1024	34 9	42 11	140 2000	190 2750	200 2900	71 624	99 876	10.4 13.9	46 411	64 565
TJ 0050	49 3.0	1020	34 9	50 13	140 2000	190 2750	200 2900	90 796	127 1120	12.8 17.2	72 637	98 871
TJ 0065	65 4.0	877	45 12	57 15	140 2000	190 2750	200 2900	125 1106	176 1558	14.7 19.8	100 885	137 1211
TJ 0080	82 5.0	695	45 12	57 15	140 2000	190 2750	200 2900	160 1416	220 1947	17.3 23.2	128 1133	171 1515
TJ 0100	98 6.0	582	45 12	57 15	140 2000	190 2750	200 2900	190 1682	264 2337	17.4 23.4	152 1345	205 1819
TJ 0130	130 8.0	438	45 12	57 15	140 2000	190 2750	200 2900	255 2257	352 3116	17.3 23.2	204 1806	274 2423
TJ 0165	163 10.0	348	45 12	57 15	140 2000	190 2750	200 2900	310 2744	436 3846	17.0 22.8	248 2195	338 2992
TJ 0195	195 11.9	292	45 12	57 15	140 2030	190 2750	200 2900	390 3452	528 4673	17.4 23.4	312 2762	411 3637
TJ 0230	228 13.9	328	57 15	75 20	120 1750	165 2400	200 2900	380 3363	514 4554	17.7 23.8	304 2691	411 3637
TJ 0260	260 15.9	287	57 15	75 20	110 1650	155 2250	200 2900	400 3540	550 4870	16.7 22.4	320 2832	449 3977
TJ 0295	293 17.9	256	57 15	75 20	100 1550	145 2100	200 2900	428 3784	582 5180	15.7 21.0	328 2903	445 3939
TJ 0330	328 20.0	228	57 15	75 20	100 1550	135 1960	200 2900	443 3926	600 5312	14.8 19.8	344 3045	453 4014
TJ 0365	370 22.6	203	57 15	75 20	95 1325	125 1825	200 2900	467 4133	648 5728	13.6 18.2	373 3301	477 4223
TJ 0390	392 24.0	191	57 15	75 20	85 1250	120 1740	200 2900	445 3935	628 5562	12.5 16.8	348 3080	462 4090

Performance data based on testing using 10W40 oil with a viscosity of 43,1 cSt. (200 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS a 54°C (130°F). Ces données correspondent a des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production a l'autre.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

\* Intermittent operation rating applies to 10% of every minute.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

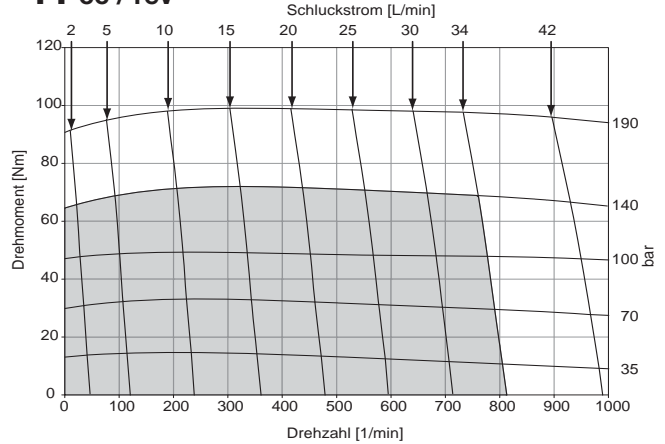
**TJ 0045 2.5 cu in / rev** PRESSURE (PSID)

	500	1000	1500	2000	2750
<b>.5</b>	121 41	272 35	425 28	579 22	809 10
<b>1</b>	126 86	282 79	440 72	599 65	832 50
<b>2</b>	128 176	288 168	452 161	619 152	860 136
<b>3</b>	126 266	287 257	453 249	620 239	874 221
<b>4</b>	123 356	285 346	454 337	624 326	876 306
<b>5</b>	119 446	281 435	451 425	624 413	874 392
<b>7</b>	105 625	270 613	440 601	615 587	862 562
<b>9</b>	94 805	259 791	430 777	605 761	865 733
<b>11</b>	79 984	245 968	415 951	590 930	848 897

**Flow (GPM)**

**TORQUE (LB IN) 862**  
**SPEED (RPM) 562**

**41 cc / rev**



**EU**

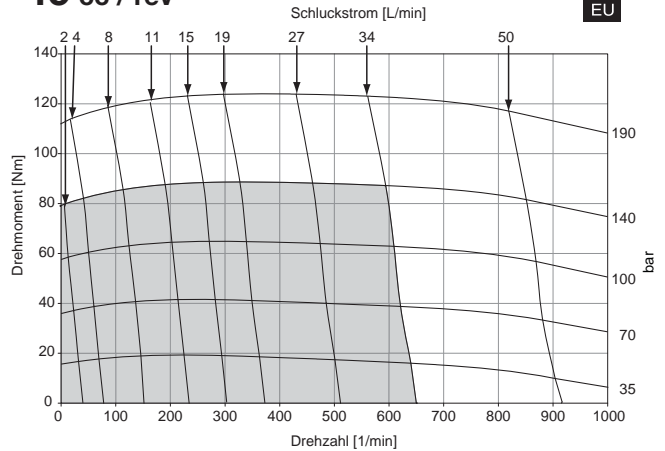
**TJ 0050 3.0 cu in / rev** PRESSURE (PSID)

	500	1000	1500	2000	2750
<b>.5</b>	146 32	327 23	516 13	705 6	
<b>1</b>	159 69	345 60	537 50	727 41	1005 18
<b>2</b>	170 146	364 136	563 124	764 113	1051 85
<b>3</b>	167 225	363 214	565 203	768 191	1079 161
<b>4</b>	169 294	367 282	574 271	784 260	1089 232
<b>5</b>	165 363	365 349	574 339	785 327	1099 294
<b>7</b>	156 501	357 485	568 474	782 460	1094 429
<b>9</b>	141 640	342 621	555 609	771 594	1084 561
<b>13</b>	86 903	299 879	506 868	724 852	1038 809

**Flow (GPM)**

**TORQUE (LB IN) 1094**  
**SPEED (RPM) 429**

**49 cc / rev**



**EU**

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

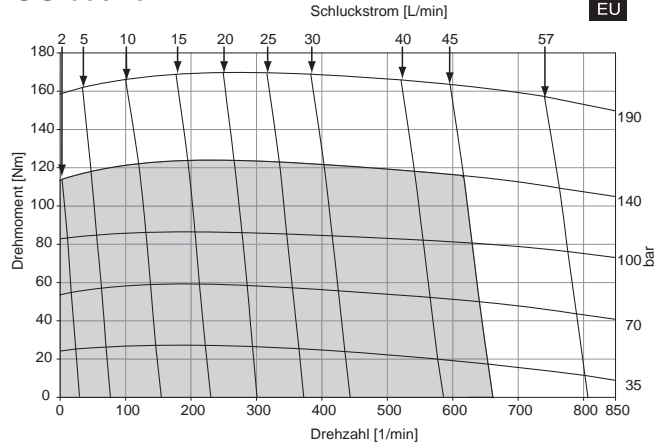
Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TJ 0065

4.0 cu in / rev PRESSURE (PSID)

	500	1000	1500	2000	2750
<b>.5</b>	220 24	481 17	743 11	1004 3	
<b>1</b>	232 52	498 45	763 38	1025 31	1418 20
<b>2</b>	239 109	512 102	789 94	1066 85	1457 67
<b>3</b>	238 167	512 159	790 151	1068 141	1489 122
<b>4</b>	237 224	514 215	795 207	1078 197	1496 180
<b>5</b>	233 279	511 271	794 262	1080 252	1500 235
<b>7</b>	216 386	497 376	783 366	1072 356	1496 337
<b>9</b>	195 494	477 483	764 472	1054 460	1492 440
<b>12</b>	152 654	435 641	724 629	1017 617	1450 596
<b>15</b>	102 802	388 789	680 775	969 763	1394 740

65 cc / rev



TORQUE (LB IN) 1496  
SPEED (RPM) 337

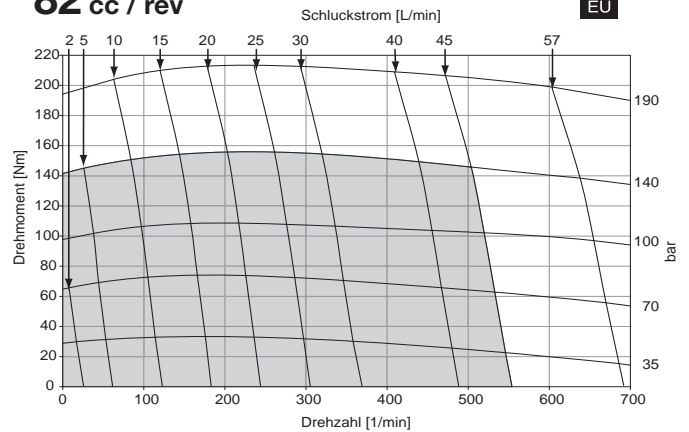
Flow (GPM)

TJ 0080

5.0 cu in / rev PRESSURE (PSID)

	500	1000	1500	2000	2750
<b>.5</b>	261 17	575 8			
<b>1</b>	276 39	596 30	918 23	1245 13	
<b>2</b>	290 85	631 76	974 68	1310 56	1774 37
<b>3</b>	291 131	633 122	978 113	1319 101	1819 79
<b>4</b>	293 177	642 167	995 158	1347 146	1846 122
<b>5</b>	290 223	641 213	999 203	1359 191	1869 166
<b>7</b>	273 316	628 304	989 293	1353 280	1887 255
<b>9</b>	249 408	603 396	966 384	1334 370	1869 340
<b>12</b>	197 546	551 533	916 519	1287 504	1815 472
<b>15</b>	136 686	494 670	857 655	1226 638	1756 605

82 cc / rev



TORQUE (LB IN) 1887  
SPEED (RPM) 255

Flow (GPM)

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositäet von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

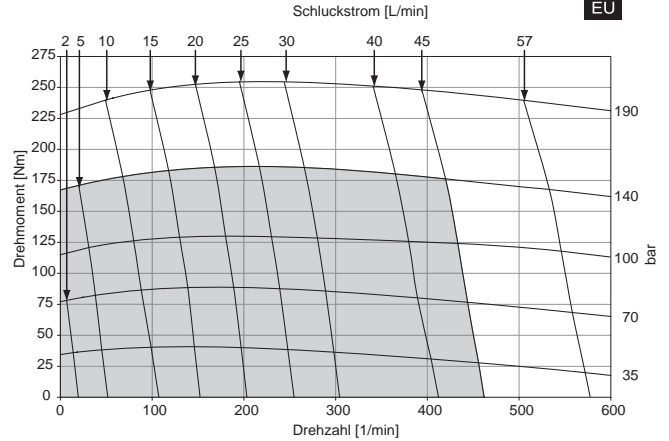
**TJ 0100 6.0 cu in / rev** PRESSURE (PSID)

	500	1000	1500	2000	2750
<b>.5</b>	315 14	687 7			
<b>1</b>	332 33	710 26	1083 18	1460 9	
<b>2</b>	348 71	751 64	1152 55	1541 45	2081 27
<b>3</b>	350 109	756 102	1160 92	1556 83	2145 62
<b>4</b>	353 147	768 140	1185 130	1596 120	2193 99
<b>5</b>	349 186	771 178	1197 168	1622 158	2220 138
<b>7</b>	330 263	759 254	1191 244	1624 232	2251 209
<b>9</b>	302 340	731 330	1167 319	1606 307	2251 284
<b>12</b>	243 456	671 444	1111 433	1555 420	2193 394
<b>15</b>	176 572	606 558	1042 546	1484 533	2113 506

TORQUE (LB IN) 2251  
SPEED (RPM) 209

**Flow (GPM)**

**98 cc / rev**



EU

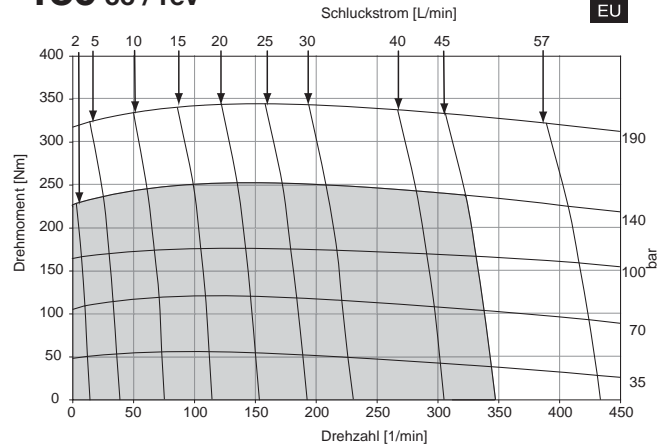
**TJ 0130 8.0 cu in / rev** PRESSURE (PSID)

	500	1000	1500	2000	2750
<b>.5</b>	445 12	962 10	1488 7	2018 3	
<b>1</b>	464 27	996 24	1525 21	2051 17	2839 4
<b>2</b>	482 55	1032 53	1584 49	2136 44	2917 31
<b>3</b>	483 84	1037 81	1594 77	2150 72	2979 60
<b>4</b>	483 113	1051 110	1619 105	2184 100	3018 87
<b>5</b>	478 142	1050 138	1625 133	2201 128	3041 115
<b>7</b>	450 200	1029 195	1613 190	2195 183	3049 170
<b>9</b>	414 257	993 252	1579 247	2166 239	3033 223
<b>12</b>	338 344	915 338	1503 331	2096 323	2963 306
<b>15</b>	252 431	827 424	1408 416	1996 407	2854 389

TORQUE (LB IN) 3049  
SPEED (RPM) 170

**Flow (GPM)**

**130 cc / rev**



EU

■ Cont.

□ Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

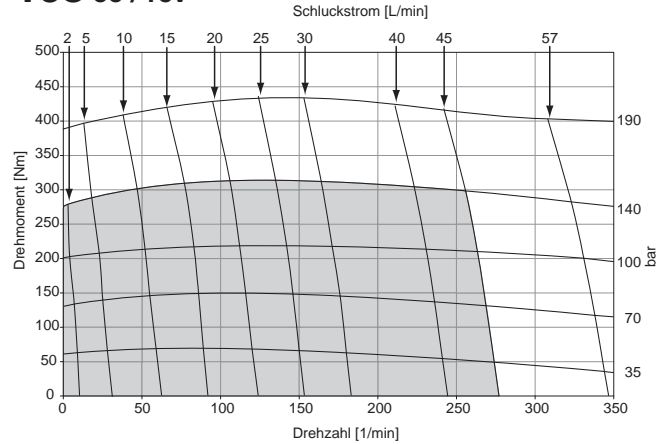
Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TJ 0165

10.0 cu in / rev PRESSURE (PSID)

	500	1000	1500	2000	2750
.5	552 9	1175 7	1813 4	2457 3	
1	574 21	1213 18	1856 16	2499 12	3472 6
2	597 44	1263 41	1938 38	2614 33	3576 25
3	600 67	1273 64	1955 60	2634 55	3654 46
4	603 90	1299 87	1997 83	2691 78	3706 67
5	597 113	1302 109	2015 105	2727 100	3758 89
7	569 159	1286 155	2009 150	2732 144	3784 133
9	523 205	1244 201	1976 195	2707 189	3766 177
12	429 274	1152 269	1890 263	2630 256	3697 242
15	316 344	1039 338	1769 331	2500 323	3576 308

163 cc / rev



TORQUE (LB IN) 3784  
SPEED (RPM) 133

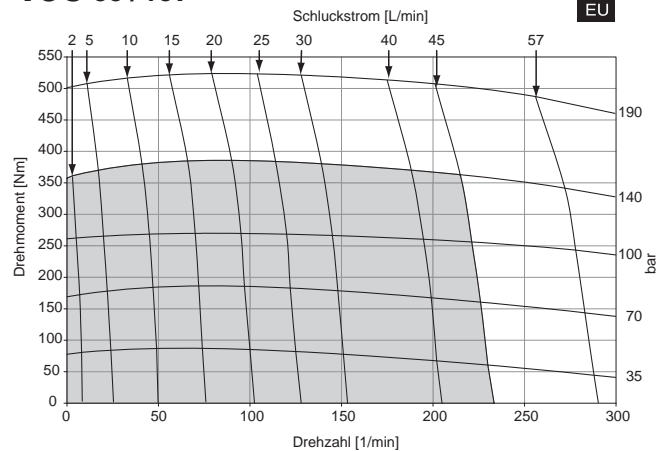
Flow (GPM)

TJ 0195

11.9 cu in / rev PRESSURE (PSID)

	500	1000	1500	2000	2500
.5	710 8	1519 7	2344 5	3182 3	
1	736 18	1558 16	2387 14	3221 12	4466 6
2	758 37	1596 35	2445 33	3302 30	4528 22
3	758 56	1604 54	2459 51	3315 48	4600 39
4	757 75	1618 73	2482 70	3346 67	4620 56
5	747 95	1615 92	2488 89	3360 85	4630 74
7	705 133	1586 130	2467 127	3343 122	4620 111
9	646 172	1528 169	2415 165	3300 160	4579 147
12	530 230	1408 226	2303 221	3197 215	4497 201
15	394 288	1273 283	2147 278	3027 272	4292 256

195 cc / rev



TORQUE (LB IN) 4620  
SPEED (RPM) 111

Flow (GPM)

■ Cont.

□ Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

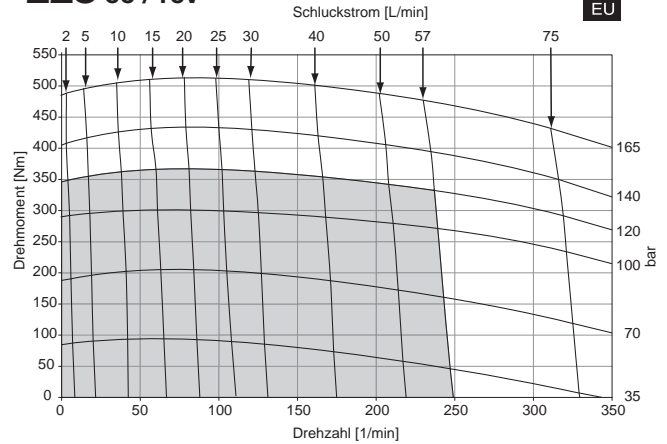
Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositatet von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TJ 0230 **13.9 cu in / rev** PRESSURE (PSID)

	500	1000	1500	1750	2000	2400
<b>.5</b>	761 7	1673 6	2614 5	3094 4	3584 3	4347 3
<b>1</b>	791 15	1712 14	2650 13	3128 12	3615 11	4367 9
<b>2</b>	819 32	1764 30	2726 29	3208 28	3692 26	4450 24
<b>3</b>	819 48	1771 47	2737 45	3226 44	3718 42	4502 41
<b>4</b>	821 65	1787 63	2765 61	3256 60	3750 58	4533 56
<b>5</b>	808 81	1786 79	2777 77	3277 76	3778 74	4554 73
<b>7</b>	770 114	1756 112	2755 109	3255 108	3760 106	4554 104
<b>9</b>	705 147	1699 145	2710 142	3216 140	3724 138	4512 137
<b>12</b>	581 197	1582 194	2595 191	3103 189	3617 186	4378 183
<b>15</b>	400 247	1409 243	2437 239	2949 237	3466 235	4232 230
<b>20</b>	64 329	1052 325	2067 321	2580 319	3100 316	3828 311

**228 cc / rev**



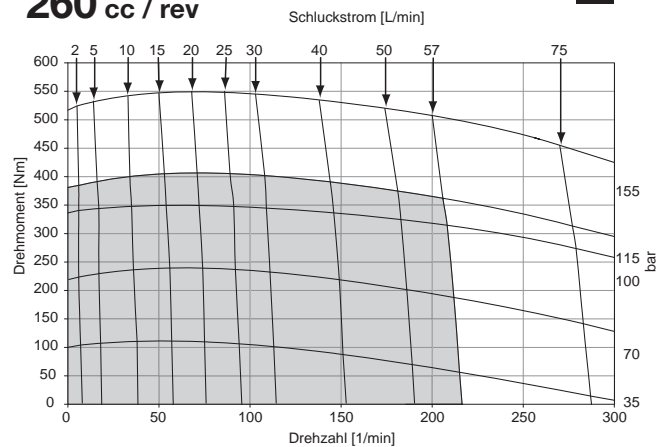
TORQUE (LB IN) 4554  
SPEED (RPM) 104

Flow (GPM)

TJ 0260 **15.9 cu in / rev** PRESSURE (PSID)

	500	1000	1500	1650	2250
<b>.5</b>	908 7	1961 6	3048 6	3380 6	4643 5
<b>1</b>	938 14	2006 13	3099 13	3433 12	4674 11
<b>2</b>	971 28	2059 27	3165 26	3501 26	4758 23
<b>3</b>	968 43	2065 42	3177 40	3514 39	4800 38
<b>4</b>	970 57	2081 56	3203 54	3541 53	4742 50
<b>5</b>	957 71	2084 70	3219 68	3561 67	4874 64
<b>7</b>	907 100	2049 98	3198 96	3542 95	4842 91
<b>9</b>	837 129	1985 127	3143 124	3489 123	4790 117
<b>12</b>	692 172	1844 169	3016 166	3367 164	4685 157
<b>15</b>	489 215	1647 212	2830 208	3188 206	4485 200
<b>20</b>	129 287	1255 283	2418 279	2773 277	4034 270

**260 cc / rev**



TORQUE (LB IN) 4842  
SPEED (RPM) 91

Flow (GPM)

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.  
Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.  
Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.  
Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.  
Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

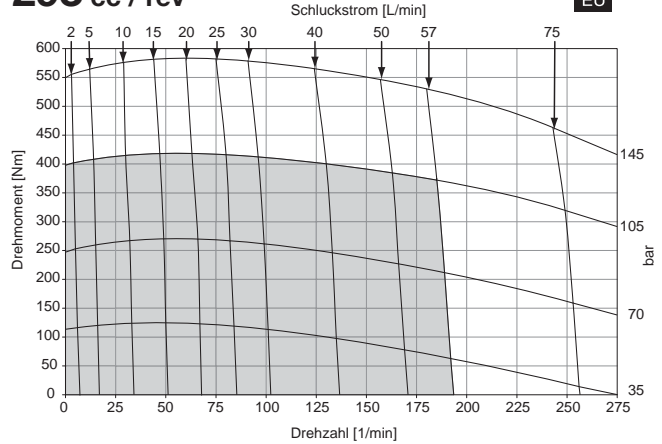


TJ 0295

17.9 cu in / rev PRESSURE (PSID)

	500	1000	1500	1550	2100
<b>.5</b>	1014 6	2216 5	3453 4	3576 4	4907 3
<b>1</b>	1051 12	2270 11	3509 10	3633 10	4943 8
<b>2</b>	1088 25	2334 24	3600 22	3727 22	5073 21
<b>3</b>	1085 38	2338 36	3611 35	3739 34	5133 33
<b>4</b>	1085 50	2353 49	3639 47	3769 47	5156 44
<b>5</b>	1072 63	2352 62	3654 60	3784 59	5180 57
<b>7</b>	1019 89	2311 87	3624 85	3755 84	5157 80
<b>9</b>	939 115	2237 113	3561 110	3693 110	5085 104
<b>12</b>	776 153	2074 151	3403 148	3537 147	4931 142
<b>15</b>	545 192	1853 189	3184 186	3319 185	4694 180
<b>20</b>	126 256	1408 253	2697 249	2826 249	4089 243

293 cc / rev



TORQUE (LB IN) 5157  
SPEED (RPM) 80

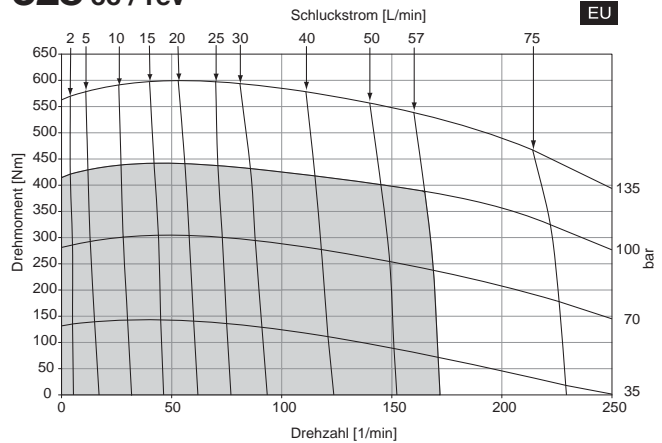
Flow (GPM)

TJ 0330

20.0 cu in / rev PRESSURE (PSID)

	500	1000	1500	1950
<b>.5</b>	1184 5	2507 5	3722 4	5051 2.8
<b>1</b>	1218 11	2558 10	3772 9	5110 7.9
<b>2</b>	1258 22	2632 21	3867 20	5204 18.6
<b>3</b>	1251 34	2633 32	3879 31	5275 29.9
<b>4</b>	1249 45	2649 44	3909 42	5311 39.9
<b>5</b>	1229 57	2648 55	3926 53	5323 50
<b>7</b>	1162 80	2600 78	3898 75	5311 71
<b>9</b>	1064 103	2518 100	3829 98	5228 93
<b>12</b>	875 137	2333 135	3657 131	5027 127
<b>15</b>	621 171	2081 169	3420 165	4779 160
<b>20</b>	163 229	1576 226	2875 222	4140 214

328 cc / rev



TORQUE (LB IN) 5311  
SPEED (RPM) 71

Flow (GPM)

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

**TJ 0365 22.6 cu in / rev** PRESSURE (PSID)

	500	1000	1325	1825
<b>.5</b>	1393 5	2942 4	3974 4	5557 3
<b>1</b>	1444 10	3005 9	4036 8	5595 7
<b>2</b>	1494 20	3090 19	4131 18	5671 17
<b>3</b>	1485 30	3082 29	4125 28	5722 27
<b>4</b>	1477 40	3089 39	4139 37	5734 36
<b>5</b>	1452 50	3075 49	4130 47	5734 45
<b>7</b>	1371 70	3009 69	4071 67	5671 63
<b>9</b>	1260 90	2899 89	3669 87	5532 84
<b>12</b>	1002 121	2658 119	3737 117	5266 113
<b>15</b>	700 151	2355 149	3432 146	4937 142
<b>20</b>	152 201	1776 199	2838 196	4228 191

**TORQUE (LB IN) 5671**  
**SPEED (RPM) 63**

**Flow (GPM)**

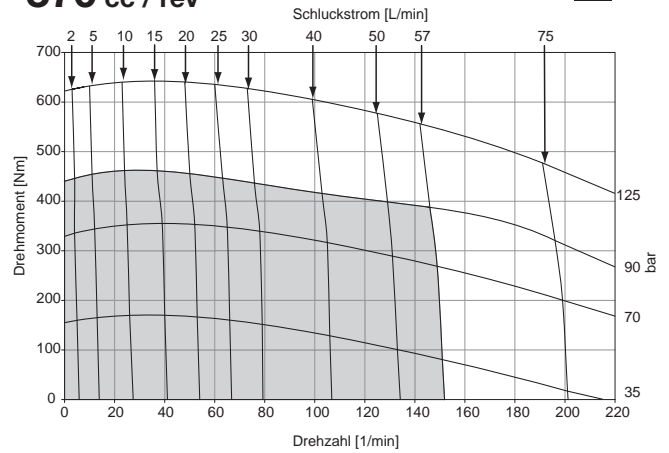
**TJ 0390 24.0 cu in / rev** PRESSURE (PSID)

	500	1000	1250	1750
<b>.5</b>	1326 4	2889 3	3682 2	5235 2
<b>1</b>	1380 9	2934 7	3724 7	5296 6
<b>2</b>	1443 18	3034 17	3840 15	5383 13
<b>3</b>	1442 28	3049 26	3861 25	5457 22
<b>4</b>	1454 37	3084 36	3905 34	5531 32
<b>5</b>	1447 47	3104 45	3935 44	5543 40
<b>7</b>	1393 66	3080 64	3923 62	5568 60
<b>9</b>	1297 85	3013 83	3868 81	5494 79
<b>12</b>	1088 114	2818 112	3686 110	5296 106
<b>15</b>	797 143	2539 140	3414 138	5000 135
<b>20</b>	264 191	2006 188	2880 186	4358 182

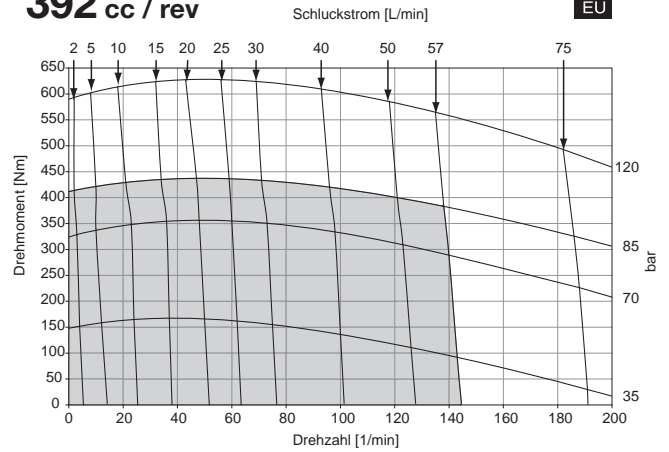
**TORQUE (LB IN) 5568**  
**SPEED (RPM) 60**

**Flow (GPM)**

**370 cc / rev** EU



**392 cc / rev** EU



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

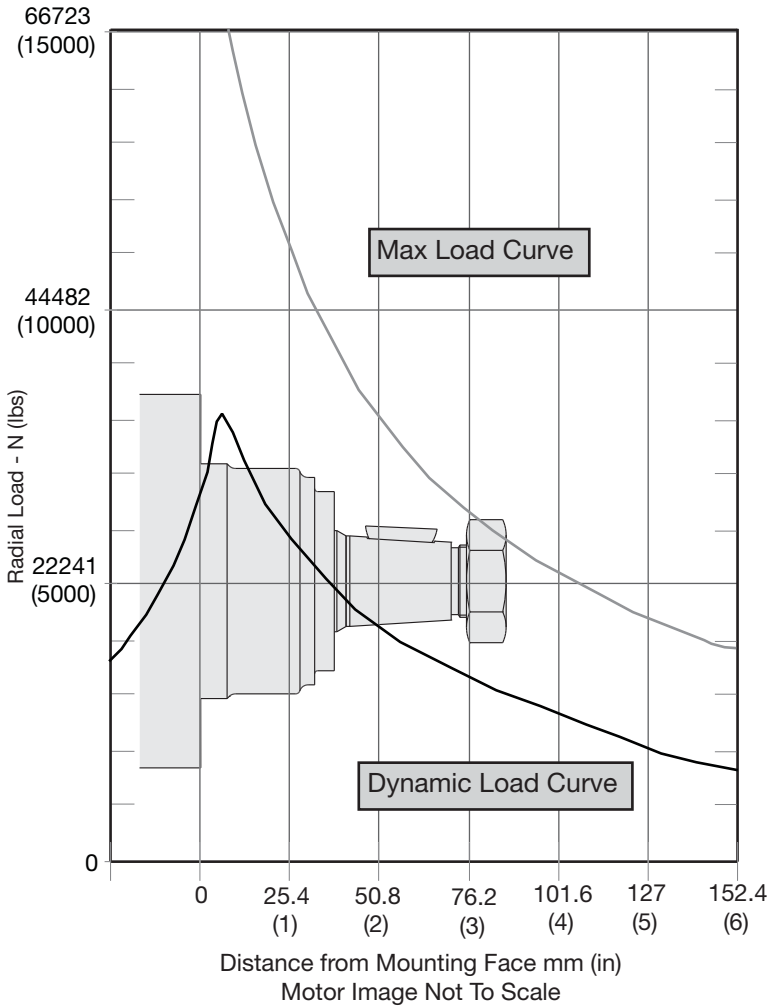
Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 6 segundos por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

Wheel Mount / Radnabengehaeuse  
Monture à roue / Montaje de rueda



The maximum load curve is defined by bearing static load capacity. This curve should not be exceeded at any time including shock loads.

Die maximale radiale Wellenbelastungskurve ist definiert als maximale statische Last ohne Drehzahl. Sie gilt als Grenze und sollte keinesfalls überschritten werden.

La courbe de charge maximale est définie par la capacité de charge statique portante. Cette courbe ne devrait être dépassée en aucun moment y compris pour les charges par à-coups.

La curva de carga máxima queda definida por la capacidad de carga estática del cojinete. No se deben superar los valores de esta curva, ni siquiera con cargas provisionarias de impacto.

The dynamic side load curve is based on unidirectional steady state loads for L<sub>10</sub> bearing life at 3 x 10<sup>6</sup> revolutions.

Die zulässige auslegbare radiale Wellenbelastungskurve ist unter ruhenden, einseitig statisch gerichteten Lastverhältnissen auf eine L<sub>10</sub> Lebensdauer mit 3 x 10<sup>6</sup> Umdrehungen kalkuliert.

La courbe de charge latérale permise se base sur des charges unidirectionnelles en régime permanent pour le roulement L<sub>10</sub> à 3 x 10<sup>6</sup> révolutions.

La curva de valores admisibles de carga lateral está basada en cargas constantes para cojinetes L<sub>10</sub> a 3 x 10<sup>6</sup> revoluciones.

Equation to Calculate the Expected Radial Bearing Life  
Gleichung zur Ermittlung der Lagerlebensdauer

Equation to calculate the dynamic bearing life for a given load:  
Bestimmung der erlaubten radialen Wellenbelastung mit vorgegebener Last

Use F<sub>a</sub>, F<sub>b</sub> and S in equation to determine hours of L<sub>10</sub> bearing life.  
Die Lebensdauer in Stunden ergibt sich durch einsetzen von F<sub>a</sub>, F<sub>b</sub>, und S in die nachstehende Formel.

$$L = \frac{3 \times 10^6}{60 \times S} \left\{ \frac{F_a}{F_b} \right\}^{3.33}$$

Where / Mit:

S = Shaft Speed RPM / Abtriebswellendrehzahl in min<sup>-1</sup>

L = Life In Hours / Lebensdauer in Stunden

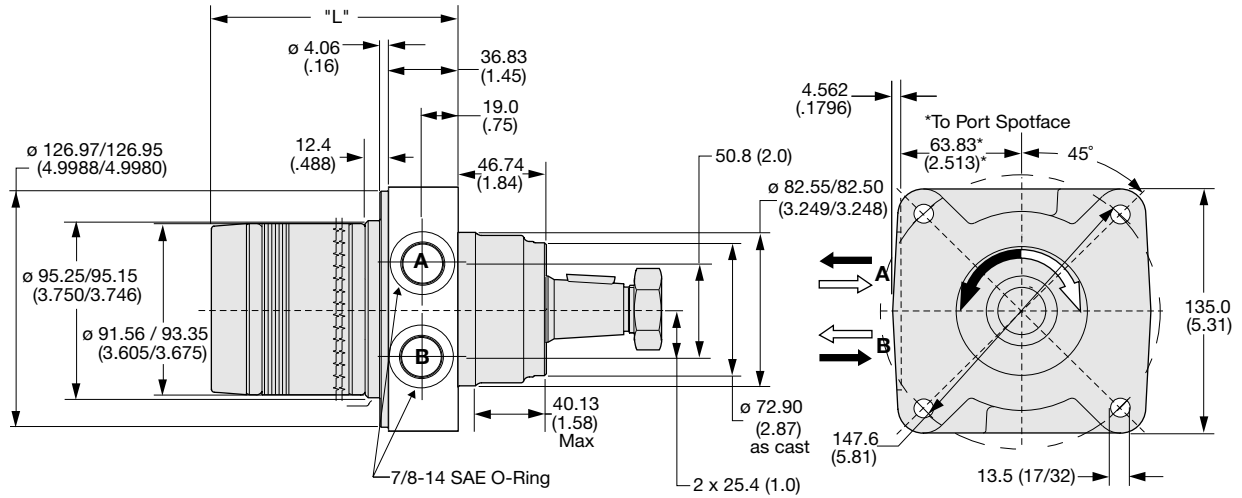
F<sub>a</sub> = Dynamic side load defined by above curve at a distance from mounting flange. / Erlaubte radiale Wellenbelastung als Function der Laenge

F<sub>b</sub> = Application side load. / Anwendungsseitige Wellenbelastung

Note: Calculations are based on L<sub>10</sub> bearing life per ISO 281.  
Auslegung basiert auf einer L<sub>10</sub> Lebensdauer nach ISO 281

Code: US

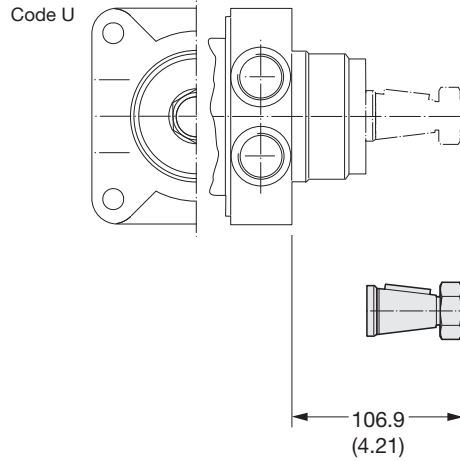
Wheel Mount, 7/8-14 SAE O-Ring



Code US	disp.	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	0330	0365	0390
Weight/Gewicht	kg	6.80	6.90	7.00	7.10	7.20	7.60	7.80	8.10	8.30	8.60	8.80	9.10	9.40	9.60
Poids/Peso	(lb)	(15.0)	(15.2)	(15.4)	(15.6)	(15.8)	(16.7)	(17.2)	(17.9)	(18.3)	(19.0)	(19.4)	(20.0)	(20.7)	(21.2)
Length	"L"	107	109	112	115	118	125	131	137	144	150	156	163	171	176
	"L" (in)	(4.21)	(4.27)	(4.39)	(4.52)	(4.64)	(4.89)	(5.14)	(5.39)	(5.64)	(5.89)	(6.14)	(6.39)	(6.73)	(6.89)

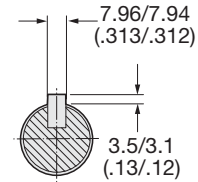
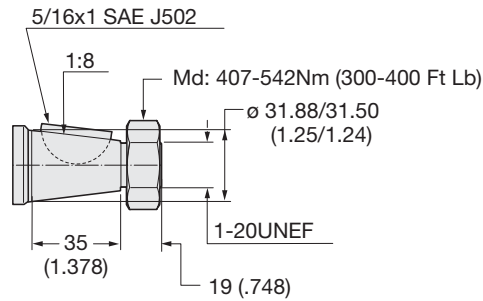
English equivalents for metric specifications are shown in ( ).

006 TJ.indd, js



Code: 08

1 1/4" Tapered



English equivalents for metric specifications are shown in ( ).



## Standard Options

### Code: AAAC

**Double Paint** — Base coat of red oxide primer and finish coat of black paint for increased corrosion resistance.

### Code AAAF\* or AABP

**Castle Nut** — All motors ordered with Tapered shafts are equipped with patch locking nuts. If desired, a castle nut may be specified.

### Code AAAJ\* or AAFG

**High Temperature Commutator Seal** — Under conditions of high temperature, it is suggested that a high temperature commutator seal be used.

### Code AAAG\* or AAAH

**Fluorocarbon** shaft and section seals is available under various registered trademarks, including **VITON™** (a registered trademark of DuPont), **FLUOREL™** (a registered trademark of 3M) or **FPM™** (a registered trademark of DuPont).

### Code AABJ\* or AABK

**Free Running Rotorset** — The “free running rotorset” is a specially dimensioned rotorset that allows for smooth operation at low flows and low pressure. Volumetric efficiency can be affected.

### Code AANM\*

**Seal Saver** — Seal saver is a metal disc that presses onto the motor shaft, covering the dirt and water (D&W) seal. It's purpose is to aid in preventing external contamination from damaging the D&W seal.

### Code: AAAC

Zweischichtlackierung schwarz

### Code AAAF\* or AABP

Kronenmutter  
 Selbstsichernde Mutter wird ersetzt durch  
 Kronenmutter

### Code: AAAJ\* or AAFG

**Kommutatordichtung fuer hohe Temperaturen**  
 — Bei hohen Temperaturen des Hydraulikoels wird empfohlen die Kommutatordichtung fuer hohe Temperaturen einzusetzen!

### Code: AAAG\* or AAAH

Fluorocarbon Dichtungen  
 Für Anwendungen im höheren/niedrigeren Temperaturbereich oder speziellen Flüssigkeiten wird der Einsatz von Fluorocarbon Dichtungen empfohlen.  
 Fluorocarbon ist bekannt unter verschiedenen eingetragenen Warenzeichen  
 VITON™ - DuPont, Fluorel™ - 3M, FPM™ - DuPont

### Code: AABJ\* or AABK

Leichtläufer Rotorsatz  
 Anlaufdruck < 5 bar

### Code: AANM\*

**Versiegelungsschutz** — Der Versiegelungsschutz besteht aus einer Metallscheibe, die gegen die Antriebswelle drückt und damit Schmutz- und Wasserdichtung (D&W-Dichtung) abdeckt. Hierdurch soll einer Beschädigung der D&W-Dichtung auf Grund externer Verunreinigungen vorgebeugt werden.

\* Option code shown is with a single black coat of paint.  
 \* Motor schwarz grundiert  
 \* Le code d'option montré correspond à une seule couche de peinture noire.  
 \* El código de la opción mostrado es con una sola capa de pintura negra.

Availability / Verfügbarkeit	Code		Description / Beschreibung
	Painted Lackiert	Unpainted Unlackiert	
TJ			
Ⓢ	AAAA		Black Paint
Ⓢ		AAAB	No Paint
Ⓢ	AAAC	-	Double Paint / Zweischichten – Lackierung
Ⓢ	AAAF	AABP	Castle Nut / Kronenmutter
Ⓢ	AAAG	AAAH	Fluorocarbon Seals / Fluorocarbon Dichtungen
Ⓢ	AAAJ	AAFG	High Temperature Commutator Seal / Kommutatordichtung fuer hohe Temperaturen
Ⓢ	AABJ*	AABK*	Free Running Rotorset / Leichtläufer-Rotorsatz
Ⓢ	AAPL		Fluorocarbon Seals, Castle Nut, Black Paint
Ⓢ	AAUA		Double Paint, Free Running Rotorset
Ⓢ		AAXD	Fluorocarbon Seals, No Commutator Seal, No Paint
Consult factory for other positions and combinations. / Weitere Optionen nach Rücksprache verfügbar			

\* Not applicable to TJ 0365 or TJ 0390 displacements.

\* Nicht verfügbar für TJ 0365 and TJ 0390.

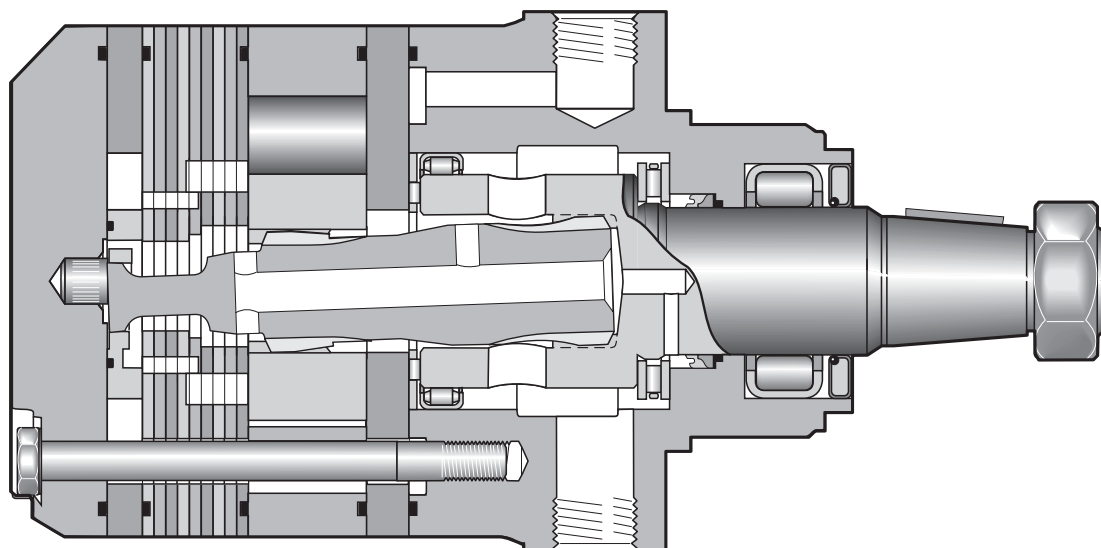
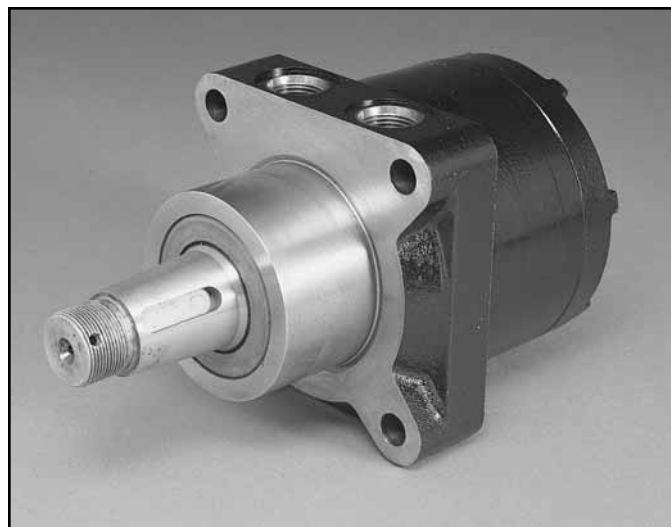
Consult factory for other available options, configurations ordering codes and lead times.



11 Displacements	(4.9 - 29.1 in <sup>3</sup> /rev)	
11 Schluckvolumen	81 . . . 477 cm <sup>3</sup> /rev	
11 Cylindrée		
11 Desplazamientos		
	<b>Cont.</b>	<b>Int.</b>
Maximum Pressure	(3000 psid)	(4000 psid)
Eingangsdruck	. . . 207 bar	. . . 276 bar
Pression entrée		
Presion Maxima		
Maximum Oil Flow	(25 gpm)	
Schluckstrom	. . . 95 lpm	
Débit d'huile		
Caudal Maximo de Aceite		
Maximum Speed	(749 rpm)	
Drehzahl	749 rpm	
Vitesse de rotation		
Velocidad Maxima		
	<b>Cont.</b>	<b>Int.</b>
Maximum Torque	(6027 lb in)	(8106 lb in)
MaxDrehmoment	681 Nm	916 Nm
Couple		
Torque Maximo		
Maximum Side Load at Key	(3597 lb)	
Seitenlast	. . . 16000 N	
Charges latérales		
Carga Maxima Lateral		

## A Tough Motor for Tough Applications

Sturdy construction throughout makes Parker's TF Series motors suitable for the most severe applications. The powertrain uses unique 60:40 spline geometry for strength. All splines are constantly flushed with cool fluid for durability. Roller vanes and sealed commutation assure high volumetric efficiency, smooth low speed operation and extended life. Shaft seals can withstand full system pressure and are washed in cool fluid for long life.



**TF**

Series









**XXXX**

Displacement  
Schluckvolumen  
Cylindrée  
Desplazamiento

Code	cm <sup>3</sup> /U cm <sup>3</sup> /tr cm <sup>3</sup> /giro in <sup>3</sup> /rev
0080	81 / 4.9
0100	100 / 6.1
0130	128 / 7.8
0140	141 / 8.6
0170	169 / 10.3
0195	197 / 11.9
0240	238 / 14.5
0280	280 / 17.1
0360	364 / 22.2
0405	405 / 24.7
0475	477 / 29.1

**X**


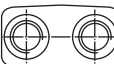
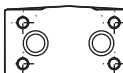
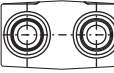
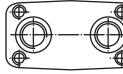
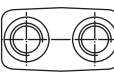
Mounting  
Gehäuse  
Carter  
Montaje

Code	Mounting
A	SAE "A" 2 Bolt 
B	SAE "B" 2 Bolt 
L	Wheel, Front Brake 
M	Magneto 
U	Wheel, Standard 
W*	Wheel, Optional 
D*	Large Wheel Mount 
V*	SAE "A" 4 Bolt 

\*Requires rear porting

**X**

Ports  
Anschluß  
Plan de raccordement  
Lumbreras






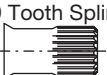

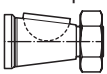
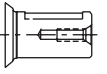
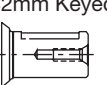

Code	Ports
A	7/8-14 SAE O-Ring; Rear Axial 
B	7/8-14 SAE O-Ring; Rear Radial 
E	Manifold; Rear Radial 
H	ISO 6149 M22 x 1.5 
M*	5/16-18 UNC Manifold 
S	7/8-14 SAE 

\*Not available on L, U or W mounting.

For other available options, see pages 261–262.

**XX**



Shaft  
Welle  
Arbre  
Eje

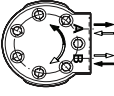
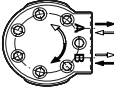
Code	Shaft
01*	1" 6B Spline 
02*	1" Keyed 
03	1 1/4" Keyed 
04	10B Spline 
05	1 1/4" 14 Tooth Spline 
06	19 Tooth Spline 
07	15 Tooth Spline 
08	1 1/4" Tapered 
22	25mm Keyed 
46	32mm Keyed 
62*	1 1/4" 14 Tooth Spline SAE 

\* Conforms to SAE recommended length

**0**

Rotation  
Drehrichtung  
Direction de rotation  
Rotacion

Code	Rotation
0	Standard B ↑↓ ↑↓ A 
1	Reverse Timed Manifold B ↑↓ ↑↓ A 

Code	Rear Rotation
0	Standard 
1	Reverse Timed Manifold 

Rotation viewed  
from shaft end.

**XXXX**

Options  
Opciones

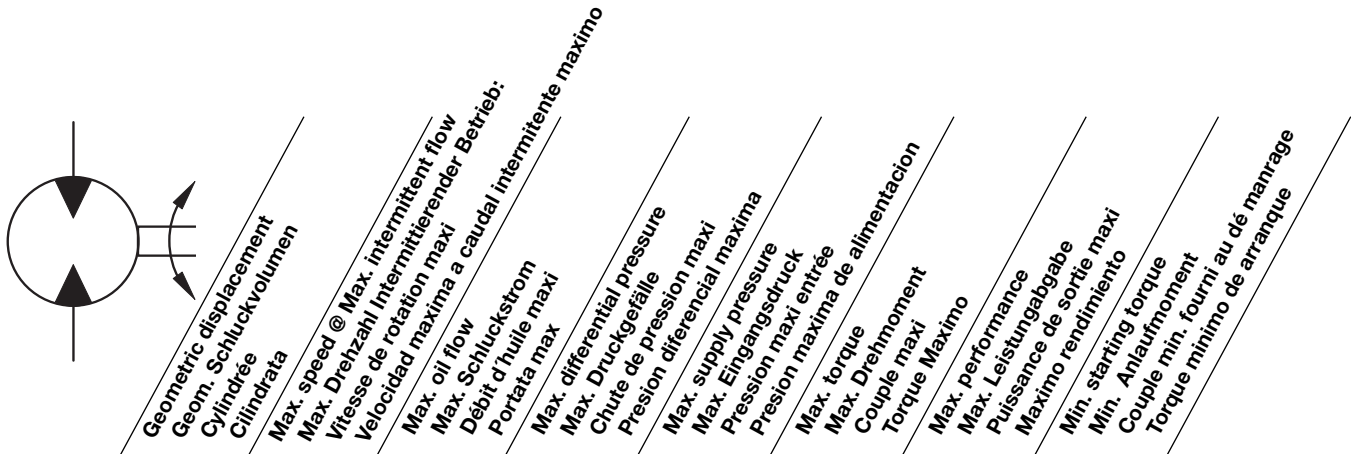
Code	Options
AAAA	Black Paint
AAAB	No Paint
AAAC	Double Paint
AAF***	Castle Nut, Black Paint
AABP***	Castle Nut, No Paint
AAAG	Fluorocarbon Seals, Black Paint
AAAH	Fluorocarbon Seals, No Paint
AAAJ	High Temperature Commutator Seal, Black Paint
AAFG	High Temperature Commutator Seal, No Paint
AAAT*	Bidirectional Shuttle (11:00**), Black Paint
AAFx*	Bidirectional Shuttle (11:00**), No Paint
AAAU*	Bidirectional Shuttle (11:00**), Castle Nut, Black Paint
AAGF*	Bidirectional Shuttle (11:00**), Castle Nut, No Paint
AABJ	Free Running Rotorset, Black Paint
AABK	Free Running Rotorset, No Paint
AABL	Free Running Rotorset, No Commutator Seal, Black Paint
AABM	Free Running Rotorset, No Commutator Seal, No Paint

\* Not available with A, B or E porting

\*\* Shuttle port position as viewed from shaft end of motor

\*\*\* Available only with shaft code 08

* Abtriebswelle Ø 25mm	Max. Moment cont./int.	} 450/550 Nm
Coupling shaft Ø 1 inch	Max. torque cont./int.	
Arbre 6B SAE	Couple maxi cont./int.	
Eje de acoplamiento	Coppia max cont./int.	



Motor Series TF	cm <sup>3</sup> /rev in <sup>3</sup> /rev	rev/min	cont / int* l/min g/min		cont / int* bar psid		max bar psig	cont / int* Nm lb-in		max KW HP	cont / int* Nm lb-in	
TF 0080	81 4.9	693	46 12	57 15	207 3000	276 4000	300 4350	220 1948	296 2621	21.5 28.8	158 1401	205 1811
TF 0100	100 6.1	749	57 15	76 20	155 2250	241 3500	300 4350	197 1746	318 2813	24.9 33.4	148 1309	243 2155
TF 0130	128 7.8	583	57 15	76 20	138 2000	207 3000	300 4350	229 2031	356 3148	21.7 29.1	180 1596	278 2460
TF 0140	141 8.6	530	57 15	76 20	138 2000	207 3000	300 4350	254 2248	393 3477	21.8 29.2	196 1739	308 2728
TF 0170	169 10.3	444	57 15	76 20	138 2000	207 3000	300 4350	317 2808	489 4324	22.7 30.5	243 2152	385 3404
TF 0195	197 12.0	381	57 15	76 20	138 2000	207 3000	300 4350	364 3222	562 4971	22.4 30.1	302 2671	468 4142
TF 0240	238 14.5	394	76 20	95 25	138 2000	207 3000	300 4350	427 3782	670 5928	27.7 37.1	366 3242	572 5058
TF 0280	280 17.1	334	76 20	95 25	138 2000	207 3000	300 4350	509 4502	794 7029	27.8 37.3	438 3876	672 5946
TF 0360	364 22.2	258	76 20	95 25	130 1880	190 2750	300 4350	594 5257	880 7788	20.0 26.8	517 4575	779 6898
TF 0365 Clutch	364 22.2	258	76 20	95 25	97 1400	152 2200	300 4350	437 3871	740 6456	20.0 26.8	398 3521	650 5749
TF 0405	405 24.7	231	76 20	95 25	128 1850	172 2750	300 4350	655 5800	916 8106	22.1 29.7	575 5091	789 6978
TF 0475	477 29.1	195	76 20	95 25	113 1645	138 2000	300 4350	681 6027	851 7528	17.4 23.3	603 5334	740 6548

Performance data based on testing using 10W40 oil with a viscosity of 43.1 cSt (200 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos técnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

\* Intermittent operation rating applies to 10% of every minute.  
Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

TF 0080

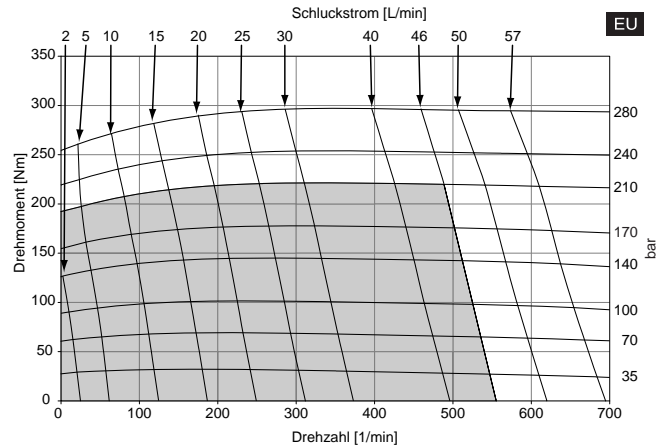
4.9 cu in / rev

	PRESSURE (PSID)							
	500	1000	1500	2000	2500	3000	3500	4000
<b>.5</b>	256 19	546 14	835 8	1118 1				
<b>1</b>	270 42	575 37	867 31	1151 24	1434 17	1713 13	2002 12	2289 13
<b>2</b>	281 89	598 83	917 76	1233 68	1537 60	1821 53	2090 46	2352 40
<b>3</b>	282 135	601 128	922 121	1238 113	1547 104	1845 96	2138 86	2428 78
<b>4</b>	284 182	610 174	938 166	1264 158	1586 149	1899 139	2202 129	2491 120
<b>5</b>	282 228	612 219	944 211	1278 202	1607 193	1932 183	2250 172	2560 163
<b>7</b>	274 321	607 311	945 301	1285 291	1622 281	1957 270	2288 258	2612 247
<b>9</b>	262 414	597 402	937 391	1279 380	1622 369	1960 357	2295 344	2628 331
<b>12</b>	239 553	574 540	916 526	1260 514	1605 501	1948 488	2287 472	2621 456
<b>15</b>	215 693	546 677	886 661	1231 646	1579 633	1927 619	2269 601	2605 582

Flow (GPM)

TORQUE (LB IN) 2605  
SPEED (RPM) 582

81 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TF 0100

6.1 cu in / rev

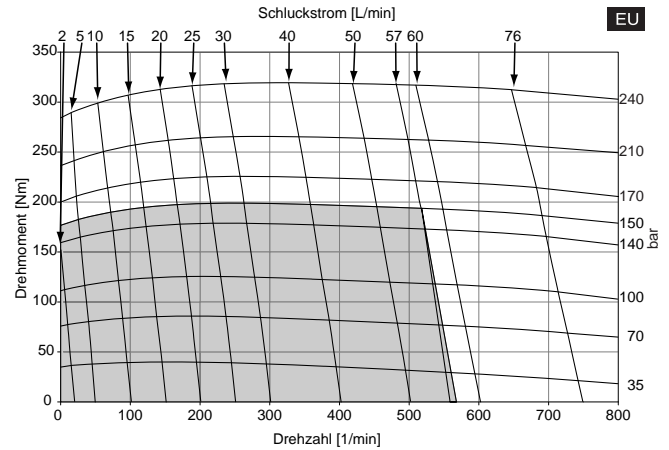
PRESSURE (PSID)

	500	1000	1500	2000	2250	2500	3000	3500
<b>.5</b>	318 14	679 9	1041 4					
<b>1</b>	335 33	703 28	1066 22	1430 17	1611 14	1791 12	2162 9	2543 6
<b>2</b>	351 71	743 65	1132 58	1514 52	1700 48	1882 45	2241 39	2602 34
<b>3</b>	350 109	746 102	1138 95	1525 88	1717 84	1907 80	2288 72	2671 64
<b>4</b>	353 147	754 139	1156 132	1554 124	1752 120	1948 116	2334 107	2716 98
<b>5</b>	352 184	759 177	1167 169	1572 161	1774 156	1974 152	2370 143	2762 133
<b>7</b>	343 260	753 252	1166 243	1581 233	1788 229	1994 224	2401 213	2810 202
<b>9</b>	329 336	741 327	1159 316	1579 306	1788 301	1997 296	2411 284	2824 272
<b>12</b>	299 449	715 438	1137 426	1561 415	1773 409	1985 403	2406 391	2825 377
<b>15</b>	259 562	679 549	1106 536	1532 523	1746 517	1959 510	2387 496	2813 480
<b>20</b>	186 749	607 734	1034 718	1463 703	1679 696	1896 689	2331 671	2763 653

Flow (GPM)

TORQUE (LB IN) 2763  
SPEED (RPM) 653

100 cc / rev



■ Cont.

□ Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

008 TF.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TF 0130

7.8 cu in / rev

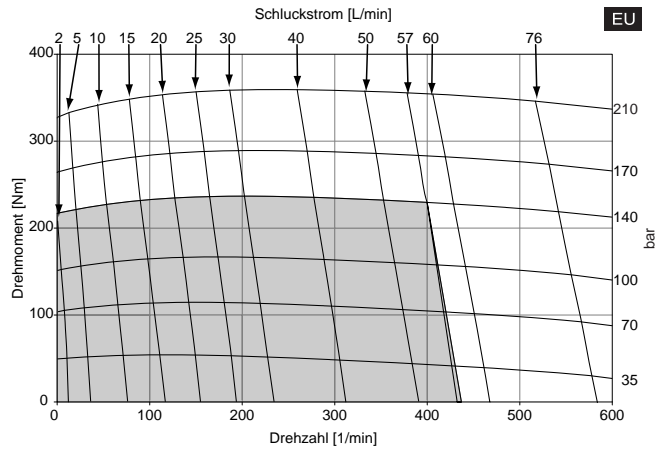
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000
<b>.5</b>	441 10	927 7	1413 3			
<b>1</b>	456 24	948 21	1440 17	1935 13	2422 9	2909 5
<b>2</b>	478 52	991 47	1495 42	2004 36	2508 32	3009 29
<b>3</b>	475 82	993 76	1510 70	2023 63	2533 57	3042 52
<b>4</b>	479 112	1006 105	1529 98	2048 91	2568 85	3084 79
<b>5</b>	478 141	1014 134	1548 127	2076 119	2600 113	3115 106
<b>7</b>	467 200	1010 192	1553 184	2094 176	2632 169	3166 161
<b>9</b>	447 259	996 251	1546 242	2094 233	2640 225	3184 216
<b>12</b>	410 348	961 338	1518 328	2073 318	2626 309	3177 299
<b>15</b>	365 436	914 426	1474 415	2031 404	2589 394	3148 382
<b>20</b>	263 583	812 572	1371 559	1933 547	2498 535	3059 522

Flow (GPM)

TORQUE (LB IN) 3059  
SPEED (RPM) 522

128 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

**TF 0140**

**8.6 cu in / rev**

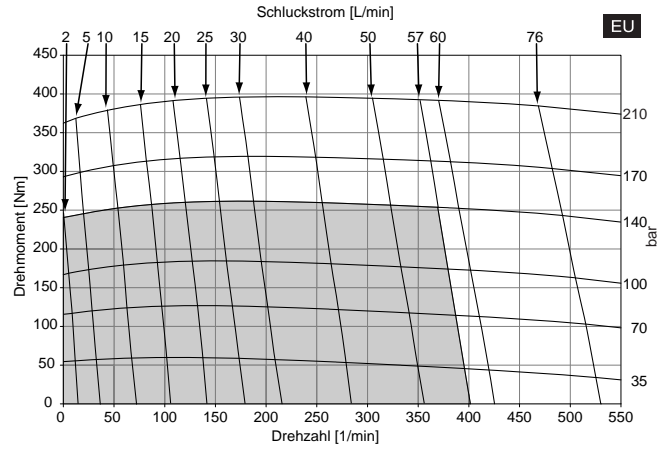
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000
<b>.5</b>	485 11	1025 8	1560 4			
<b>1</b>	507 24	1056 20	1594 16	2137 12	2682 8	3224 5
<b>2</b>	526 50	1101 46	1670 42	2237 37	2796 33	3336 28
<b>3</b>	525 77	1103 72	1676 68	2246 63	2814 57	3370 52
<b>4</b>	528 103	1114 98	1696 93	2277 88	2857 82	3423 77
<b>5</b>	528 130	1120 125	1712 119	2301 113	2885 107	3456 101
<b>7</b>	516 184	1115 177	1716 170	2314 164	2908 158	3497 151
<b>9</b>	496 237	1100 230	1707 222	2311 215	2912 208	3510 200
<b>12</b>	454 317	1063 309	1677 300	2290 292	2901 284	3506 275
<b>15</b>	403 397	1011 388	1629 378	2248 368	2866 359	3477 349
<b>20</b>	298 530	908 520	1525 508	2149 497	2775 485	3401 473

**Flow (GPM)**

**TORQUE (LB IN) 3401**  
**SPEED (RPM) 473**

**141 cc / rev**



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.



TF 0170

10.3 cu in / rev

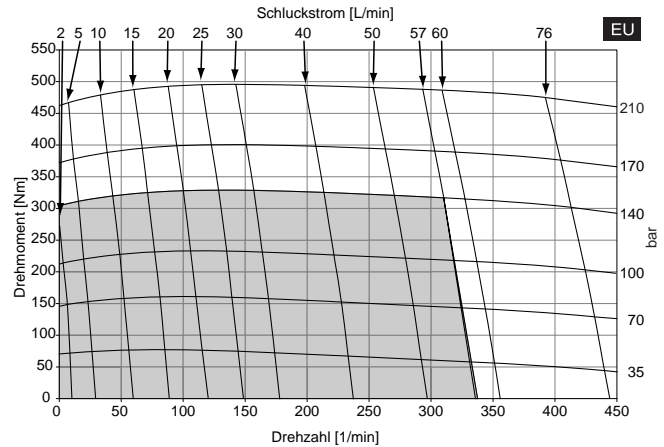
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000
<b>.5</b>	627 8	1304 6	1980 2			
<b>1</b>	657 19	1341 16	2021 12	2714 9	3404 4	4101 1
<b>2</b>	687 42	1409 38	2123 34	2829 29	3520 25	4197 21
<b>3</b>	681 64	1407 60	2127 56	2841 51	3552 45	4263 40
<b>4</b>	681 86	1419 82	2153 77	2879 72	3604 67	4321 61
<b>5</b>	675 109	1423 104	2165 99	2897 94	3628 88	4355 82
<b>7</b>	654 153	1406 148	2161 143	2911 137	3652 130	4385 123
<b>9</b>	624 198	1380 193	2143 186	2900 180	3645 173	4384 165
<b>12</b>	572 265	1331 259	2101 252	2863 244	3618 236	4364 228
<b>15</b>	514 332	1267 325	2040 317	2808 309	3570 300	4324 291
<b>20</b>	387 444	1138 436	1903 427	2667 417	3435 407	4201 396

Flow (GPM)

TORQUE (LB IN) 4201  
SPEED (RPM) 396

169 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst beo 54°C. Geringfugige Abweichungen von den Katalogerten sond möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipcos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TF 0195

12.0 cu in / rev

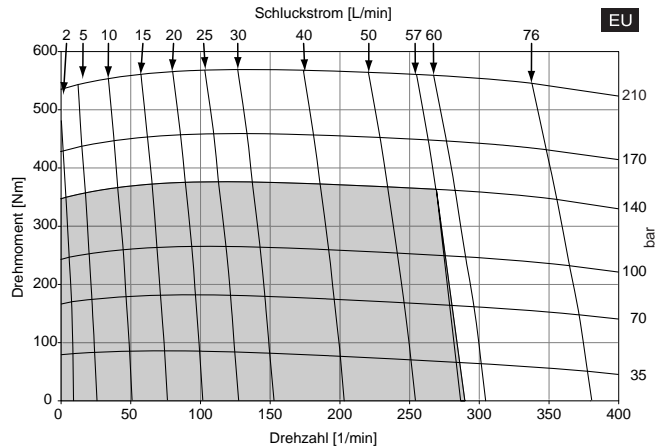
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000
<b>.5</b>	710 8	1494 7	2286 5	3085 3		
<b>1</b>	737 18	1537 16	2334 14	3133 12	3946 9	4767 7
<b>2</b>	757 37	1587 35	2417 32	3242 29	4067 26	4887 23
<b>3</b>	758 56	1591 53	2424 51	3254 47	4086 44	4914 40
<b>4</b>	759 75	1604 72	2450 69	3292 66	4131 62	4965 58
<b>5</b>	755 94	1610 91	2469 88	3321 84	4163 80	5000 75
<b>7</b>	737 132	1599 129	2467 125	3329 120	4185 116	5034 110
<b>9</b>	709 170	1577 166	2451 162	3319 157	4181 152	5034 146
<b>12</b>	652 228	1523 223	2405 218	3283 212	4154 206	5018 199
<b>15</b>	586 285	1451 280	2338 273	3222 267	4100 260	4971 252
<b>20</b>	445 381	1303 375	2174 367	3056 359	3939 350	4822 341

Flow (GPM)

TORQUE (LB IN) 4822  
SPEED (RPM) 341

197 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst beo 54°C. Geringfügige Abweichungen von den Katalogerten sond möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipcos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TF 0240

14.5 cu in / rev

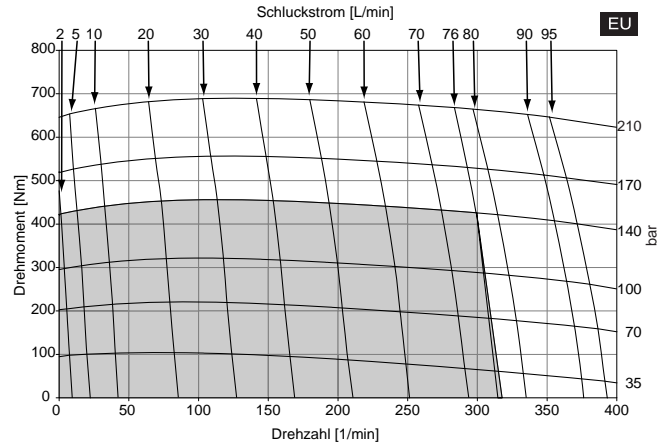
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000
<b>.5</b>	856 7	1796 5	2758 3	3739 1		
<b>1</b>	883 15	1838 13	2801 11	3780 8	4756 5	5741 3
<b>2</b>	920 30	1912 28	2910 26	3895 23	4880 20	5864 17
<b>3</b>	919 46	1920 44	2927 41	3931 38	4924 35	5919 31
<b>4</b>	924 62	1941 60	2958 57	3967 54	4978 50	5985 45
<b>5</b>	919 78	1948 75	2975 72	3998 69	5017 64	6025 60
<b>7</b>	904 109	1947 106	2995 103	4036 99	5066 94	6090 89
<b>9</b>	868 141	1922 137	2982 134	4033 130	5072 124	6101 119
<b>12</b>	815 188	1866 184	2930 180	3998 175	5053 169	6090 162
<b>15</b>	726 235	1791 231	2865 227	3934 221	5002 214	6054 206
<b>20</b>	539 315	1616 310	2699 304	3782 297	4863 289	5928 280
<b>25</b>	335 394	1404 389	2464 382	3542 374	4634 365	5718 354

Flow (GPM)

TORQUE (LB IN) 5718  
SPEED (RPM) 354

238 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TF 0280

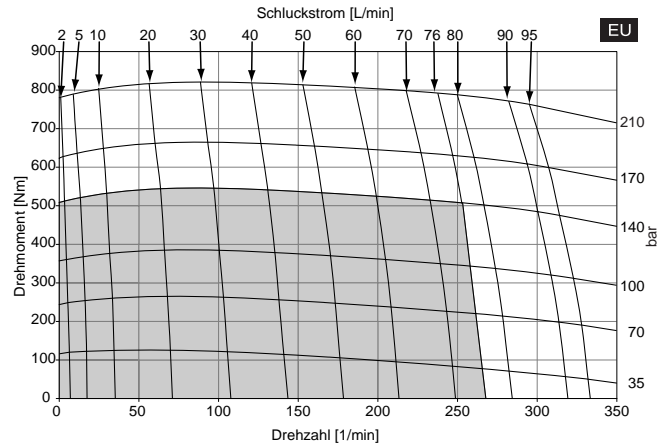
17.1 cu in / rev

	PRESSURE (PSID)					
	500	1000	1500	2000	2500	3000
<b>.5</b>	1048 6	2180 5	3333 4	4508 3	5704 2	
<b>1</b>	1080 13	2237 12	3399 11	4577 9	5762 7	6925 5
<b>2</b>	1120 26	2316 25	3516 23	4726 22	5915 19	7092 17
<b>3</b>	1117 39	2320 38	3528 36	4742 34	5949 32	7134 29
<b>4</b>	1120 53	2337 51	3559 49	4778 47	5988 44	7187 41
<b>5</b>	1109 66	2342 64	3575 62	4802 60	6020 56	7218 53
<b>7</b>	1086 93	2331 91	3582 88	4827 85	6058 81	7266 77
<b>9</b>	1040 120	2299 117	3562 114	4811 111	6048 106	7264 102
<b>12</b>	978 160	2226 157	3494 154	4758 149	6001 144	7217 138
<b>15</b>	888 200	2146 197	3419 193	4688 188	5945 182	7176 175
<b>20</b>	678 267	1945 263	3223 258	4502 252	5777 245	7029 236
<b>25</b>	442 334	1686 330	2938 324	4206 316	5487 308	6754 297

Flow (GPM)

TORQUE (LB IN) 6754  
SPEED (RPM) 297

280 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TF 0360

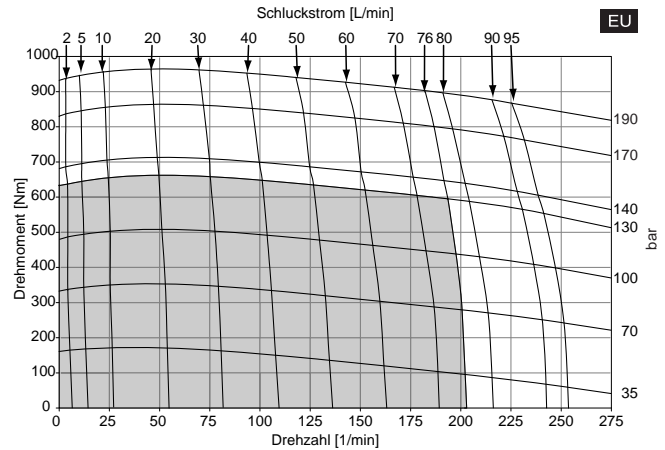
22.2 cu in / rev

	PRESSURE (PSID)							
	500	1000	1500	1850	2000	2500	2750	
<b>.5</b>	1436 5	2955 4	4497 4	5582 4	6047 3	7608 3	8393 3	
<b>1</b>	1492 10	3042 9	4591 9	5672 8	6136 8	7673 8	8445 7	
<b>2</b>	1532 20	3114 19	4691 19	5784 18	6249 18	7799 17	8575 16	
<b>3</b>	1527 30	3114 29	4699 29	5796 28	6263 27	7814 26	8590 25	
<b>4</b>	1526 40	3125 40	4718 38	5821 37	6290 37	7847 35	8624 34	
<b>5</b>	1504 51	3114 50	4719 48	5831 47	6304 46	7866 44	8641 43	
<b>7</b>	1469 71	3090 70	4697 68	5809 66	6282 66	7850 63	8630 61	
<b>9</b>	1392 92	3017 90	4640 88	5766 86	6243 85	7817 81	8595 79	
<b>12</b>	1279 122	2902 120	4526 117	5653 115	6133 113	7712 109	8493 106	
<b>15</b>	1106 153	2739 151	4385 147	5518 144	5999 142	7578 139	8355 134	
<b>20</b>	840 204	2465 202	4115 197	5256 193	5735 191	7329 184	8121 180	
<b>25</b>	516 255	2138 253	3756 248	4876 243	5356 240	6976 232	7785 226	

Flow (GPM)

TORQUE (LB IN) 7785  
SPEED (RPM) 226

364 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst beo 54°C. Geringfügige Abweichungen von den Katalogerten sond möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipcos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TF 0405

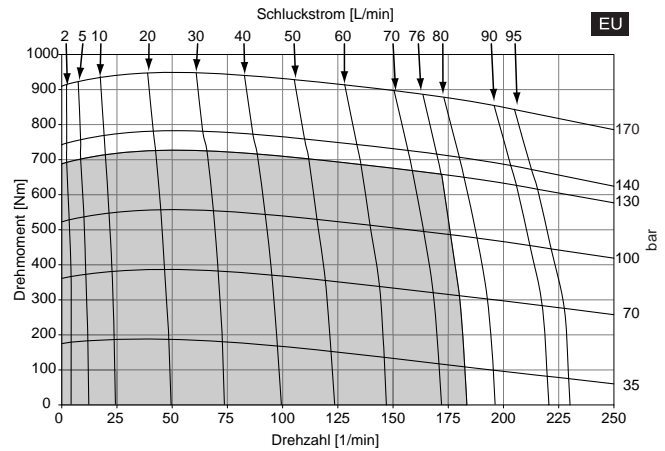
24.7 cu in / rev

	PRESSURE (PSID)					
	500	1000	1500	1850	2000	2500
<b>.5</b>	1567 4	3212 4	4883 3	6075 2	6587 2	8325 2
<b>1</b>	1623 9	3298 8	4972 7	6151 6	6660 6	8371 5
<b>2</b>	1662 18	3377 17	5103 16	6306 14	6815 14	8507 12
<b>3</b>	1665 27	3392 26	5118 24	6325 23	6839 22	8554 20
<b>4</b>	1667 37	3414 35	5155 33	6367 32	6880 31	8591 28
<b>5</b>	1652 46	3417 44	5171 42	6393 40	6909 39	8625 36
<b>7</b>	1623 64	3399 62	5163 60	6392 58	6912 56	8638 53
<b>9</b>	1549 83	3337 81	5125 78	6361 75	6883 73	8605 69
<b>12</b>	1432 111	3216 108	5006 104	6252 101	6779 99	8523 94
<b>15</b>	1259 138	3059 136	4866 131	6113 128	6644 126	8394 120
<b>20</b>	936 185	2735 182	4542 177	5800 172	6335 170	8106 162
<b>25</b>	657 231	2435 229	4187 222	5418 217	5945 214	7709 205

Flow (GPM)

TORQUE (LB IN) 7709  
SPEED (RPM) 205

405 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TF 0475

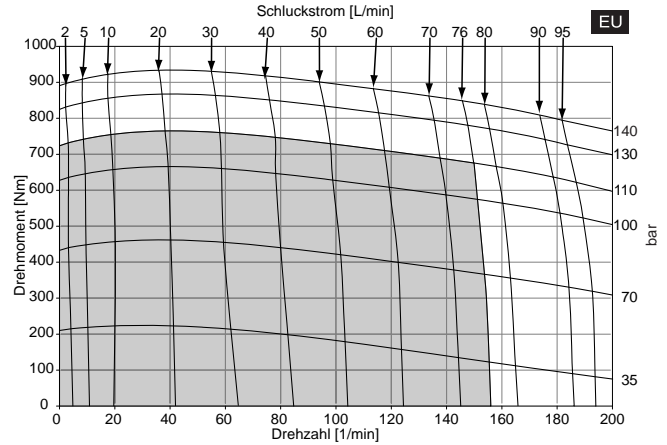
29.1 cu in / rev

477 cc / rev

	PRESSURE (PSID)					
	500	1000	1500	1645	1850	2000
<b>.5</b>	1870 4	3857 3	5875 3	6460 3	7292 2	7902 2
<b>1</b>	1941 8	3967 7	5992 7	6582 6	7410 6	8016 6
<b>2</b>	2003 15	4071 15	6124 14	6717 14	7554 13	8166 13
<b>3</b>	1994 23	4072 23	6145 22	6738 21	7578 20	8192 20
<b>4</b>	1993 31	4091 30	6177 29	6776 28	7620 27	8235 27
<b>5</b>	1964 39	4081 38	6186 37	6790 36	7639 35	8258 34
<b>7</b>	1918 55	4048 54	6159 52	6765 51	7620 50	8242 48
<b>9</b>	1829 70	3965 59	6098 67	6709 66	7565 64	8189 63
<b>12</b>	1694 94	3822 92	5954 89	6575 89	7440 87	8063 85
<b>15</b>	1462 117	3617 116	5766 112	6385 111	7254 109	7875 107
<b>20</b>	1070 156	3231 154	5394 151	6027 149	6900 147	7530 145
<b>25</b>	711 195	2820 194	4927 190	5531 188	6391 185	7028 183

Flow (GPM)

TORQUE (LB IN) 7028  
SPEED (RPM) 183



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement intermitt. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TF 0365 Clutch Motor

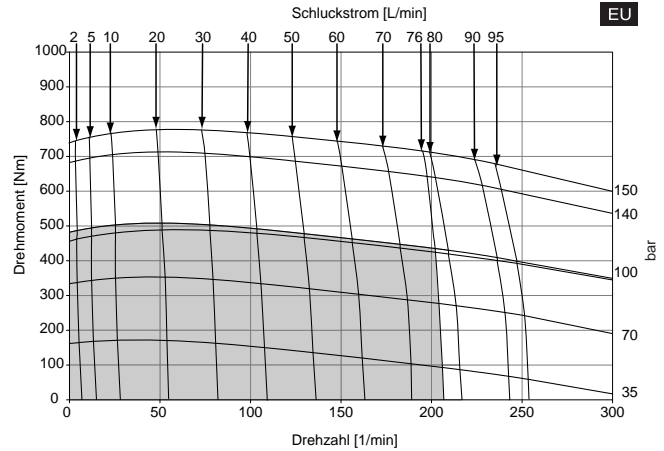
22.2 cu in / rev

364 cc / rev

	PRESSURE (PSID)					
	500	1000	1400	1500	2000	2200
<b>.5</b>	1392 5	2902 4	4131 3	4441 3	6013 2	6653 2
<b>1</b>	1439 10	2972 9	4208 8	4518 8	6090 7	6725 7
<b>2</b>	1478 20	3061 19	4332 18	4651 18	6248 17	6884 16
<b>3</b>	1478 30	3071 29	4349 29	4670 28	6268 27	6906 26
<b>4</b>	1480 41	3089 40	4379 39	4703 38	6311 37	6950 36
<b>5</b>	1467 51	3096 50	4396 49	4720 49	6332 47	6971 46
<b>7</b>	1434 72	3072 70	4384 69	4712 69	6344 66	6990 65
<b>9</b>	1378 92	3031 91	4355 89	4686 89	6322 86	6970 85
<b>12</b>	1278 123	2922 122	4252 120	4585 119	6242 116	6897 115
<b>15</b>	1158 154	2810 152	4139 150	4470 150	6127 146	6787 144
<b>20</b>	873 206	2531 204	3871 202	4206 201	5878 197	6546 194
<b>25</b>	557 258	2197 255	3509 253	3839 252	5498 247	6175 244

Flow (GPM)

TORQUE (LB IN) 6175  
SPEED (RPM) 244



EU

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

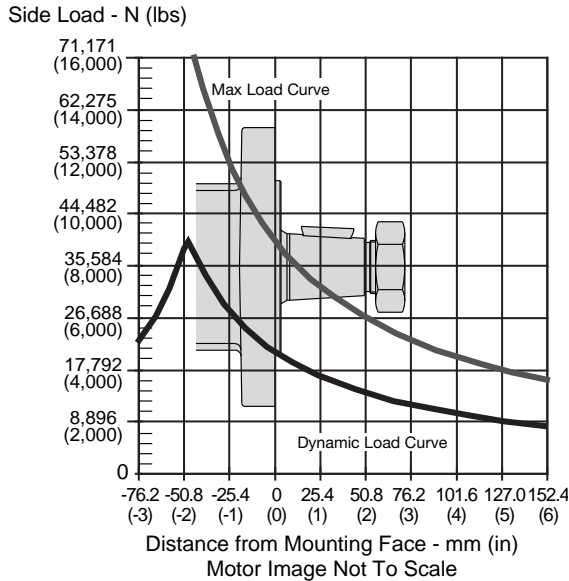
Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.



**Flange Mount / Standardgehäuse**  
**Monture à bride(s) / Montaje de brida**



The dynamic side load curve is based on uni-directional steady state loads for  $L_{10}$  bearing life at  $3 \times 10^6$  revolutions.

Die zulässige auslegbare radiale Wellenbelastungskurve ist unter ruhenden, einseitig statisch gerichteten Lastverhältnissen auf eine  $L_{10}$  Lebensdauer mit  $3 \times 10^6$  Umdrehungen kalkuliert. La courbe de charge latérale permise se base sur des charges unidirectionnelles en régime permanent pour le roulement  $L_{10}$  à  $3 \times 10^6$  révolutions. La curva de valores admisibles de carga lateral está basada en cargas constantes para cojinetes  $L_{10}$  a  $3 \times 10^6$  revoluciones.

**Equation to Calculate the Expected Radial Bearing Life**  
**Gleichung zur Ermittlung der Lagerlebensdauer**

Equation to calculate the dynamic bearing life for a given load:  
 Bestimmung der erlaubten radialen Wellenbelastung mit vorgegebener Last

Use  $F_a$ ,  $F_b$  and S in equation to determine hours of  $L_{10}$  bearing life.  
 Die Lebensdauer in Stunden ergibt sich durch einsetzen von  $F_a$ ,  $F_b$ , und S in die nachstehende Formel.

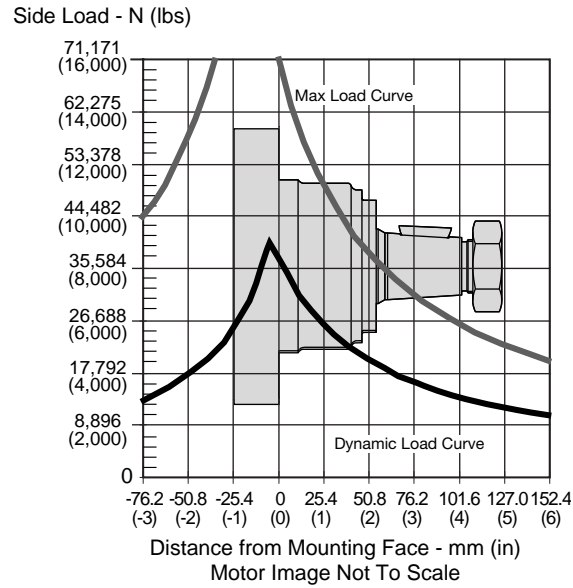
$$L = \frac{3 \times 10^6}{60 \times S} \left\{ \frac{F_a}{F_b} \right\}^{3.33}$$

Where / Mit:

- S = Shaft Speed RPM / Abtriebswellendrehzahl in  $\text{min}^{-1}$
- L = Life In Hours / Lebensdauer in Stunden
- $F_a$  = Dynamic side load defined by above curve at a distance from mounting flange. / Erlaubte radiale Wellenbelastung als Function der Laenge
- $F_b$  = Application side load. / Anwendungsseitige Wellenbelastung

Note: Calculations are based on  $L_{10}$  bearing life per ISO 281.  
 Auslegung basiert auf einer  $L_{10}$  Lebensdauer nach ISO 281.

**Wheel Mount / Radnabengehäuse**  
**Monture à roue / Montaje de rueda**



The maximum load curve is defined by bearing static load capacity. This curve should not be exceeded at any time including shock loads.

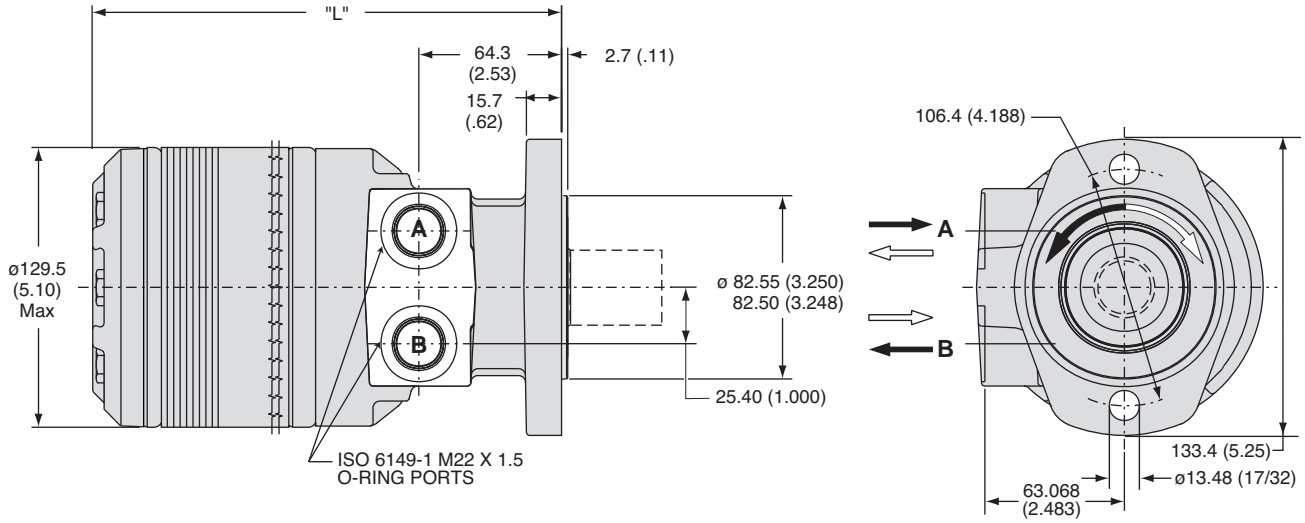
Die maximale radiale Wellenbelastungskurve ist definiert als maximale statische Last ohne Drehzahl. Sie gilt als Grenze und sollte keinesfalls überschritten werden.

La courbe de charge maximale est définie par la capacité de charge statique portante. Cette courbe ne devrait être dépassée en aucun moment y compris pour les charges par à-coups.

La curva de carga máxima queda definida por la capacidad de carga estática del cojinete. No se deben superar los valores de esta curva, ni siquiera con cargas provisionarias de impacto.

**Code: AH**

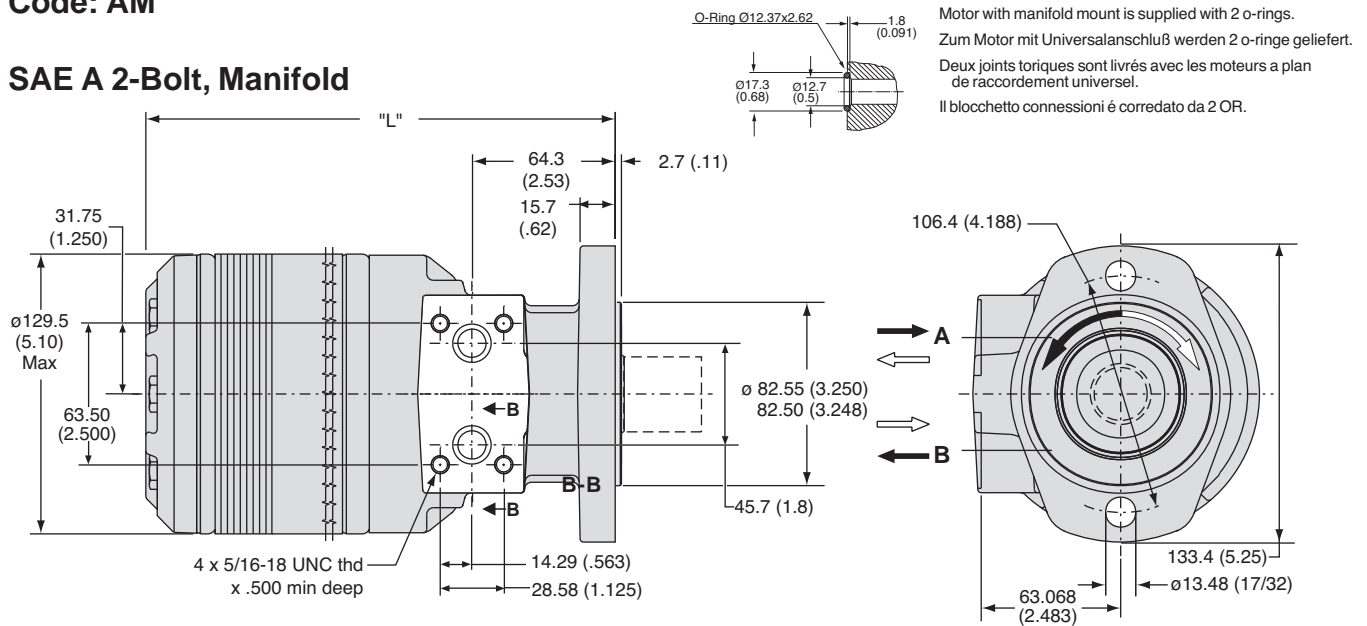
**SAE A 2-Bolt, ISO 6149-1 M22 x 1.5**



Code AH	disp.	0080	0100	0130	0140	0170	0195	0240	0280	0360	0405	0475
Weight/Gewicht	kg	13.6	13.6	13.8	13.9	14.2	14.5	14.9	15.2	16.0	16.5	17.2
Poids/Peso	(lb)	(29.9)	(30.0)	(30.5)	(30.7)	(31.3)	(31.9)	(32.9)	(33.5)	(35.2)	(36.4)	(37.9)
Length	"L" mm	191	191	194	196	199	202	207	211	221	225	234
	"L" (in)	(7.51)	(7.51)	(7.63)	(7.70)	(7.82)	(7.95)	(8.13)	(8.32)	(8.70)	(8.87)	(9.20)

**Code: AM**

**SAE A 2-Bolt, Manifold**



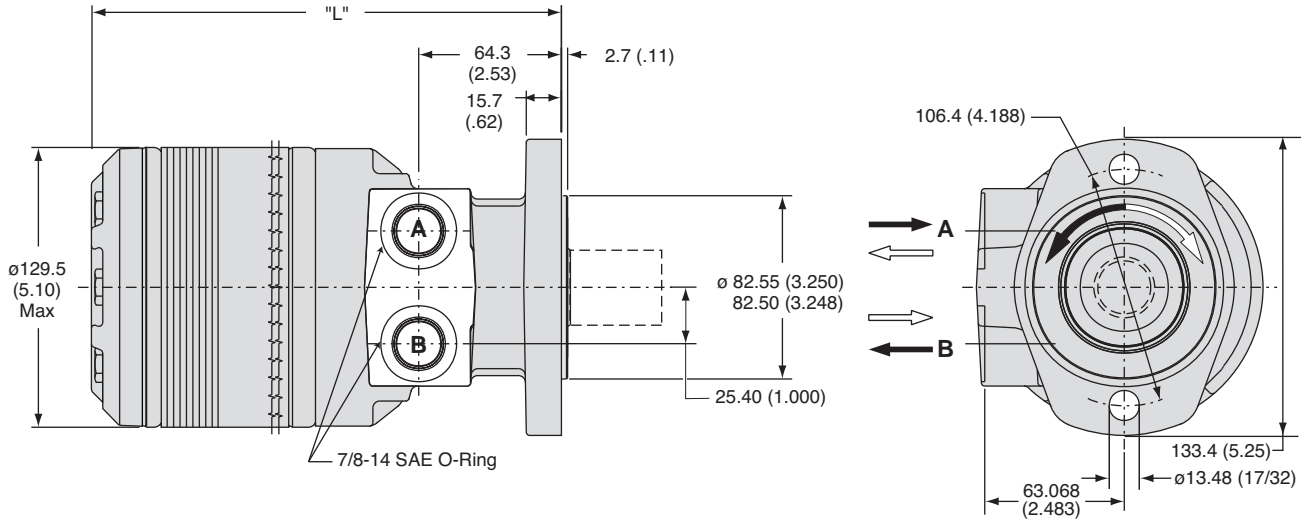
Motor with manifold mount is supplied with 2 o-rings.  
 Zum Motor mit Universalanschluß werden 2 o-ringe geliefert.  
 Deux joints toriques sont livrés avec les moteurs a plan de raccordement universel.  
 Il blocchetto connessioni è correato da 2 OR.

Code AM	disp.	0080	0100	0130	0140	0170	0195	0240	0280	0360	0405	0475
Weight/Gewicht	kg	13.6	13.6	13.8	13.9	14.2	14.5	14.9	15.2	16.0	16.5	17.2
Poids/Peso	(lb)	(29.9)	(30.0)	(30.5)	(30.7)	(31.3)	(31.9)	(32.9)	(33.5)	(35.2)	(36.4)	(37.9)
Length	"L" mm	191	191	194	196	199	202	207	211	221	225	234
	"L" (in)	(7.51)	(7.51)	(7.63)	(7.70)	(7.82)	(7.95)	(8.13)	(8.32)	(8.70)	(8.87)	(9.20)

English equivalents for metric specifications are shown in ( ).

**Code: AS**

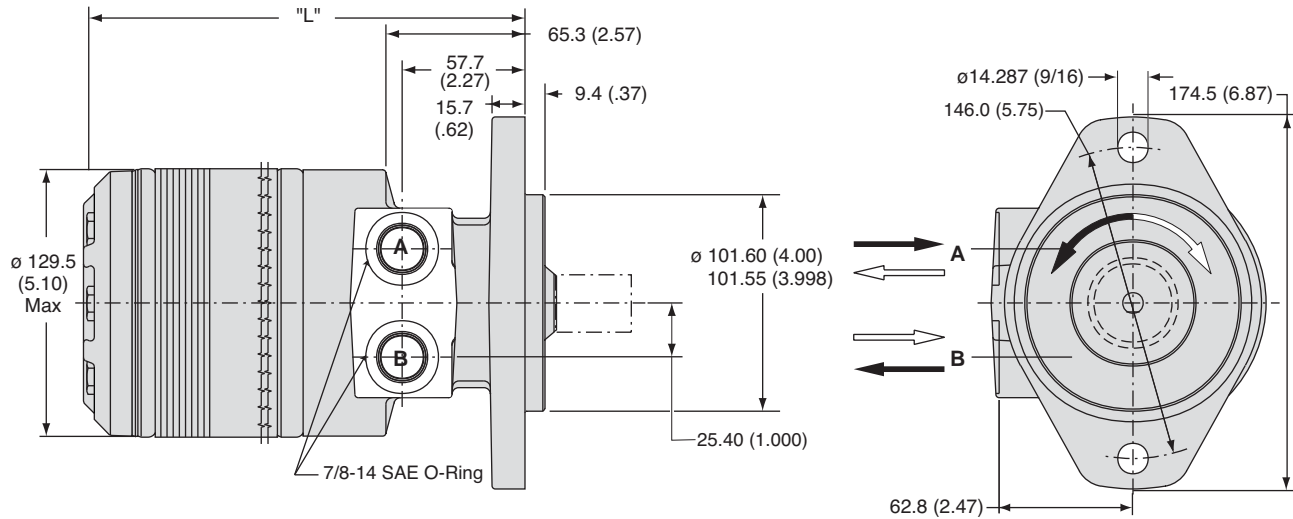
**SAE A 2-Bolt, 7/8-14 SAE O-Ring**



Code AS	disp.	0080	0100	0130	0140	0170	0195	0240	0280	0360	0405	0475
Weight/Gewicht	kg	13.6	13.6	13.8	13.9	14.2	14.5	14.9	15.2	16.0	16.5	17.2
Poids/Peso	(lb)	(29.9)	(30.0)	(30.5)	(30.7)	(31.3)	(31.9)	(32.9)	(33.5)	(35.2)	(36.4)	(37.9)
Length	"L" mm	191	191	194	196	199	202	207	211	221	225	234
	"L" (in)	(7.51)	(7.51)	(7.63)	(7.70)	(7.82)	(7.95)	(8.13)	(8.32)	(8.70)	(8.87)	(9.20)

**Code: BS**

**SAE B 2-Bolt, 7/8-14 SAE O-Ring**



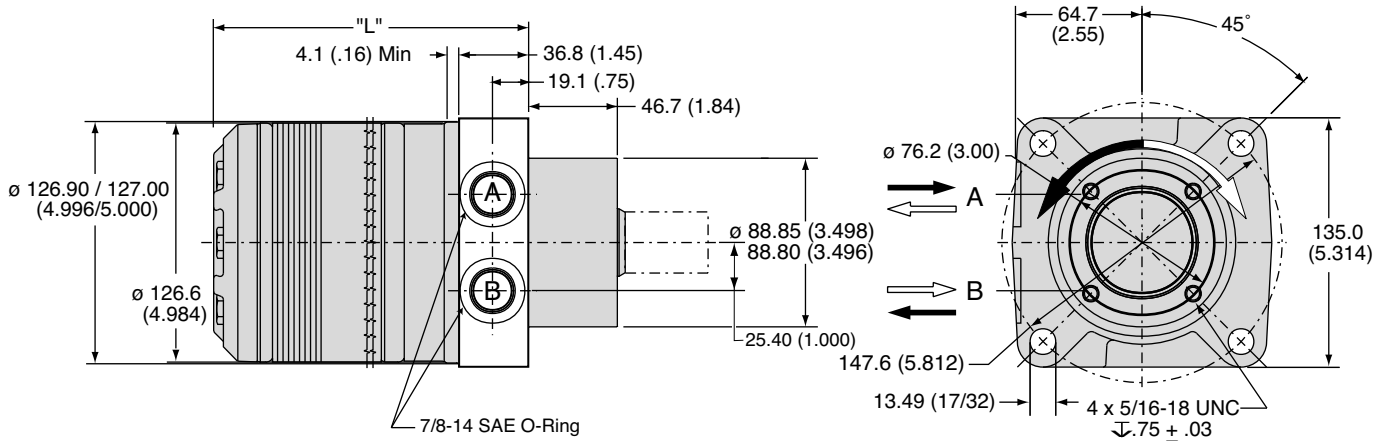
Code BS	disp.	0080	0100	0130	0140	0170	0195	0240	0280	0360	0405	0475
Weight/Gewicht	kg	14.2	14.2	14.5	14.6	14.8	15.1	15.5	15.8	16.6	17.1	17.8
Poids/Peso	(lb)	(31.3)	(31.4)	(31.9)	(32.1)	(32.7)	(33.3)	(34.3)	(34.9)	(36.6)	(37.8)	(39.3)
Length	"L" mm	184	184	187	189	192	195	200	205	214	218	227
	"L" (in)	(7.25)	(7.25)	(7.37)	(7.44)	(7.56)	(7.69)	(7.87)	(8.06)	(8.44)	(8.60)	(8.94)

English equivalents for metric specifications are shown in ( ).

008 TF.indd, js

**Code: LS**

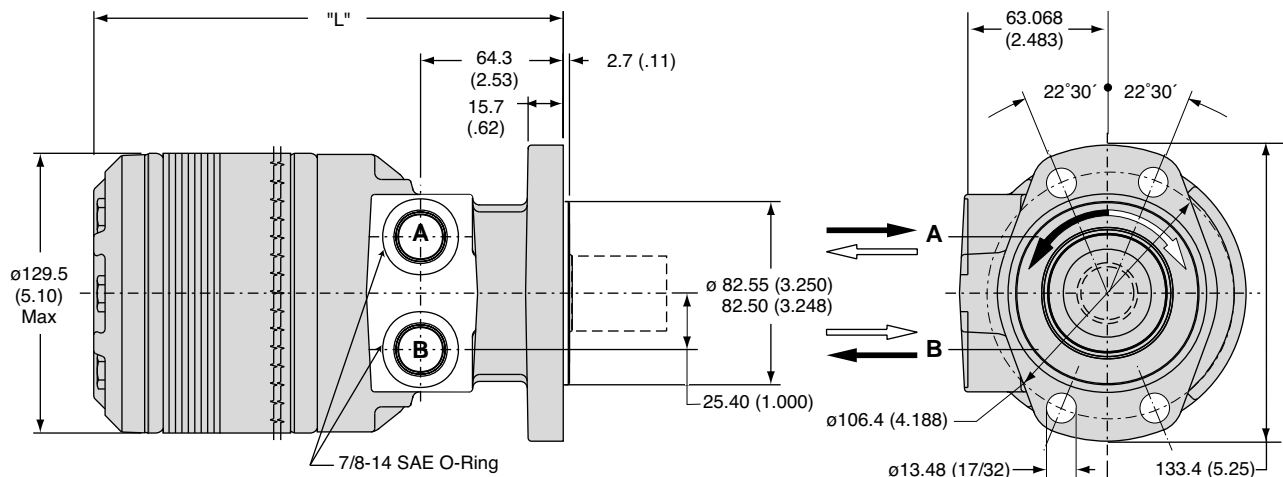
**Wheel, Front Brake Nose**



Code LS	disp.	0080	0100	0130	0140	0170	0195	0240	0280	0360	0405	0475
Weight/Gewicht	kg	14.0	14.0	14.2	14.3	14.6	14.9	15.3	15.6	16.3	17.0	17.5
Poids/Peso	(lb)	(30.9)	(30.9)	(31.2)	(31.5)	(32.1)	(32.9)	(33.7)	(34.4)	(35.9)	(37.5)	(38.6)
Length	"L" mm	146	146	149	151	154	157	162	167	175	180	189
	"L" (in)	(5.73)	(5.73)	(5.85)	(5.92)	(6.04)	(6.17)	(6.35)	(6.54)	(6.92)	(7.08)	(7.42)

**Code: MS**

**Magneto, 7/8-14 SAE O-Ring**



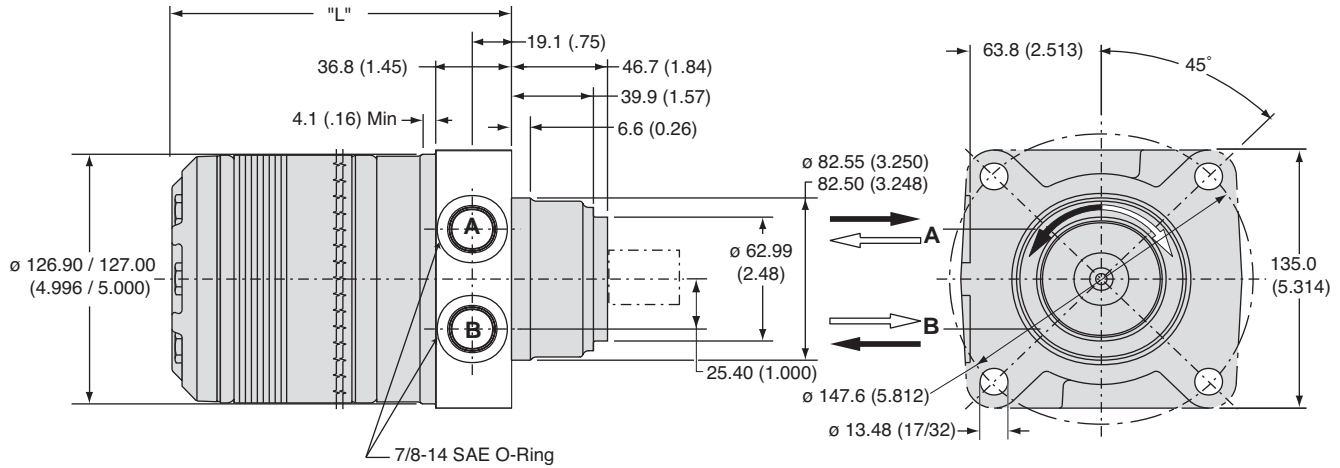
Code MS	disp.	0080	0100	0130	0140	0170	0195	0240	0280	0360	0405	0475
Weight/Gewicht	kg	13.6	13.6	13.8	13.9	14.2	14.5	14.9	15.2	16.0	16.5	17.2
Poids/Peso	(lb)	(29.9)	(30.0)	(30.5)	(30.7)	(31.3)	(31.9)	(32.9)	(33.5)	(35.2)	(36.4)	(37.9)
Length	"L" mm	191	191	194	196	199	202	207	211	221	225	234
	"L" (in)	(7.51)	(7.51)	(7.63)	(7.70)	(7.82)	(7.95)	(8.13)	(8.32)	(8.70)	(8.87)	(9.20)

English equivalents for metric specifications are shown in ( ).

008 TF.indd, js

**Code: US**

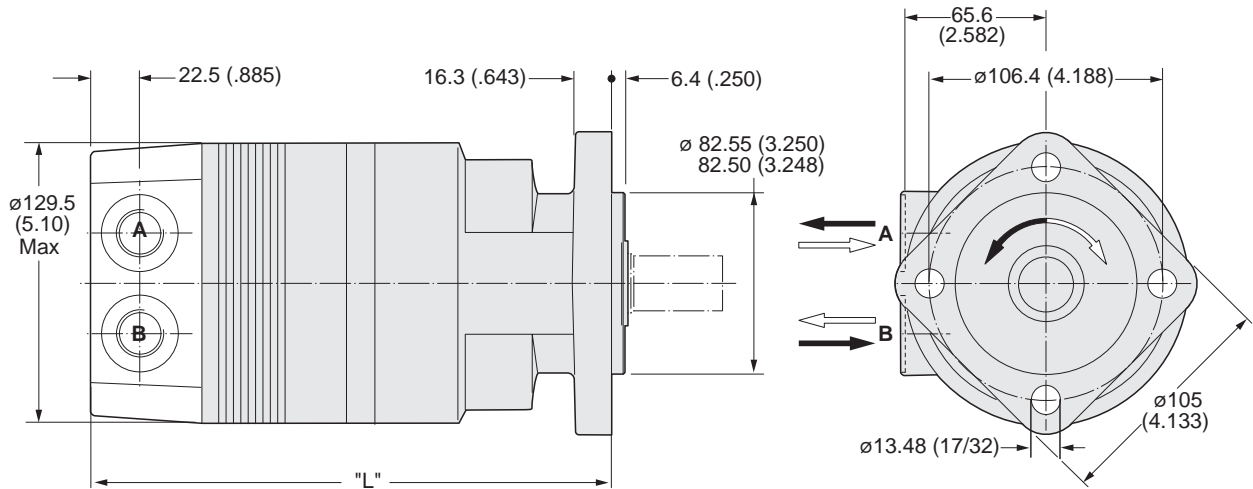
**Wheel, Standard, 7/8-14 SAE O-Ring**



Code US	disp.	0080	0100	0130	0140	0170	0195	0240	0280	0360	0405	0475
<b>Weight/Gewicht</b>	<b>kg</b>	<b>13.9</b>	<b>13.9</b>	<b>14.2</b>	<b>14.3</b>	<b>14.5</b>	<b>14.8</b>	<b>15.2</b>	<b>15.5</b>	<b>16.3</b>	<b>16.9</b>	<b>17.5</b>
<b>Poids/Peso</b>	<b>(lb)</b>	<b>(30.6)</b>	<b>(30.7)</b>	<b>(31.2)</b>	<b>(31.5)</b>	<b>(32.0)</b>	<b>(32.7)</b>	<b>(33.6)</b>	<b>(34.2)</b>	<b>(35.9)</b>	<b>(37.2)</b>	<b>(38.6)</b>
<b>Length</b>	<b>"L" mm</b>	<b>146</b>	<b>146</b>	<b>149</b>	<b>151</b>	<b>154</b>	<b>157</b>	<b>162</b>	<b>167</b>	<b>176</b>	<b>180</b>	<b>189</b>
	<b>"L" (in)</b>	<b>(5.73)</b>	<b>(5.73)</b>	<b>(5.85)</b>	<b>(5.92)</b>	<b>(6.04)</b>	<b>(6.17)</b>	<b>(6.35)</b>	<b>(6.54)</b>	<b>(6.92)</b>	<b>(7.08)</b>	<b>(7.42)</b>

**Code: VB**

**SAE A 4-Bolt, 7/8-14 SAE Rear Port**



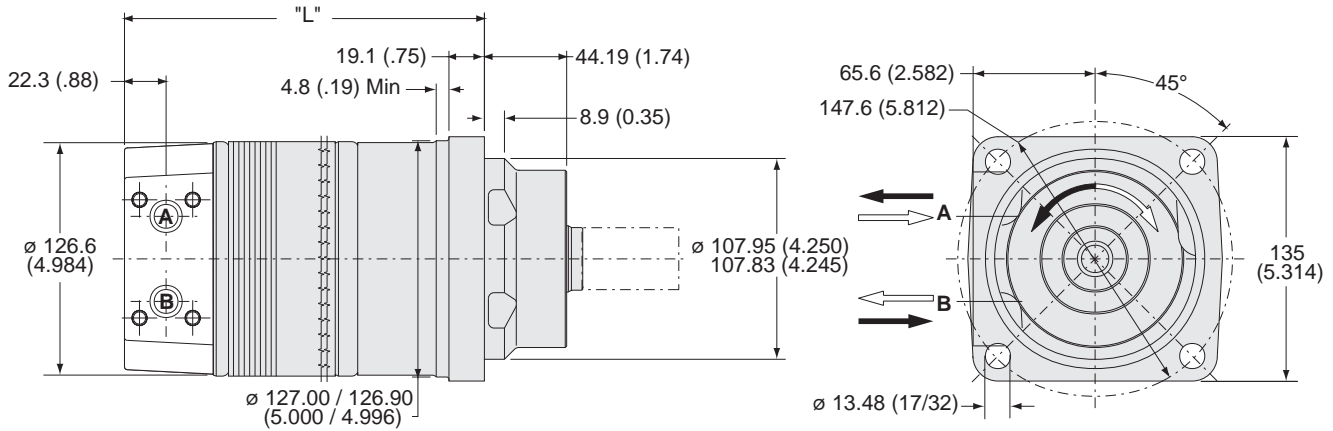
Code VB	disp.	0080	0100	0130	0140	0170	0195	0240	0280	0360	0405	0475
<b>Weight/Gewicht</b>	<b>kg</b>	<b>14.0</b>	<b>14.0</b>	<b>14.2</b>	<b>14.3</b>	<b>14.6</b>	<b>14.9</b>	<b>15.3</b>	<b>15.6</b>	<b>16.3</b>	<b>17.0</b>	<b>17.5</b>
<b>Poids/Peso</b>	<b>(lb)</b>	<b>(30.9)</b>	<b>(30.9)</b>	<b>(31.2)</b>	<b>(31.5)</b>	<b>(32.1)</b>	<b>(32.9)</b>	<b>(33.7)</b>	<b>(34.4)</b>	<b>(35.9)</b>	<b>(37.5)</b>	<b>(38.6)</b>
<b>Length</b>	<b>"L" mm</b>	<b>213</b>	<b>213</b>	<b>216</b>	<b>218</b>	<b>221</b>	<b>224</b>	<b>229</b>	<b>233</b>	<b>242</b>	<b>247</b>	<b>256</b>
	<b>"L" (in)</b>	<b>(8.39)</b>	<b>(8.39)</b>	<b>(8.49)</b>	<b>(8.60)</b>	<b>(8.70)</b>	<b>(8.82)</b>	<b>(9.02)</b>	<b>(9.17)</b>	<b>(9.53)</b>	<b>(9.72)</b>	<b>(10.08)</b>

English equivalents for metric specifications are shown in ( ).

008 TF.indd, js

**Code: WE**

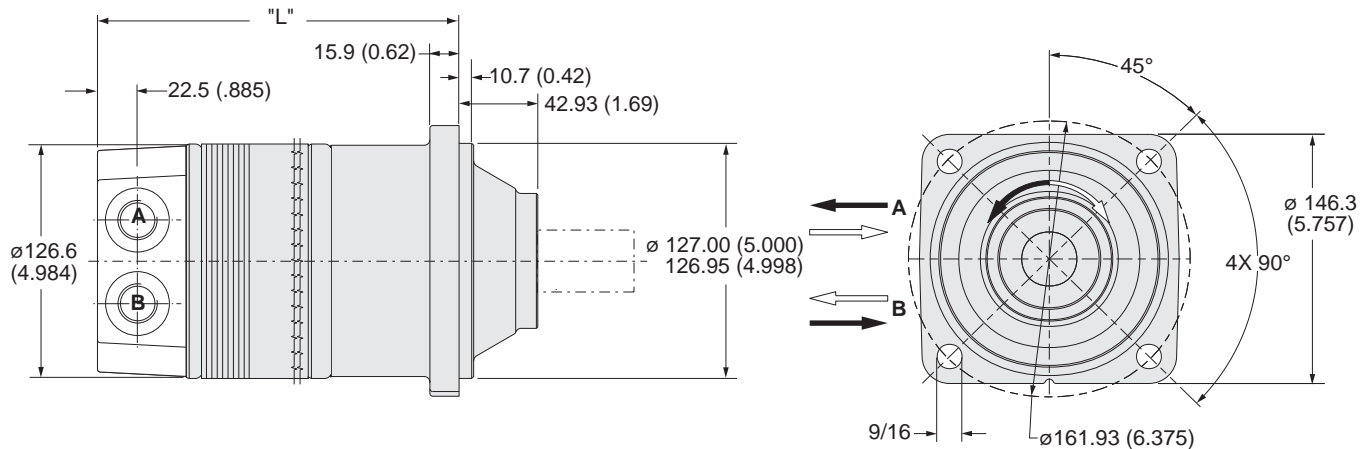
**Wheel, Optional, Manifold Rear Port**



Code WB	disp.	0080	0100	0130	0140	0170	0195	0240	0280	0360	0405	0475
Weight/Gewicht Poids/Peso	kg	16.9	16.9	17.2	17.3	17.5	17.8	18.2	18.5	19.3	19.8	20.5
	lb	37.2	37.3	37.8	38.0	38.6	39.2	40.2	40.8	42.5	43.7	45.2
Length	"L" mm	173	173	176	178	181	184	189	194	203	207	216
	"L" in	6.80	6.80	6.93	6.99	7.11	7.24	7.43	7.61	7.99	8.15	8.49

**Code: DB**

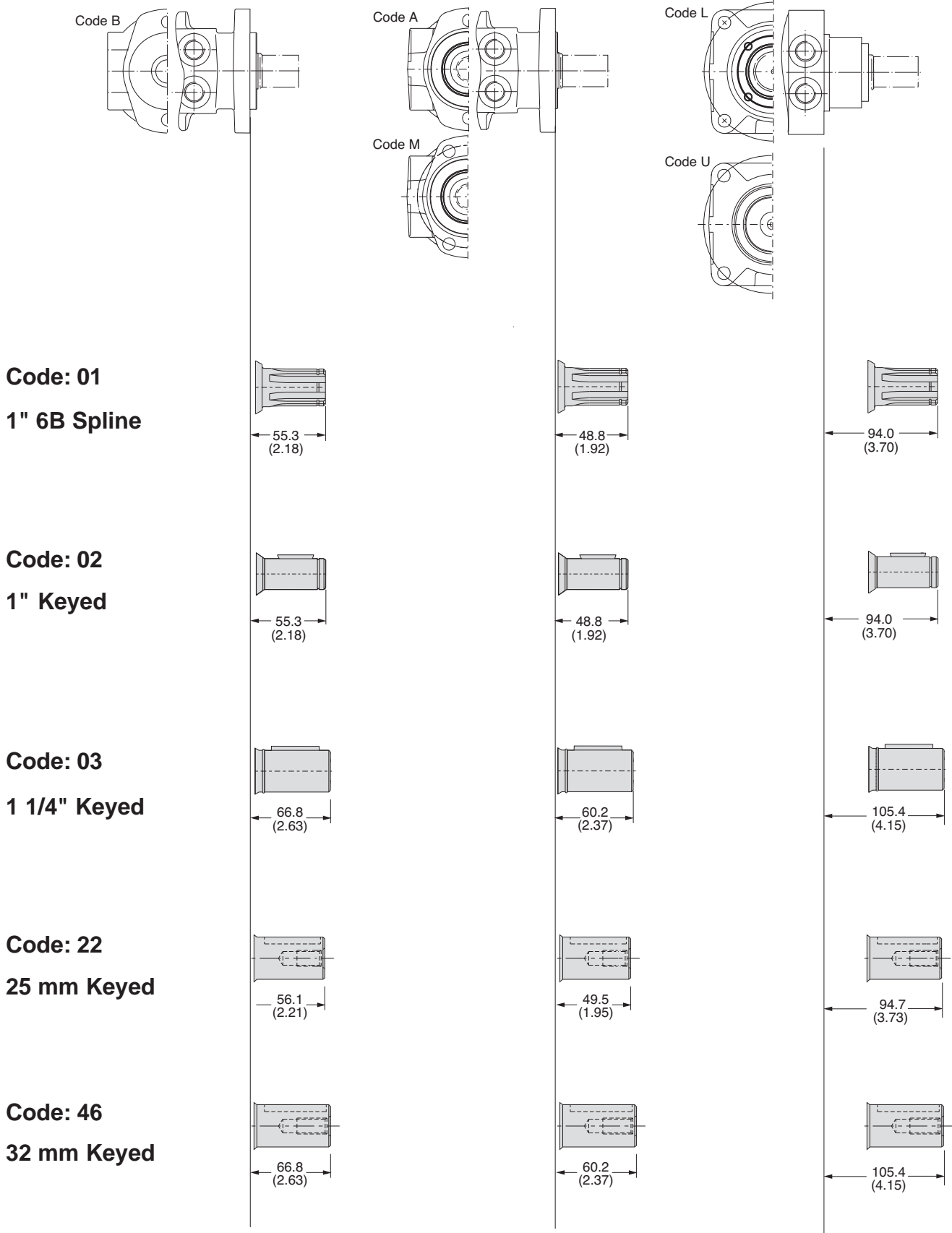
**Large Wheel Mount, 7/8-14 SAE Rear Port**



Code DB	disp.	0080	0100	0130	0140	0170	0195	0240	0280	0360	0405	0475
Weight/Gewicht Poids/Peso	kg	16.9	16.9	17.2	17.3	17.5	17.8	18.2	18.5	19.3	19.8	20.5
	lb	37.2	37.3	37.8	38.0	38.6	39.2	40.2	40.8	42.5	43.7	45.2
Length	"L" mm	173	173	176	179	182	185	190	195	201	209	217
	"L" (in)	(6.81)	(6.81)	(6.91)	(7.04)	(7.17)	(7.29)	(7.48)	(7.67)	(7.91)	(8.21)	(8.54)

English equivalents for metric specifications are shown in ( ).

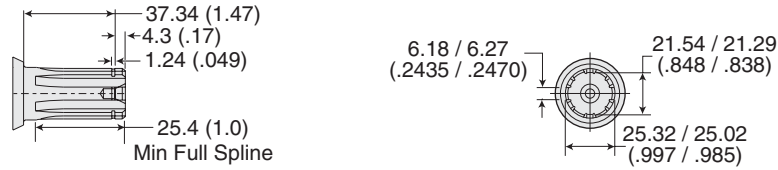
008 TF.indd, js



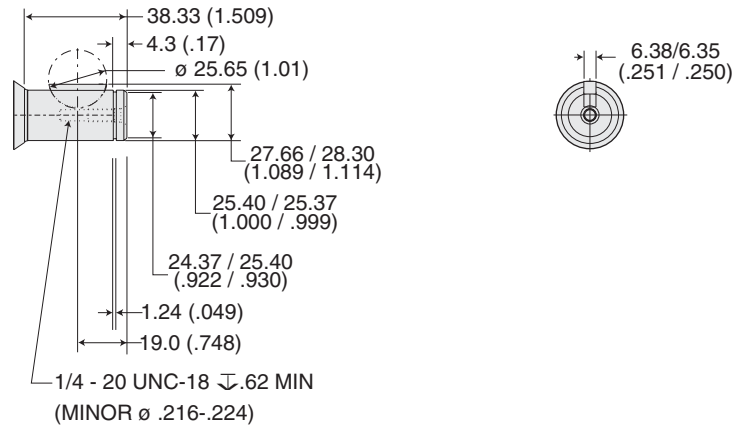
English equivalents for metric specifications are shown in ( ).

008 TF.indd, js

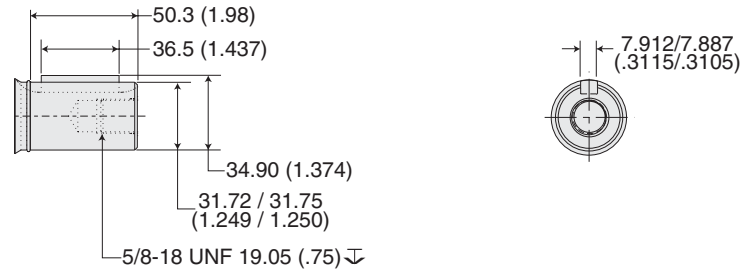
Code: 01  
1" 6B Spline



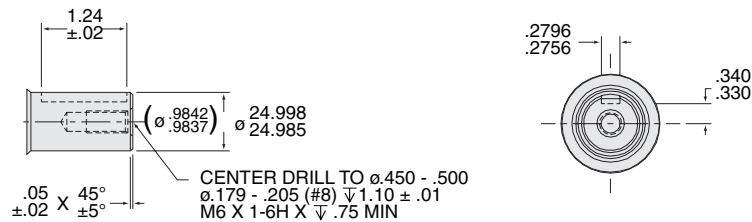
Code: 02  
1" Keyed



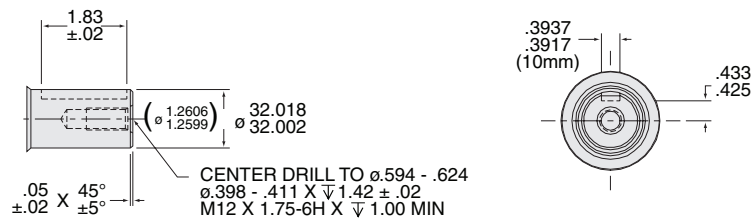
Code: 03  
1 1/4" Keyed



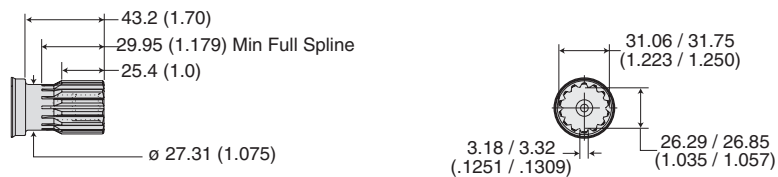
Code: 22  
25 mm Keyed



Code: 46  
32 mm Keyed



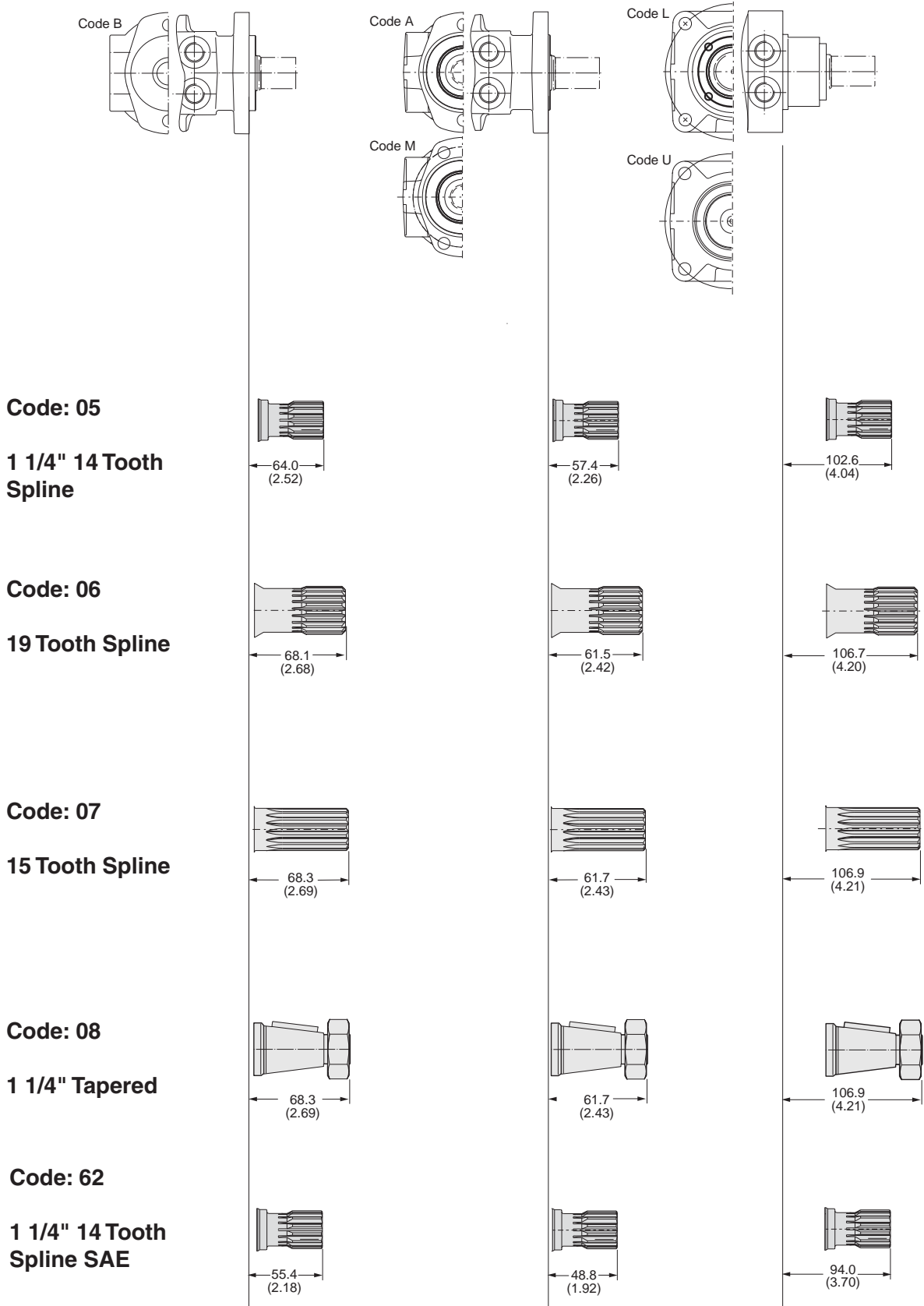
Code: 62  
1 1/4" 14 Tooth Spline SAE



English equivalents for metric specifications are shown in ( ).

008 TF.indd, js

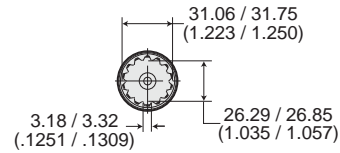
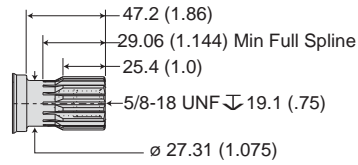




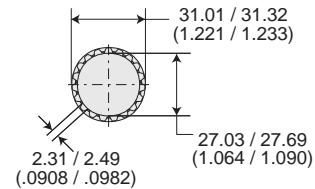
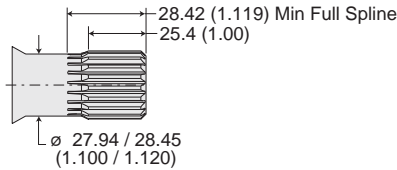
English equivalents for metric specifications are shown in ( ).

008 TF.indd, js

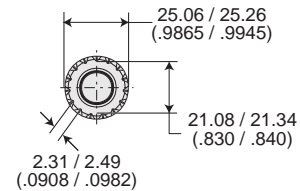
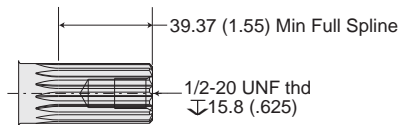
**Code: 05**  
**1 1/4" 14 Tooth Spline**



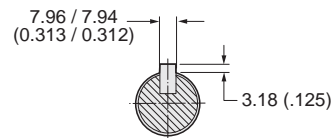
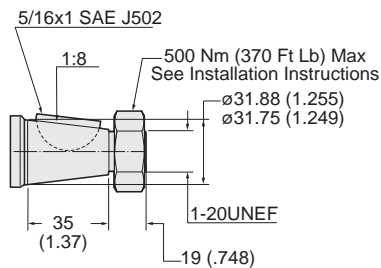
**Code: 06**  
**19 Tooth Spline**



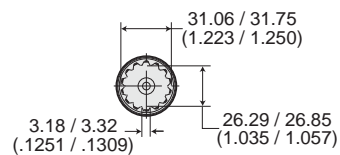
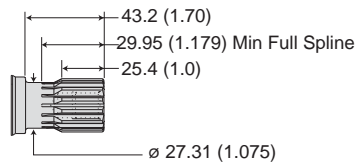
**Code: 07**  
**15 Tooth Spline**



**Code: 08**  
**1 1/4" Tapered**



**Code: 62**  
**1 1/4" 14 Tooth Spline SAE**

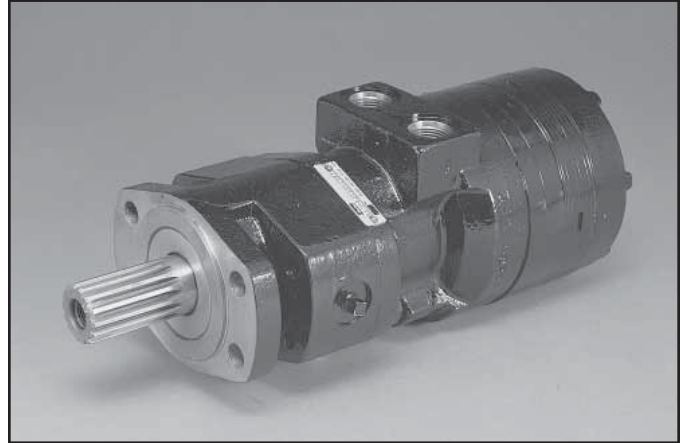


English equivalents for metric specifications are shown in ( ).

008 TF.indd, js

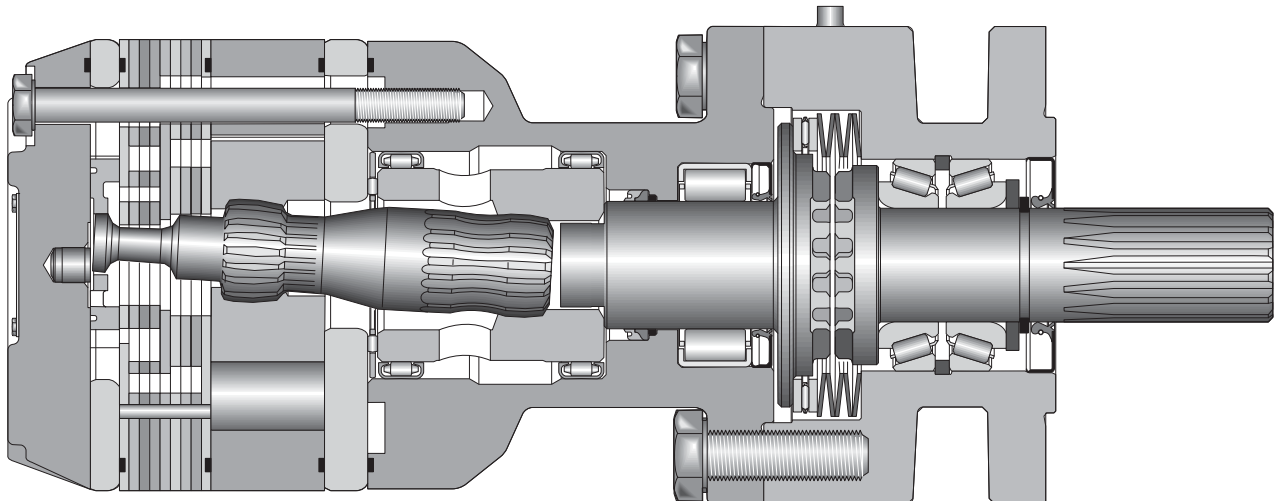
9 Displacements 9 Schluckvolumen 9 Cylindrée 9 Despazamientos	(4.9 - 22.2 in <sup>3</sup> /rev) 81 . . . 364 cm <sup>3</sup> /rev
Maximum Pressure Eingangsdruk Pression entrée Presion Maxima	Cont. (3000 psid) Int. (4000 psid) . . . 207 bar . . . 276 bar
Maximum Oil Flow Schluckstrom Débit d'huile Caudal Maximo de Aceite	(25 gpm) . . . 95 lpm
Maximum Speed Drehzahl Vitesse de rotation Velocidad Maxima	(749 rpm) 749 rpm
Maximum Torque MaxDrehmoment Couple Torque Maximo	Cont. (4502 lb in) Int. (7029 lb in) 509 Nm 794 Nm

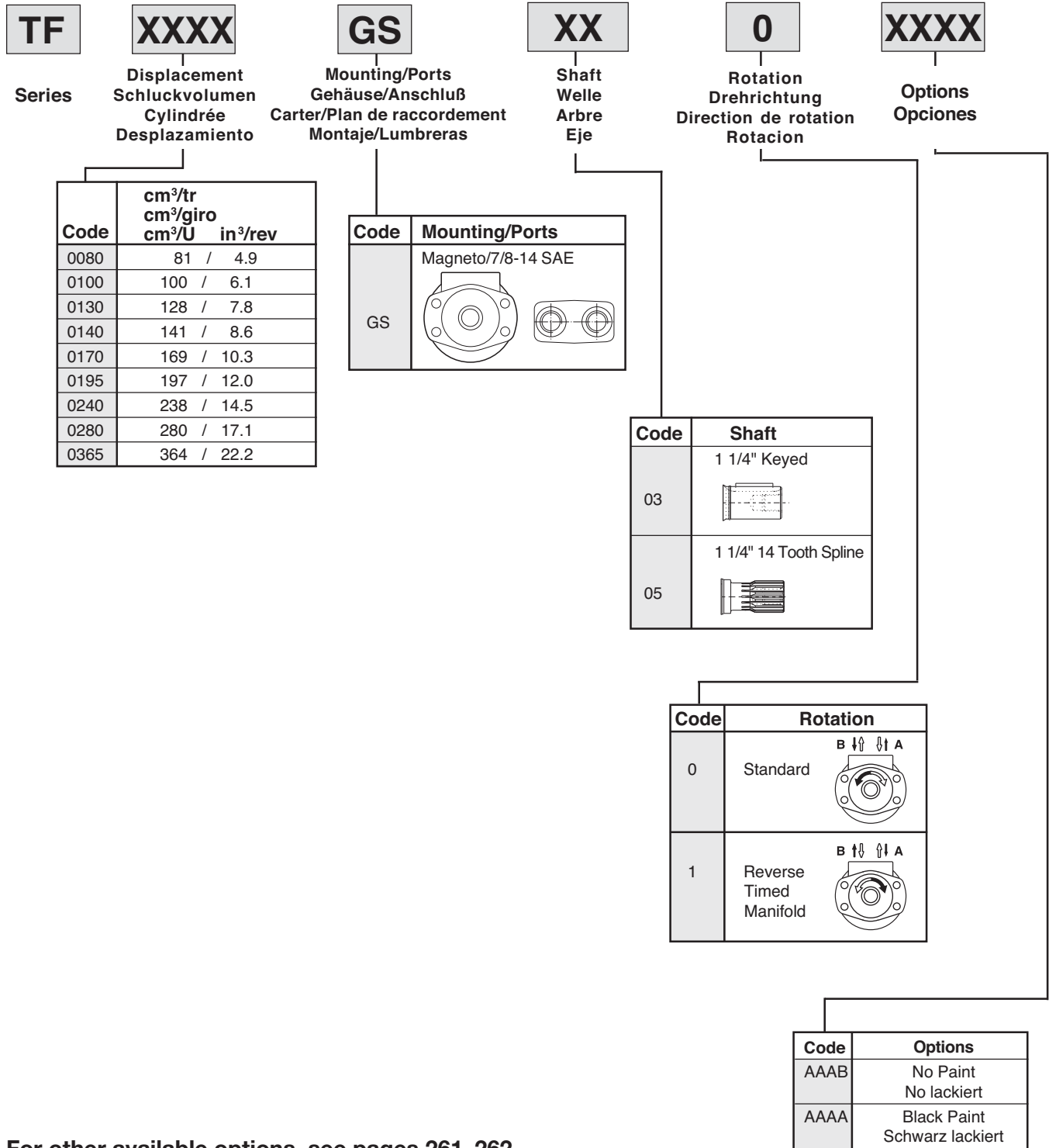
The Clutch Motor consists of a TF Series motor separated from the output shaft by a face spline coupling. The coupling is held apart by springs, disconnecting the motor from the output shaft, allowing the output shaft to freewheel. When hydraulic pressure is applied to either motor port, the springs separating the coupling are overcome and the motor is coupled to the output shaft.



Notes:

- 1) It is not recommended to engage the clutch while the output shaft is rotating.
- 2) Clutch may not disengage if there is residual torque on output shaft when pressure is lost at motor ports.
- 3) Minimum pressure to engage clutch - 200 PSI.
- 4) To assure clutch disengagement, pressure at motor ports must be below 60 PSI.
- 5) Shaft will freewheel when pressure is lost at motor ports whether by design or inadvertently. The possibility of unplanned freewheeling should be considered in the design of the system.
- 6) If applicable, contact factory for radial load capacity.

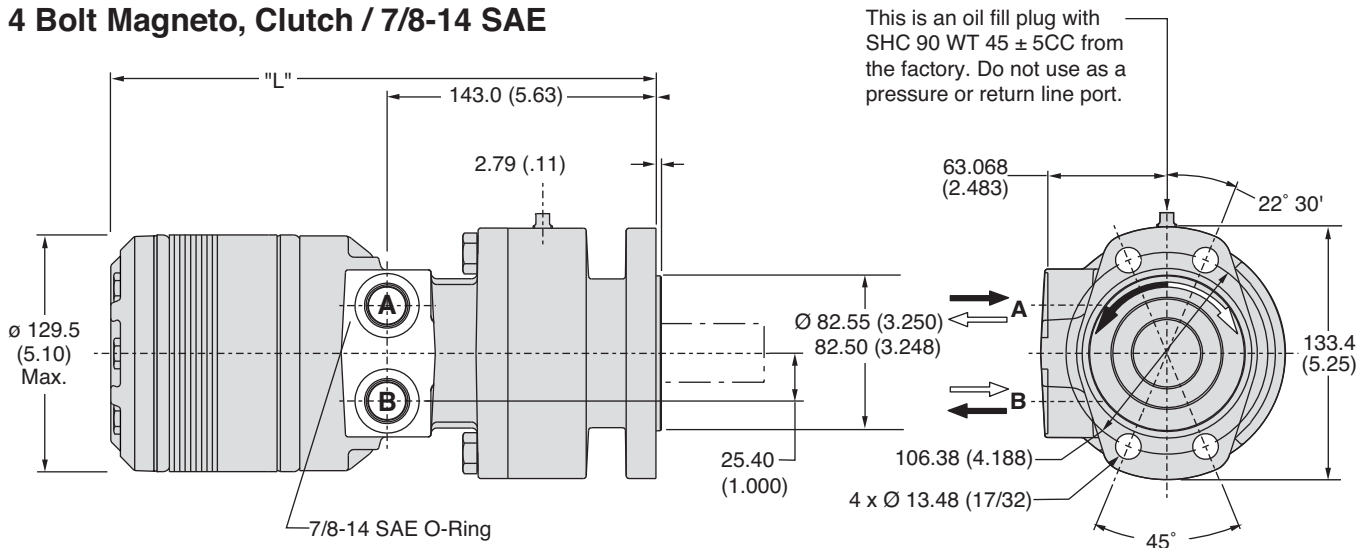




For other available options, see pages 261–262.

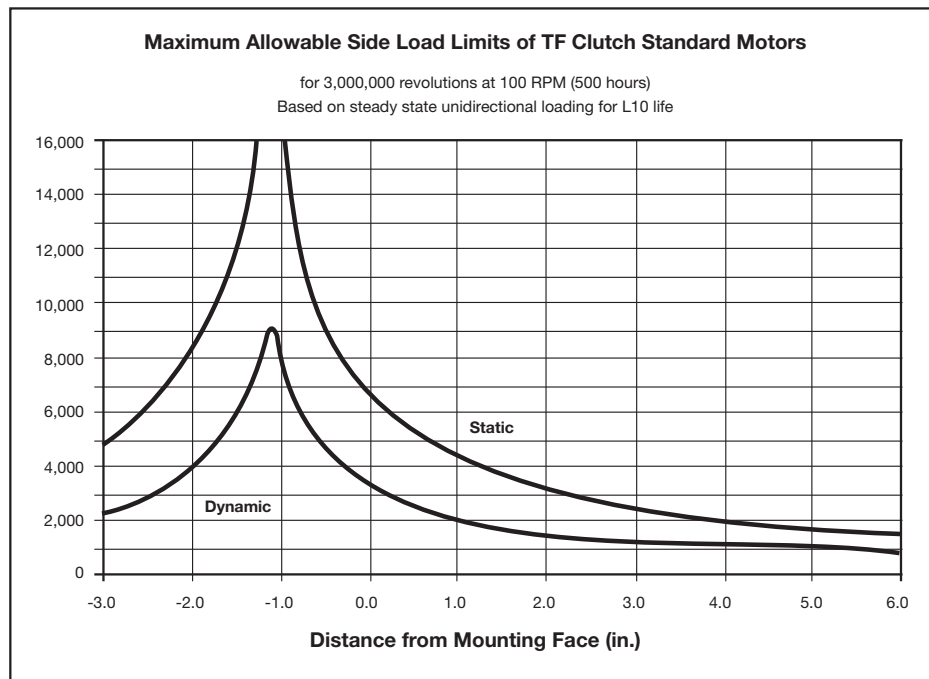
Code: GS

4 Bolt Magneto, Clutch / 7/8-14 SAE



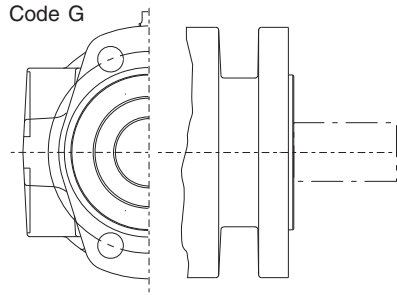
Code GS	disp.	0080	0100	0130	0140	0170	0195	0240	0280	0365
Weight/Gewicht	kg	17.9	17.9	18.1	18.2	18.5	18.8	19.2	19.5	20.3
Poids/Peso	(lb)	(39.3)	(39.4)	(39.9)	(40.1)	(40.7)	(41.3)	(42.3)	(42.9)	(44.6)
Length	"L" mm	270	270	273	275	278	281	286	290	300
	"L" (in)	(10.61)	(10.61)	(10.73)	(10.80)	(10.92)	(11.05)	(11.23)	(11.42)	(11.80)

For performance data curves, see TF section.



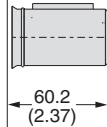
English equivalents for metric specifications are shown in ( ).

009 TF Clutch.indd, js



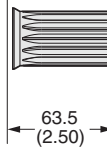
**Code: 03**

**1 1/4" Keyed**



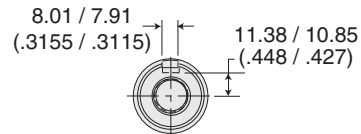
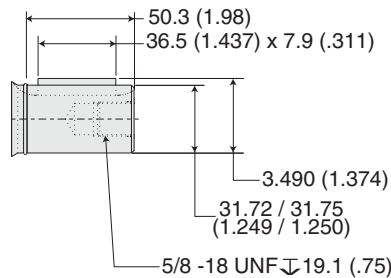
**Code: 05**

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



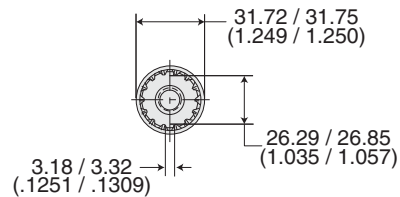
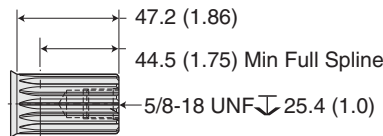
**Code: 03**

**1 1/4" Keyed**



**Code: 05**

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



English equivalents for metric specifications are shown in ( ).

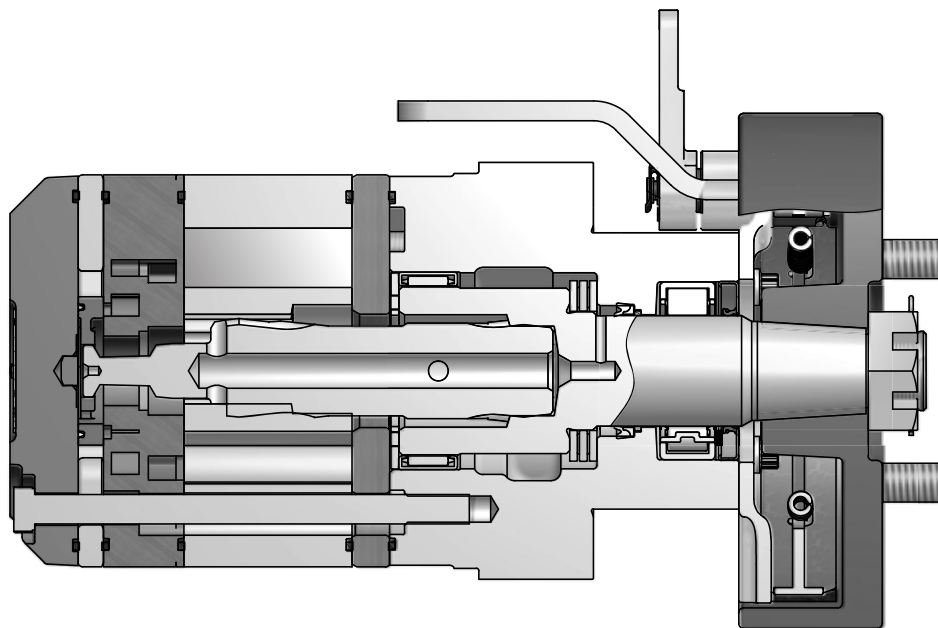
009 TF Clutch.indd, js

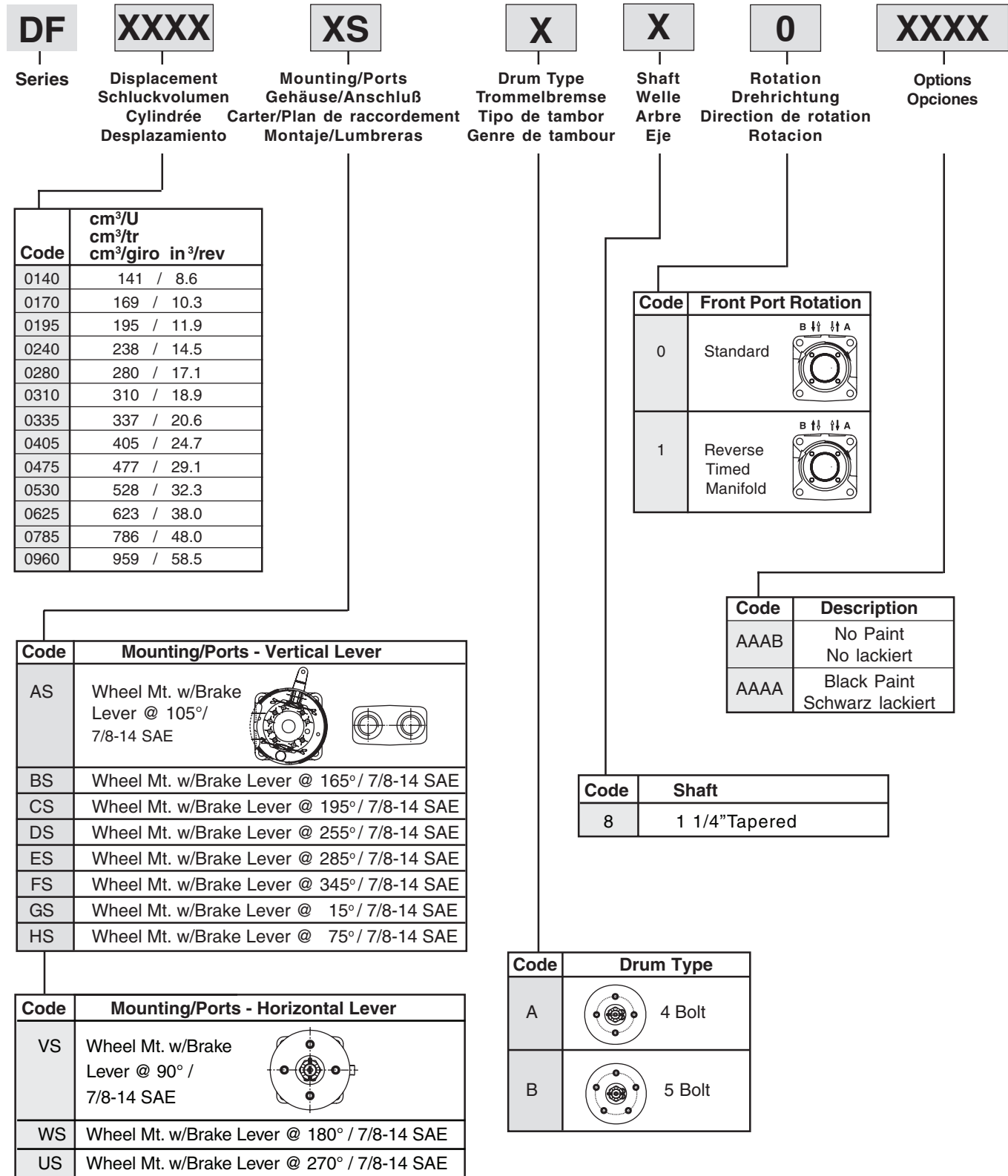
11 Displacements	(4.9 - 29.1 in <sup>3</sup> /rev)	
11 Schluckvolumen	81 . . . 477 cm <sup>3</sup> /rev	
11 Cylindrée		
11 Desplazamientos		
	<b>Cont.</b>	<b>Int.</b>
Maximum Pressure	(3000 psid)	(4000 psid)
Eingangsdruck	. . . 207 bar	. . . 276 bar
Pression entrée		
Presion Maxima		
Maximum Oil Flow	(25 gpm)	
Schluckstrom	. . . 95 lpm	
Débit d'huile		
Caudal Maximo de Aceite		
Maximum Speed	(749 rpm)	
Drehzahl	749 rpm	
Vitesse de rotation		
Velocidad Maxima		
	<b>Cont.</b>	<b>Int.</b>
Maximum Torque	(6027 lb in)	(8106 lb in)
MaxDrehmoment	681 Nm	916 Nm
Couple		
Torque Maximo		
Maximum Side Load at Key	(3597 lb)	
Seitenlast	. . . 16000 N	
Charges latérales		
Carga Maxima Lateral		

## A Mechanical Brake Motor for Tough Applications

Parker's DF Series brake motors consists of a mechanical drum brake mounted integrally to our rugged TF Series LSHT hydraulic motor. The compact size, reliable holding capacity and ease of installation make this motor with parking brake the ideal choice for the propulsion systems on many turf, agricultural and other vehicles.

The brake is available with either vertical or horizontally applied levers. The vertical style has fixed brake pads, while the horizontal version has floating brake pads that can be adjusted as required over the life of the brake. Both versions are for static applications only.





For other available options, see pages 261–262.



## Vertical Lever

Holding capacity is 497 Nm (4,400 in lbs) with 68 Nm (600 in lbs) of input torque at lever pivot. Brake capacities are typical for non-burnished brake shoe. OEM testing required to verify actual field conditions.

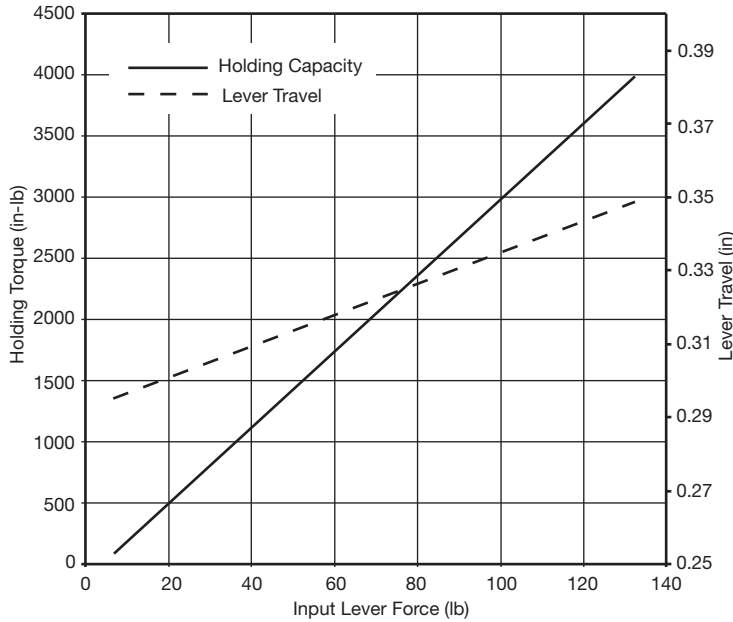
Das maximale Bremsmoment von 497 Nm (4400 in lbs) wird erreicht durch Betätigung des Bremshebels mit 68 Nm (600 in lbs). Genannte Einsatzdaten beziehen sich auf Neuprodukte. Die Eignung der Geräte ist vom Anwender für den jeweiligen Einsatz individuell zu prüfen.

La puissance de maintien est de 497 Nm (4400 pouces-livres) avec couple d'entrée au pivot du levier de 68 Nm (600 pouces-livres). Les puissances de freinage sont typiques pour des sabots de frein non brunis. Les essais imposés par le constructeur d'origine exigent la vérification des conditions réelles sur place.

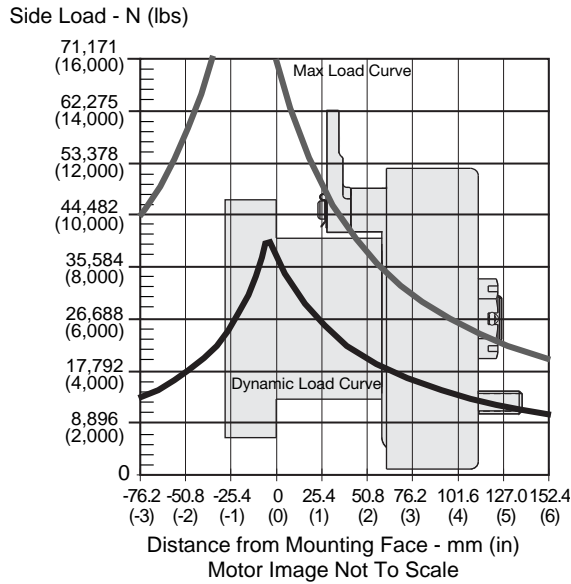
Capacidad de retención de 497 N-m (4.400 libras-pulgada) con 69 N-m (600 libras-pulgada) de torque de entrada en el brazo de articulación. Los valores de capacidad de frenado son típicas para zapatas de freno no bruñidas. Para fabricantes de equipos originales se deben efectuar pruebas bajo condiciones reales de funcionamiento.

## Horizontal Lever

**Brake Torque and Travel of 3.72 inch Horizontal Lever**



Wheel Mount/Radnabengehäuse  
Monture à roue/ Montaje de rueda



The dynamic side load curve is based on uni-directional steady state loads for  $L_{10}$  bearing life at  $3 \times 10^6$  revolutions. Die zulässige auslegbare radiale Wellenbelastungskurve ist unter ruhenden, einseitig statisch gerichteten Lastverhältnissen auf eine  $L_{10}$  Lebensdauer mit  $3 \times 10^6$  Umdrehungen kalkuliert. La courbe de charge latérale permise se base sur des charges unidirectionnelles en régime permanent pour le roulement  $L_{10}$  à  $3 \times 10^6$  révolutions. La curva de valores admisibles de carga lateral está basada en cargas constantes para cojinetes  $L_{10}$  a  $3 \times 10^6$  revoluciones.

The maximum load curve is defined by bearing static load capacity. This curve should not be exceeded at any time including shock loads. Die maximale radiale Wellenbelastungskurve ist definiert als maximale statische Last ohne Drehzahl. Sie gilt als Grenze und sollte keinesfalls überschritten werden. La courbe de charge maximale est définie par la capacité de charge statique portante. Cette courbe ne devrait être dépassée en aucun moment y compris pour les charges par à-coups. La curva de carga máxima queda definida por la capacidad de carga estática del cojinete. No se deben superar los valores de esta curva, ni siquiera con cargas provisorias de impacto.

Equation to Calculate the Expected Radial Bearing Life  
Gleichung zur Ermittlung der Lagerlebensdauer

Equation to calculate the dynamic bearing life for a given load:  
Bestimmung der erlaubten radialen Wellenbelastung mit vorgegebener Last

Use  $F_a$ ,  $F_b$  and S in equation to determine hours of  $L_{10}$  bearing life.  
Die Lebensdauer in Stunden ergibt sich durch einsetzen von  $F_a$ ,  $F_b$ , und S in die nachstehende Formel.

$$L = \frac{3 \times 10^6}{60 \times S} \left\{ \frac{F_a}{F_b} \right\}^{3.33}$$

Where / Mit:

S = Shaft Speed RPM / Abtriebswellendrehzahl in  $\text{min}^{-1}$

L = Life In Hours / Lebensdauer in Stunden

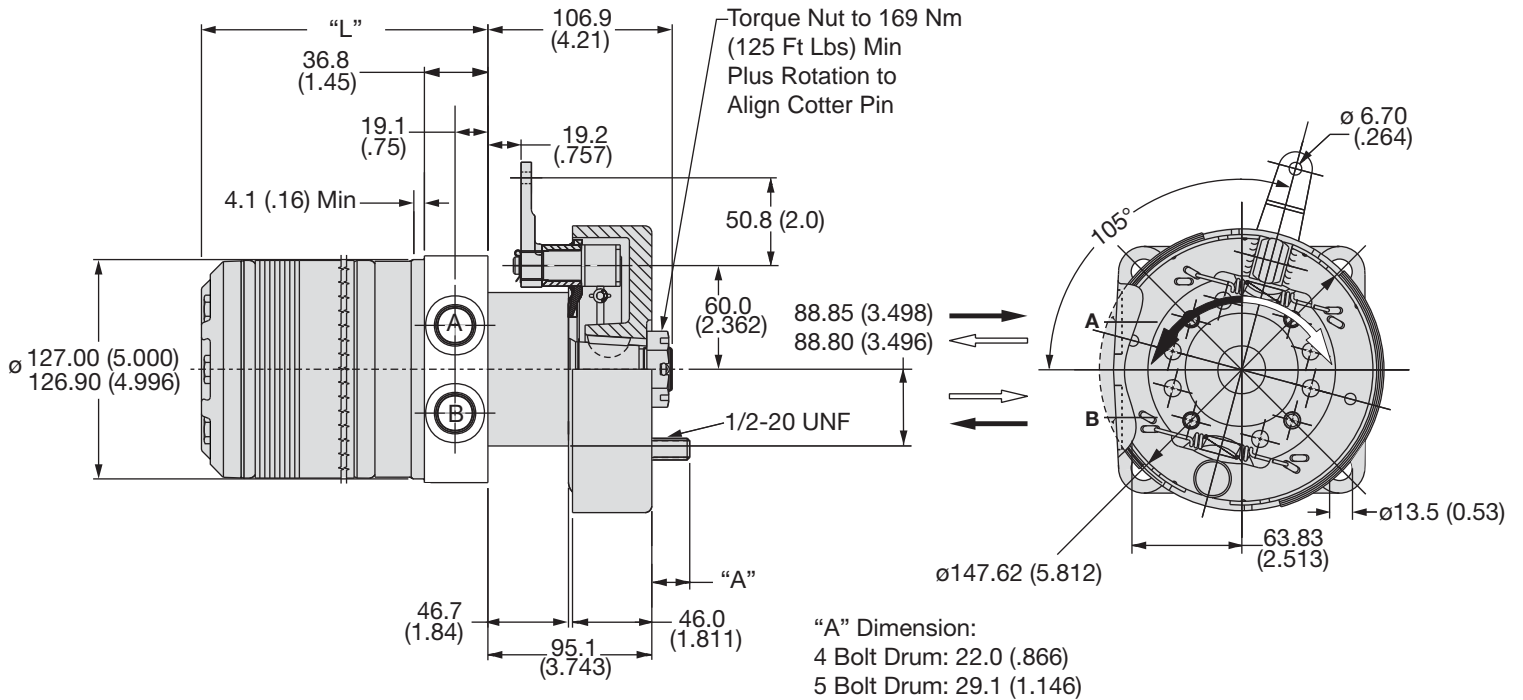
$F_a$  = Dynamic side load defined by above curve at a distance from mounting flange. / Erlaubte radiale Wellenbelastung als Funktion der Laenge

$F_b$  = Application side load. / Anwendungsseitige Wellenbelastung

Note: Calculations are based on  $L_{10}$  bearing life per ISO 281.  
Auslegung basiert auf einer  $L_{10}$  Lebensdauer nach ISO 281

**Code: AS - Vertical Lever**

**Wheel Mount w/Brake Lever / 7/8-14 SAE O-Ring**



**Note:**

1. Brake Acuation Lever can be positioned in 12.00° increments from that shown.  
 Bremshebel ist kreisförmig in Segmenten von 12.00° positionierbar.  
 Le levier de commande du frein peut être positionné à des échelons d'accroissement de 12,00° de ce qui est montré.  
 El brazo de actuación del freno se puede colocar en avances de 12,00 grados con respecto a la posición mostrada.
2. Brake Acuation Lever is shipped unattached, secured with wire or tiewrap to assembly.  
 Hebel ist anbei. Endmontage erforderlich.  
 Le levier de commande du frein est expédié sous forme détachée; il est attaché à l'ensemble avec du fil ou du ruban.  
 El brazo de actuación del freno se suministra suelto, sin conexión, sólo atado provisoriamente al mecanismo.

Code AS	disp.	0080	0100	0130	0140	0170	0195	0240	0280	0360	0405	0475
<b>Weight/Gewicht</b>	<b>kg</b>	<b>18.0</b>	<b>18.1</b>	<b>18.3</b>	<b>18.4</b>	<b>18.7</b>	<b>19.0</b>	<b>19.4</b>	<b>19.7</b>	<b>20.4</b>	<b>21.0</b>	<b>21.7</b>
Poids/Peso	(lb)	(39.74)	(39.84)	(40.34)	(40.64)	(41.14)	(41.84)	(42.74)	(43.34)	(45.04)	(46.34)	(47.74)
<b>Length</b>	<b>"L" mm</b>	<b>146</b>	<b>146</b>	<b>149</b>	<b>151</b>	<b>154</b>	<b>157</b>	<b>162</b>	<b>167</b>	<b>176</b>	<b>180</b>	<b>189</b>
	"L" (in)	(5.73)	(5.73)	(5.85)	(5.92)	(6.04)	(6.17)	(6.35)	(6.54)	(6.92)	(7.08)	(7.42)

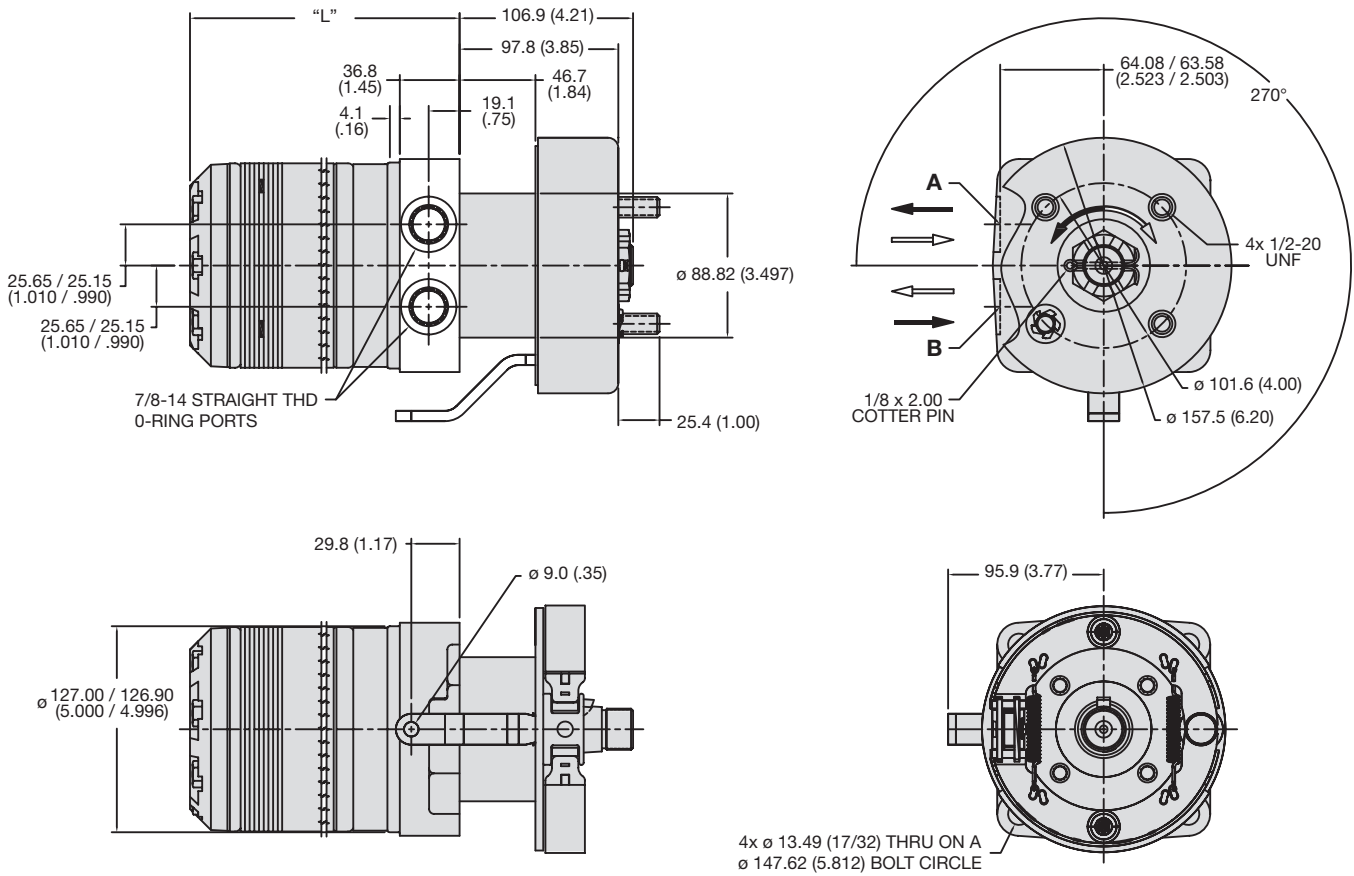
**For performance data curves, see TF section.**

English equivalents for metric specifications are shown in ( ).

010 DF.indd, js

**Code: US - Horizontal Lever**

**Wheel Mount w/Brake Lever / 7/8-14 SAE O-Ring**



**Note:**

Brake Acuation Lever can be positioned in 90° increments from that shown.

Bremshebel ist kreisförmig in Sgmenten von 90° positionierbar.

Le levier de commande du frein peut être positionné à des échelons d'accroissement de 90° de ce qui est montré.

El brazo de actuación del freno se puede colocar en avances de 90° grados con respecto a la posición mostrada.

Code US	disp.	0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
<b>Weight/Gewicht</b>	<b>kg</b>	<b>14.6</b>	<b>14.8</b>	<b>15.1</b>	<b>15.5</b>	<b>15.9</b>	<b>16.1</b>	<b>16.3</b>	<b>16.9</b>	<b>17.5</b>	<b>18.3</b>	<b>19.0</b>	<b>20.5</b>	<b>22.2</b>
<b>Poids/Peso</b>	<b>(lb)</b>	<b>(41.3)</b>	<b>(41.8)</b>	<b>(42.4)</b>	<b>(43.2)</b>	<b>(44.1)</b>	<b>(44.6)</b>	<b>(44.9)</b>	<b>(46.3)</b>	<b>(47.7)</b>	<b>(49.4)</b>	<b>(50.9)</b>	<b>(54.4)</b>	<b>(58.1)</b>
<b>Length</b>	<b>"L" mm</b>	<b>150</b>	<b>154</b>	<b>157</b>	<b>161</b>	<b>166</b>	<b>170</b>	<b>173</b>	<b>180</b>	<b>188</b>	<b>195</b>	<b>204</b>	<b>223</b>	<b>242</b>
	<b>"L" (in)</b>	<b>(5.92)</b>	<b>(6.04)</b>	<b>(6.17)</b>	<b>(6.35)</b>	<b>(6.54)</b>	<b>(6.68)</b>	<b>(6.79)</b>	<b>(7.08)</b>	<b>(7.42)</b>	<b>(7.67)</b>	<b>(8.04)</b>	<b>(8.79)</b>	<b>(9.54)</b>

**For performance data curves, see TF section.**

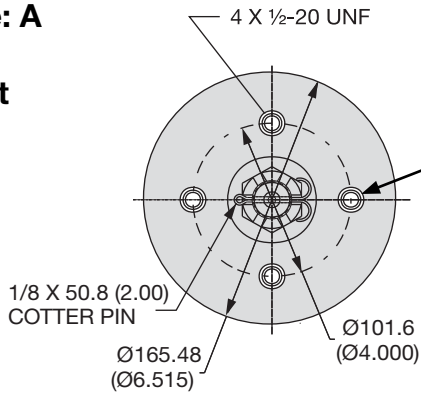
English equivalents for metric specifications are shown in ( ).

010 DF.indd, js

**Drum Type/Trommelbremse/  
 Tipo de tambor/  
 Genre de Tambour**

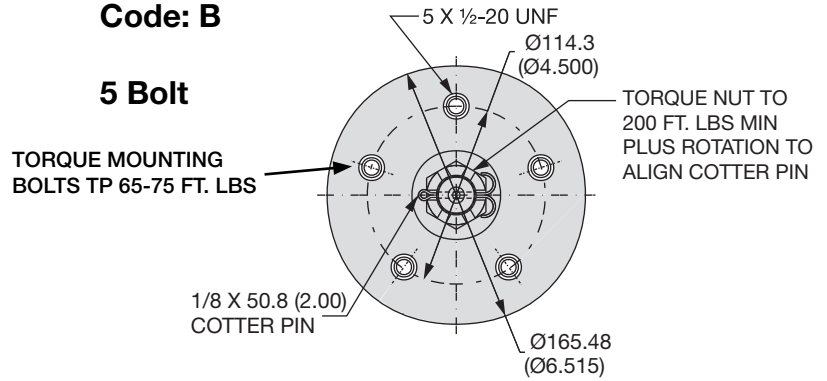
**Code: A**

**4 Bolt**



**Code: B**

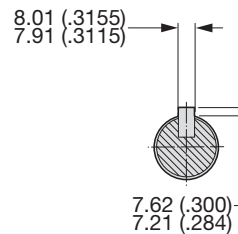
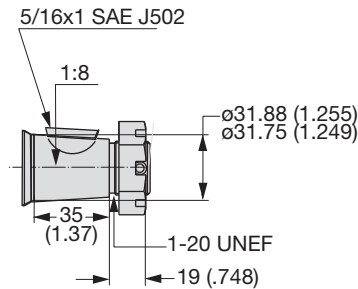
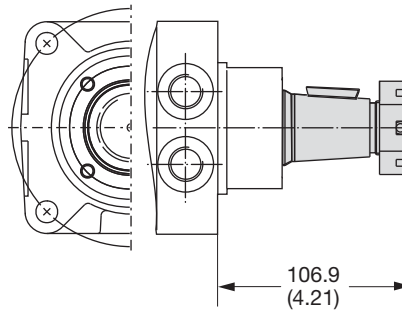
**5 Bolt**



**Shafts / Abtriebswellen  
 Arbre / Ejes**

**Code: 8**

**1 1/4" Taper**



English equivalents for metric specifications are shown in ( ).

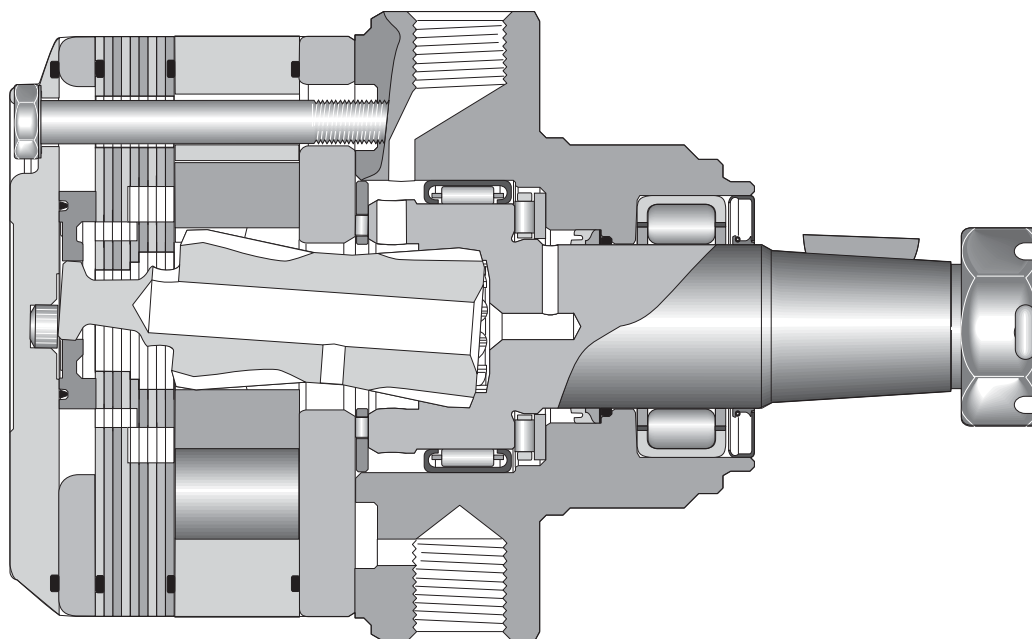
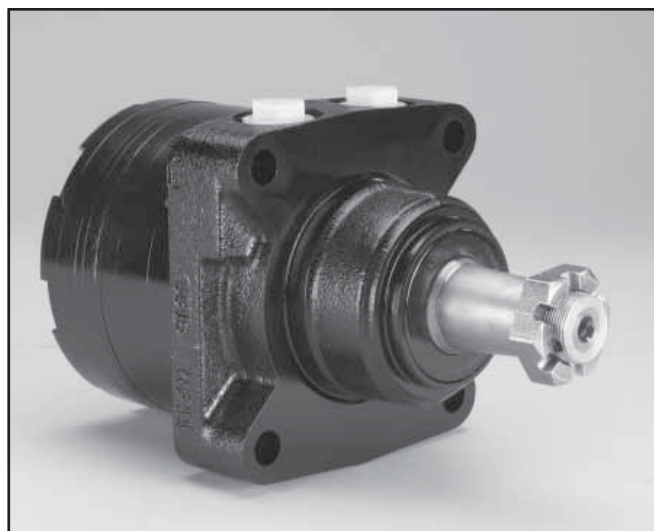
010 DF.indd, js

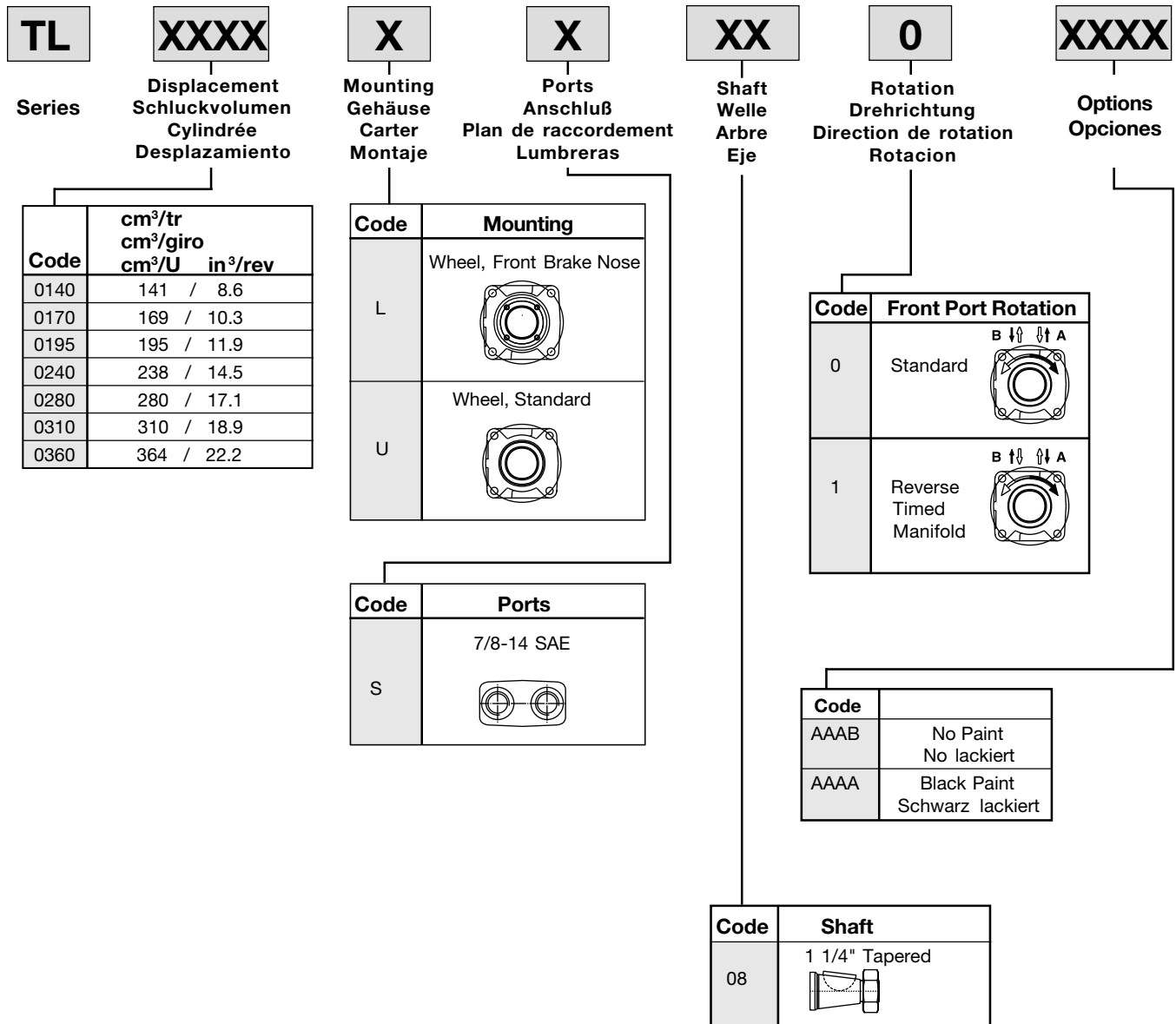


7 Displacements	(8.6 to 22.2 in <sup>3</sup> /rev)	
7 Schluckvolumen	140 . . . 364 cm <sup>3</sup> /rev	
7 Cylindrée		
7 Desplazamientos		
	<b>Cont.</b>	<b>Int.</b>
Maximum Pressure	(2750 psid)	(3500 psid)
Eingangsdruck	. . . 190 bar	. . . 241 bar
Pression entrée		
Presion Maxima		
Maximum Oil Flow	(25 gpm)	
Schluckstrom	. . . 95 lpm	
Débit d'huile		
Caudal Maximo de Aceite		
Maximum Speed	(484 rpm)	
Drehzahl	484 rpm	
Vitesse de rotation		
Velocidad Maxima		
	<b>Cont.</b>	<b>Int.</b>
Maximum Torque	(8,650 lb in)	(10,300 lb in)
MaxDrehmoment	977 Nm	1164 Nm
Couple		
Torque Maximo		

## Exceptional Power Density and Durability

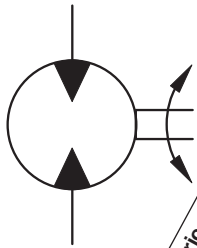
The heart of the new compact Torqmotor™ is the strongest drive train in its class. Coupled with this extra heavy-duty drive train are the high efficiencies and low speed performance for which the Parker Torqmotor™ is known. As with all Torqmotors™, high speed valving and full flow drive train lubrication are standard. Case drains are not required. Roller vanes and a sealed commutator maintain high efficiencies and provide smooth low speed performance.





For other available options, see pages 261–262.





Geometric displacement  
Geom. Schluckvolumen  
Cylindrée  
Cilindrata  
Max. speed @ Max. intermittent flow  
Max. Drehzahl Intermittierender Betrieb:  
Vitesse de rotation maxi  
Velocidad maxima a caudal intermitente maximo  
Max. oil flow  
Max. Schluckstrom  
Débit d'huile maxi  
Portata max  
Max. differential pressure  
Max. Druckgefälle  
Chute de pression maxi  
Presion diferencial maxima  
Max. supply pressure  
Max. Eingangsdruck  
Presion maxi entrée  
Presion maxima de alimentacion  
Max. torque  
Max. Drehmoment  
Couple maxi  
Torque Maximo  
Max. Performance  
Max. Leistungabgabe  
Puissance de sortie maxi  
Potenza meccanica max  
Min. starting torque  
Min. Anlaufmoment  
Couple min. fourni au dé manrage  
Torque minimo de arranque

Motor Series TL	cm <sup>3</sup> /rev in <sup>3</sup> /rev	rev/min	cont / int l/min g/min		cont / int bar psid		max bar psig	cont / int Nm lb-in		max KW HP	cont / int Nm lb-in	
TL0140	140 8.6	613	68 18	95 25	190 2750	241 3500	300 4350	364 3226	463 4095	30 40	294 2606	365 3234
TL0170	169 10.3	512	68 18	95 25	190 2750	241 3500	300 4350	449 3970	570 5042	31 41	354 3137	445 3943
TL 0195	195 11.9	484	68 18	95 25	190 2750	241 3500	300 4350	511 4520	648 5739	34 46	414 3666	526 4654
TL 0240	238 14.5	399	68 18	95 25	190 2750	241 3500	300 4350	620 5485	790 6990	34 46	536 4740	679 6011
TL 0280	280 17.1	335	68 18	95 25	190 2750	241 3500	300 4350	730 6460	929 8218	34 45	619 5479	787 6967
TL 0310	310 18.9	310	68 18	95 25	190 2750	241 3500	300 4350	847 7499	1079 9548	36 48	713 6309	907 8029
TL 0360	364 22.2	255	68 18	95 25	172 2500	224 3250	300 4350	890 7874	1163 10293	31 42	778 6882	1002 8867

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

Intermittent operation rating applies to 10% of every minute.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Peak operation rating applies to 1% max of every minute.

TL 0140

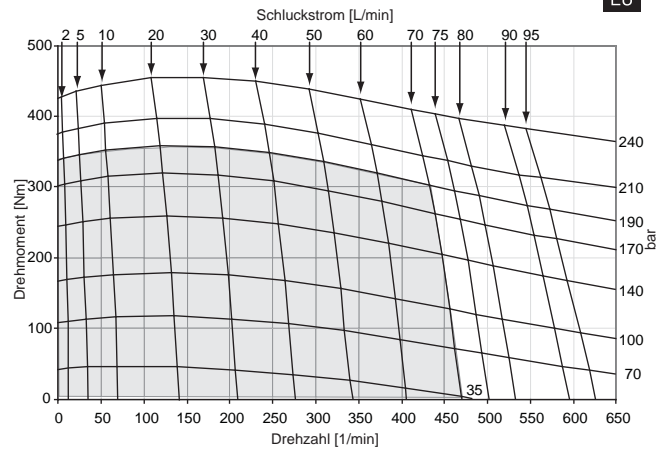
8.6 cu in / rev

	PRESSURE (PSID)							
	500	1000	1500	2000	2500	2750	3000	3500
<b>.5</b>	364 12	955 11	1531 10	2115 9	2719 7	3016 6	3288 5	3803 2
<b>1</b>	395 25	1014 24	1599 23	2174 21	2761 19	3056 17	3352 16	3871 13
<b>2</b>	408 51	1011 49	1634 47	2229 45	2828 42	3127 40	3421 38	3943 35
<b>3</b>	411 77	1029 74	1659 72	2257 69	2856 65	3191 63	3459 62	4006 57
<b>4</b>	414 103	1040 99	1675 96	2286 93	2900 89	3226 86	3509 83	4054 78
<b>5</b>	407 129	1039 126	1685 123	2285 119	2899 113	3210 110	3532 108	4075 102
<b>7</b>	381 182	1004 177	1646 172	2250 168	2862 162	3180 158	3499 155	4095 147
<b>9</b>	338 235	951 231	1599 226	2208 220	2802 213	3117 208	3422 203	4041 193
<b>12</b>	263 308	856 303	1485 297	2093 290	2693 283	2983 278	3314 272	3957 260
<b>15</b>	170 380	771 376	1381 371	1983 364	2587 356	2898 350	3219 343	3838 328
<b>20</b>	65 454	659 446	1242 437	1864 430	2443 422	2748 418	3100 413	3744 399
<b>25</b>		361 613	896 601	1464 588	2046 575	2363 567	2770 558	3455 539

Flow (GPM)

TORQUE (LB IN) 2770  
SPEED (RPM) 558

140 cc / rev



Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

Cont.

Int.

**TL 0170**

**10.3 cu in / rev**

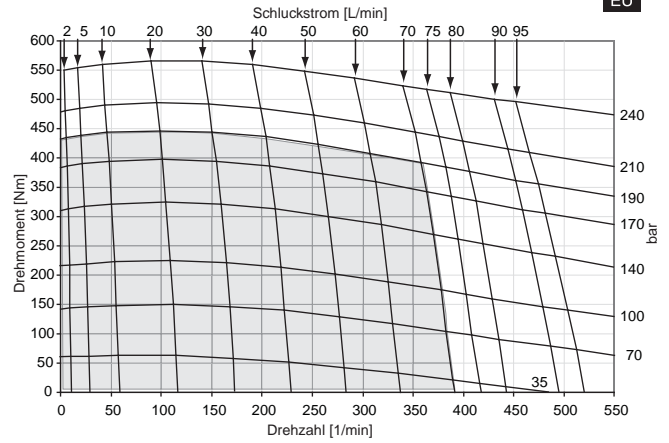
PRESSURE (PSID)

	500	1000	1500	2000	2500	2750	3000	3500
<b>.5</b>	499 10	1226 10	1937 9	2656 7	3395 6	3760 5	4100 4	4750 2
<b>1</b>	530 21	1285 20	2005 19	2715 17	3437 16	3800 15	4164 13	4818 11
<b>2</b>	543 43	1282 41	2040 39	2770 38	3504 35	3871 34	4233 32	4890 29
<b>3</b>	546 64	1300 62	2065 60	2798 58	3532 55	3935 53	4271 52	4953 48
<b>4</b>	549 86	1311 83	2081 80	2827 78	3576 74	3970 72	4321 70	5001 66
<b>5</b>	542 108	1310 105	2091 102	2826 99	3575 95	3954 92	4344 90	5022 85
<b>7</b>	516 152	1275 148	2052 144	2791 140	3538 135	3924 132	4311 129	5042 123
<b>9</b>	473 196	1222 193	2005 189	2749 184	3478 178	3861 174	4234 169	4988 162
<b>12</b>	398 257	1127 253	1891 248	2634 242	3369 236	3727 232	4126 227	4904 217
<b>15</b>	305 317	1042 314	1787 310	2524 304	3263 297	3642 293	4031 286	4785 274
<b>20</b>	200 379	930 372	1648 365	2405 359	3119 352	3492 349	3912 345	4691 333
<b>25</b>		632 512	1302 502	2005 491	2722 480	3107 474	3582 466	4402 450

**Flow (GPM)**

**TORQUE (LB IN) 3582**  
**SPEED (RPM) 466**

**169 cc / rev**



**EU**

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TL 0195

11.9 cu in / rev

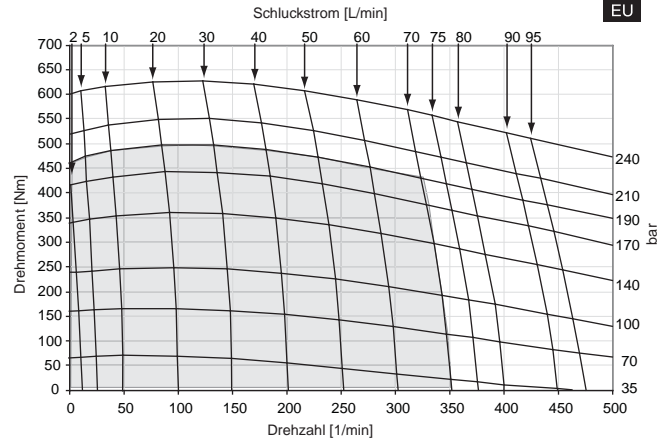
PRESSURE (PSID)

	500	1000	1500	2000	2500	2750	3000	3500
<b>.5</b>	571 9	1353 7	2148 5	2938 3				
<b>1</b>	609 18	1417 16	2234 14	3032 12	3873 10	4250 8.5	4641 7	5400 4
<b>2</b>	621 37	1443 35	2267 33	3086 30	3923 27	4300 25.5	4712 24	5450 19
<b>3</b>	619 56	1448 54	2279 52	3104 49	3952 46	4331 44	4727 42	5490 37
<b>4</b>	615 75	1456 73	2303 71	3142 68	3963 64	4371 61.5	4761 59	5535 53.5
<b>5</b>	604 94	1448 92	2301 90	3148 87	3980 82	4400 79.5	4792 77	5587 72
<b>7</b>	571 132	1419 130	2272 127	3125 123	3965 119	4370 116	4784 113	5590 107
<b>9</b>	518 170	1364 168	2223 165	3072 161	3911 155	4310 152	4738 149	5549 142
<b>12</b>	437 226	1264 224	2113 221	2956 216	3792 210	4191 206.8	4620 203	5433 195
<b>15</b>	344 283	1164 281	2003 277	2835 272	3668 265	4062 261	4498 257	5314 248
<b>20</b>	189 343	1013 340	1833 333	2633 325	3461 319	3876 315	4295 310	5116 300
<b>25</b>		613 468	1397 460	2100 452	2903 443	3302 438	3750 433	4542 422

Flow (GPM)

TORQUE (LB IN) 3750  
SPEED (RPM) 433

195 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TL 0240

14.5 cu in / rev

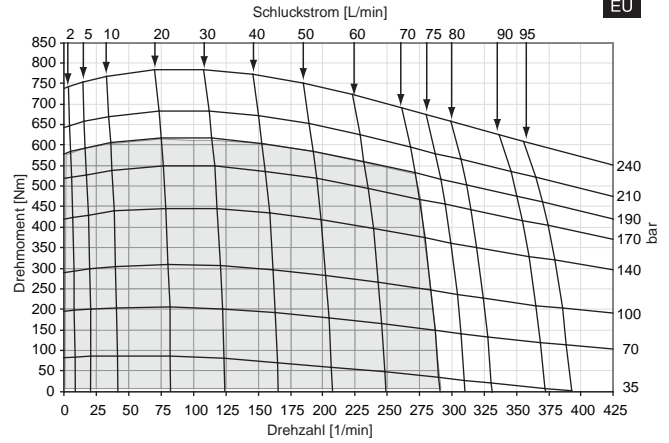
PRESSURE (PSID)

	500	1000	1500	2000	2500	2750	3000	3500
<b>.5</b>	705 8	1662 8	2641 7	3635 6	4620 5	5095 5	5585 4	6536 3
<b>1</b>	752 16	1740 15	2740 14	3746 14	4739 13	5200 12	5712 11	6661 10
<b>2</b>	772 31	1783 30	2799 30	3818 29	4830 27	5300 26	5823 25	6793 23
<b>3</b>	769 47	1784 46	2812 45	3844 44	4863 42	5362 41	5857 40	6828 37
<b>4</b>	766 62	1797 62	2840 61	3887 59	4923 57	5384 56	5932 55	6910 51
<b>5</b>	751 78	1790 77	2842 76	3895 75	4933 72	5438 71	5951 69	6946 66
<b>7</b>	710 109	1758 108	2816 107	3875 105	4920 102	5425 101	5947 99	6958 95
<b>9</b>	649 141	1697 139	2762 138	3826 136	4875 132	5387 130	5908 128	6922 124
<b>12</b>	553 188	1583 186	2633 184	3675 182	4706 178	5219 175	5725 172	6734 167
<b>15</b>	438 235	1471 233	2499 230	3513 227	4520 223	4998 220	5526 217	6534 211
<b>20</b>	312 282	1350 279	2300 276	3305 273	4310 267	4732 264	5250 261	6200 254
<b>25</b>		1021 388	1837 384	2710 380	3735 373	4060 370	4500 365	5423 354

Flow (GPM)

TORQUE (LB IN) 4500  
SPEED (RPM) 365

238 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TL 0280

17.1 cu in / rev

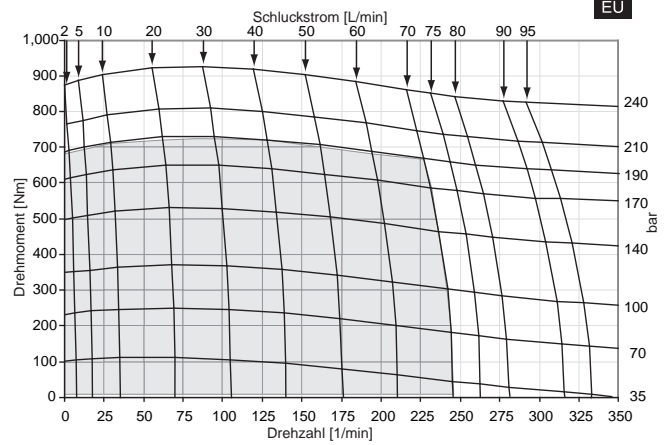
PRESSURE (PSID)

	500	1000	1500	2000	2500	2750	3000	3500
<b>.5</b>	887 7	2008 6	3147 5	4299 4	5458 3	6022 2	6599 2	7724 0
<b>1</b>	947 13	2093 13	3262 12	4424 11	5582 10	6144 9	6715 8	7812 6
<b>2</b>	982 27	2164 26	3361 25	4561 24	5745 22	6315 21	6902 19	8033 15
<b>3</b>	982 40	2167 39	3366 39	4570 37	5757 36	6356 34	6943 32	8070 28
<b>4</b>	984 53	2184 52	3397 51	4612 50	5820 48	6435 46	6985 45	8147 40
<b>5</b>	975 66	2185 65	3409 64	4634 62	5841 60	6417 58	7031 56	8201 52
<b>7</b>	931 93	2149 92	3381 90	4614 88	5829 85	6420 83	7029 81	8200 76
<b>9</b>	865 119	2083 118	3319 117	4556 114	5780 110	6396 108	6992 106	8193 101
<b>12</b>	746 159	1956 158	3190 156	4428 153	5661 149	6270 147	6885 143	8089 137
<b>15</b>	581 199	1800 198	3025 196	4255 192	5494 187	6128 184	6721 181	7912 174
<b>20</b>	415 239	1650 238	2850 235	4120 230	5350 224	5995 221	6570 217	7750 209
<b>25</b>	50 332	1240 330	2450 327	3700 320	5000 312	5650 307	6170 302	7340 290

Flow (GPM)

TORQUE (LB IN) 6170  
SPEED (RPM) 302

280 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TL 0310

18.9 cu in / rev

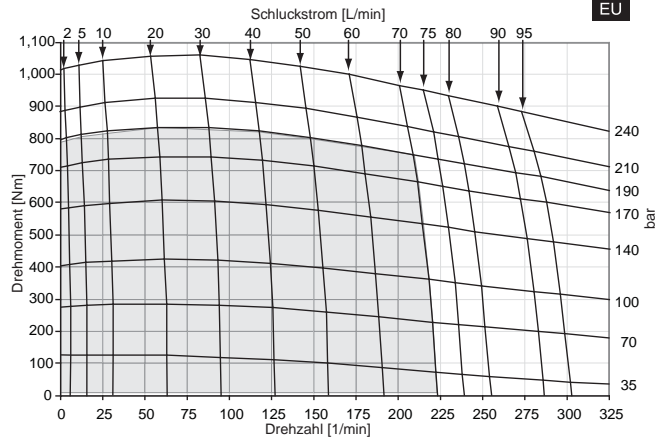
PRESSURE (PSID)

	500	1000	1500	2000	2500	2750	3000	3500
<b>.5</b>	1031 6	2296 5	3579 5	4875 4	6178 3	6814 2	7463 2	8732 0
<b>1</b>	1091 12	2381 11	3694 11	5000 10	6302 9	6936 8	7579 7	8820 5
<b>2</b>	1126 24	2452 24	3793 23	5137 22	6465 20	7107 19	7766 17	9041 14
<b>3</b>	1126 36	2455 36	3798 35	5146 34	6477 32	7148 31	7807 29	9078 25
<b>4</b>	1128 48	2472 47	3829 46	5188 45	6540 43	7227 42	7849 40	9155 36
<b>5</b>	1119 60	2473 59	3841 58	5210 56	6561 54	7209 52	7895 51	9209 47
<b>7</b>	1075 84	2437 83	3813 81	5190 80	6549 77	7212 75	7893 73	9208 69
<b>9</b>	1009 108	2371 107	3751 106	5132 103	6500 99	7188 98	7856 96	9201 91
<b>12</b>	890 144	2244 143	3622 141	5004 138	6381 135	7062 132	7749 129	9097 124
<b>15</b>	725 180	2088 179	3457 177	4831 174	6214 169	6920 166	7585 164	8920 157
<b>20</b>	559 216	1938 215	3282 213	4696 208	6070 203	6787 200	7434 196	8758 189
<b>25</b>	194 300	1528 298	2882 295	4276 289	5720 282	6442 277	7034 273	8348 262

Flow (GPM)

TORQUE (LB IN) 7034  
SPEED (RPM) 273

310 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TL 0360

22.2 cu in / rev

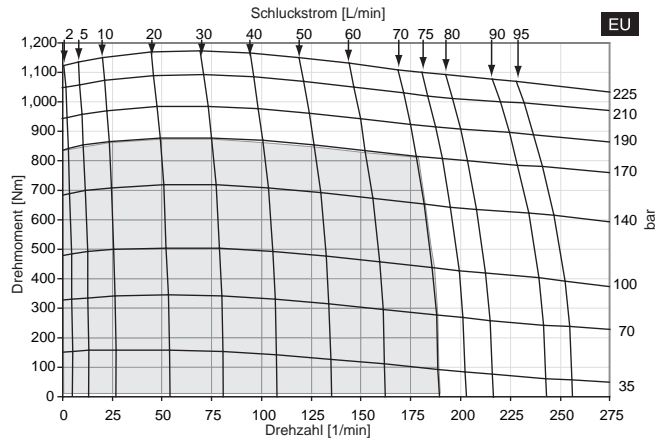
PRESSURE (PSID)

	500	1000	1500	2000	2500	2750	3000	3250
<b>.5</b>	1294 5	2821 5	4367 4	5926 3	7491 2	8259 2	9039 1	9810 1
<b>1</b>	1354 10	2906 10	4482 9	6051 8	7615 8	8381 7	9155 6	9947 6
<b>2</b>	1389 20	2977 20	4581 19	6188 18	7778 17	8552 16	9342 15	10152 14
<b>3</b>	1389 31	2980 30	4586 30	6197 29	7790 27	8593 26	9383 25	10190 24
<b>4</b>	1391 41	2997 40	4617 39	6239 38	7853 37	8672 36	9425 34	10262 33
<b>5</b>	1382 51	2998 50	4629 49	6261 48	7874 46	8654 45	9471 43	10288 42
<b>7</b>	1338 72	2962 71	4601 69	6241 68	7862 65	8657 64	9469 62	10293 61
<b>9</b>	1272 92	2896 91	4539 90	6183 88	7813 85	8633 83	9432 82	10261 79
<b>12</b>	1153 122	2769 122	4410 120	6055 118	7694 115	8507 113	9325 110	10144 108
<b>15</b>	988 153	2613 152	4245 151	5882 148	7527 144	8365 142	9161 139	9985 136
<b>20</b>	822 184	2463 183	4070 181	5747 177	7383 173	8232 170	9010 167	9847 164
<b>25</b>	457 255	2053 254	3670 251	5327 246	7033 240	7887 236	8610 232	9472 227

Flow (GPM)

TORQUE (LB IN) 8610  
SPEED (RPM) 232

364 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

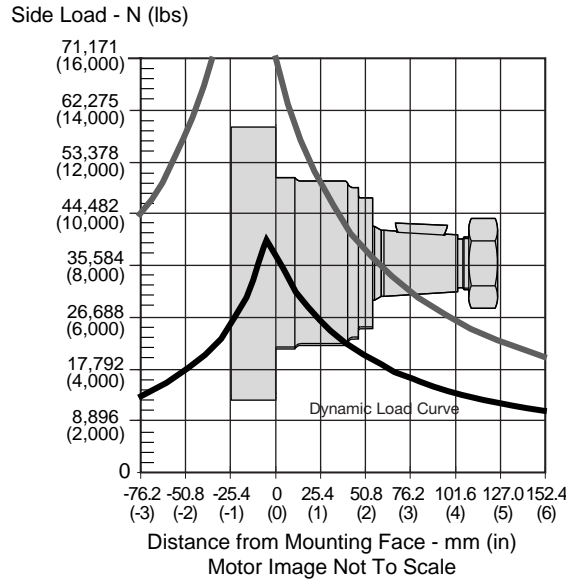
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.



Wheel Mount / Radnabengehäuse  
Monture à roue/ Montaje de rueda



The dynamic side load curve is based on uni-directional steady state loads for  $L_{10}$  bearing life at  $3 \times 10^6$  revolutions.

Die zulässige auslegbare radiale Wellenbelastungskurve ist unter ruhenden, einseitig statisch gerichteten Lastverhältnissen auf eine  $L_{10}$  Lebensdauer mit  $3 \times 10^6$  Umdrehungen kalkuliert. La courbe de charge latérale permise se base sur des charges unidirectionnelles en régime permanent pour le roulement  $L_{10}$  à  $3 \times 10^6$  révolutions. La curva de valores admisibles de carga lateral está basada en cargas constantes para cojinetes  $L_{10}$  a  $3 \times 10^6$  revoluciones.

The maximum load curve is defined by bearing static load capacity. This curve should not be exceeded at any time including shock loads.

Die maximale radiale Wellenbelastungskurve ist definiert als maximale statische Last ohne Drehzahl. Sie gilt als Grenze und sollte keinesfalls überschritten werden. La courbe de charge maximale est définie par la capacité de charge statique portante. Cette courbe ne devrait être dépassée en aucun moment y compris pour les charges par à-coups. La curva de carga máxima queda definida por la capacidad de carga estática del cojinete. No se deben superar los valores de esta curva, ni siquiera con cargas provisorias de impacto.

Equation to Calculate the Expected Radial Bearing Life  
Gleichung zur Ermittlung der Lagerlebensdauer

Equation to calculate the dynamic bearing life for a given load:  
Bestimmung der erlaubten radialen Wellenbelastung mit vorgegebener Last

Use  $F_a$ ,  $F_b$  and  $S$  in equation to determine hours of  $L_{10}$  bearing life.  
Die Lebensdauer in Stunden ergibt sich durch einsetzen von  $F_a$ ,  $F_b$ , und  $S$  in die nachstehende Formel.

$$L = \frac{3 \times 10^6}{60 \times S} \left\{ \frac{F_a}{F_b} \right\}^{3.33}$$

Where / Mit:

$S$  = Shaft Speed RPM / Abtriebswellendrehzahl in  $\text{min}^{-1}$

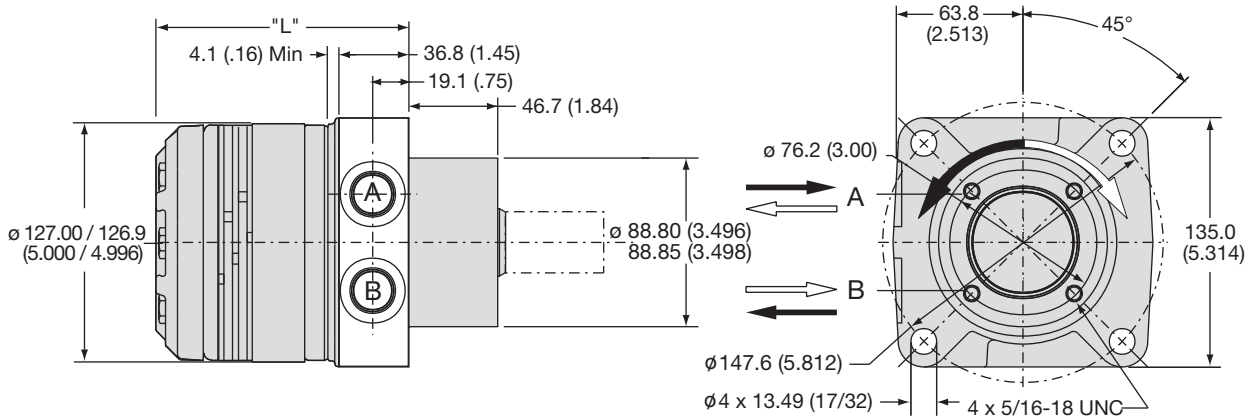
$L$  = Life In Hours / Lebensdauer in Stunden

$F_a$  = Dynamic side load defined by above curve at a distance from mounting flange. / Erlaubte radiale Wellenbelastung als Function der Laenge

$F_b$  = Application side load. / Anwendungsseitige Wellenbelastung

**Code: L** 

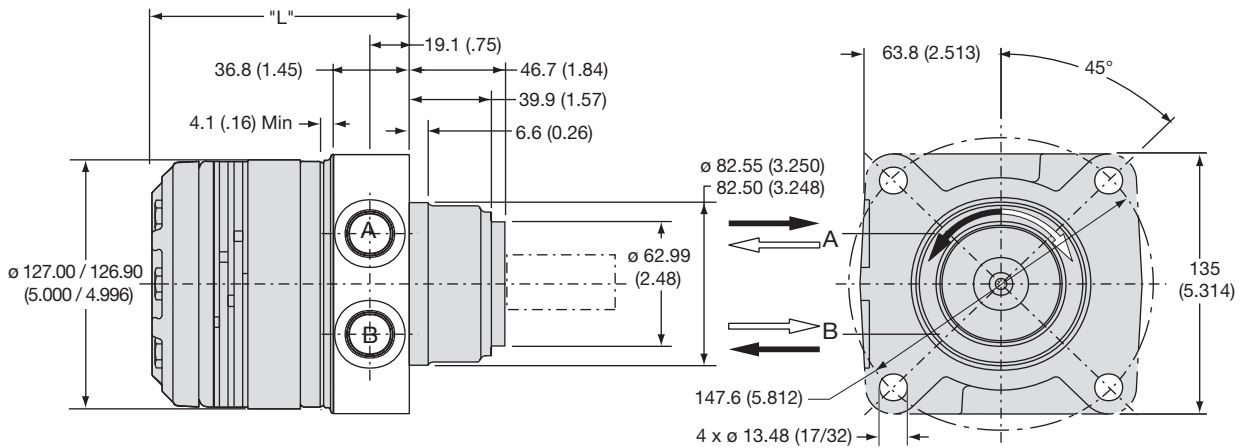
**Wheel, Front Brake Nose**



Code L	disp.	0140	0170	0195	0240	0280	0310	0360
<b>Weight/Gewicht</b>	<b>kg</b>	<b>10.9</b>	<b>11.1</b>	<b>11.4</b>	<b>11.8</b>	<b>12.2</b>	<b>12.4</b>	<b>12.9</b>
Poids/Peso	(lb)	(24.1)	(24.6)	(25.2)	(26.0)	(26.9)	(27.4)	(28.4)
<b>Length</b>	<b>"L" mm</b>	<b>124</b>	<b>124</b>	<b>124</b>	<b>127</b>	<b>132</b>	<b>135</b>	<b>143</b>
	"L" (in)	(4.83)	(4.83)	(4.83)	(4.99)	(5.16)	(5.30)	(5.58)

**Code: U** 

**Wheel, Standard**



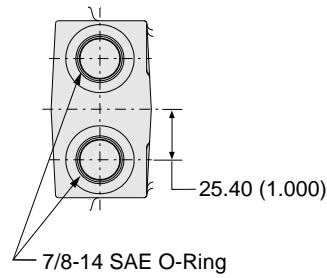
Code U	disp.	0140	0170	0195	0240	0280	0310	0360
<b>Weight/Gewicht</b>	<b>kg</b>	<b>10.9</b>	<b>11.1</b>	<b>11.4</b>	<b>11.8</b>	<b>12.2</b>	<b>12.4</b>	<b>12.9</b>
Poids/Peso	(lb)	(24.1)	(24.6)	(25.2)	(26.0)	(26.9)	(27.4)	(28.4)
<b>Length</b>	<b>"L" mm</b>	<b>124</b>	<b>124</b>	<b>124</b>	<b>127</b>	<b>132</b>	<b>135</b>	<b>143</b>
	"L" (in)	(4.83)	(4.83)	(4.83)	(4.99)	(5.16)	(5.30)	(5.58)

English equivalents for metric specifications are shown in ( ).

011 TL.indd, js

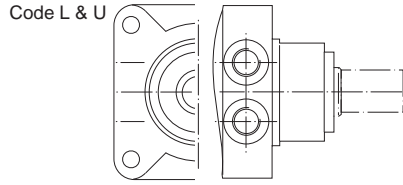
Code: S 

7/8-14 SAE O-Ring



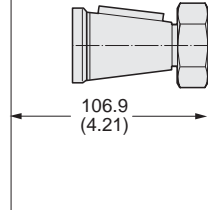
English equivalents for metric specifications are shown in ( ).

011 TL.indd, js



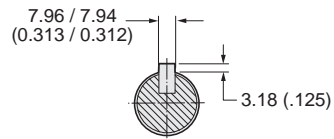
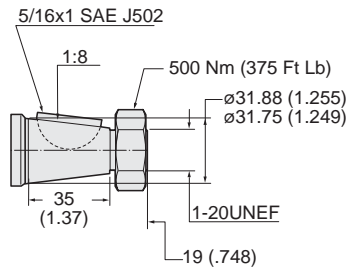
Code: 08 EU US

1 1/4" Tapered



Code: 08 EU US

1 1/4" Tapered



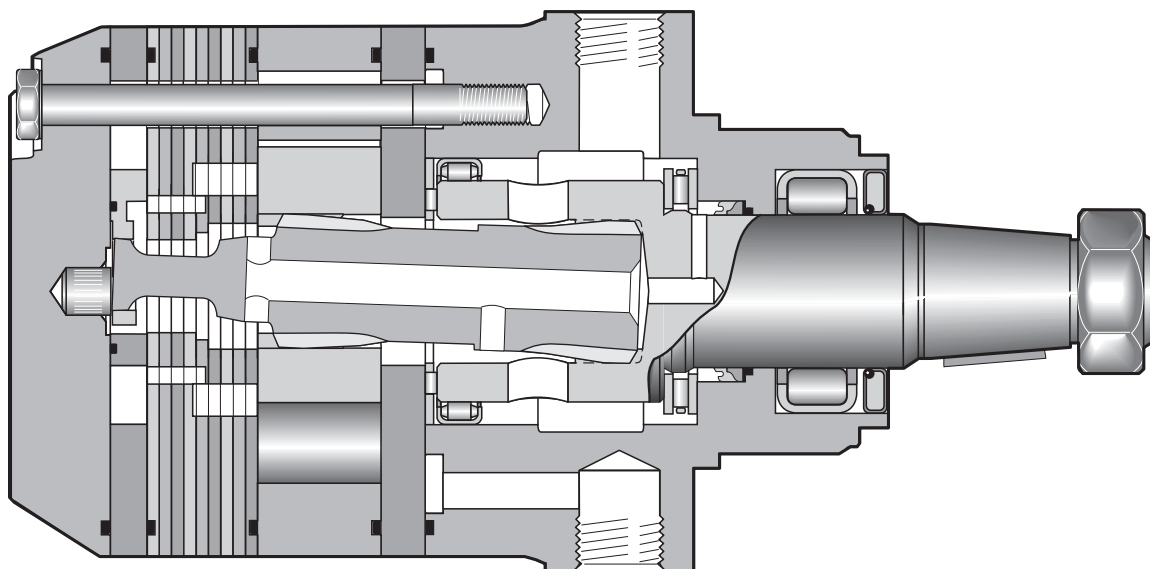
English equivalents for metric specifications are shown in ( ).

011 TL.indd, js

13 Displacements 13 Schluckvolumen 13 Cylindrée 13 Desplazamientos	(8.6 to 58.5 in <sup>3</sup> /rev) 141 . . . 959 cm <sup>3</sup> /rev	
Maximum Pressure Eingangsdruck Pression entrée Presion Maxima	<b>Cont.</b> (3000 psid) . . . 207 bar	<b>Int.</b> (4000 psid) . . . 276 bar
Maximum Oil Flow Schluckstrom Débit d'huile Caudal Maximo de Aceite		(30 gpm) . . . 114 lpm
Maximum Speed Drehzahl Vitesse de rotation Velocidad Maxima		(660 rpm) 660 rpm
Maximum Torque MaxDrehmoment Couple Torque Maximo	<b>Cont.</b> (9,239 lb in) 1044 Nm	<b>Int.</b> (12,636 lb in) 1428 Nm
Maximum Side Load at Key Seitenlast Charges latérales Carga Maxima Lateral		(3597 lb) . . . 16000 N

### Exceptional Strength and Durability in a High Performance Motor

The heart of Parker's TG Series powertrain, the torque link, is an extra heavy duty part that includes unique 60:40 spline geometry. Rugged construction throughout allows the transmission of over 13,000 lb-in of torque. The entire powertrain is continually washed in cool, high flow fluid to assure long life. Roller vanes and sealed commutator maintain high efficiency and provide smooth low speed performance.



**TG**

Series

**XXXX**

Displacement  
Schluckvolumen  
Cylindrée  
Desplazamiento









**X**


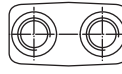

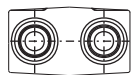
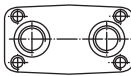
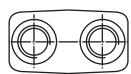
Mounting  
Gehäuse  
Carter  
Montaje

**X**

Ports  
Anschluß  
Plan de raccordement  
Lumbreras

Code	cm <sup>3</sup> /tr	
	cm <sup>3</sup> /giro	in <sup>3</sup> /rev
0140	141	8.6
0170	169	10.3
0195	195	11.9
0240	238	14.5
0280	280	17.1
0310	310	18.9
0335	337	20.6
0405	405	24.7
0475	477	29.1
0530	528	32.3
0625	623	38.0
0785	786	48.0
0960	959	58.5

Code	Mounting
A	SAE "A" 2 Bolt 
B	SAE "B" 2 Bolt 
L	Wheel, Front Brake 
M	Magneto 
U	Wheel, Standard 
W*	Wheel, Optional 
D*	Large Wheel Mount 
V*	SAE "A" 4 Bolt 

Code	Ports
A	7/8-14 SAE O-Ring; Rear Axial 
B	7/8-14 SAE O-Ring; Rear Radial 
E	Manifold; Rear Radial 
H	ISO 6149 M22 x 1.5 
M*	5/16-18 UNC Manifold 
S	7/8-14 SAE 

\*Not available on L, U or W mounting.













\*Requires rear porting

\* Requires rear porting.  
Nur Endanschluss möglich  
Exige des orifices en arriere  
Necesita lumbrera posterior

* Abtriebswelle	Ø 25mm	Max. Moment cont./int.	} 450/550 Nm
Coupling shaft	Ø 1 inch	Max. torque cont./int.	
Arbre	6BSAE	Couple maxi cont./int.	
Eje de acople		Coppia max cont./int.	

**XX**



Shaft  
Welle  
Arbre  
Eje



Code	Shaft
01*	1" 6B Spline 
02*	1" Keyed 
03	1 1/4" Keyed 
04	10B Spline 
05	1 1/4" 14 Tooth Spline 
06	19 Tooth Spline 
07	15 Tooth Spline 
08	1 1/4" Tapered 
19	1 3/8" J501 Taper 
20	1 3/8" Keyed 
46	32 mm Keyed 
62*	1 1/4" 14 Tooth Spline SAE 

\* Conforms to SAE recommended length

**0**

Rotation  
Drehrichtung  
Direction de rotation  
Rotacion

Code	Rotation
0	Standard B ↓ ↑ A 
1	Reverse Timed Manifold B ↑ ↓ A 

Code	Rear Rotation
0	Standard 
1	Reverse Timed Manifold 

Rotation viewed from shaft end.

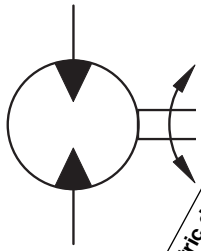
**XXXX**

Options  
Opciones

Code	Options
AAAA	Black Paint
AAAB	No Paint
AAAC	Double Paint
AAAF***	Castle Nut, Black Paint
AABP***	Castle Nut, No Paint
AAAG	Fluorocarbon Seals, Black Paint
AAAH	Fluorocarbon Seals, No Paint
AAAJ	High Temperature Commutator Seal, Black Paint
AAFG	High Temperature Commutator Seal, No Paint
AAAT*	Bidirectional Shuttle (11:00**), Black Paint
AAFX*	Bidirectional Shuttle (11:00**), No Paint
AAAU*	Bidirectional Shuttle (11:00**), Castle Nut, Black Paint
AAGF*	Bidirectional Shuttle (11:00**), Castle Nut, No Paint
AABJ****	Free Running Rotorset, Black Paint
AABK****	Free Running Rotorset, No Paint
AABL****	Free Running Rotorset, No Commutator Seal, Black Paint
AABM****	Free Running Rotorset, No Commutator Seal, No Paint

- \* Not available with A, B or E porting
- \*\* Shuttle port position as viewed from shaft end of motor
- \*\*\* Available only with shaft codes 08 & 19
- \*\*\*\* Not available on 0625, 0785 or 0960 displacement codes

For other available options, see pages 261–262.



Geometric displacement  
Geom. Schluckvolumen  
Cylindrée  
Cilindrata  
Max. speed @ Max. intermittent flow  
Max. Drehzahl Intermitterender-Betrieb:  
Vitesse de rotation maxi  
Velocidad maxima a caudal intermitente maximo  
Max. oil flow  
Max. Schluckstrom  
Débit d'huile maxi  
Portata max  
Max. differential pressure  
Max. Druckgefälle  
Chute de pression maxi  
Presion diferencial maxima  
Max. supply pressure  
Max. Eingangsdruck  
Presion maxi entrée  
Presion maxima de alimentacion  
Max. torque  
Max. Drehmoment  
Couple maxi  
Torque Maximo  
Max. performance  
Max. Leistungabgabe  
Potenza meccanica max  
Min. starting torque  
Min. Anlaufmoment  
Couple min. fourni au dé manrage  
Torque minimo de arranque

Motor Series TG	cm³/rev in³/rev	rev/min	cont / int* l/min g/min		cont / int* bar psid		max bar psig	cont / int* Nm lb-in			max KW HP	cont / int* Nm lb-in	
TG 0140	141 8.6	660	76 20	95 25	207 3000	276 4000	300 4350	390 3455	530 4692	33 45	315 2791	418 3706	
TG 0170	169 10.3	554	76 20	95 25	207 3000	276 4000	300 4350	476 4216	646 5714	33 45	376 3331	505 4469	
TG 0195	195 11.9	477	76 20	95 25	207 3000	276 4000	300 4350	556 4919	753 6663	33 45	451 3989	611 5408	
TG 0240	238 14.5	393	76 20	95 25	207 3000	276 4000	300 4350	677 5991	913 8081	32 44	582 5152	776 6865	
TG 0280	280 17.1	334	76 20	95 25	207 3000	276 4000	300 4350	796 7044	1073 9499	31 42	675 5972	870 7699	
TG 0310	310 18.9	303	76 20	95 25	207 3000	276 4000	300 4350	924 8184	1229 10817	31 41	778 6882	1005 8893	
TG 0335	337 20.6	277	76 20	95 25	207 3000	276 4000	300 4350	964 8533	1297 11479	30 41	843 7458	1117 9889	
TG 0405	405 24.7	232	76 20	95 25	172 2500	241 3500	300 4350	942 8336	1342 11877	27 37	791 7002	1145 10133	
TG 0475	477 29.1	237	76 20	114 30	138 2000	207 3000	300 4350	887 7853	1372 12145	28 38	740 6549	1120 9909	
TG 0530	528 32.3	213	76 20	114 30	138 2000	172 2500	300 4350	983 8701	1253 11086	23 31	874 7737	1091 9657	
TG 0625	623 38.0	182	76 20	114 30	121 1750	155 2250	300 4350	986 8727	1291 11424	20 27	895 7924	1165 10312	
TG 0785	786 48.0	143	76 20	114 30	103 1500	138 2000	300 4350	1044 9239	1428 12636	17 23	991 8772	1341 11876	
TG 0960	959 58.5	118	76 20	114 30	69 1000	103 1500	300 4350	773 6843	1268 11227	12 16	763 6752	1177 10419	

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

\* Intermittent operation rating applies to 10% of every minute. Intermittierende Werte maximal 10% von jeder Betriebsminute. Fonctionnement interm. 10% max. de chaque minute d'utilisation. Capacidad de funcionamiento intermitente valida para 10% por cada minuto.



TG 0140

8.6 cu in / rev

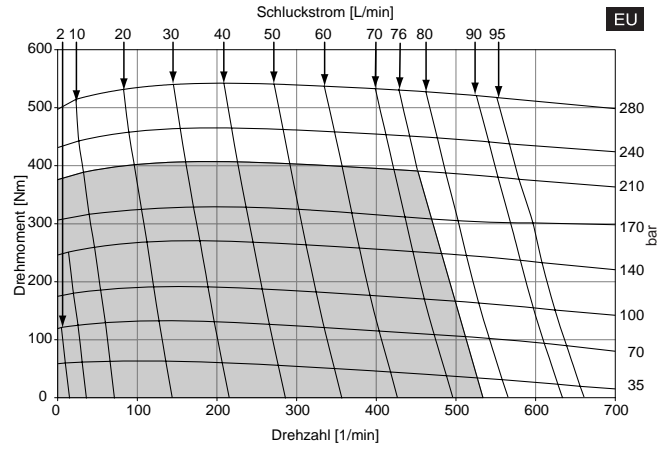
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500	4000
<b>.5</b>	519 9	1060 4						
<b>1</b>	540 22	1090 17	1635 11	2180 6				
<b>2</b>	569 49	1156 43	1730 36	2286 30	2827 23	3368 19	3899 12	4447 12
<b>3</b>	565 75	1159 69	1744 62	2321 55	2899 47	3477 40	4048 33	4608 29
<b>4</b>	564 102	1170 94	1768 87	2358 80	2943 72	3517 64	4082 57	4644 52
<b>5</b>	556 128	1170 120	1776 112	2375 105	2968 97	3556 89	4135 81	4701 76
<b>7</b>	540 182	1160 172	1779 164	2390 155	2994 146	3592 138	4181 130	4763 123
<b>9</b>	515 235	1143 225	1768 215	2385 206	2996 196	3601 187	4199 179	4794 171
<b>12</b>	471 315	1096 303	1729 292	2356 281	2974 271	3587 261	4193 252	4794 243
<b>15</b>	418 395	1042 381	1673 368	2307 357	2933 346	3549 336	4163 325	4771 314
<b>20</b>	299 528	931 512	1565 497	2198 484	2825 472	3455 459	4078 447	4692 435
<b>25</b>	173 660	794 643	1426 626	2059 612	2695 598	3332 583	3961 569	4579 555

Flow (GPM)

TORQUE (LB IN) 3961  
SPEED (RPM) 569

141 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TG 0170

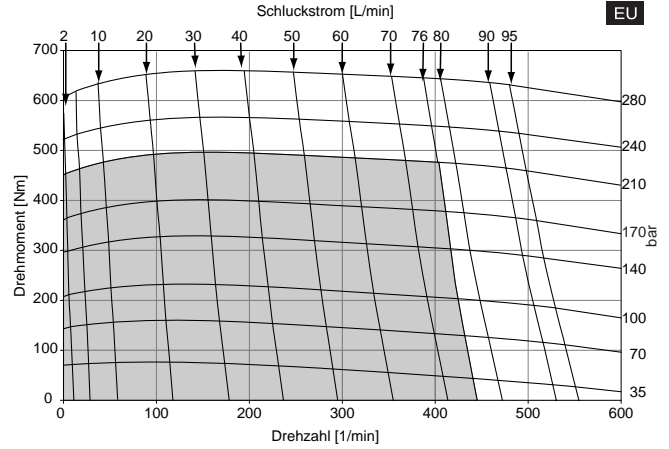
10.3 cu in / rev

	PRESSURE (PSID)							
	500	1000	1500	2000	2500	3000	3500	4000
<b>.5</b>	620 9	1284 7	1945 5	2613 4	3293 3	3983 2		
<b>1</b>	652 20	1337 18	2006 16	2683 14	3375 12	4063 11	4744 8	5402 8
<b>2</b>	678 42	1390 40	2105 37	2822 35	3535 32	4226 30	4909 27	5587 25
<b>3</b>	678 64	1397 61	2117 58	2836 56	3554 53	4263 50	4963 46	5652 44
<b>4</b>	679 86	1409 83	2142 80	2872 77	3596 74	4310 71	5021 67	5716 64
<b>5</b>	675 108	1413 104	2150 101	2885 98	3616 94	4339 91	5057 87	5761 83
<b>7</b>	661 153	1405 148	2152 143	2900 140	3642 136	4374 132	5101 127	5818 123
<b>9</b>	632 197	1385 191	2140 186	2891 181	3638 177	4380 173	5114 168	5838 163
<b>12</b>	583 263	1334 256	2096 250	2860 244	3617 239	4362 234	5101 228	5823 223
<b>15</b>	524 330	1275 322	2035 314	2804 308	3572 302	4327 296	5070 289	5801 283
<b>20</b>	382 442	1143 432	1908 422	2683 413	3455 406	4216 399	4972 391	5714 383
<b>25</b>	239 554	983 543	1747 531	2523 520	3299 511	4071 501	4839 492	5591 483

Flow (GPM)

TORQUE (LB IN) 4839  
SPEED (RPM) 492

169 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TG 0195

11.9 cu in / rev

PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500	4000
<b>.5</b>	733 7	1503 3						
<b>1</b>	761 16	1546 13	2326 8	3104 3				
<b>2</b>	799 35	1638 32	2465 27	3270 21	4046 16	4813 11	5589 7	6375 6
<b>3</b>	794 55	1639 50	2476 45	3303 39	4132 34	4970 28	5792 23	6595 19
<b>4</b>	794 74	1654 69	2509 64	3356 58	4196 52	5023 46	5830 40	6635 35
<b>5</b>	783 93	1653 88	2517 83	3375 76	4224 70	5065 64	5895 58	6710 52
<b>7</b>	762 131	1637 126	2514 120	3384 113	4245 106	5098 99	5940 92	6772 86
<b>9</b>	731 170	1616 164	2499 157	3373 150	4239 142	5093 135	5936 127	6774 120
<b>12</b>	677 228	1562 221	2455 213	3343 205	4217 196	5081 188	5934 179	6776 172
<b>15</b>	613 285	1498 278	2389 269	3283 260	4169 251	5040 242	5907 232	6765 233
<b>20</b>	448 381	1350 373	2245 363	3141 353	4031 342	4919 331	5798 321	6663 310
<b>25</b>	334 477	1158 468	2044 457	2941 445	3837 433	4729 421	5612 409	6500 397

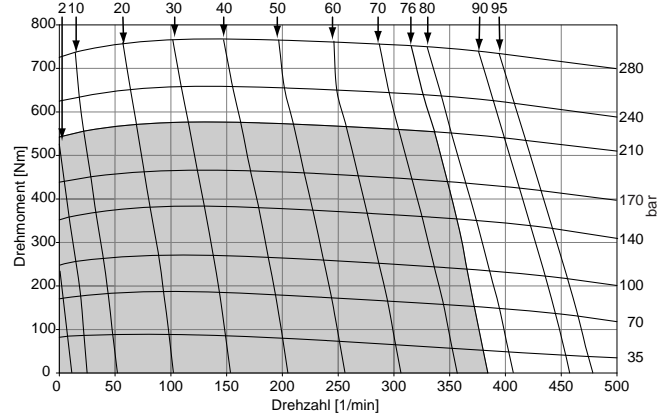
Flow (GPM)

TORQUE (LB IN) 5612  
SPEED (RPM) 409

195 cc / rev

Schluckstrom [L/min]

EU



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TG 0240

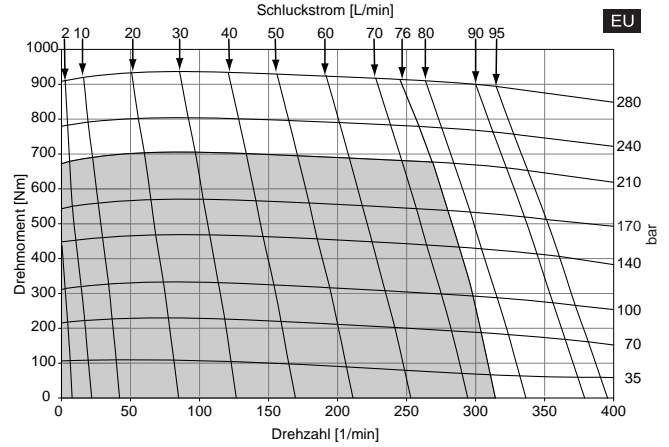
14.5 cu in / rev

PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500	4000
<b>.5</b>	932 6	1907 4	2894 2					
<b>1</b>	960 14	1954 12	2950 9	3943 6	4939 3	5930 2		
<b>2</b>	988 30	2031 27	3065 24	4090 20	5107 17	6100 14	7068 11	8037 9
<b>3</b>	983 45	2029 42	3071 39	4101 35	5128 31	6161 27	7182 23	8184 20
<b>4</b>	978 61	2037 58	3090 54	4136 49	5176 45	6207 42	7230 37	8234 33
<b>5</b>	962 77	2030 73	3092 69	4144 64	5190 60	6231 56	7259 51	8271 47
<b>7</b>	933 108	2005 104	3078 99	4141 94	5194 89	6239 84	7275 78	8298 73
<b>9</b>	890 140	1972 135	3048 129	4112 123	5169 117	6213 112	7245 106	8271 100
<b>12</b>	832 187	1912 181	2996 175	4071 167	5125 161	6163 154	7195 147	8224 140
<b>15</b>	753 235	1832 228	2921 220	4009 212	5081 204	6137 196	7182 188	8212 180
<b>20</b>	559 314	1654 306	2744 297	3834 287	4917 278	5991 268	7045 258	8081 248
<b>25</b>	524 393	1427 384	2507 373	3595 363	4690 352	5780 340	6853 328	7913 317

Flow (GPM)

238 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

012 TG.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

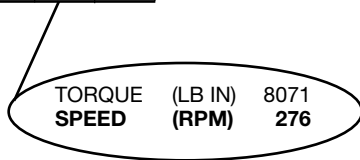
TG 0280

17.1 cu in / rev

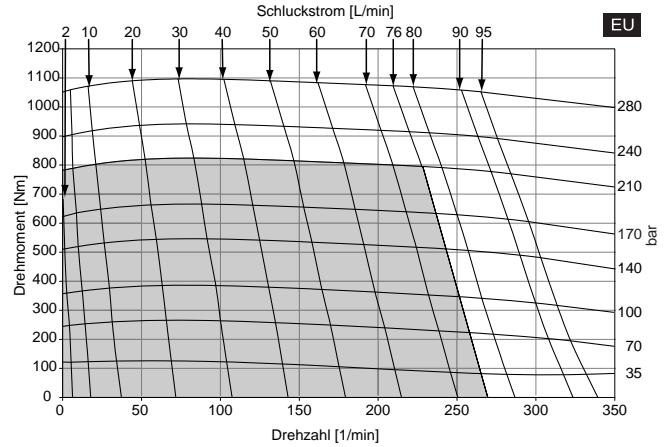
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500	4000
<b>.5</b>	1056 5	2177 4	3323 2	4512 1				
<b>1</b>	1087 12	2223 10	3378 8	4552 6	5734 5	6930 3	8135 3	9350 2
<b>2</b>	1124 25	2313 23	3513 21	4700 18	5880 16	7060 14	8239 12	9400 11
<b>3</b>	1124 39	2323 36	3532 34	4740 31	5940 28	7143 25	8346 22	9536 19
<b>4</b>	1126 52	2346 49	3568 47	4786 43	6004 40	7214 37	8415 33	9596 30
<b>5</b>	1115 65	2350 62	3582 59	4816 56	6044 52	7256 49	8457 45	9641 41
<b>7</b>	1091 92	2338 88	3586 85	4832 80	6072 76	7301 72	8515 67	9706 63
<b>9</b>	1046 118	2309 114	3564 110	4811 105	6051 101	7280 96	8499 90	9707 85
<b>12</b>	981 159	2242 154	3506 148	4757 143	5992 137	7221 132	8444 125	9652 118
<b>15</b>	898 199	2164 193	3437 186	4702 180	5951 174	7187 168	8416 160	9625 152
<b>20</b>	691 266	1976 258	3255 250	4529 243	5795 235	7044 227	8275 218	9499 209
<b>25</b>	703 334	1726 324	2987 314	4260 305	5540 296	6815 286	8071 276	9311 267

Flow (GPM)



280 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

**TG 0310**

**18.9 cu in / rev**

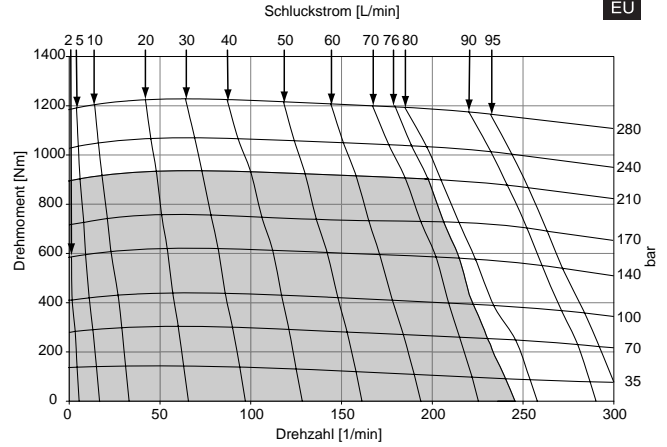
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500	4000
<b>.5</b>	1188 4	2464 3	3766 2	5102 1				
<b>1</b>	1220 11	2508 9	3812 7	5145 5	6477 4	7822 2	9181 2	10530 1
<b>2</b>	1259 23	2598 21	3950 19	5298 17	6642 14	7972 13	9282 10	10574 9
<b>3</b>	1257 35	2606 33	3889 30	5332 28	6688 25	8044 22	9392 19	10693 16
<b>4</b>	1259 47	2628 44	4003 42	5377 39	6749 36	8114 33	9461 29	10780 26
<b>5</b>	1247 59	2629 56	4252 52	5401 50	6782 47	8149 42	9499 39	10823 35
<b>7</b>	1218 84	2614 80	4013 76	5413 72	6806 68	8184 64	9543 60	10874 56
<b>9</b>	1167 107	2574 103	3983 99	5386 94	6780 90	8162 85	9529 80	10877 75
<b>12</b>	1089 143	2493 139	3904 133	5308 128	6696 122	8075 117	9443 110	10793 102
<b>15</b>	995 180	2400 173	3817 167	5225 160	6621 154	8003 148	9371 140	10718 131
<b>20</b>	769 241	2194 234	3618 225	5043 218	6462 210	7863 203	9238 194	10588 183
<b>25</b>	626 303	1955 294	3359 284	4771 274	6251 265	7608 256	8998 246	10360 236

**Flow (GPM)**

**TORQUE (LB IN) 7608**  
**SPEED (RPM) 256**

**310 cc / rev**



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TG 0335

20.6 cu in / rev

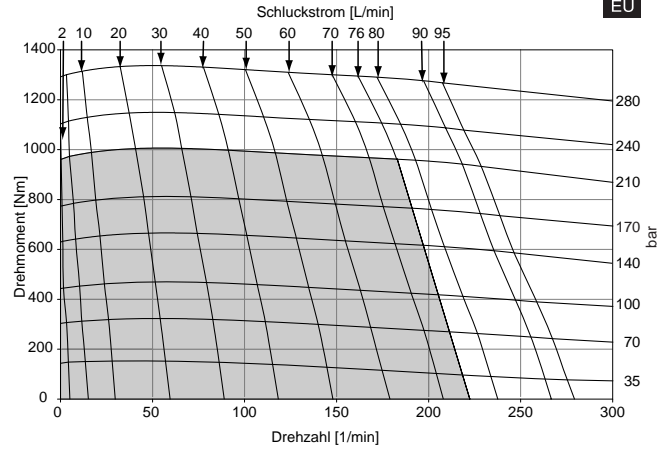
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500	4000
<b>.5</b>	1297 4	2699 3	4128 1	5584 1				
<b>1</b>	1329 10	2741 8	4176 7	5630 5	7084 4	8551 2	10036 2	11496 1
<b>2</b>	1369 21	2832 19	4308 17	5787 15	7265 13	8718 11	10136 9	11534 8
<b>3</b>	1366 32	2838 30	4326 27	5817 25	7301 22	8781 20	10248 17	11685 14
<b>4</b>	1368 43	2858 40	4358 38	5861 35	7358 32	8850 29	10317 25	11748 22
<b>5</b>	1355 54	2858 51	4368 48	5880 45	7386 42	8880 38	10352 34	11791 30
<b>7</b>	1323 76	2840 73	4363 69	5888 65	7407 61	8908 57	10384 53	11829 47
<b>9</b>	1266 98	2791 94	4326 90	5856 85	7376 81	8884 76	10372 71	11834 64
<b>12</b>	1177 131	2698 127	4230 121	5759 116	7273 110	8773 105	10261 98	11726 90
<b>15</b>	1075 165	2594 159	4127 153	5654 146	7170 140	8670 134	10153 126	11613 116
<b>20</b>	833 221	2372 214	3915 205	5463 197	7008 189	8533 182	10026 173	11479 161
<b>25</b>	678 277	2142 269	3663 259	5189 248	6726 239	8257 230	9757 219	11219 209

Flow (GPM)

TORQUE (LB IN) 8257  
SPEED (RPM) 230

337 cc / rev



EU

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TG 0405

24.7 cu in / rev

PRESSURE (PSID)

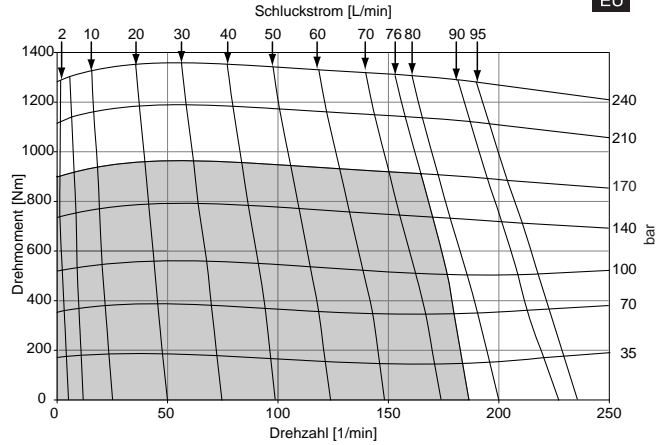
	500	1000	1500	2000	2500	3000	3500
<b>.5</b>	1544 4	3178 3	4840 2	6515 1	8185 1		
<b>1</b>	1593 8	3256 7	4928 6	6607 6	8303 5	9987 4	11652 3
<b>2</b>	1636 17	3351 16	5084 15	6817 14	8550 13	10272 12	11978 11
<b>3</b>	1637 27	3365 25	5106 23	6847 22	8588 21	10314 19	12031 18
<b>4</b>	1645 36	3394 34	5159 32	6920 30	8668 29	10402 27	12130 26
<b>5</b>	1640 45	3408 43	5201 41	6983 39	8733 37	10466 35	12194 33
<b>7</b>	1606 64	3396 61	5211 59	7003 56	8772 54	10527 51	12271 49
<b>9</b>	1551 82	3350 80	5176 77	6981 73	8763 70	10519 67	12269 64
<b>12</b>	1428 110	3238 107	5075 103	6888 99	8670 95	10424 91	12172 88
<b>15</b>	1310 138	3112 135	4948 130	6759 125	8545 120	10306 115	12060 111
<b>20</b>	1136 185	2862 181	4692 175	6518 168	8336 162	10122 156	11877 151
<b>25</b>			4492 219	6303 212	8084 204	9848 197	11585 190

Flow (GPM)

TORQUE (LB IN) 9848  
SPEED (RPM) 197

405 cc / rev

EU



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.



TG 0475

29.1 cu in / rev

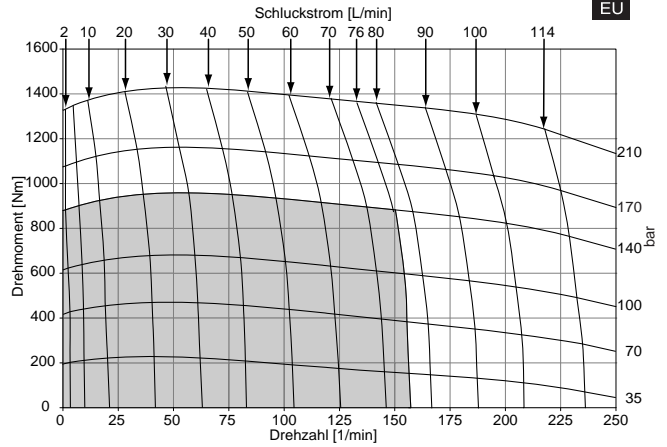
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000
<b>.5</b>	1768 3	3732 3	5733 2	7744 1	9762 1	
<b>1</b>	1868 7	3878 7	5879 6	7851 5	9838 4	11830 3
<b>2</b>	1964 15	4055 14	6180 14	8237 12	10241 10	12136 8
<b>3</b>	1972 23	4074 22	6208 21	8321 19	10379 17	12355 13
<b>4</b>	2005 31	4135 30	6287 29	8382 27	10463 24	12496 20
<b>5</b>	2004 39	4129 38	6304 37	8428 34	10514 31	12544 26
<b>7</b>	1990 55	4133 54	6308 52	8445 50	10555 45	12602 40
<b>9</b>	1924 70	4104 69	6285 68	8430 65	10528 60	12608 54
<b>12</b>	1775 94	3974 93	6157 91	8328 87	10446 82	12528 75
<b>15</b>	1619 118	3784 116	5990 114	8188 110	10311 104	12372 96
<b>20</b>	1314 157	3373 156	5629 153	7853 149	10038 141	12145 132
<b>25</b>	1141 197	3029 196	5220 193	7427 189	9629 182	11757 174
<b>30</b>	606 237	2505 236	4649 233	6766 230	8878 224	10989 219

Flow (GPM)

TORQUE (LB IN) 6766  
SPEED (RPM) 230

477 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TG 0530

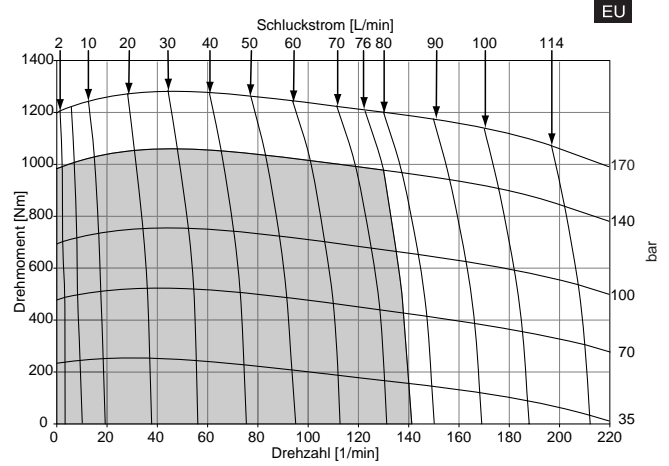
32.2 cu in / rev

	PRESSURE (PSID)				
	500	1000	1500	2000	2500
<b>.5</b>	2080 3	4256 3	6479 2	8726 2	11012 1
<b>1</b>	2158 7	4372 6	6592 6	8779 5	10994 4
<b>2</b>	2246 14	4567 13	6869 12	9126 11	11376 9
<b>3</b>	2242 21	4578 20	6916 19	9237 17	11500 14
<b>4</b>	2253 28	4625 27	6977 25	9296 23	11586 20
<b>5</b>	2235 35	4629 34	7002 32	9333 29	11626 26
<b>7</b>	2182 49	4599 48	7006 46	9362 42	11659 38
<b>9</b>	2095 63	4535 62	6960 59	9330 55	11650 50
<b>12</b>	1943 85	4390 83	6825 80	9217 75	11549 69
<b>15</b>	1753 106	4199 104	6638 100	9052 95	11408 87
<b>20</b>	1327 141	3783 139	6262 135	8701 129	11086 120
<b>25</b>	1011 177	3300 175	5751 171	8210 165	10639 158
<b>30</b>	269 213	2698 211	5083 208	7415 203	9814 197

Flow (GPM)

TORQUE (LB IN) 9814  
SPEED (RPM) 197

528 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TG 0625

38.0 cu in / rev

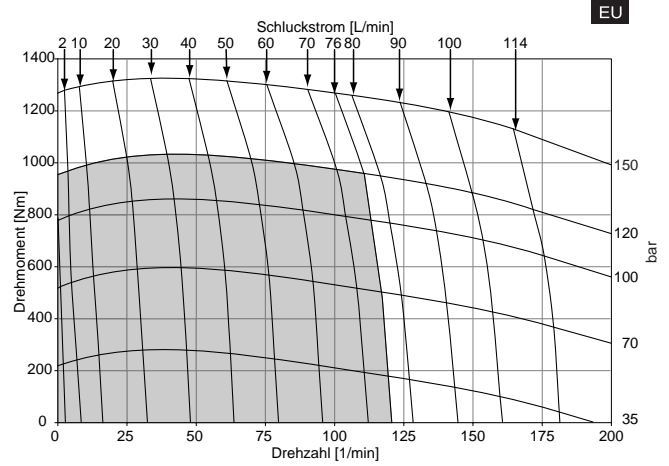
PRESSURE (PSID)

	500	1000	1500	1750	2250
<b>.5</b>	1939 2	4593 1			
<b>1</b>	2087 5	4665 3	7283 2	8680 2	11579 1
<b>2</b>	2338 11	4991 9	7590 8	8853 7	11458 5
<b>3</b>	2386 17	5101 15	7753 13	9055 12	11689 9
<b>4</b>	2457 23	5202 21	7872 19	9174 17	11769 14
<b>5</b>	2479 29	5246 27	7943 25	9242 23	11821 18
<b>7</b>	2464 41	5273 39	7995 36	9306 34	11859 28
<b>9</b>	2401 53	5223 51	7993 48	9337 45	11935 39
<b>12</b>	2254 71	5092 69	7886 65	9239 62	11900 54
<b>15</b>	2052 89	4901 87	7721 83	9086 80	11763 70
<b>20</b>	1600 120	4490 117	7334 112	8725 109	11424 98
<b>25</b>	1063 151	3933 148	6818 144	8235 140	11021 131
<b>30</b>	359 182	3250 180	6074 176	7443 172	10179 165

Flow (GPM)

TORQUE (LB IN) 7443  
SPEED (RPM) 172

623 cc / rev



EU

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TG 0785

48.0 cu in / rev

PRESSURE (PSID)

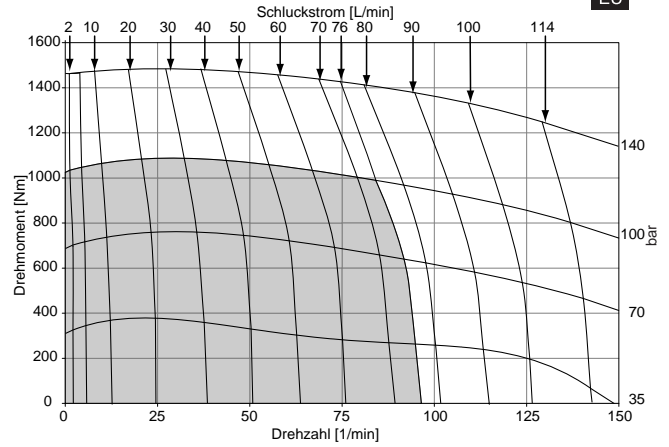
	500	1000	1500	2000
<b>.5</b>	2910 2	6153 2	9607 1	12950 1
<b>1</b>	3011 4	6296 4	9670 3	12919 3
<b>2</b>	3217 9	6536 8	9935 7	13060 6
<b>3</b>	3220 14	6613 13	9977 11	13079 9
<b>4</b>	3265 19	6679 17	10021 15	13078 13
<b>5</b>	3263 23	6703 22	10047 19	13103 16
<b>7</b>	3218 33	6722 31	10068 28	13062 24
<b>9</b>	3107 43	6664 41	10108 36	13185 31
<b>12</b>	2892 57	6489 55	9959 49	13082 42
<b>15</b>	2643 71	6238 69	9733 62	12938 54
<b>20</b>	2044 95	5673 92	9239 85	12636 75
<b>25</b>	2313 119	4976 117	8571 110	12073 101
<b>30</b>	496 143	4104 141	7582 137	11024 130

Flow (GPM)

TORQUE (LB IN) 11024  
SPEED (RPM) 130

786 cc / rev

EU



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TG 0960

58.5 cu in / rev

PRESSURE (PSID)

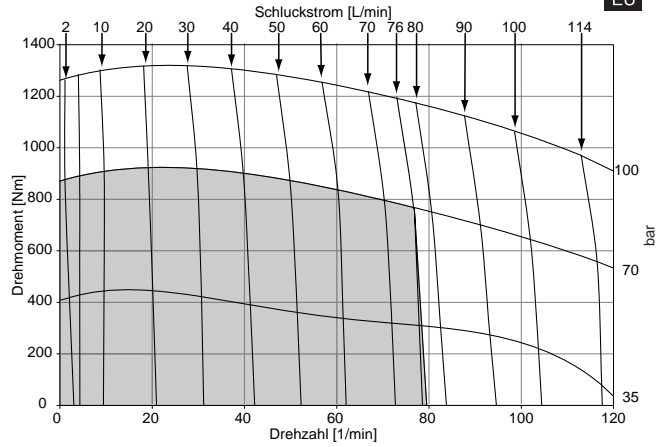
	500	1000	1500
<b>.5</b>	3692 2	7712 1	11750 1
<b>1</b>	3788 3	7858 3	11895 3
<b>2</b>	3900 7	8045 7	12058 6
<b>3</b>	3905 11	8078 11	12135 10
<b>4</b>	3939 15	8155 14	12210 13
<b>5</b>	3923 19	8173 18	12238 17
<b>7</b>	3860 27	8160 26	12262 24
<b>9</b>	3733 35	8074 34	12224 31
<b>12</b>	3475 47	7848 45	12062 42
<b>15</b>	3149 58	7545 57	11823 53
<b>20</b>	2437 78	6843 76	11227 72
<b>25</b>	2969 98	5990 96	10360 92
<b>30</b>	603 118	4919 117	9170 113

Flow (GPM)

TORQUE (LB IN) 9170  
SPEED (RPM) 113

959 cc / rev

EU



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

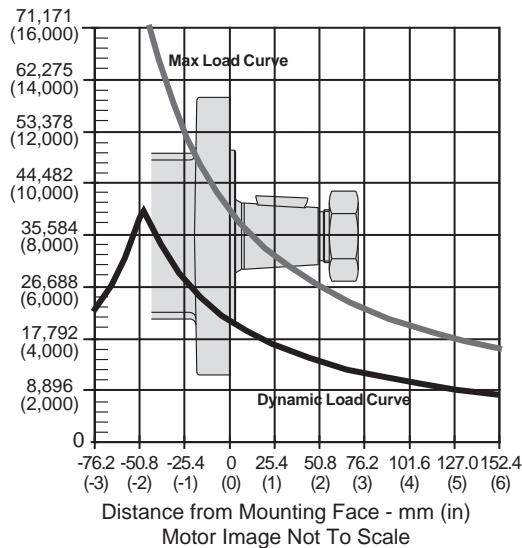
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

**Flange Mount / Standardgehäuse**  
**Monture à bride(s) / Montaje de brida**

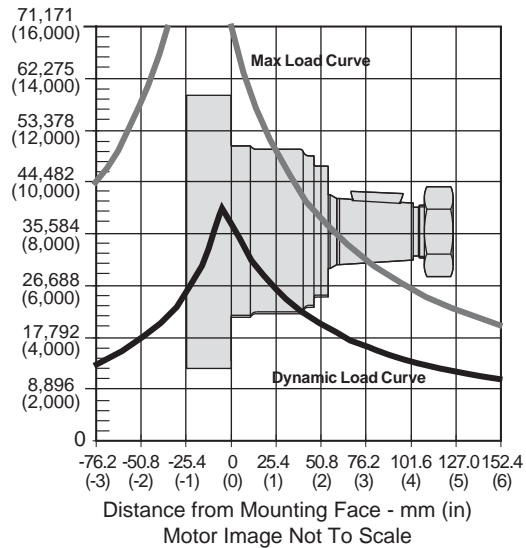
Side Load - N (lbs)



The dynamic side load curve is based on uni-directional steady state loads for  $L_{10}$  bearing life at  $3 \times 10^6$  revolutions. Die zulässige auslegbare radiale Wellenbelastungskurve ist unter ruhenden, einseitig statisch gerichteten Lastverhältnissen auf eine  $L_{10}$  Lebensdauer mit  $3 \times 10^6$  Umdrehungen kalkuliert. La courbe de charge latérale permise se base sur des charges unidirectionnelles en régime permanent pour le roulement  $L_{10}$  à  $3 \times 10^6$  révolutions. La curva de valores admisibles de carga lateral está basada en cargas constantes para cojinetes  $L_{10}$  a  $3 \times 10^6$  revoluciones.

**Wheel Mount / Radnabengehäuse**  
**Monture à roue/ Montaje de rueda**

Side Load - N (lbs)



The maximum load curve is defined by bearing static load capacity. This curve should not be exceeded at any time including shock loads. Die maximale radiale Wellenbelastungskurve ist definiert als maximale statische Last ohne Drehzahl. Sie gilt als Grenze und sollte keinesfalls überschritten werden. La courbe de charge maximale est définie par la capacité de charge statique portante. Cette courbe ne devrait être dépassée en aucun moment y compris pour les charges par à-coups. La curva de carga máxima queda definida por la capacidad de carga estática del cojinete. No se deben superar los valores de esta curva, ni siquiera con cargas provisorias de impacto.

**Equation to Calculate the Expected Radial Bearing Life**  
**Gleichung zur Ermittlung der Lagerlebensdauer**

Equation to calculate the dynamic bearing life for a given load:  
 Bestimmung der erlaubten radialen Wellenbelastung mit vorgegebener Last

Use  $F_a$ ,  $F_b$  and  $S$  in equation to determine hours of  $L_{10}$  bearing life.  
 Die Lebensdauer in Stunden ergibt sich durch einsetzen von  $F_a$ ,  $F_b$ , und  $S$  in die nachstehende Formel.

$$L = \frac{3 \times 10^6}{60 \times S} \left\{ \frac{F_a}{F_b} \right\}^{3.33}$$

Where / Mit:

$S$  = Shaft Speed RPM / Abtriebswellendrehzahl in  $\text{min}^{-1}$

$L$  = Life In Hours / Lebensdauer in Stunden

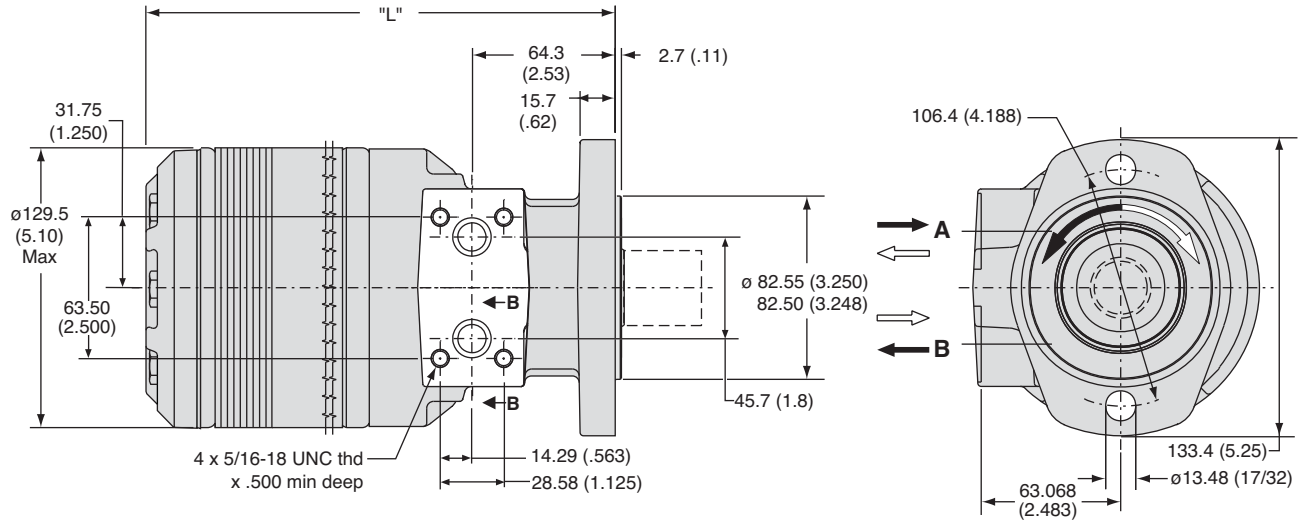
$F_a$  = Dynamic side load defined by above curve at a distance from mounting flange. / Erlaubte radiale Wellenbelastung als Funktion der Länge

$F_b$  = Application side load. / Anwendungsseitige Wellenbelastung

Note: Calculations are based on  $L_{10}$  bearing life per ISO 281.  
 Auslegung basiert auf einer  $L_{10}$  Lebensdauer nach ISO 281.

**Code: AM**

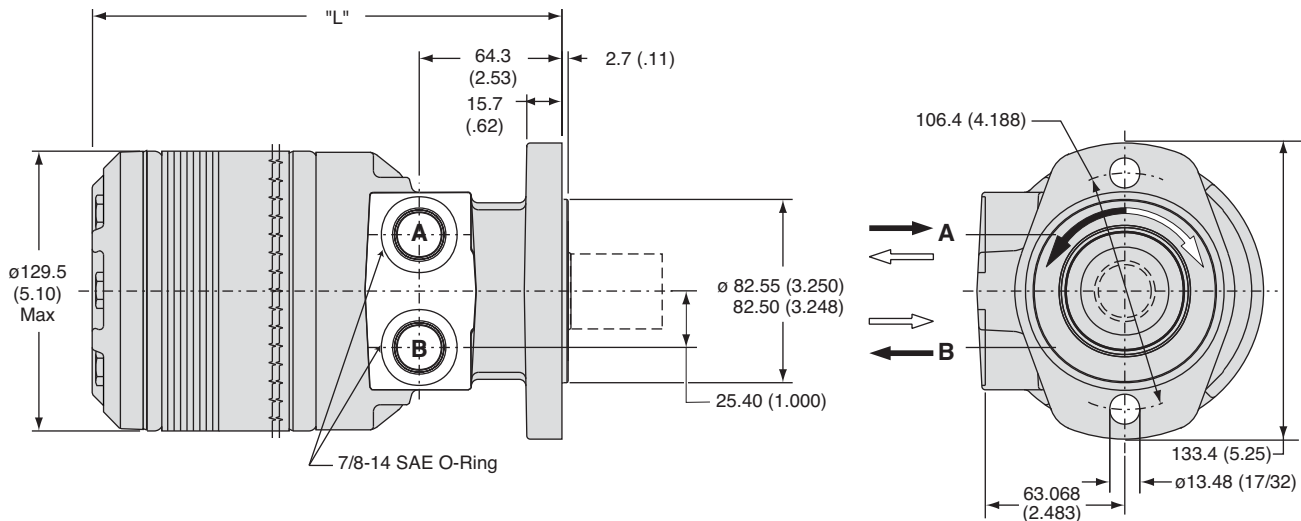
**SAE A 2-Bolt, 5/16-18 UNC Manifold**



Code AM	disp.	0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
Weight/Gewicht	kg	14.2	14.5	14.7	15.1	15.5	15.7	15.9	16.5	17.2	17.9	18.6	20.2	21.9
Poids/Peso	(lb)	(31.4)	(32.0)	(32.5)	(33.3)	(34.2)	(34.7)	(35.1)	(36.4)	(37.9)	(39.5)	(41.1)	(44.5)	(48.3)
Length	"L" mm	196	199	202	207	211	215	218	225	234	240	250	267	288
	"L" (in)	(7.70)	(7.82)	(7.95)	(8.13)	(8.32)	(8.46)	(8.57)	(8.86)	(9.20)	(9.45)	(9.82)	(10.57)	(11.32)

**Code: AS**

**SAE A 2-Bolt, 7/8-14 SAE**

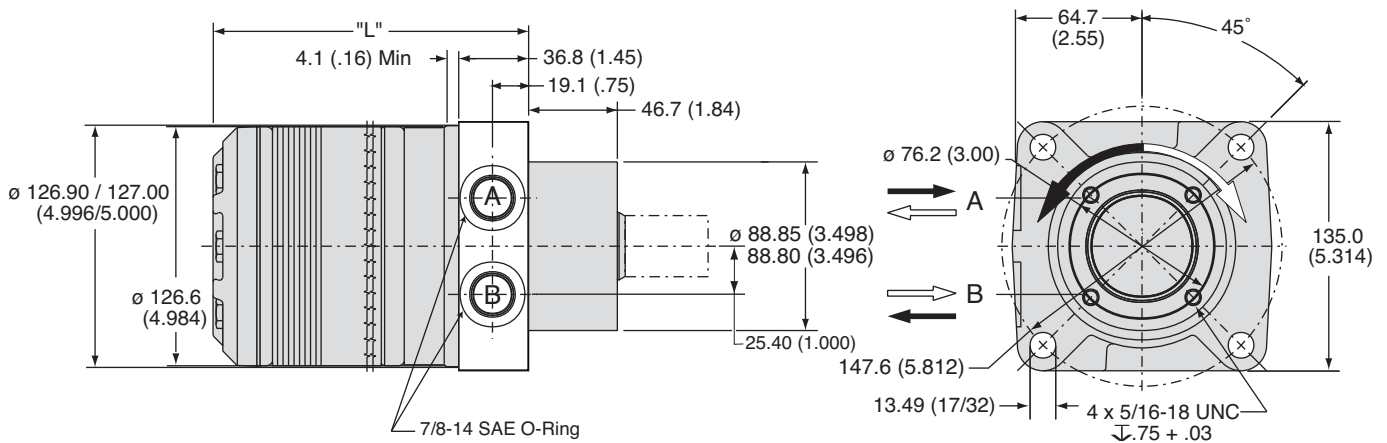


Code AS	disp.	0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
Weight/Gewicht	kg	14.2	14.5	14.7	15.1	15.5	15.7	15.9	16.5	17.2	17.9	18.6	20.2	21.9
Poids/Peso	(lb)	(31.4)	(32.0)	(32.5)	(33.3)	(34.2)	(34.7)	(35.1)	(36.4)	(37.9)	(39.5)	(41.1)	(44.5)	(48.3)
Length	"L" mm	196	199	202	207	211	215	218	225	234	240	250	267	288
	"L" (in)	(7.70)	(7.82)	(7.95)	(8.13)	(8.32)	(8.46)	(8.57)	(8.86)	(9.20)	(9.45)	(9.82)	(10.57)	(11.32)

English equivalents for metric specifications are shown in ( ).

**Code: LS**

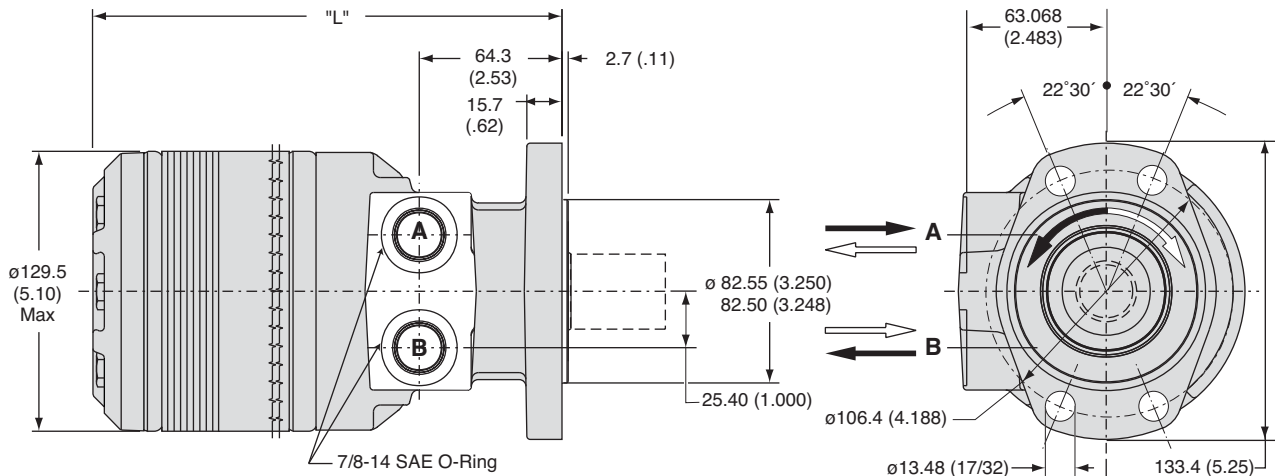
**Wheel, Front Brake Nose, 7/8-14 SAE**



Code LS	disp.	0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
Weight/Gewicht	kg	14.6	14.8	15.1	15.5	15.9	16.1	16.3	16.9	17.5	18.3	19.0	20.5	22.2
Poids/Peso	(lb)	(32.2)	(37.7)	(33.3)	(34.1)	(35.0)	(35.5)	(35.8)	(37.2)	(38.6)	(40.3)	(41.8)	(45.3)	(49.0)
Length	"L" mm	150	154	157	161	166	170	173	180	188	195	204	223	242
	"L" (in)	(5.92)	(6.04)	(6.17)	(6.35)	(6.54)	(6.68)	(6.79)	(7.08)	(7.42)	(7.67)	(8.04)	(8.79)	(9.54)

**Code: MS**

**Magneto, 7/8-14 SAE**



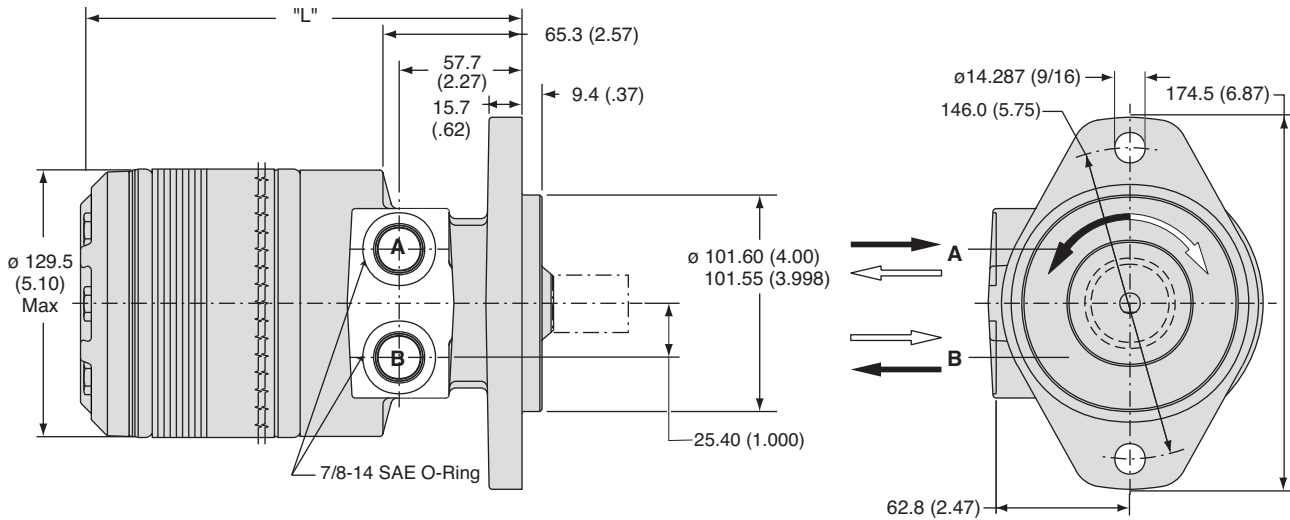
Code MS	disp.	0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
Weight/Gewicht	kg	14.2	14.5	14.7	15.1	15.5	16.1	15.9	16.5	17.2	17.9	18.6	20.2	21.9
Poids/Peso	(lb)	(31.4)	(32.0)	(32.5)	(33.3)	(34.2)	(35.5)	(35.1)	(36.4)	(37.9)	(39.5)	(41.1)	(44.5)	(48.3)
Length	"L" mm	196	199	202	207	211	215	218	225	234	240	250	267	288
	"L" (in)	(7.70)	(7.82)	(7.95)	(8.13)	(8.32)	(8.46)	(8.57)	(8.86)	(9.20)	(9.45)	(9.82)	(10.57)	(11.32)

English equivalents for metric specifications are shown in ( ).



**Code: BS**

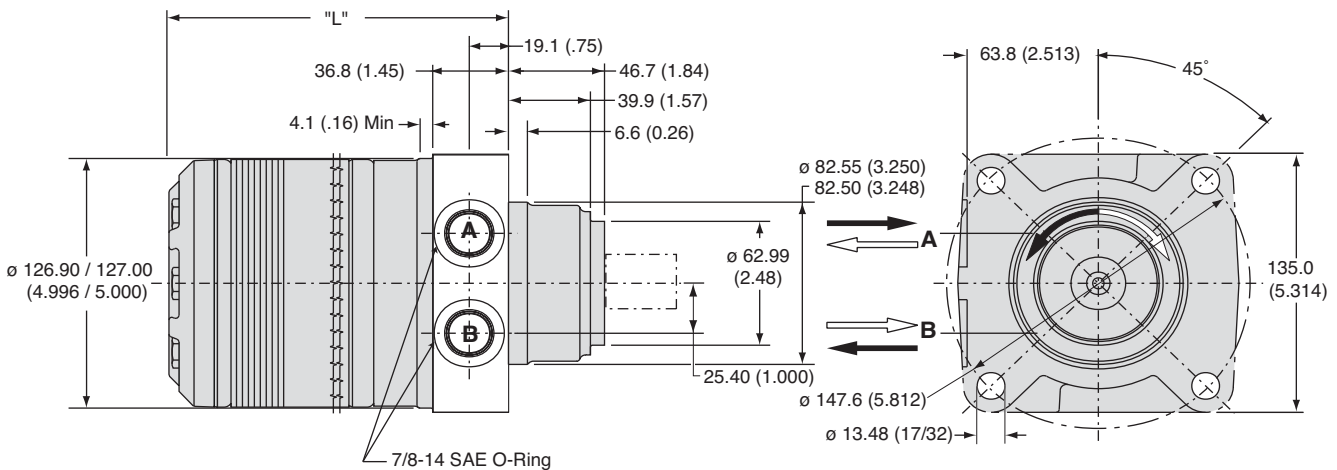
**SAE B 2-Bolt, 7/8-14 SAE O-Ring**



Code BS	disp.	0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
<b>Weight/Gewicht</b>	<b>kg</b>	<b>14.9</b>	<b>15.2</b>	<b>15.3</b>	<b>15.7</b>	<b>16.1</b>	<b>16.4</b>	<b>16.6</b>	<b>17.1</b>	<b>17.8</b>	<b>18.6</b>	<b>19.3</b>	<b>20.8</b>	<b>22.5</b>
<b>Poids/Peso</b>	<b>(lb)</b>	<b>(32.8)</b>	<b>(33.4)</b>	<b>(33.9)</b>	<b>(34.7)</b>	<b>(35.6)</b>	<b>(36.1)</b>	<b>(36.5)</b>	<b>(37.8)</b>	<b>(39.3)</b>	<b>(40.9)</b>	<b>(42.5)</b>	<b>(45.9)</b>	<b>(49.7)</b>
<b>Length</b>	<b>"L" mm</b>	<b>196</b>	<b>199</b>	<b>202</b>	<b>207</b>	<b>211</b>	<b>215</b>	<b>218</b>	<b>225</b>	<b>234</b>	<b>240</b>	<b>250</b>	<b>267</b>	<b>288</b>
	<b>"L" (in)</b>	<b>(7.70)</b>	<b>(7.82)</b>	<b>(7.95)</b>	<b>(8.13)</b>	<b>(8.32)</b>	<b>(8.46)</b>	<b>(8.57)</b>	<b>(8.86)</b>	<b>(9.20)</b>	<b>(9.45)</b>	<b>(9.82)</b>	<b>(10.57)</b>	<b>(11.32)</b>

**Code: US**

**Wheel, Standard, 7/8-14 SAE**

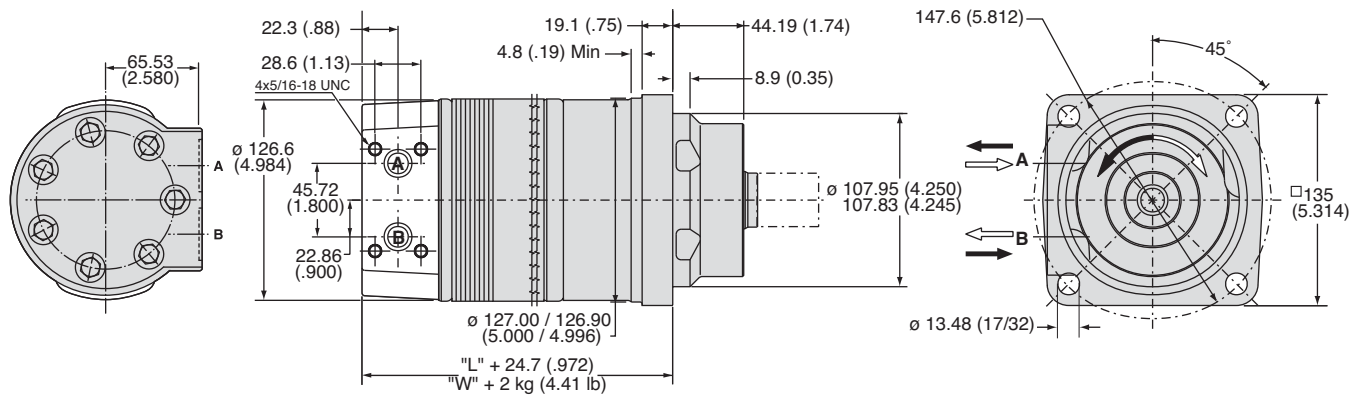


Code US	disp.	0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
<b>Weight/Gewicht</b>	<b>kg</b>	<b>14.6</b>	<b>14.8</b>	<b>15.1</b>	<b>15.5</b>	<b>15.9</b>	<b>16.1</b>	<b>16.3</b>	<b>16.9</b>	<b>17.5</b>	<b>18.3</b>	<b>19.0</b>	<b>20.5</b>	<b>22.2</b>
<b>Poids/Peso</b>	<b>(lb)</b>	<b>(32.2)</b>	<b>(32.7)</b>	<b>(33.3)</b>	<b>(34.1)</b>	<b>(35.0)</b>	<b>(35.5)</b>	<b>(35.8)</b>	<b>(37.2)</b>	<b>(38.6)</b>	<b>(40.3)</b>	<b>(41.8)</b>	<b>(45.3)</b>	<b>(49.0)</b>
<b>Length</b>	<b>"L" mm</b>	<b>150</b>	<b>154</b>	<b>157</b>	<b>161</b>	<b>166</b>	<b>170</b>	<b>173</b>	<b>180</b>	<b>188</b>	<b>195</b>	<b>204</b>	<b>223</b>	<b>242</b>
	<b>"L" (in)</b>	<b>(5.92)</b>	<b>(6.04)</b>	<b>(6.17)</b>	<b>(6.35)</b>	<b>(6.54)</b>	<b>(6.68)</b>	<b>(6.79)</b>	<b>(7.08)</b>	<b>(7.42)</b>	<b>(7.67)</b>	<b>(8.04)</b>	<b>(8.79)</b>	<b>(9.54)</b>

English equivalents for metric specifications are shown in ( ).

**Code: WE**

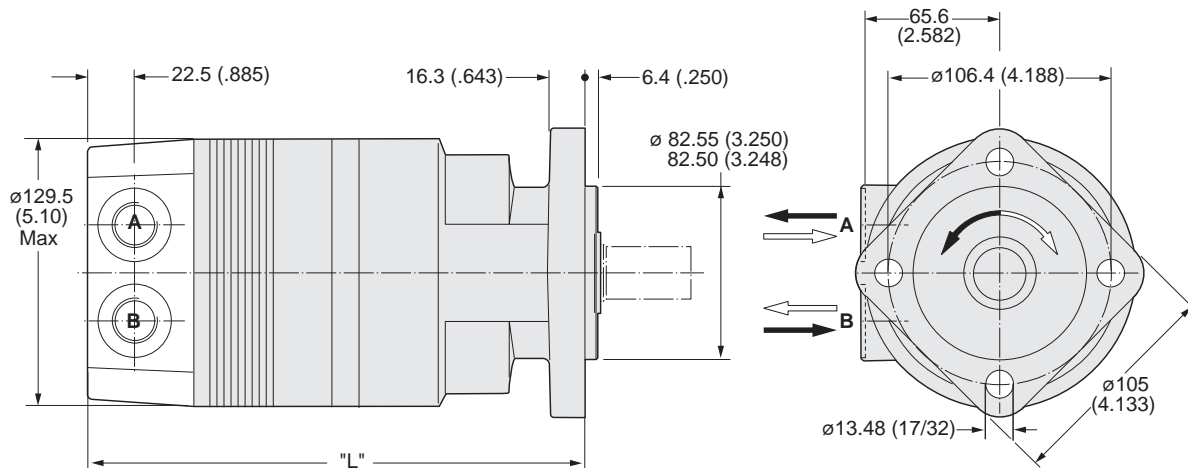
**Wheel, Optional, Manifold Rear Port**



Code WE	disp.	0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
Weight/Gewicht	kg	17.6	17.8	18.1	18.4	18.8	19.1	19.3	19.8	20.5	21.3	22.0	23.5	25.2
Poids/Peso	(lb)	(38.7)	(39.3)	(39.8)	(40.6)	(41.5)	(42.0)	(42.4)	(43.7)	(45.2)	(46.8)	(48.4)	(51.8)	(55.6)
Length	"L" mm	178	181	184	189	193	197	200	207	216	222	232	251	270
	"L" (in)	(6.99)	(7.11)	(7.24)	(7.43)	(7.61)	(7.75)	(7.86)	(8.15)	(8.49)	(8.74)	(9.12)	(9.87)	(10.62)

**Code: VB**

**SAE A 4-Bolt, 7/8-14 SAE Rear Port**

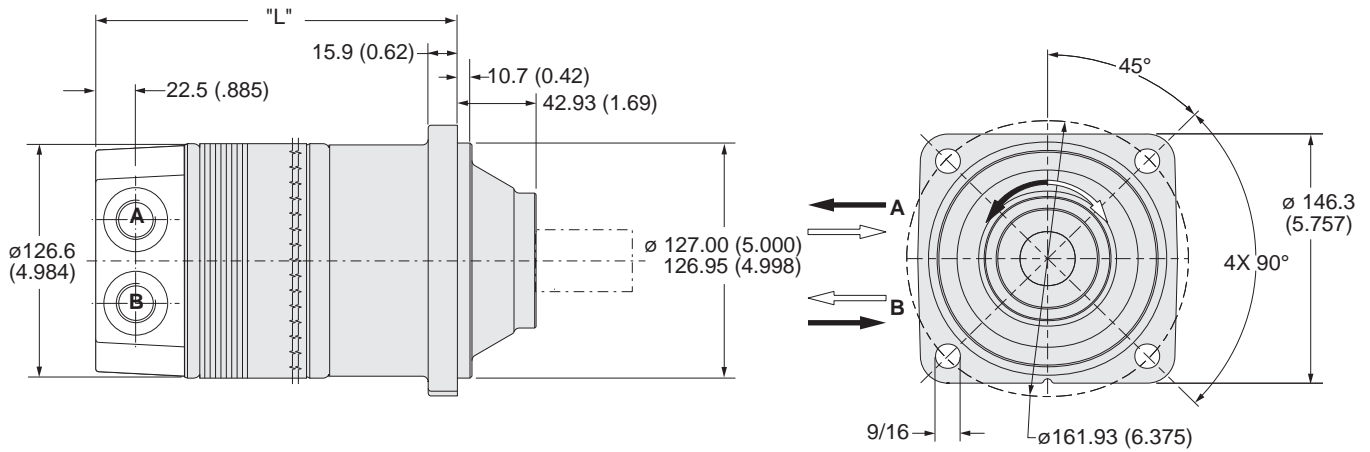


Code VB	disp.	0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
Weight/Gewicht	kg	16.1	16.3	16.6	17.0	17.4	17.6	17.8	18.4	19.0	19.8	20.5	22.0	23.7
Poids/Peso	(lb)	(35.5)	(35.9)	(36.6)	(37.5)	(38.4)	(38.8)	(39.2)	(41.0)	(41.9)	(43.7)	(45.2)	(48.5)	(52.2)
Length	"L" mm	217	220	223	228	233	237	239	246	255	261	271	290	309
	"L" (in)	(8.53)	(8.65)	(8.78)	(8.97)	(9.15)	(9.29)	(9.40)	(9.69)	(10.03)	(10.28)	(10.66)	(11.41)	(12.16)

English equivalents for metric specifications are shown in ( ).

**Code: DB**

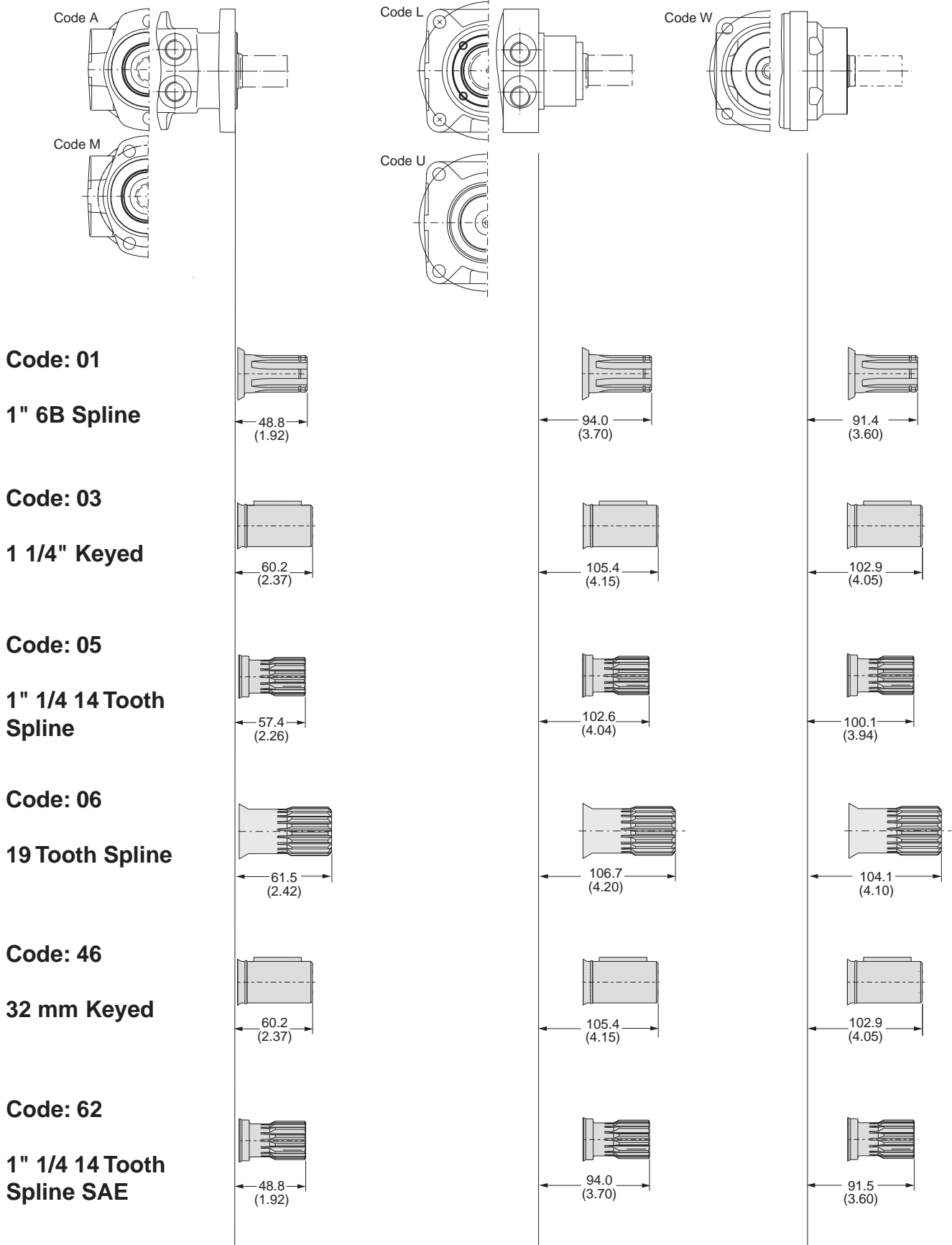
**Large Wheel Mount, 7/8-14 SAE Rear Port**



Code DB	disp.	0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
<b>Weight/Gewicht</b>	<b>kg</b>	<b>17.6</b>	<b>17.8</b>	<b>18.1</b>	<b>18.4</b>	<b>18.8</b>	<b>19.1</b>	<b>19.3</b>	<b>19.8</b>	<b>20.5</b>	<b>21.3</b>	<b>22.0</b>	<b>23.5</b>	<b>25.2</b>
	<b>(lb)</b>	<b>(38.7)</b>	<b>(39.3)</b>	<b>(39.8)</b>	<b>(40.6)</b>	<b>(41.5)</b>	<b>(42.0)</b>	<b>(42.4)</b>	<b>(43.7)</b>	<b>(45.2)</b>	<b>(46.8)</b>	<b>(48.4)</b>	<b>(51.8)</b>	<b>(55.6)</b>
<b>Length</b>	<b>"L" mm</b>	<b>179</b>	<b>182</b>	<b>185</b>	<b>190</b>	<b>195</b>	<b>199</b>	<b>201</b>	<b>209</b>	<b>217</b>	<b>223</b>	<b>233</b>	<b>252</b>	<b>271</b>
	<b>"L" (in)</b>	<b>(7.04)</b>	<b>(7.17)</b>	<b>(7.29)</b>	<b>(7.48)</b>	<b>(7.67)</b>	<b>(7.81)</b>	<b>(7.92)</b>	<b>(8.21)</b>	<b>(8.54)</b>	<b>(8.79)</b>	<b>(9.17)</b>	<b>(9.92)</b>	<b>(10.67)</b>

English equivalents for metric specifications are shown in ( ).

012 TG.indd, js



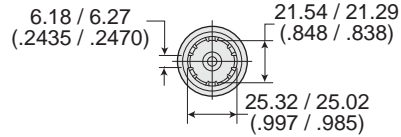
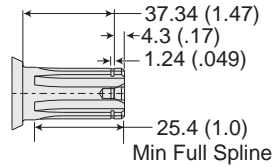
English equivalents for metric specifications are shown in ( ).

012 TG.indd, js



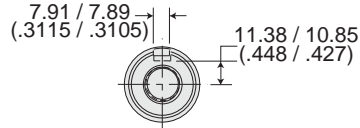
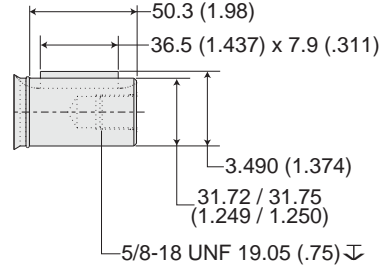
Code: 01

1" 6B Spline



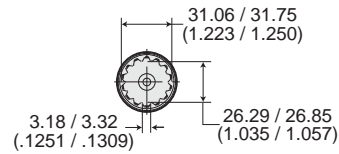
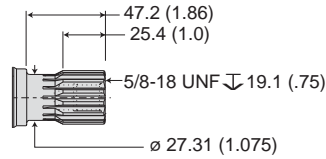
Code: 03

1 1/4" Keyed



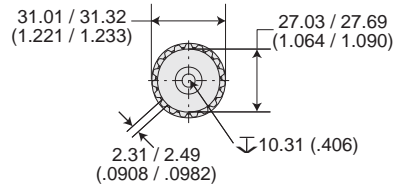
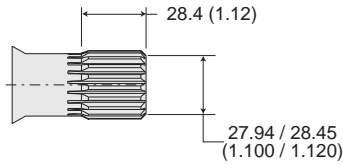
Code: 05

1" 1/4 14 Tooth Spline



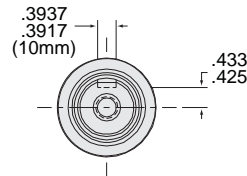
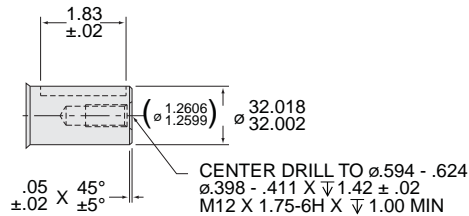
Code: 06

19 Tooth Spline



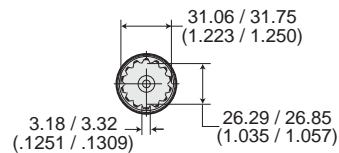
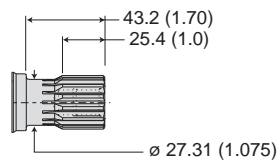
Code: 46

32 mm Keyed

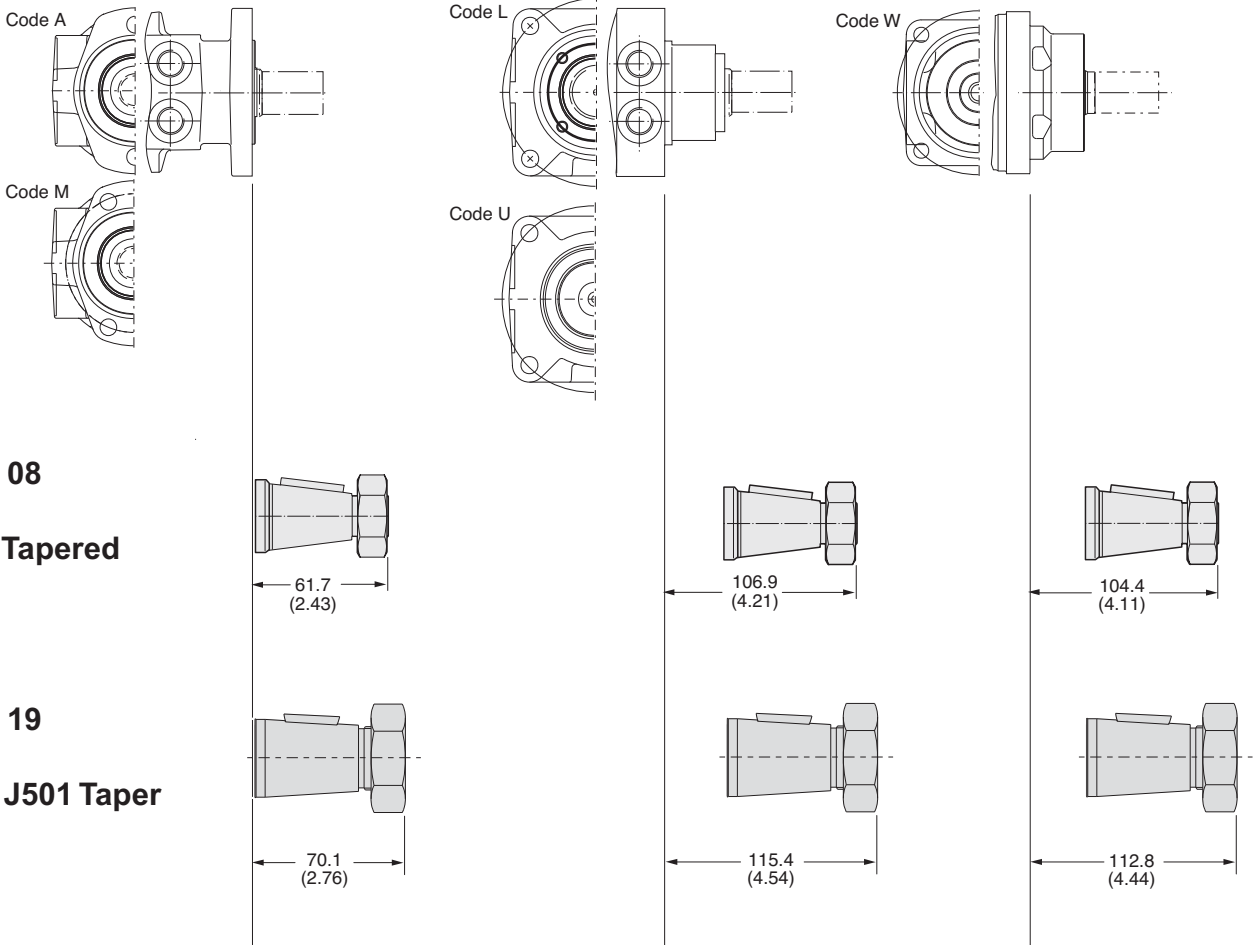


Code: 62

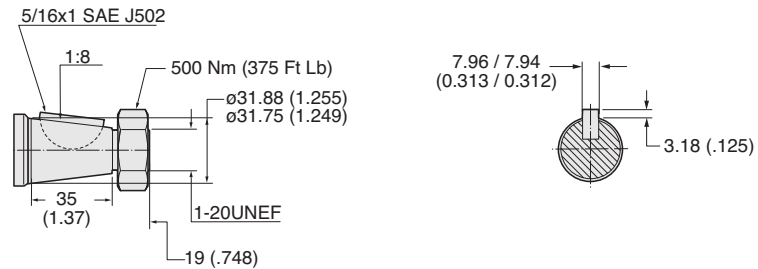
1" 1/4 14 Tooth Spline SAE



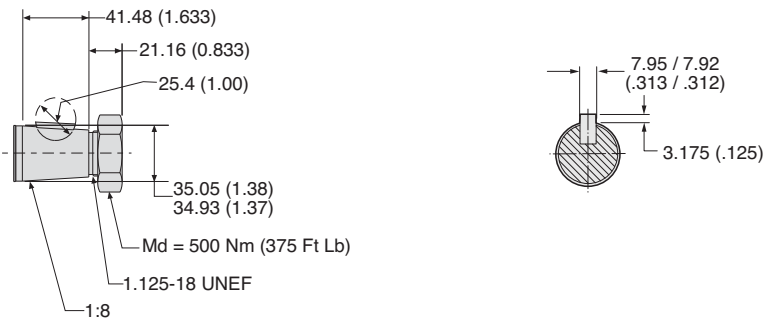
English equivalents for metric specifications are shown in ( ).



**Code: 08**  
**1 1/4" Tapered**



**Code: 19**  
**1 3/8" J501 Taper**



English equivalents for metric specifications are shown in ( ).

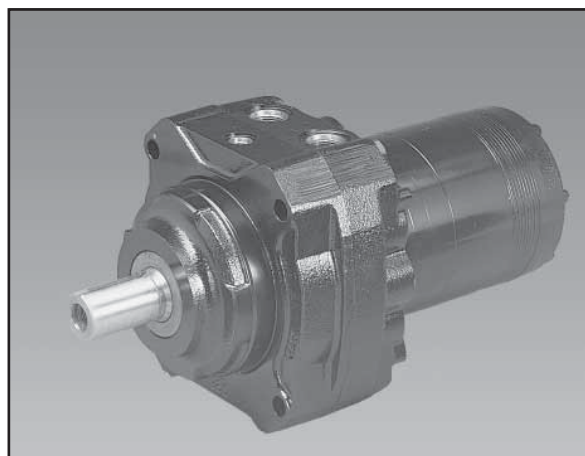
012 TG.indd.js

13 Displacements 13 Schluckvolumen 13 Cylindrée 13 Desplazamientos	(8.6 to 58.5 in <sup>3</sup> /rev) 140 . . . 959 cm <sup>3</sup> /rev	
Maximum Pressure Eingangsdruck Pression entrée Presion Maxima	Cont. (3000 psid) . . . 207 bar	Int. (4000 psid) . . . 276 bar
Maximum Oil Flow Schluckstrom Débit d'huile Caudal Maximo de Aceite	(30 gpm) . . . 114 lpm	
Maximum Speed Drehzahl Vitesse de rotation Velocidad Maxima	(660 rpm) 660 rpm	
Maximum Torque MaxDrehmoment Couple Torque Maximo	Cont. (9,239 lb in) 1044 Nm	Int. (12,636 lb in) 1428 Nm
Maximum Side Load at Key Seitenlast Charges latérales Carga Maxima Lateral	(3597 lb) . . . 16000 N	

**CAUTION!**  
See installation/operating instructions for product cautions and proper use.

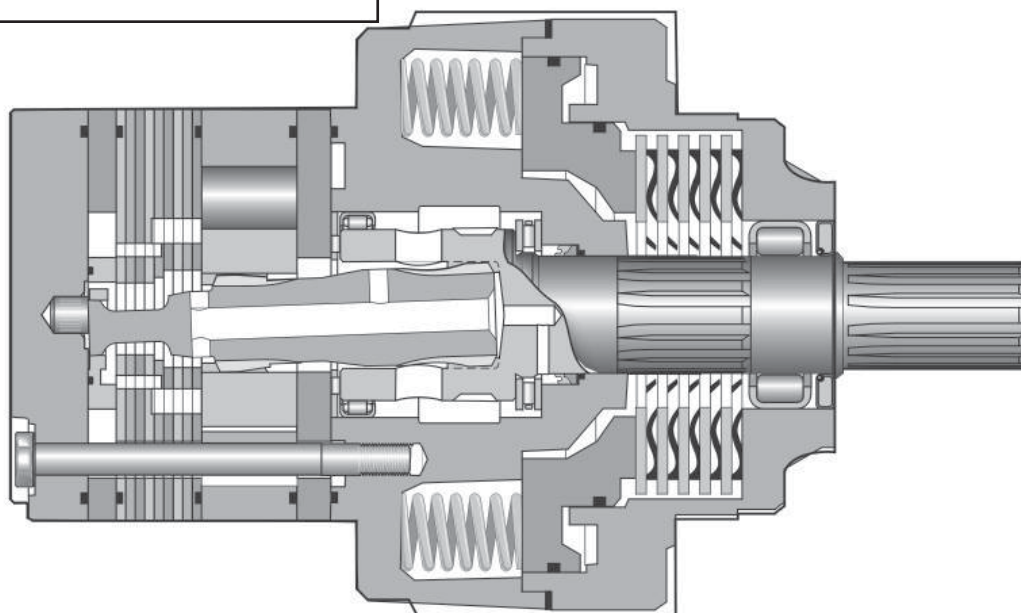
## Exceptional Strength and Durability in a High Performance Motor/Brake Package

This brake motor consists of a BG Series motor integrated into a wet disc, spring applied, hydraulically released brake. Standard holding capacity is 12,000 lb in of holding torque. The brake is front mounted for reliable operation even in the event of a system failure. The brake release port is capable of pressures to 3000 PSI.



Rated Brake Holding Capacity @ Zero Release Pressure Nm (in-lbs)	Minimum Full Release Pressure bar (PSI)
1350 (12,000)	22 (315)

12,000 in-lbs is standard holding capacity.  
For other holding capacities, see page 265.





<b>BG</b>	<b>XXXX</b>	<b>X</b>	<b>X</b>	<b>XX</b>	<b>0</b>	<b>XXXX</b>
Series	Displacement Schluckvolumen Cylindrée Desplazamiento	Mounting Gehäuse Carter Montaje	Ports Anschluß Plan de raccordement Lumbreras	Shaft Welle Arbre Eje	Rotation Drehrichtung Direction de rotation Rotacion	Options Opciones






  

Code	cm <sup>3</sup> /U cm <sup>3</sup> /tr cm <sup>3</sup> /giro in <sup>3</sup> /rev
0140	141 / 8.6
0170	169 / 10.3
0195	195 / 11.9
0240	238 / 14.5
0280	280 / 17.1
0310	310 / 18.9
0335	337 / 20.6
0405	405 / 24.7
0475	477 / 29.1
0530	528 / 32.3
0625	623 / 38.0
0785	786 / 48.0
0960	959 / 58.5

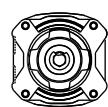


  

Code	Front Port Rotation
0	Standard 
1	Reverse Timed Manifold 

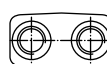

  

Code	Shaft
03	1 1/4" Keyed 
05	1 1/4" 14 Tooth Spline 
08	1 1/4" Tapered* 
19	1 3/8" Tapered* 
62	SAE 14 Tooth Spline 

Code	Mounting
A	Front Mtg/Front Bolting 1/2-13 UNC Thd 
B	SAE "B" 2 Bolt 
C	Rear Mtg/Thru Bolting 

Code	Ports
S	7/8-14 SAE 
M	Manifold 

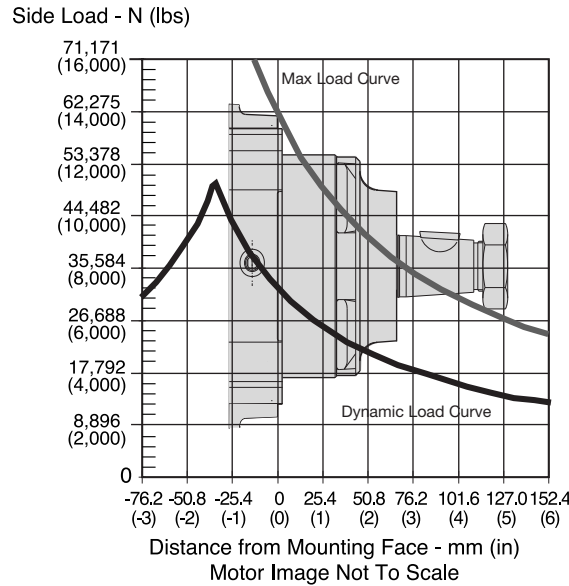
Code	Description
AAAB	No Paint No lackiert
AAAA	Black Paint Schwarz lackiert

For performance data curves, see TG section.

For other available options, see pages 261–262.



Wheel Mount/Radnabengehause  
Monture à roue/ Montaje de rueda



The dynamic side load curve is based on uni-directional steady state loads for  $L_{10}$  bearing life at  $3 \times 10^6$  revolutions.

Die zulässige auslegbare radiale Wellenbelastungskurve ist unter ruhenden, einseitig statisch gerichteten Lastverhältnissen auf eine  $L_{10}$  Lebensdauer mit  $3 \times 10^6$  Umdrehungen kalkuliert.

La courbe de charge latérale permise se base sur des charges unidirectionnelles en régime permanent pour le roulement  $L_{10}$  à  $3 \times 10^6$  révolutions.

La curva de valores admisibles de carga lateral está basada en cargas constantes para cojinetes  $L_{10}$  a  $3 \times 10^6$  revoluciones.

The maximum load curve is defined by bearing static load capacity. This curve should not be exceeded at any time including shock loads.

Die maximale radiale Wellenbelastungskurve ist definiert als maximale statische Last ohne Drehzahl. Sie gilt als Grenze und sollte keinesfalls überschritten werden.

La courbe de charge maximale est définie par la capacité de charge statique portante. Cette courbe ne devrait être dépassée en aucun moment y compris pour les charges par à-coups.

La curva de carga máxima queda definida por la capacidad de carga estática del cojinete. No se deben superar los valores de esta curva, ni siquiera con cargas provisorias de impacto.

Equation to Calculate the Expected Radial Bearing Life  
Gleichung zur Ermittlung der Lagerlebensdauer

Equation to calculate the dynamic bearing life for a given load:  
Bestimmung der erlaubten radialen Wellenbelastung mit vorgegebener Last

Use  $F_a$ ,  $F_b$  and S in equation to determine hours of  $L_{10}$  bearing life.  
Die Lebensdauer in Stunden ergibt sich durch einsetzen von  $F_a$ ,  $F_b$ , und S in die nachstehende Formel.

$$L = \frac{3 \times 10^6}{60 \times S} \left\{ \frac{F_a}{F_b} \right\}^{3.33}$$

Where / Mit:

S = Shaft Speed RPM / Abtriebswellendrehzahl in  $\text{min}^{-1}$

L = Life In Hours / Lebensdauer in Stunden

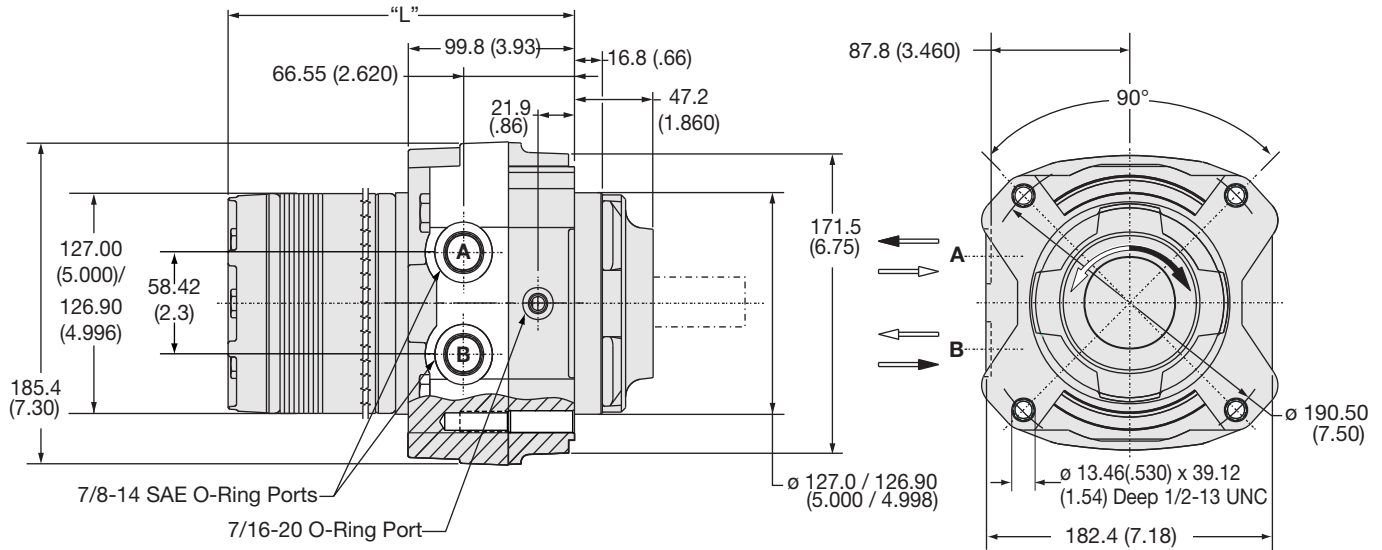
$F_a$  = Dynamic side load defined by above curve at a distance from mounting flange. / Erlaubte radiale Wellenbelastung als Function der Laenge

$F_b$  = Application side load. / Anwendungsseitige Wellenbelastung

Note: Calculations are based on  $L_{10}$  bearing life per ISO 281.  
Auslegung basiert auf einer  $L_{10}$  Lebensdauer nach ISO 281

**Code: AS**

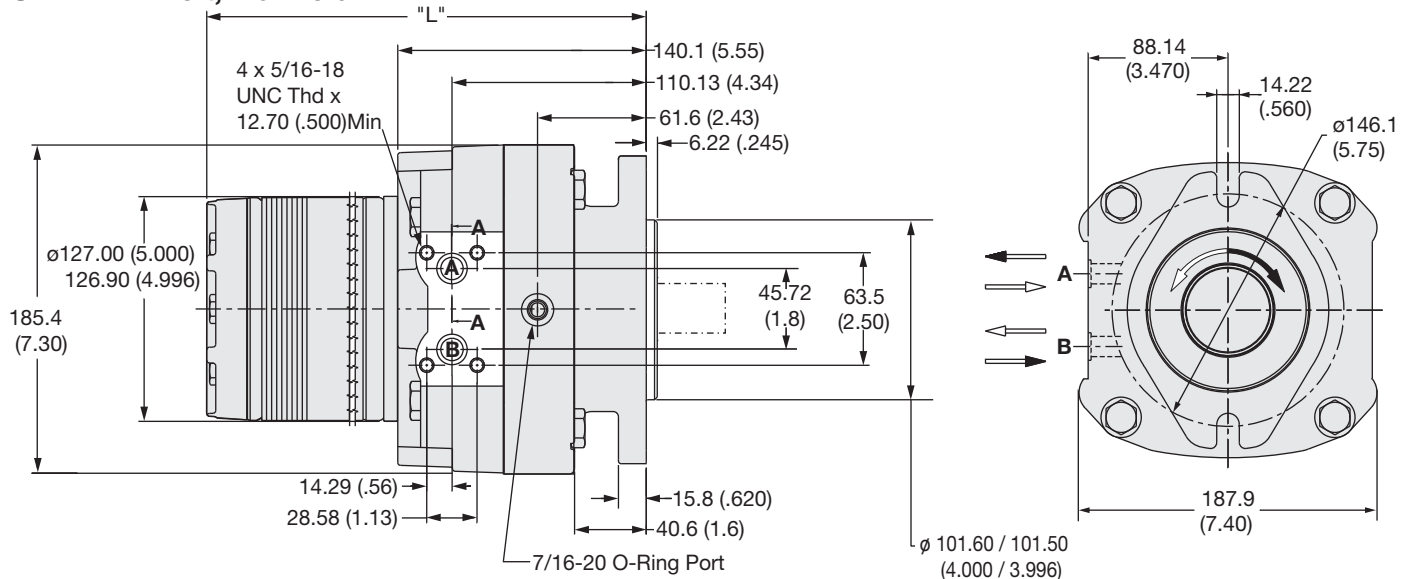
**Front Mounting / Front Bolting, 7/8-14 SAE O-Ring**



Code AS	0140	0170	0195	0240	0280	0335	0405	0475	0530	0625	0785	0960	
Weight / Gewicht kg	27.3	27.5	27.8	28.1	28.5	28.9	29.5	30.2	30.9	31.7	33.2	34.9	
Poids/Peso (lb)	(60.2)	(60.8)	(61.3)	(62.1)	(63.0)	(63.9)	(65.2)	(66.7)	(68.3)	(69.9)	(73.3)	(77.1)	
Length	"L" mm	192.3	195.3	198.6	203.2	208.0	214.4	221.7	230.4	236.7	246.1	265.2	284.2
	"L" (in)	(7.57)	(7.69)	(7.82)	(8.00)	(8.19)	(8.44)	(8.73)	(9.07)	(9.32)	(9.69)	(10.44)	(11.19)

**Code: BM\***

**SAE "B" 2 Bolt, Manifold**

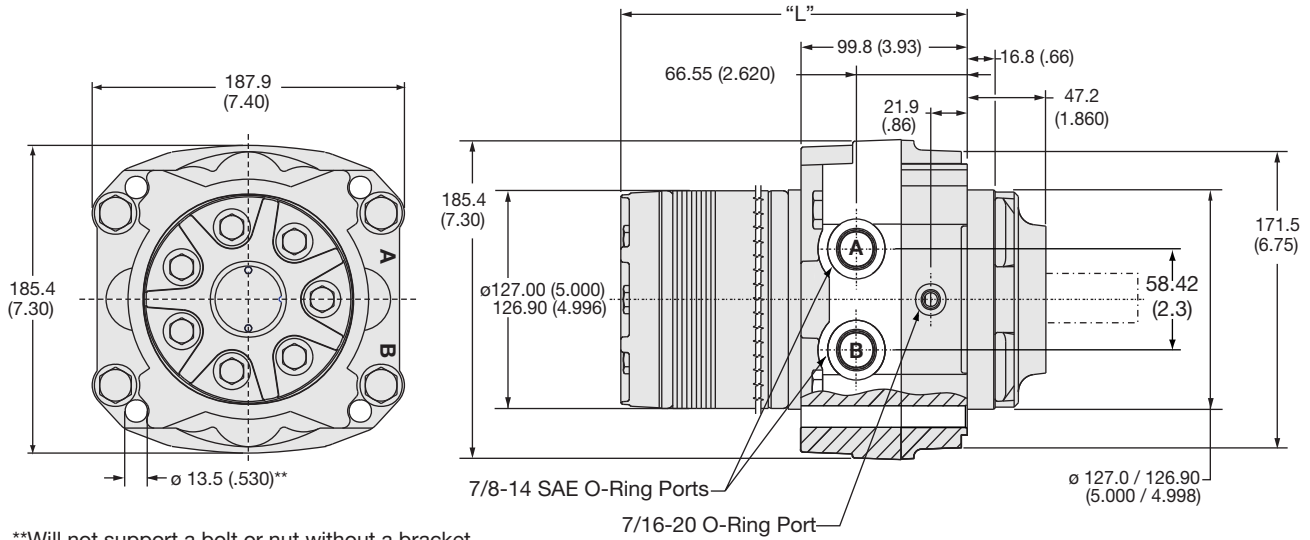


Code BM	0140	0170	0195	0240	0280	0335	0405	0475	0530	0625	0785	0960	
Weight / Gewicht kg	28.4	28.7	28.9	29.3	29.7	30.1	30.1	30.7	31.3	32.8	34.3	36.1	
Poids/Peso (lb)	(62.6)	(63.2)	(63.7)	(64.5)	(65.4)	(66.3)	(67.6)	(69.1)	(70.7)	(72.3)	(75.7)	(79.5)	
Length	"L" mm	233.2	236.4	239.6	244.3	249.1	255.4	262.8	271.3	277.7	287.2	306.3	325.3
	"L" (in)	(9.18)	(9.31)	(9.43)	(9.62)	(9.81)	(10.06)	(10.35)	(10.68)	(10.93)	(11.31)	(12.06)	(12.81)

English equivalents for metric specifications are shown in ( ).

Code: CS

Rear Mounting/Thru Bolting, 7/8-14 SAE O-Ring



\*\*Will not support a bolt or nut without a bracket.

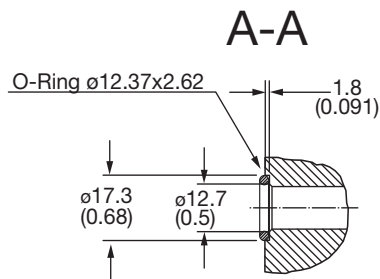
Code CS	0140	0170	0195	0240	0280	0335	0405	0475	0530	0625	0785	0960	
Weight / Gewicht	kg 27.3	27.5	27.8	28.1	28.5	28.9	29.5	30.2	30.9	31.7	33.2	34.9	
Poids/Peso	(lb) (60.2)	(60.8)	(61.3)	(62.1)	(63.0)	(63.9)	(65.2)	(66.7)	(68.3)	(69.9)	(73.3)	(77.1)	
Length	"L" mm	192.3	195.3	198.6	203.2	208.0	214.4	221.7	230.4	236.7	246.1	265.2	284.2
	"L" (in)	(7.57)	(7.69)	(7.82)	(8.00)	(8.19)	(8.44)	(8.73)	(9.07)	(9.32)	(9.69)	(10.44)	(11.19)

**\*Note:** Motor with manifold mount is supplied with 2 o-rings.

Zum Motor mit Universalanschluß werden 2 o-ringe geliefert.

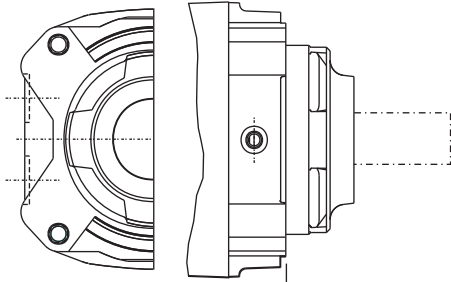
Deux joints toriques sont livrés avec les moteurs a plan de raccordement universel.

El motor con montaje de distribuidor se suministra con 2 sellos toroidales.

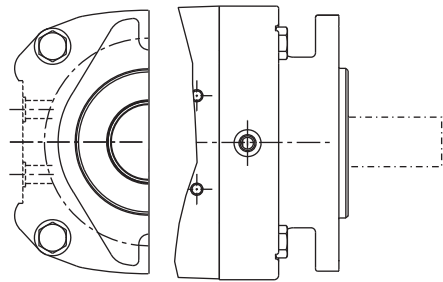


English equivalents for metric specifications are shown in ( ).

Code A & C

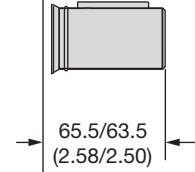
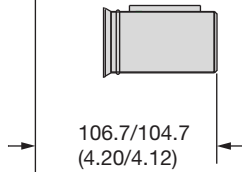


Code B



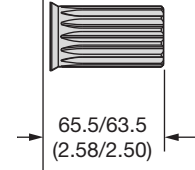
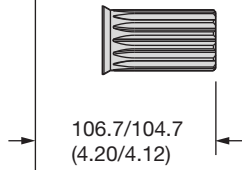
**Code: 03**

**1 1/4" Keyed**



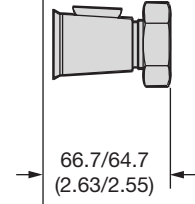
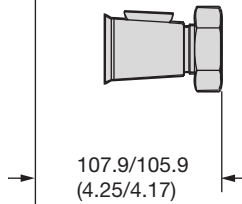
**Code: 05**

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



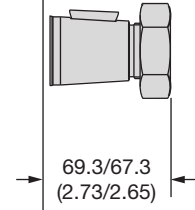
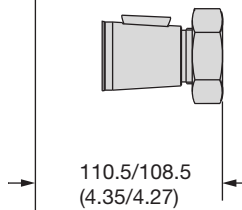
**Code: 08**

**1 1/4" Taper**



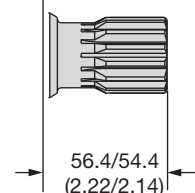
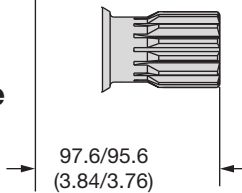
**Code: 19**

**1 3/8" J501 Taper**



**Code: 62**

**SAE 14 Tooth Spline**

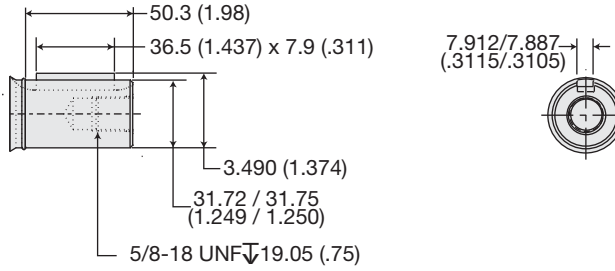


English equivalents for metric specifications are shown in ( ).

013 BG Brake.indd, js

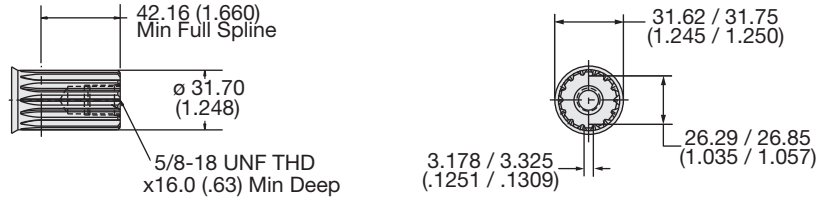
Code: 03

1 1/4" Keyed



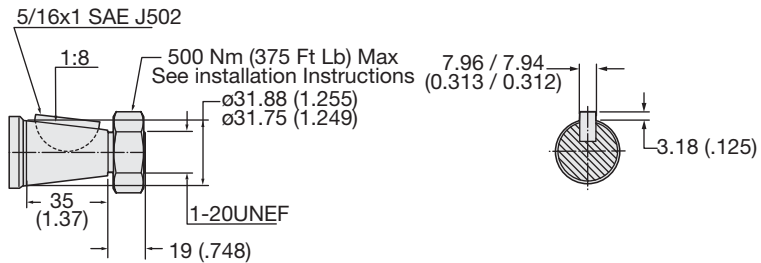
Code: 05

1 1/4" 14 Tooth Spline



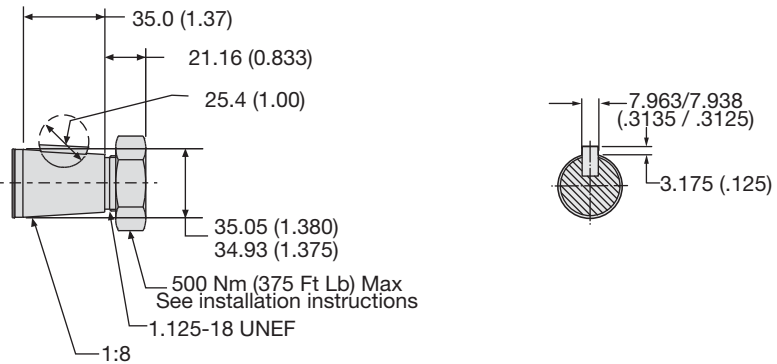
Code: 08

1 1/4" Taper



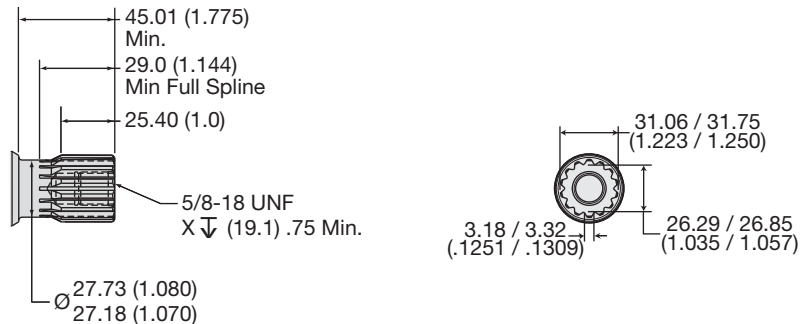
Code: 19

1 3/8" J501 Taper



Code: 62

SAE 14 Tooth Spline



English equivalents for metric specifications are shown in ( ).

013 BG Brake.indd, js

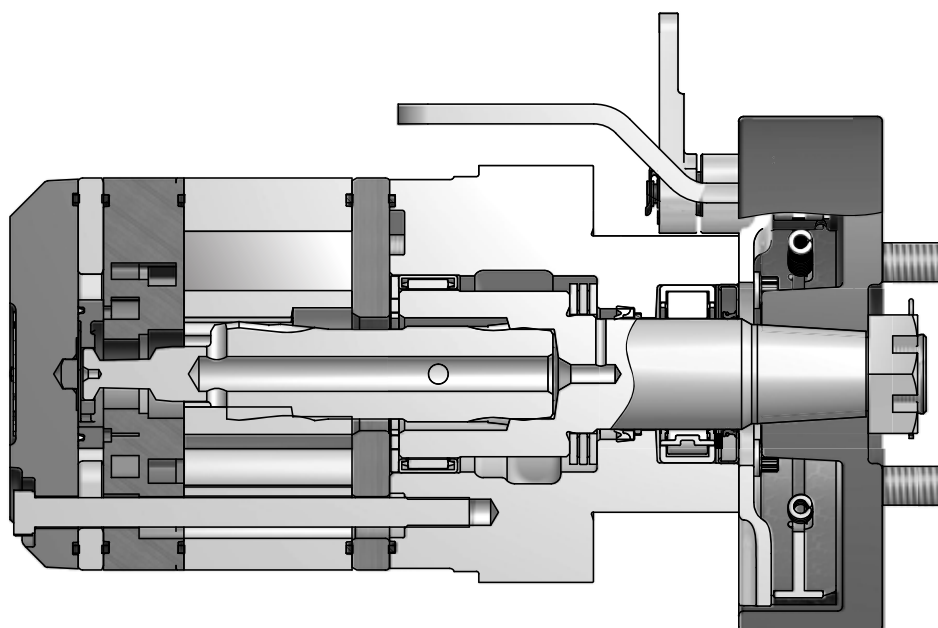


13 Displacements 13 Schluckvolumen 13 Cylindrée 13 Desplazamientos	(8.6 to 58.5 in <sup>3</sup> /rev) 140 . . . 958 cm <sup>3</sup> /rev						
Maximum Pressure Eingangsdruck Pression entrée Presion Maxima	<table border="0"> <tr> <td style="text-align: center;"><b>Cont.</b></td> <td style="text-align: center;"><b>Int.</b></td> </tr> <tr> <td>(3000 psid)</td> <td>(4000 psid)</td> </tr> <tr> <td>. . . 207 bar</td> <td>. . . 276 bar</td> </tr> </table>	<b>Cont.</b>	<b>Int.</b>	(3000 psid)	(4000 psid)	. . . 207 bar	. . . 276 bar
<b>Cont.</b>	<b>Int.</b>						
(3000 psid)	(4000 psid)						
. . . 207 bar	. . . 276 bar						
Maximum Oil Flow Schluckstrom Débit d'huile Caudal Maximo de Aceite	(30 gpm) . . . 114 lpm						
Maximum Speed Drehzahl Vitesse de rotation Velocidad Maxima	(660 rpm) 660 rpm						
Maximum Torque MaxDrehmoment Couple Torque Maximo	<table border="0"> <tr> <td style="text-align: center;"><b>Cont.</b></td> <td style="text-align: center;"><b>Int.</b></td> </tr> <tr> <td>(9,239 lb in)</td> <td>(12,636 lb in)</td> </tr> <tr> <td>1044 Nm</td> <td>1428 Nm</td> </tr> </table>	<b>Cont.</b>	<b>Int.</b>	(9,239 lb in)	(12,636 lb in)	1044 Nm	1428 Nm
<b>Cont.</b>	<b>Int.</b>						
(9,239 lb in)	(12,636 lb in)						
1044 Nm	1428 Nm						
Maximum Side Load at Key Seitenlast Charges latérales Carga Maxima Lateral	(3597 lb) . . . 16000 N						

## A Mechanical Brake Motor for Tough Applications

Parker's DG Series brake motors consists of a mechanical drum brake mounted integrally to our rugged TG Series LSHT hydraulic motor. The compact size, reliable holding capacity and ease of installation make this motor with parking brake the ideal choice for the propulsion systems on many turf, agricultural and other vehicles.

The brake is available with either vertical or horizontally applied levers. The vertical style has fixed brake pads, while the horizontal version has floating brake pads that can be adjusted as required over the life of the brake. Both versions are for static applications only.

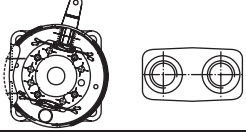


<b>DG</b>	<b>XXXX</b>	<b>XS</b>	<b>X</b>	<b>X</b>	<b>0</b>	<b>XXXX</b>
Series	Displacement Schluckvolumen Cylindrée Desplazamiento	Mounting/Ports Gehäuse/Anschluß Carter/Plan de raccordement Montaje/Lumbreras	Drum Type Trommelbremse Tipo de tambor Genre de tambour	Shaft Welle Arbre Eje	Rotation Drehrichtung Direction de rotation Rotacion	Options Opciones

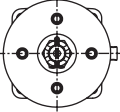
  

Code	cm <sup>3</sup> /U cm <sup>3</sup> /tr cm <sup>3</sup> /giro in <sup>3</sup> /rev
0140	141 / 8.6
0170	169 / 10.3
0195	195 / 11.9
0240	238 / 14.5
0280	280 / 17.1
0310	310 / 18.9
0335	337 / 20.6
0405	405 / 24.7
0475	477 / 29.1
0530	528 / 32.3
0625	623 / 38.0
0785	786 / 48.0
0960	959 / 58.5



  

Code	Mounting/Ports - Vertical Lever
AS	Wheel Mt. w/Brake Lever @ 105° / 7/8-14 SAE 
BS	Wheel Mt. w/Brake Lever @ 165° / 7/8-14 SAE
CS	Wheel Mt. w/Brake Lever @ 195° / 7/8-14 SAE
DS	Wheel Mt. w/Brake Lever @ 255° / 7/8-14 SAE
ES	Wheel Mt. w/Brake Lever @ 285° / 7/8-14 SAE
FS	Wheel Mt. w/Brake Lever @ 345° / 7/8-14 SAE
GS	Wheel Mt. w/Brake Lever @ 15° / 7/8-14 SAE
HS	Wheel Mt. w/Brake Lever @ 75° / 7/8-14 SAE

Code	Mounting/Ports - Horizontal Lever
VS	Wheel Mt. w/Brake Lever @ 90° / 7/8-14 SAE 
WS	Wheel Mt. w/Brake Lever @ 180° / 7/8-14 SAE
US	Wheel Mt. w/Brake Lever @ 270° / 7/8-14 SAE

Code	Front Port Rotation
0	Standard 
1	Reverse Timed Manifold 



  

Code	Description
AAAB	No Paint No lackiert
AAAA	Black Paint Schwarz lackiert

Code	Shaft
8	1 1/4" Tapered

Code	Drum Type
A	 4 Bolt
B	 5 Bolt

For other available options, see pages 261–262.



## Vertical Lever

Holding capacity is 497 Nm (4,400 in lbs) with 68 Nm (600 in lbs) of input torque at lever pivot. Brake capacities are typical for non-burnished brake shoe. OEM testing required to verify actual field conditions.

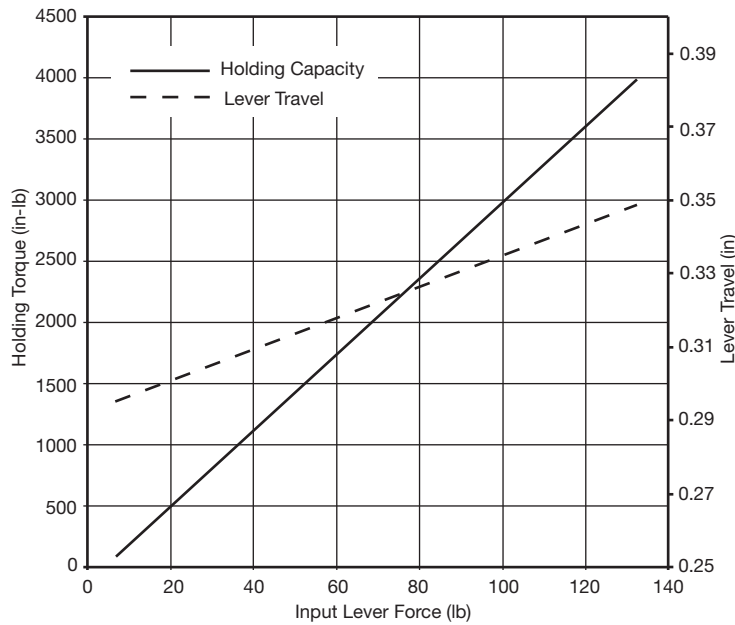
Das maximale Bremsmoment von 497 Nm (4400 in lbs) wird erreicht durch Betätigung des Bremshebels mit 68 Nm (600 in lbs). Genannte Einsatzdaten beziehen sich auf Neuprodukte. Die Eignung der Geräte ist vom Anwender für den jeweiligen Einsatz individuell zu prüfen.

La puissance de maintien est de 497 Nm (4400 pouces-livres) avec couple d'entrée au pivot du levier de 68 Nm (600 pouces-livres). Les puissances de freinage sont typiques pour des sabots de frein non brunis. Les essais imposés par le constructeur d'origine exigent la vérification des conditions réelles sur place.

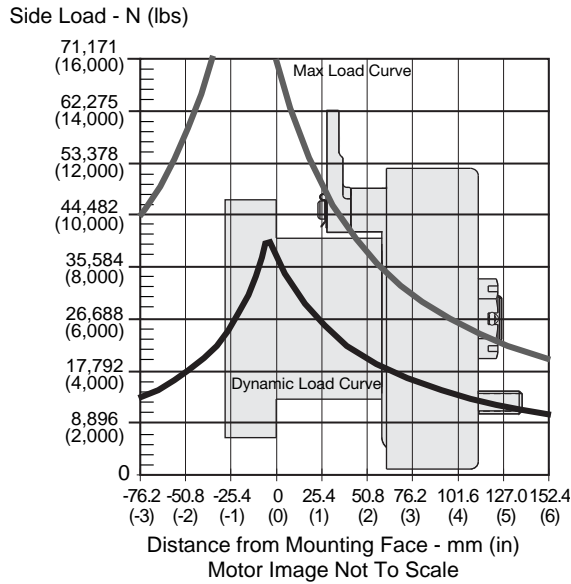
Capacidad de retención de 497 N-m (4.400 libras-pulgada) con 69 N-m (600 libras-pulgada) de torque de entrada en el brazo de articulación. Los valores de capacidad de frenado son típicas para zapatas de freno no bruñidas. Para fabricantes de equipos originales se deben efectuar pruebas bajo condiciones reales de funcionamiento.

## Horizontal Lever

**Brake Torque and Travel of 3.72 inch Horizontal Lever**



**Wheel Mount/Radnabengehäuse**  
**Monture à roue/ Montaje de rueda**



The dynamic side load curve is based on uni-directional steady state loads for L<sub>10</sub> bearing life at 3 x 10<sup>6</sup> revolutions. Die zulässige auslegbare radiale Wellenbelastungskurve ist unter ruhenden, einseitig statisch gerichteten Lastverhältnissen auf eine L<sub>10</sub> Lebensdauer mit 3 x 10<sup>6</sup> Umdrehungen kalkuliert. La courbe de charge latérale permise se base sur des charges unidirectionnelles en régime permanent pour le roulement L<sub>10</sub> à 3 x 10<sup>6</sup> révolutions. La curva de valores admisibles de carga lateral está basada en cargas constantes para cojinetes L<sub>10</sub> a 3 x 10<sup>6</sup> revoluciones.

The maximum load curve is defined by bearing static load capacity. This curve should not be exceeded at any time including shock loads. Die maximale radiale Wellenbelastungskurve ist definiert als maximale statische Last ohne Drehzahl. Sie gilt als Grenze und sollte keinesfalls überschritten werden. La courbe de charge maximale est définie par la capacité de charge statique portante. Cette courbe ne devrait être dépassée en aucun moment y compris pour les charges par à-coups. La curva de carga máxima queda definida por la capacidad de carga estática del cojinete. No se deben superar los valores de esta curva, ni siquiera con cargas provisorias de impacto.

**Equation to Calculate the Expected Radial Bearing Life**  
**Gleichung zur Ermittlung der Lagerlebensdauer**

Equation to calculate the dynamic bearing life for a given load:  
 Bestimmung der erlaubten radialen Wellenbelastung mit vorgegebener Last

Use F<sub>a</sub>, F<sub>b</sub> and S in equation to determine hours of L<sub>10</sub> bearing life.  
 Die Lebensdauer in Stunden ergibt sich durch einsetzen von F<sub>a</sub>, F<sub>b</sub>, und S in die nachstehende Formel.

$$L = \frac{3 \times 10^6}{60 \times S} \left\{ \frac{F_a}{F_b} \right\}^{3.33}$$

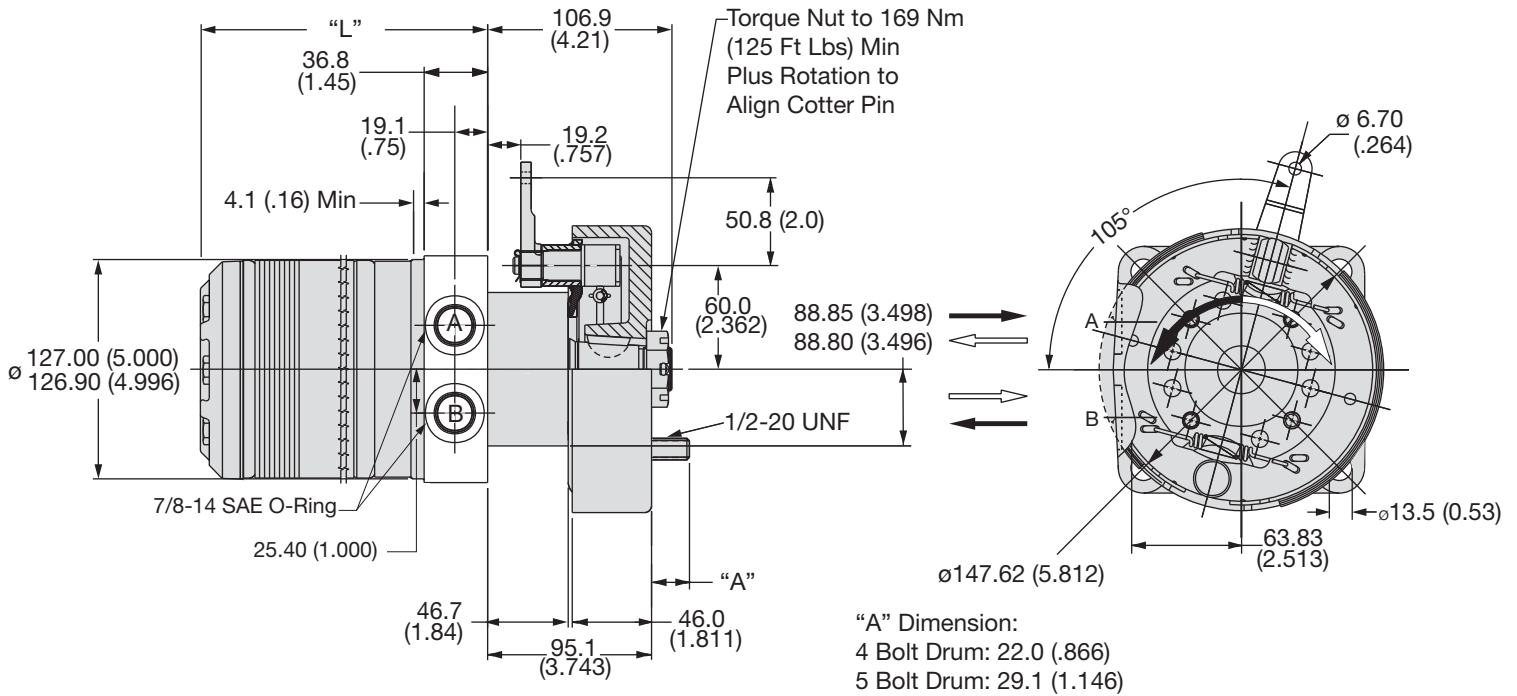
Where / Mit:

- S = Shaft Speed RPM / Abtriebswellendrehzahl in min<sup>-1</sup>
- L = Life In Hours / Lebensdauer in Stunden
- F<sub>a</sub> = Dynamic side load defined by above curve at a distance from mounting flange. / Erlaubte radiale Wellenbelastung als Function der Laenge
- F<sub>b</sub> = Application side load. / Anwendungsseitige Wellenbelastung

Note: Calculations are based on L<sub>10</sub> bearing life per ISO 281.  
 Auslegung basiert auf einer L<sub>10</sub> Lebensdauer nach ISO 281

**Code: AS - Vertical Lever**

**Wheel Mount w/Brake Lever / 7/8-14 SAE O-Ring**



**Note:**

1. Brake Acuation Lever can be positioned in 12.00° increments from that shown.  
 Bremshebel ist kreisförmig in Sgmenten von 12.00 ° positionierbar.  
 Le levier de commande du frein peut être positionné à des échelons d'accroissement de 12,00° de ce qui est montré.  
 El brazo de actuación del freno se puede colocar en avances de 12,00 grados con respecto a la posición mostrada.
2. Brake Acuation Lever is shipped unattached, secured with wire or tiewrap to assembly.  
 Hebel ist anbei. Endmontage erforderlich.  
 Le levier de commande du frein est expédié sous forme détachée; il est attaché à l'ensemble avec du fil ou du ruban.  
 El brazo de actuación del freno se suministra suelto, sin conexión, sólo atado provisoriamente al mecanismo.

Code AS	disp.	0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
<b>Weight/Gewicht</b>	<b>kg</b>	<b>14.6</b>	<b>14.8</b>	<b>15.1</b>	<b>15.5</b>	<b>15.9</b>	<b>16.1</b>	<b>16.3</b>	<b>16.9</b>	<b>17.5</b>	<b>18.3</b>	<b>19.0</b>	<b>20.5</b>	<b>22.2</b>
<b>Poids/Peso</b>	<b>(lb)</b>	(41.3)	(41.8)	(42.4)	(43.2)	(44.1)	(44.6)	(44.9)	(46.3)	(47.7)	(49.4)	(50.9)	(54.4)	(58.1)
<b>Length</b>	<b>"L" mm</b>	<b>150</b>	<b>154</b>	<b>157</b>	<b>161</b>	<b>166</b>	<b>170</b>	<b>173</b>	<b>180</b>	<b>188</b>	<b>195</b>	<b>204</b>	<b>223</b>	<b>242</b>
	<b>"L" (in)</b>	(5.92)	(6.04)	(6.17)	(6.35)	(6.54)	(6.68)	(6.79)	(7.08)	(7.42)	(7.67)	(8.04)	(8.79)	(9.54)

**For performance data curves, see TG section.**

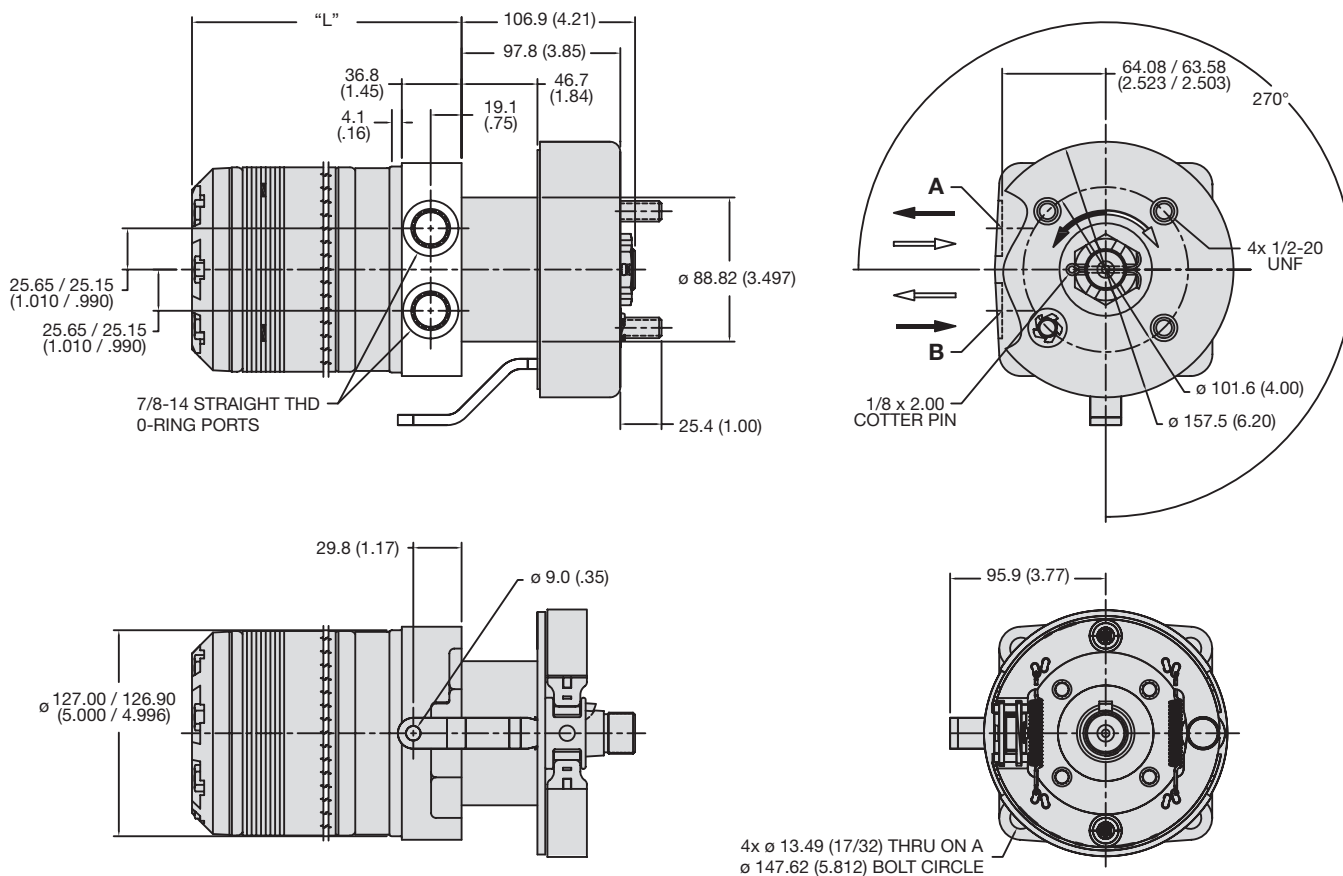
English equivalents for metric specifications are shown in ( ).

014 DG Brake.indd, js



**Code: US - Horizontal Lever**

**Wheel Mount w/Brake Lever / 7/8-14 SAE O-Ring**



**Note:**

Brake Acuation Lever can be positioned in 90° increments from that shown.

Bremshebel ist kreisförmig in Sgmenten von 90° positionierbar.

Le levier de commande du frein peut être positionné à des échelons d'accroissement de 90° de ce qui est montré.

El brazo de actuación del freno se puede colocar en avances de 90° grados con respecto a la posición mostrada.

Code US	disp.	0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
<b>Weight/Gewicht</b>	<b>kg</b>	<b>14.6</b>	<b>14.8</b>	<b>15.1</b>	<b>15.5</b>	<b>15.9</b>	<b>16.1</b>	<b>16.3</b>	<b>16.9</b>	<b>17.5</b>	<b>18.3</b>	<b>19.0</b>	<b>20.5</b>	<b>22.2</b>
<b>Poids/Peso</b>	<b>(lb)</b>	<b>(41.3)</b>	<b>(41.8)</b>	<b>(42.4)</b>	<b>(43.2)</b>	<b>(44.1)</b>	<b>(44.6)</b>	<b>(44.9)</b>	<b>(46.3)</b>	<b>(47.7)</b>	<b>(49.4)</b>	<b>(50.9)</b>	<b>(54.4)</b>	<b>(58.1)</b>
<b>Length</b>	<b>"L" mm</b>	<b>150</b>	<b>154</b>	<b>157</b>	<b>161</b>	<b>166</b>	<b>170</b>	<b>173</b>	<b>180</b>	<b>188</b>	<b>195</b>	<b>204</b>	<b>223</b>	<b>242</b>
	<b>"L" (in)</b>	<b>(5.92)</b>	<b>(6.04)</b>	<b>(6.17)</b>	<b>(6.35)</b>	<b>(6.54)</b>	<b>(6.68)</b>	<b>(6.79)</b>	<b>(7.08)</b>	<b>(7.42)</b>	<b>(7.67)</b>	<b>(8.04)</b>	<b>(8.79)</b>	<b>(9.54)</b>

**For performance data curves, see TG section.**

English equivalents for metric specifications are shown in ( ).

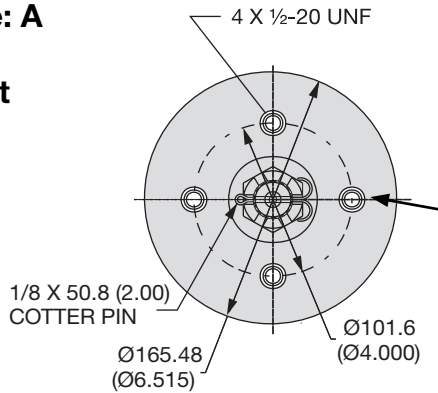
014 DG Brake.indd, js



**Drum Type/Trommelbremse/  
 Tipo de tambor/  
 Genre de Tambour**

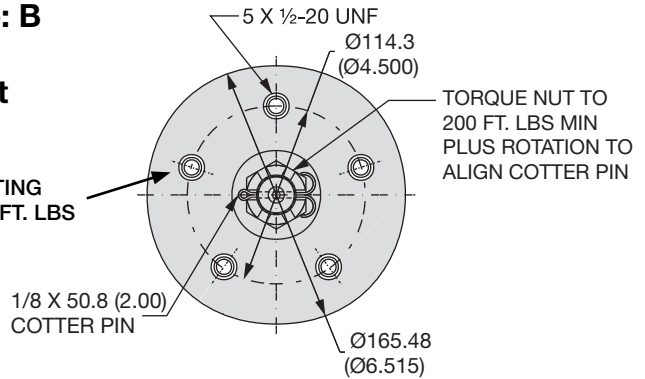
**Code: A**

**4 Bolt**



**Code: B**

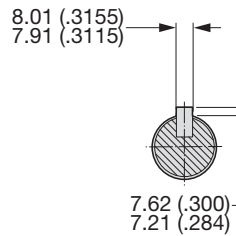
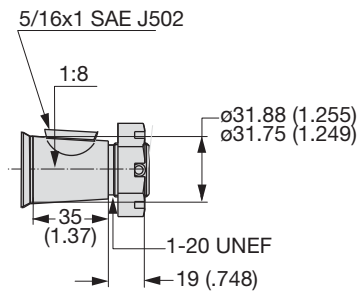
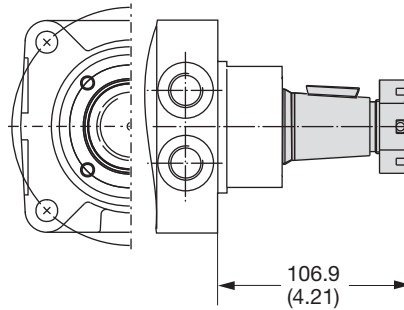
**5 Bolt**



**Shafts / Abtriebswellen**  
**Arbre / Ejes**

**Code: 8**

**1 1/4" Taper**



English equivalents for metric specifications are shown in ( ).

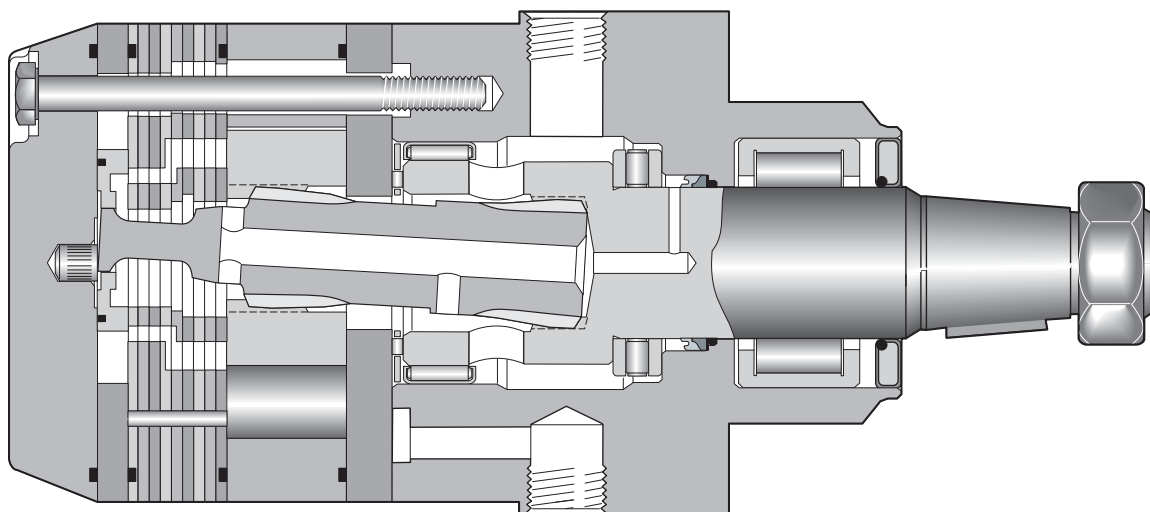
014 DG Brake.indd, js

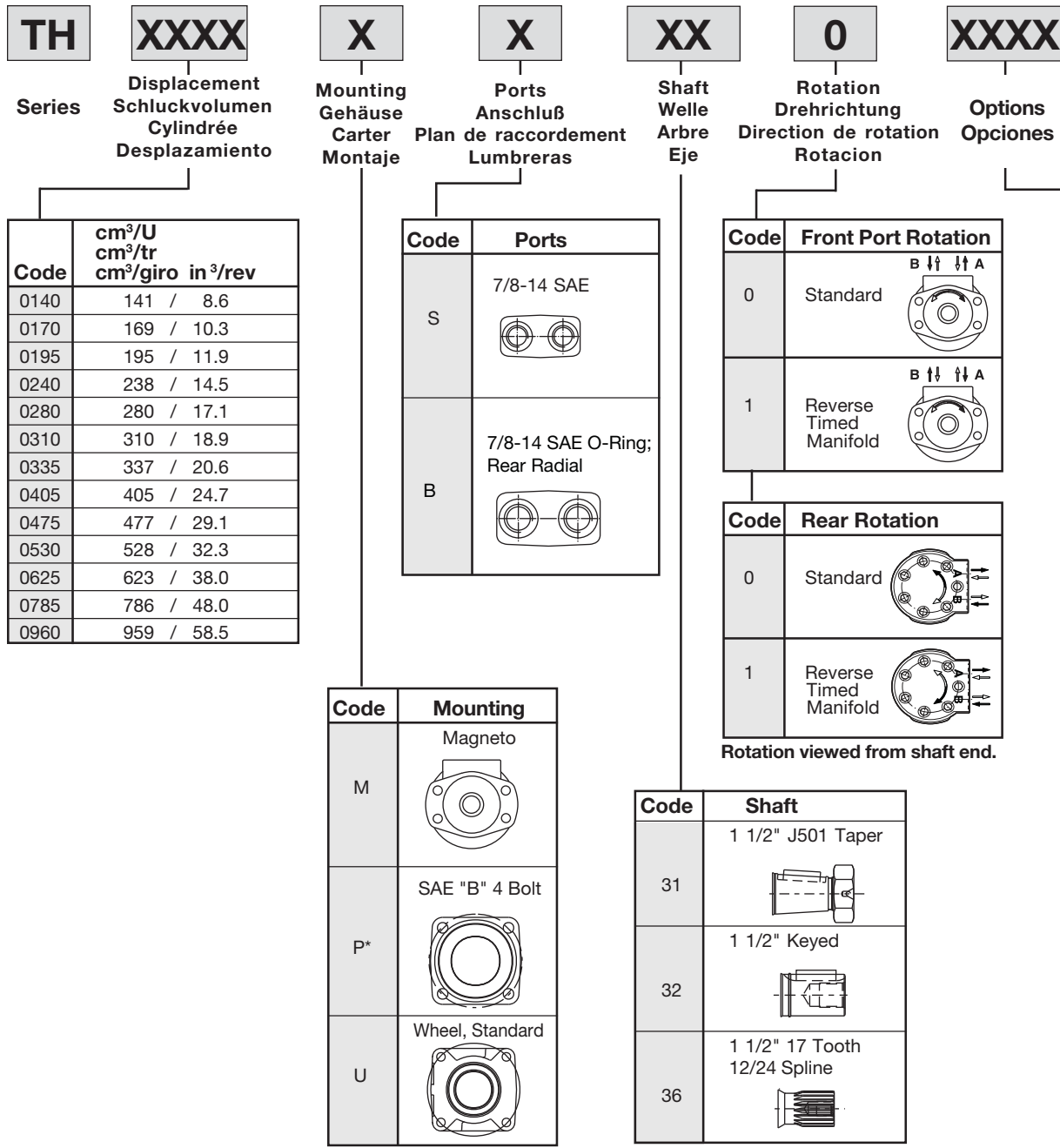


13 Displacements 13 Schluckvolumen 13 Cylindrée 13 Desplazamientos	(8.6 to 58.5 in <sup>3</sup> /rev) 141 . . . 959 cm <sup>3</sup> /rev	
Maximum Pressure Eingangsdruck Pression entrée Presion Maxima	<b>Cont.</b> (3000 psid) . . . 207 bar	<b>Int.</b> (4000 psid) . . . 276 bar
Maximum Oil Flow Schluckstrom Débit d'huile Caudal Maximo de Aceite		(30 gpm) . . . 114 lpm
Maximum Speed Drehzahl Vitesse de rotation Velocidad Maxima		(660 rpm) 660 rpm
Maximum Torque MaxDrehmoment Couple Torque Maximo	<b>Cont.</b> (8,772 lb in) 991 Nm	<b>Int.</b> (11,876 lb in) 1342 Nm
Maximum Side Load at Key Seitenlast Charges latérales Carga Maxima Lateral		(4800 lb) . . . 21360 N

## A Rugged Motor for Heavy Duty, High Side Load Applications

This motor was designed for tough applications. A stout drive link with unique 60:40 spline geometry will transmit over 13,000 lb-in of torque. The 1-1/2" output shaft can support 7000 pounds of radial load. Efficiency is assured by the use of roller vanes and sealed commutator. Durability is maintained by continually washing the powertrain splines and shaft seal in cooling fluid.



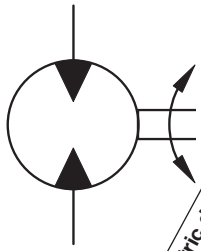


\* Requires rear porting.  
Nur Endanschluss möglich  
Exige des orifices en arriere  
Necesita lumbrera posterior

Consult factory for other available options, configurations ordering codes and lead times.

For other available options, see pages 261–262.





Geometric displacement  
Geom. Schluckvolumen  
Cylindrée  
Cilindrata  
Max. speed @ Max. intermittent flow  
Max. Drehzahl Intermittierender-Betrieb:  
Vitesse de rotation maxi  
Velocidad maxima a caudal intermitente maximo  
Max. oil flow  
Max. Schluckstrom  
Débit d'huile maxi  
Portata max  
Max. differential pressure  
Max. Druckgefälle  
Chute de pression maxi  
Presion diferencial maxima  
Max. supply pressure  
Max. Eingangsdruck  
Presion maxi entrée  
Presion maxima de alimentacion  
Max. torque  
Max. Drehmoment  
Couple maxi  
Torque Maximo  
Max. performance  
Max. Leistungabgabe  
Potenza meccanica max  
Min. starting torque  
Min. Anlaufmoment  
Couple min. fourni au démarrage  
Torque minimo de arranque

Motor Series TH	cm³/rev in³/rev	rev/min	cont / int* l/min g/min		cont / int* bar psid		max bar psig	cont / int* Nm lb-in			max KW HP	cont / int* Nm lb-in	
TH 0140	141 8.6	660	76 20	95 25	207 3000	276 4000	300 4350	390 3455	530 4692	33 45	315 2791	418 3706	
TH 0170	169 10.3	554	76 20	95 25	207 3000	276 4000	300 4350	476 4216	646 5714	33 45	376 3331	505 4469	
TH 0195	195 11.9	477	76 20	95 25	207 3000	276 4000	300 4350	556 4919	753 6663	33 45	451 3989	611 5408	
TH 0240	238 14.5	393	76 20	95 25	207 3000	276 4000	300 4350	677 5991	913 8081	32 44	582 5152	776 6865	
TH 0280	280 17.1	334	76 20	95 25	207 3000	276 4000	300 4350	796 7044	1073 9499	31 42	675 5972	870 7699	
TH 0310	310 18.9	303	76 20	95 25	207 3000	276 4000	300 4350	964 8533	1297 11479	30 41	843 7458	1117 9889	
TH 0335	337 20.6	277	76 20	95 25	207 3000	276 4000	300 4350	924 8184	1229 10817	31 41	778 6882	1005 8893	
TH 0405	405 24.7	232	76 20	95 25	172 2500	241 3500	300 4350	942 8336	1342 11877	27 37	791 7002	1145 10133	
TH 0475	477 29.1	237	76 20	114 30	138 2000	207 3000	300 4350	887 7853	1372 12145	28 38	740 6549	1120 9909	
TH 0530	528 32.3	213	76 20	114 30	138 2000	172 2500	300 4350	983 8701	1253 11086	23 31	874 7737	1091 9657	
TH 0625	623 38.0	182	76 20	114 30	121 1750	155 2250	300 4350	986 8727	1291 11424	20 27	895 7924	1165 10312	
TH 0785	786 48.0	143	76 20	114 30	103 1500	138 2000	300 4350	1044 9239	1428 12636	17 23	991 8772	1341 11876	
TH 0960	959 58.5	118	76 20	114 30	69 1000	103 1500	300 4350	773 6843	1268 11227	12 16	763 6752	1177 10419	

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

\* Intermittent operation rating applies to 10% of every minute. Intermittierende Werte maximal 10% von jeder Betriebsminute. Fonctionnement interm. 10% max. de chaque minute d'utilisation. Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

TH 0140

8.6 cu in / rev

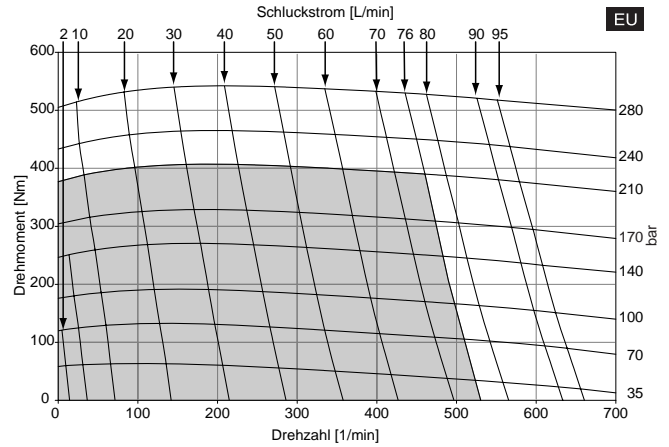
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500	4000
<b>.5</b>	519 9	1060 4						
<b>1</b>	540 22	1090 17	1635 11	2180 6				
<b>2</b>	569 49	1156 43	1730 36	2286 30	2827 23	3368 19	3899 12	4447 12
<b>3</b>	565 75	1159 69	1744 62	2321 55	2899 47	3477 40	4048 33	4608 29
<b>4</b>	564 102	1170 94	1768 87	2358 80	2943 72	3517 64	4082 57	4644 52
<b>5</b>	556 128	1170 120	1776 112	2375 105	2968 97	3556 89	4135 81	4701 76
<b>7</b>	540 182	1160 172	1779 164	2390 155	2994 146	3592 138	4181 130	4763 123
<b>9</b>	515 235	1143 225	1768 215	2385 206	2996 196	3601 187	4199 179	4794 171
<b>12</b>	471 315	1096 303	1729 292	2356 281	2974 271	3587 261	4193 252	4794 243
<b>15</b>	418 395	1042 381	1673 368	2307 357	2933 346	3549 336	4163 325	4771 314
<b>20</b>	299 528	931 512	1565 497	2198 484	2825 472	3455 459	4078 447	4692 435
<b>25</b>	173 660	794 643	1426 626	2059 612	2695 598	3332 583	3961 569	4579 555

Flow (GPM)

TORQUE (LB IN) 3332  
SPEED (RPM) 583

141 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TH 0170

10.3 cu in / rev

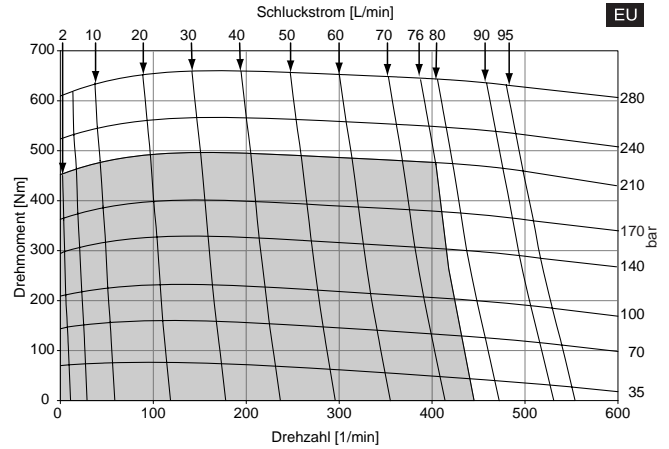
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500	4000
<b>.5</b>	620 9	1284 7	1945 5	2613 4	3293 3	3983 2		
<b>1</b>	652 20	1337 18	2006 16	2683 14	3375 12	4063 11	4744 8	5402 8
<b>2</b>	678 42	1390 40	2105 37	2822 35	3535 32	4226 30	4909 27	5587 25
<b>3</b>	678 64	1397 61	2117 58	2836 56	3554 53	4263 50	4963 46	5652 44
<b>4</b>	679 86	1409 83	2142 80	2872 77	3596 74	4310 71	5021 67	5716 64
<b>5</b>	675 108	1413 104	2150 101	2885 98	3616 94	4339 91	5057 87	5761 83
<b>7</b>	661 153	1405 148	2152 143	2900 140	3642 136	4374 132	5101 127	5818 123
<b>9</b>	632 197	1385 191	2140 186	2891 181	3638 177	4380 173	5114 168	5838 163
<b>12</b>	583 263	1334 256	2096 250	2860 244	3617 239	4362 234	5101 228	5823 223
<b>15</b>	524 330	1275 322	2035 314	2804 308	3572 302	4327 296	5070 289	5801 283
<b>20</b>	382 442	1143 432	1908 422	2683 413	3455 406	4216 399	4972 391	5714 383
<b>25</b>	239 554	983 543	1747 531	2523 520	3299 511	4071 501	4839 492	5591 483

Flow (GPM)

TORQUE (LB IN) 4839  
SPEED (RPM) 492

169 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TH 0195

11.9 cu in / rev

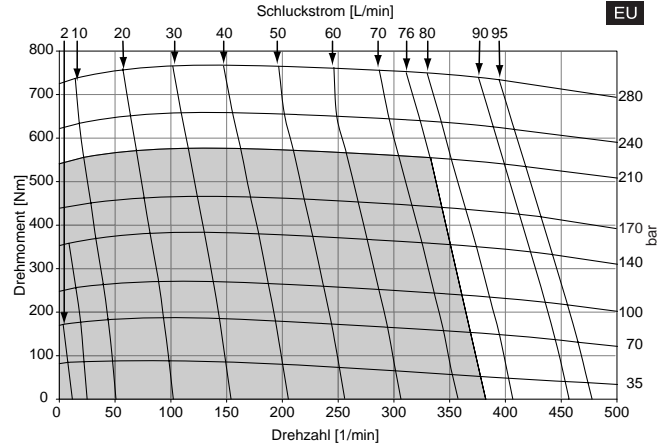
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500	4000
<b>.5</b>	733 7	1503 3						
<b>1</b>	761 16	1546 13	2326 8	3104 3				
<b>2</b>	799 35	1638 32	2465 27	3270 21	4046 16	4813 11	5589 7	6375 6
<b>3</b>	794 55	1639 50	2476 45	3303 39	4132 34	4970 28	5792 23	6595 19
<b>4</b>	794 74	1654 69	2509 64	3356 58	4196 52	5023 46	5830 40	6635 35
<b>5</b>	783 93	1653 88	2517 83	3375 76	4224 70	5065 64	5895 58	6710 52
<b>7</b>	762 131	1637 126	2514 120	3384 113	4245 106	5098 99	5940 92	6772 86
<b>9</b>	731 170	1616 164	2499 157	3373 150	4239 142	5093 135	5936 127	6774 120
<b>12</b>	677 228	1562 221	2455 213	3343 205	4217 196	5081 188	5934 179	6776 172
<b>15</b>	613 285	1498 278	2389 269	3283 260	4169 251	5040 242	5907 232	6765 233
<b>20</b>	448 381	1350 373	2245 363	3141 353	4031 342	4919 331	5798 321	6663 310
<b>25</b>	334 477	1158 468	2044 457	2941 445	3837 433	4729 421	5612 409	6500 397

Flow (GPM)

TORQUE (LB IN) 5612  
SPEED (RPM) 409

195 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TH 0240

14.5 cu in / rev

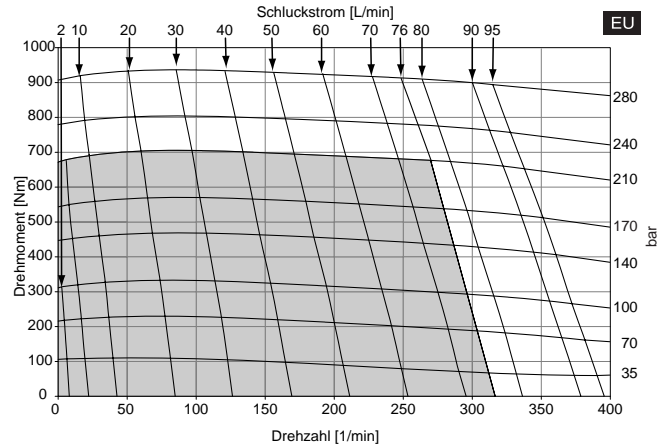
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500	4000
<b>.5</b>	932 6	1907 4	2894 2					
<b>1</b>	960 14	1954 12	2950 9	3943 6	4939 3	5930 2		
<b>2</b>	988 30	2031 27	3065 24	4090 20	5107 17	6100 14	7068 11	8037 9
<b>3</b>	983 45	2029 42	3071 39	4101 35	5128 31	6161 27	7182 23	8184 20
<b>4</b>	978 61	2037 58	3090 54	4136 49	5176 45	6207 42	7230 37	8234 33
<b>5</b>	962 77	2030 73	3092 69	4144 64	5190 60	6231 56	7259 51	8271 47
<b>7</b>	933 108	2005 104	3078 99	4141 94	5194 89	6239 84	7275 78	8298 73
<b>9</b>	890 140	1972 135	3048 129	4112 123	5169 117	6213 112	7245 106	8271 100
<b>12</b>	832 187	1912 181	2996 175	4071 167	5125 161	6163 154	7195 147	8224 140
<b>15</b>	753 235	1832 228	2921 220	4009 212	5081 204	6137 196	7182 188	8212 180
<b>20</b>	559 314	1654 306	2744 297	3834 287	4917 278	5991 268	7045 258	8081 248
<b>25</b>	524 393	1427 384	2507 373	3595 363	4690 352	5780 340	6853 328	7913 317

Flow (GPM)

TORQUE (LB IN) 5780  
SPEED (RPM) 340

238 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TH 0280

17.1 cu in / rev

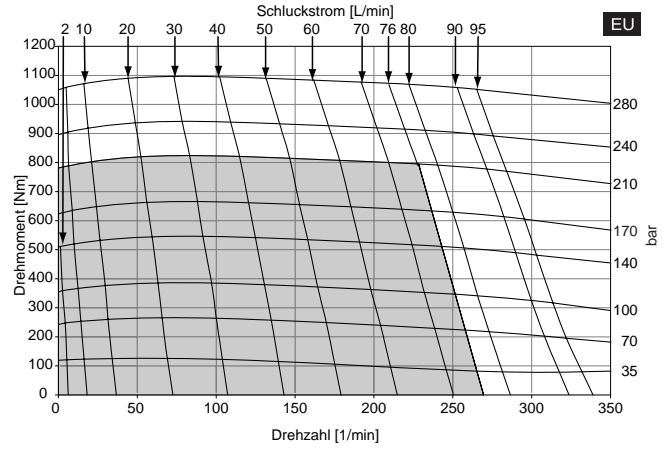
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500	4000
<b>.5</b>	1056 5	2177 4	3323 2	4512 1				
<b>1</b>	1087 12	2223 10	3378 8	4552 6	5734 5	6930 3	8135 3	9350 2
<b>2</b>	1124 25	2313 23	3513 21	4700 18	5880 16	7060 14	8239 12	9400 11
<b>3</b>	1124 39	2323 36	3532 34	4740 31	5940 28	7143 25	8346 22	9536 19
<b>4</b>	1126 52	2346 49	3568 47	4786 43	6004 40	7214 37	8415 33	9596 30
<b>5</b>	1115 65	2350 62	3582 59	4816 56	6044 52	7256 49	8457 45	9641 41
<b>7</b>	1091 92	2338 88	3586 85	4832 80	6072 76	7301 72	8515 67	9706 63
<b>9</b>	1046 118	2309 114	3564 110	4811 105	6051 101	7280 96	8499 90	9707 85
<b>12</b>	981 159	2242 154	3506 148	4757 143	5992 137	7221 132	8444 125	9652 118
<b>15</b>	898 199	2164 193	3437 186	4702 180	5951 174	7187 168	8416 160	9625 152
<b>20</b>	691 266	1976 258	3255 250	4529 243	5795 235	7044 227	8275 218	9499 209
<b>25</b>	703 334	1726 324	2987 314	4260 305	5540 296	6815 286	8071 276	9311 267

Flow (GPM)

TORQUE (LB IN) 8071  
SPEED (RPM) 276

280 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto. Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TH 0310

18.9 cu in / rev

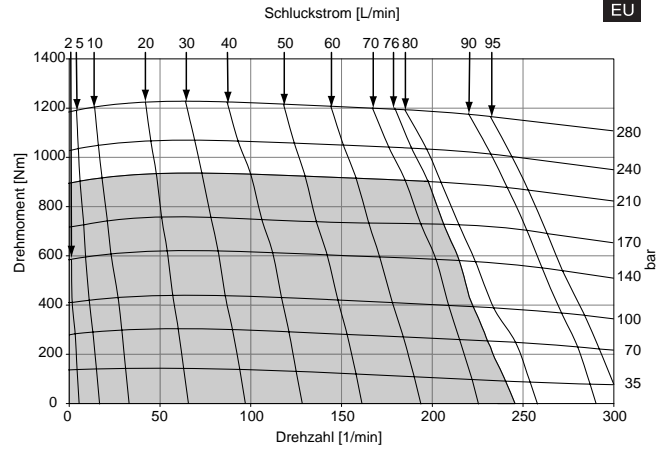
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500	4000
<b>.5</b>	1188 4	2464 3	3766 2	5102 1				
<b>1</b>	1220 11	2508 9	3812 7	5145 5	6477 4	7822 2	9181 2	10530 1
<b>2</b>	1259 23	2598 21	3950 19	5298 17	6642 14	7972 13	9282 10	10574 9
<b>3</b>	1257 35	2606 33	3889 30	5332 28	6688 25	8044 22	9392 19	10693 16
<b>4</b>	1259 47	2628 44	4003 42	5377 39	6749 36	8114 33	9461 29	10780 26
<b>5</b>	1247 59	2629 56	4252 52	5401 50	6782 47	8149 42	9499 39	10823 35
<b>7</b>	1218 84	2614 80	4013 76	5413 72	6806 68	8184 64	9543 60	10874 56
<b>9</b>	1167 107	2574 103	3983 99	5386 94	6780 90	8162 85	9529 80	10877 75
<b>12</b>	1089 143	2493 139	3904 133	5308 128	6696 122	8075 117	9443 110	10793 102
<b>15</b>	995 180	2400 173	3817 167	5225 160	6621 154	8003 148	9371 140	10718 131
<b>20</b>	769 241	2194 234	3618 225	5043 218	6462 210	7863 203	9238 194	10588 183
<b>25</b>	626 303	1955 294	3359 284	4771 274	6251 265	7608 256	8998 246	10360 236

Flow (GPM)

TORQUE (LB IN) 7608  
SPEED (RPM) 256

310 cc / rev



EU

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TH 0335

20.6 cu in / rev

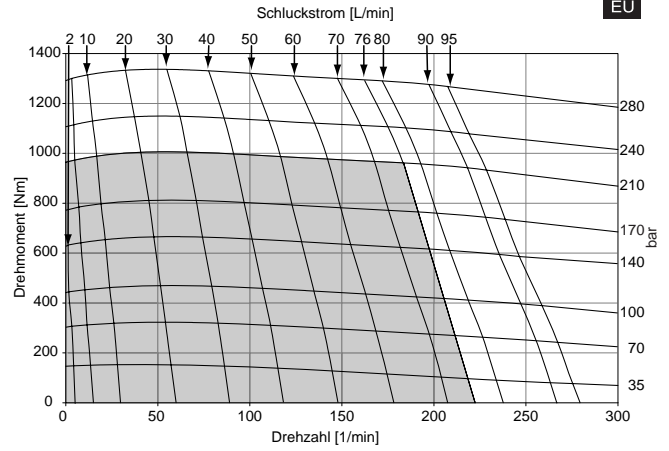
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500	4000
<b>.5</b>	1297 4	2699 3	4128 1	5584 1				
<b>1</b>	1329 10	2741 8	4176 7	5630 5	7084 4	8551 2	10036 2	11496 1
<b>2</b>	1369 21	2832 19	4308 17	5787 15	7265 13	8718 11	10136 9	11534 8
<b>3</b>	1366 32	2838 30	4326 27	5817 25	7301 22	8781 20	10248 17	11685 14
<b>4</b>	1368 43	2858 40	4358 38	5861 35	7358 32	8850 29	10317 25	11748 22
<b>5</b>	1355 54	2858 51	4368 48	5880 45	7386 42	8880 38	10352 34	11791 30
<b>7</b>	1323 76	2840 73	4363 69	5888 65	7407 61	8908 57	10384 53	11829 47
<b>9</b>	1266 98	2791 94	4326 90	5856 85	7376 81	8884 76	10372 71	11834 64
<b>12</b>	1177 131	2698 127	4230 121	5759 116	7273 110	8773 105	10261 98	11726 90
<b>15</b>	1075 165	2594 159	4127 153	5654 146	7170 140	8670 134	10153 126	11613 116
<b>20</b>	833 221	2372 214	3915 205	5463 197	7008 189	8533 182	10026 173	11479 161
<b>25</b>	678 277	2142 269	3663 259	5189 248	6726 239	8257 230	9757 219	11219 209

Flow (GPM)

TORQUE (LB IN) 9757  
SPEED (RPM) 219

337 cc / rev



EU

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.  
Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.



TH 0405

24.7 cu in / rev

PRESSURE (PSID)

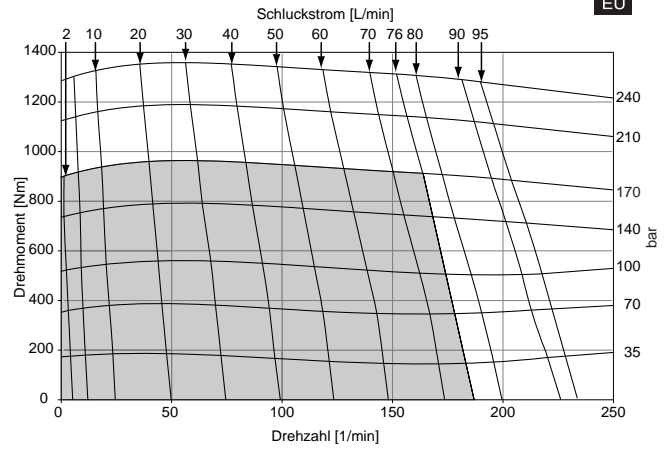
	500	1000	1500	2000	2500	3000	3500
<b>.5</b>	1544 4	3178 3	4840 2	6515 1	8185 1		
<b>1</b>	1593 8	3256 7	4928 6	6607 6	8303 5	9987 4	11652 3
<b>2</b>	1636 17	3351 16	5084 15	6817 14	8550 13	10272 12	11978 11
<b>3</b>	1637 27	3365 25	5106 23	6847 22	8588 21	10314 19	12031 18
<b>4</b>	1645 36	3394 34	5159 32	6920 30	8668 29	10402 27	12130 26
<b>5</b>	1640 45	3408 43	5201 41	6983 39	8733 37	10466 35	12194 33
<b>7</b>	1606 64	3396 61	5211 59	7003 56	8772 54	10527 51	12271 49
<b>9</b>	1551 82	3350 80	5176 77	6981 73	8763 70	10519 67	12269 64
<b>12</b>	1428 110	3238 107	5075 103	6888 99	8670 95	10424 91	12172 88
<b>15</b>	1310 138	3112 135	4948 130	6759 125	8545 120	10306 115	12060 111
<b>20</b>	1136 185	2862 181	4692 175	6518 168	8336 162	10122 156	11877 151
<b>25</b>			4492 219	6303 212	8084 204	9848 197	11585 190

Flow (GPM)

TORQUE (LB IN) 9848  
SPEED (RPM) 197

405 cc / rev

EU



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TH 0475

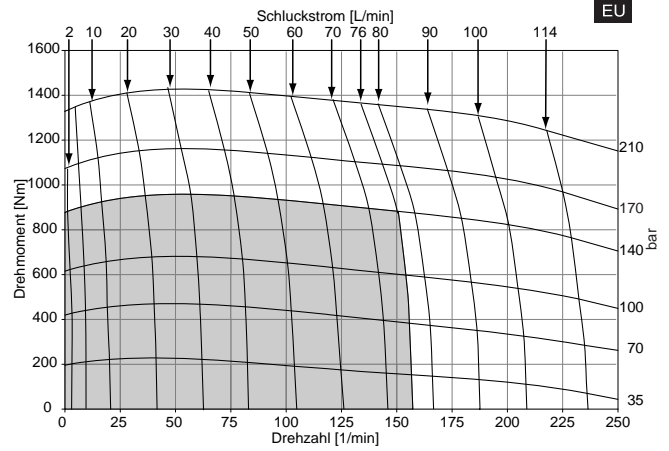
29.1 cu in / rev PRESSURE (PSID)

	500	1000	1500	2000	2500	3000
<b>.5</b>	1768 3	3732 3	5733 2	7744 1	9762 1	
<b>1</b>	1868 7	3878 7	5879 6	7851 5	9838 4	11830 3
<b>2</b>	1964 15	4055 14	6180 14	8237 12	10241 10	12136 8
<b>3</b>	1972 23	4074 22	6208 21	8321 19	10379 17	12355 13
<b>4</b>	2005 31	4135 30	6287 29	8382 27	10463 24	12496 20
<b>5</b>	2004 39	4129 38	6304 37	8428 34	10514 31	12544 26
<b>7</b>	1990 55	4133 54	6308 52	8445 50	10555 45	12602 40
<b>9</b>	1924 70	4104 69	6285 68	8430 65	10528 60	12608 54
<b>12</b>	1775 94	3974 93	6157 91	8328 87	10446 82	12528 75
<b>15</b>	1619 118	3784 116	5990 114	8188 110	10311 104	12372 96
<b>20</b>	1314 157	3373 156	5629 153	7853 149	10038 141	12145 132
<b>25</b>	1141 197	3029 196	5220 193	7427 189	9629 182	11757 174
<b>30</b>	606 237	2505 236	4649 233	6766 230	8878 224	10989 219

Flow (GPM)

TORQUE (LB IN) 6766  
SPEED (RPM) 230

477 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogdaten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TH 0530

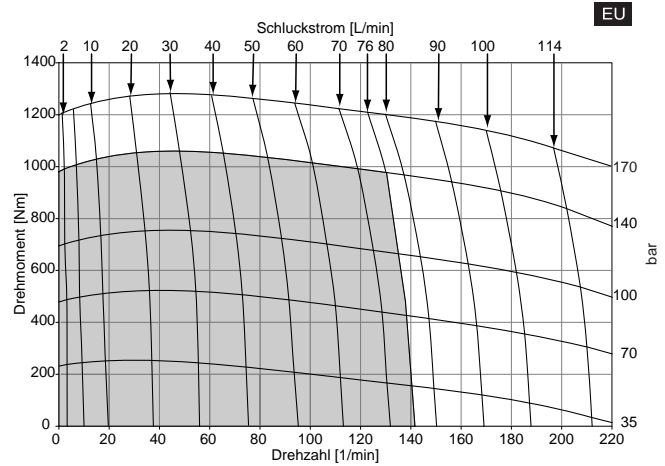
32.2 cu in / rev

	PRESSURE (PSID)				
	500	1000	1500	2000	2500
<b>.5</b>	2080 3	4256 3	6479 2	8726 2	11012 1
<b>1</b>	2158 7	4372 6	6592 6	8779 5	10994 4
<b>2</b>	2246 14	4567 13	6869 12	9126 11	11376 9
<b>3</b>	2242 21	4578 20	6916 19	9237 17	11500 14
<b>4</b>	2253 28	4625 27	6977 25	9296 23	11586 20
<b>5</b>	2235 35	4629 34	7002 32	9333 29	11626 26
<b>7</b>	2182 49	4599 48	7006 46	9362 42	11659 38
<b>9</b>	2095 63	4535 62	6960 59	9330 55	11650 50
<b>12</b>	1943 85	4390 83	6825 80	9217 75	11549 69
<b>15</b>	1753 106	4199 104	6638 100	9052 95	11408 87
<b>20</b>	1327 141	3783 139	6262 135	8701 129	11086 120
<b>25</b>	1011 177	3300 175	5751 171	8210 165	10639 158
<b>30</b>	269 213	2698 211	5083 208	7415 203	9814 197

Flow (GPM)

TORQUE (LB IN) 9814  
SPEED (RPM) 197

528 cc / rev



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

**TH 0625**

**38.0 cu in / rev**

PRESSURE (PSID)

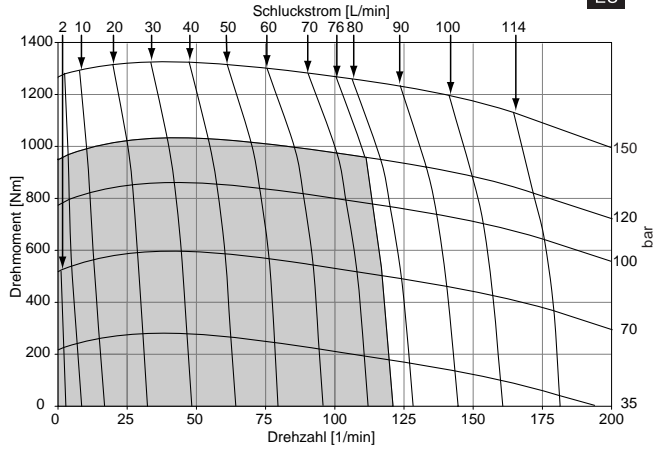
	500	1000	1500	1750	2250
<b>.5</b>	1939 2	4593 1			
<b>1</b>	2087 5	4665 3	7283 2	8680 2	11579 1
<b>2</b>	2338 11	4991 9	7590 8	8853 7	11458 5
<b>3</b>	2386 17	5101 15	7753 13	9055 12	11689 9
<b>4</b>	2457 23	5202 21	7872 19	9174 17	11769 14
<b>5</b>	2479 29	5246 27	7943 25	9242 23	11821 18
<b>7</b>	2464 41	5273 39	7995 36	9306 34	11859 28
<b>9</b>	2401 53	5223 51	7993 48	9337 45	11935 39
<b>12</b>	2254 71	5092 69	7886 65	9239 62	11900 54
<b>15</b>	2052 89	4901 87	7721 83	9086 80	11763 70
<b>20</b>	1600 120	4490 117	7334 112	8725 109	11424 98
<b>25</b>	1063 151	3933 148	6818 144	8235 140	11021 131
<b>30</b>	359 182	3250 180	6074 176	7443 172	10179 165

**Flow (GPM)**

TORQUE (LB IN) 7443  
 SPEED (RPM) 172

**623 cc / rev**

EU



Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

Cont.

Int.

TH 0785

48.0 cu in / rev

PRESSURE (PSID)

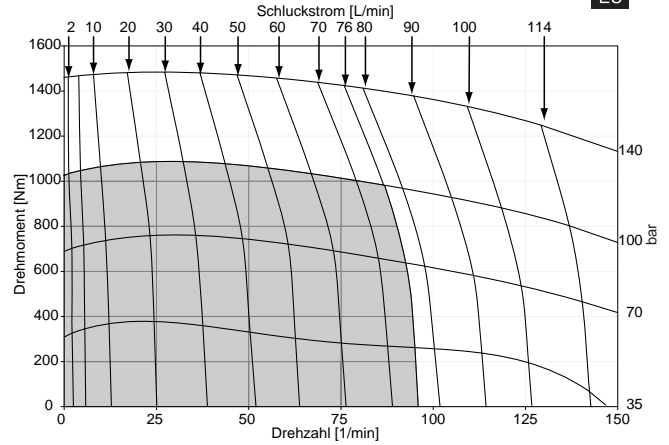
	500	1000	1500	2000
<b>.5</b>	2910 2	6153 2	9607 1	12950 1
<b>1</b>	3011 4	6296 4	9670 3	12919 3
<b>2</b>	3217 9	6536 8	9935 7	13060 6
<b>3</b>	3220 14	6613 13	9977 11	13079 9
<b>4</b>	3265 19	6679 17	10021 15	13078 13
<b>5</b>	3263 23	6703 22	10047 19	13103 16
<b>7</b>	3218 33	6722 31	10068 28	13062 24
<b>9</b>	3107 43	6664 41	10108 36	13185 31
<b>12</b>	2892 57	6489 55	9959 49	13082 42
<b>15</b>	2643 71	6238 69	9733 62	12938 54
<b>20</b>	2044 95	5673 92	9239 85	12636 75
<b>25</b>	2313 119	4976 117	8571 110	12073 101
<b>30</b>	496 143	4104 141	7582 137	11024 130

Flow (GPM)

TORQUE (LB IN) 11024  
SPEED (RPM) 130

786 cc / rev

EU



Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TH 0960

58.5 cu in / rev

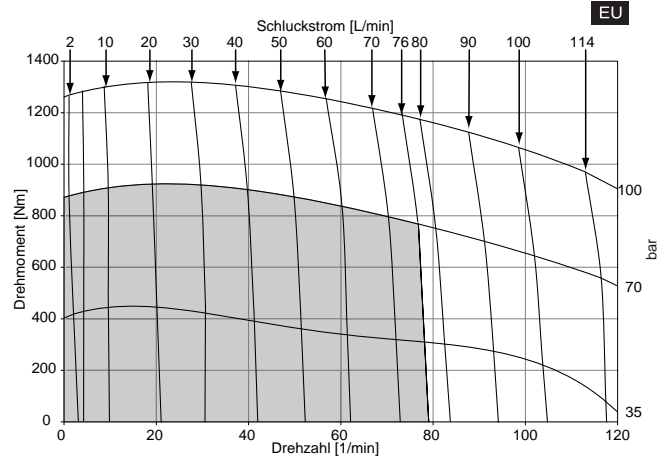
PRESSURE (PSID)

	500	1000	1500
<b>.5</b>	3692 2	7712 1	11750 1
<b>1</b>	3788 3	7858 3	11895 3
<b>2</b>	3900 7	8045 7	12058 6
<b>3</b>	3905 11	8078 11	12135 10
<b>4</b>	3939 15	8155 14	12210 13
<b>5</b>	3923 19	8173 18	12238 17
<b>7</b>	3860 27	8160 26	12262 24
<b>9</b>	3733 35	8074 34	12224 31
<b>12</b>	3475 47	7848 45	12062 42
<b>15</b>	3149 58	7545 57	11823 53
<b>20</b>	2437 78	6843 76	11227 72
<b>25</b>	2969 98	5990 96	10360 92
<b>30</b>	603 118	4919 117	9170 113

Flow (GPM)

TORQUE (LB IN) 9170  
SPEED (RPM) 113

959 cc / rev



EU

Cont.

Int.

Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

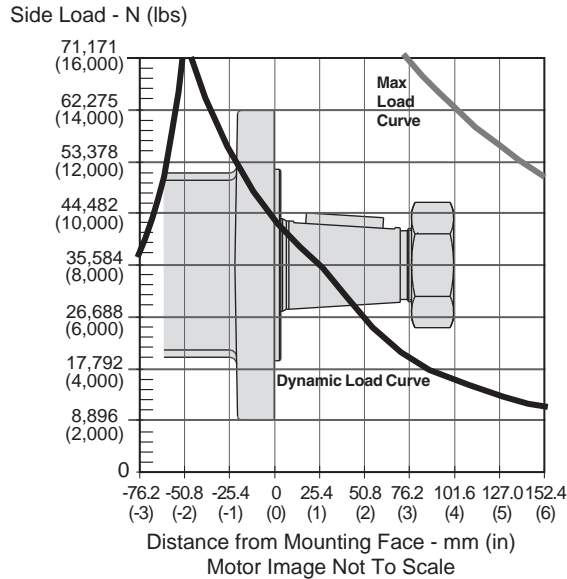
Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogdaten sind moeglich.

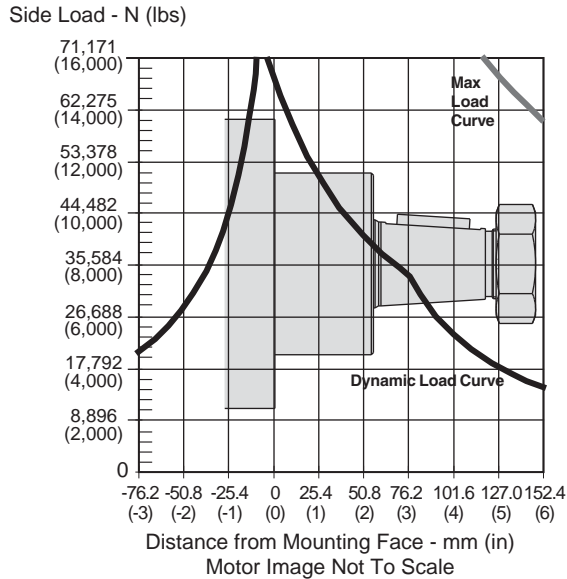
Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

**Flange Mount / Standardgehäuse**  
**Monture à bride(s) / Montaje de brida**



The dynamic side load curve is based on uni-directional steady state loads for  $L_{10}$  bearing life at  $6 \times 10^6$  revolutions. Die zulässige auslegbare radiale Wellenbelastungskurve ist unter ruhenden, einseitig statisch gerichteten Lastverhältnissen auf eine  $L_{10}$  Lebensdauer mit  $6 \times 10^6$  Umdrehungen kalkuliert. La courbe de charge latérale permise se base sur des charges unidirectionnelles en régime permanent pour le roulement  $L_{10}$  à  $6 \times 10^6$  révolutions. La curva de valores admisibles de carga lateral está basada en cargas constantes para cojinetes  $L_{10}$  a  $6 \times 10^6$  revoluciones.

**Wheel Mount / Radnabengehäuse**  
**Monture à roue / Montaje de rueda**



The maximum load curve is defined by bearing static load capacity. This curve should not be exceeded at any time including shock loads. Die maximale radiale Wellenbelastungskurve ist definiert als maximale statische Last ohne Drehzahl. Sie gilt als Grenze und sollte keinesfalls überschritten werden. La courbe de charge maximale est définie par la capacité de charge statique portante. Cette courbe ne devrait être dépassée en aucun moment y compris pour les charges par à-coups. La curva de carga máxima queda definida por la capacidad de carga estática del cojinete. No se deben superar los valores de esta curva, ni siquiera con cargas provisorias de impacto.

**Equation to Calculate the Expected Radial Bearing Life**  
**Gleichung zur Ermittlung der Lagerlebensdauer**

Equation to calculate the dynamic bearing life for a given load:  
 Bestimmung der erlaubten radialen Wellenbelastung mit vorgegebener Last

Use  $F_a$ ,  $F_b$  and  $S$  in equation to determine hours of  $L_{10}$  bearing life.  
 Die Lebensdauer in Stunden ergibt sich durch einsetzen von  $F_a$ ,  $F_b$ , und  $S$  in die nachstehende Formel.

$$L = \frac{6 \times 10^6}{60 \times S} \left\{ \frac{F_a}{F_b} \right\}^{3.33}$$

Where / Mit:

$S$  = Shaft Speed RPM / Abtriebswellendrehzahl in  $\text{min}^{-1}$

$L$  = Life In Hours / Lebensdauer in Stunden

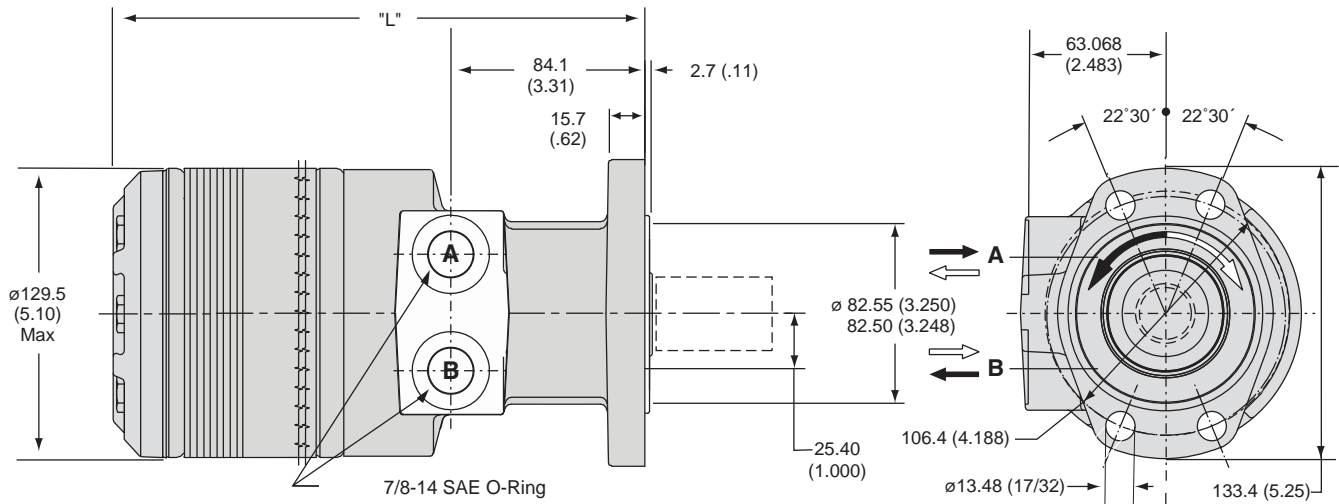
$F_a$  = Dynamic side load defined by above curve at a distance from mounting flange. / Erlaubte radiale Wellenbelastung als Funktion der Länge

$F_b$  = Application side load. / Anwendungsseitige Wellenbelastung

Note: Calculations are based on  $L_{10}$  bearing life per ISO 281.  
 Auslegung basiert auf einer  $L_{10}$  Lebensdauer nach ISO 281.

**Code: MS**

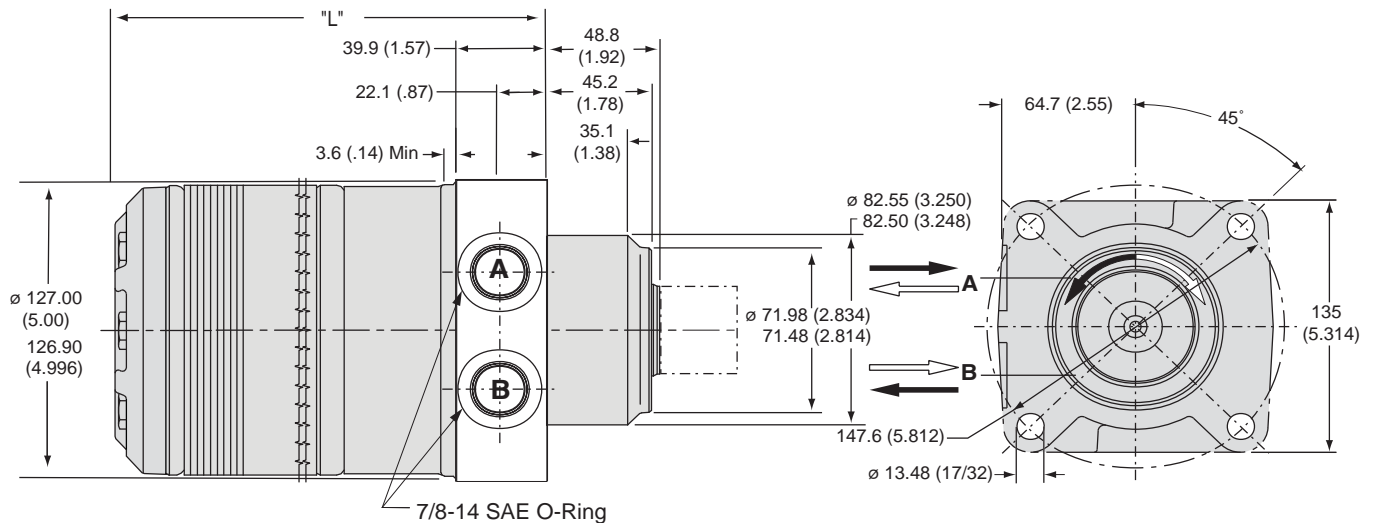
**Magneto, 7/8-14 SAE O-Ring**



Code MS	disp.	0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
<b>Weight/Gewicht</b>	<b>kg</b>	<b>14.7</b>	<b>14.9</b>	<b>15.2</b>	<b>15.5</b>	<b>15.9</b>	<b>16.3</b>	<b>16.1</b>	<b>16.9</b>	<b>17.6</b>	<b>18.3</b>	<b>19.0</b>	<b>20.6</b>	<b>22.3</b>
<b>Poids/Peso</b>	<b>(lb)</b>	<b>(32.3)</b>	<b>(32.8)</b>	<b>(33.4)</b>	<b>(34.2)</b>	<b>(35.1)</b>	<b>(35.9)</b>	<b>(35.4)</b>	<b>(37.3)</b>	<b>(38.7)</b>	<b>(40.4)</b>	<b>(41.9)</b>	<b>(45.4)</b>	<b>(49.1)</b>
<b>Length</b>	<b>"L" mm</b>	<b>216</b>	<b>219</b>	<b>222</b>	<b>227</b>	<b>232</b>	<b>238</b>	<b>235</b>	<b>245</b>	<b>254</b>	<b>260</b>	<b>270</b>	<b>289</b>	<b>308</b>
	<b>"L" (in)</b>	<b>(8.50)</b>	<b>(8.62)</b>	<b>(8.75)</b>	<b>(8.94)</b>	<b>(9.12)</b>	<b>(9.37)</b>	<b>(9.25)</b>	<b>(9.66)</b>	<b>(10.00)</b>	<b>(10.25)</b>	<b>(10.62)</b>	<b>(11.37)</b>	<b>(12.12)</b>

**Code: US**

**Wheel, Standard, 7/8-14 SAE O-Ring**



Code US	disp.	0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
<b>Weight/Gewicht</b>	<b>kg</b>	<b>16.9</b>	<b>17.2</b>	<b>17.4</b>	<b>17.8</b>	<b>18.2</b>	<b>18.4</b>	<b>18.6</b>	<b>19.2</b>	<b>19.8</b>	<b>20.6</b>	<b>21.3</b>	<b>22.9</b>	<b>24.5</b>
<b>Poids/Peso</b>	<b>(lb)</b>	<b>(37.3)</b>	<b>(37.8)</b>	<b>(38.4)</b>	<b>(39.2)</b>	<b>(40.1)</b>	<b>(40.5)</b>	<b>(40.9)</b>	<b>(42.3)</b>	<b>(43.7)</b>	<b>(45.4)</b>	<b>(46.9)</b>	<b>(50.4)</b>	<b>(54.1)</b>
<b>Length</b>	<b>"L" mm</b>	<b>173</b>	<b>177</b>	<b>180</b>	<b>184</b>	<b>189</b>	<b>192</b>	<b>196</b>	<b>203</b>	<b>212</b>	<b>218</b>	<b>227</b>	<b>246</b>	<b>265</b>
	<b>"L" (in)</b>	<b>(6.82)</b>	<b>(6.95)</b>	<b>(7.07)</b>	<b>(7.26)</b>	<b>(7.45)</b>	<b>(7.55)</b>	<b>(7.70)</b>	<b>(7.99)</b>	<b>(8.32)</b>	<b>(8.57)</b>	<b>(8.95)</b>	<b>(9.70)</b>	<b>(10.45)</b>

English equivalents for metric specifications are shown in ( ).

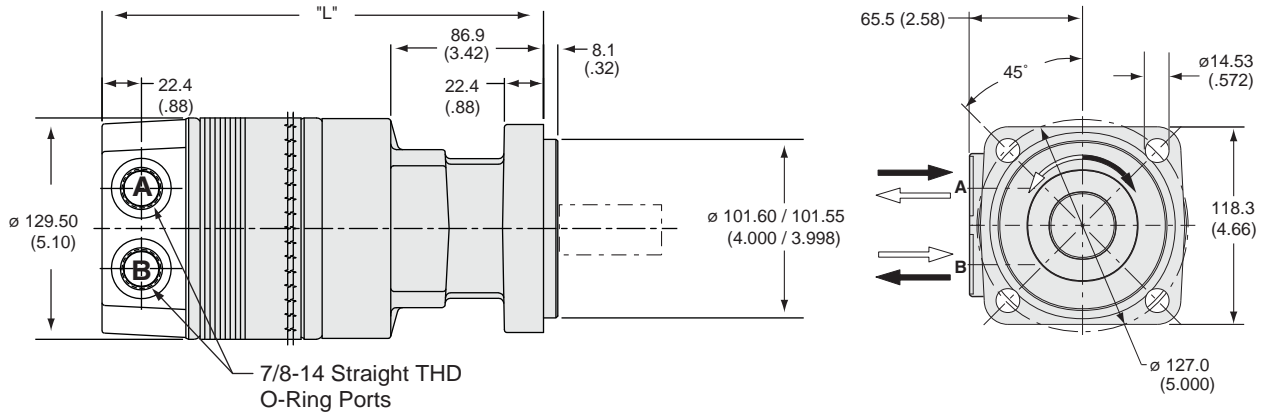
015 TH.indd, js





**Code: PB**

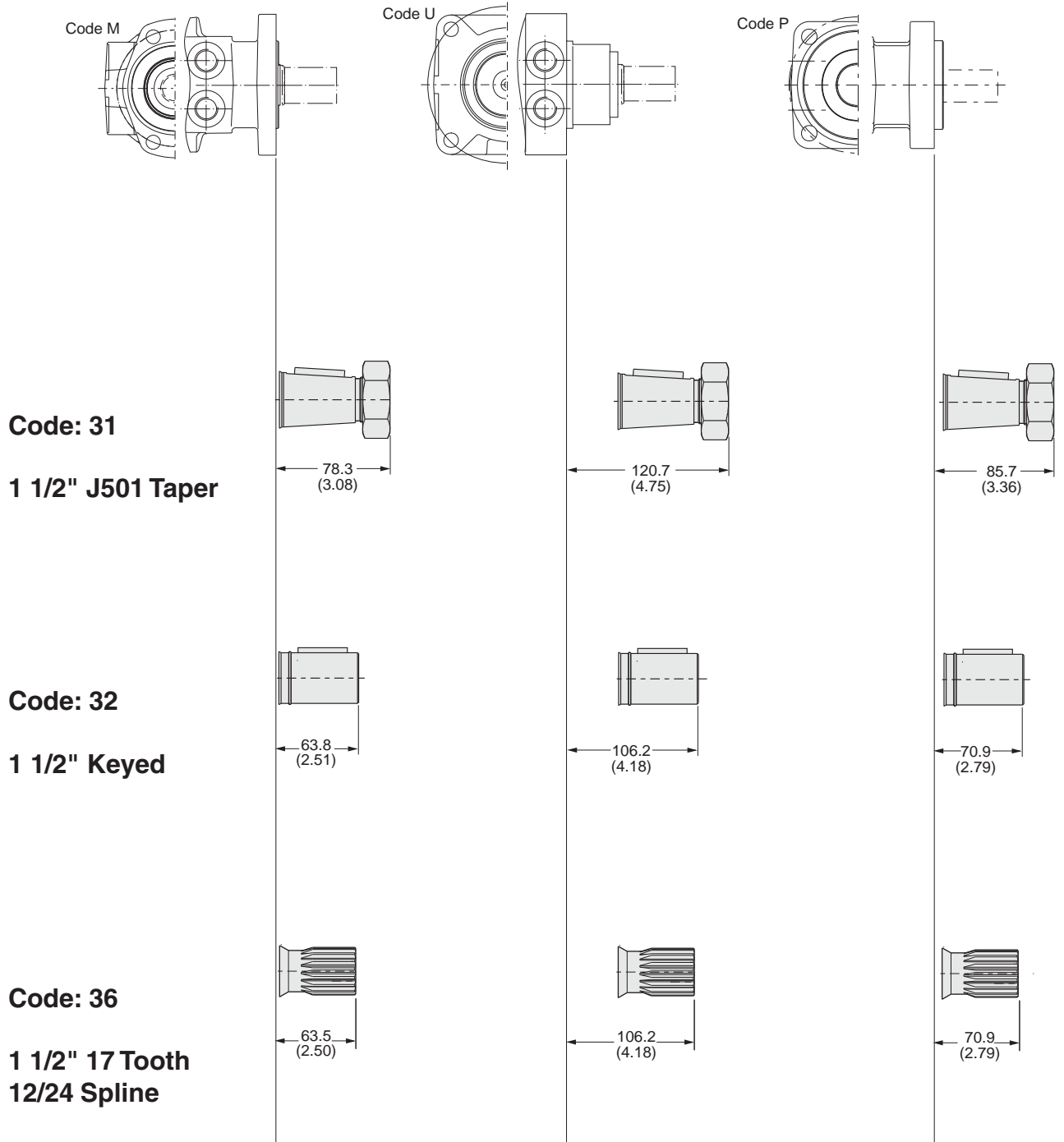
**SAE "B" 4 Bolt, Rear 7/8-14 SAE O-Ring Radial**



Code PA	disp.	0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
<b>Weight/Gewicht</b>	<b>kg</b>	<b>16.9</b>	<b>17.2</b>	<b>17.4</b>	<b>17.8</b>	<b>18.2</b>	<b>18.4</b>	<b>18.6</b>	<b>19.2</b>	<b>19.8</b>	<b>20.6</b>	<b>21.3</b>	<b>22.9</b>	<b>24.5</b>
<b>Poids/Peso</b>	<b>(lb)</b>	<b>(37.3)</b>	<b>(37.8)</b>	<b>(38.4)</b>	<b>(39.2)</b>	<b>(40.1)</b>	<b>(40.5)</b>	<b>(40.9)</b>	<b>(42.3)</b>	<b>(43.7)</b>	<b>(45.4)</b>	<b>(46.9)</b>	<b>(50.4)</b>	<b>(54.1)</b>
<b>Length</b>	<b>"L" mm</b>	<b>235</b>	<b>238</b>	<b>242</b>	<b>246</b>	<b>251</b>	<b>254</b>	<b>257</b>	<b>265</b>	<b>273</b>	<b>280</b>	<b>289</b>	<b>308</b>	<b>327</b>
	<b>"L" (in)</b>	<b>(9.26)</b>	<b>(9.38)</b>	<b>(9.51)</b>	<b>(9.70)</b>	<b>(9.88)</b>	<b>(10.0)</b>	<b>(10.13)</b>	<b>(10.43)</b>	<b>(10.76)</b>	<b>(11.01)</b>	<b>(11.39)</b>	<b>(12.14)</b>	<b>(12.89)</b>

English equivalents for metric specifications are shown in ( ).

015 TH.indd, js

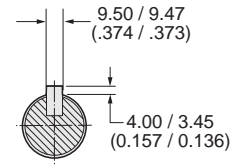
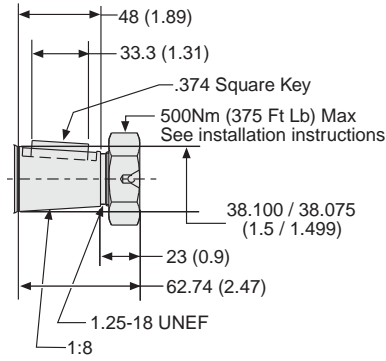


English equivalents for metric specifications are shown in ( ).

015 TH.indd.js

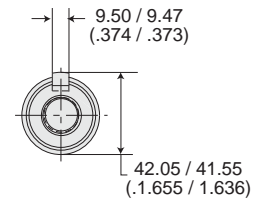
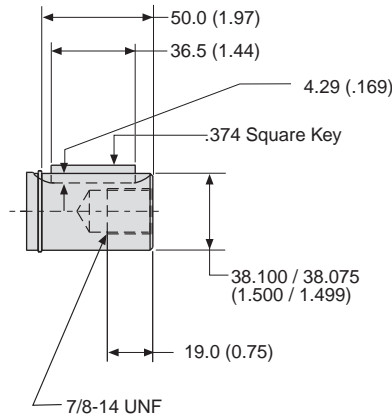
**Code: 31**

**1 1/2" J501 Taper**



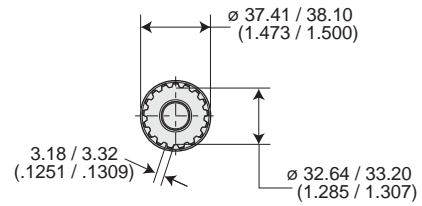
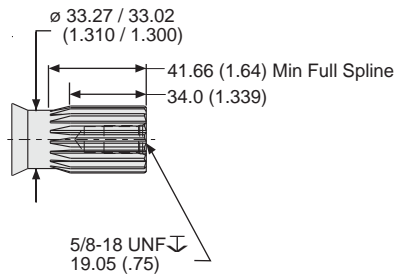
**Code: 32**

**1 1/2" Keyed**



**Code: 36**

**1 1/2" 17 Tooth  
12/24 Spline**



English equivalents for metric specifications are shown in ( ).

015 TH.indd, js

English equivalents for metric specifications are shown in ( ).

015 TH.indd, js



13 Displacements 13 Schluckvolumen 13 Cylindrée 13 Despazamientos	(8.6 to 58.5 in <sup>3</sup> /rev) 141 . . . 959 cm <sup>3</sup> /rev
<b>Maximum Pressure</b> Eingangsdruck Pression entrée Presion Maxima	<b>Cont.</b> (3000 psid) ... 207 bar <b>Int.</b> (4000 psid) ... 276 bar
<b>Maximum Oil Flow</b> Schluckstrom Débit d'huile Caudal Maximo de Aceite	(30 gpm) ... 114 lpm
<b>Maximum Speed</b> Drehzahl Vitesse de rotation Velocidad Maxima	(660 rpm) 660 rpm
<b>Maximum Torque</b> MaxDrehmoment Couple Torque Maximo	<b>Cont.</b> (9,239 lb in) 1044 Nm <b>Int.</b> (12,636 lb in) 1428 Nm
<b>Maximum Side Load at Key</b> Seitenlast Charges latérales Carga Maxima Lateral	(4790 lb) ... 21306 N

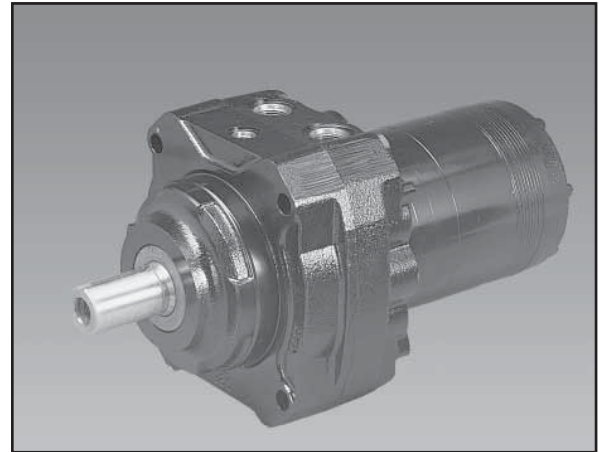


**CAUTION!**

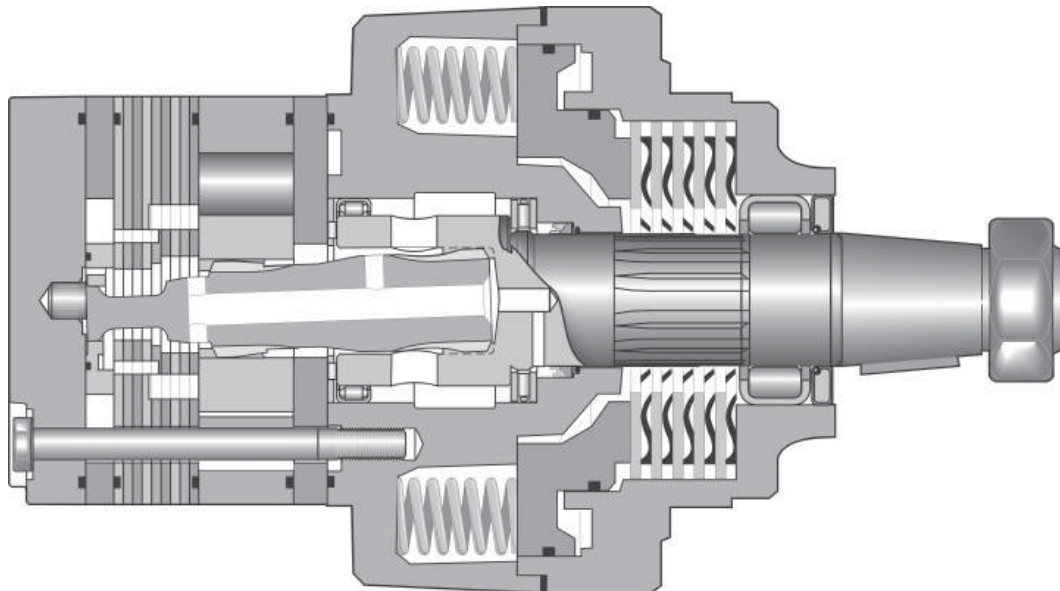
See installation/operating instructions for product cautions and proper use.

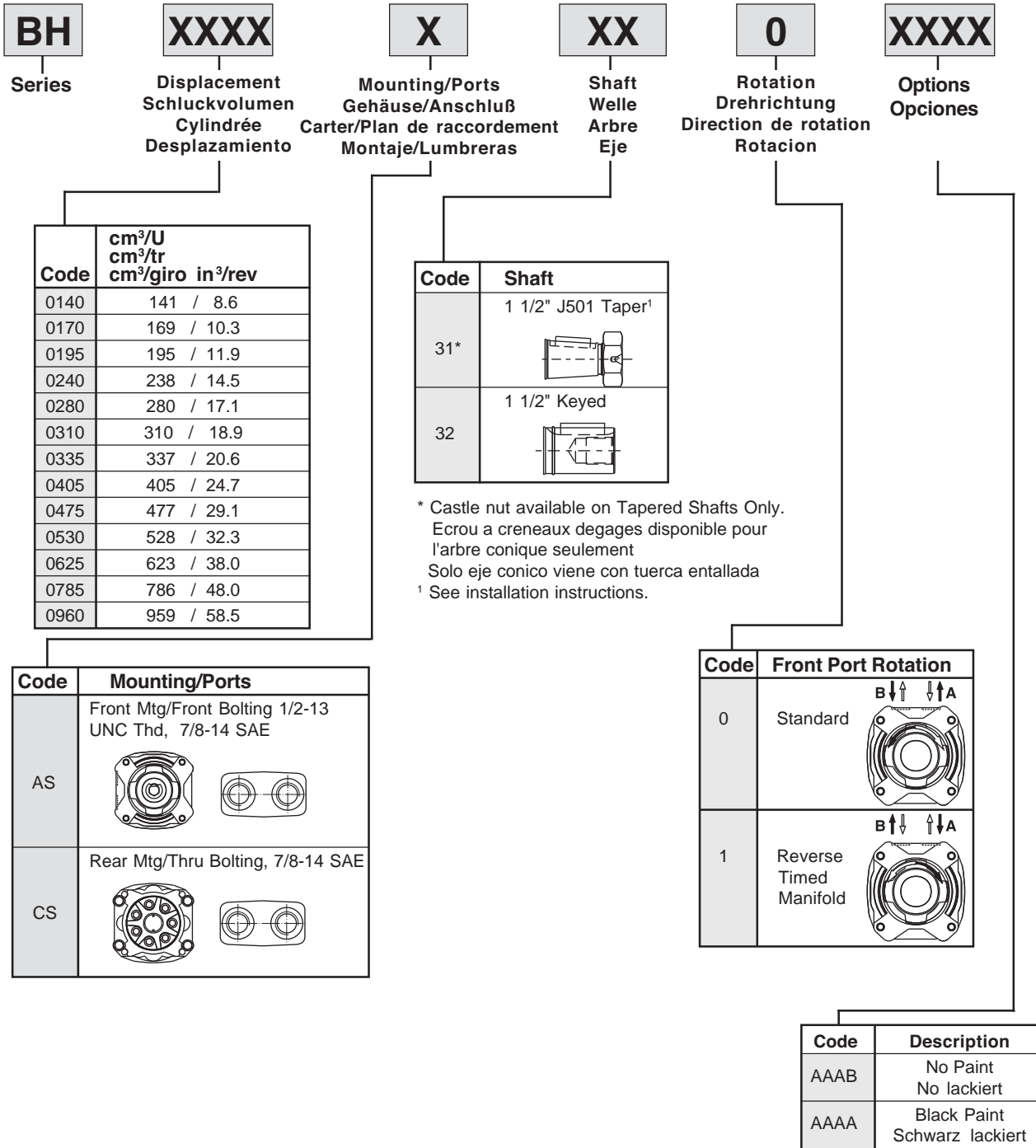
**Exceptional Strength and Durability in a High Performance Motor/Brake Package**

This brake motor consists of a BH Series motor integrated into a wet disc, spring applied, hydraulically released brake. Standard holding capacity is 16,000 lb in of holding torque. The brake is front mounted for reliable operation even in the event of a system failure. The brake release port is capable of pressures to 3000 PSI.



Rated Brake Holding Capacity @ Zero Release Pressure Nm (in-lbs)	Minimum Full Release Pressure bar (PSI)
1800 (16,000)	22 (315)
16,000 in-lbs is standard holding capacity. For other holding capacities, see page 261.	

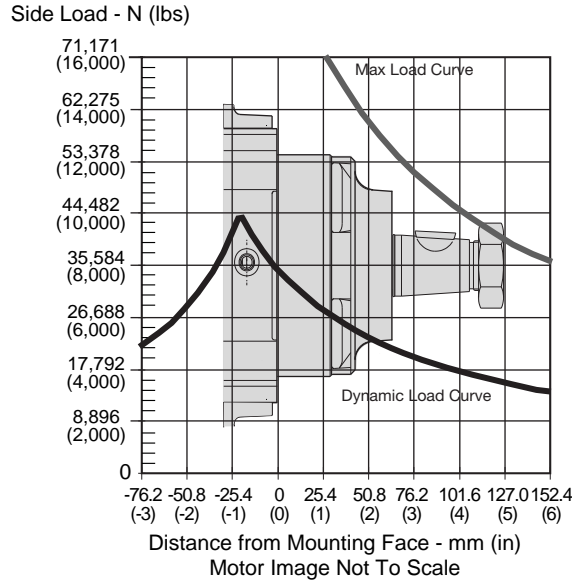




For performance data curves, see TH section.

For other available options, see pages 261–262.

Wheel Mount/Radnabengenhause  
Monture à roue/ Montaje de rueda



The maximum load curve is defined by bearing static load capacity. This curve should not be exceeded at any time including shock loads.  
Die maximale radiale Wellenbelastungskurve ist definiert als maximale statische Last ohne Drehzahl. Sie gilt als Grenze und sollte keinesfalls überschritten werden.  
La courbe de charge maximale est définie par la capacité de charge statique portante. Cette courbe ne devrait être dépassée en aucun moment y compris pour les charges par à-coups.  
La curva de carga máxima queda definida por la capacidad de carga estática del cojinete. No se deben superar los valores de esta curva, ni siquiera con cargas provisorias de impacto.

The dynamic side load curve is based on uni-directional steady state loads for  $L_{10}$  bearing life at  $6 \times 10^6$  revolutions. Die zulässige auslegbare radiale Wellenbelastungskurve ist unter ruhenden, einseitig statisch gerichteten Lastverhältnissen auf eine  $L_{10}$  Lebensdauer mit  $6 \times 10^6$  Umdrehungen kalkuliert.  
La courbe de charge latérale permise se base sur des charges unidirectionnelles en régime permanent pour le roulement  $L_{10}$  à  $6 \times 10^6$  révolutions.  
La curva de valores admisibles de carga lateral está basada en cargas constantes para cojinetes  $L_{10}$  a  $6 \times 10^6$  revoluciones.

Equation to Calculate the Expected Radial Bearing Life  
Gleichung zur Ermittlung der Lagerlebensdauer

Equation to calculate the dynamic bearing life for a given load:  
Bestimmung der erlaubten radialen Wellenbelastung mit vorgegebener Last

Use  $F_a$ ,  $F_b$  and  $S$  in equation to determine hours of  $L_{10}$  bearing life.  
Die Lebensdauer in Stunden ergibt sich durch einsetzen von  $F_a$ ,  $F_b$ , und  $S$  in die nachstehende Formel.

$$L = \frac{6 \times 10^6}{60 \times S} \left\{ \frac{F_a}{F_b} \right\}^{3.33}$$

Where / Mit:

$S$  = Shaft Speed RPM / Abtriebswellendrehzahl in  $\text{min}^{-1}$

$L$  = Life In Hours / Lebensdauer in Stunden

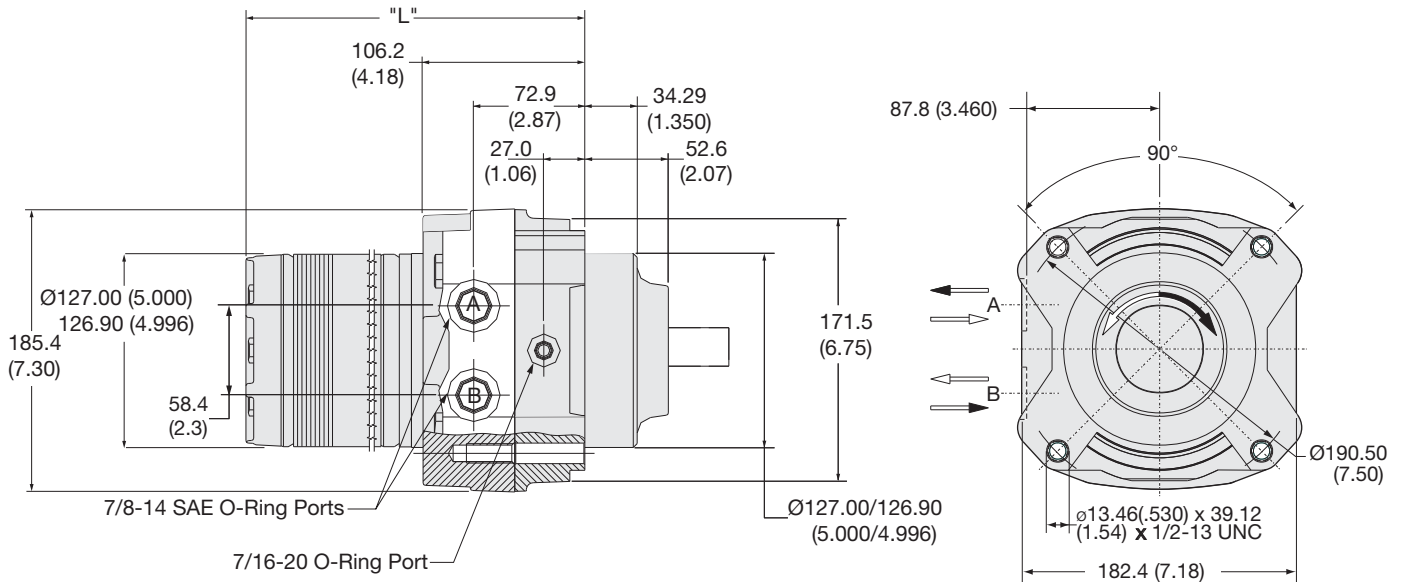
$F_a$  = Dynamic side load defined by above curve at a distance from mounting flange. / Erlaubte radiale Wellenbelastung als Funktion der Laenge

$F_b$  = Application side load. / Anwendungsseitige Wellenbelastung

Note: Calculations are based on  $L_{10}$  bearing life per ISO 281.  
Auslegung basiert auf einer  $L_{10}$  Lebensdauer nach ISO 281

**Code: AS**

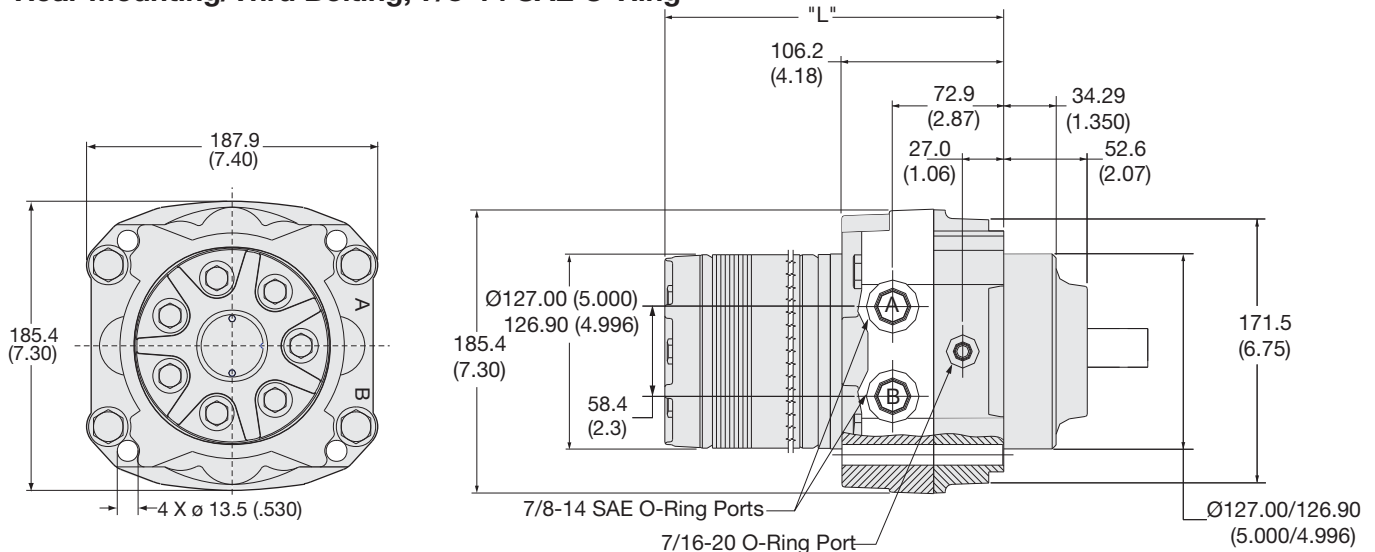
**Front Mounting / Front Bolting, 7/8-14 SAE O-Ring**



Code AS		0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
Weight/Gewicht	kg	27.3	27.5	27.8	28.1	28.5	28.7	28.9	29.5	30.2	30.9	31.7	33.2	34.9
Poids/Peso	(lb)	(60.2)	(60.8)	(61.3)	(62.1)	(63.0)	(63.5)	(63.9)	(65.2)	(66.7)	(68.3)	(69.9)	(73.3)	(77.1)
Length	"L" mm	198.6	201.7	205.0	209.6	214.4	217.9	220.7	228.1	236.7	243.1	252.5	271.5	290.6
	"L" (in)	(7.82)	(7.94)	(8.07)	(8.25)	(8.44)	(8.58)	(8.69)	(8.98)	(9.32)	(9.57)	(9.94)	(10.69)	(11.44)

**Code: CS**

**Rear Mounting/Thru Bolting, 7/8-14 SAE O-Ring**



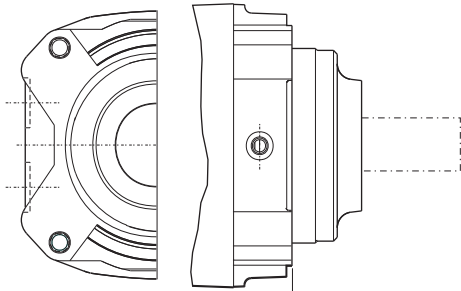
Code CS		0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
Weight/Gewicht	kg	27.3	27.5	27.8	28.1	28.5	28.7	28.9	29.5	30.2	30.9	31.7	33.2	34.9
Poids/Peso	(lb)	(60.2)	(60.8)	(61.3)	(62.1)	(63.0)	(63.5)	(63.9)	(65.2)	(66.7)	(68.3)	(69.9)	(73.3)	(77.1)
Length	"L" mm	198.6	201.7	205.0	209.6	214.4	217.9	220.7	228.1	236.7	243.1	252.5	271.5	290.6
	"L" (in)	(7.82)	(7.94)	(8.07)	(8.25)	(8.44)	(8.58)	(8.69)	(8.98)	(9.32)	(9.57)	(9.94)	(10.69)	(11.44)

English equivalents for metric specifications are shown in ( ).

016 BH Brake.indd, js

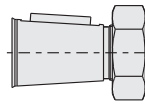






Code: 31

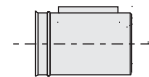
1 1/2" J501 Taper



130.0  
(5.12)

Code: 32

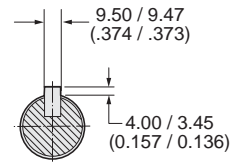
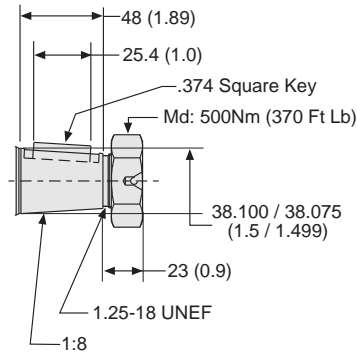
1 1/2" Keyed



116.4  
(4.58)

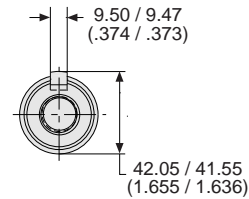
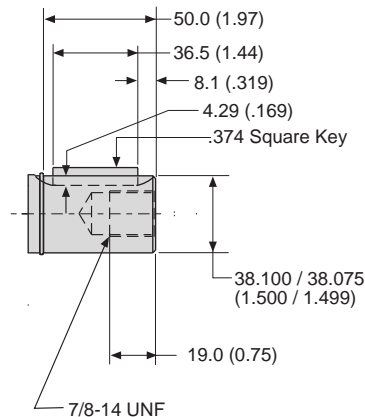
Code: 31

1 1/2" J501 Taper



Code: 32

1 1/2" Keyed



English equivalents for metric specifications are shown in ( ).

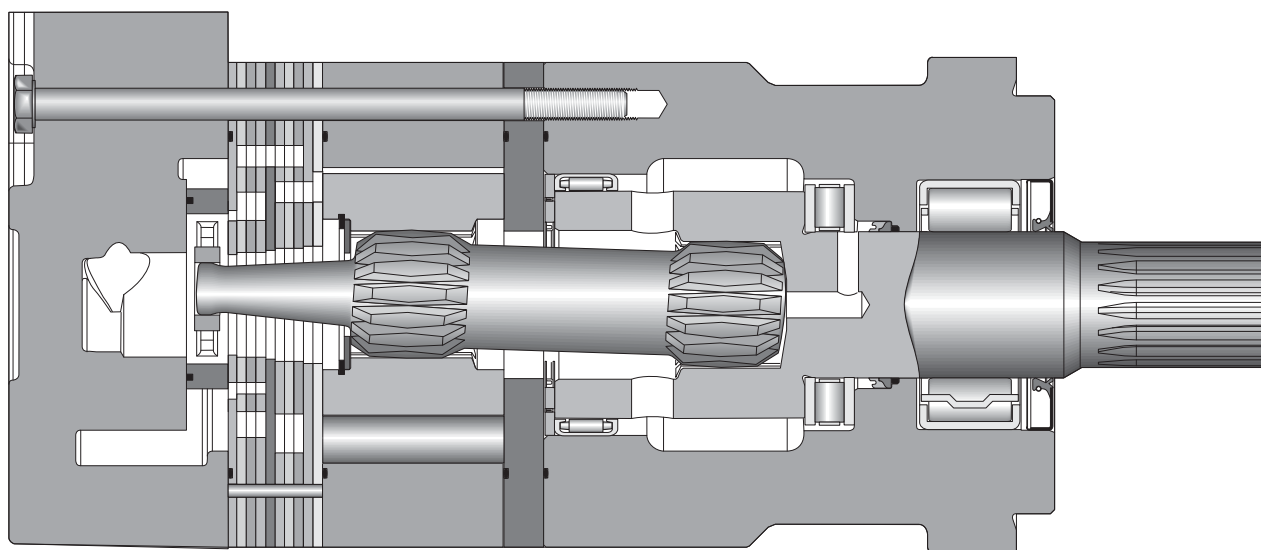
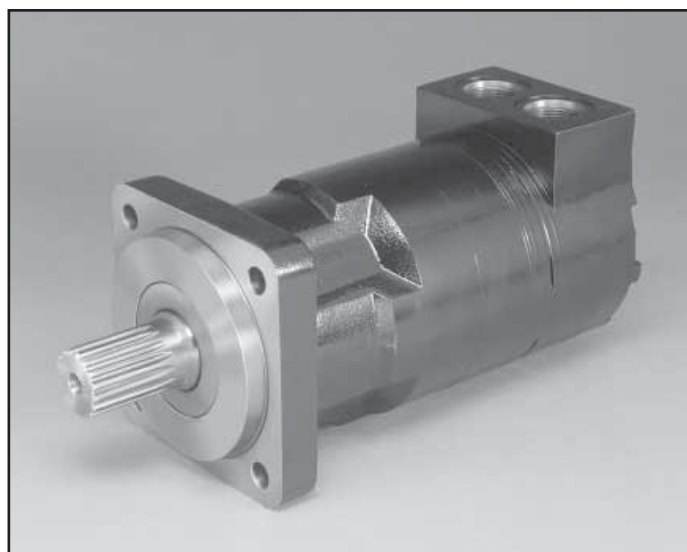
016 BH Brake.indd, js

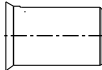

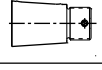
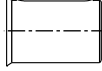
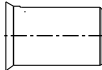

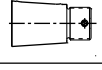
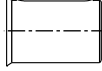




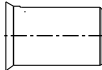

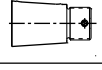
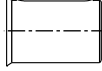


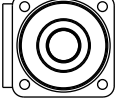
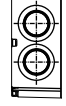
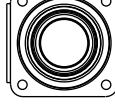

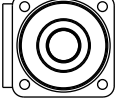
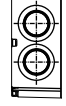
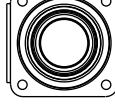

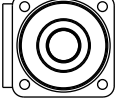
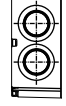
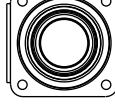



7 Displacements 7 Schluckvolumen Cylindrée 7 Desplazamientos	(15.3 to 61.0 in <sup>3</sup> /rev) 250 . . . 1000 cm <sup>3</sup> /rev	
Maximum Pressure Eingangsdruck Pression entrée Pressione in entrata	<b>Cont.</b> (3500 psid) . . . <b>241 bar</b>	<b>Int.</b> (4500 psid) . . . <b>310 bar</b>
Maximum Oil Flow Schluckstrom Débit d'huile Portata		(60 gpm) . . . <b>227 lpm</b>
Maximum Speed Drehzahl Velocità di rotazione Vitesse de rotation		(523 rpm) <b>523 rpm</b>
Maximum Torque MaxDrehmoment Couple Coppia	<b>Cont.</b> (21360 lb in) <b>2413 Nm</b>	<b>Int.</b> (23540 lb in) <b>2660 Nm</b>
Maximum Side Load at Key Seitenlast Charges latérales Carico radiale		(5900 lb) . . . <b>26245 N</b>

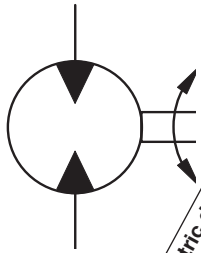
## Exceptional Strength and Durability in a High Performance Motor

The heart of Parker's TK Series powertrain, the torque link, is an extra heavy duty part that includes unique 60:40 spline geometry. Rugged construction throughout allows the transmission of over 23,000 lb-in of torque. The entire powertrain is continually washed in cool, high flow fluid to assure long life. Roller vanes and sealed commutator maintain high efficiency and provide smooth low speed performance.



<b>TK</b>	<b>XXXX</b>	<b>X5</b>	<b>XX</b>	<b>0</b>	<b>XXXX</b>																																						
<b>Series</b>	<b>Displacement</b> Schluckvolumen Cylindrée Desplazamiento	<b>Mounting/Rear Ports</b> Gehäuse/Endanschluß Carter/Alimentazione Laterale Montaje/Orifices arriér	<b>Shaft</b> Welle Arbre Ejes	<b>Rotation</b> Drehrichtung Direction de rotation Rotacion	<b>Options</b> Opciones																																						
	<table border="1"> <thead> <tr> <th>Code</th> <th>cm<sup>3</sup>/tr cm<sup>3</sup>/giro cm<sup>3</sup>/U in<sup>3</sup>/rev</th> </tr> </thead> <tbody> <tr><td>0250</td><td>250 / 15.3</td></tr> <tr><td>0315</td><td>315 / 19.2</td></tr> <tr><td>0400</td><td>400 / 24.4</td></tr> <tr><td>0500</td><td>500 / 30.5</td></tr> <tr><td>0630</td><td>630 / 38.4</td></tr> <tr><td>0800</td><td>800 / 48.8</td></tr> <tr><td>1000</td><td>1000 / 61.0</td></tr> </tbody> </table>	Code	cm <sup>3</sup> /tr cm <sup>3</sup> /giro cm <sup>3</sup> /U in <sup>3</sup> /rev	0250	250 / 15.3	0315	315 / 19.2	0400	400 / 24.4	0500	500 / 30.5	0630	630 / 38.4	0800	800 / 48.8	1000	1000 / 61.0		<table border="1"> <thead> <tr> <th>Code</th> <th>Shaft</th> </tr> </thead> <tbody> <tr> <td>32</td> <td>1 1/2" Keyed </td> </tr> <tr> <td>36</td> <td>1 1/2" 17 Tooth 12/24 Spline </td> </tr> <tr> <td>63</td> <td>1 3/4" Tapered </td> </tr> <tr> <td>64</td> <td>40mm Keyed </td> </tr> </tbody> </table>	Code	Shaft	32	1 1/2" Keyed 	36	1 1/2" 17 Tooth 12/24 Spline 	63	1 3/4" Tapered 	64	40mm Keyed 	<table border="1"> <thead> <tr> <th>Code</th> <th>Rear Port Rotation</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Standard </td> </tr> <tr> <td>1</td> <td>Reverse Timed Manifold </td> </tr> </tbody> </table>	Code	Rear Port Rotation	0	Standard 	1	Reverse Timed Manifold 	<table border="1"> <thead> <tr> <th>Code</th> <th>Options</th> </tr> </thead> <tbody> <tr> <td>AAAB</td> <td>No Paint No lackiert</td> </tr> <tr> <td>AAAA</td> <td>Black Paint Schwarz lackiert</td> </tr> </tbody> </table>	Code	Options	AAAB	No Paint No lackiert	AAAA	Black Paint Schwarz lackiert
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For other available options, see pages 261–262.



Geometric displacement  
Geom. Schluckvolumen  
Cylindrée  
Despazamientos  
Max. speed @ Max. intermittent flow  
Max. Drehzahl Intermitterender Betrieb:  
Velocità di rotazione max Funzionement intermittente  
Max. oil flow  
Max. Schluckstrom  
Débit d'huile maxi  
Caudal Maximo de Aceite  
Max. differential pressure  
Max. Druckgefälle  
Chute de pression maxi  
Presion diferencial maxima  
Max. supply pressure  
Max. Eingangsdruck  
Presion maxi entrée  
Max. torque  
Max. Drehmoment  
Couple maxi  
Torque Maximo  
Max. performance  
Max. Leistungsgabe  
Maximo redinamiento  
Min. starting torque  
Min. Anlaufmoment  
Couple min. fourni au dé manrage  
Torque minimo de arranque

Motor Series TK	cm <sup>3</sup> /rev in <sup>3</sup> /rev	rev/min	cont / int* l/min g/min		cont / int* bar psid		max bar psig	cont / int* Nm lb-in		max KW HP	cont / int* Nm lb-in	
TK 0250	250 15.3	523	114 30	133 35	241 3500	310 4500	328 4750	814 7204	1043 9234	48.5 65.0	689 6100	879 7780
TK 0315	315 19.2	413	114 30	133 35	241 3500	310 4500	328 4750	1029 9105	1314 11625	47.4 63.5	949 8400	1217 10770
TK 0400	400 24.4	373	114 30	151 40	207 3000	276 4000	328 4750	1153 10201	1524 13484	48.7 65.3	1049 9280	1410 12480
TK 0500	500 30.5	298	114 30	151 40	207 3000	276 4000	328 4750	1439 12736	1914 16940	48.1 64.5	1322 11700	1783 15780
TK 0630	630 38.4	237	114 30	151 40	207 3000	224 3250	328 4750	1617 14313	1716 15187	33.7 45.2	1497 13250	1621 14350
TK 0800	800 48.8	276	151 40	227 60	190 2750	207 3000	328 4750	1916 16960	2300 20360	44.4 59.5	1745 15440	1902 16834
TK 1000	1000 61.0	218	151 40	227 60	172 2500	190 2750	328 4750	2413 21360	2660 23540	35.4 47.5	1981 17535	2180 19290

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F.) Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS a 54°C (130°F). Ces données correspondent a des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production a l'autre.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

\* Intermittent operation rating applies to 10% of every minute.  
Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

TK 0250

15.3 cu in / rev

PRESSURE (PSID)

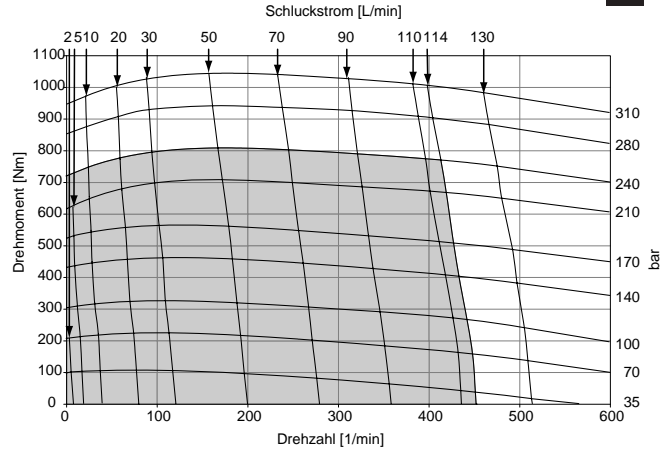
	500	1000	1500	2000	2500	3000	3500	4000	4500
<b>.5</b>	892 5	1838 3							
<b>1</b>	895 12	1834 10	2777 7	3729 5	4687 4	5366 3			
<b>2</b>	941 27	1922 25	2911 21	3900 19	4895 18	5614 17	6576 16	7551 15	8526 14
<b>4</b>	951 57	1959 55	2972 51	3988 48	5012 46	5932 43	6874 40	7824 38	8792 37
<b>8</b>	927 118	1960 114	2997 110	4035 107	5069 103	6121 98	7124 95	8114 92	9139 89
<b>12</b>	870 178	1913 174	2958 170	4008 166	5060 161	6167 155	7204 149	8221 144	9230 139
<b>16</b>	786 239	1841 234	2895 229	3943 224	4994 219	6147 214	7183 209	8203 205	9234 199
<b>20</b>	671 299	1731 294	2799 289	3855 283	4896 278	6088 272	7126 267	8159 261	9185 255
<b>24</b>	555 359	1600 354	2666 349	3739 342	4796 336	6001 330	7044 324	8075 319	9120 314
<b>28</b>	410 419	1457 416	2516 409	3585 402	4657 395	5887 388	6939 380	7967 373	8993 366
<b>32</b>	237 479	1294 476	2362 469	3424 462	4490 455	5747 448	6802 441	7806 434	8809 426
<b>35</b>	119 523	1157 522	2216 514	3296 507	4381 499	5647 492	6676 484	7661 477	8685 470

Flow (GPM)

TORQUE (LB IN) 5647  
SPEED (RPM) 492

250 cc / rev

EU



Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

017 TK.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

Cont.

Int.

TK 0315

19.2 cu in / rev

PRESSURE (PSID)

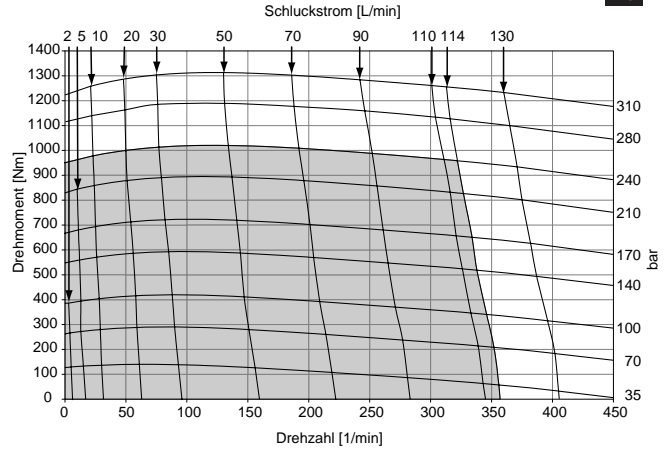
	500	1000	1500	2000	2500	3000	3500	4000	4500
<b>.5</b>	1105 5	2300 4	3519 3						
<b>1</b>	1161 11	2342 9	3567 9	4786 8	6035 8	7319 7			
<b>2</b>	1210 22	2468 21	3728 20	4992 19	6222 18	7454 17	8675 16	9899 15	1104 14
<b>4</b>	1224 46	2512 43	3803 41	5094 39	6363 37	7623 35	8875 33	10108 31	11337 30
<b>8</b>	1201 94	2524 91	3853 89	5183 86	6498 83	7799 80	9084 78	10343 77	11587 76
<b>12</b>	1128 142	2458 137	3791 133	5134 130	6469 127	7793 124	9105 121	10383 118	11625 117
<b>16</b>	1021 189	2358 184	3702 179	5045 176	6390 172	7724 168	9043 164	10340 161	11601 159
<b>20</b>	890 237	2227 232	3580 226	4931 222	6278 218	7620 214	8942 210	10245 205	11520 201
<b>24</b>	739 284	2067 280	3419 273	4771 268	6123 263	7470 259	8798 254	10099 249	11374 244
<b>28</b>	586 331	1904 327	3249 320	4605 314	5953 309	7296 304	8636 300	9937 293	11222 289
<b>32</b>	397 377	1721 374	3087 367	4420 361	5757 355	7100 350	8447 346	9766 339	11057 332
<b>35</b>	240 413	1558 410	2897 403	4257 395	5606 389	6943 383	8284 378	9593 371	10888 367

Flow (GPM)

TORQUE (LB IN) 6943  
SPEED (RPM) 383

315 cc / rev

EU



Intermittent operation rating applies to 10% of every minute.

Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

017 TK.indd, js

Cont.

Int.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Caacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositäet von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TK 0400

24.4 cu in / rev

PRESSURE (PSID)

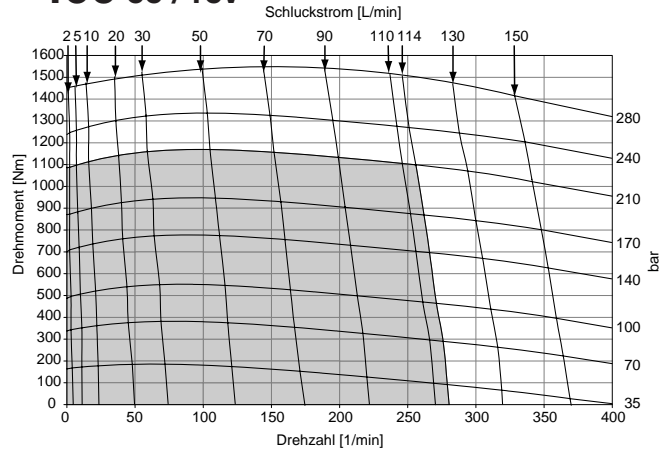
	500	1000	1500	2000	2500	3000	3500	4000
<b>.5</b>	1429 4	2974 3	4559 3	6201 2	7860 2	9483 2	11110 2	12511 1
<b>1</b>	1498 8	3029 8	4566 7	6173 6	7829 6	9479 5	11101 5	12648 4
<b>2</b>	1586 17	3211 15	4835 14	6466 13	8043 12	9590 11	11206 10	12865 9
<b>4</b>	1620 36	3295 34	4974 32	6652 29	8321 28	9962 26	11582 25	13052 23
<b>8</b>	1615 73	3334 70	5062 68	6790 65	8488 63	10160 60	11825 58	13301 56
<b>12</b>	1536 110	3282 107	5025 105	6764 101	8493 98	10201 95	11893 92	13462 89
<b>16</b>	1418 148	3171 144	4924 141	6676 138	8421 134	10150 130	11846 127	13484 123
<b>20</b>	1270 185	3022 181	4776 178	6537 174	8296 170	10037 166	11744 161	13432 157
<b>24</b>	1095 222	2846 219	4601 215	6371 210	8135 206	9876 201	11610 197	13405 192
<b>28</b>	907 259	2645 256	4397 251	6171 247	7937 242	9681 237	11430 232	13250 228
<b>32</b>	683 297	2420 293	4179 288	5951 283	7714 278	9467 273	11211 268	12923 262
<b>35</b>	501 325	2216 322	4007 316	5779 311	7529 306	9280 300	11020 294	12745 289
<b>40</b>	195 373	1908 368	3649 362	5417 357	7193 351	8961 345	10703 339	12390 332

Flow (GPM)

TORQUE (LB IN) 8961  
SPEED (RPM) 345

400 cc / rev

EU



Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Cont.

Int.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskositäet von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.



TK 0500

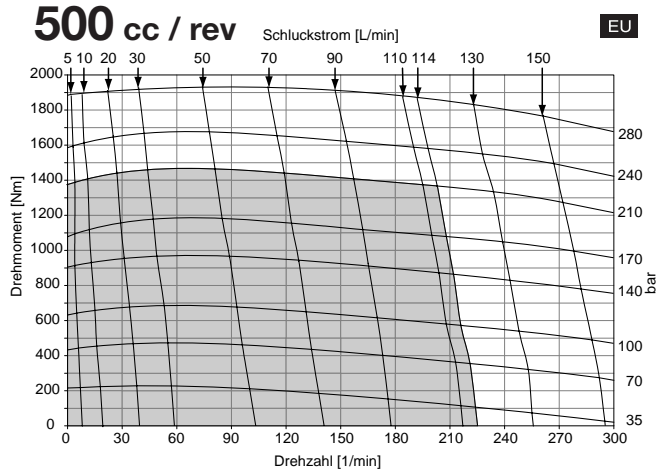
30.5 cu in / rev

PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500	4000
<b>1</b>	1880 5	3810 4	5826 3	7926 2	9000 2	11979 2	14077 1	16261 1
<b>2</b>	1982 13	4013 11	6067 9	8109 8	10154 6	12243 5	14323 5	16394 5
<b>4</b>	2000 28	4103 26	6223 24	8346 22	10464 20	12559 18	14642 16	16615 14
<b>8</b>	1971 58	4118 56	6276 53	8437 50	10584 48	12724 45	14852 44	16825 40
<b>12</b>	1876 91	4041 87	6219 85	8400 80	10575 77	12736 73	14873 70	16901 66
<b>16</b>	1724 120	3904 115	6088 112	8277 109	10461 103	12633 101	14801 97	16940 93
<b>20</b>	1537 148	3725 145	5911 142	8105 138	10301 134	12494 130	14660 125	16783 121
<b>24</b>	1318 178	3504 175	5694 171	7898 167	10108 163	12310 159	14481 154	16607 149
<b>28</b>	1066 208	3242 205	5430 200	7634 196	9856 192	12063 188	14232 182	16405 177
<b>32</b>	781 238	2959 235	5146 230	7357 225	9580 221	11781 217	13939 211	16110 206
<b>35</b>	551 260	2702 258	4940 252	7153 248	9335 243	11517 239	13703 233	15892 228
<b>40</b>	178 298	2341 296	4519 290	6746 285	8957 280	11041 275	13296 269	15400 264

Flow (GPM)

TORQUE (LB IN) 11041  
SPEED (RPM) 275



Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

017 TK.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Caacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TK 0630

38.4 cu in / rev

PRESSURE (PSID)

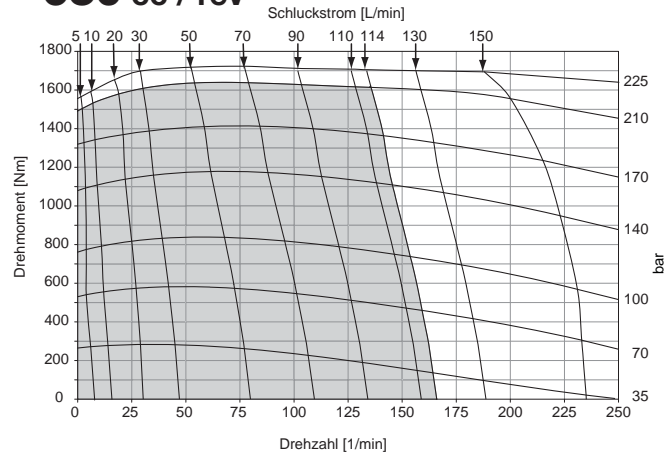
	500	1000	1500	2000	2500	3000	3250
<b>1</b>	2319 4	4638 2	6993 2	9395 1			
<b>2</b>	2431 10	4839 8	7230 7	9636 6	1969 5	13330 4	13946 3
<b>4</b>	2492 22	4992 19	7446 17	9896 15	2235 14	13800 13	14516 11
<b>8</b>	2475 45	5116 42	7670 39	10180 36	2504 33	14216 31	15003 29
<b>12</b>	2323 69	5027 66	7694 62	10275 57	2614 53	14253 50	15147 46
<b>16</b>	2106 94	4850 90	7572 85	10229 79	2659 74	14290 70	15187 65
<b>20</b>	1885 118	4638 114	7390 109	10092 102	2609 97	14313 91	15095 85
<b>25</b>	1455 147	4261 143	7110 136	9946 129	2528 119	14268 111	15068 104
<b>30</b>	969 177	3737 175	6596 168	9451 161	2111 152	14113 142	15044 133
<b>32</b>	751 189	3508 187	6330 181	9201 174	1909 165	14028 154	15018 144
<b>40</b>	121 237	2592 235	5266 233	8201 226	1101 217	13504 205	14912 191

Flow (GPM)

TORQUE (LB IN) 13504  
SPEED (RPM) 205

630 cc / rev

EU



Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

■ Cont.

□ Int.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

TK 0800

48.8 cu in / rev

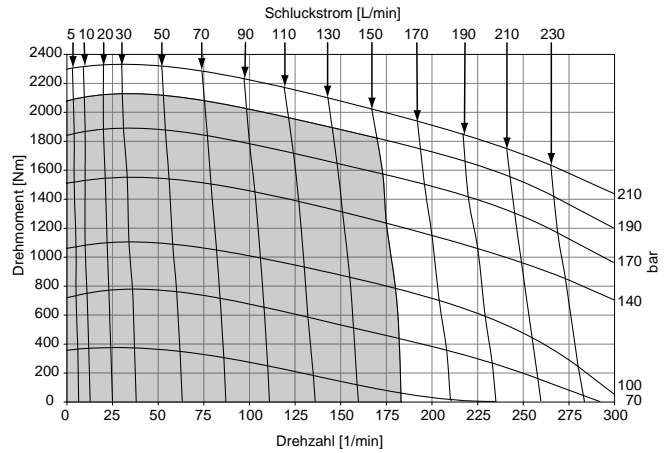
PRESSURE (PSID)

	500	1000	1500	2000	2500	2750	3000
<b>1</b>	3144 4	6368 4	9714 3	13131 3	16586 3	18303 3	20020 3
<b>2</b>	3254 9	6589 8	9957 8	13355 7	16783 7	18511 7	20239 7
<b>4</b>	3313 18	6721 17	10131 17	13531 16	16926 15	18632 15	20338 15
<b>8</b>	3267 37	6707 36	10146 35	13561 33	16961 32	18661 32	20360 31
<b>12</b>	3105 55	6564 54	10011 53	13436 51	16832 49	18512 48	20191 47
<b>16</b>	2817 74	6316 73	9812 71	13263 68	16678 66	18380 65	20082 64
<b>20</b>	2530 93	6046 91	9530 89	12963 86	16392 84	18099 83	19806 81
<b>24</b>	2153 112	5637 109	9156 107	12636 104	16060 101	17758 100	19456 99
<b>28</b>	1741 130	5226 128	8766 125	12213 122	15621 119	17339 118	19057 116
<b>32</b>	1302 149	4774 147	8267 144	11748 140	15196 137	16885 136	18574 134
<b>35</b>	941 162	4411 161	7913 158	11363 154	14816 151	16511 149	18206 147
<b>40</b>	349 186	3765 184	7231 181	10684 177	14141 174	15842 172	17543 170
<b>45</b>	244 209	3134 208	6585 205	10019 201	13462 197	15149 195	16835 193
<b>50</b>	0 234	2287 232	5748 228	9207 224	12688 219	14407 218	16125 216
<b>55</b>		1441 256	4326 252	8356 247	12212 242	13713 241	15213 239
<b>60</b>			2904 276	7505 270	10677 265	12489 264	14301 262

Flow (GPM)

800 cc / rev

EU



TORQUE (LB IN) 17543  
SPEED (RPM) 170

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.  
Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.  
Les donnees sur les performances sont basees sur des tests utilisant de l'huile 10W40 d'une viscosite de 200 SUS a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.  
017 TK.indd, js

Cont.  Int.  
Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Caacidad de funcionamiento intermitente valida para 10% por cada minuto.  
Leistugsdaten sind gemessen mit SAE 10W40 bei einer Viskositaet von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogerten sond moeglich.  
Datos tecnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipcos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

TK 1000

61.0 cu in / rev

PRESSURE (PSID)

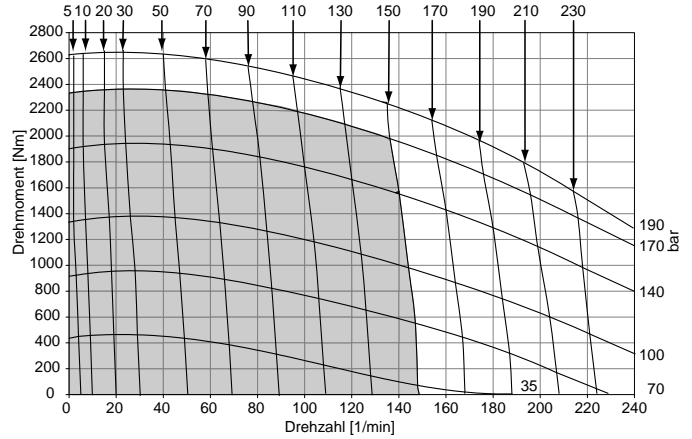
	500	1000	1500	2000	2500	2750
<b>1</b>	3839 3	7926 2	12129 1	16431 1	20758 1	23100 1
<b>2</b>	4049 7	8269 6	12522 5	16814 4	21124 4	23195 4
<b>4</b>	4122 14	8406 13	12692 12	16997 11	21317 11	23477 11
<b>8</b>	4040 29	8378 28	12711 26	17031 25	21366 23	23546 23
<b>12</b>	3846 44	8215 42	12581 41	16899 39	21173 37	23312 36
<b>16</b>	3519 59	7958 57	12362 55	16690 53	20955 50	23083 50
<b>20</b>	3168 74	7615 72	12006 70	16369 67	20683 64	22750 63
<b>24</b>	2705 89	7132 87	11594 85	15965 82	20245 78	22358 77
<b>28</b>	2173 104	6629 102	11088 100	15457 96	19776 93	21883 92
<b>32</b>	1627 119	6008 117	10463 114	14911 111	19230 107	21354 105
<b>35</b>	1170 130	5568 129	9988 126	14376 123	18768 119	20921 117
<b>40</b>	399 149	4732 148	9133 145	13544 142	17944 138	20093 136
<b>45</b>	0 169	3802 167	8071 164	12397 161	16791 157	18963 155
<b>50</b>	0 187	2733 186	6958 183	11168 179	15338 175	17376 174
<b>55</b>		1502 205	5845 202	9939 198	13985 194	15973 191
<b>60</b>			4732 218	8710 215	12632 213	14202 211

Flow (GPM)

1000 cc / rev

Schluckstrom [L/min]

EU



TORQUE (LB IN) 20093  
SPEED (RPM) 136

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on testing using 10W40 oil with a viscosity of 200 SUS at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 10W40 d'une viscosité de 200 SUS à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

■ Cont.

□ Int.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

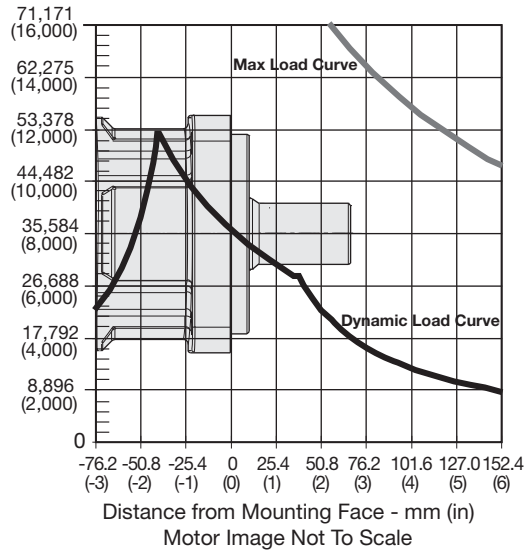
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 10W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos técnicos obtenidos con aceite 10W40 de 200 SUS de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

**Flange Mount / Standardgehäuse**  
**Monture à bride(s) / Montaje de brida**

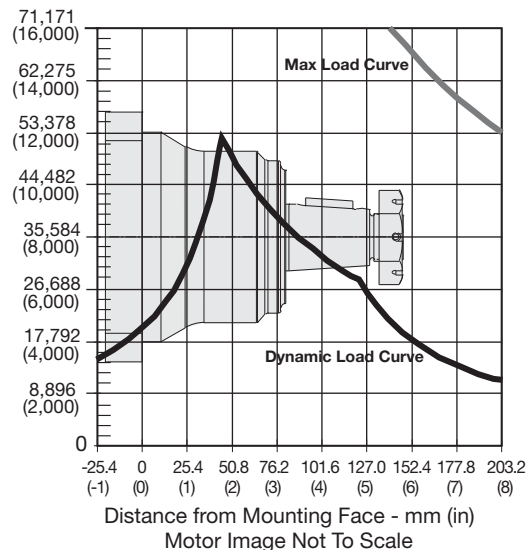
Side Load - N (lbs)



The dynamic side load curve is based on uni-directional steady state loads for  $L_{10}$  bearing life at  $12 \times 10^6$  @ 100 RPM revolutions.  
 Die zulaessige auslegbare radiale Wellenbelastungskurve ist unter ruhenden, einseitig statisch gerichteten Lastverhältnissen auf eine  $L_{10}$  Lebensdauer mit  $12 \times 10^6$  Umdrehungen kalkuliert bei 100 min.  
 La courbe de charge laterale permise se base sur des charges unidirectionnelles en regime permanent pour le roulement  $L_{10}$  a  $12 \times 10^6$  @ 100 RPM revolutions.  
 La curva de valores admisibles de carga lateral esta basada en cargas contantes para cojinetes  $L_{10}$  a  $12 \times 10^6$  revoluciones @ 100 RPM.

**Wheel Mount / Radnabengehäuse**  
**Monture à roue / Montaje de rueda**

Side Load - N (lbs)



The maximum load curve is defined by bearing static load capacity. This curve should not be exceeded at any time including shock loads.  
 Die maximale radiale Wellenbelastungskurve ist definiert als maximale statische Last ohne Drehzahl. Sie gilt als Grenze und sollte keinesfalls überschritten werden.  
 La courbe de charge maximale est définie par la capacité de charge statique portante. Cette courbe ne devrait être dépassée en aucun moment y compris pour les charges par à-coups.  
 La curva de carga máxima queda definida por la capacidad de carga estática del cojinete. No se deben superar los valores de esta curva, ni siquiera con cargas provisorias de impacto.

**Equation to Calculate the Expected Radial Bearing Life**  
**Gleichung zur Ermittlung der Lagerlebensdauer**

Equation to calculate the dynamic bearing life for a given load:  
 Bestimmung der erlaubten radialen Wellenbelastung mit vorgegebener Last

Use  $F_a$ ,  $F_b$  and  $S$  in equation to determine hours of  $L_{10}$  bearing life.  
 Die Lebensdauer in Stunden ergibt sich durch einsetzen von  $F_a$ ,  $F_b$  und  $S$  in die nachstehende Formel.

$$L = \frac{12 \times 10^6}{60 \times S} \left\{ \frac{F_a}{F_b} \right\}^{3.33}$$

Where / Mit:

$S$  = Shaft Speed RPM / Abtriebswellendrehzahl in  $\text{min}^{-1}$

$L$  = Life In Hours / Lebensdauer in Stunden

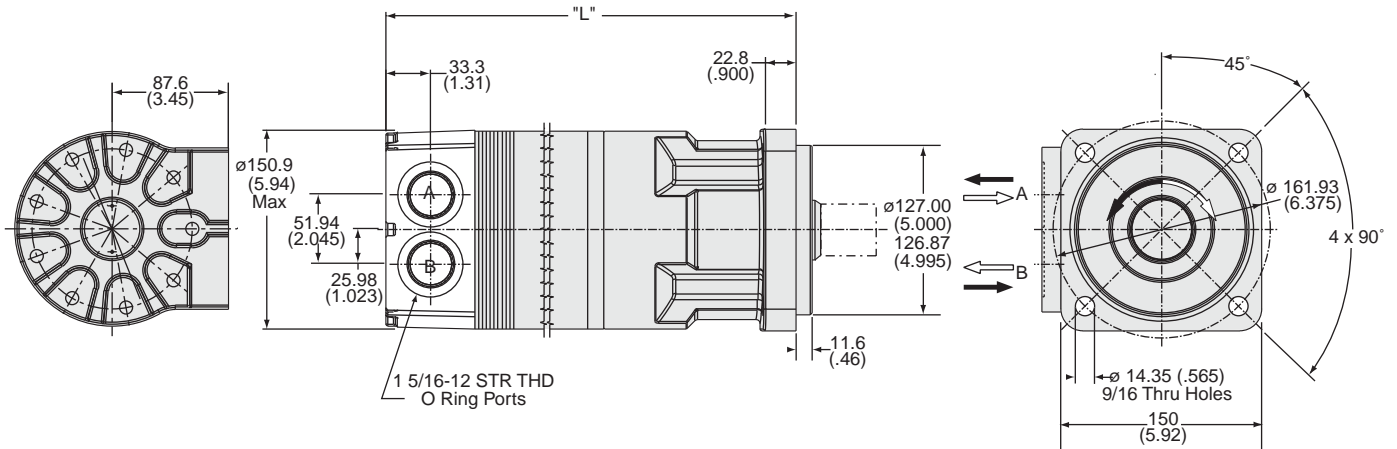
$F_a$  = Allowable side load defined by above curve at a distance from mounting flange. / Erlaubte radiale Wellenbelastung als Function der Laenge

$F_b$  = Application side load. / Anwendungsseitige Wellenbelastung

Note: Calculations are based on  $L_{10}$  bearing life per ISO 281.  
 Auslegung basiert auf einer  $L_{10}$  Lebensdauer nach ISO 281.

Code: K5

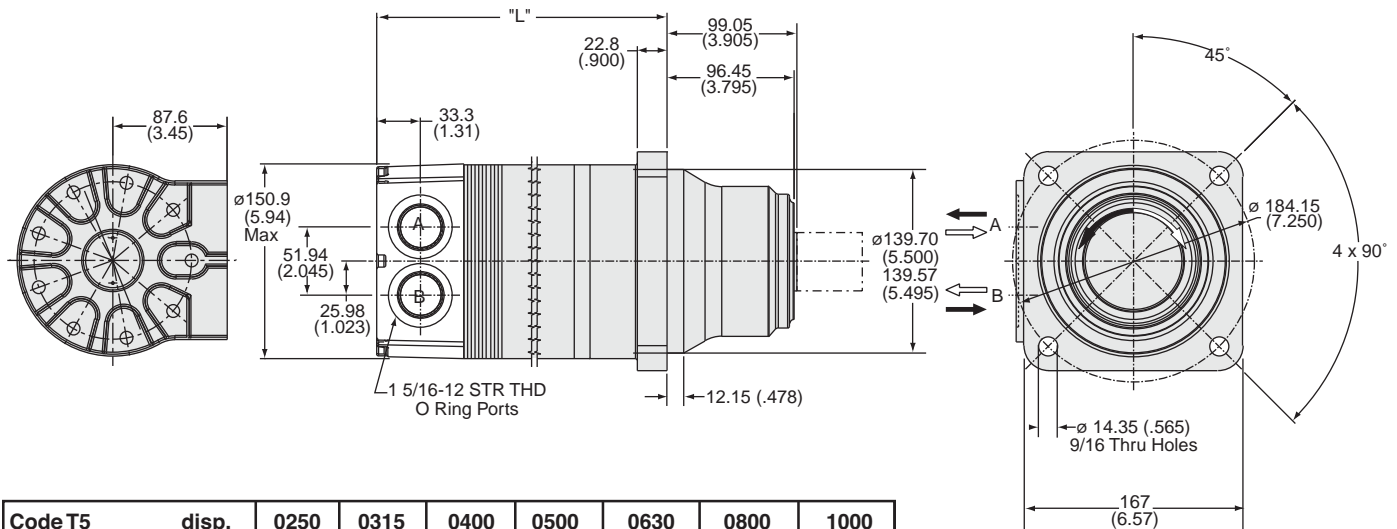
Standard SAE CC, 1 5/16-12 SAE Rear Radial



Code K5	disp.	0250	0315	0400	0500	0630	0800	1000
Weight/Gewicht	kg	32.0	32.7	33.5	34.5	35.7	37.2	39.1
Poids/Peso	(lb)	(70.6)	(72.0)	(73.8)	(76.0)	(78.8)	(82.1)	(86.3)
Length	"L" mm	277	282	290	297	310	323	340
	"L" (in)	(10.9)	(11.1)	(11.4)	(11.7)	(12.2)	(12.7)	(13.4)

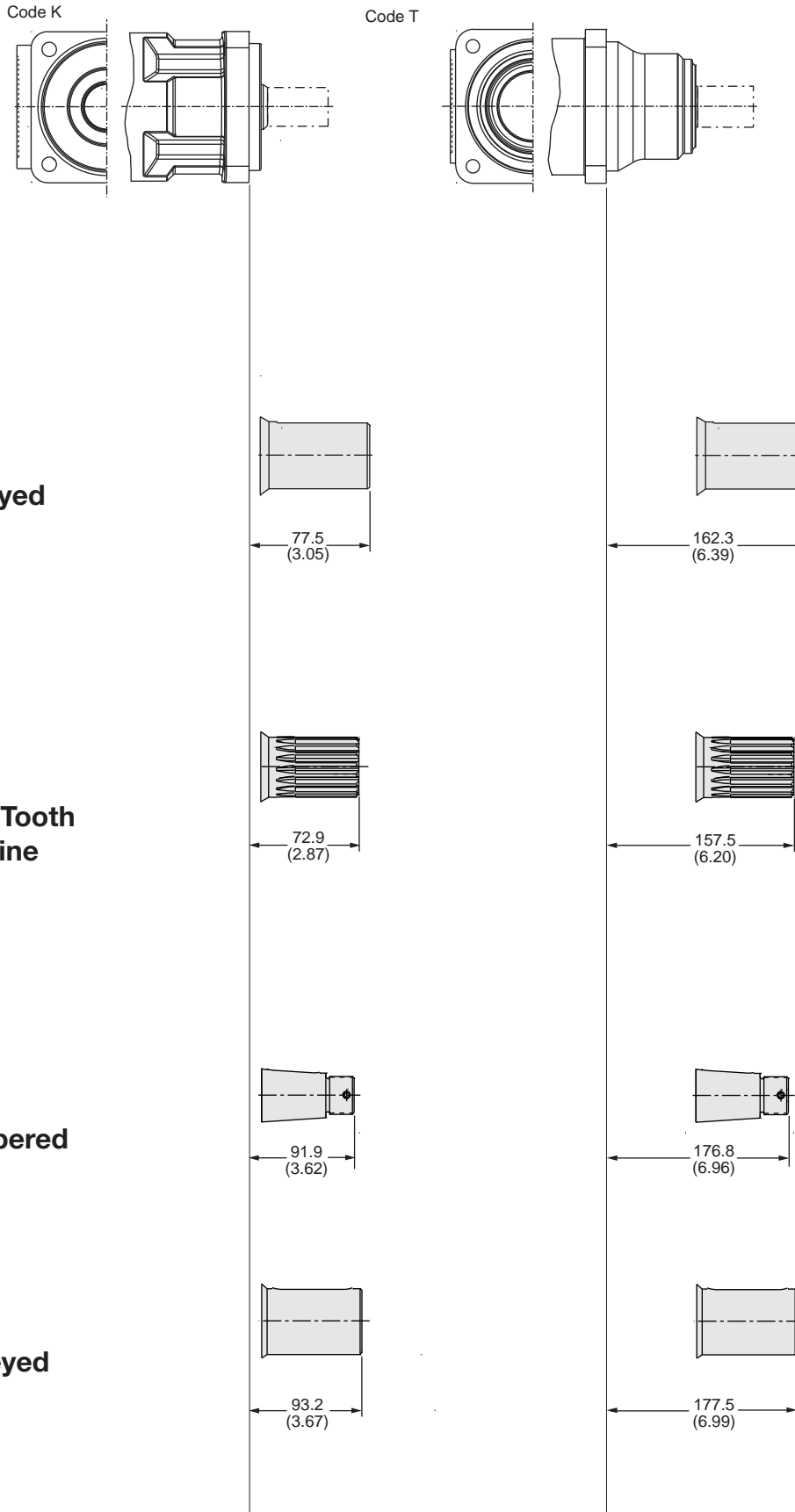
Code: T5

Wheel Mount, 1 5/16-12 SAE Rear Radial



Code T5	disp.	0250	0315	0400	0500	0630	0800	1000
Weight/Gewicht	kg	30.8	31.4	32.3	33.2	34.5	36.0	37.9
Poids/Peso	(lb)	(67.9)	(69.3)	(71.1)	(73.3)	(76.1)	(79.4)	(83.5)
Length	"L" mm	191	196	203	213	224	239	257
	"L" (in)	(7.5)	(7.7)	(8.0)	(8.4)	(8.8)	(9.4)	(10.1)

English equivalents for metric specifications are shown in ( ).

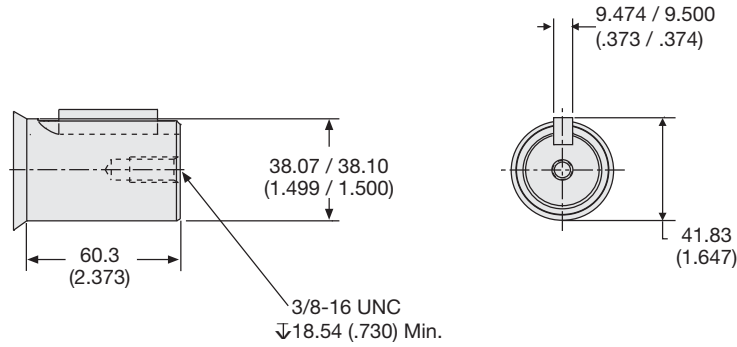


English equivalents for metric specifications are shown in ( ).

017 TK.indd, js

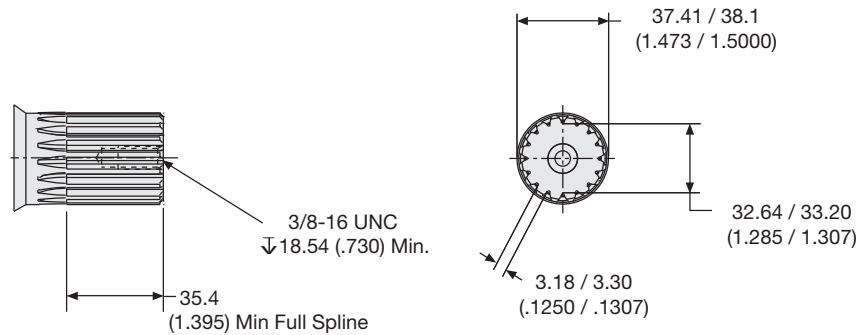
Code: 32

1 1/2" Keyed



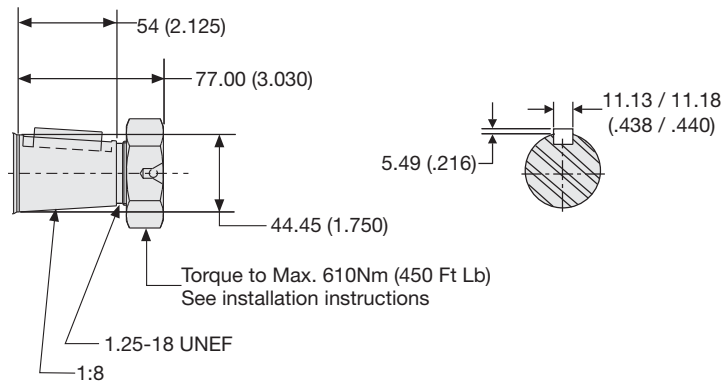
Code: 36

1 1/2" 17 Tooth  
12/24 Spline



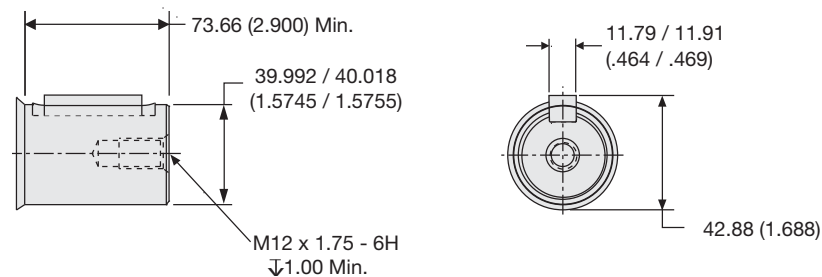
Code: 63

1 3/4" Tapered



Code: 64

40mm Keyed



English equivalents for metric specifications are shown in ( ).

017 TK.indd, js



Code: FSAA\* or FSAB  

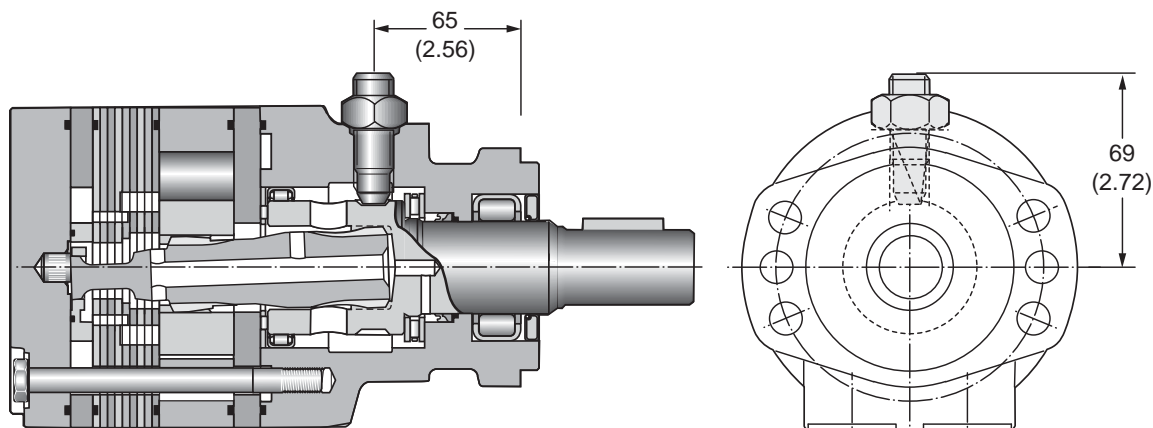
## An Economical Sensor for Speed Readout

This rugged, weather resistant design is ideal for industrial and mobile applications. Applications include salt/sand/fertilizer spreader drives, conveyer drives and injection molder compression drives. The sensor is a hall-effect type, which when externally powered outputs 30 square wave digital pulses per coupling shaft revolution. The connector is a user friendly universally available 4 pin polarized M12 connector allowing for simplified field service. The integrated design does not effect the side load capacity or performance of the torque motor.

Dieser robuste, wetterfeste Drehzahlaufnehmer arbeitet nach dem Halleffekt. Es werden 30 Rechteckimpulse pro Abtriebswellenumdrehung erzeugt. Durch Erfassung der positiven und negativen Wellenflanken sind 60 Impulse pro Umdrehung möglich. Der Sensor führt zu keiner Leistungsbeschränkung des Motors. Die volle Radiallastkapazität bleibt erhalten.

Un capteur economique pour mesure de la vitesse. Ce capteur robuste et resistant aux intemperies est a effet Hall. Alimente par une source externe, il fournit 30 ondes digitales carrees par tour. Par multiplication lelectronique on obtient 60 pulsations par tour. Son montage ne modifie pas le couple ni la charge radiale du moteur qui le recoit.

Este es un diseño de construcción reforzada, apto para uso a la intemperie e ideal para uso industrial y en equipos móviles. Entre sus aplicaciones, se puede mencionar esparcidores de sal, arena o fertilizantes, unidades motoras de transportadores y unidades motoras de compresión para moldeo a inyección. El sensor es del tipo de medio efecto, que al ser excitado externamente, genera 30 pulsos digitales de onda cuadrada por cada revolución del eje del acoplamiento. Utiliza un simple conector M12 polarizado tetrapolar, que es de uso común y facilita el mantenimiento en el lugar de instalación. El diseño integrado no afecta la capacidad de carga lateral ni la potencia del motor de torque.

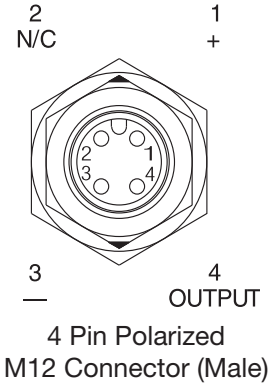


**Maximum operating pressure 172 bar (2500 psi).**

English equivalents for metric specifications are shown in ( ).

018 Large Frame Options.indd, js

<b>Operating voltage range</b> Versorgungsspannung Gamme de tension de service Gama de voltaje de alimentacion	4.5...24 VDC
<b>Operating temperature</b> Arbeitstemperatur Temperature de service Temperatura de servicio	-20° to 220° F -29°...104° C
<b>Operating frequency range</b> Arbeitsfrequenz Gamme de frequences de service Gama de frecuencia de servicio	0...10 KHZ
<b>Max sink current</b> Erforderlicher Laststrom Courant d'affaïsement maxi Corriente maxima de alimentacion	0 ... 20 mA (max.)
<b>Connection</b> Anschluß Branchement Conexion	4 Pin Polarized (12mm)  30 Pulses per revolution which can be doubled electronically 30 impulsions par revolution pouvant etre doublees electroniquement 30 pulsos por revolucion, que pueden duplicarse electronicamente
<b>Sensor output</b> Sorsorausgang Sortie du détecteur Salida del sensor	Open Collector Collecteur ouvert Colector abierto
<b>Output is NPN</b> Ausgang is NPN La sortie est NPN La salida es NPN	

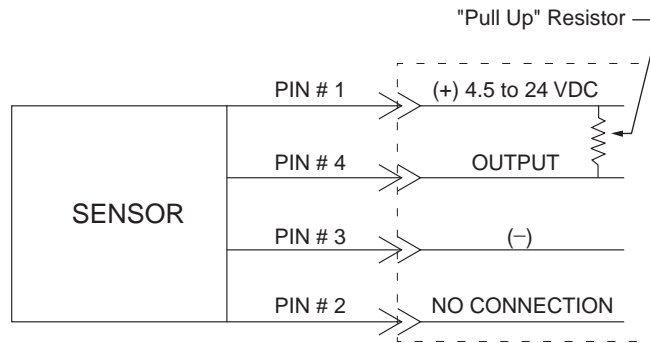


Cable and "Pull Up" Resistor are *not* supplied by factory.

Zubehör wie z.B. Kabel gehören nicht zum Lieferumfang.

Le câble et la résistance "Pull Up" ne sont pas fournis par l'usine.

El cable y la resistencia de arranque no se suministran originalmente de fábrica.



**Pull-up Resistor Value Formula**

Formel zur Ermittlung des Pull up-Widerstandes

Formule de la valeur de resistance "Pull-up"

Calculo de la resistencia de carga

(0.25 Watt, 5% de tol.)  
 (0.25 Watt, Tol. 5%)  
 (0.25 Watt 5% Tol.)  
 (0.25 Watt, toll. 5%)

Voltage / Spannung

Curant d'affaïsement / Voltaje 4.5...24 VDC

Sink Current / Laststrom 0...20 mA

Resistance / Corriente de ali mentacion

Resistor = Widerstand (k Ohm)  
 Resistance  
 Resistancia

Status: Offstate / aus  
 Etat: Arret / Estado Inactivo  
 (95% +V)

+ V

Status: Onstate / ein  
 Etat: Marche / Estado Activo  
 (max. 0.4 VDC)

0 V

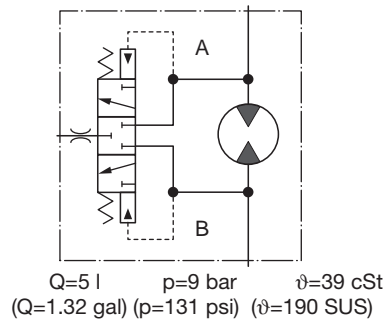
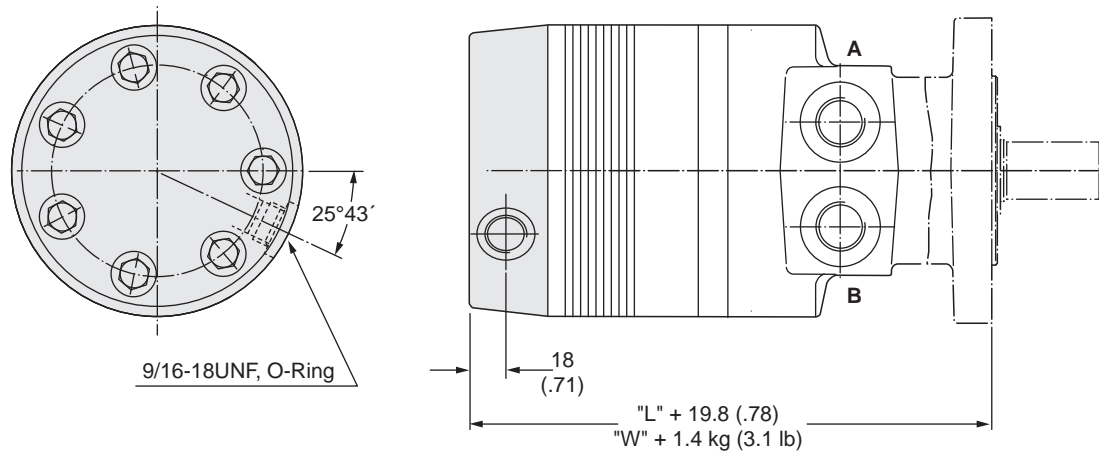
**Code: AAFX or AAAT\* EU US**

A Hot Oil Shuttle is used to continuously remove a portion of the fluid in a closed loop transmission or other closed loop system. At 125 PSI pressure differential between the motor return port and the shuttle outlet, 1.5 GPM\* will exit the circuit to cool, filter and return to the reservoir. The constant loop replenishment helps to keep heat and contamination from building up in the circuit. This option is not available with rear ports or integral cross over relief.

Spülventil für geschlossene Systeme zur Rückführung einer definierten Menge des Niederdrucköls in den Tank zur Abkühlung innerhalb desselben Kreislaufs.

Valve de rincage pour systèmes fermés pour le retour d'un volume déterminé de fluide basse pression vers le réservoir, un refroidisseur ou un filtre de réfrigération, dans le même circuit.

Un transferidor de aceite caliente actúa permanentemente para extraer una parte del fluido en una transmisión de circuito cerrado u otro sistema de circuito cerrado. Entre la entrada de retorno del motor y la salida del transferidor hay una diferencia de presión de 125 psi (libras/pulg.<sup>2</sup>), y a esta presión salen 1,5 galones por minuto del circuito para enfriarse, filtrarse y volver al depósito de fluido. El reacondicionamiento permanente de parte del fluido evita la contaminación del mismo y el incremento de temperatura en el circuito.



Standard Length & Weights for TF Series on Pages 84-85, TG Series on Pages 120-121 and TH Series on Pages 150-151.

Längen/Gewichte TF Serie Seiten 84-85, TG Serie Seiten 120-121, TH Serie Seiten 150-151.

Longueurs et poids courants pour la série TF, voir les pages 84-85, et la série TG, voir les pages 120-121, et la série TH, voir les pages 150-151.

Los valores estándar de longitud y peso de la Serie TF se puede ver en las Páginas 84-85, y de la Serie TG en las Páginas 120-121, y de la Serie TH en las Páginas 150-151.

English equivalents for metric specifications are shown in ( ).

018 Large Frame Options.indd, js

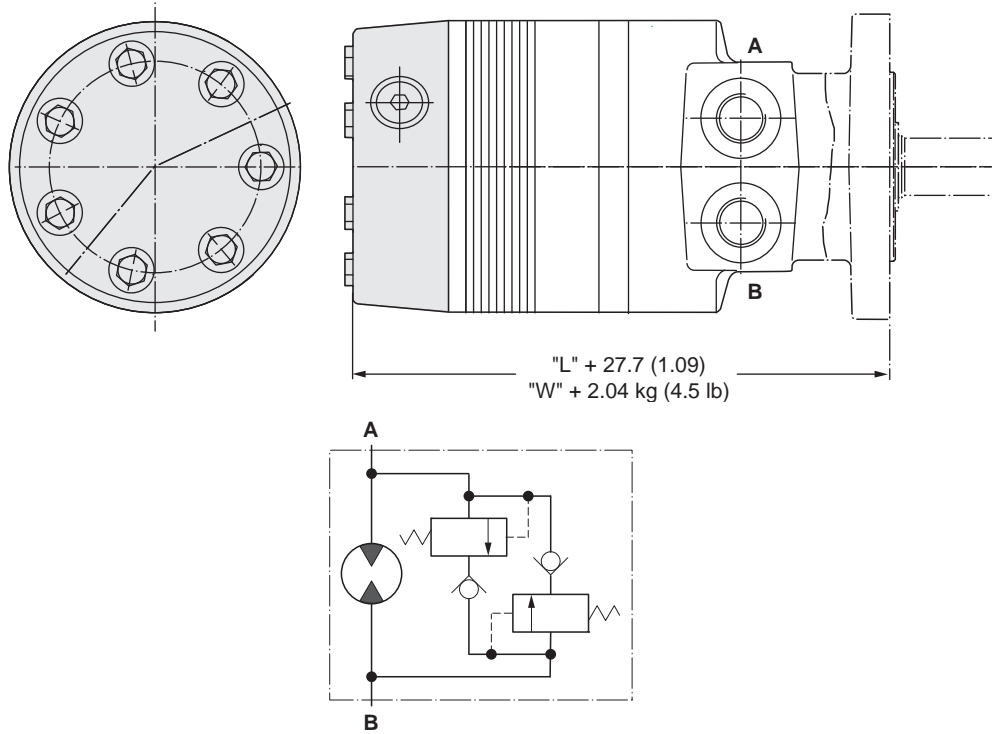
**Code: BBBA\*, BBBB\*, BBBC\*, BBBD\* or BBBG\* EU US**

This integrated internal relief valve is used for fixed pressure settings.

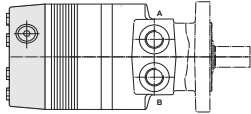
Internes Schockventil

La soupape de sécurité interne utilise pour des valeurs de pression fixes.

La valvula interna de alivio se utiliza para cablibraciones fijas de presion.



Bestellschlüssel / Système de Commande / Ordering system / Información para pedidos

Option		Pressure bar (psi)
BBBA	 <p><b>Öffnungsdruck</b>  <b>Opening pressure</b>  <b>Tarage</b>  <b>Presion de apertura</b></p>	69 (1000)
BBBB		138 (2000)
BBBC		207 (3000)
BBBD		276 (4000)
BBBG		103 (1500)

Standard Length & Weights for TF Series on Pages 84-85, TG Series on Pages 109-111 and TH Series on Pages 139-140.

Längen/Gewichte TF Serie Seiten 84-85, TG Serie Seiten 109-111, TH Serie Seiten 139-140.

Longueurs et poids courants pour la série TF, voir les pages 84-85, et la série TG, voir les pages 109-111, et la série TH, voir les pages 139-140.

Los valores estándar de longitud y peso de la Serie TF se puede ver en las Páginas 84-85, y de la Serie TG en las Páginas 109-111, y de la Serie TH en las Páginas 139-140.

English equivalents for metric specifications are shown in ( ).

018 Large Frame Options.indd, js

**Code: AAAC** 

**Double Paint** — Base coat of red oxide primer and finish coat of black paint for increased corrosion resistance.

**Code: AAAF\* or AABP**  

**Castle Nut** — All motors ordered with Tapered shafts are equipped with patch locking nuts. If desired, a castle nut may be specified.

**Code: AAAJ\* or AAFG**  

**High Temperature Commutator Seal** — Under conditions of high temperature, it is suggested that a high temperature commutator seal be used.

**Code: AAAG\* or AAAH**  

**Fluorocarbon** — is available under various registered trademarks, including VITON™ (a registered trademark of DuPont), FLUOREL™ (a registered trademark of 3M) or FPM™ (a registered trademark of DuPont).

**Code: AABJ\* or AABK**  

**Free Running Rotorset** — The “free running rotorset” is a specially dimensioned rotorset that allows for smoother operation at low flows and low pressure. Volumetric efficiency can be affected.

**Code: AANM\***  

**Seal Saver** — Seal saver is a metal disc that presses onto the motor shaft, covering the dirt and water (D&W) seal. It's purpose is to aid in preventing external contamination from damaging the D&W seal.

**Code: AAAC**

**Zweischichtlackierung schwarz**

**Code AAAF\* or AABP****Kronenmutter**

Selbstsichernde Mutter wird ersetzt durch Kronenmutter

**Code: AAAJ\* or AAFG****Kommutatordichtung fuer hohe Temperaturen**

— Bei hohen Temperaturen des Hydraulikoels wird empfohlen die Kommutatordichtung fuer hohe Temperaturen einzusetzen!

**Code: AAAG\* or AAAH****Fluorocarbon Dichtungen**

Für Anwendungen im höheren/niedrigeren Temperaturbereich oder speziellen Flüssigkeiten wird der Einsatz von Fluorocarbon Dichtungen empfohlen. Fluorocarbon ist bekannt unter verschiedenen eingetragenen Warenzeichen  
VITON™ - DuPont, Fluorel™ - 3M, FPM™ - DuPont

**Code: AABJ\* or AABK****Leichtläufer Rotorsatz**

Anlaufdruck < 5 bar

**Code: AANM\*****Versiegelungsschutz** — Der Versiegelungsschutz

besteht aus einer Metallscheibe, die gegen die Antriebswelle drückt und damit Schmutz- und Wasserdichtung (D&W-Dichtung) abdeckt. Hierdurch soll einer Beschädigung der D&W-Dichtung auf Grund externer Verunreinigungen vorgebeugt werden.

\* Option code shown is with a single black coat of paint.

\* Motor schwarz grundiert

Availability							Code		Description
TF/DF	Clutch	TG/DG	TH	BG/BH	TK	TL	Painted	Unpainted	
US	US	US	US	US	US	US	AAAA	AAAB	Black Paint
US		US	US	US	US		AAAC	-	Double Paint
US		US	US	US	US		AAAF	AABP	Castle Nut
US	US	US	US	US	US		AAAG	AAAH	Fluorocarbon Seals
US		US	US	US	US		AAAJ	AAFG	High Temperature Commutator Seal
US		US	US	US			AABJ*	AABK*	Free Running Rotorset
US		US	US	US			AAAT**	AAFX**	Hot Oil Shuttle (11:00)
US		US					AANM	-	Seal saver for 1.25 taper shaft only
US		US		US			AANB	-	678 Nm (6000 in-lb) Holding Capacity
				US			AAMN	AANH	1808 Nm (16000 in-lb) Holding Capacity
						US	AAWM	AAWL	Fluorocarbon shaft seal.
US		US	US	US		US	AAAU**	-	Bi-directional Shuttle (11:00*), Castle Nut
US		US	US	US		US	AAAW**	-	Bi-directional Shuttle (11:00*), High Temperature Commutator Seal
US	US	US	US	US			AABL*	AABM*	Free Running Rotor Set & No Commutator Seal
US	US	US	US	US	US		AABT	-	No Nut
US		US	US	US	US	US	AACP*	-	Free Running Rotor Set, Castle Nut
US	US	US	US	US	US	US	-	AADJ	High Temperature Commutator Seal, Castle Nut
US	US	US		US	US	US	AAFV	-	Fluorocarbon (Viton) Seals, High Temperature Commutator Seal
US	US	US	US	US		US	-	AAFX**	Bidirectional shuttle (11:00*)
US	US	US	US	US	US	US	AAHU	-	High Temperature Commutator Seal, No Nut
US	US	US	US	US	US	US	-	AAJL	No Nut
US	US	US	US	US		US	AALD**	-	Bidirectional shuttle (1:00*), Castle Nut
US	US	US	US	US		US	AALE**	-	Bidirectional shuttle (1:00*)
US	US	US	US	US	US		AALF	-	No Commutator Seal
US	US	US	US	US			-	AALP*	Free Running Rotor Set, Fluorocarbon (Viton) Seals, High Temperature Commutator Seal
				US			AAML**	-	(IBM) Bidirectional shuttle (11:00*), Castle Nut, 6 Brake Springs Installed
				US			AAMM	-	(IBM) Castle Nut, 6 brake springs installed, (9000 in-lbs hold cap)
				US			AAMN	-	(IBM) 'Yellow' brake springs (8), (16,000 in-lbs hold cap)
				US			AAMP	-	(IBM) 'Yellow' brake springs (8), (16,000 in-lbs hold cap), Castle Nut
US		US	US	US			BBBA**	BBBM**	69 Bar (1000 PSI) Internal Bidirectional Relief
US		US	US	US			BBBG**	BBBJ**	103 Bar (1500 PSI) Internal Bidirectional Relief
US	US	US	US				BBBB**	BBBN**	138 Bar (2000 PSI) Internal Bidirectional Relief
US	US	US	US	US			BBBC**	BBBF**	207 Bar (3000 PSI) Internal Bidirectional Relief
US		US	US	US			BBBD**	BBBW**	276 Bar (4000 PSI) Internal Bidirectional Relief
US		US	US				-	BBCG**	2500 PSI Int Bidirectional Relief
US		US	US				-	BBCW**	3000 PSI Int Bidirectional Relief, No Nut
US		US	US				BBCX**	-	2500 PSI Int Bidirectional Relief, No Nut
US		US	US				-	BBDA**	3000 PSI Int Bidirectional Relief, Castle Nut
US		US	US				-	BBDH**	2500 PSI Int Bidirectional Relief, Castle Nut
US		US	US				BBDN**	-	1750 PSI Int Bidirectional Relief
US		US	US				-	BBDP**	725 PSI Int Bidirectional Relief
US		US	US				BBDW**	-	725 PSI CCW Int Bidirectional Relief (045134)
US		US					FSAA	FSAB	Speed Sensor
US		US					FSAJ	FSAH	Int Short Speed Sensor, Castle Nut
US		US	US				-	AAUY	Complete Motor Nickel Plated, 40 um, Except Shaft

Consult factory for other positions and combinations.

\* Not applicable to TF, TG or TH 0625, 0785 or 0960 displacement codes.

\*\* Not available with A, B, E, Y, X or L porting. If specifying internal bidirectional reliefs, relief settings cannot exceed intermittent pressure rating of motor.

## Fluid

To insure maximum motor performance and life, use a premium grade hydraulic or engine oil. Fluids with a minimum of .125% zinc (or equivalent) anti-wear package should be used. A mineral or synthetic based 10W40 engine oil or hydraulic (200 SUS) is recommended. Torqmotor™ seals come standard in nitrile rubber. If a fluid that is not compatible with nitrile is to be used, a fluoroelastomer seal material can be specified.

- Minimum fluid viscosity is 50 SUS
- Recommended fluid operating temperature is -28° C to 93° C (-20°F to 200° F)
- Filtration level is 20-50 micron nominal

## Pressure

Operating the motor in its intermittent pressure range will shorten the life of the motor and should generally be restricted to 10% or less per minute. The reduced life resulting from continuous operation in the intermittent range may be acceptable in some applications. Consult the factory for details.

## Shaft Loading

The use of 1 inch and 25mm diameter shafts are not recommended when torque loads exceed 3500 lb-in. 316 stainless shafts should be limited to 2000 lb-in. For 7/8 inch diameter shafts, torque should be limited to 1250 lb-in. Corrosion resistant Nitrotec shafts have reduced torque-carrying capability. Consult factory for values for specific shafts. The maximum thrust load on all shafts should not exceed 1000 lbs inward or outward.

## Performance Data

Performance data shown in this catalog is the result of testing performed using 10W40 oil at 54°C (130°F), 200 SUS. Actual performance will vary with fluid conditions. Lower viscosity will produce lower performance.

## Inlet Conditions

Positive pressure *must* be available at the motor inlet while it is rotating. If an overrunning load causes the motor to rotate faster than the pump can fill it, cavitation will occur. Consult the factory for inlet pressure requirements and speed limitations.

## Other Operating Conditions

Consult factory before operating at conditions exceeding any ratings or recommendations in this catalog.

## Installation Recommendations

- To avoid contamination do not remove plastic port plugs until fittings are to be installed.
- Motor mounting flange must make full contact with equipment mount; do not use the mounting bolts to force the motor pilot into the pilot hole to align the motor.
- Pulleys, sprockets, wheels, or couplings should be properly aligned on the shaft to avoid excessive radial or thrust loads.
- To avoid damaging the thrust system, do not hammer on the motor or shaft to install or remove couplings, pulleys, sprockets, etc.

## Tapered Shaft

The tightening torque listed for a taper shaft nut is based on strength of the shaft and nut. Hub design and hub material determine the application tightening torque. Refer to hub manufacturers specifications to determine actual assembly torque. Factory suggested assembly torques are: 250-400 lb-ft (1.25, 1.5 & 1.75 Dia. Shafts), 175-225 lb-ft (1.0 dia. shafts).

To insure a sound hub to shaft coupling, the hub must conform to the full length of the shaft taper. This will prevent bending stresses at the keyway that could cause a fatigue failure.

## Castle Nut

All motors ordered with Tapered shafts are equipped with patch locking nuts. If desired, a castle nut may be specified.

## Paint

Unless specified otherwise, motors are shipped unpainted and coated with a rust inhibitor. Paint options are:

- \* Single coat of black paint.
- \* Single coat of black paint plus a coat of red oxide primer. (Double paint).

**Reverse Timed Manifold**

All motors in this catalog are bi-rotational. The efficiency of the motors is essentially unaffected by direction of rotation.

The direction of output shaft rotation depicted below is that which will result from pressurizing the “A” port of the motor. Pressurizing the “B” port will cause shaft rotation in the opposite direction. Direction of rotation is as seen by looking directly at the shaft.

“Front ported” motors have the ports at the shaft end of the motor. “Rear ported” motors have the ports in the end cap of the motor. Standard motors are Rotation Code “0”. Reverse timed motors are Rotation Code “1”.

Series	Standard Code “0”		Reverse Timed Code “1”	
	Front Ported	Rear Ported	Front Ported	Rear Ported
TC, TB, TE, TJ	CW	CCW	CCW	CW
TF, DF, TG, BG, DG, TH, BH	CCW	CW	CW	CCW
TK	N/A	CW	N/A	CCW
110A	CW	N/A	N/A	N/A
700, 716	CCW	N/A	N/A	N/A





**CAUTION!**

**Static Brake Only:**

The brakes on these motors are designed for static use only, i.e., the brake should not be used to stop the motor and the motor should not be started while the brake is applied. These brakes are "parking" brakes only. Using the brake in a dynamic condition (while the motor is turning) will damage and reduce the holding capacity of the brake. If the brake does not hold because it has been damaged, personal injury or property damage could result.

**Brake holding capacity and periodic test:**

The brake holding capacity rating is based on actual holding capacity when new. If properly used as a static brake only, the holding capacity will slowly decrease with time. Since holding capacity will slowly decrease over time, a proper maintenance procedure should include periodically testing the holding capacity of the brake. This can be achieved by running a vehicle ramp test per OEM instructions.

**Brake orientation:**

This wet sump, multi-disk brake is designed to be mounted with the shaft in a horizontal position. If your application will have the motor in any other orientation, the motor should be thoroughly tested for longevity of brake holding capacity. This can be achieved by running a vehicle ramp test per OEM instructions after a predetermined number of brake actuations. Under no circumstances, however, should the motor be mounted with the shaft pointing vertically upward because the disks will not be operating within the oil sump and damage to the brake disks will occur.

**Holding torque/brake release pressure:**

The brake release port is designed for 3000 psi maximum. Limiting the pressure in that port to below 1500 psi is recommended to enhance seal life. The minimum pressure required to fully release the brake depends upon the holding torque of the brake.

BG Series	Holding Torque	Release Pressure
<b>Standard</b>	<b>12,000 lb in</b>	<b>315 psi</b>
Optional	6,000 lb in	160 psi
Optional	9,000 lb in	240 psi
Optional	16,000 lb in	405 psi

BH Series	Holding Torque	Release Pressure
<b>Standard</b>	<b>16,000 lb in</b>	<b>315 psi</b>

**Initial use, bleeding not required:**

Bleeding the brake is not required. It is recommended that the brake release port be filled with approximately 1.2 oz. (36cc) system oil prior to installation or first use.

**Torque for mounting bolts:**

Customer installed mounting bolts should be grade 8 and torqued to a minimum of 90 ft-lbs.

**Brake service intervals:**

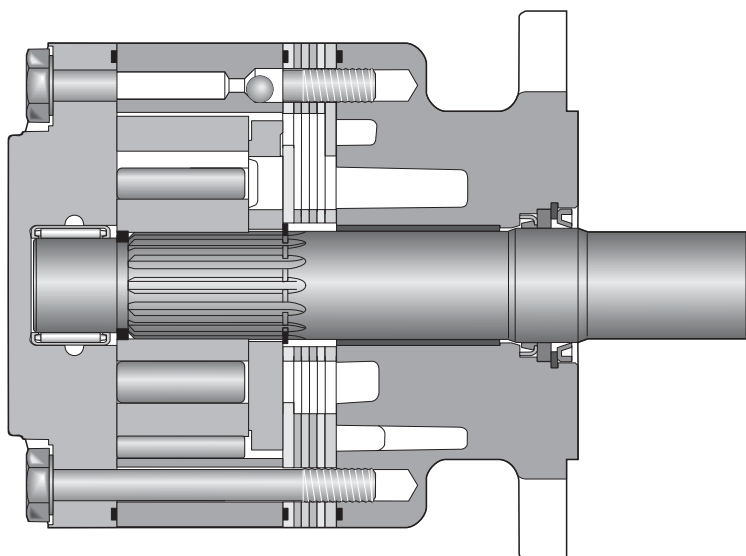
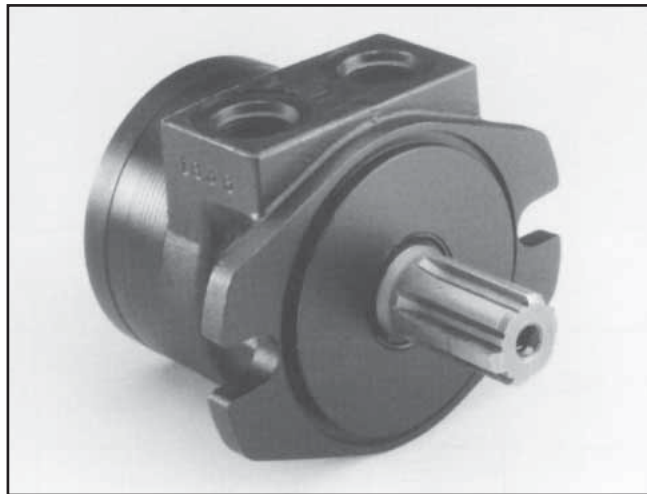
The seals, springs and brake disc package should be periodically (how often depends on your application) inspected and replaced if damaged or worn. All should be replaced at least every 250,000 brake cycles or 3 years, whichever occurs first.

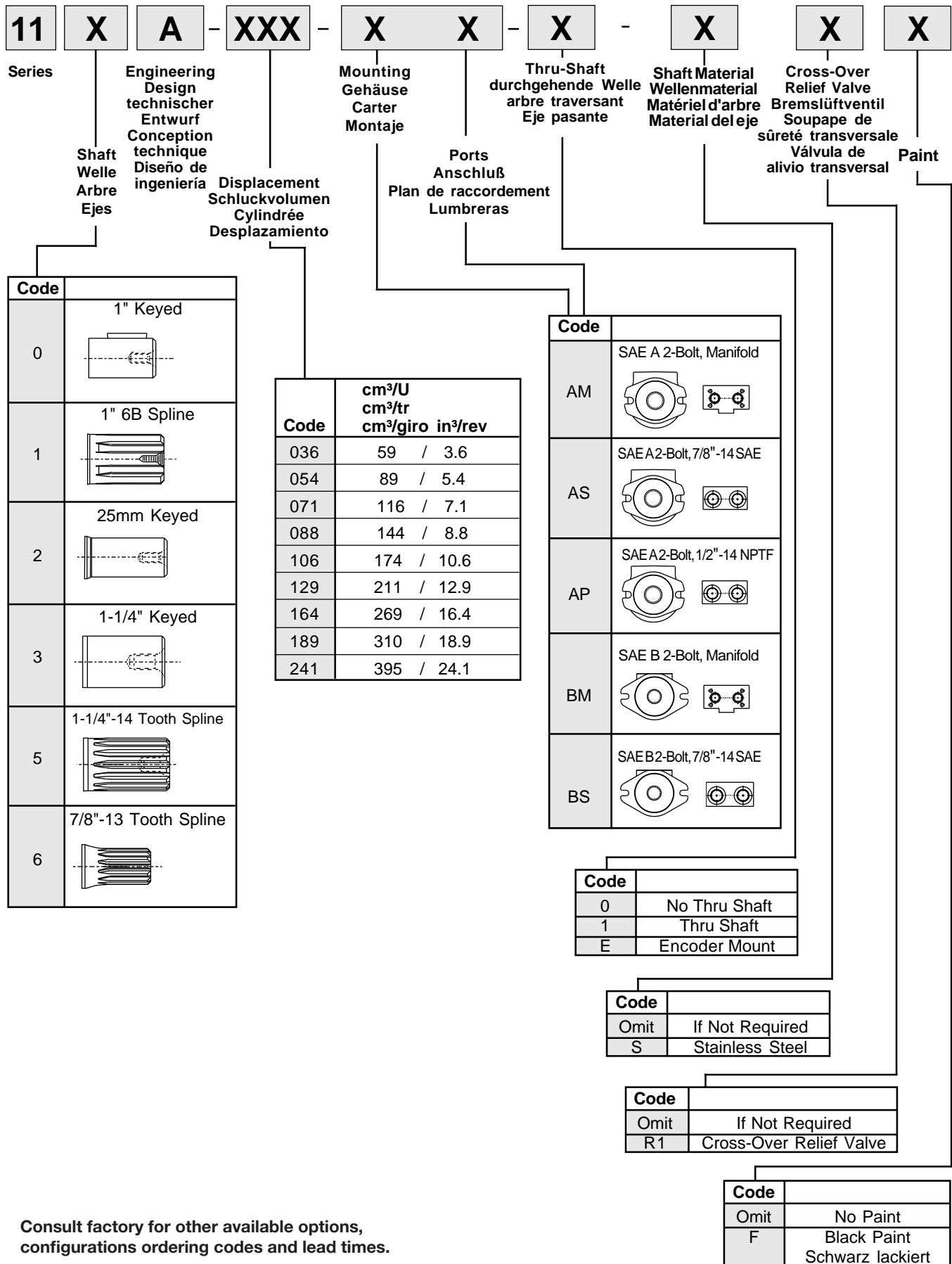


9 Displacements 9 Schluckvolumen 9 Cylindrée 9 Despazamientos	(3.6 – 24.1 in <sup>3</sup> /rev) 59...395 cm <sup>3</sup> /rev	
Maximum Pressure Eingangsdruck Pression entrée Presion Maxima	<b>Cont</b> (2500 psid) ...172.4 bar	<b>Int</b> (3000 psid) ...206.8 bar
Maximum Oil Flow Schluckstrom Débit d'huile Caudal Maximo de Aceite	(30 gpm) ...113.6 lpm	
Maximum Speed Drehzahl Vitesse de rotation Velocidad Maxima	858 rpm	
Maximum Torque Max Drehmoment Couple Torque Maximo	<b>Cont</b> (4164 lb in) ...470 Nm	<b>Int</b> (5215 lb in) ...589 Nm
Maximum Side Load at Key Seitenlast Charges latérales Carga Maxima Lateral	(1450 lb) ... 6450 N	

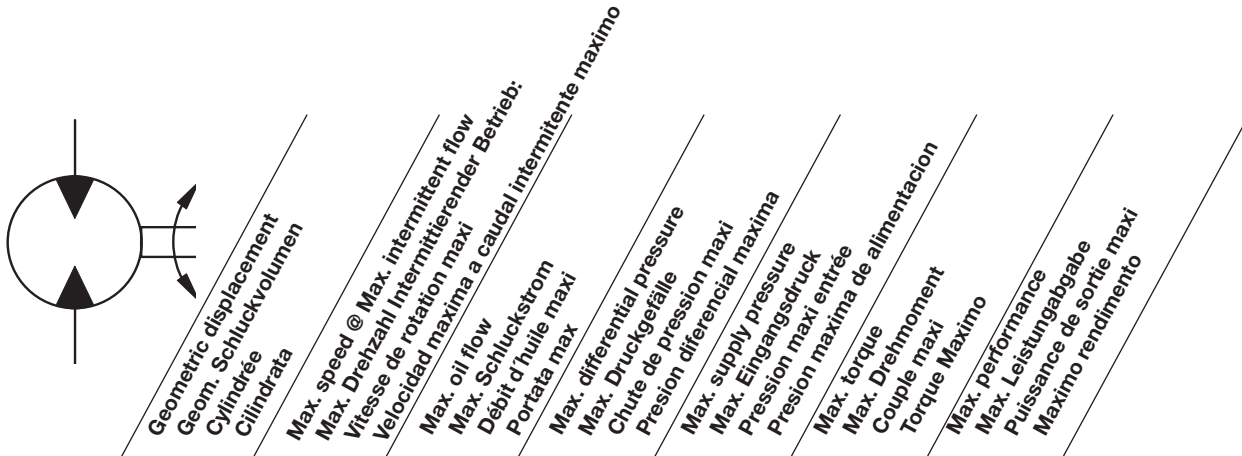
### When the Ultimate in Efficiency and Reliability is a Must

This high performance motor contains a power element that is pressure loaded against internal leakage for high volumetric efficiency. It is wear compensated, so that its volumetric efficiency will not degrade with use. It can provide up to 5215 lb-in of torque through a one-piece solid fixed axis shaft. This shaft design allows for full stationary spline contact between shaft and rotor, minimizing spline contact stresses. It also allows the shaft to be extended through the rear cover for mounting parking brakes, auxiliary drive functions or encoders for speed readout or closed loop control. Low internal pressure drop means high mechanical efficiency and higher flow capability. This rugged motor is the most compact on the market.





Consult factory for other available options, configurations ordering codes and lead times.



Motor Series 110A	cm <sup>3</sup> /rev in <sup>3</sup> /rev	rev/min	cont / int* l/min g/min		cont / int* bar psid		max bar psig	cont / int* Nm lb-in		max KW HP
110A 036	59 3.6	858	45.4 12	53 14	170 2500	210 3000	225 3250	127 1125	149 1319	8.5 11.4
110A 054	89 5.4	740	60.6 16	68.1 18	170 2500	210 3000	225 3250	182 1608	213 1884	11.2 15.1
110A 071	116 7.1	684	75.7 20	83.3 22	170 2500	210 3000	225 3250	256 2267	308 2725	14.2 19.1
110A 088	144 8.8	622	75.7 20	94.6 25	170 2500	210 3000	225 3250	324 2874	389 3449	14.6 19.6
110A 106	174 10.6	519	75.7 20	94.5 25	155 2250	210 3000	225 3250	352 3115	465 4121	13.1 17.6
110A 129	211 12.9	437	75.7 20	94.6 25	155 2250	190 2750	225 3250	412 3651	503 4453	12.9 17.3
110A 164	269 16.4	415	75.7 20	114 30	140 2000	170 2500	225 3250	470 4164	589 5215	12.1 16.2
110A 189	310 18.9	350	75.7 20	114 30	140 2000	170 2500	225 3250	542 4803	675 5977	7.9 10.6
110A 241	395 24.1	279	75.7 20	114 30	120 1750	155 2250	225 3250	594 5261	764 6765	9.2 12.4

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 15W40 d'une viscosité de 55 cSt (215 SUS) à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 55,1 cSt bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos técnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

- \* Intermittent operation rating applies to 10% of every minute.  
Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

110A 036

3.6 cu in / rev

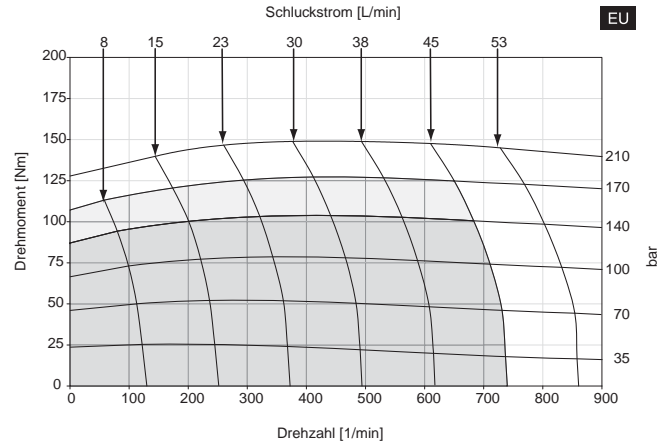
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500
<b>2</b>	244	473	688	882	1031		
	128	124	119	105	82		
<b>4</b>	238	471	700	905	1067	1203	1293
	257	251	245	226	193	139	87
<b>6</b>	232	470	713	928	1103	1255	1344
	385	381	377	362	331	289	250
<b>8</b>	226	461	700	922	1117	1289	1404
	513	508	503	490	454	403	359
<b>10</b>	221	453	688	917	1132	1324	1464
	642	635	629	622	584	526	481
<b>12</b>	216	443	675	897	1117	1349	1564
	770	762	755	747	708	651	601
<b>14</b>	212	433	662	877	1103	1375	1664
	898	889	880	871	835	782	728

FLOW (GPM)

TORQUE (LB IN) 1664  
SPEED (RPM) 728

59 cc / rev



110A 054

5.4 cu in / rev

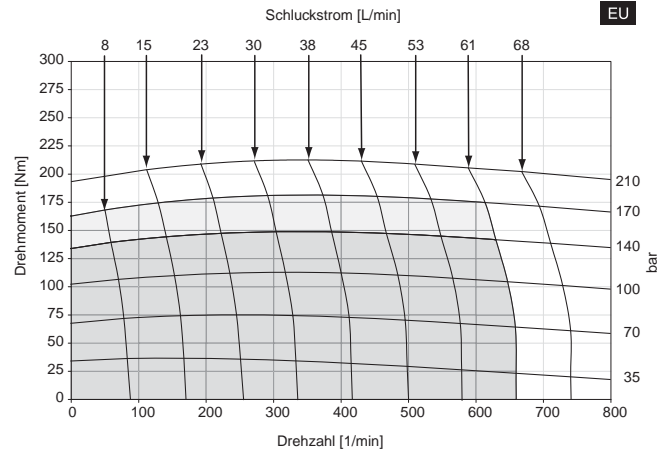
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500
<b>2</b>	365	716	1051	1368	1635		
	86	83	80	72	58		
<b>4</b>	365	713	1076	1407	1700	1957	2134
	171	167	164	153	134	101	60
<b>6</b>	361	722	1100	1445	1765	2055	2278
	257	253	250	244	226	198	171
<b>8</b>	352	713	1057	1419	1731	2020	2237
	342	338	334	329	309	278	247
<b>10</b>	340	713	1057	1392	1697	1985	2196
	428	424	419	415	396	366	332
<b>12</b>	331	679	1038	1382	1697	2011	2316
	513	508	503	498	480	450	408
<b>14</b>	318	653	1019	1372	1732	2129	2543
	599	593	587	581	566	536	488
<b>16</b>	309	636	987	1335	1700	2091	2491
	684	678	671	664	645	618	566
<b>18</b>	281	600	955	1298	1668	2052	2438
	770	762	755	747	724	701	647
<b>20</b>	264	567	880	1220	1581	1947	2235
	856	849	843	830	804	785	729
<b>22</b>	247	541	824	1390	1593	2026	2423
	942	936	931	913	885	871	813

FLOW (GPM)

TORQUE (LB IN) 2491  
SPEED (RPM) 566

89 cc / rev



■ Cont.    ■ Cont. with no side load    □ Int.  
                  ■ Int. with rated side load

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54°C (130°F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 15W40 d'une viscosité de 55 cSt (215 SUS) à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

020 110A.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos técnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

110A 071

7.1 cu in / rev

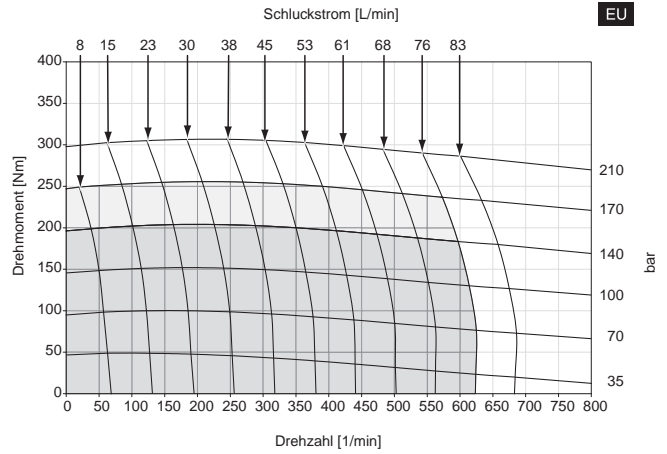
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500
<b>2</b>	480 65	949 63	1407 62	1853 56	2260 47		
<b>4</b>	480 130	994 128	1492 125	1989 118	2430 105	2848 83	3243 47
<b>6</b>	458 195	972 192	1483 189	1966 187	2458 176	2915 154	3322 133
<b>8</b>	446 260	961 258	1475 255	1966 251	2458 239	2915 219	3362 193
<b>10</b>	424 325	927 322	1449 319	1944 316	2444 306	2915 290	3382 260
<b>12</b>	412 390	904 387	1407 383	1921 379	2444 371	2898 353	3391 316
<b>14</b>	396 455	859 451	1373 447	1876 442	2373 437	2882 419	3401 374
<b>16</b>	379 521	825 515	1339 510	1853 505	2345 497	2848 482	3342 429
<b>18</b>	362 586	791 580	1288 574	1785 568	2317 556	2814 545	3283 486
<b>20</b>	339 651	757 644	1237 638	1763 631	2288 618	2780 608	3243 543
<b>22</b>	305 716	701 709	1187 701	1740 694	2232 680	2746 673	3243 601

FLOW (GPM)

TORQUE (LB IN) 701  
SPEED (RPM) 709

116 cc / rev



Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

020 110A.indd, js

■ Cont.    □ Cont. with no side load    □ Int.  
                  □ Int. with rated side load

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

110A 088

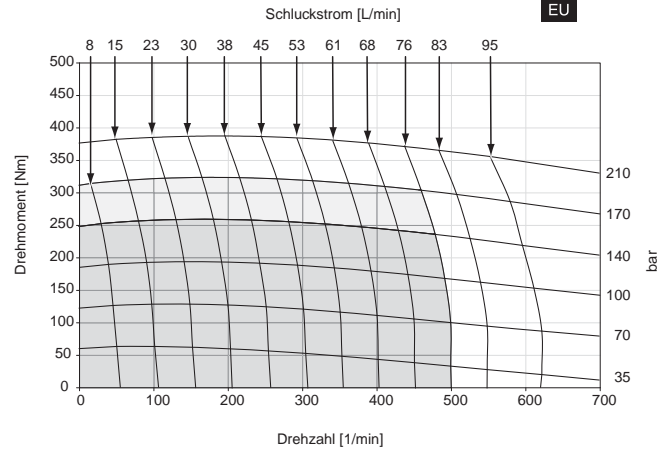
8.8 cu in / rev

PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500
<b>2</b>	605 52	1210 51	1774 50	2324 48	2869 41		
<b>4</b>	590 105	1207 103	1804 102	2387 99	2975 88	3475 73	3929 63
<b>6</b>	574 158	1204 156	1833 154	2451 152	3080 142	3593 126	4141 107
<b>8</b>	553 210	1183 208	1817 206	2437 203	3067 192	3634 178	4154 159
<b>10</b>	532 263	1162 261	1801 259	2423 253	3054 243	3675 235	4167 219
<b>12</b>	509 315	1127 312	1762 309	2381 303	3006 295	3623 284	4179 264
<b>14</b>	487 367	1092 363	1722 358	2339 353	2958 347	3571 335	4192 310
<b>16</b>	468 420	1044 415	1659 411	2269 403	2914 396	3529 384	4143 362
<b>18</b>	448 472	997 468	1595 463	2199 454	2870 444	3487 435	4094 416
<b>20</b>	428 525	973 520	1551 516	2178 507	2832 499	3446 486	4051 458
<b>22</b>	408 578	949 573	1506 569	2158 562	2794 555	3405 537	4008 499
<b>25</b>	348 656	846 651	1423 647	2008 636	2610 625	3191 608	3809 575
<b>30</b>	279 787	740 782	1313 776	1821 760	2381 744	2921 725	3555 697

FLOW (GPM)

144 cc / rev



TORQUE (LB IN) 4051  
SPEED (RPM) 458

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 15W40 d'une viscosité de 55 cSt (215 SUS) à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

020 110A.indd, js

■ Cont.    ■ Cont. with no side load    □ Int.  
                  ■ Int. with rated side load

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.



110A 106

10.6 cu in / rev

PRESSURE (PSID)

	500	1000	1500	1750	2000	2250	2500	2750	3000	3250	3500
<b>2</b>	742	1501	2227	2569	2919	3264	3585	3897	4201	4537	4871
	44	43	42	41	40	39	37	34	31	27	23
<b>4</b>	721	1485	2214	2576	2935	3302	3669	3990	4251	4599	4945
	87	86	85	83	82	79	76	71	66	61	57
<b>6</b>	700	1468	2202	2583	2969	3359	3754	4036	4302	4660	5019
	131	129	128	127	126	122	118	112	106	104	102
<b>8</b>	675	1442	2189	2569	2952	3340	3733	4071	4403	4715	5019
	174	173	171	169	166	162	158	153	149	146	144
<b>10</b>	650	1417	2176	2554	2935	3321	3711	4106	4504	4770	5019
	218	216	214	210	207	203	198	197	196	193	190
<b>12</b>	616	1383	2138	2509	2885	3264	3648	4025	4403	4715	5019
	262	258	255	252	248	245	241	238	235	232	229
<b>14</b>	582	1350	2100	2465	2834	3207	3585	3943	4302	4660	5019
	305	301	296	293	290	287	284	279	275	272	268
<b>16</b>	567	1278	2050	2410	2775	3155	3543	3903	4264	4626	4989
	349	344	340	336	331	328	324	320	316	311	307
<b>18</b>	553	1206	1999	2354	2716	3103	3501	3862	4226	4592	4960
	392	388	384	379	373	369	365	361	357	351	345
<b>20</b>	529	1168	1885	2270	2674	3060	3458	3822	4188		
	436	431	427	422	416	412	408	403	399		
<b>22</b>	506	1130	1771	2185	2632	3018	3416	3781	4150		
	479	475	470	465	460	455	451	446	441		
<b>25</b>	492	1110	1747	2145	2573	2951	3342	3700	4061		
	545	541	537	531	526	520	515	511	507		
<b>30</b>	470	1076	1708	2078	2474	2840	3219	3564	3913		
	654	651	647	641	634	628	621	615	608		

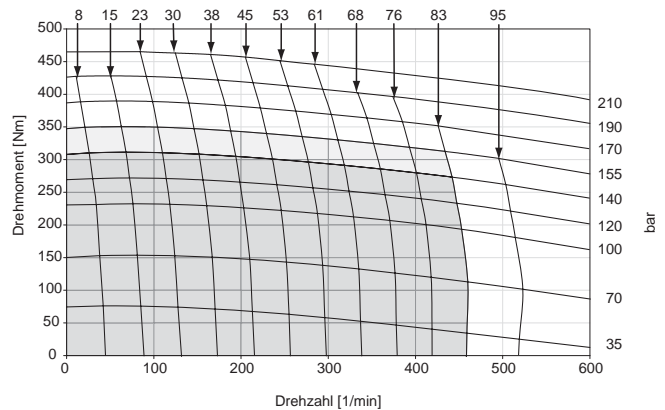
TORQUE (LB IN) 5019  
SPEED (RPM) 229

FLOW (GPM)

174 cc / rev

Schluckstrom [L/min]

EU



■ Cont.    ■ Cont. with no side load    □ Int. with rated side load

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 15W40 d'une viscosité de 55 cSt (215 SUS) à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

020 110A.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos técnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

110A 129

12.9 cu in / rev

PRESSURE (PSID)

	500	1000	1500	1750	2000	2250	2500	2750	3000	3250	3500
<b>2</b>	905	1827	2698	3112	3527	3943	4336	4729	5115	5522	5925
	<b>36</b>	<b>35</b>	<b>34</b>	<b>33</b>	<b>32</b>	<b>31</b>	<b>29</b>	<b>27</b>	<b>25</b>	<b>23</b>	<b>20</b>
<b>4</b>	880	1807	2691	3128	3567	3999	4420	4805	5180	5599	6017
	<b>72</b>	<b>70</b>	<b>69</b>	<b>68</b>	<b>66</b>	<b>64</b>	<b>62</b>	<b>58</b>	<b>55</b>	<b>51</b>	<b>48</b>
<b>6</b>	854	1786	2684	3144	3607	4055	4503	4881	5245	5677	6108
	<b>107</b>	<b>106</b>	<b>105</b>	<b>104</b>	<b>103</b>	<b>100</b>	<b>97</b>	<b>93</b>	<b>89</b>	<b>87</b>	<b>85</b>
<b>8</b>	822	1755	2666	3122	3582	4035	4490	4912	5330	5723	6108
	<b>143</b>	<b>142</b>	<b>140</b>	<b>139</b>	<b>137</b>	<b>134</b>	<b>130</b>	<b>127</b>	<b>123</b>	<b>121</b>	<b>118</b>
<b>10</b>	790	1725	2648	3101	3556	4015	4476	4944	5416	5769	6108
	<b>179</b>	<b>177</b>	<b>175</b>	<b>173</b>	<b>171</b>	<b>168</b>	<b>164</b>	<b>162</b>	<b>160</b>	<b>157</b>	<b>154</b>
<b>12</b>	750	1683	2605	3060	3511	3965	4419	4867	5324	5718	6104
	<b>215</b>	<b>212</b>	<b>210</b>	<b>208</b>	<b>205</b>	<b>202</b>	<b>199</b>	<b>196</b>	<b>193</b>	<b>189</b>	<b>186</b>
<b>14</b>	710	1642	2562	3020	3465	3914	4363	4790	5233		
	<b>251</b>	<b>247</b>	<b>244</b>	<b>242</b>	<b>240</b>	<b>237</b>	<b>234</b>	<b>230</b>	<b>226</b>		
<b>16</b>	685	1557	2501	2948	3394	3850	4309	4742	5183		
	<b>287</b>	<b>283</b>	<b>280</b>	<b>277</b>	<b>274</b>	<b>271</b>	<b>268</b>	<b>263</b>	<b>259</b>		
<b>18</b>	661	1472	2439	2876	3322	3785	4256	4695	5133		
	<b>322</b>	<b>319</b>	<b>316</b>	<b>312</b>	<b>307</b>	<b>304</b>	<b>301</b>	<b>297</b>	<b>293</b>		
<b>20</b>	628	1418	2294	2741	3205	3651	4105	4522			
	<b>358</b>	<b>355</b>	<b>351</b>	<b>347</b>	<b>343</b>	<b>339</b>	<b>336</b>	<b>331</b>			
<b>22</b>	596	1363	2150	2605	3089	3517	3954				
	<b>394</b>	<b>390</b>	<b>386</b>	<b>382</b>	<b>378</b>	<b>374</b>	<b>370</b>				
<b>25</b>	571	1322	2093	2532	2997	3427	3869				
	<b>448</b>	<b>444</b>	<b>440</b>	<b>436</b>	<b>431</b>	<b>427</b>	<b>422</b>				
<b>30</b>	531	1254	1999	2410	2843	3276					
	<b>537</b>	<b>533</b>	<b>530</b>	<b>524</b>	<b>519</b>	<b>514</b>					

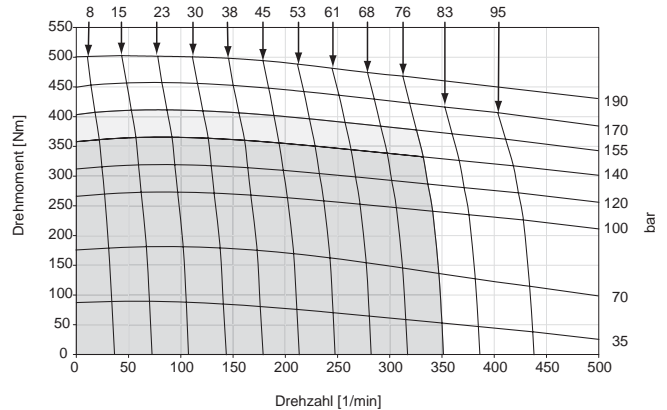
TORQUE (LB IN) 6108  
SPEED (RPM) 154

FLOW (GPM)

211 cc / rev

Schluckstrom [L/min]

EU



■ Cont.    ■ Cont. with no side load    □ Int.  
                  ■ Int. with rated side load

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54°C (130°F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 15W40 d'une viscosité de 55 cSt (215 SUS) à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

020 110A.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

110A 164

16.4 cu in / rev

PRESSURE (PSID)

	500	1000	1500	1750	2000	2250	2500	2750	3000	3250
<b>2</b>	1155 28	2323 27	3406 26	3928 25	4437 24	4954 23	5462 22	5986 21	6507 20	7020 19
<b>4</b>	1122 56	2297 55	3414 54	3963 53	4505 51	5023 49	5530 48	6065 46	6597 44	7124 43
<b>6</b>	1088 85	2271 84	3422 83	3997 82	4573 80	5092 79	5599 77	6144 74	6687 72	7227 70
<b>8</b>	1047 113	2232 112	3394 110	3963 109	4531 108	5071 106	5605 104	6164 101	6722 98	7247 95
<b>10</b>	1005 141	2193 139	3367 138	3928 137	4489 135	5051 133	5612 131	6184 128	6758 125	
<b>12</b>	955 169	2061 167	3318 166	3888 164	4463 163	5021 161	5579 158	6141 155		
<b>14</b>	904 197	2086 195	3269 193	3878 192	4437 191	4998 188	5547 185	6072 181		
<b>16</b>	861 225	1925 223	3191 221	3763 219	4346 217	4908 215	5475 212			
<b>18</b>	818 254	1879 251	3113 248	3677 246	4255 243	4827 241				
<b>20</b>	783 282	1853 279	3015 276	3577 273	4155 270	4733 268				
<b>22</b>	718 310	1710 307	2721 304	3209 301	3706 297	4170 294				
<b>25</b>	672 352	1626 349	2596 345	3068 342	3550 338	4038 335				
<b>30</b>	596 423	1488 418	2388 414	2832 410	3289 406	3817 401				

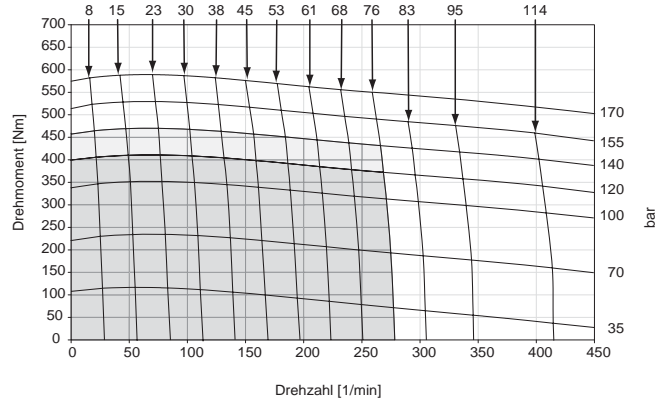
TORQUE (LB IN) 6758  
SPEED (RPM) 125

FLOW (GPM)

269 cc / rev

Schluckstrom [L/min]

EU



■ Cont.    ■ Cont. with no side load    □ Int.  
                  ■ Int. with rated side load

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

020 110A.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

110A 189

18.9 cu in / rev

PRESSURE (PSID)

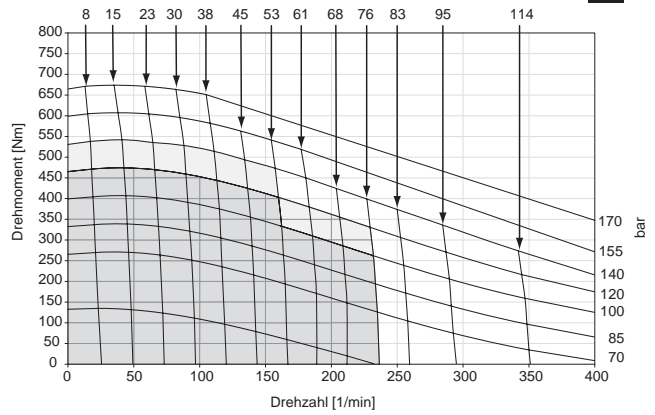
	500	1000	1250	1500	1750	2250	2500
<b>2</b>	1285 23	2619 22	3224 21	3838 20	4442 18	5548 16	6131 13
<b>4</b>	1264 47	2589 46	3250 45	3859 44	4486 42	5668 40	6282 38
<b>6</b>	1228 73	2559 72	3240 71	3865 70	4513 69	5765 67	6409 66
<b>8</b>	1171 97	2509 96	3176 95	3829 94	4503 93	5771 90	6439 89
<b>10</b>	1114 121	2449 120	3111 119	3793 118	4476 117	5777 114	6468 112
<b>12</b>	1065 145	2391 144	3061 143	3750 142	4439 141	5747 137	
<b>14</b>	1016 169	2333 168	3011 167	3707 166	4402 165	5717 161	
<b>16</b>	975 200	2257 199	2938 198	3636 197	4326 195	5645 185	
<b>18</b>	966 232	1988 230	2506 228	3037 227	3563 226		
<b>20</b>	941 263	1815 261	2253 259	2702 258	3143 256		
<b>22</b>	916 295	1643 293	2001 290	2367 288	2724 286		
<b>25</b>	879 342	1384 339	1622 335	1865 334	2094 331		
<b>30</b>	816 420	952 417	990 412	1027 410	1045 407		

FLOW (GPM)

310 cc / rev

Schluckstrom [L/min]

EU



TORQUE (LB IN) 2724  
SPEED (RPM) 286

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 15W40 d'une viscosité de 55 cSt (215 SUS) à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

020 110A.indd.js

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

■ Cont.    ■ Cont. with no side load    □ Int.  
                  ■ Int. with rated side load

110A 241

24.1 cu in / rev

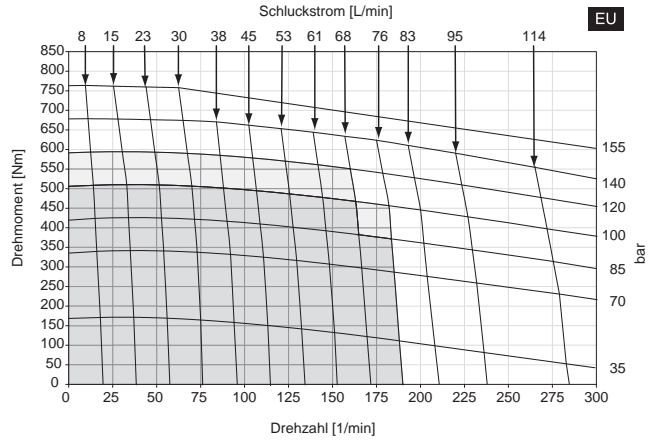
PRESSURE (PSID)

	500	1000	1250	1500	1750	2250
<b>2</b>	1515 <b>15</b>	3184 <b>14</b>	3884 <b>12</b>	4660 <b>11</b>	5427 <b>10</b>	6645 <b>9</b>
<b>4</b>	1534 <b>35</b>	3145 <b>34</b>	4027 <b>32</b>	4718 <b>30</b>	5504 <b>29</b>	6904 <b>28</b>
<b>6</b>	1496 <b>56</b>	3107 <b>55</b>	4027 <b>54</b>	4718 <b>53</b>	5504 <b>52</b>	7077 <b>51</b>
<b>8</b>	1400 <b>74</b>	3030 <b>73</b>	3884 <b>72</b>	4660 <b>70</b>	5571 <b>68</b>	7163 <b>66</b>
<b>10</b>	1304 <b>93</b>	2915 <b>92</b>	3740 <b>91</b>	4603 <b>90</b>	5571 <b>89</b>	
<b>12</b>	1266 <b>112</b>	2851 <b>112</b>	3708 <b>110</b>	4584 <b>109</b>	5549 <b>107</b>	
<b>14</b>	1227 <b>130</b>	2787 <b>129</b>	3676 <b>128</b>	4564 <b>127</b>	5527 <b>126</b>	
<b>16</b>	1189 <b>149</b>	2723 <b>148</b>	3644 <b>147</b>	4545 <b>146</b>	5504 <b>144</b>	
<b>18</b>	1170 <b>167</b>	2685 <b>166</b>	3596 <b>165</b>	4488 <b>164</b>	5437 <b>162</b>	
<b>20</b>	1151 <b>184</b>	2685 <b>183</b>	3596 <b>182</b>	4430 <b>180</b>	5370 <b>178</b>	
<b>22</b>	1112 <b>205</b>	2608 <b>204</b>	3452 <b>203</b>	4258 <b>202</b>	5169 <b>200</b>	
<b>25</b>	1055 <b>235</b>	2455 <b>232</b>	3260 <b>231</b>	4085 <b>230</b>	4900 <b>228</b>	
<b>30</b>	959 <b>288</b>	2225 <b>285</b>	2925 <b>282</b>	3682 <b>279</b>	4363 <b>273</b>	

FLOW (GPM)

TORQUE (LB IN) 5169  
SPEED (RPM) 200

395 cc / rev



Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54°C (130°F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 15W40 d'une viscosité de 55 cSt (215 SUS) à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

020 110A.indd, js

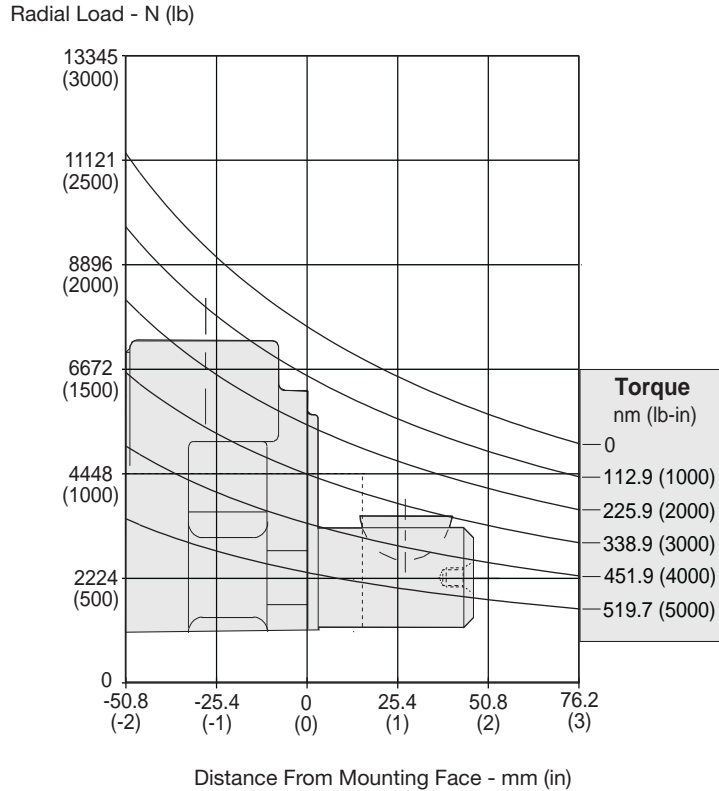
Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos técnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

■ Cont.    ■ Cont. with no side load    □ Int.  
                  ■ Int. with rated side load



The allowable side load curve is based on  $L_{10}$  bushing life of  $3 \times 10^6$  revolutions @ 100 RPM.  
 Die zulässige radiale Wellenbelastung bezieht sich auf die Lager-Lebensdauer  $3 \times 10^6$  Umdrehungen.  
 L'effort radial admissible sur l'arbre depend a une duree de vie  $3 \times 10^6$  de rotation.  
 La curva de carga lateral admisible se basa en vida util de cojinete de  $3 \times 10^6$  revoluciones.

**Equation to Calculate the Expected Radial Bearing Life**  
**Gleichung zur Ermittlung der Lagerlebensdauer**

Equation to calculate the dynamic bearing life for a given load:  
 Bestimmung der erlaubten radialen Wellenbelastung mit vorgegebener Last

Use  $F_a$ ,  $F_b$  and S in equation to determine hours of  $L_{10}$  bearing life.  
 Die Lebensdauer in Stunden ergibt sich durch einsetzen von  $F_a$ ,  $F_b$ , und S in die nachstehende Formel.

$$L = \frac{3.0 \times 10^6}{60 \times S} \left\{ \frac{F_a}{F_b} \right\}^{3.33}$$

Where / Mit:

S = Shaft Speed RPM / Abtriebswellendrehzahl in  $\text{min}^{-1}$

L = Life In Hours / Lebensdauer in Stunden

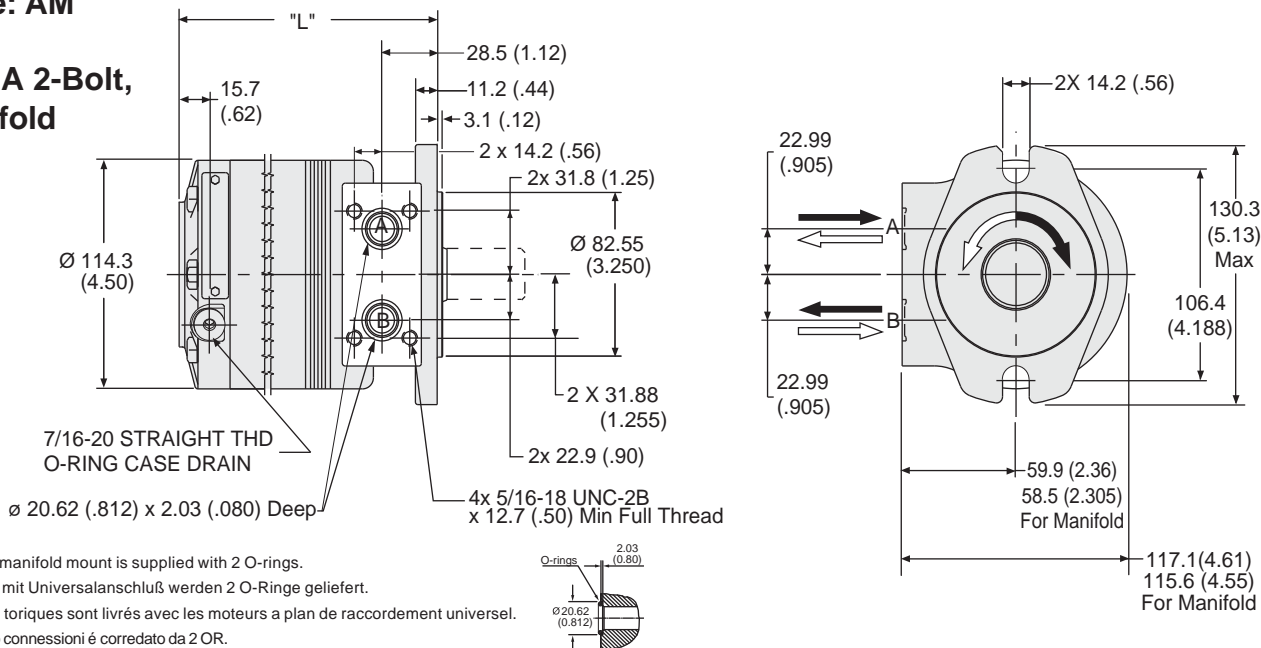
$F_a$  = Allowable side load defined by above curve at a distance from mounting flange. / Erlaubte radiale Wellenbelastung als Function der Laenge

$F_b$  = Application side load. / Anwendungsseitige Wellenbelastung

Note: Calculations are based on  $L_{10}$  bearing life per ISO 281.  
 Auslegung basiert auf einer  $L_{10}$  Lebensdauer nach ISO 281

**Code: AM**

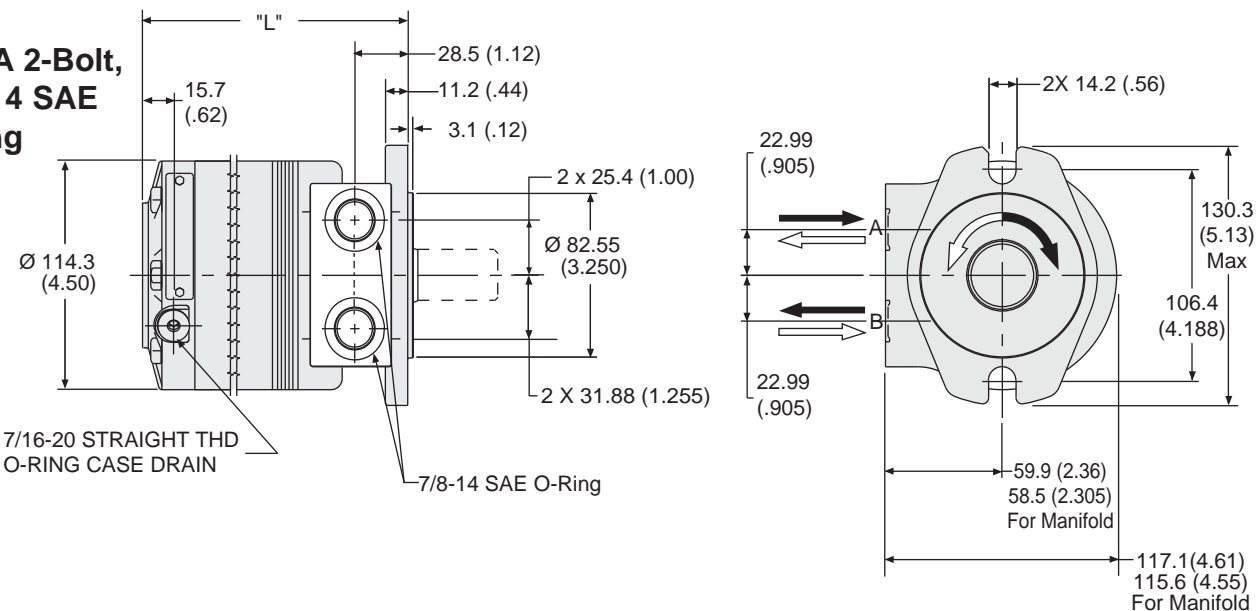
**SAE A 2-Bolt,  
Manifold**



Code AM	036	054	071	088	106	129	164	189	241	
Weight/Gewicht	kg	7.0	7.4	7.7	8.0	8.4	8.7	9.4	9.8	10.8
Poids/Peso	(lb)	(15.4)	(16.2)	(16.9)	(17.5)	(18.4)	(19.1)	(20.6)	(21.6)	(23.7)
Length	"L" mm	112	117	121	127	131	138	147	154	169
	"L" (in)	(4.41)	(4.60)	(4.78)	(4.98)	(5.17)	(5.42)	(5.80)	(6.07)	(6.64)

**Code: AS**

**SAE A 2-Bolt,  
7/8"-14 SAE  
O-Ring**



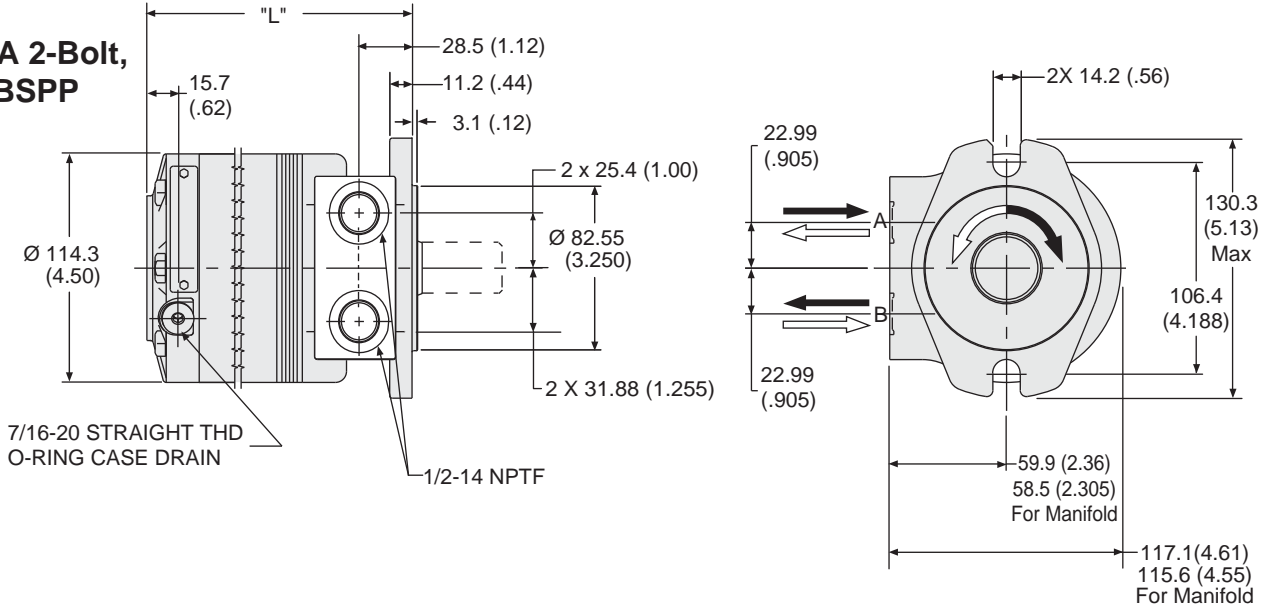
Code AS	036	054	071	088	106	129	164	189	241	
Weight/Gewicht	kg	7.0	7.4	7.7	8.0	8.4	8.7	9.4	9.8	10.8
Poids/Peso	(lb)	(15.4)	(16.2)	(16.9)	(17.5)	(18.4)	(19.1)	(20.6)	(21.6)	(23.7)
Length	"L" mm	112	117	121	127	131	138	147	154	169
	"L" (in)	(4.41)	(4.60)	(4.78)	(4.98)	(5.17)	(5.42)	(5.80)	(6.07)	(6.64)

English equivalents for metric specifications are shown in ( ).

020 110A.indd, js

**Code: AP**

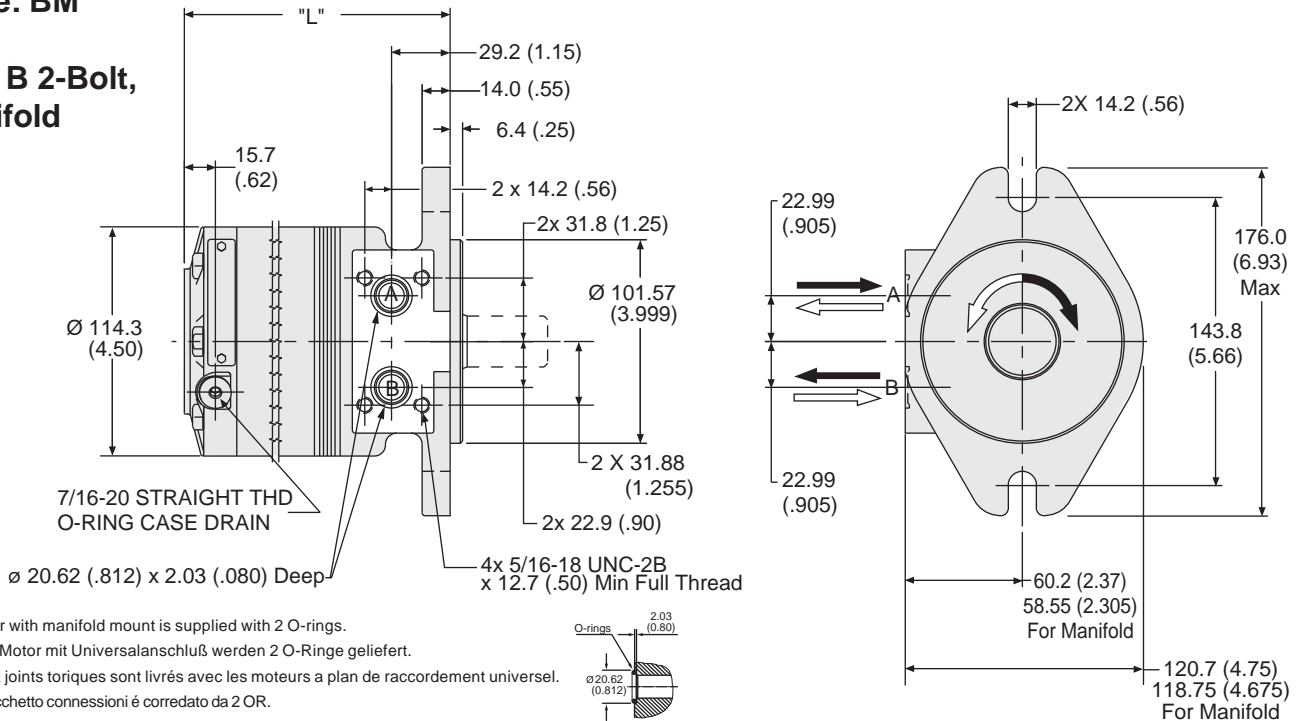
**SAE A 2-Bolt,  
1/2" BSPP**



Code AT		036	054	071	088	106	129	164	189	241
<b>Weight/Gewicht</b>	<b>kg</b>	<b>7.0</b>	<b>7.4</b>	<b>7.7</b>	<b>8.0</b>	<b>8.4</b>	<b>8.7</b>	<b>9.4</b>	<b>9.8</b>	<b>10.8</b>
Poids/Peso	(lb)	(15.4)	(16.2)	(16.9)	(17.5)	(18.4)	(19.1)	(20.6)	(21.6)	(23.7)
<b>Length</b>	<b>"L" mm</b>	<b>112</b>	<b>117</b>	<b>121</b>	<b>127</b>	<b>131</b>	<b>138</b>	<b>147</b>	<b>154</b>	<b>169</b>
	"L" (in)	(4.41)	(4.60)	(4.78)	(4.98)	(5.17)	(5.42)	(5.80)	(6.07)	(6.64)

**Code: BM**

**SAE B 2-Bolt,  
Manifold**



Motor with manifold mount is supplied with 2 O-rings.  
 Zum Motor mit Universalanschluß werden 2 O-Ringe geliefert.  
 Deux joints toriques sont livrés avec les moteurs a plan de raccordement universel.  
 Il blocchetto connessioni é corredato da 2 OR.

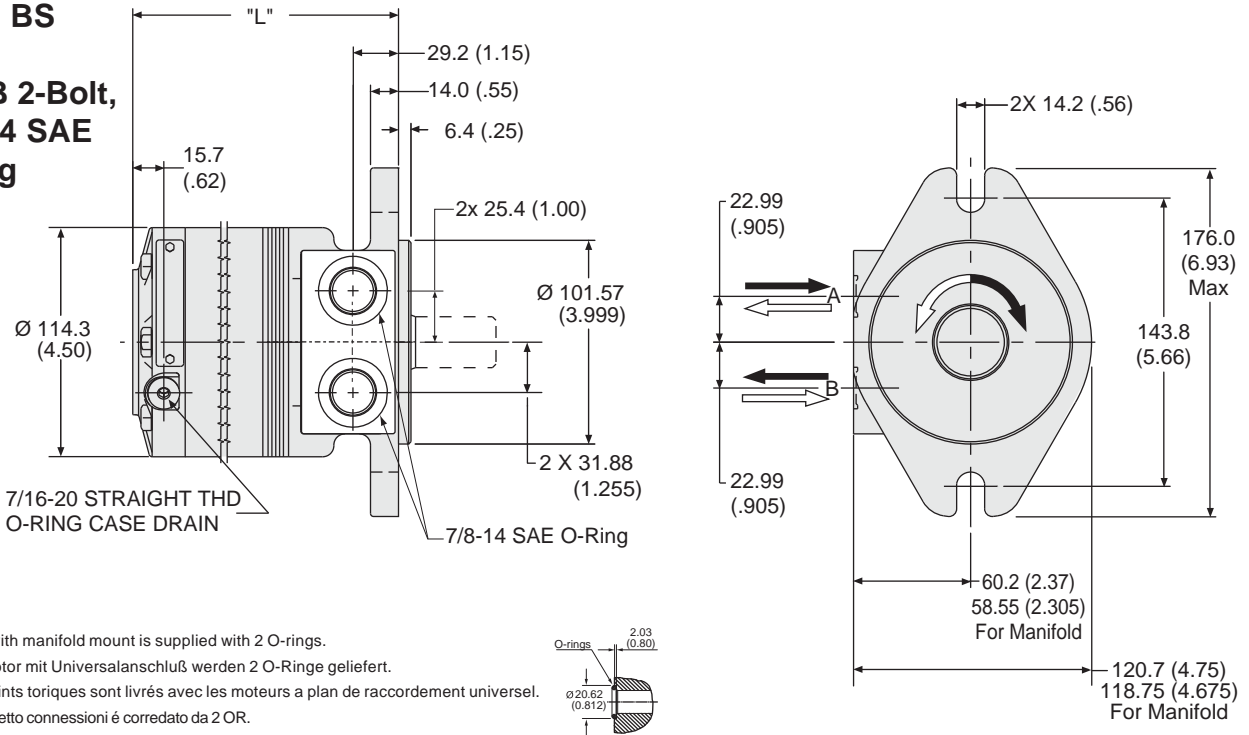
Code BM		036	054	071	088	106	129	164	189	241
<b>Weight/Gewicht</b>	<b>kg</b>	<b>7.0</b>	<b>7.4</b>	<b>7.7</b>	<b>8.0</b>	<b>8.4</b>	<b>8.7</b>	<b>9.4</b>	<b>9.8</b>	<b>10.8</b>
Poids/Peso	(lb)	(15.4)	(16.2)	(16.9)	(17.5)	(18.4)	(19.1)	(20.6)	(21.6)	(23.7)
<b>Length</b>	<b>"L" mm</b>	<b>112</b>	<b>117</b>	<b>121</b>	<b>127</b>	<b>131</b>	<b>138</b>	<b>147</b>	<b>154</b>	<b>169</b>
	"L" (in)	(4.41)	(4.60)	(4.78)	(4.98)	(5.17)	(5.42)	(5.80)	(6.07)	(6.64)

English equivalents for metric specifications are shown in ( ).



**Code: BS**

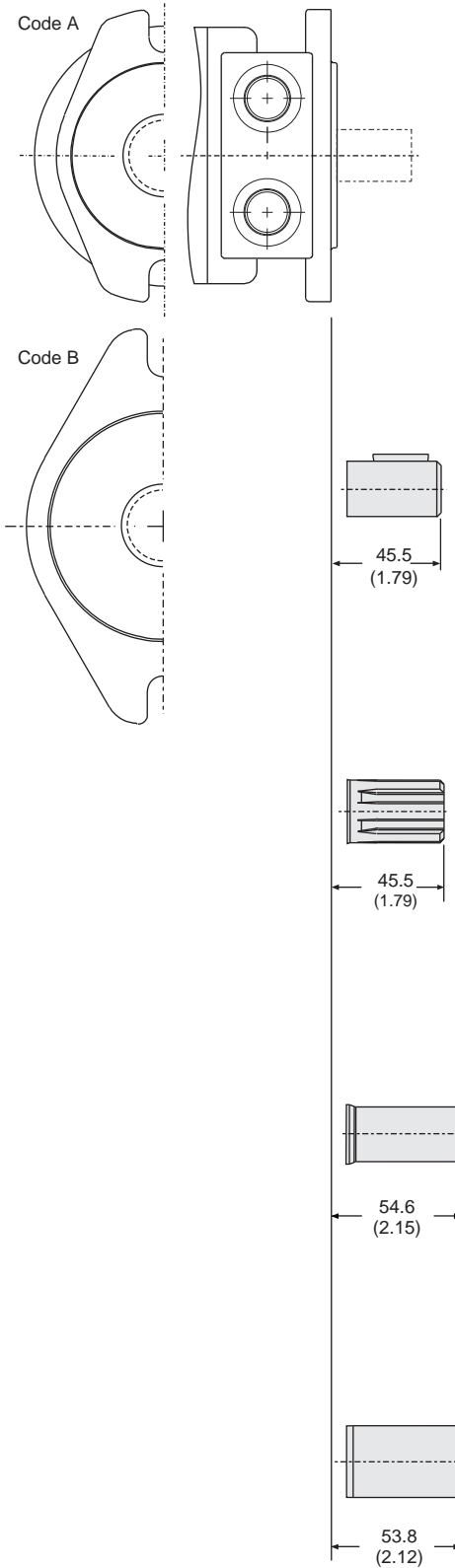
**SAE B 2-Bolt,  
 7/8"-14 SAE  
 O-Ring**



Code BS	036	054	071	088	106	129	164	189	241
<b>Weight/Gewicht</b> kg	<b>7.0</b>	<b>7.4</b>	<b>7.7</b>	<b>8.0</b>	<b>8.4</b>	<b>8.7</b>	<b>9.4</b>	<b>9.8</b>	<b>10.8</b>
Poids/Peso (lb)	(15.4)	(16.2)	(16.9)	(17.5)	(18.4)	(19.1)	(20.6)	(21.6)	(23.7)
<b>Length</b> "L" mm	<b>112</b>	<b>117</b>	<b>121</b>	<b>127</b>	<b>131</b>	<b>138</b>	<b>147</b>	<b>154</b>	<b>169</b>
"L" (in)	(4.41)	(4.60)	(4.78)	(4.98)	(5.17)	(5.42)	(5.80)	(6.07)	(6.64)

English equivalents for metric specifications are shown in ( ).

020 110A.indd, js

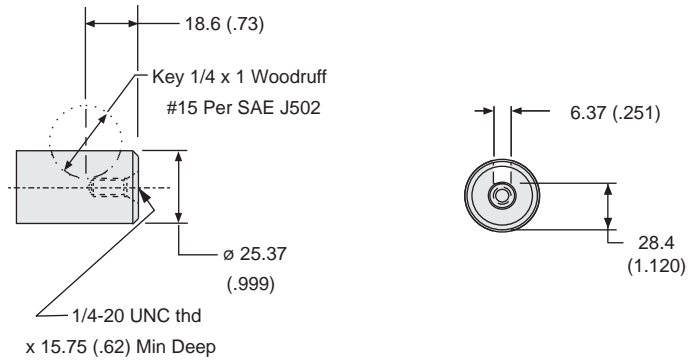


English equivalents for metric specifications are shown in ( ).

020 110A.indd, js

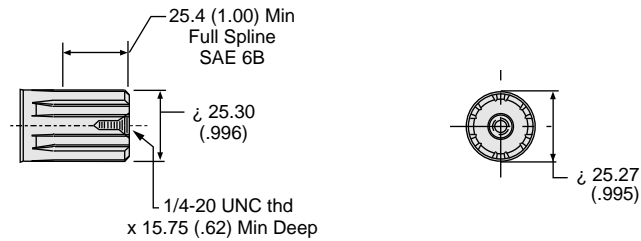
Code: 0

1" Keyed



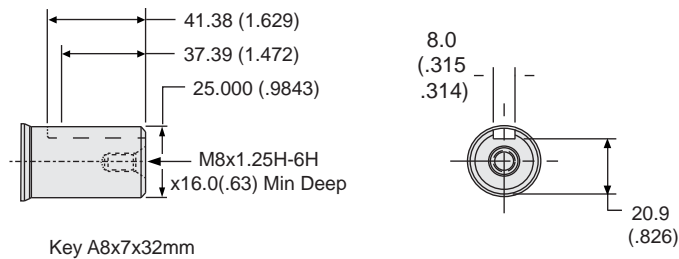
Code: 1

1" 6B Spline



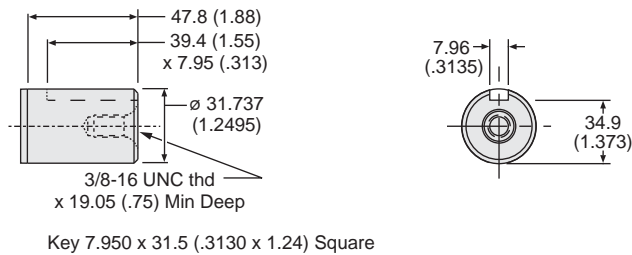
Code: 2

25mm Keyed



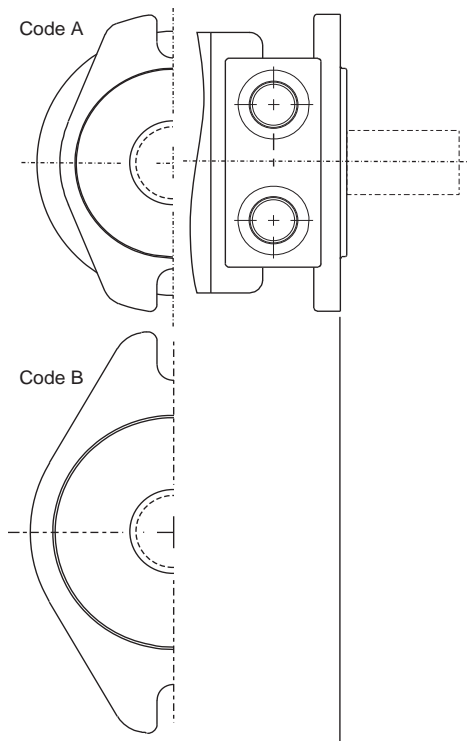
Code: 3

1-1/4" Keyed



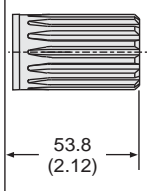
English equivalents for metric specifications are shown in ( ).

020 110A.indd, js



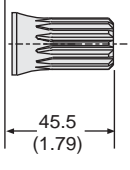
**Code: 5**

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



**Code: 6**

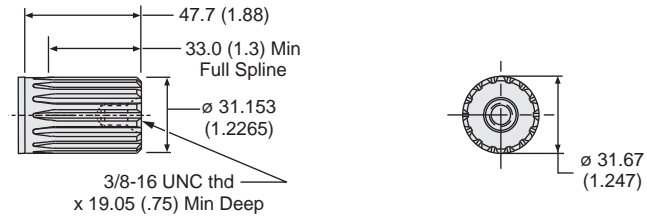
**7/8"-13 Tooth Spline**



English equivalents for metric specifications are shown in ( ).

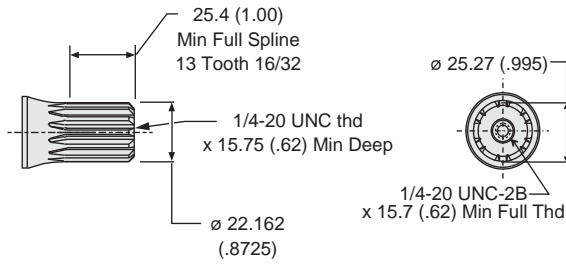
Code: 5

1-1/4"-14 Tooth Spline



Code: 6

7/8"-13 Tooth Spline



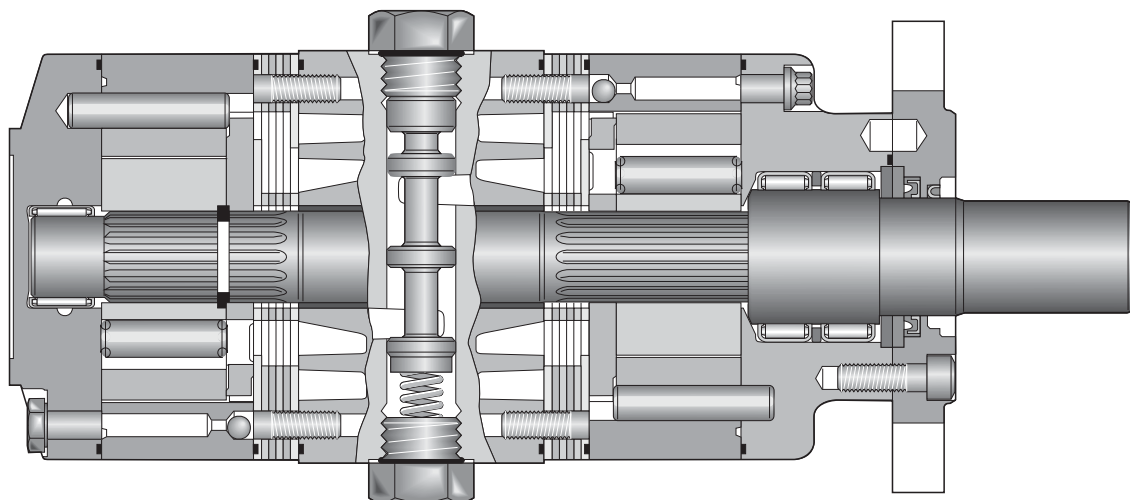
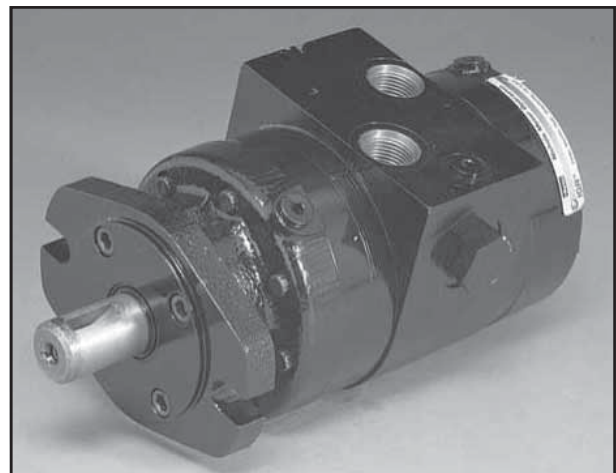
English equivalents for metric specifications are shown in ( ).

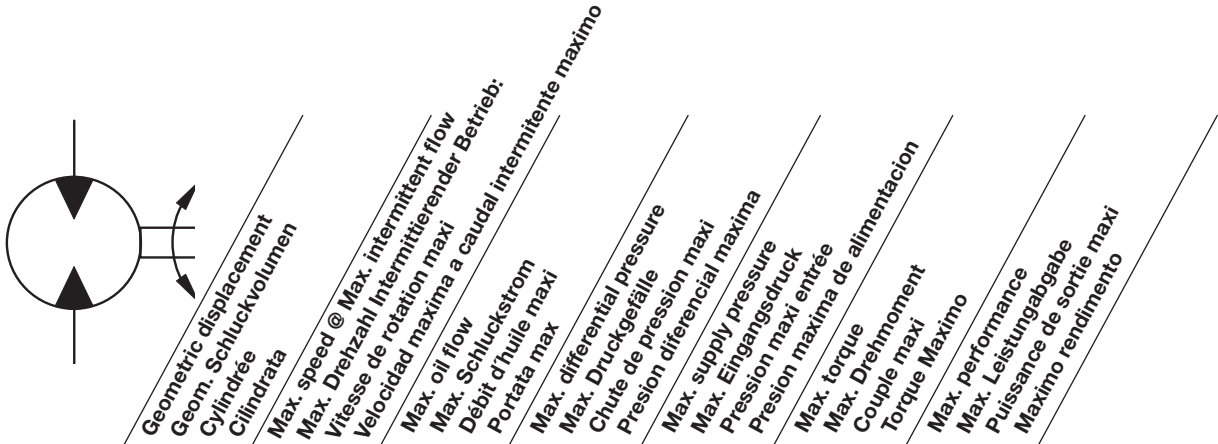


6 Displacements	Series	(3.6 – 12.9 in <sup>3</sup> /rev)
6 Schluckvolumen		<b>59...211 cm<sup>3</sup>/rev</b>
6 Cylindrée	Parallel	(7.2 – 25.8 in <sup>3</sup> /rev)
6 Despazamientos		<b>118...423 cm<sup>3</sup>/rev</b>
		<b>Cont                      Int</b>
Maximum Pressure	Series	(2500 psid) (3000 psid)
Eingangsdruck		<b>...170 bar                      ...210 bar</b>
Pression entrée	Parallel	(2500 psid) (3000 psid)
Pressione Maxima		<b>...170 bar                      ...210 bar</b>
Maximum Oil Flow	Series	(20 gpm)
Schluckstrom		<b>...76 lpm</b>
Débit d'huile	Parallel	(30 gpm)
Caudal Maximo de Aceite		<b>...114 lpm</b>
Maximum Speed	Series	<b>890 rpm</b>
Drehzahl	Parallel	<b>782 rpm</b>
Vitesse de rotation		
Velocidad Maxima		
		<b>Cont                      Int</b>
Maximum Torque	Series	(3816 lb in) (4694 lb in)
Max Drehmoment		<b>...431 Nm                      ...530 Nm</b>
Couple	Parallel	(6648 lb in) (7463 lb in)
Torque Maximo		<b>...751 Nm                      ...843 Nm</b>
Maximum Side Load at Key	Series	(700 lb)
Seitenlast		<b>... 3114 N</b>
Charges latérales		
Carga Maxima Lateral		

### High Efficiency, High Flow Two-Speed Motor

Parker's unique two-speed motor utilizes two separate IGR™ power elements on a common shaft. An integral selector valve shifts between high torque, low speed (parallel) operation and high speed, low torque (series) mode in a ration of 2:1. The use of two power elements eliminates the deficiencies of traditional, single power element designs. In the high torque mode, the motor delivers twice the torque and half the speed that it does in the high speed mode. The selector valve can be open or closed center and may be actuated by an external pilot or optional solenoid valve. The open center selector valve can be shifted "on the fly" while the motor shaft is rotating under load. The selector valve is spring loaded to return to its pilot-pressure-off position. Normal mode of operation is field changeable and can be selected as series or parallel. Pilot pressure must be 300 psi higher than motor case or outlet pressure and may be as high as typical hydraulic system operating pressure.





Motor Series 700	cm <sup>3</sup> /rev in <sup>3</sup> /rev	int rev/min	cont / int* l/min g/min	cont / int* bar psid	max bar psig	cont / int* Nm lb-in	max KW HP
072 Series	59 3.6	890	45.4 53.0 12 14	170 210 2500 3000	276 4000	129 154 1146 1366	8.6 11.5
072 Parallel	118 7.2	782	83.3 94.6 22 25	170 210 2500 3000	276 4000	264 309 2338 2739	15.5 20.8
108 Series	88 5.4	843	60.6 68.1 16 18	170 210 2500 3000	276 4000	197 236 1743 2088	12.4 16.6
108 Parallel	177 10.8	656	94.6 113.5 25 30	170 210 2500 3000	276 4000	527 624 4666 5525	26.9 36.1
142 Series	116 7.1	695	75.7 83.3 20 22	170 210 2500 3000	276 4000	260 313 2306 2769	12.8 17.2
142 Parallel	233 14.2	481	113.5 113.5 30 30	170 210 2500 3000	276 4000	518 616 4592 5456	21.8 29.2
176 Series	144 8.8	688	75.7 94.6 20 25	170 210 2500 3000	276 4000	325 392 2818 3472	14.2 19.1
176 Parallel	288 17.6	419	113.5 113.5 30 30	170 210 2500 3000	276 4000	644 709 5707 6283	23.9 32.1
212 Series	174 10.6	580	75.7 113.5 20 30	155 210 2250 3000	276 4000	353 475 3125 4205	13.0 17.4
212 Parallel	347 21.2	352	113.5 113.5 30 30	155 210 2250 3000	276 4000	696 774 6167 6860	21.2 29.4
258 Series	211 12.9	440	75.7 113.5 20 30	155 210 2250 3000	276 4000	431 531 3816 4699	12.3 16.5
258 Parallel	423 25.8	268	113.5 113.5 30 30	137.9 155.1 2000 2250	276 4000	751 843 6648 7463	18.0 24.2

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.  
Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

\* Intermittent operation rating applies to 10% of every minute.  
Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.





Series	Series	Shaft Welle Arbre Ejes	Displacement Schluckvolumen Cylindrée Desplazamiento	Mounting Gehäuse Carter Montaje	Ports Anschluß Plan de raccordement Lumbreras	Thru-Shaft durchgehende Welle arbre traversant Eje pasante	Spool Actuation Spulenbetätigung Actionnement de la bobine Actuado por bobina	Normal Center Position 1 Normale Mittenposition Position centrale normale Posición central normal	Normal Mode of Operation 4 Normaler Betriebsmodus Mode opératoire normal Modo normal de operación	Paint Anstrich Peinture Pintura
--------	--------	---------------------------------	---	--	--	---	--	--	--	--

Code	
0	1" Keyed 
1	1" 6B Spline 
2	25mm Keyed 
3	1-1/4" Keyed 
5	1-1/4"-14 Tooth Spline 
6	7/8"-13 Tooth Spline 

Code	
AM	SAE A 2-Bolt, Manifold 
AS	SAE A 2-Bolt, 7/8"-14 SAE 
BM	SAE B 2-Bolt, Manifold 
BS	SAE B 2-Bolt, 7/8"-14 SAE 

Code	
0	No Thru Shaft
1	Thru Shaft
E	Encoder Mount

Code	
P	Remotely Piloted 
E1	Solenoid Actuated with Manual Override 
W1	Solenoid Actuated without Manual Override 

Standard Solenoid is 12V DC with 1/4" Spade Connections.  
Standardausführung ist ein 12-V-Gleichstrom-Solenoid mit  
1/4-Zoll-Gabelschuhanschlüssen.  
Le solénoïde standardisé est du type 12 Vcc avec cosse  
à fourche de 1/4".  
La solénoïde estándar es para 12 VCC, con conectores tipo  
bayoneta de 1/4".

Code	
O	Open
C	Closed

Code	
L	Parallel
R	Series

Code	
Omit	No Paint
F	Black Paint Schwarz lackiert

Code	cm³/U cm³/tr cm³/giro	in³/rev
072	60 / 3.6 Series 119 / 7.2 Parallel	
108	88 / 5.4 Series 176 / 10.8 Parallel	
142	116 / 7.1 Series 232 / 14.2 Parallel	
176	144 / 8.8 Series 289 / 17.6 Parallel	
212	174 / 10.6 Series 348 / 21.2 Parallel	
258	211 / 12.9 Series 423 / 25.8 Parallel	

Consult factory for other available options, configurations ordering codes and lead times.

072 Series

3.6 cu in / rev

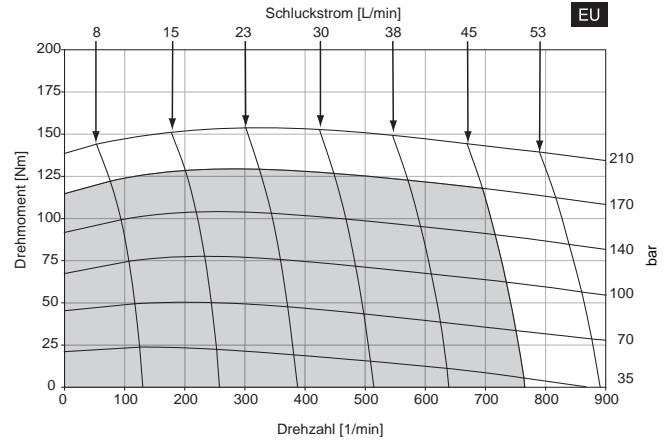
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500
<b>2</b>	242	481	718	941	1143	1313	
	128	127	119	107	88	70	
<b>4</b>	240	476	695	961	1193	1399	1574
	257	256	255	239	219	194	157
<b>6</b>	217	449	697	947	1189	1420	1606
	385	384	382	378	357	329	289
<b>8</b>	187	421	670	910	1155	1384	1610
	513	512	513	511	492	467	418
<b>10</b>	139	372	618	867	1116	1361	1534
	642	640	641	638	628	599	553
<b>12</b>	74	307	553	818	1056	1275	1496
	770	770	768	768	756	708	671
<b>14</b>		240	486	754	994	1191	1448
		898	898	897	882	847	798

FLOW (GPM)

TORQUE (LB IN) 994  
SPEED (RPM) 882

59 cc / rev



Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

021 700.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskositäet von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

072 Parallel

7.2 cu in / rev

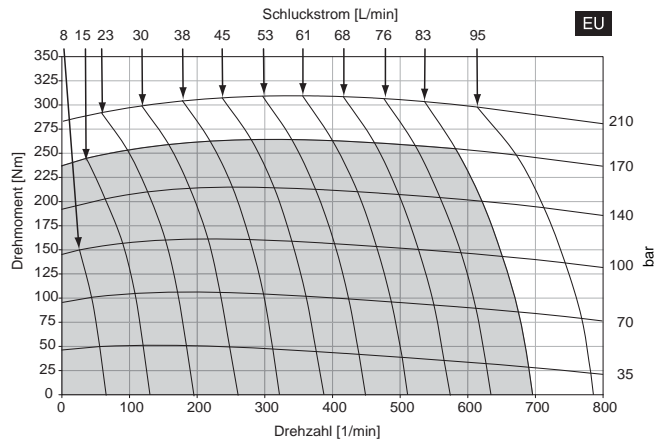
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500
<b>2</b>	441 63	889 59	1272 48	1650 29			
<b>4</b>	481 128	966 125	1403 121	1824 104	2163 81		
<b>6</b>	477 192	957 187	1401 181	1813 159	2186 121	2485 67	
<b>8</b>	464 257	964 251	1428 244	1850 212	2249 161	2578 90	
<b>10</b>	437 321	941 320	1427 316	1836 283	2243 240	2620 178	2968 115
<b>12</b>	419 385	913 382	1401 377	1833 353	2229 309	2589 249	2960 174
<b>14</b>	405 449	881 448	1384 444	1824 420	2220 372	2582 300	2952 235
<b>16</b>	395 513	858 510	1363 503	1801 485	2192 438	2571 356	2940 280
<b>18</b>	381 577	821 576	1327 573	1769 553	2183 495	2520 414	2931 334
<b>20</b>	369 642	799 642	1308 641	1772 616	2146 578	2513 507	2904 405
<b>22</b>	350 706	779 706	1272 705	1742 678	2114 608	2503 534	2884 452
<b>25</b>		710 802	1169 801	1604 770	1997 691	2314 606	2647 513
<b>30</b>		653 962	1066 962	1444 924	1776 830	2097 728	2366 616

FLOW (GPM)

TORQUE (LB IN) 2647  
SPEED (RPM) 513

118 cc / rev



Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F) Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

021 700.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

108 Series

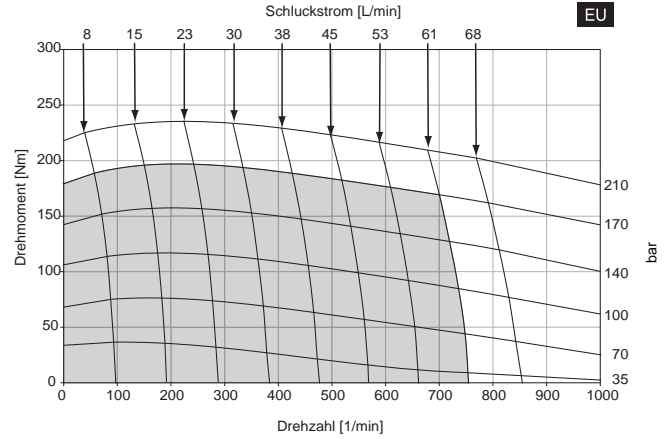
5.4 cu in / rev

88 cc / rev

PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500
<b>2</b>	366 86	727 84	1084 80	1431 74	1740 62	2036 52	
<b>4</b>	361 171	725 171	1071 170	1462 163	1816 150	2122 135	2424 110
<b>6</b>	329 257	690 256	1066 255	1443 252	1812 242	2159 224	2455 200
<b>8</b>	289 342	654 341	1029 342	1395 340	1764 330	2118 317	2463 288
<b>10</b>	229 428	593 427	968 427	1337 425	1712 419	2078 406	2375 379
<b>12</b>	151 513	509 513	882 512	1271 511	1636 505	1979 481	2324 459
<b>14</b>	77 599	426 599	800 598	1194 596	1552 588	1874 571	2253 547
<b>16</b>	40 684	342 684	720 683	1133 680	1469 671	1790 649	2146 656
<b>18</b>		259 769	627 769	1031 765	1339 755	1642 738	1961 731
<b>20</b>			536 855	858 850	1139 845	1407 817	1678 788
<b>22</b>			452 940	775 935	1031 930	1277 899	1532 867

FLOW (GPM)



TORQUE (LB IN) 1678  
SPEED (RPM) 788

Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

021 700.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskositäet von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

108 Parallel

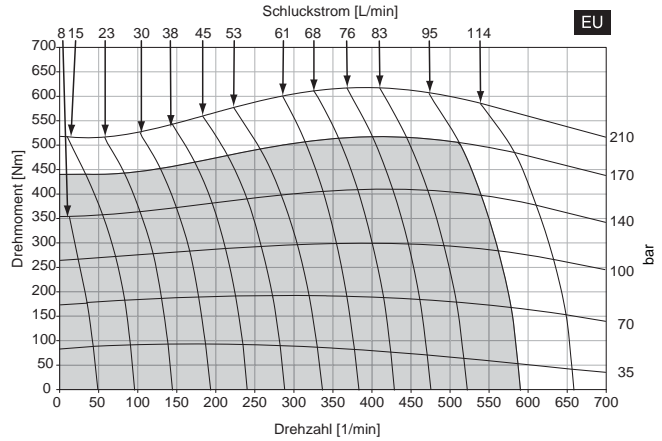
10.8 cu in / rev

PRESSURE (PSID)

177 cc / rev

	500	1000	1500	2000	2500	3000	3500
<b>2</b>	683 42	1366 40	1970 33				
<b>4</b>	729 85	1455 83	2140 78	2809 65	3383 47		
<b>6</b>	728 128	1465 124	2150 120	2801 105	3399 76		
<b>8</b>	711 171	1469 168	2185 163	2856 142	3491 110		
<b>10</b>	678 214	1442 213	2182 211	2838 189	3482 159	4104 77	
<b>12</b>	651 257	1401 254	2150 252	2833 235	3456 205	4022 109	
<b>14</b>	630 299	1362 298	2104 295	2814 280	3445 246	4012 131	4614 75
<b>16</b>	611 342	1329 340	2095 335	2778 323	3408 290	3981 226	4598 151
<b>18</b>	587 385	1295 383	2051 379	2756 368	3364 333	3898 267	4519 184
<b>20</b>	565 428	1250 426	2013 425	2723 411	3335 382	3878 317	4482 236
<b>22</b>	539 469	1215 469	1962 467	2678 452	3295 409	3847 338	4451 257
<b>25</b>		1123 534	1834 532	2515 513	3108 464	3594 385	4309 290
<b>30</b>		1037 641	1693 639	2313 615	2828 557	3311 462	4151 379

FLOW (GPM)



TORQUE (LB IN) 4309  
SPEED (RPM) 290

Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

021 700.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

142 Series

7.1 cu in / rev

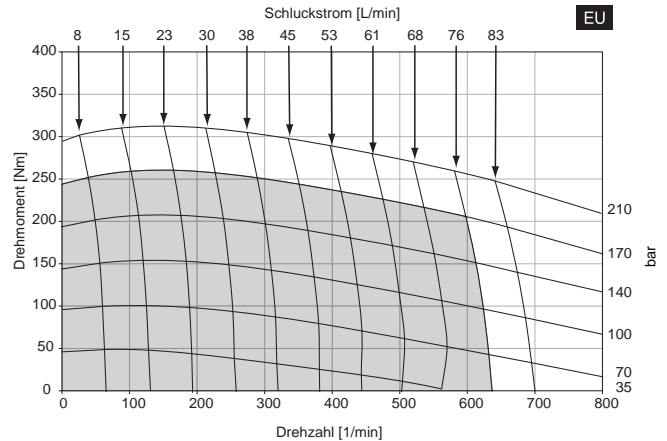
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500
<b>2</b>	484 65	964 64	1434 62	1907 58	2319 50	2759 43	
<b>4</b>	474 130	968 130	1444 130	1948 126	2410 118	2819 107	3264 87
<b>6</b>	438 195	930 195	1428 194	1926 192	2417 1987	2875 174	3285 158
<b>8</b>	391 260	889 260	1381 260	1870 259	2359 253	2838 245	3298 226
<b>10</b>	327 325	821 324	1324 324	1804 323	2298 320	2776 313	3215 295
<b>12</b>	249 390	728 390	1226 390	1725 388	2217 385	2664 372	3092 358
<b>14</b>	184 455	643 455	1141 454	1648 452	2116 447	2573 439	3063 427
<b>16</b>	101 520	532 520	1040 519	1558 516	2011 511	2474 501	2949 497
<b>18</b>		439 585	930 584	1441 581	1876 575	2325 564	2790 559
<b>20</b>		300 651	810 650	1275 647	1712 643	2125 629	2535 612
<b>22</b>		249 716	707 715	1169 711	1594 707	1983 692	2386 673

FLOW (GPM)

TORQUE (LB IN) 2535  
SPEED (RPM) 612

116 cc / rev



Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

021 700.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskositäet von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

142 Parallel

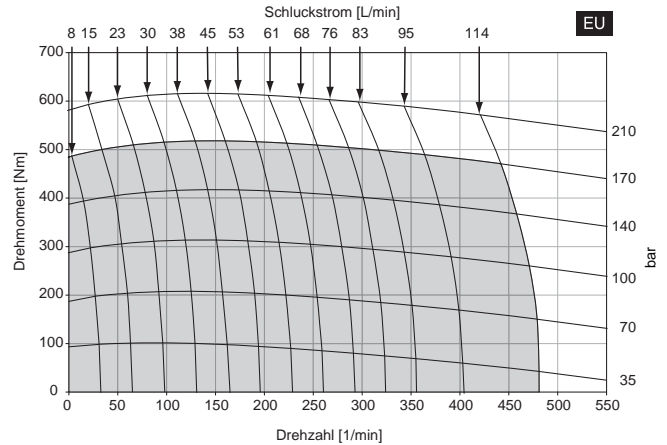
14.2 cu in / rev

PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3250
<b>2</b>	925 32	1836 31	2668 26	3467 16			
<b>4</b>	969 65	1920 63	2860 57	3784 46	4619 31		
<b>6</b>	971 97	1963 94	2886 90	3785 79	4619 55		
<b>8</b>	954 130	1962 128	2927 125	3858 108	4736 85		
<b>10</b>	918 163	1933 162	2921 160	3837 145	4724 121		
<b>12</b>	884 195	1882 193	2886 191	3829 179	4685 164		
<b>14</b>	857 228	1841 226	2831 224	3796 212	4672 191		
<b>16</b>	826 260	1799 259	2816 255	3747 246	4630 219	5261 164	
<b>18</b>	790 293	1754 290	2755 286	3703 280	4557 246	5207 197	5523 164
<b>20</b>	757 325	1709 323	2710 322	3661 313	4528 273	5166 226	5472 198
<b>22</b>	726 356	1655 356	2648 353	3603 344	4485 301	5099 245	5259 211
<b>25</b>	452 406	1547 405	2513 403	3441 390	4227 342	4861 278	5068 239
<b>30</b>	374 488	1436 486	2344 484	3225 468	3921 410	4577 334	4921 294

FLOW (GPM)

233 cc / rev



TORQUE (LB IN) 5068  
SPEED (RPM) 239

Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 15W40 d'une viscosité de 55 cSt (215 SUS) à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

021 700.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos técnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

176 Series

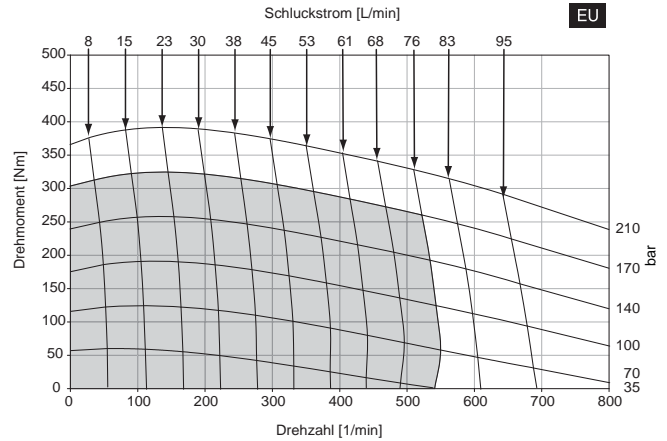
8.8 cu in / rev

PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500
<b>2</b>	604 52	1204 52	1788 50	2395 49	2913 43	3521 38	
<b>4</b>	588 105	1217 105	1834 105	2445 104	3022 98	3529 90	4142 73
<b>6</b>	548 158	1179 157	1803 157	2423 155	3039 153	3609 143	4142 131
<b>8</b>	497 210	1137 209	1748 210	2364 208	2973 206	3584 201	4162 188
<b>10</b>	436 263	1070 262	1704 261	2291 260	2906 259	3496 256	4098 244
<b>12</b>	371 315	976 315	1601 315	2204 313	2829 311	3441 305	4034 295
<b>14</b>	332 367	899 367	1525 366	2140 363	2717 361	3324 358	3922 353
<b>16</b>	186 420	762 419	1405 418	2017 416	2591 413	3214 410	3814 400
<b>18</b>		665 472	1284 471	1891 468	2468 465	3088 462	3721 450
<b>20</b>		553 524	1134 524	1762 522	2388 519	2975 514	3549 503
<b>22</b>		459 576	1017 576	1636 574	2272 571	2836 565	3417 554
<b>25</b>		81 655	721 655	1375 652	1968 648	2534 637	3113 624
<b>30</b>			284 786	958 782	1562 778	2097 765	2691 749

FLOW (GPM)

144 cc / rev



Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

021 700.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskositäet von 43,1 Centipoise bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.



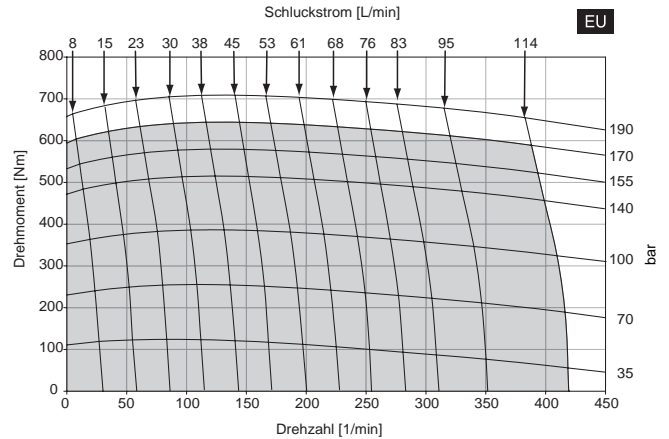
176 Parallel  
17.6 cu in / rev

PRESSURE (PSID)

	500	1000	1500	2000	2250	2500	2750
<b>2</b>	1179 26	2325 26	3403 22				
<b>4</b>	1214 52	2412 51	3601 44	4801 34			
<b>6</b>	1221 79	2479 75	3651 72	4818 64	5338 55		
<b>8</b>	1206 105	2468 104	3693 101	4908 88	5483 83	6050 70	
<b>10</b>	1172 131	2443 130	3685 129	4885 117	5464 108	6036 97	6532 93
<b>12</b>	1130 157	2381 156	3651 155	4874 144	5420 137	5980 125	6394 112
<b>14</b>	1097 184	2345 182	3613 180	4824 171	5408 164	5966 149	6363 130
<b>16</b>	1052 210	2294 209	3567 206	4762 198	5345 189	5924 175	6317 149
<b>18</b>	1003 236	2238 233	3487 229	4689 226	5275 216	5812 208	6255 184
<b>20</b>	955 262	2199 260	3437 258	4639 253	5231 240	5791 231	6209 205
<b>22</b>	922 286	2123 286	3366 283	4566 277	5200 264	5749 254	6147 225
<b>25</b>	832 328	2006 326	3240 324	4431 314	4954 302	5413 289	5816 256
<b>30</b>	689 393	1868 392	3050 389	4224 377	4651 362	5112 347	5546 307

FLOW (GPM)

288 cc / rev



TORQUE (LB IN) 5816  
SPEED (RPM) 256

Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F) Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 15W40 d'une viscosité de 55 cSt (215 SUS) à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

021 700.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos técnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

212 Series

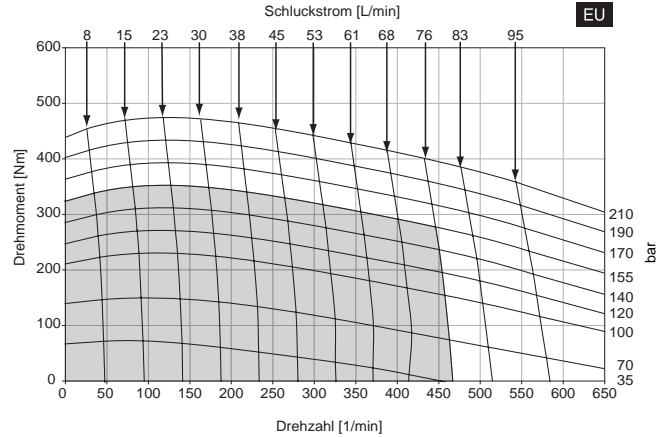
10.6 cu in / rev

PRESSURE (PSID)

	500	1000	1500	1750	2000	2250	2500	2750	3000	3250
<b>2</b>	731 44	1458 43	2162 42	2509 42	2901 40	3175 39	3532 36			
<b>4</b>	712 87	1468 87	2210 87	2562 87	2946 86	3274 84	3641 81	3955 80	4269 75	4623 71
<b>6</b>	665 131	1426 130	2175 130	2553 129	2920 128	3290 127	3658 127	4009 123	4351 119	4702 115
<b>8</b>	603 174	1371 174	2110 174	2473 173	2854 173	3229 171	3587 170	3961 170	4323 166	4674 161
<b>10</b>	527 218	1287 217	2053 217	2406 216	2767 215	3136 215	3508 214	3872 213	4223 212	
<b>12</b>	450 262	1182 261	1935 261	2315 260	2665 259	3040 258	3414 257	3775 256	4150 251	
<b>14</b>	390 305	1089 304	1844 303	2210 302	2588 301	2940 300	3291 299	3667 298	3948 293	
<b>16</b>	225 349	929 348	1703 347	2076 346	2443 346	2789 345	3149 343	3526 338	3846 335	
<b>18</b>		806 391	1559 391	1921 389	2300 389	2672 388	2995 384	3340 380	3644 377	
<b>20</b>		669 435	1377 435	1769 434	2128 433	2498 432	2741 427	2992 423	3239 418	
<b>22</b>		567 478	1244 478	1612 477	1994 476	2337 475	2657 470	2876 465	3113 460	
<b>25</b>		153 544	900 544	1244 543	1676 541	2037 540	2404 534	2830 528	3037 523	
<b>30</b>			398 653	732 651	1183 650	1534 648	1898 641	2366 641	2531 628	

FLOW (GPM)

174 cc / rev



Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskositäet von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

212 Parallel

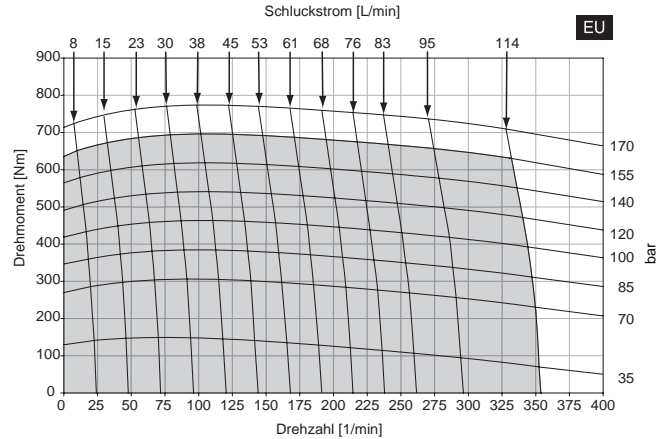
21.2 cu in / rev

347 cc / rev

PRESSURE (PSID)

	500	1000	1250	1500	1750	2000	2250	2500
<b>2</b>	1413 22	2789 21	3434 19	4057 18	4676 15	5276 11		
<b>4</b>	1455 44	2874 42	3580 39	4299 36	5036 34	5719 29		
<b>6</b>	1471 65	2970 63	3686 61	4380 60	5047 56	5777 52	6388 46	
<b>8</b>	1455 87	2964 86	3698 85	4429 84	5163 80	5877 73	6498 69	7170 47
<b>10</b>	1413 109	2938 108	3678 108	4429 107	5135 103	5869 98	6520 90	7187 65
<b>12</b>	1366 131	2871 129	3627 129	4390 128	5112 127	5845 120	6492 115	7069 105
<b>14</b>	1326 153	2827 151	3542 150	4256 149	5052 148	5785 143	6476 137	6984 122
<b>16</b>	1269 174	2767 173	3522 172	4241 171	5005 169	5718 165	6400 158	6900 139
<b>18</b>	1215 196	2699 194	3445 193	4207 191	4948 190	5643 188	6326 180	6833 157
<b>20</b>	1158 218	2656 216	3393 215	4153 213	4898 209	5587 210	6210 200	6790 174
<b>22</b>	1114 240	2572 238	3297 237	4068 236	4806 234	5493 230	6226 220	6740 192
<b>25</b>	1004 272	2439 271	3165 270	3897 269	4659 266	5347 261	5982 252	6647 218
<b>30</b>	831 327	2299 325	2973 324	3690 323	4393 319	5093 313	5709 302	6267 262

FLOW (GPM)



TORQUE (LB IN) 6647  
SPEED (RPM) 218

Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F) Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 15W40 d'une viscosité de 55 cSt (215 SUS) à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

021 700.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos técnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

258 Series

12.9 cu in / rev

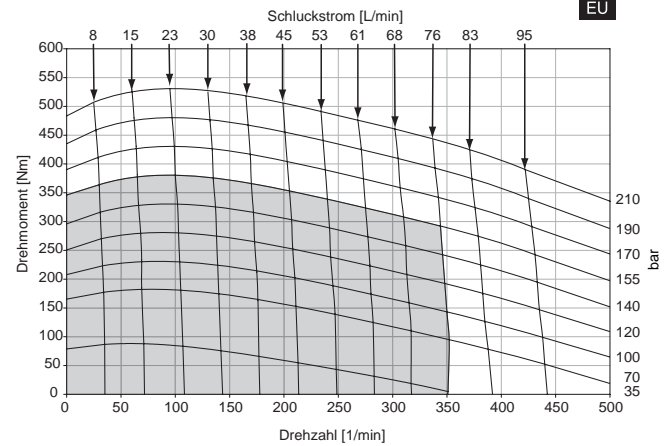
PRESSURE (PSID)

	500	1000	1500	1750	2000	2250	2500	2750	3000
<b>2</b>	905 36	1811 36	2673 35	3155 35	3613 33	3950 33	4414 31	4822 30	5226 26
<b>4</b>	882 72	1799 72	2692 71	3147 71	3585 70	4014 69	4440 66	4850 65	5287 62
<b>6</b>	834 107	1762 107	2645 106	3119 106	3560 104	4000 104	4440 103	4856 101	5318 98
<b>8</b>	757 143	1675 143	2593 142	3036 141	3507 140	3940 139	4399 138	4839 137	5292 135
<b>10</b>	652 179	1556 178	2504 177	2957 176	3400 175	3857 174	4306 173	4771 172	5201 171
<b>12</b>	565 215	1472 213	2390 212	2867 210	3289 208	3737 208	4188 207	4635 207	5072 205
<b>14</b>	423 251	1357 249	2279 249	2731 248	3199 245	3668 243	4096 243	4517 241	4957 239
<b>16</b>	278 287	1187 286	2125 286	2587 285	3043 284	3525 283	3973 283		
<b>18</b>		1006 321	1962 321	2440 319	2911 319	3349 318			
<b>20</b>		827 357	1728 357	2264 356	2620 355	3003 354			
<b>22</b>		758 393	1614 393	2037 392	2546 390	2975 390			
<b>25</b>		466 446	1260 446	1681 446	2135 445	2624 443			
<b>30</b>			773 537	1099 536	1585 535	2079 534			

FLOW (GPM)

TORQUE (LB IN) 1099  
SPEED (RPM) 536

211 cc / rev



Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskositäet von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

258 Parallel

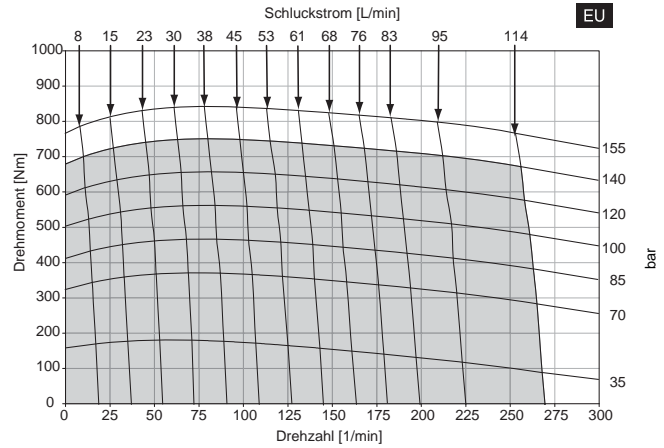
25.8 cu in / rev

PRESSURE (PSID)

	500	1000	1250	1500	1750	2000	2250
<b>2</b>	1679 18	3334 15	4055 14	4724 12			
<b>4</b>	1731 36	3474 34	4224 32	5038 30	5979 27	6636 25	
<b>6</b>	1790 54	3531 53	4419 51	5235 48	6072 45	6898 42	7557 38
<b>8</b>	1782 71	3564 71	4435 71	5291 68	6115 66	6981 60	7715 56
<b>10</b>	1727 89	3552 89	4424 88	5340 87	6209 84	7063 81	7853 76
<b>12</b>	1684 107	3511 107	4424 106	5303 104	6187 103	6981 100	7715 97
<b>14</b>	1636 125	3457 124	4373 124	5279 123	6108 123	6915 120	7650 118
<b>16</b>	1556 143	3388 143	4312 143	5223 142	6050 140	6866 138	7594 135
<b>18</b>	1515 161	3301 161	4240 160	5149 160	6022 159	6841 155	7557 151
<b>20</b>	1445 179	3273 179	4193 178	5118 178	5979 178	6800 172	7502 168
<b>22</b>	1378 197	3203 197	4060 196	5020 196	5878 195	6652 189	7391 185
<b>25</b>	1234 224	3084 224	3998 223	4866 222	5763 222	6553 215	7354 210
<b>30</b>	1018 268	3043 268	3798 267	4570 266	5468 266	6225 258	6975 252

FLOW (GPM)

423 cc / rev



TORQUE (LB IN) 7354  
SPEED (RPM) 210

Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F) Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

021 700.indd, js

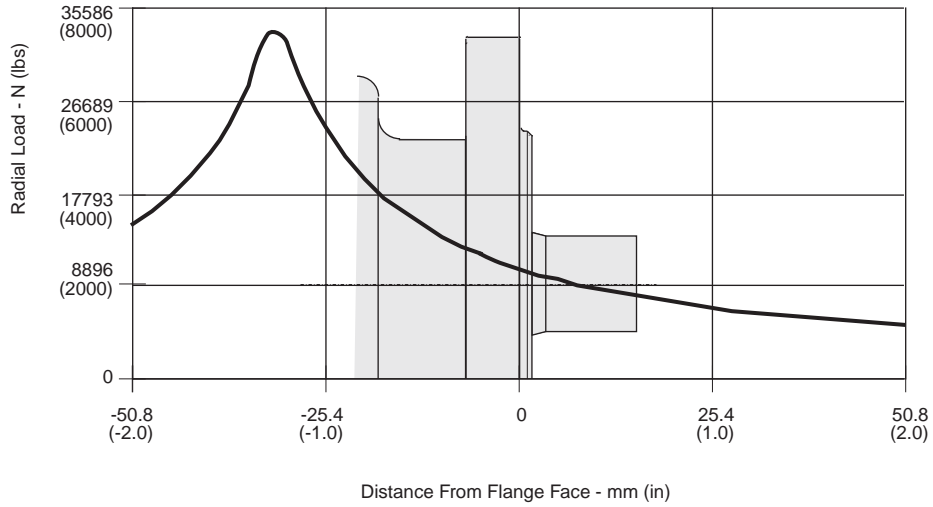
Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskositat von 43,1 Cst beo 54°C. Geringfuegige Abweichungen von den Katalogerten sond moeglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipcos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

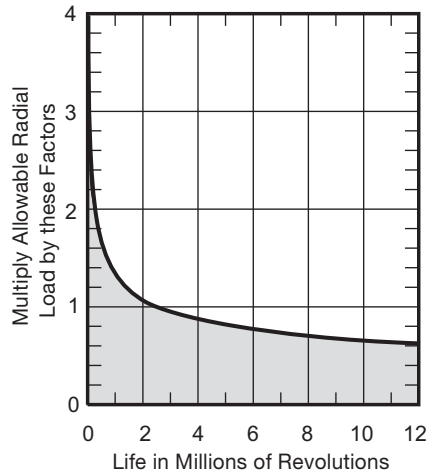


700 Series Roller Bearing Allowable Radial Load Curve  
 Chart A



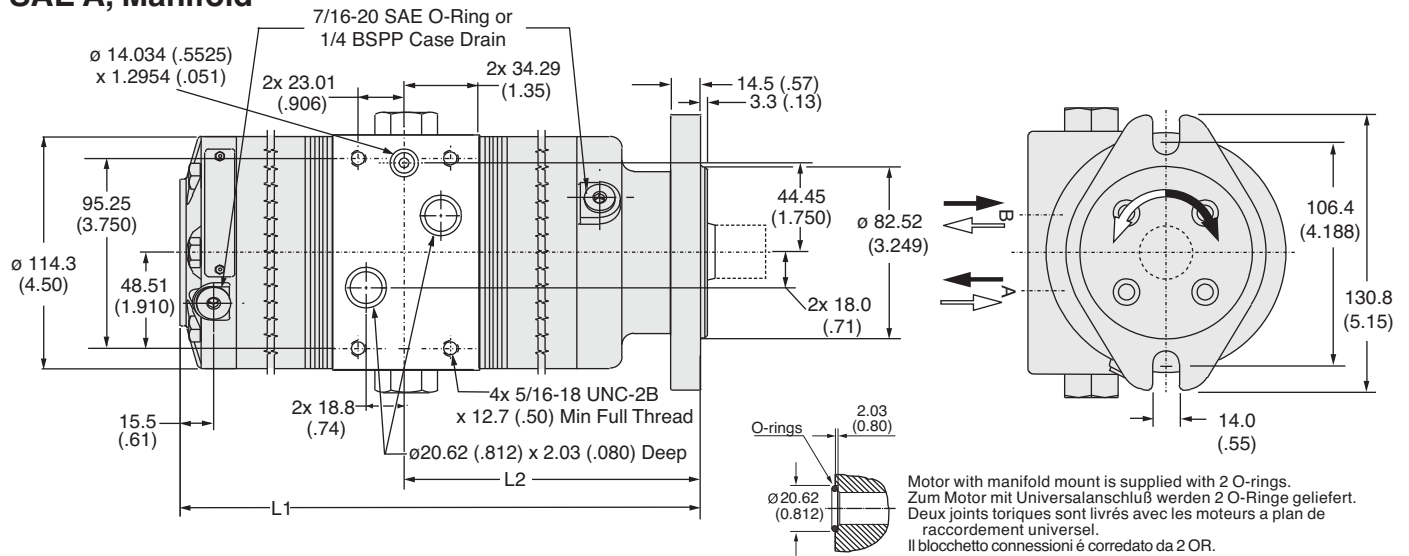
The allowable side load curve is based on  $L_{10}$  bearing life of  $2.5 \times 10^6$  revolutions.  
 Die zulässige radiale Wellenbelastung bezieht sich auf die Lager-Lebensdauer  $2.5 \times 10^6$  Umdrehungen.  
 L'effort radial admissible sur l'arbre depend a une duree de vie  $2.5 \times 10^6$  de rotation.  
 La curva de carga lateral admisible se basa en vida util de cojinete de  $2.5 \times 10^6$  revoluciones.

Bearing Life Factor Curve  
 Chart B



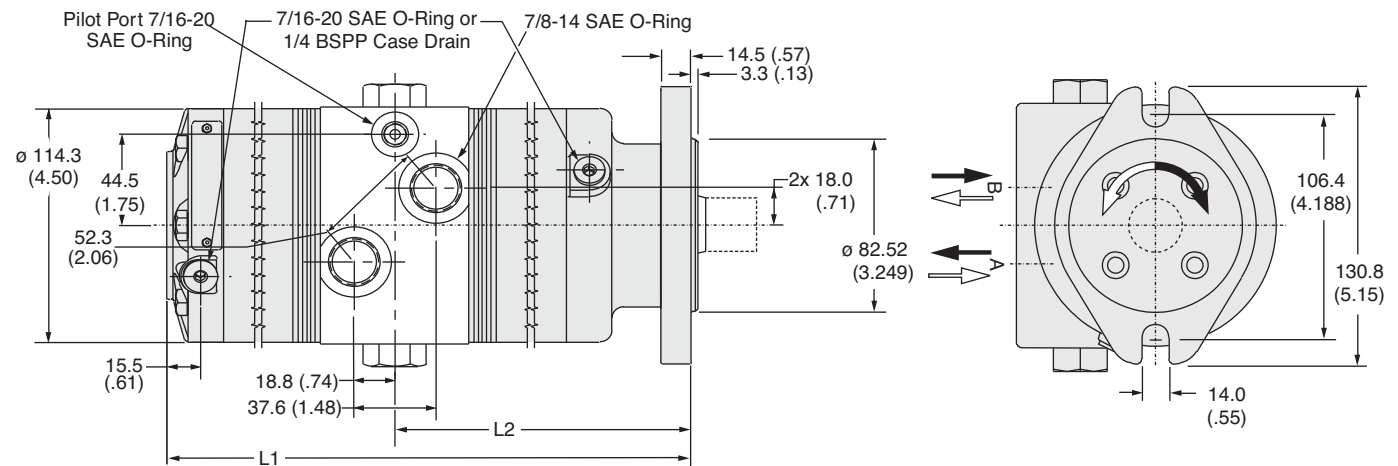
Note:  
 Side load should be considered a vector sum of all imposed loads.

**Code: AM**  
**SAE A, Manifold**



Code AM	072	108	142	176	212	258
Weight/Gewicht kg	15.9	16.1	16.2	16.4	16.6	16.8
Poids/Peso (lb)	(35.0)	(35.4)	(35.7)	(36.1)	(36.5)	(37.0)
Length "L1" mm	214.6	224.3	233.7	243.3	253.2	266.0
	"L1" (in)	(8.45)	(8.83)	(9.20)	(9.58)	(10.47)
"L2" mm	123.2	128.0	132.9	137.7	142.5	148.8
	"L2" (in)	(4.85)	(5.04)	(5.23)	(5.42)	(5.86)

**Code: AS**  
**SAE A, 7/8"-14 SAE**



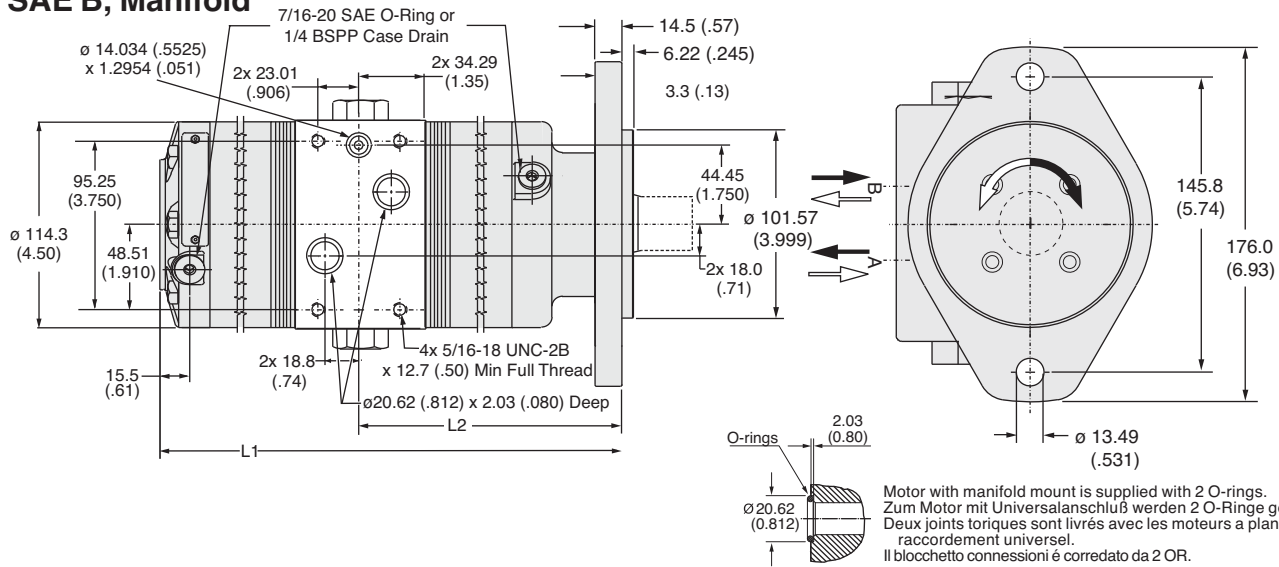
Code AS	072	108	142	176	212	258
Weight/Gewicht kg	15.9	16.1	16.2	16.4	16.6	16.8
Poids/Peso (lb)	(35.0)	(35.4)	(35.7)	(36.1)	(36.5)	(37.0)
Length "L1" mm	214.6	224.3	233.7	243.3	253.2	266.0
	"L1" (in)	(8.45)	(8.83)	(9.20)	(9.58)	(10.47)
"L2" mm	123.2	128.0	132.9	137.7	142.5	148.8
	"L2" (in)	(4.85)	(5.04)	(5.23)	(5.42)	(5.86)

English equivalents for metric specifications are shown in ( ).

021 700.indd, js

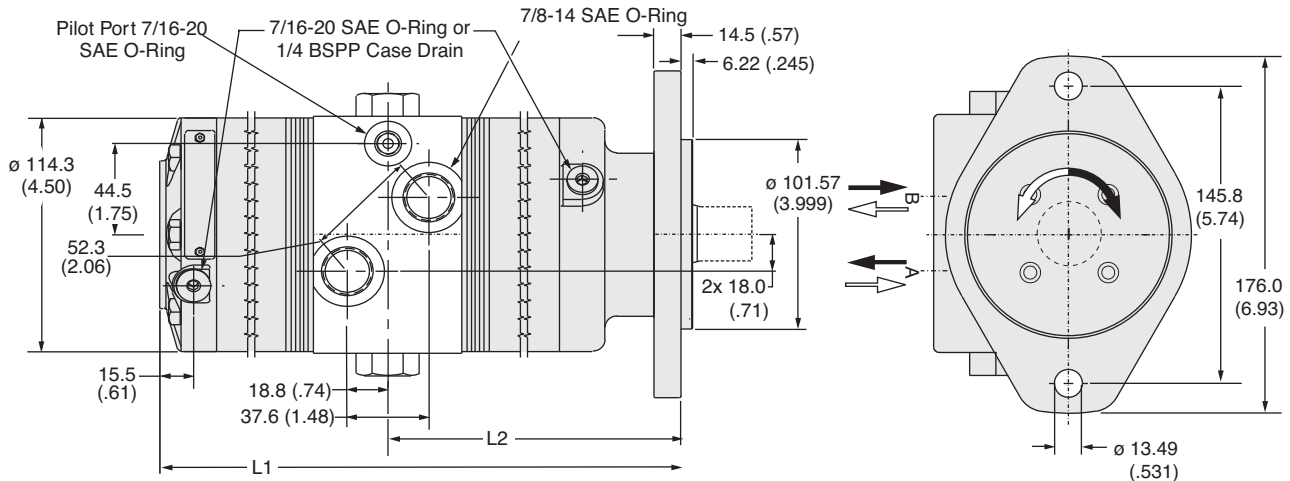


**Code: BM**  
**SAE B, Manifold**



Code BM	072	108	142	176	212	258
Weight/Gewicht kg	15.9	16.1	16.2	16.4	16.6	16.8
Poids/Peso (lb)	(35.0)	(35.4)	(35.7)	(36.1)	(36.5)	(37.0)
Length "L1" mm	214.6	224.3	233.7	243.3	253.2	266.0
	"L1" (in)	(8.45)	(8.83)	(9.20)	(9.58)	(10.47)
"L2" mm	123.2	128.0	132.9	137.7	142.5	148.8
	"L2" (in)	(4.85)	(5.04)	(5.23)	(5.42)	(5.86)

**Code: BS**  
**SAE B, 7/8"-14 SAE**

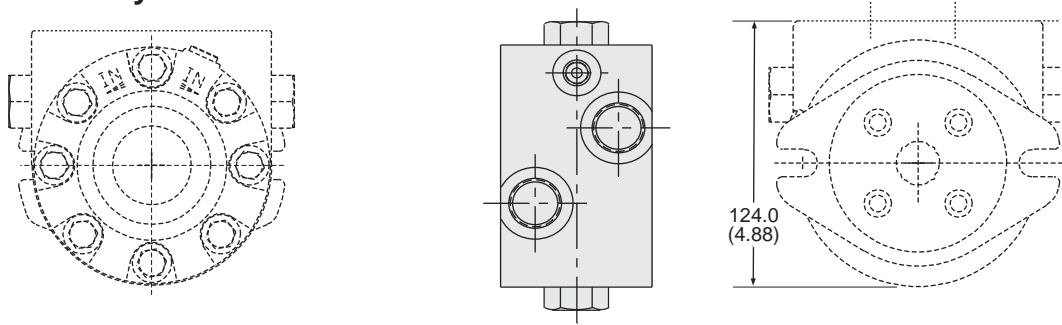


Code BS	072	108	142	176	212	258
Weight/Gewicht kg	15.9	16.1	16.2	16.4	16.6	16.8
Poids/Peso (lb)	(35.0)	(35.4)	(35.7)	(36.1)	(36.5)	(37.0)
Length "L1" mm	214.6	224.3	233.7	243.3	253.2	266.0
	"L1" (in)	(8.45)	(8.83)	(9.20)	(9.58)	(10.47)
"L2" mm	123.2	128.0	132.9	137.7	142.5	148.8
	"L2" (in)	(4.85)	(5.04)	(5.23)	(5.42)	(5.86)

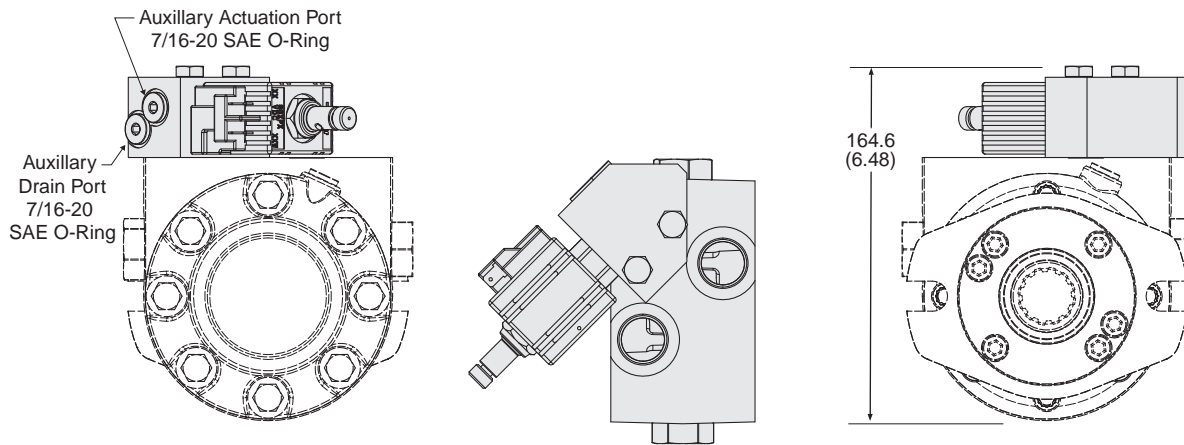
English equivalents for metric specifications are shown in ( ).

021 700.indd, js

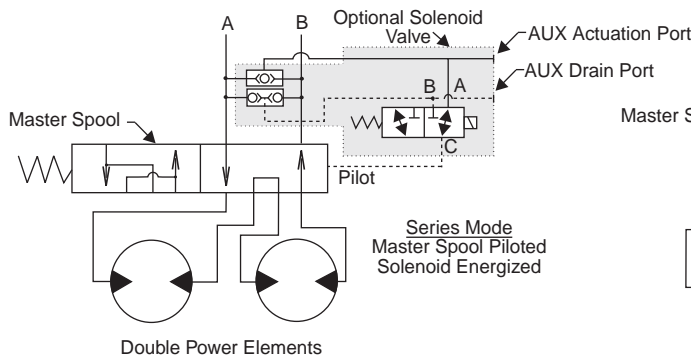
**Code: P**  
**Remotely Piloted**



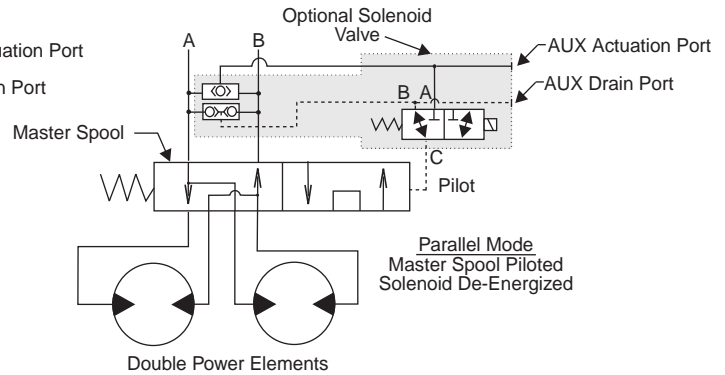
**Code: E, W**  
**Solenoid Actuated**



**High Speed Series Mode**



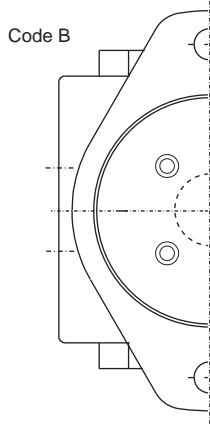
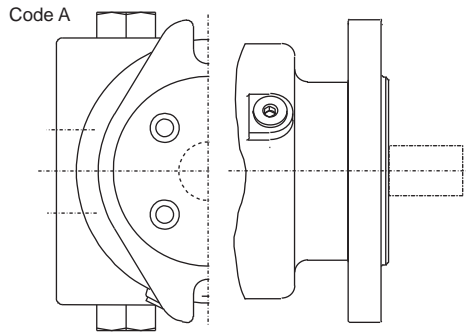
**High Torque Parallel Mode**



Add .5 kg (1.1 lb) for this option.

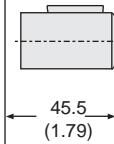
English equivalents for metric specifications are shown in ( ).

021 700.indd, js



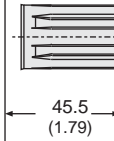
**Code: 0**

**1" Keyed**



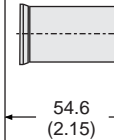
**Code: 1**

**1" 6B Spline**



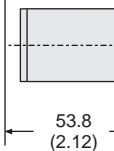
**Code: 2**

**25mm Keyed**



**Code: 3**

**1-1/4" Keyed**

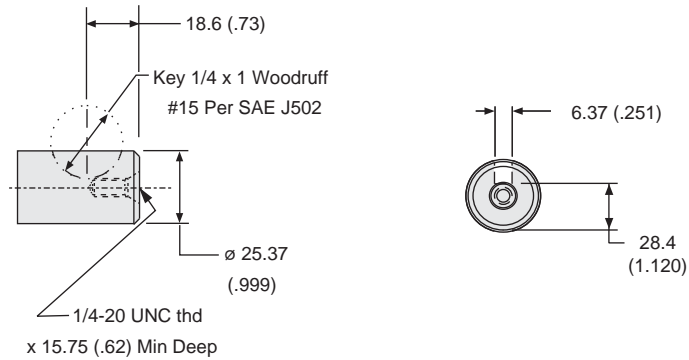


English equivalents for metric specifications are shown in ( ).

021 700.indd, js

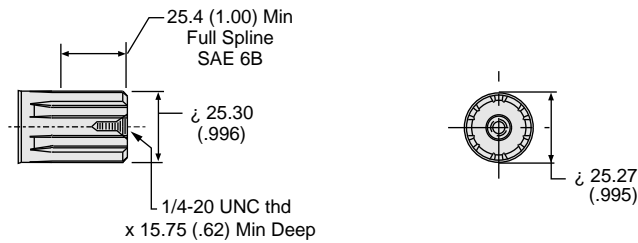
Code: 0

1" Keyed



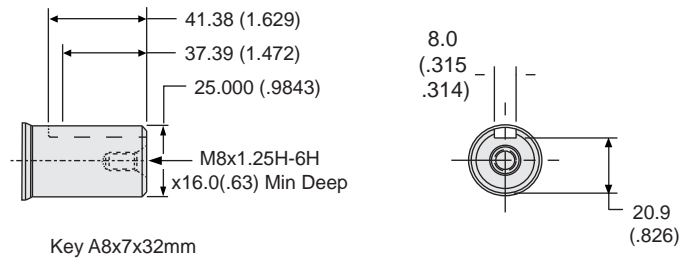
Code: 1

1" 6B Spline



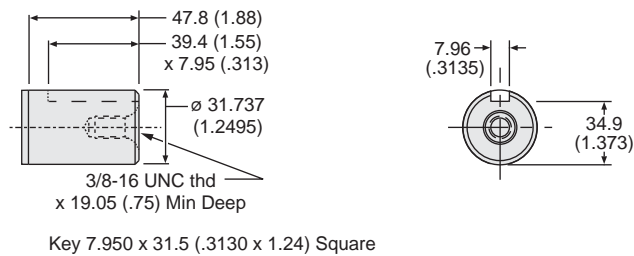
Code: 2

25mm Keyed



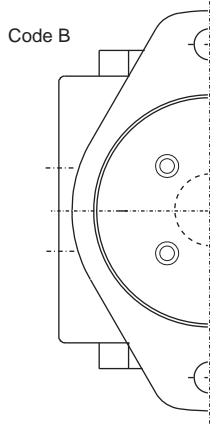
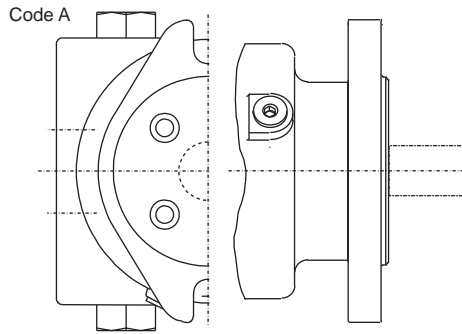
Code: 3

1-1/4" Keyed



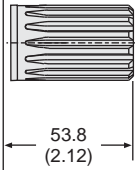
English equivalents for metric specifications are shown in ( ).

021 700.indd, js



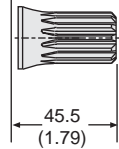
**Code: 5**

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



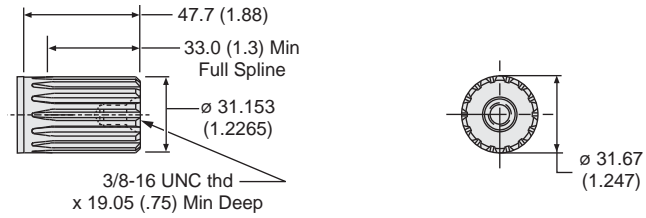
**Code: 6**

**7/8"-13 Tooth Spline**



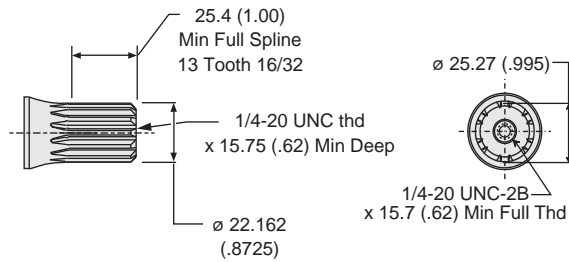
**Code: 5**

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



**Code: 6**

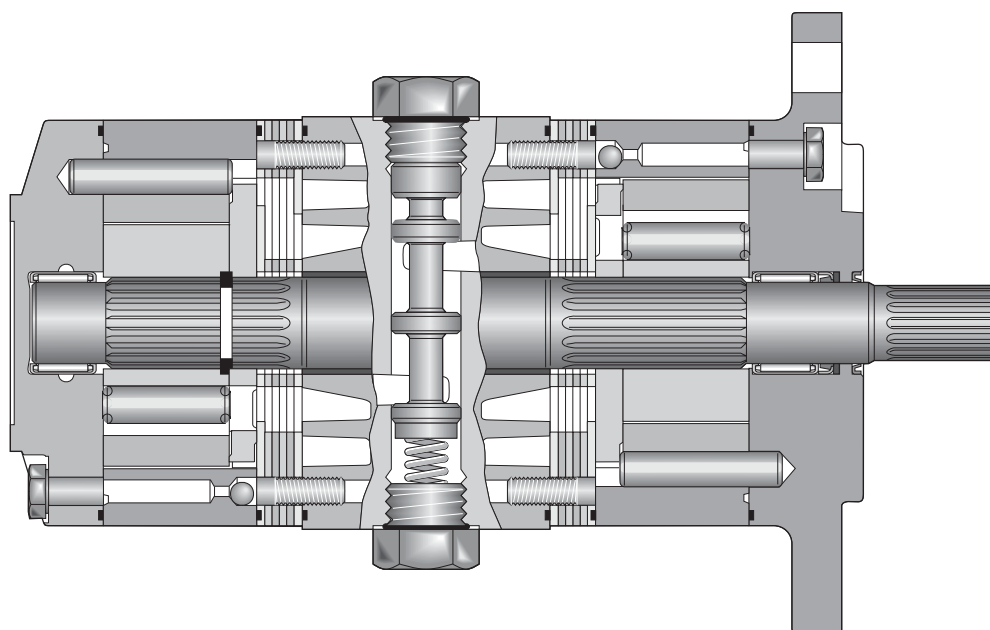
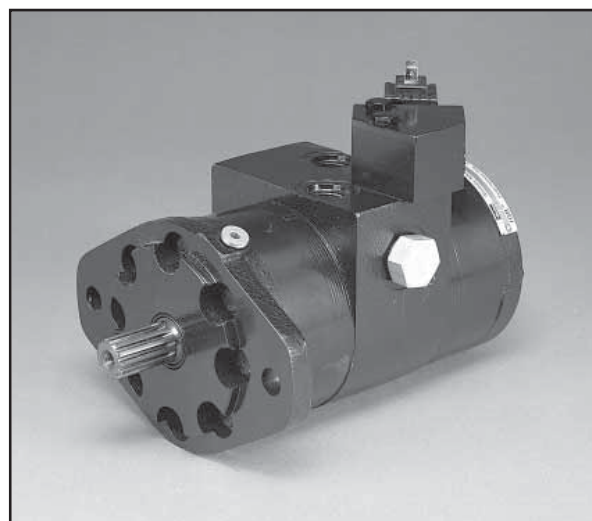
**7/8"-13 Tooth Spline**

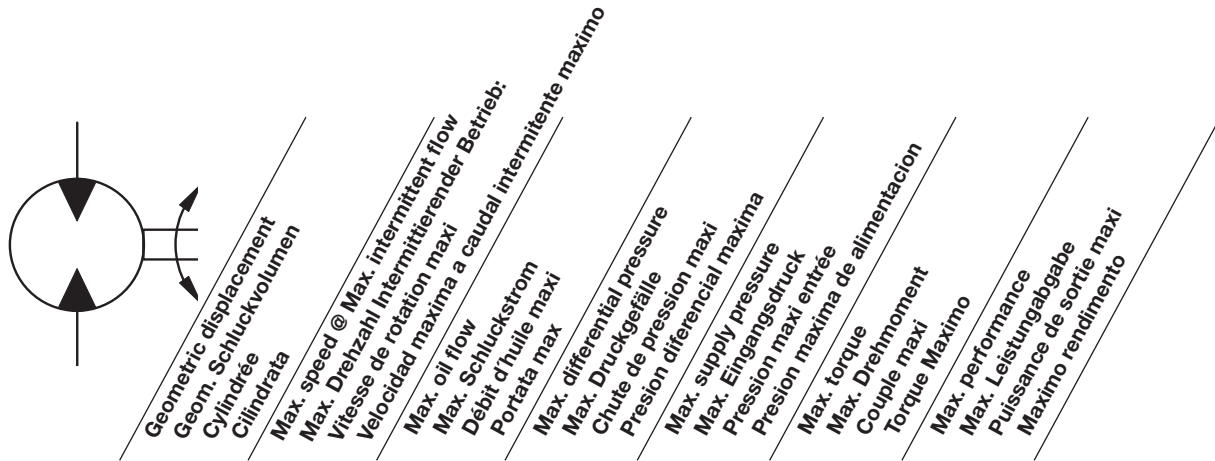


6 Displacements	Series	(3.6 – 12.9 in <sup>3</sup> /rev)	
6 Schluckvolumen		<b>59...211 cm<sup>3</sup>/rev</b>	
6 Cylindrée	Parallel	(7.2 – 25.8 in <sup>3</sup> /rev)	
6 Despazamientos		<b>118...423 cm<sup>3</sup>/rev</b>	
		<b>Cont</b>	<b>Int</b>
Maximum Pressure	Series	(2500 psid)	(3000 psid)
Eingangsdruk		<b>...170 bar</b>	<b>...210 bar</b>
Pression entrée	Parallel	(2000 psid)	(2500 psid)
Presion Maxima		<b>...140 bar</b>	<b>...170 bar</b>
Maximum Oil Flow	Series	(20 gpm)	
Schluckstrom		<b>...76 lpm</b>	
Débit d'huile	Parallel	(30 gpm)	
Caudal Maximo de Aceite		<b>...114 lpm</b>	
Maximum Speed	Series	<b>890 rpm</b>	
Drehzahl	Parallel	<b>782 rpm</b>	
Vitesse de rotation			
Velocidad Maxima			
		<b>Cont</b>	<b>Int</b>
Maximum Torque	Series	(3125 lb in)	(3844 lb in)
Max Drehmoment		<b>...353 Nm</b>	<b>...434 Nm</b>
Couple	Parallel	(3735 lb in)	(4666 lb in)
Torque Maximo		<b>...422 Nm</b>	<b>...527 Nm</b>
Maximum Side Load at Key	Series	(700 lb)	
Seitenlast		<b>... 3114 N</b>	
Charges latérales			
Carga Maxima Lateral			

### High Efficiency, High Flow Two-Speed Motor

Parker's unique two-speed motor utilizes two separate IGR™ power elements on a common shaft. An integral selector valve shifts between high torque, low speed (parallel) operation and high speed, low torque (series) mode in a ratio of 2:1. The use of two power elements eliminates the deficiencies of traditional, single power element designs. In the high torque mode, the motor delivers twice the torque and half the speed that it does in the high speed mode. The selector valve can be open or closed center and may be actuated by an external pilot or optional solenoid valve. The open center selector valve can be shifted "on the fly" while the motor shaft is rotating under load. The selector valve is spring loaded to return to its pilot-pressure-off position. Normal mode of operation is field changeable and can be selected as series or parallel. Pilot pressure must be 300 psi higher than motor case or outlet pressure and may be as high as typical hydraulic system operating pressure.





Motor Series	cm <sup>3</sup> /rev in <sup>3</sup> /rev	int rev/min	cont / int l/min g/min	cont / int bar psid	max bar psig	cont / int Nm lb-in	max KW HP
<b>700 Series</b>							
<b>072 Series</b>	59 3.6	890	45.4 53.0 12 14	170 210 2500 3000	276 4000	129 154 1146 1366	8.6 11.5
<b>072 Parallel</b>	118 7.2	782	83.3 94.6 22 25	170 210 2500 3000	276 4000	264 309 2338 2739	15.5 20.8
<b>108 Series</b>	88 5.4	843	60.6 68.1 16 18	170 210 2500 3000	276 4000	197 236 1743 2088	12.4 16.6
<b>108 Parallel</b>	177 10.8	656	94.6 113.5 30 30	140 170 2000 2500	276 4000	422 527 3735 4666	22.2 29.8
<b>142 Series</b>	116 7.1	695	75.7 83.3 20 22	170 210 2500 3000	276 4000	260 313 2306 2769	12.8 17.2
<b>142 Parallel</b>	233 14.2	481	113.5 113.5 30 30	100 140 1500 2000	276 4000	314 418 2780 3699	12.8 17.2
<b>176 Series</b>	144 8.8	688	75.7 94.6 20 25	170 210 2500 3000	276 4000	325 392 2818 3472	14.1 19.0
<b>176 Parallel</b>	288 17.6	419	113.5 113.5 30 30	85 100 1250 1500	276 4000	321 386 2843 3423	11.1 14.9
<b>212 Series</b>	174 10.6	580	75.7 94.6 20 25	155 190 2250 2750	276 4000	353 434 3125 3844	12.9 17.3
<b>212 Parallel</b>	347 21.2	352	113.5 113.5 30 30	85 100 1250 1500	276 4000	385 464 3407 4107	11.3 15.2
<b>258 Series</b>	211 12.9	440	68.1 94.6 18 25	120 155 1750 2250	276 4000	332 431 2926 3816	8.8 11.8
<b>258 Parallel</b>	423 25.8	268	113.5 113.5 30 30	70 85 1000 1250	276 4000	371 467 3285 4134	7.8 10.5

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

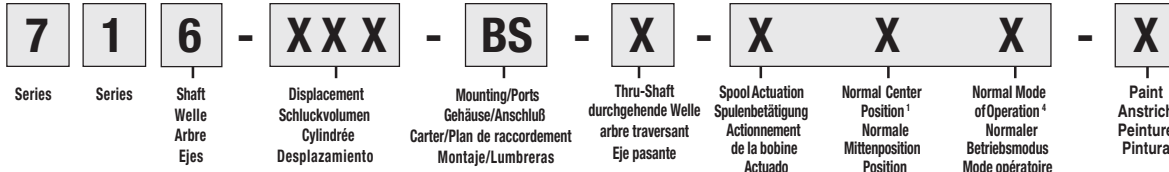
Les données sur les performances sont basées sur des tests utilisant de l'huile 15W40 d'une viscosité de 55 cSt (215 SUS) à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

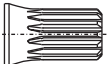
Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogwerten sind möglich.

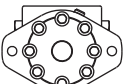
Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

\* Intermittent operation rating applies to 10% of every minute.  
Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.



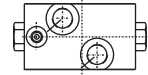
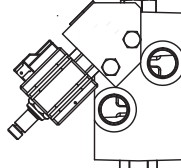
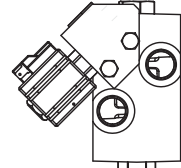


<b>Code</b>	
6	7/8"-13 Tooth Spline 

<b>Code</b>	
BS	SAE B 2-Bolt, 7/8"-14 SAE 

Code	cm <sup>3</sup> /U cm <sup>3</sup> /tr cm <sup>3</sup> /giro	in <sup>3</sup> /rev
072	60 / 119	3.6 Series / 7.2 Parallel
108	88 / 176	5.4 Series / 10.8 Parallel
142	116 / 232	7.1 Series / 14.2 Parallel
176	144 / 289	8.8 Series / 17.6 Parallel
212	174 / 348	10.6 Series / 21.2 Parallel
258	211 / 423	12.9 Series / 25.8 Parallel

<b>Code</b>	
0	No Thru Shaft
1	Thru Shaft
E	Encoder Mount

<b>Code</b>	
P	Remotely Piloted 
E <sup>1</sup>	Solenoid Actuated with Manual Override 
W <sup>1</sup>	Solenoid Actuated without Manual Override 

<sup>1</sup> Standard Solenoid is 12V DC with 1/4" Spade Connections. Standardausführung ist ein 12-V-Gleichstrom-Solenoid mit 1/4-Zoll-Gabelschuhanschlüssen. Le solénoïde standardisé est du type 12 Vcc avec cosses à fourche de 1/4". La solenoïde estándar es para 12 VCC, con conectores tipo bayoneta de 1/4".

<b>Code</b>	
O	Open
C	Closed

<b>Code</b>	
L	Parallel
R	Series

<b>Code</b>	
Omit	No Paint
F	Black Paint Schwarz lackiert

Consult factory for other available options, configurations ordering codes and lead times.

072 Series

3.6 cu in / rev

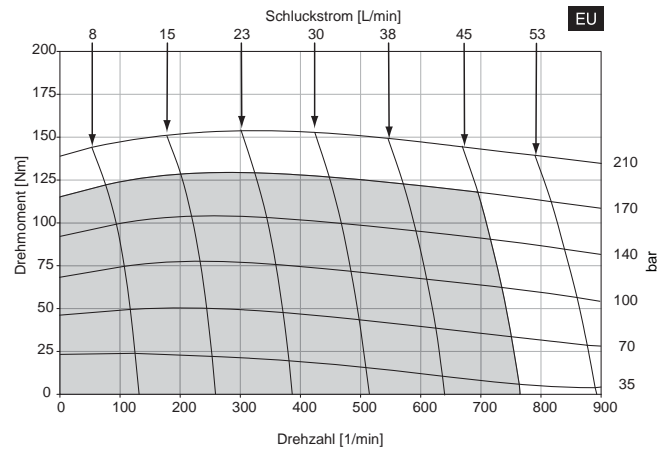
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500
<b>2</b>	242	481	718	941	1143	1313	
	<b>128</b>	<b>127</b>	<b>119</b>	<b>107</b>	<b>88</b>	<b>70</b>	
<b>4</b>	240	476	695	961	1193	1399	1574
	<b>257</b>	<b>256</b>	<b>255</b>	<b>239</b>	<b>219</b>	<b>194</b>	<b>157</b>
<b>6</b>	217	449	697	947	1189	1420	1606
	<b>385</b>	<b>384</b>	<b>382</b>	<b>378</b>	<b>357</b>	<b>329</b>	<b>289</b>
<b>8</b>	187	421	670	910	1155	1384	1610
	<b>513</b>	<b>512</b>	<b>513</b>	<b>511</b>	<b>492</b>	<b>467</b>	<b>418</b>
<b>10</b>	139	372	618	867	1116	1361	1534
	<b>642</b>	<b>640</b>	<b>641</b>	<b>638</b>	<b>628</b>	<b>599</b>	<b>553</b>
<b>12</b>	74	307	553	818	1056	1275	1496
	<b>770</b>	<b>770</b>	<b>768</b>	<b>768</b>	<b>756</b>	<b>708</b>	<b>671</b>
<b>14</b>		240	486	754	994	1191	1448
		<b>898</b>	<b>898</b>	<b>897</b>	<b>882</b>	<b>847</b>	<b>798</b>

FLOW (GPM)

TORQUE (LB IN) 994  
SPEED (RPM) 882

59 cc / rev



Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 15W40 d'une viscosité de 55 cSt (215 SUS) à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

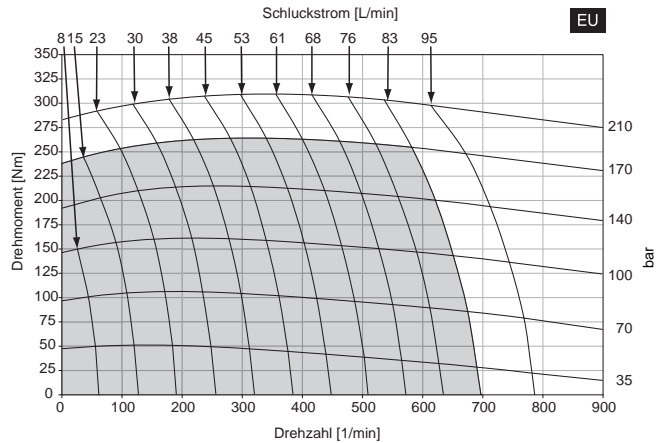
072 Parallel

7.2 cu in / rev

PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500
<b>2</b>	441	889	1272	1650			
	<b>63</b>	<b>59</b>	<b>48</b>	<b>29</b>			
<b>4</b>	481	966	1403	1824	2163		
	<b>128</b>	<b>125</b>	<b>121</b>	<b>104</b>	<b>81</b>		
<b>6</b>	477	957	1401	1813	2186	2485	
	<b>192</b>	<b>187</b>	<b>181</b>	<b>159</b>	<b>121</b>	<b>67</b>	
<b>8</b>	464	964	1428	1850	2249	2578	
	<b>257</b>	<b>251</b>	<b>244</b>	<b>212</b>	<b>161</b>	<b>90</b>	
<b>10</b>	437	941	1427	1836	2243	2620	2968
	<b>321</b>	<b>320</b>	<b>316</b>	<b>283</b>	<b>240</b>	<b>178</b>	<b>115</b>
<b>12</b>	419	913	1401	1833	2229	2589	2960
	<b>385</b>	<b>382</b>	<b>377</b>	<b>353</b>	<b>309</b>	<b>249</b>	<b>174</b>
<b>14</b>	405	881	1384	1824	2220	2582	2952
	<b>449</b>	<b>448</b>	<b>444</b>	<b>420</b>	<b>372</b>	<b>300</b>	<b>235</b>
<b>16</b>	395	858	1363	1801	2192	2571	2940
	<b>513</b>	<b>510</b>	<b>503</b>	<b>485</b>	<b>438</b>	<b>356</b>	<b>280</b>
<b>18</b>	381	821	1327	1769	2183	2520	2931
	<b>577</b>	<b>576</b>	<b>573</b>	<b>553</b>	<b>495</b>	<b>414</b>	<b>334</b>
<b>20</b>	369	799	1308	1772	2146	2513	2904
	<b>642</b>	<b>642</b>	<b>641</b>	<b>616</b>	<b>578</b>	<b>507</b>	<b>405</b>
<b>22</b>	350	779	1272	1742	2114	2503	2884
	<b>706</b>	<b>706</b>	<b>705</b>	<b>678</b>	<b>608</b>	<b>534</b>	<b>452</b>
<b>25</b>		710	1169	1604	1997	2314	2647
		<b>802</b>	<b>801</b>	<b>770</b>	<b>691</b>	<b>606</b>	<b>513</b>

118 cc / rev



FLOW (GPM)

TORQUE (LB IN) 2647  
SPEED (RPM) 513

Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 15W40 d'une viscosité de 55 cSt (215 SUS) à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

108 Series

5.4 cu in / rev

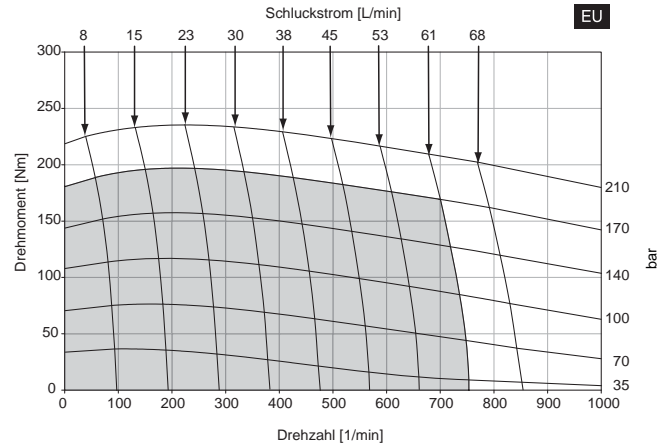
PRESSURE (PSID)

	500	1000	1500	2000	2500	3000	3500
<b>2</b>	366 86	727 84	1084 80	1431 74	1740 62	2036 52	
<b>4</b>	361 171	725 171	1071 170	1462 163	1816 150	2122 135	2424 110
<b>6</b>	329 257	690 256	1066 255	1443 252	1812 242	2159 224	2455 200
<b>8</b>	289 342	654 341	1029 342	1395 340	1764 330	2118 317	2463 288
<b>10</b>	229 428	593 427	968 427	1337 425	1712 419	2078 406	2375 379
<b>12</b>	151 513	509 513	882 512	1271 511	1636 505	1979 481	2324 459
<b>14</b>	77 599	426 599	800 598	1194 596	1552 588	1874 571	2253 547
<b>16</b>	40 684	342 684	720 683	1133 680	1469 671	1790 649	2146 656
<b>18</b>		259 769	627 769	1031 765	1339 755	1642 738	1961 731
<b>20</b>			536 855	858 850	1139 845	1407 817	1678 788
<b>22</b>			452 940	775 935	1031 930	1277 899	1532 867

FLOW (GPM)

TORQUE (LB IN) 1678  
SPEED (RPM) 788

88 cc / rev



Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

108 Parallel

10.8 cu in / rev

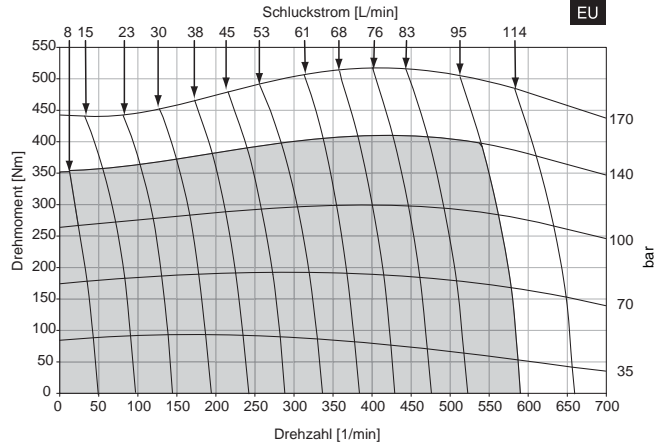
PRESSURE (PSID)

	500	1000	1500	2000
<b>2</b>	683 42	1366 40	1970 33	
<b>4</b>	729 85	1455 83	2140 78	2809 65
<b>6</b>	728 128	1465 124	2150 120	2801 105
<b>8</b>	711 171	1469 168	2185 163	2856 142
<b>10</b>	678 214	1442 213	2182 211	2838 189
<b>12</b>	651 257	1401 254	2150 252	2833 235
<b>14</b>	630 299	1362 298	2104 295	2814 280
<b>16</b>	611 342	1329 340	2095 335	2778 323
<b>18</b>	587 385	1295 383	2051 379	2756 368
<b>20</b>	565 428	1250 426	2013 425	2723 411
<b>22</b>	539 469	1215 469	1962 467	2678 452
<b>25</b>		1123 534	1834 532	2515 513
<b>30</b>		1037 641	1693 639	2313 615

FLOW (GPM)

TORQUE (LB IN) 2515  
SPEED (RPM) 513

177 cc / rev



Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

022 716.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

142 Series

7.1 cu in / rev

PRESSURE (PSID)

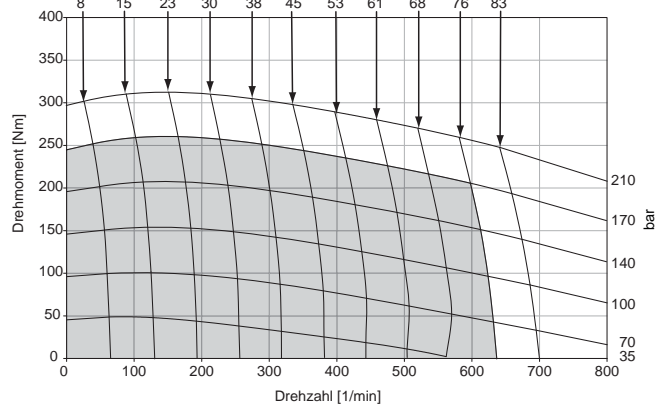
	500	1000	1500	2000	2500	3000	3500
<b>2</b>	484 65	964 64	1434 62	1907 58	2319 50	2759 43	
<b>4</b>	474 130	968 130	1444 130	1948 126	2410 118	2819 107	3264 87
<b>6</b>	438 195	930 195	1428 194	1926 192	2417 1987	2875 174	3285 158
<b>8</b>	391 260	889 260	1381 260	1870 259	2359 253	2838 245	3298 226
<b>10</b>	327 325	821 324	1324 324	1804 323	2298 320	2776 313	3215 295
<b>12</b>	249 390	728 390	1226 390	1725 388	2217 385	2664 372	3092 358
<b>14</b>	184 455	643 455	1141 454	1648 452	2116 447	2573 439	3063 427
<b>16</b>	101 520	532 520	1040 519	1558 516	2011 511	2474 501	2949 497
<b>18</b>		439 585	930 584	1441 581	1876 575	2325 564	2790 559
<b>20</b>		300 651	810 650	1275 647	1712 643	2125 629	2535 612
<b>22</b>		249 716	707 715	1169 711	1594 707	1983 692	2386 673

FLOW (GPM)

116 cc / rev

Schluckstrom [L/min]

EU



TORQUE (LB IN) 2535  
SPEED (RPM) 612

Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 15W40 d'une viscosité de 55 cSt (215 SUS) à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos técnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

142 Parallel

14.2 cu in / rev

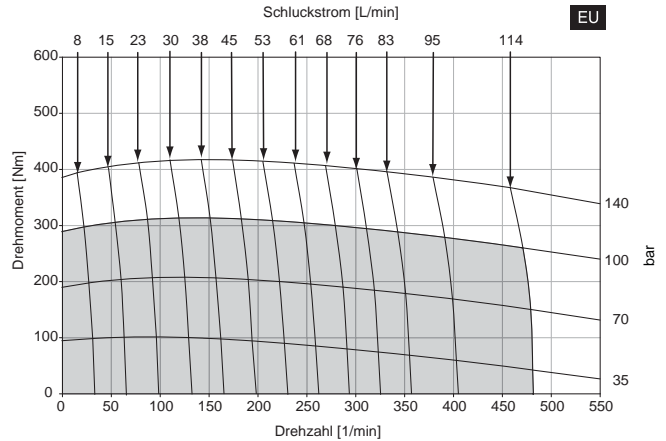
PRESSURE (PSID)

	500	1000	1500
<b>2</b>	925 32	1836 31	2668 26
<b>4</b>	969 65	1920 63	2860 57
<b>6</b>	971 97	1963 94	2886 90
<b>8</b>	954 130	1962 128	2927 125
<b>10</b>	918 163	1933 162	2921 160
<b>12</b>	884 195	1882 193	2886 191
<b>14</b>	857 228	1841 226	2831 224
<b>16</b>	826 260	1799 259	2816 255
<b>18</b>	790 293	1754 290	2755 286
<b>20</b>	757 325	1709 323	2710 322
<b>22</b>	726 356	1655 356	2648 353
<b>25</b>	452 406	1547 405	2513 403
<b>30</b>	374 488	1436 486	2344 484

FLOW (GPM)

TORQUE (LB IN) 2513  
SPEED (RPM) 403

233 cc / rev



Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

022 716.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

176 Series

8.8 cu in / rev

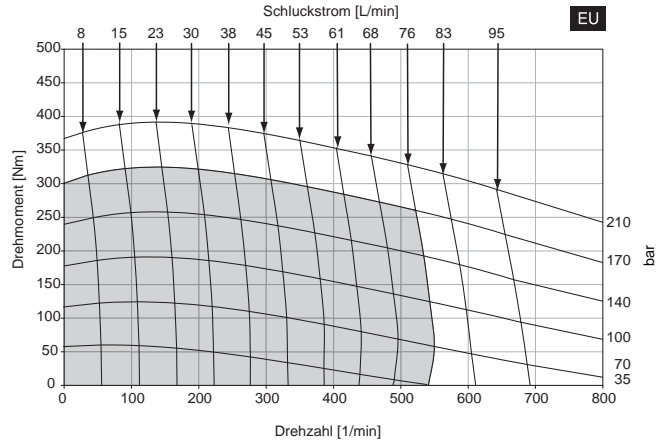
PRESSURE (PSID)

	500	1000	1500	2000	2500
<b>2</b>	604 52	1204 52	1788 50	2395 49	2913 43
<b>4</b>	588 105	1217 105	1834 105	2445 104	3022 98
<b>6</b>	548 158	1179 157	1803 157	2423 155	3039 153
<b>8</b>	497 210	1137 209	1748 210	2364 208	2973 206
<b>10</b>	436 263	1070 262	1704 261	2291 260	2906 259
<b>12</b>	371 315	976 315	1601 315	2204 313	2829 311
<b>14</b>	332 367	899 367	1525 366	2140 363	2717 361
<b>16</b>	186 420	762 419	1405 418	2017 416	2591 413
<b>18</b>		665 472	1284 471	1891 468	2468 465
<b>20</b>		553 524	1134 524	1762 522	2388 519
<b>22</b>		459 576	1017 576	1636 574	2272 571
<b>25</b>		81 655	721 655	1375 652	1968 648
<b>30</b>			284 786	958 782	1562 778

FLOW (GPM)

TORQUE (LB IN) 2272  
SPEED (RPM) 571

144 cc / rev



Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.



176 Parallel

17.6 cu in / rev

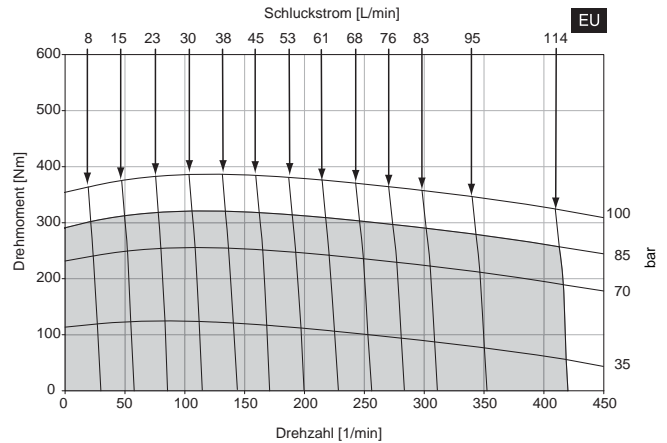
PRESSURE (PSID)

	500	1000	1250
<b>2</b>	1179 26	2325 26	2836 26
<b>4</b>	1214 52	2412 51	3000 51
<b>6</b>	1221 79	2479 75	3042 75
<b>8</b>	1206 105	2468 104	3077 104
<b>10</b>	1172 131	2443 130	3070 130
<b>12</b>	1130 157	2381 156	3042 156
<b>14</b>	1097 184	2345 182	3010 182
<b>16</b>	1052 210	2294 209	3056 209
<b>18</b>	1003 236	2238 233	2906 233
<b>20</b>	955 262	2199 260	2864 260
<b>22</b>	922 286	2123 286	2805 286
<b>25</b>	832 328	2006 326	2700 326
<b>30</b>	689 393	1868 392	2542 392

TORQUE (LB IN) 2805  
SPEED (RPM) 286

FLOW (GPM)

288 cc / rev



Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

022 716.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskositäet von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind moeglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

212 Series

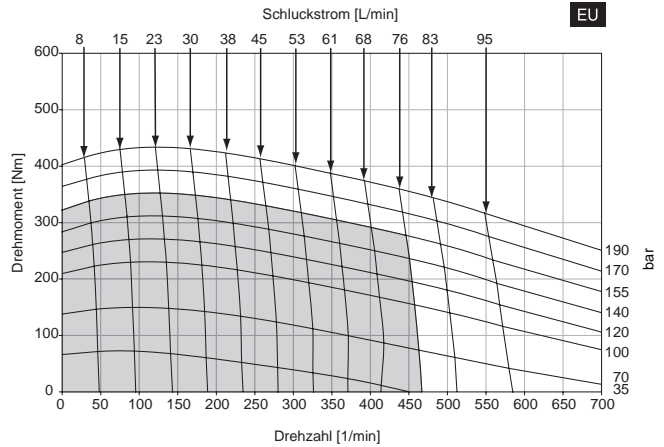
10.6 cu in / rev

PRESSURE (PSID)

	500	1000	1500	1750	2000	2250
<b>2</b>	731 44	1458 43	2162 42	2509 42	2901 40	3175 39
<b>4</b>	712 87	1468 87	2210 87	2562 87	2946 86	3274 84
<b>6</b>	665 131	1426 130	2175 130	2553 129	2920 128	3290 127
<b>8</b>	603 174	1371 174	2110 174	2473 173	2854 173	3229 171
<b>10</b>	527 218	1287 217	2053 217	2406 216	2767 215	3136 215
<b>12</b>	450 262	1182 261	1935 261	2315 260	2665 259	3040 258
<b>14</b>	390 305	1089 304	1844 303	2210 302	2588 301	2940 300
<b>16</b>	225 349	929 348	1703 347	2076 346	2443 346	2789 345
<b>18</b>		806 391	1559 391	1921 389	2300 389	2672 388
<b>20</b>		669 435	1377 435	1769 434	2128 433	2498 432
<b>22</b>		567 478	1244 478	1612 477	1994 476	2337 475
<b>25</b>		153 544	900 544	1244 543	1676 541	2037 540
<b>30</b>			398 653	732 651	1183 650	1534 648

FLOW (GPM)

174 cc / rev



TORQUE (LB IN) 2337  
SPEED (RPM) 475

Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les données sur les performances sont basées sur des tests utilisant de l'huile 15W40 d'une viscosité de 55 cSt (215 SUS) à 54°C (130°F). Ces données correspondent à des situations typiques. Les données réelles peuvent varier légèrement d'un moteur de production à l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 43,1 Cst bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores típicos. Los valores exactos reales podrían tener una pequeña variación entre distintos motores.

212 Parallel

21.2 cu in / rev

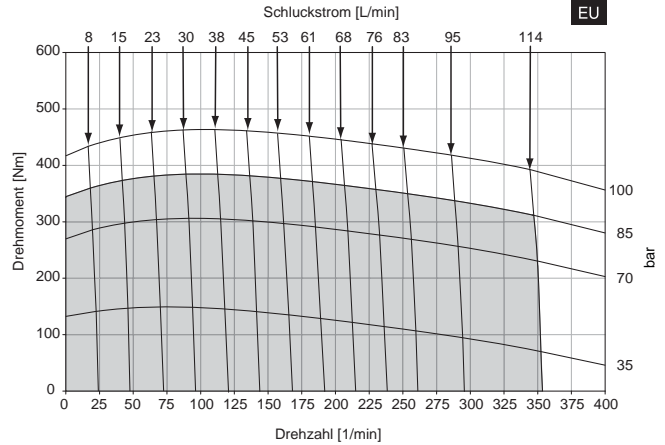
PRESSURE (PSID)

	500	1000
<b>2</b>	1413 22	2789 21
<b>4</b>	1455 44	2874 42
<b>6</b>	1471 65	2970 63
<b>8</b>	1455 87	2964 86
<b>10</b>	1413 109	2938 108
<b>12</b>	1366 131	2871 129
<b>14</b>	1326 153	2827 151
<b>16</b>	1269 174	2767 173
<b>18</b>	1215 196	2699 194
<b>20</b>	1158 218	2656 216
<b>22</b>	1114 240	2572 238
<b>25</b>	1004 272	2439 271
<b>30</b>	831 327	2299 325

FLOW (GPM)

TORQUE (LB IN) 2439  
SPEED (RPM) 271

347 cc / rev



Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

022 716.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistugsdaten sind gemessen mit SAE 15W40 bei einer Viskositaet von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogerten sond moeglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipcos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

258 Series

12.9 cu in / rev

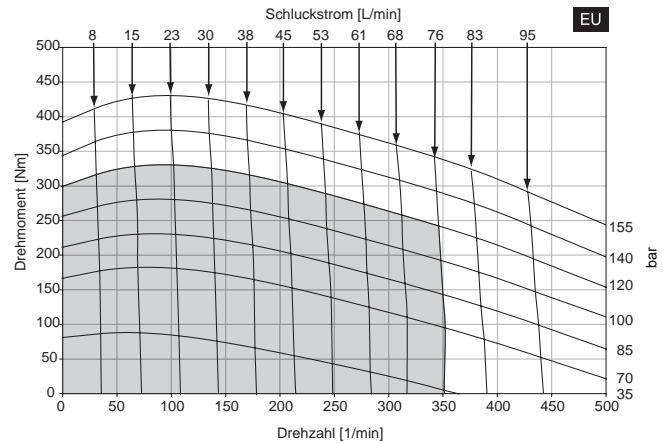
PRESSURE (PSID)

	500	1000	1500	1750
<b>2</b>	905 36	1811 36	2673 35	3155 35
<b>4</b>	882 72	1799 72	2692 71	3147 71
<b>6</b>	834 107	1762 107	2645 106	3119 106
<b>8</b>	757 143	1675 143	2593 142	3036 141
<b>10</b>	652 179	1556 178	2504 177	2957 176
<b>12</b>	565 215	1472 213	2390 212	2867 210
<b>14</b>	423 251	1357 249	2279 249	2731 248
<b>16</b>	278 287	1187 286	2125 286	2587 285
<b>18</b>		1006 321	1962 321	2440 319
<b>20</b>		827 357	1728 357	2264 356
<b>22</b>		758 393	1614 393	2037 392
<b>25</b>		466 446	1260 446	1681 446
<b>30</b>			773 537	1099 536

FLOW (GPM)

TORQUE (LB IN) 1099  
SPEED (RPM) 536

211 cc / rev



Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

Intermittierende Werte maximal 10% von jeder Betriebsminute.  
Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskosität von 55 cSt bei 54°C. Geringfügige Abweichungen von den Katalogerten sind möglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.

258 Parallel

25.8 cu in / rev

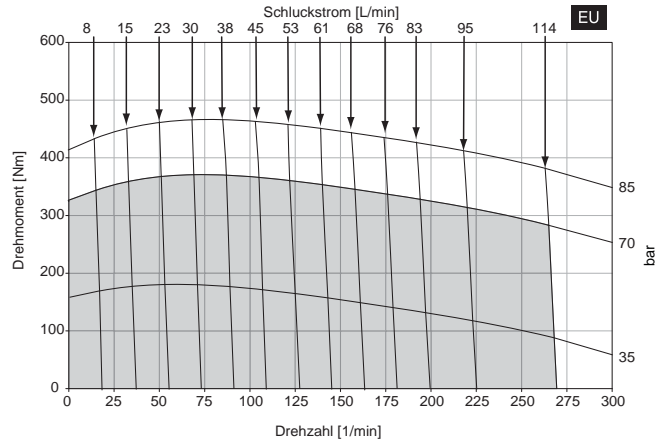
PRESSURE (PSID)

	500	850
<b>2</b>	1679 18	2834 16
<b>4</b>	1731 36	2953 35
<b>6</b>	1790 54	3000 53
<b>8</b>	1782 71	3030 71
<b>10</b>	1727 89	3020 88
<b>12</b>	1684 107	2984 106
<b>14</b>	1636 125	2938 124
<b>16</b>	1556 143	2980 143
<b>18</b>	1515 161	2865 160
<b>20</b>	1445 179	2782 178
<b>22</b>	1378 197	2723 196
<b>25</b>	1234 224	2621 223
<b>30</b>	1018 268	2587 268

FLOW (GPM)

TORQUE (LB IN) 2621  
SPEED (RPM) 223

423 cc / rev



Cont.  Int.

Intermittent operation rating applies to 10% of every minute.  
Fonctionnement interm. 10% max. de chaque minute d'utilisation.

Performance data based on tests using 15W40 oil with a viscosity of 55 cSt (215 SUS) at 54° C (130° F). Performance data is typical. Actual data may vary slightly from one production motor to another.

Les donnees sur les performances sont basees sur des tests utilisant de l'huile 15W40 d'une viscosite de 55 cSt (215 SUS) a 54°C (130°F). Ces donnees correspondent a des situations typiques. Les donnees reelles peuvent varier legerement d'un moteur de production a l'autre.

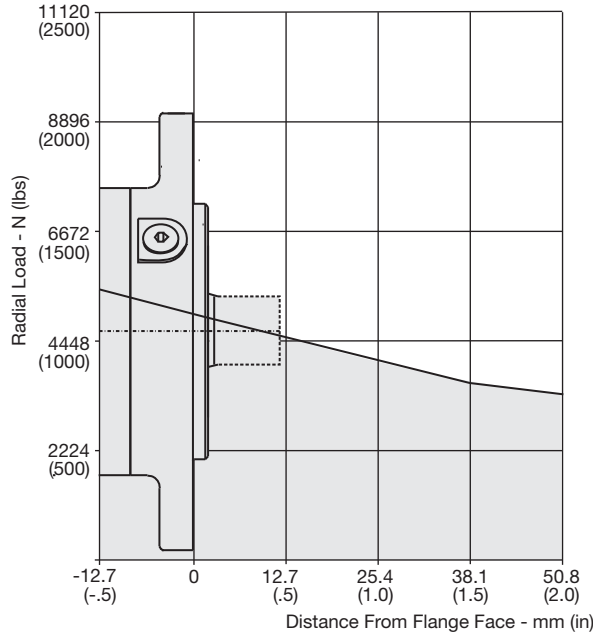
022 716.indd, js

Intermittierende Werte maximal 10% von jeder Betriebsminute.

Capacidad de funcionamiento intermitente valida para 10% por cada minuto.

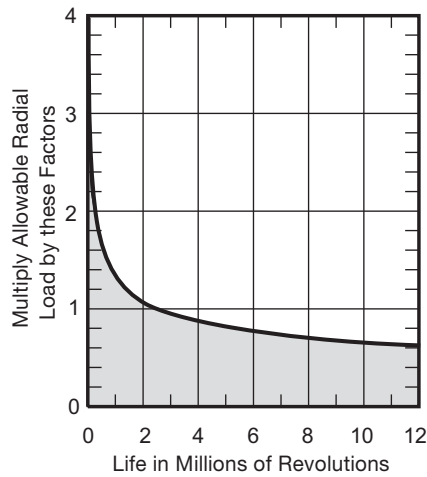
Leistungsdaten sind gemessen mit SAE 15W40 bei einer Viskositat von 43,1 Cst bei 54°C. Geringfuegige Abweichungen von den Katalogerten sind moeglich.

Datos tecnicos obtenidos con aceite 15W40 de 55 cSt (215 SUS) de viscosidad a 54°C (130°F). Los datos proporcionados son valores tipicos. Los valores exactos reales podrian tener una pequena variacion entre distintos motores.



The allowable side load curve is based on a  $L_{10}$  bearing life of  $2.5 \times 10^6$  revolutions.  
 Die zulässige radiale Wellenbelastung bezieht sich auf die Lager-Lebensdauer  $2.5 \times 10^6$  Umdrehungen.  
 L'effort radial admissible sur l'arbre depend a une duree de vie  $2.5 \times 10^6$  de rotation.  
 La curva de carga lateral admisible se basa en vida util de cojinete de  $2.5 \times 10^6$  revoluciones.

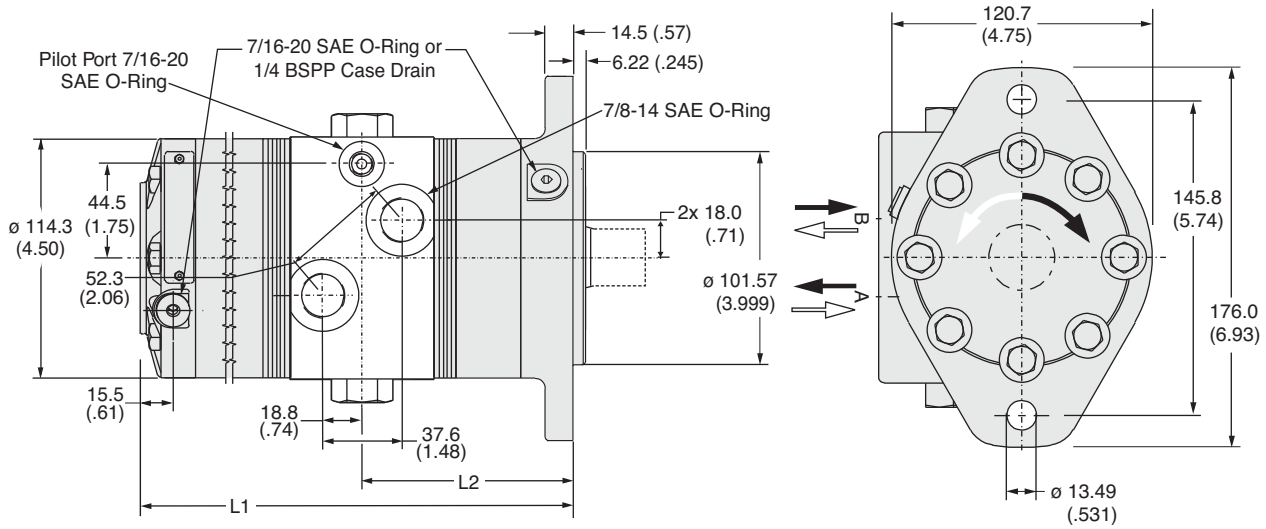
Bearing Life Factor Curve  
 Chart B



Note:  
 Side load should be considered a vector sum of all imposed loads.

Code: BS

SAE B, 7/8"-14 SAE



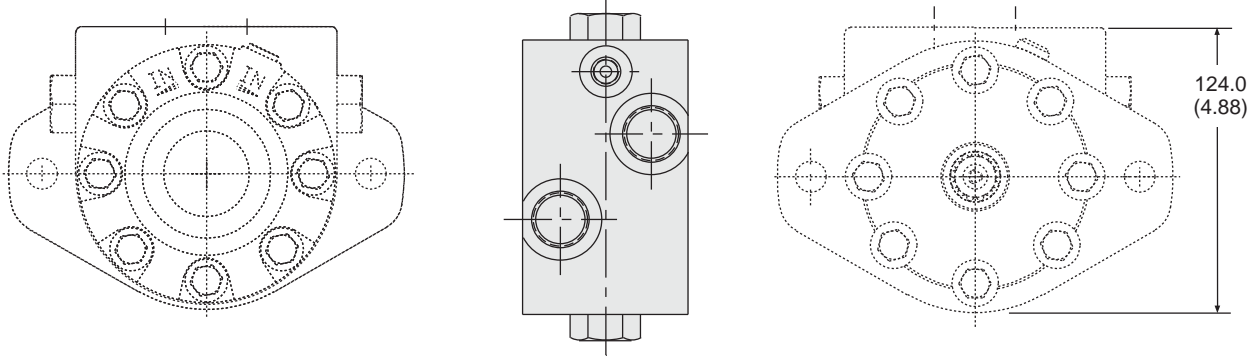
Code BS		072	108	142	176	212	258
Weight/Gewicht	kg	14.8	15.2	15.4	15.6	15.7	15.9
Poids/Peso	(lb)	(32.7)	(33.6)	(33.9)	(34.3)	(34.7)	(35.2)
Length	"L1" mm	182.6	192.3	201.7	211.3	221.2	234.0
	"L1" (in)	(7.18)	(7.57)	(7.94)	(8.32)	(8.71)	(9.21)
	"L2" mm	91.4	96.3	101.8	105.7	110.7	117.1
	"L2" (in)	(3.60)	(3.79)	(3.97)	(4.16)	(4.36)	(4.61)

English equivalents for metric specifications are shown in ( ).

022 716.indd, js

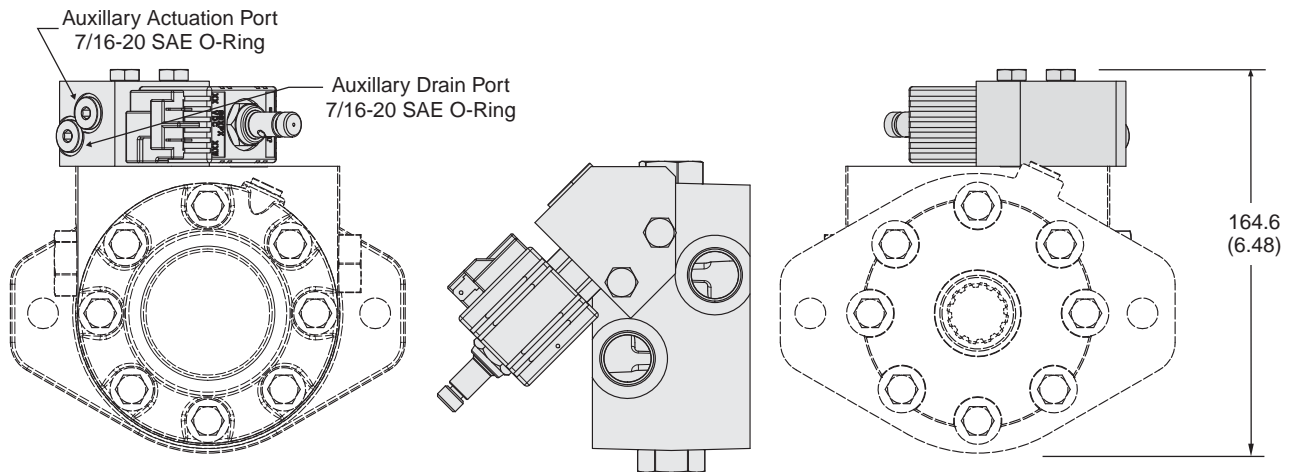
Code: P

Remotely Piloted

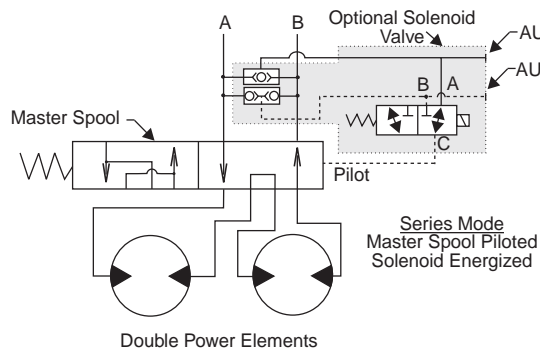


Code: E, W

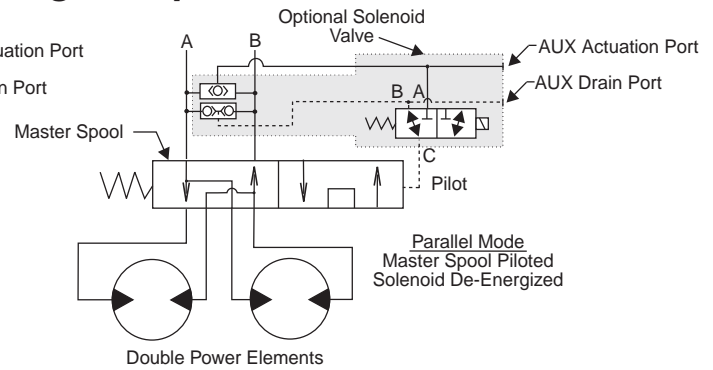
Solenoid Actuated



High Speed Series Mode



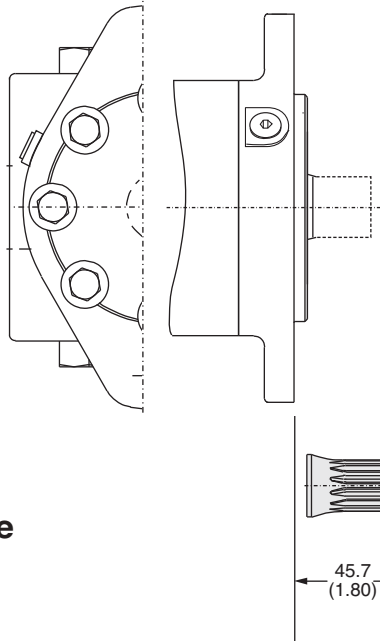
High Torque Parallel Mode



Add .5 kg (1.1 lb) for this option.

English equivalents for metric specifications are shown in ( ).  
 022 716.indd, js



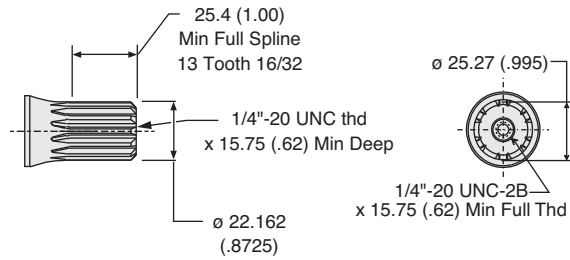


Code: 6

7/8"-13 Tooth Spline

Code: 6

7/8"-13 Tooth Spline



English equivalents for metric specifications are shown in ( ).

022 716.indd, js



**Specifications**

- **Rated flow** — 20 gpm
- **Max. Operating Pressure** — adjustable up to 3500 psi, factory preset at 1750 psi.
- **Reseat Pressure** — 90% of set pressure
- **Operating Temperature Range:** -40°F to 250°F
- **Cartridge Material** — All parts steel. All operating parts hardened steel.
- **Body Material** — Steel

**Einsatzdaten**

- Max. Fluß 76l/min.
- Max. Druck 240 bar (Voreinstellung 120 bar)
- Hysterese 90% des Öffnungsdrucks
- Betriebstemperatur -40°C bis 115°C
- Ventil in Stahlausführung
- Code für Ausführung schwarz grundiert

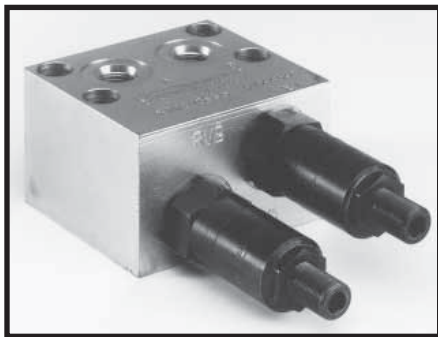
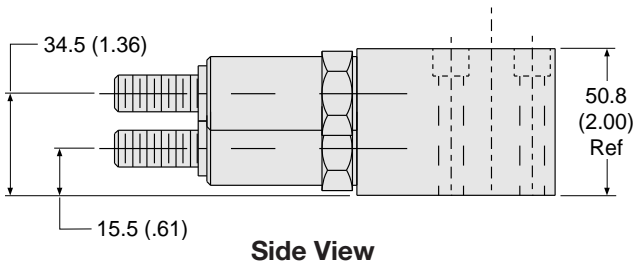
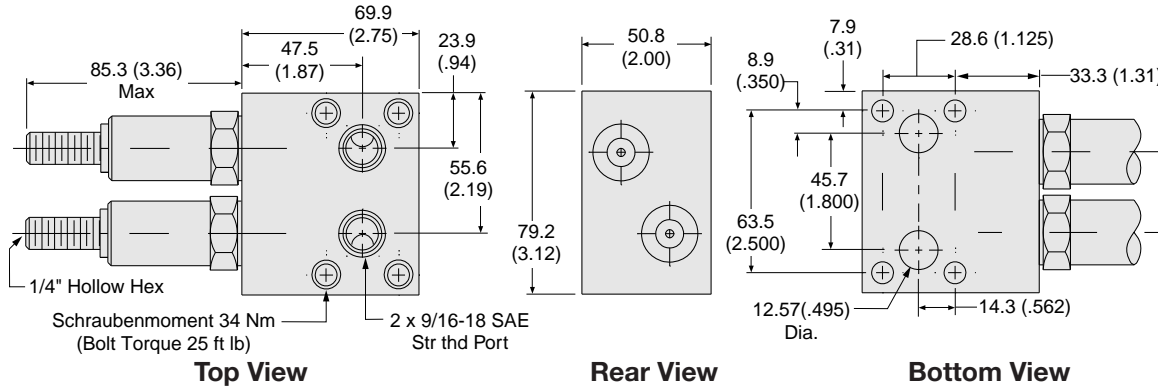
Consult factory for other available options, configurations ordering codes and lead times.

**Spécifications**

- **Débit nominal** – 75,7 litres/minute (20 gallons/minute)
- **Pressure de service maximale** – ajustable jusqu'à 246 kg/cm<sup>2</sup> (3 500 ppo<sup>2</sup>), pré réglée à l'usine à 123 kg/cm<sup>2</sup> (1 750 ppo<sup>2</sup>).
- **Pression de rajustage** – 90% de la pression de consigne
- **Gamme des températures de service** – de - 40° C à 121° C (-40° F à 250° F).
- **Matériau de la cartouche** – Entièrement en acier. Toutes les pièces de service en acier durci.
- **Matériau du corps** – Acier

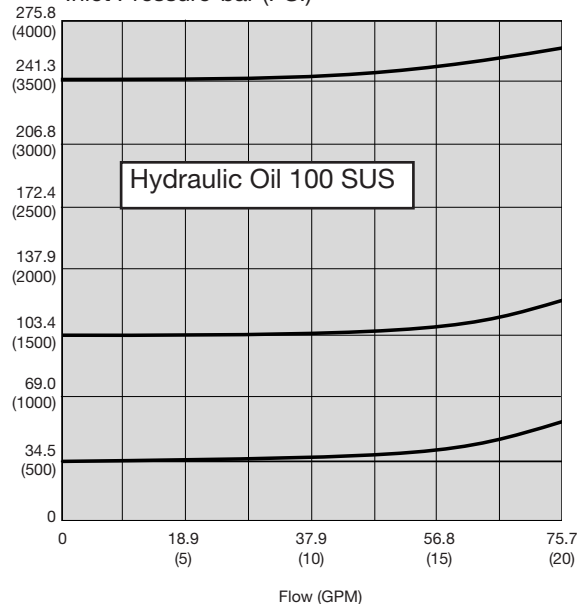
**Especificaciones técnicas**

- **Caudal:** 20 galones/minuto
- **Presión máxima de servicio:** regulable hasta 3.500 libras/pulg.<sup>2</sup>. Regulada de fábrica a 1.750 libras/pulg.<sup>2</sup>.
- **Presión de reasentamiento:** 90% de la presión calibrada.
- **Gama de temperatura de servicio:** - 40° F a 250° F
- **Material del cartucho:** todas las partes son de acero. Todas las partes activas son de acero templado.
- **Material del cuerpo:** acero

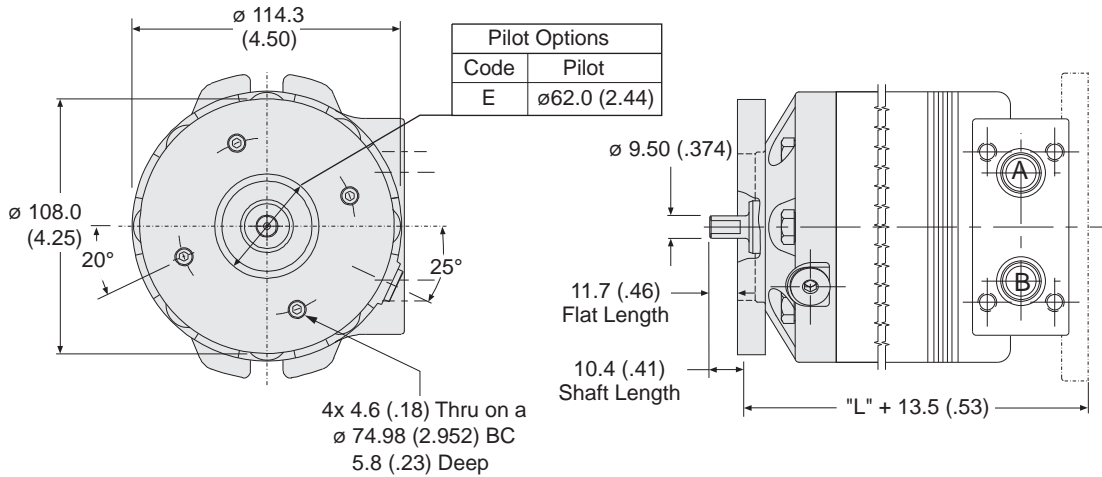


**Performance Curve**

Flow vs. Pressure  
 Inlet Pressure-bar (PSI)



English equivalents for metric specifications are shown in ( ).  
 023 Nichols Options.indd, js



**Note:**

To mount encoder, remove (4) socket head cap screws attaching rear encoder mounting plate to motor. Attach encoder and encoder mounting plate to motor using (4) longer socket head cap screws, furnished. Torque to 10 lb in.

**Hinweis:**

Zur Montage der Impulsscheibe zunächst die vier Sechskantkopfschrauben lösen, mit denen die hintere Impulsscheiben-Befestigungsplatte am Motor angeschraubt ist. Zum Anschrauben von Impulsscheibe und Impulsscheiben-Befestigungsplatte am Motor die bereitgestellten vier längeren Sechskantkopfschrauben verwenden. Maximal zulässiges Drehmoment: 1,13 Nm (10 lb in).

**Remarque :**

Pour monter l'encodeur, enlever les (4) vis à tête creuse qui retiennent la plaque de montage arrière de l'encodeur au moteur. Attacher l'encodeur et la plaque de montage de l'encodeur au moteur à l'aide des (4) longues vis à tête creuse fournies. Serrer jusqu'à 10 liv.po.

**Nota:**

Para montar el codificador, quitar los (4) tornillos de cabeza hueca que fijan la placa del codificador al motor. Fijar el codificador y la placa al motor, usando los (4) tornillos más largos que se suministran. Ajustarlos con un torque de 10 libras-pulgada.

Consult factory for other available options, configurations ordering codes and lead times.

Standard Length & Weights for 700 Series on Page 202-203, 716 Series on Page 216.

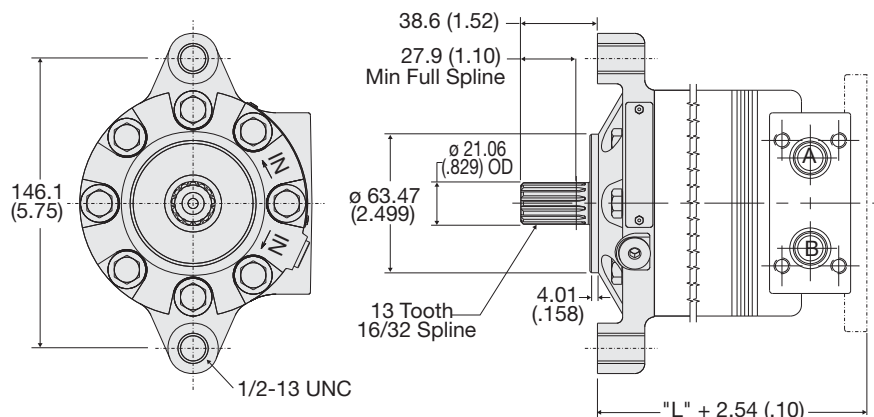
Längen/Gewichte 700 Serie siehe Seiten 202-203, 716 Serie siehe Seiten 216.

Longueurs et poids courants pour la série 700, voir les pages 202-203, série 716, voir les pages 216.

Los valores estándar de longitud y peso de la Serie 700 se puede ver en las Páginas 202-203, Serie 716 se puede ver en las Páginas 216.

English equivalents for metric specifications are shown in ( ).

023 Nichols Options.indd, js



**Note:**

Torque Rating: Maximum torque should not exceed 339 Nm (3000 lb in) in dynamic on the thru-shaft. Consult factory if the radial load on the thru-shaft exceed 1780 N (400 lb).

**Hinweis:**

Drehmoment-Grenzwert: Das statische Drehmoment auf die durchgehende Welle darf höchstens 339 Nm (3000 lb in) betragen. Wenn die radiale Querbelastung auf die durchgehende Welle größer als 1780 N (400 lb) ist, vom Herstellerwerk beraten lassen.

**Remarque :**

Couple: Le couple maximal ne devrait pas dépasser 339 Nm (3000 liv. po.) dynamique sur l'arbre traversant. Consulter l'usine si la charge radiale sur l'arbre traversant dépasse 1780 N (400 livres).

**Nota:**

Valor de torque: el torque máximo en el eje pasante no debe superar 339 N-m (3000 libras-pulgada) dinámico. Si la carga radial sobre el eje pasante superara 1780 N (400 libras), consultar a fábrica.

**⚠ WARNING**

If torque on the thru-shaft exceeds 339 Nm (3000 lb in) when attempting to dynamically brake a load, the thru-shaft splines and/or shaft could fail and all braking action could be lost.

**⚠ WARNUNG**

Wenn beim Versuch, die Last dynamisch abzubremesen, das Drehmoment auf die Welle größer als 339 Nm (3000 lb in) wird, können die Keilwellenverbindung und/oder die Welle versagen und alle Bremswirkung verloren gehen.

**⚠ AVERTISSEMENT**

Si le couple sur l'arbre traversant dépasse 339 Nm (3000 liv. po.) au moment d'essayer le freinage dynamique d'une charge, les cannelures de l'arbre traversant et/ou l'arbre pourraient échouer et toute action de freinage pourrait être perdue.

**⚠ ADVERTENCIA**

Si el torque en el eje pasante superara 339 N-m (3000 libras-pulgada) al intentar frenar una carga dinámicamente, las estrías del eje o el mismo eje podrían fallar, perdiéndose la acción de frenado.

Standard Length & Weights for 110A Series on Pages 187-189.

Längen/Gewichte 110A Serie siehe Seiten 187-189.

Longueurs et poids courants pour la série 110A, voir les pages 187-189.

Los valores estándar de longitud y peso de la Serie 110A se puede ver en las Páginas 187-189.

**Consult factory for other available options, configurations ordering codes and lead times.**

English equivalents for metric specifications are shown in ( ).

Stainless Steel Shaft

Encoder Mount Standard, 2.44 Pilot

External Relief Valve - adjustable up to 3500 psi, factory preset at 1750 psi.

Thru Shaft with Brake Mount

Consult Factory for Other Positions

\* To order crossover relief valve mounted on a specific motor see the ordering information for that motor.

To order crossover relief valve as a field conversion or a spare part consult factory for part number.

Mounting bolts are available as 5/16-18 socket head cap screw (4 required) as well as 2 o-rings.

Consult factory for part number.

\* Zur Bestellung eines bestimmten Motors mit werkseitig montiertem Bremsdruckbegrenzungsventil konsultieren Sie bitte die Bestellinformationen für den betreffenden Motor.

Soll das Bremsdruckbegrenzungsventil für eine Feldumrüstung oder als Ersatzteil bestellt werden, bitte die Artikelnummer beim Werk erfragen.

Befestigungsschrauben in Form von 5/16-18-Sechskantkopfschrauben (es werden 4 benötigt) sowie 2 O-Ringe können vom Werk bezogen werden.

Artikelnummer beim Werk erfragen.

\* Pour commander une soupape de sûreté transversale montée sur un certain moteur, voir les informations de commande pour ce moteur.

Pour commander une soupape de sûreté transversale pour la conversion sur place ou comme pièce de rechange, consulter l'usine pour obtenir le numéro de la pièce.

Les boulons de montage sont disponibles en tant que vis à tête creuse de 5/16-18 (4 sont requises) ainsi que 2 joints toriques.

Consulter l'usine pour obtenir le numéro de la pièce.

\* Para pedir una válvula de alivio transversal montada en determinado motor, véanse las especificaciones de dicho motor.

Para pedir una válvula de alivio transversal para conversión directa o como parte de repuesto, consultar con fábrica sobre el número de parte.

Los pernos de montaje vienen en tipo de cabeza hueca hexagonal de 5/16-18 (se necesitan 4) y con 2 sellos toroidales (O rings).

Consultar con fábrica sobre el número de parte.

**Consult factory for other available options, configurations ordering codes and lead times.**

## Fluid

To insure maximum motor performance and life, use a premium grade hydraulic or engine oil. Fluids with a minimum .125% zinc (or equivalent) anti-wear package should be used. A mineral or synthetic based 10W40 engine oil or hydraulic oil (200 SUS) is recommended. Nichols motor seals come standard in nitrile rubber. If a fluid that is not compatible with nitrile is to be used, fluoroelastomer seal material can be specified.

- Minimum fluid viscosity - 50 SUS
- Recommended fluid operating temperature is -28°C to 82°C (-20°F to 180°F)
- Minimum recommended fluid filtration 25 micron with a beta ratio of 2.

## Pressure

Operating the motor in its intermittent pressure range will shorten the life of the motor and should generally be restricted to 10% or less per minute. The reduced life resulting from continuous operation in the intermittent range may be acceptable in some applications. Consult the factory for details.

## Case Drain

A check ball system drains the shaft seal to the outlet port regardless of direction of rotation of the shaft. This maintains low pressure on the shaft seal, reducing heat and friction for long seal life. If high pressure exists in the outlet port due to series operation, meter-out circuitry or other causes, the shaft seal can be externally drained to tank for low seal pressure. For continuous operation with outlet pressure above 1000 psi use of the external case drain is recommended for extended seal life.

## Shaft Loading

The use of 1 inch and 25mm diameter shafts are not recommended when torque loads exceed 3500 lb-in. For 7/8 inch diameter shafts, torque should be limited to 1250 lb-in. Maximum thrust load on the shaft should not exceed 1000 lbs inward or outward.

## Stainless Steel Shafts

Torque, speed, axial, and radial load ratings are reduced by 20% when operating with the stainless steel shaft that is optional on some series of motors. Maximum speed to be limited to 600 RPM.

## Thru-Shafts

Shaft torque should not exceed 3000 lb-in.

## Performance Data

Performance data shown in this catalog is the result of testing performed using petroleum based fluid at 120°F, 180 SUS. Actual performance will vary with fluid conditions. Lower viscosity will produce lower performance.

## Run-In

For optimum performance and life, a 15 minute run-in period at no load and mid-flow conditions is recommended. Do not subject the system to full load until air has been bled from the hydraulic system and all contaminate particles have been filtered out.

## Inlet Conditions

Positive pressure *must* be available at the motor inlet while it is operating. If an overrunning load causes the motor to rotate faster than the pump can fill it, cavitation will occur. Consult the factory for inlet pressure requirements and speed limitations.

## Other Operating Conditions

Consult factory before operating at conditions exceeding any ratings or recommendations in this catalog.

## Installation Recommendations

- To avoid contamination do not remove plastic port plugs until fittings are to be installed.
- Motor mounting flange must make full contact with equipment mount; do not use the mounting bolts to force the motor pilot into the pilot hole to align the motor.
- Pulleys, sprockets, wheels, or couplings should be properly aligned on the shaft to avoid excessive radial or thrust loads.
- To avoid damaging the thrust system, do not hammer on the motor or shaft to install or remove couplings, pulleys, sprockets, etc.





Engineering Data

Hydraulic Formulas

$$HP_{in} = \frac{Q \Delta P}{1714}$$

$$HP_{out} = \frac{NT}{63025}$$

$$T = \frac{D \Delta P e_m}{2 \pi}$$

$$Q = \frac{DN}{231 e_v}$$

Where

- HP = Horsepower
- Q = Flow, GPM
- P = Pressure, PSI
- P = Pressure differential across the motor
- $\Delta \pi = 3.1416$
- T = Torque, lb in
- D = Motor displacement, cubic inches per revolution
- N = Shaft Speed, RPM
- $e_m$  = Mechanical efficiency
- $e_v$  = Volumetric efficiency

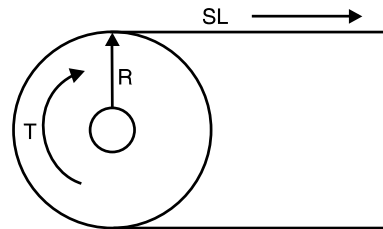
To Convert	Into	Multiply By
Into	To Convert	Divide By
bars	pounds/sq.in.	14.5
BTU/min	horsepower	.02356
BTU/min	kilowatts	.01757
centigrade	fahrenheit	$(C^\circ \times 9/5) + 32$
centimeters	inches	.3937
cu. cms.	cu. inches	.06102
cu. cms.	liters	.001
cu. inches	cu.cms.	16.39
cu. inches	liters	.01639
feet	meters	.3048
gallons	cu. inches	231
gallons	liters	3.785
horsepower	kilowatts	.7457
inches	millimeters	25.4
kilograms	pounds	2.205
pounds	newtons	4.448
pound-inches	newton-meters	.113
pound-inches	daNM	.0113
radians	degrees	57.3
square inches	sq. cms.	6.452

Side Load

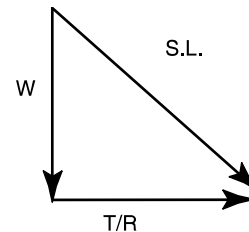
Side loads are imposed upon the shaft of a motor by:

- Driving the load through a pulley or gear
- Supporting the weight of a vehicle or other load on the shaft

Or both



If the load above requires torque T pound-inches and is driven with a pulley on the motor shaft with a radius of R inches, the side load imposed on the motor shaft is T/R pounds. If the motor shaft is connected to a sprocket for a chain drive, R is one half the pitch diameter of the sprocket. If an external load with a weight of W pounds is also being supported by the motor shaft above, the total side load on the shaft is:



$$(SL)^2 = W^2 + (T/R)^2$$

$$\text{Side Load(lb)} = \sqrt{W^2 + (T/R)^2}$$

**Warning**

This Catalog is not a Controlled Document. All Dimensions listed herein are for reference only. Consult a Sales engineer for detailed information.

## Vehicle Propulsion Systems

Hydraulic motors are often used to drive off-highway vehicles, either directly or through gear reducers. The power required to propel the vehicle, called "Tractive Effort," is supplied by the hydraulic motor(s). It is normally expressed in pounds and is the sum of the forces below:

$$TE = (RR+GR+F+DP) \times 1.1$$

Where:

- RR = Rolling Resistance**
- GR = Grade Resistance**
- F = Acceleration Force**
- DP = Drawbar Pull**

## Definitions

### • Tractive Effort (TE)

Tractive effort is the total linear force that a vehicle can exert on the ground. Sometimes called "rim pull," it is the axle torque divided by the distance from the axle to the surface it is traversing.

### • Rolling Resistance (RR)

Rolling resistance is the force in pounds required to propel a vehicle at constant speed over level terrain. It varies with the weight of the vehicle and the type of surface it is traversing. Soft sand, for example, offers more resistance to movement than concrete.

RR = GVW x R      where:

- RR = Rolling Resistance (lbs.)
- GVW = Gross Vehicle Weight (lbs.)
- R = Rolling Resistance Factor dependent upon type and condition of surface. Typical "R" values are shown in the accompanying table.

Surface Type	Surface Condition	R Value
Concrete	Excellent	0.010 lb.
Concrete	Good	0.015 lb.
Concrete	Poor	0.020 lb.
Asphalt	Good	0.012 lb.
Asphalt	Fair	0.017 lb.
Asphalt	Poor	0.022 lb.
Macadam	Good	0.015 lb.
Macadam	Fair	0.022 lb.
Macadam	Poor	0.037 lb.
Cobbles	Ordinary	0.055 lb.
Cobbles	Poor	0.085 lb.
Grass		0.025 lb.
Snow	2 In.	0.025 lb.
Snow	4 In.	0.037 lb.
Dirt	Smooth	0.025 lb.
Dirt	Sandy	0.037 lb.
Mud		0.037 to 0.150 lb.
Sand	Level/Soft	0.060 to 0.150 lb.
Sand	Dune	0.150 to 0.300 lb.

**Engineering Data**

• **Grade Resistance (GR)**

Grade resistance is the additional force required to move a vehicle up an incline. The grade of a slope is normally expressed as a percentage, and represents the number of feet of rise in 100 feet of length. A slope that rises 10 feet in 100 feet has a grade of 10%. The gradeability of a vehicle is defined as the maximum grade the vehicle can climb.

$GR = 0.01 \times GVW \times G$  where:

- GR = Grade Resistance (lbs.)
- GVW = Gross Vehicle Weight (lbs.)
- G = Grade (%)

The following table gives the approximate relationship between grade in percent and slope in degrees.

Grade (Percent)	Slope (Degrees)
1%	0° 35'
2%	1° 9'
5%	2° 51'
6%	3° 26'
8%	4° 35'
10%	5° 43'
12%	6° 54'
15%	8° 31'
20%	11° 19'
25%	14° 3'
32%	18°
60%	31°

• **Acceleration Force (F)**

The force required to accelerate a vehicle from an initial speed  $V_1$  (in feet/second) to speed  $V_2$  in T seconds is the accelerating force in pounds. If the acceleration is from rest,  $V_1$  is zero.

$F = \frac{V \times GVW}{T \times 32.16}$  where

V = Change in Velocity (ft. per Second)  
(Final Velocity - Initial Velocity)

GVW = Gross Vehicle Weight (lbs.)

T = Time for Velocity Change (Seconds)

Note - To obtain velocity in feet per second when MPH is known, Multiply MPH by 1.467.

• **Drawbar Pull (DP)**

Drawbar Pull is the force a vehicle can exert on a load in addition to the force required to propel itself.

Actual force to tow or push a load can be calculated based upon Rolling Resistance, Accelerating Force and Grade Resistance of towed or pushed load.

• **Motor Torque**

The total Tractive effort required to propel a vehicle is the sum of the forces due to Rolling Resistance, Grade Resistance, Acceleration and Drawbar Pull plus 10% for friction and other variables:

$TE = (RR + GR + F + DP) \times 1.1$

When Tractive Effort has been calculated, hydraulic motor torque can be estimated by:

$T = \frac{TE \times r}{G \times N}$  where:

T = Hydraulic Motor Torque (lbs. in.)

TE = Tractive Effort

r = Rolling Radius of Driven Tires (inches)

G = Gear Reduction Ratio Between Hydraulic Motors and Driven Wheels (if none, use a value of 1)

N = Number of Driving Motors

**Engineering Data**

• **Slip Torque**

Slip torque is the torque at the motor shaft that will cause the wheels or tracks to break traction and skid. It is affected by the weight of the vehicle and the coefficient of friction between the wheels or tracks and the surface.

$$ST = \frac{VW \times u \times r}{G \times N} \text{ where:}$$

- ST = Hydraulic Motor Slip Torque (lb in)
- VW = Maximum Weight on Driven Wheel (lb) Including: Allowable Vehicle Overload Dynamic Weight Shift.
- u = Coefficient of Friction Between Tire and Ground. (A value of 0.6 is used for "normal" tires and an average road surface)
- r = Rolling Radius of Driven Tires (inches)
- G = Gear Reduction Ratio Between Hydraulic Motors and Driven Wheel.
- N = Number of Driving Motors

• **Rolling Radius**

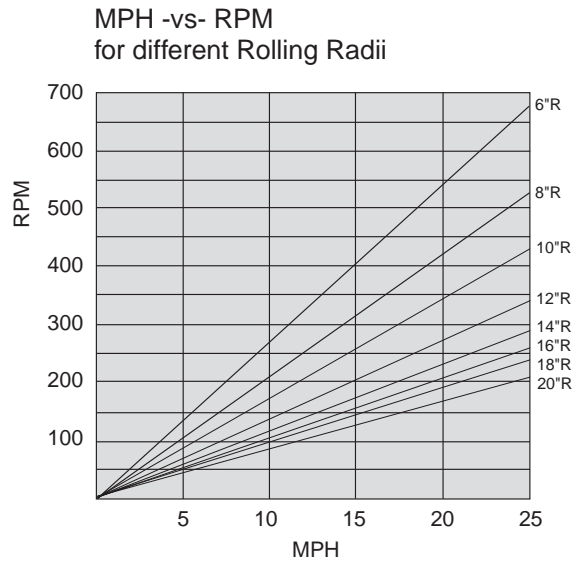
The rolling radius should be based on actual application factors such as Plyrating, Rated Load and inflation pressure can result in different values.

• **Hydraulic Motor Speed**

$$S = \frac{168 \times V \times G}{r} \text{ where:}$$

- S = Required Hydraulic Motor Speed (RPM)
- V = Desired Vehicle Velocity (MPH)
- G = Gear Reduction Ratio Between Hydraulic Motors and Driven Wheels (if none, use a value of 1)
- r = Rolling Radius of driven Tires (inches)

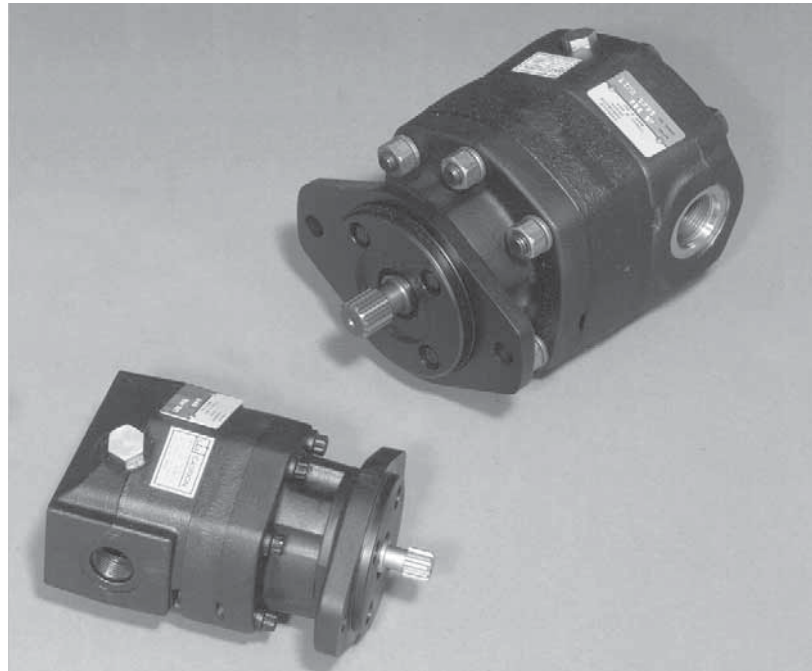
The chart below will estimate the wheel RPM -vs- vehicle velocity for various rolling radii.

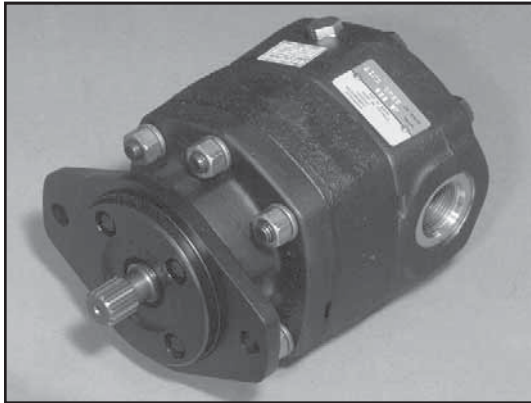




# *High Speed Hydraulic Motors*

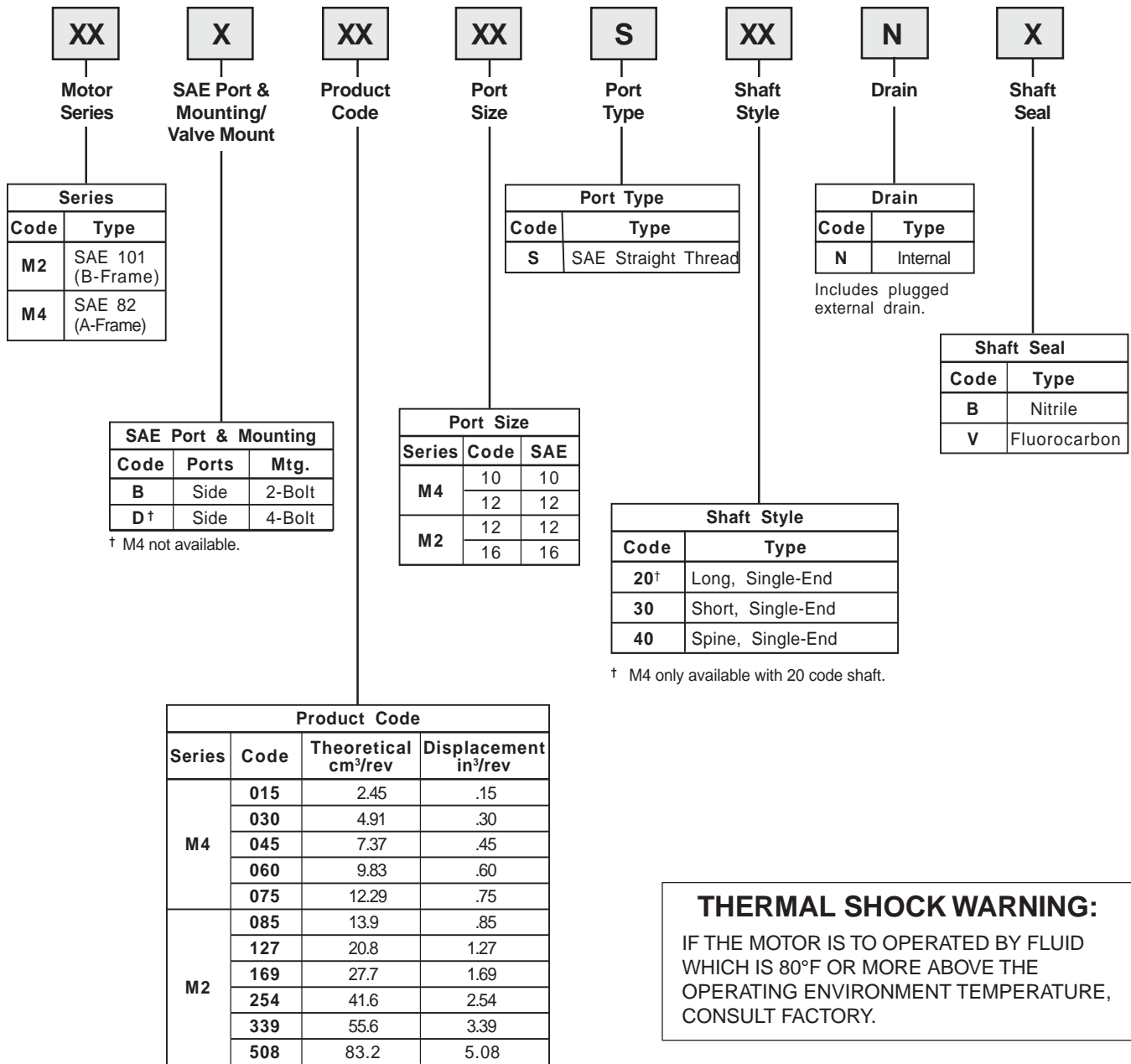
*Catalog HY13-2600-800-001/NA*





## Features

- **High Starting Torque** typically 90% of running torque.
- **Smooth Output Torque** throughout the entire speed range of the motor.
- **High Speed Capabilities** up to 7500 rpm on some models.
- **Bi-Directional Operation** built in checks internally relieve high pressure from the shaft seal.
- **High Pressure Shaft Seal** allows back pressure to 400 PSI without the requirement of Case Drain.
- **Standard SAE Mounting** 2 or 4 bolt mounting flanges, shaft and port dimensions conform to SAE standards.
- **Long Life & Quiet Operation** Precision Gerotor Design results in a motor with extended operating life and noise levels below most other hydraulic motors.
- **Heavy Duty Bearings** capable of withstanding radial and thrust loads.

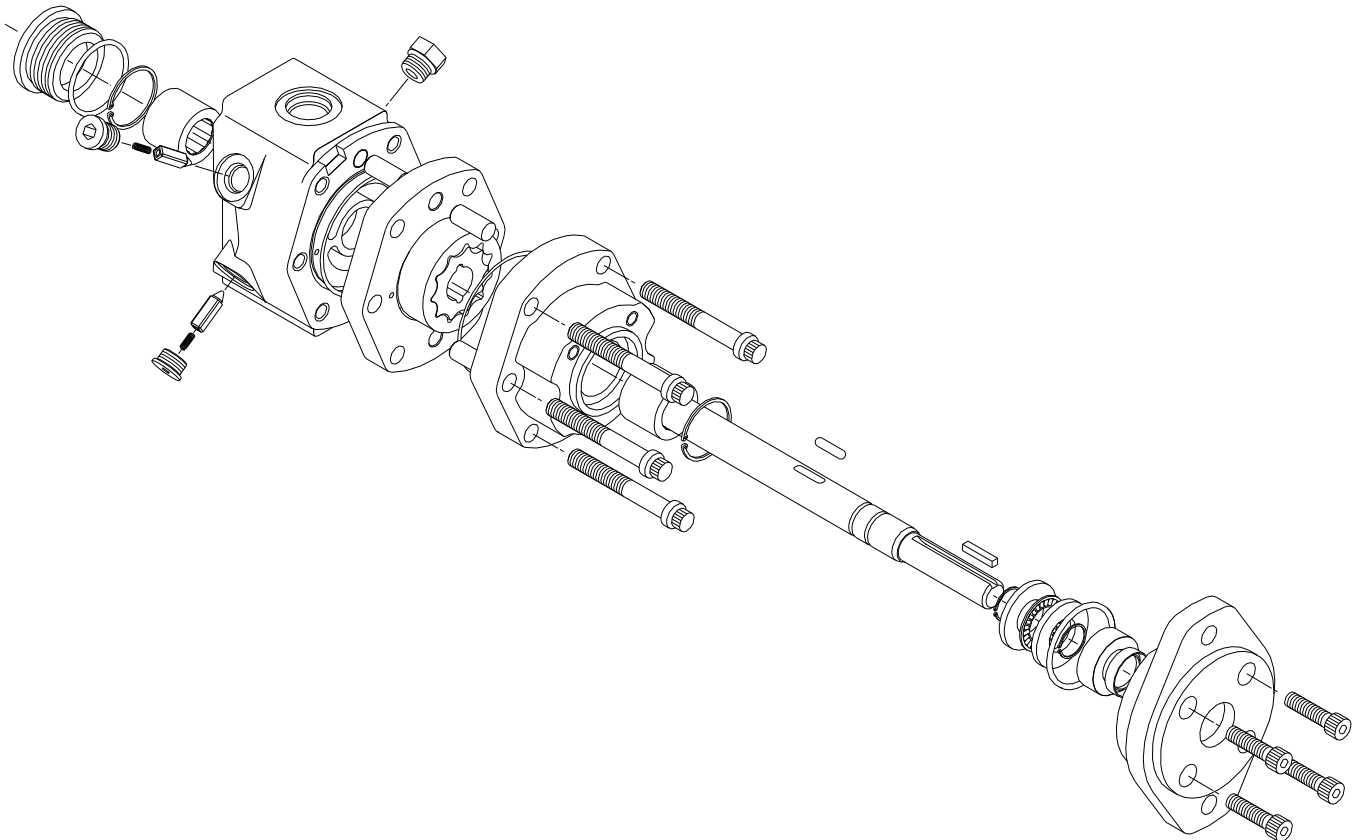
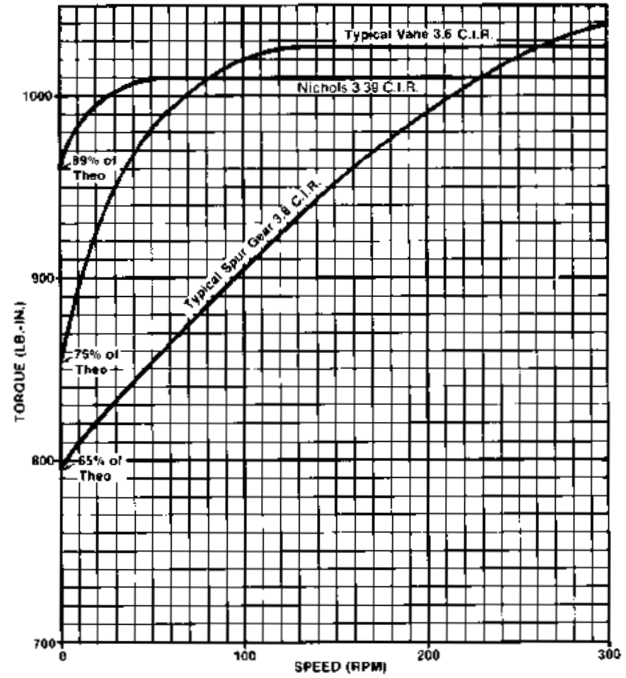


## Applications

Parker motors serve our customers worldwide in many industries and in many applications. Typical applications include:

- Fan Drives** High speed capabilities means increased cooling capacity. Rugged bearing design allows the fan to be mounted directly on the motor shaft.
- Swing Drives** High starting torque and smooth output torque throughout the motor's speed range means optimum control.
- Vibratory Drives** Rugged design, high speed capabilities, and optional cross port relief valve means maximum life for vibratory drives.
- Wheel Drives** High speed capabilities and high starting torque means faster road speeds and increased productivity.
- Winch Drives** Smooth output torque throughout the speed range, high speed capabilities, and high starting torque means increased control, greater productivity.

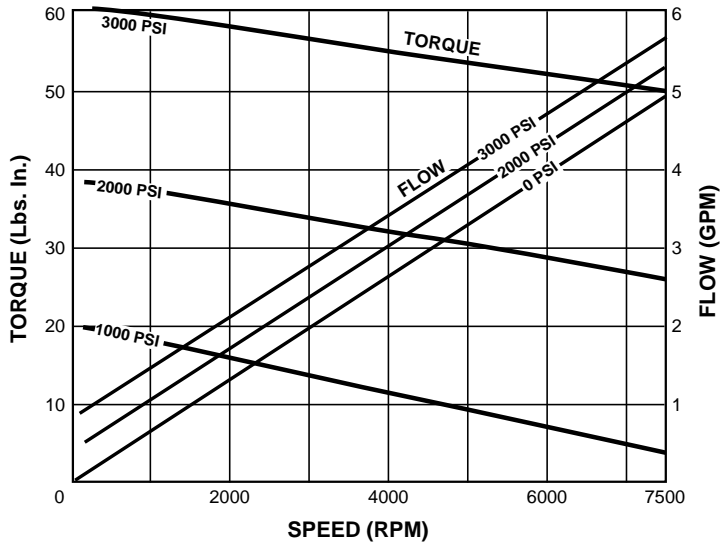
### Starting and running torque comparison between Parker Gerotor and typical Spur Gear and Vane Motors.



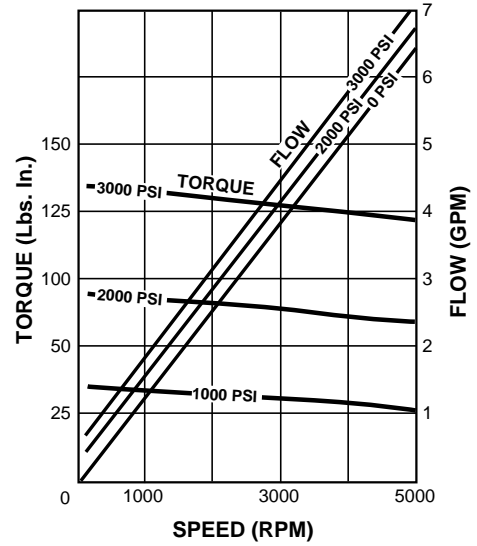


Performance Data & Mounting Data

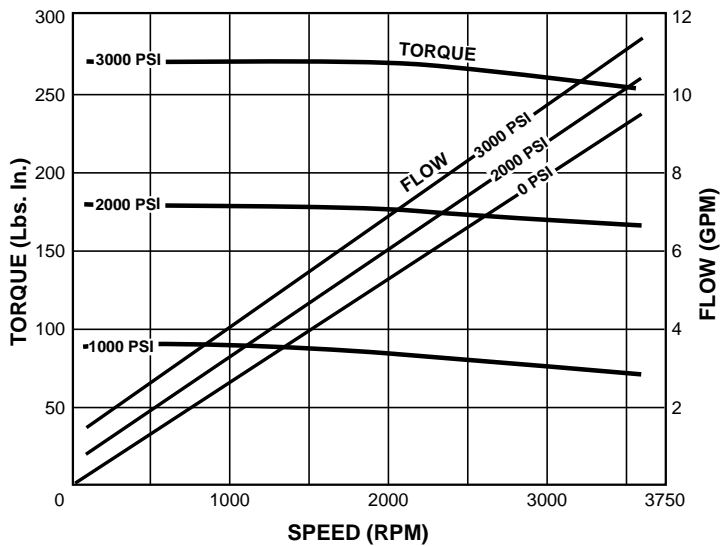
M4-015



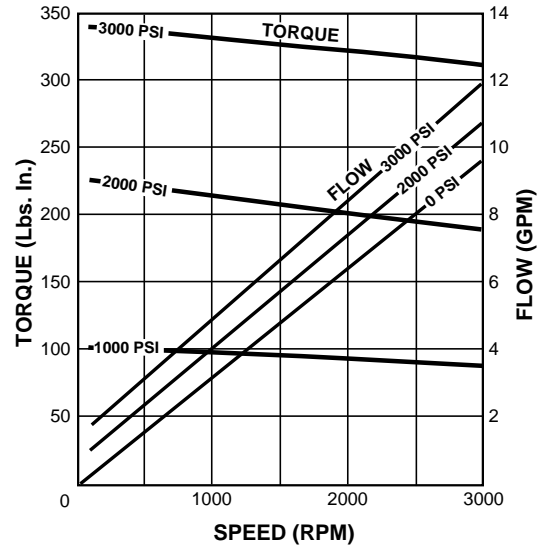
M4-030



M4-060



M4-075



Displacement

	cm <sup>3</sup> /rev	(in <sup>3</sup> /rev)
015 Unit	2.45	(.15)
030 Unit	4.91	(.30)
045 Unit	7.37	(.45)
060 Unit	9.83	(.60)
075 Unit	12.29	(.75)

Speed

	Recommended Range
015 Unit	75 to 7500 rpm
030 Unit	50 to 5000 rpm
045 Unit	50 to 5000 rpm
060 Unit	36 to 3600 rpm
075 Unit	30 to 3000 rpm

Performance Curves:

Data based on:  
Oil: 65 cst (300 SSU)  
Mobil DTE-26  
Temp: 38°C (100°F)

Weight

	Kg	(lb)
015 Unit	7.3	(16)
030 Unit	7.7	(17)
045 Unit	8.2	(18)
060 Unit	8.6	(19)
075 Unit	9.1	(20)

Minimum speeds indicated are based on constant load. For speeds outside of the recommended range, consult the factory.

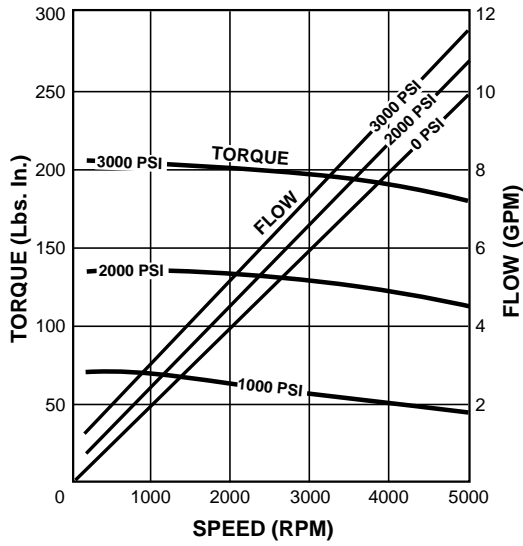
Pressure

Continuous: 2000 PSI  
† Intermittent, Max: 2400 PSI  
‡ Transient, Max: 3000 PSI

† Intermittent conditions are to be less than 10% of each minute.  
‡ Transient conditions are to be less than 1% of every minute.

Performance Data & Mounting Data

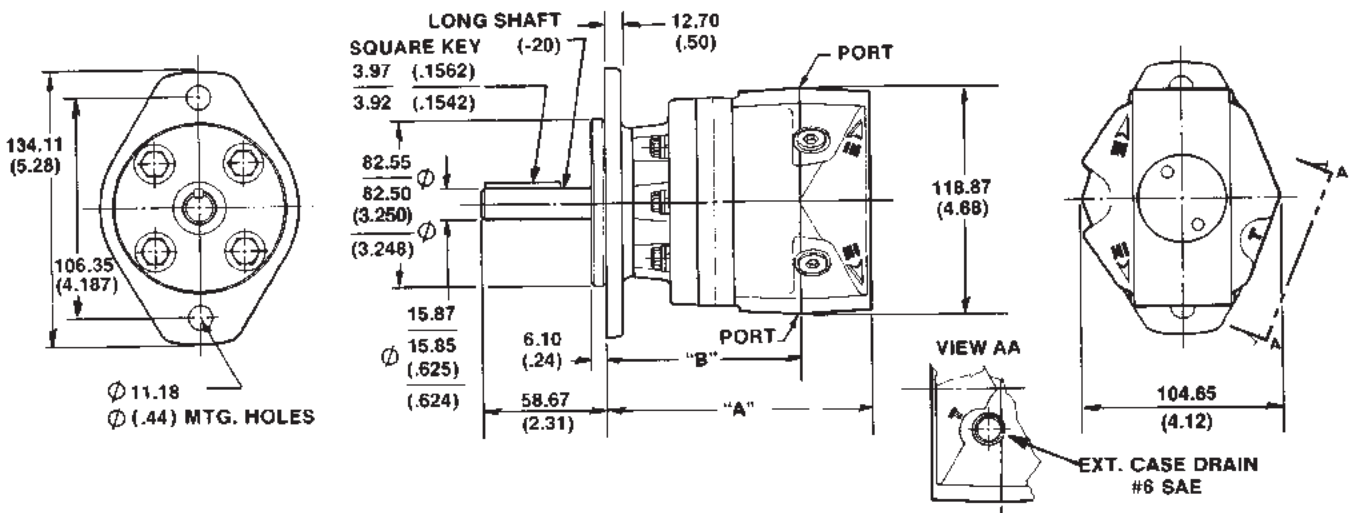
M4-045



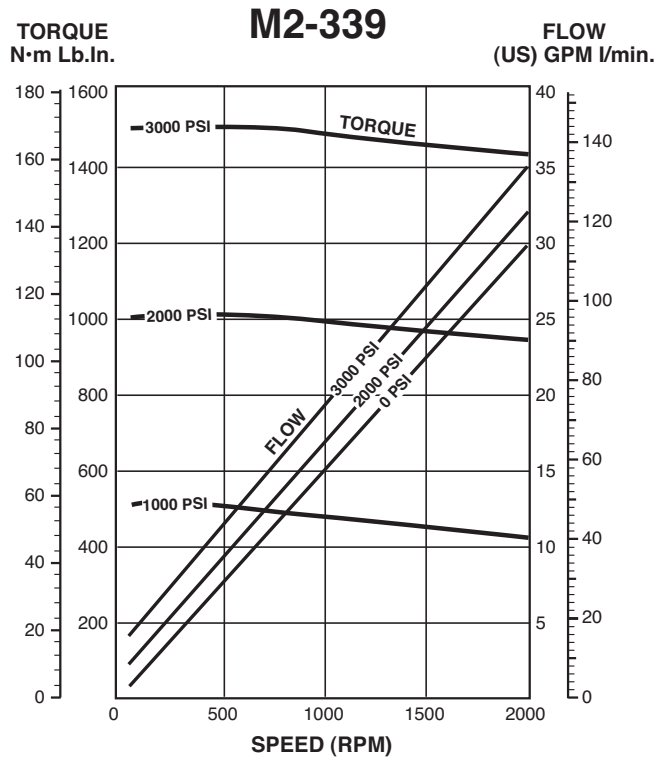
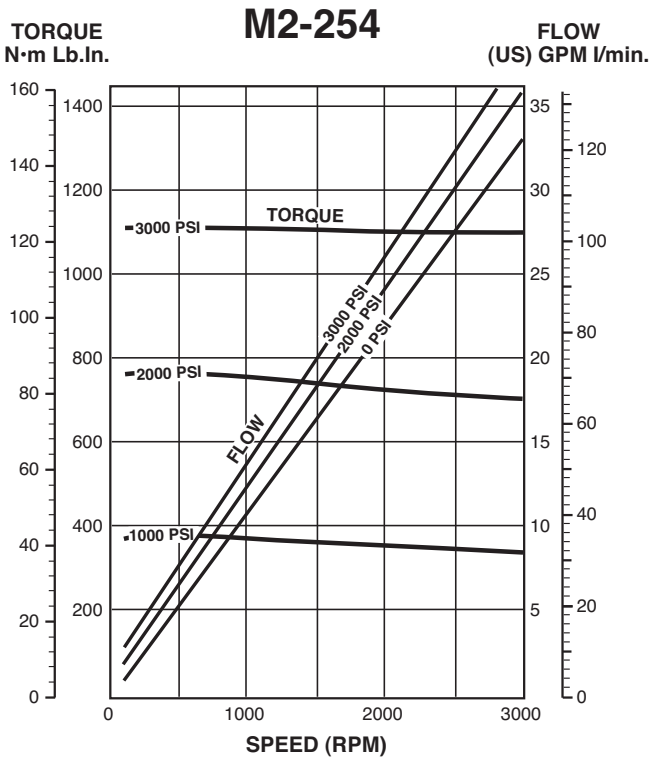
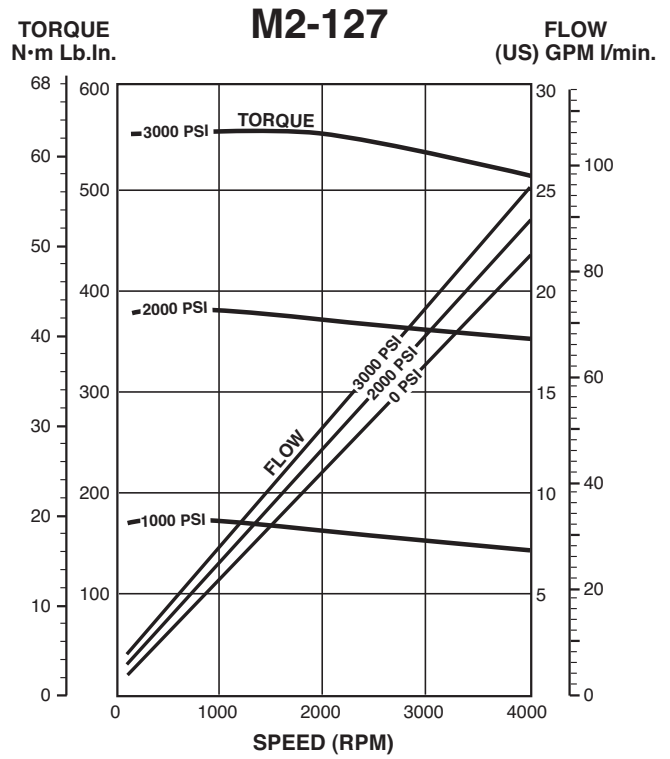
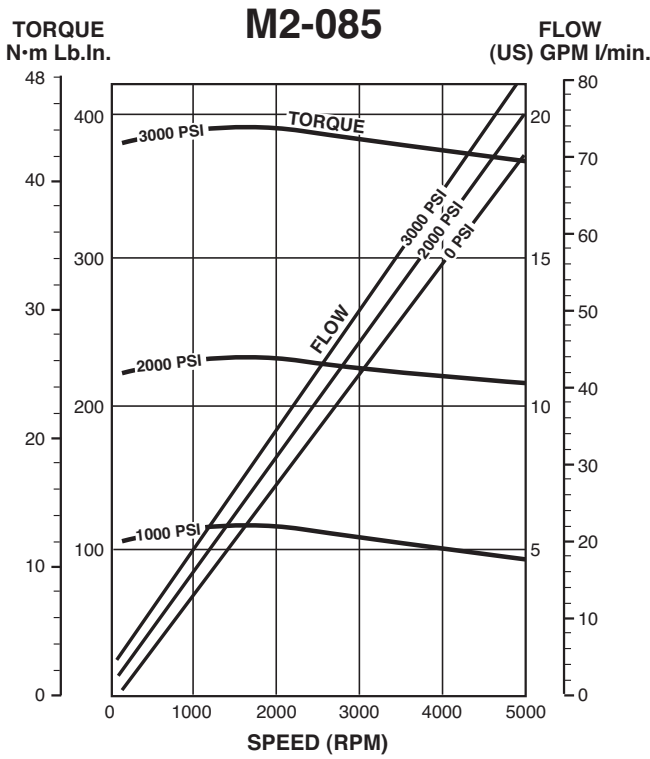
Dimensions are shown in millimeters.  
Dimensions within ( ) are in inches.

Code	A	B
015	143.26 (5.64)	107.44 (4.23)
030	149.61 (5.89)	113.79 (4.48)
045	156.21 (6.15)	120.14 (4.73)
060	162.31 (6.39)	126.49 (4.98)
075	168.66 (6.64)	132.84 (5.23)

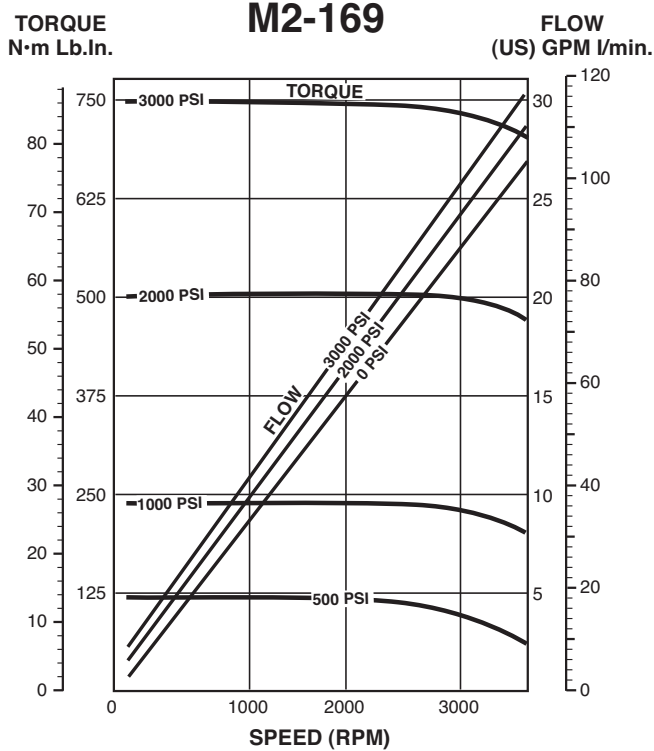
MOUNTING DATA



Performance Data



Performance Data



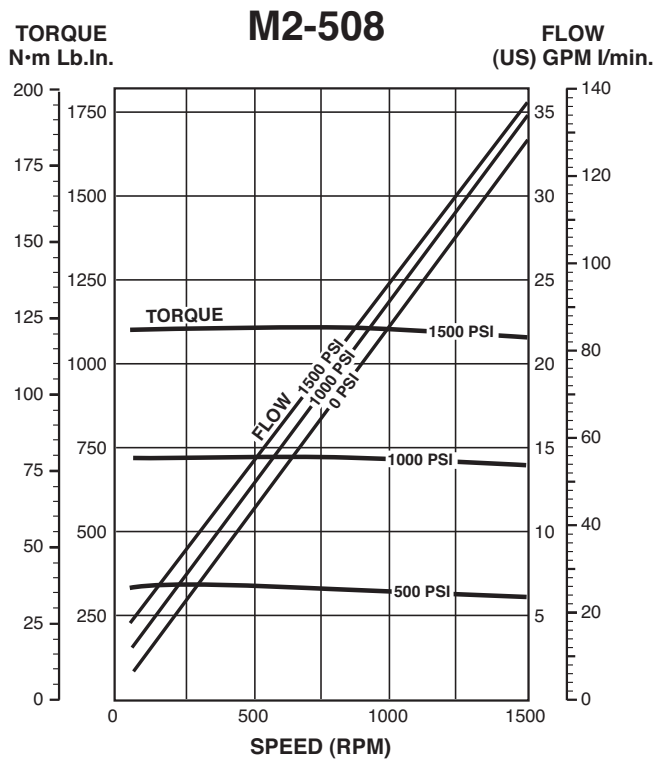
Displacement

Unit	cm <sup>3</sup> /rev	(in <sup>3</sup> /rev)
085 Unit	13.9	(0.85)
127 Unit	20.8	(1.27)
169 Unit	27.7	(1.69)
254 Unit	41.6	(2.54)
339 Unit	55.6	(3.39)
508 Unit	83.2	(5.08)

Pressure

- Continuous:
  - M2-508 1000 PSI
  - All other Units 2000 PSI
- † Intermittent, Max:
  - M2-508 1400 PSI
  - All other Units 2400 PSI
- ‡ Transient, Max:
  - M2-508 1700 PSI
  - All other Units 3000 PSI

† Intermittent conditions are to be less than 10% of each minute.  
‡ Transient conditions are to be less than 1% of every minute.



Speed

Recommended Range

085 Unit	50 to 5000 rpm
127 Unit	40 to 4000 rpm
169 Unit	36 to 3600 rpm
254 Unit	30 to 3000 rpm
339 Unit	20 to 2000 rpm
508 Unit	15 to 1500 rpm

Minimum speeds indicated are based on constant load. For speeds outside of the recommended range, consult the factory.

Weight

085 Unit	15.4 Kg	(34 lb)
127 Unit	16.3 Kg	(36 lb)
169 Unit	17.2 Kg	(38 lb)
254 Unit	18.6 Kg	(41 lb)
339 Unit	20.4 Kg	(45 lb)
508 Unit	24.0 Kg	(52 lb)

Performance Curves:

Data based on:  
Oil: 65 cst (300 SSU) Mobil DTE-26  
Temp: 38°C (100°F)

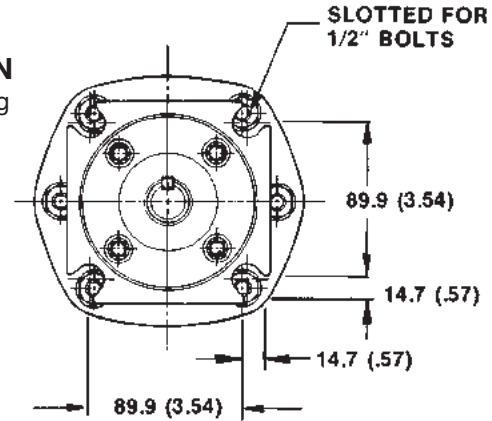
\* Stall torque band is application dependent, consult factory.

### Mounting Data

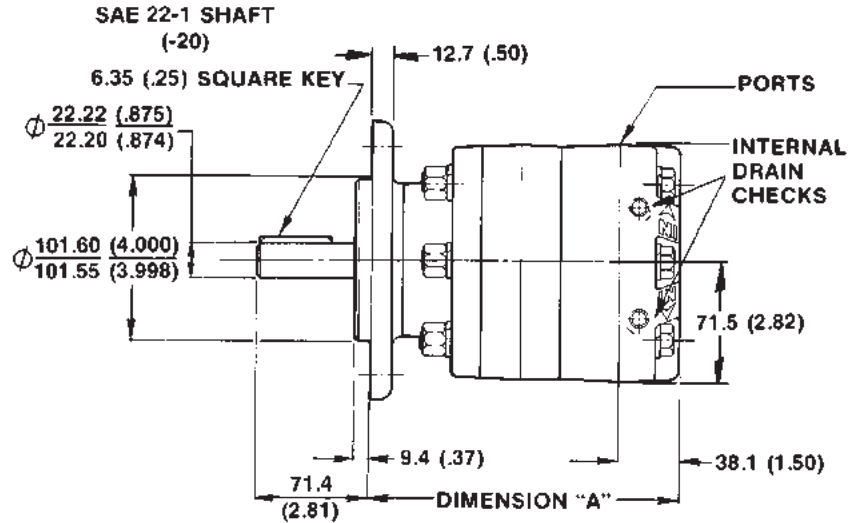
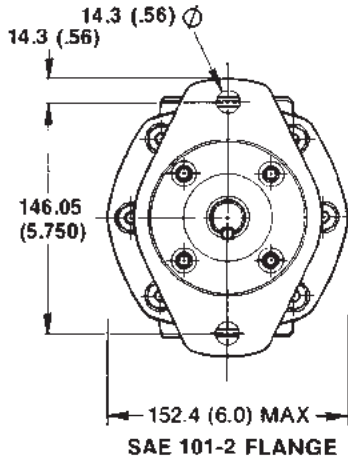
Dimensions are shown in millimeters.  
Dimensions within ( ) are in inches.

Code	Dimension "A"
085	158.8 (6.25)
127	165.1 (6.50)
169	171.5 (6.75)
254	184.2 (7.25)
339	196.9 (7.75)
508	222.3 (8.75)

#### FLANGE OPTION SAE 101-4 Mounting

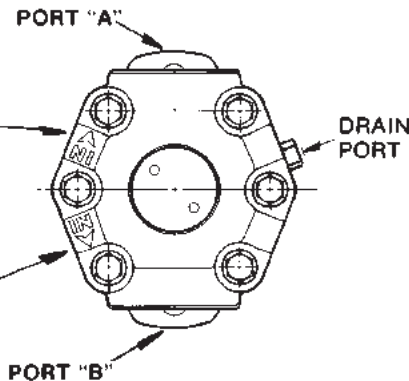


### DIMENSIONS

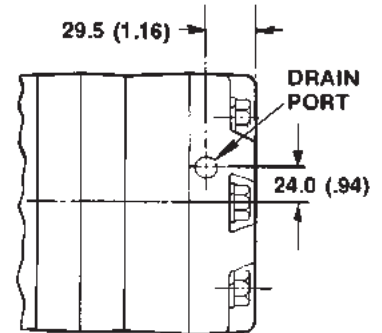


### PORT LOCATION

1. The shaft will rotate in the direction of this "ARROWHEAD" when Port "A" is the inlet "IN" or pressure port.
2. With Port "B" as the inlet "IN" or pressure port, the shaft will rotate in the direction of this "ARROWHEAD".



### DRAIN PORT

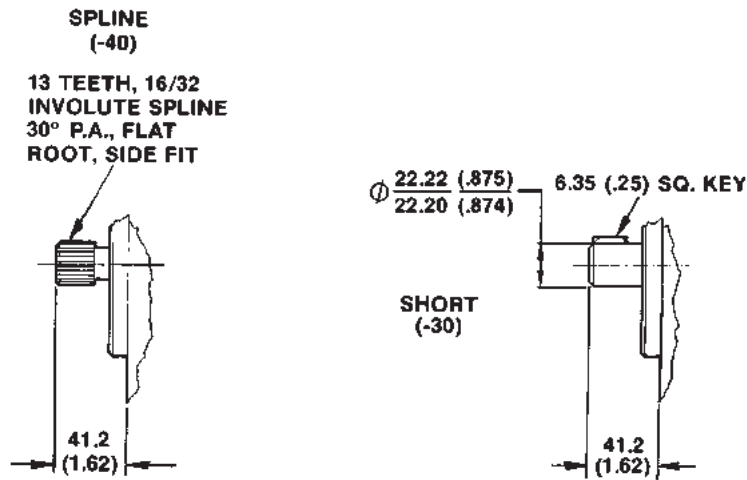


Drain Port Will Be:

1. No. 6-SAE for the SAE ported motors.

## Mounting Data

### SHAFT OPTIONS



**Operating Pressures**

Continuous:

M2-508 1000 PSI

All other Units 2000 PSI

Intermittent, Max:

M2-508 1400 PSI

All other Units 2400 PSI

Transient, Max:

M2-508 1700 PSI

All other Units 3000 PSI

**Filtration**

25 micron or less

**Fluids**

To insure ultimate component life, use premium quality hydraulic oils. Fluids with effective quantities of anti-wear agents or additives, (such as Mobil Oil DTE-26), are highly recommended.

**Viscosity**

Maximum 1000 centistokes  
5000 SSU

Minimum 13.5 centistokes  
70 SSU

**Recommended Temperature Range**

-40°C (-40°F) to 82°C (180°F)

**Case Drain Precaution**

If outlet port exceeds 400 PSI, the external case drain should be used with no more than 400 PSI back pressure.

**Dimensions**

Published dimensions are nominal. Allowances should be made for dimensional variations of cast parts.

**Installation Requirements**

Pulleys, sprockets, and belts should be properly aligned on the shaft; and fan blades should be properly sized to prevent excessive thrust loads.

**Shaft Seal**

The standard Nitrile shaft seal is adequate for most applications. For applications which involve shaft speeds above 2500 rpm or synthetic fluids, the operational Viton shaft seal should be specified.

**Static Seals**

All the o-rings included within the motor and the shaft dust seal are Nitrile. They may be used with all types of hydraulic fluids. However, since these seals swell after exposure to ester base synthetic fluids, they should be replaced if the motor is repaired.

**Motor Precaution**

A hydraulic motor is not designed to hold a suspended load. Therefore, if the application requires a locked position, a mechanical holding device (such as a brake) must be employed. Consult factory for availability.

**For different operating conditions, consult the factory.**





The items described in this document and other documents and descriptions provided by Parker Hannifin Corporation, Hydraulics Group, and its authorized distributors ("Seller") are hereby offered for sale at prices to be established by Seller. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any item described in its document, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer. All goods or work described will be referred to as "Products".

**1. Terms and Conditions.** Seller's willingness to offer Products, or accept an order for Products, to or from Buyer is expressly conditioned on Buyer's assent to these Terms and Conditions and to the terms and conditions found on-line at [www.parker.com/saleterms/](http://www.parker.com/saleterms/). Seller objects to any contrary or additional term or condition of Buyer's order or any other document issued by Buyer.

**2. Price Adjustments; Payments.** Prices stated on the reverse side or preceding pages of this document are valid for 30 days. After 30 days, Seller may change prices to reflect any increase in its costs resulting from state, federal or local legislation, price increases from its suppliers, or any change in the rate, charge, or classification of any carrier. The prices stated on the reverse or preceding pages of this document do not include any sales, use, or other taxes unless so stated specifically. Unless otherwise specified by Seller, all prices are F.O.B. Seller's facility, and payment is due 30 days from the date of invoice. After 30 days, Buyer shall pay interest on any unpaid invoices at the rate of 1.5% per month or the maximum allowable rate under applicable law.

**3. Delivery Dates; Title and Risk; Shipment.** All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay. Regardless of the manner of shipment, title to any products and risk of loss or damage shall pass to Buyer upon tender to the carrier at Seller's facility (i.e., when it's on the truck, it's yours). Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyers' request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's changes in shipping, product specifications or in accordance with Section 13, herein.

**4. Warranty.** Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of eighteen (18) months from the date of delivery to Buyer or 2,000 hours of normal use, whichever occurs first. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HEREUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

**5. Claims; Commencement of Actions.** Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 60 days after delivery or, in the case of an alleged breach of warranty, within 30 days after the date within the warranty period on which the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for any amount due to Seller from Buyer) must be commenced within thirteen months from the date of tender of delivery by Seller or, for a cause of action based upon an alleged breach of warranty, within thirteen months from the date within the warranty period on which the defect is or should have been discovered by Buyer.

**6. LIMITATION OF LIABILITY.** UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.

**7. Contingencies.** Seller shall not be liable for any default or delay in performance if caused by circumstances beyond the reasonable control of Seller.

**8. User Responsibility.** The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.

**9. Loss to Buyer's Property.** Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

**10. Special Tooling.** A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

**11. Buyer's Obligation; Rights of Seller.** To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest. Seller shall have a security interest in, and lien upon, any property of Buyer in Seller's possession as security for the payment of any amounts owed to Seller by Buyer.

**12. Improper use and Indemnity.** Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

**13. Cancellations and Changes.** Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.

**14. Limitation on Assignment.** Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

**15. Entire Agreement.** This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of the agreement. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.

**16. Waiver and Severability.** Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

**17. Termination.** This agreement may be terminated by Seller for any reason and at any time by giving Buyer thirty (30) days written notice of termination. In addition, Seller may by written notice immediately terminate this agreement for the following: (a) Buyer commits a breach of any provision of this agreement (b) the appointment of a trustee, receiver or custodian for all or any part of Buyer's property (c) the filing of a petition for relief in bankruptcy of the other Party on its own behalf, or by a third party (d) an assignment for the benefit of creditors, or (e) the dissolution or liquidation of the Buyer.

**18. Governing Law.** This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement. Disputes between the parties shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.

**19. Indemnity for Infringement of Intellectual Property Rights.** Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

**20. Taxes.** Unless otherwise indicated, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of Products.

**21. Equal Opportunity Clause.** For the performance of government contracts and where dollar value of the Products exceed \$10,000, the equal employment opportunity clauses in Executive Order 11246, EVVRAA, and 41 C.F.R. §§ 60-1.4(a), 60-741.5(a), and 60-250.4, are hereby incorporated.

1/09









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## Parker Hannifin Corporation

### About Parker Hannifin Corporation

Parker Hannifin is a leading global motion-control company dedicated to delivering premier customer service. A Fortune 500 corporation listed on the New York Stock Exchange (PH), our components and systems comprise over 1,400 product lines that control motion in some 1,000 industrial and aerospace markets. Parker is the only manufacturer to offer its customers a choice of hydraulic, pneumatic, and electromechanical motion-control solutions. Our Company has the largest distribution network in its field, with over 7,500 distributors serving nearly 400,000 customers worldwide.

### Parker's Charter

To be a leading worldwide manufacturer of components and systems for the builders and users of durable goods. More specifically, we will design, market and manufacture products controlling motion, flow and pressure. We will achieve profitable growth through premier customer service.

### Product Information

North American customers seeking product information, the location of a nearby distributor, or repair services will receive prompt attention by calling the Parker Product Information Center at our toll-free number: 1-800-C-PARKER (1-800-272-7537). In Europe, call 00800-C-PARKER-H (00800-2727-5374).

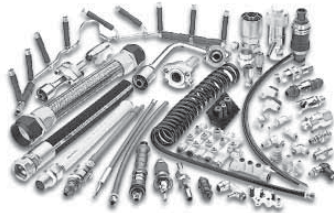
The Aerospace Group is a leader in the development, design, manufacture and servicing of control systems and components for aerospace and related high-technology markets, while achieving growth through premier customer service.



The Climate & Industrial Controls Group designs, manufactures and markets system-control and fluid-handling components and systems to refrigeration, air-conditioning and industrial customers worldwide.



The Fluid Connectors Group designs, manufactures and markets rigid and flexible connectors, and associated products used in pneumatic and fluid systems.



The Seal Group designs, manufactures and distributes industrial and commercial sealing devices and related products by providing superior quality and total customer satisfaction.



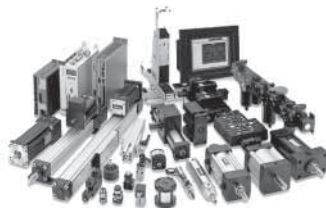
The Hydraulics Group designs, produces and markets a full spectrum of hydraulic components and systems to builders and users of industrial and mobile machinery and equipment.



The Filtration Group designs, manufactures and markets quality filtration and clarification products, providing customers with the best value, quality, technical support, and global availability.



The Automation Group is a leading supplier of pneumatic and electromechanical components and systems to automation customers worldwide.



The Instrumentation Group is a global leader in the design, manufacture and distribution of high-quality critical flow components for worldwide process instrumentation, ultra-high-purity, medical and analytical applications.



# Parker Hydraulics International Sales Offices

## North America

### Hydraulics Group Headquarters

6035 Parkland Boulevard  
Cleveland, OH 44124-4141 USA  
Tel: 216-896-3000  
Fax: 216-896-4031

### Parker Hannifin Canada Division

160 Chisholm Drive Milton  
Ontario, Canada L9T 3G9  
Tel: 905-693-3000  
Fax: 905-876-1958

## Mexico

### Parker Hannifin de México

Industrial Hydraulic Sales  
Eje Uno Norte No. 100  
Parque Industrial Toluca 2000  
Toluca, Edo. de Mexico CP 50100  
Tel: 52 72 2275 4200  
Fax: 52 72 2279 9308

### Parker Hannifin de México

Mobile Hydraulic Sales  
Via de FFCC a Matamoros 730  
Apodaca, NL CP de Mexico 66600  
Tel: 52 81 8156 6000  
Fax: 52 81 8156 6068

## Europe

### Hydraulics Group Headquarters

La Tuilière 6  
1163 Etoy - Switzerland  
Tel: 41 21 821 8500  
Fax: 41 21 821 8580

## South Africa

### Parker Hannifin Africa Pty Ltd

P.O. Box 1153  
ZA-Kempton Park 1620,  
Republic of South Africa  
Tel: 27 11 961 0700  
Fax: 27 11 392 7213

## Mobile Sales

### Mobile Sales Organization and Global Sales

850 Arthur Avenue  
Elk Grove Village, IL 60007 USA  
Tel: 847-258-6200  
Fax: 847-258-6299

## Industrial Sales

### Central Region

1042 Maple Avenue  
Unit 331  
Lisle, IL 60532 USA  
Tel: 630-964-0796

### Great Lakes Region

6035 Parkland Boulevard  
Cleveland, OH 44124-4141 USA  
Tel: 216-896-2740  
Fax: 866-498-7507

### Gulf Region

20002 Standing Cypress Drive  
Spring, TX 77379 USA  
Tel: 817-473-4431  
Fax: 888-227-9454

### Southwest Region

700 S. 4th Avenue  
Mansfield, TX 76063 USA  
Tel: 817-473-4431  
Fax: 888-227-9454

### Mid Atlantic & Southeast Regions

1225 Old Alpharetta Rd  
Suite 290  
Alpharetta, GA 30005 USA  
Tel: 770-619-9767  
Fax: 770-619-9806

### Midwest Region

8145 Lewis Road  
Minneapolis, MN 55427 USA  
Tel: 763-513-3535  
Fax: 763-544-3418

### Northeast Region

P.O. Box 396  
Pine Brook, NJ 07058 USA  
Tel: 973-227-2565  
Fax: 973-227-2467

### Northwest Region

6458 North Basin Avenue  
Portland, OR 97217 USA  
Tel: 503-283-1020  
Fax: 866-611-7308

### Pacific Region

8460 Kass Drive  
Buena Park, CA 90621 USA  
Tel: 714-228-2509  
Fax: 714-228-2511

## Asia Pacific

### Parker Hannifin Shanghai Ltd.

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Jin Qiao Export Processing Zone  
Shanghai 201206, China  
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Fax: 86 21 6445 9717

### Parker Hannifin Hong Kong Ltd.

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9 Cheung Yee Street  
Cheung Sha Wan, Hong Kong  
Tel: 852 2428 8008  
Fax: 852 2480 4256

### Parker Hannifin Korea Ltd.

9F KAMCO Yangjae Tower  
949-3 Dogok1-dong, Gangnam-gu  
Seoul, 135-860, Korea  
Tel: 82 2 559 0400  
Fax: 82 2 556 8187

### Parker Hannifin India Pvt Ltd.

Plot No. EL-26, MIDC,  
TTC Industrial Area  
Mahape, Navi Mumbai, 400 709, India  
Tel: 91 22 6513 7081  
Fax: 91 22 2768 6841

### Parker Hannifin Australia

Parker Hannifin Pty Ltd.  
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Castle Hill, NSW 2154, Australia  
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Fax: 612 9842 5111

## Latin America

### Parker Hannifin Ind. e Com. Ltda Hydraulics Division

Av. Frederico Ritter, 1100  
94930-000 Cachoeirinha RS, Brazil  
Tel: 55 51 3470 6090  
Fax: 55 51 3470 9281

### Parker Hannifin Argentina S.A.I.C.

Stephenson 2711  
1667-Tortuguitas-Malvinas Argentinas  
Pcia. de Buenos Aires, Argentina  
Tel: 54 3327 44 4129  
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### Pan American Division

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Tel: 305-470-8800  
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Parker Hannifin Corporation  
**Hydraulic Pump Motor Division**

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