

Genuine Metaris Orbital Motor Technical Catalog

Low Speed High Torque Orbital Motors



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All measurements are in inches (millimeters) unless otherwise marked.

All manufacturers names, symbols and descriptions in this document are used for reference purposes only, and it is not implied that any parts listed is the product of these manufacturers.

Technical Information - All Series

Shaft Seal Specifications/Benefits

- Genuine Metaris Motors incorporate a high pressure shaft seal which allows higher back pressures
- Case drain line is recommended when back pressure exceeds individual performance data table
- Increases ability to handle high pressure spikes

Recommended Fluid Specifications

- Anti-wear hydraulic oil
- Viscosity of 172 - 334 SUS (37 - 73 cSt)
- Recommended oil cleanliness - ISO4406 = 18/13
- Maximum recommended operating temperature - 80°C (176°F)

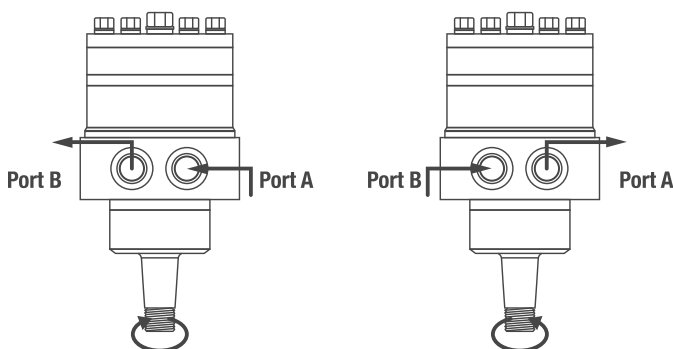
Pressure and Speed Operation Parameters

- Simultaneous maximum RPM and maximum pressure NOT recommended
- Maximum pressure or maximum RPM operation: 10% of every minute
- Intermittent pressure is the allowed pressure at the inlet port
- Continuous pressure is the working pressure difference between inlet and outlet ports

Start-up Procedures (to assure best motor life)

- Ensure motor is filled with equipment manufacturers' recommended fluids prior to any load application
- Operate motor at 30% of rated pressure for at least one hour before application of full load

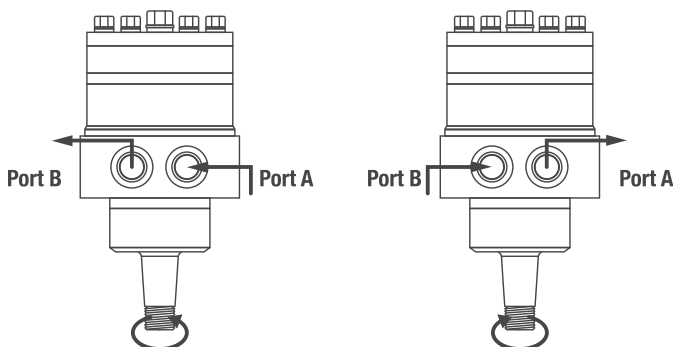
Rotation - Port Plumbing



Standard Rotation:

(Viewed from the shaft end)

- Port A Pressurized = Clock-wise Rotation (CW)
- Port B Pressurized = Counter Clock-wise Rotation (CCW)



Opposite Rotation:

(Viewed from the shaft end)

- Port A Pressurized = Counter Clock-wise Rotation (CCW)
- Port B Pressurized = Clock-wise Rotation (CW)

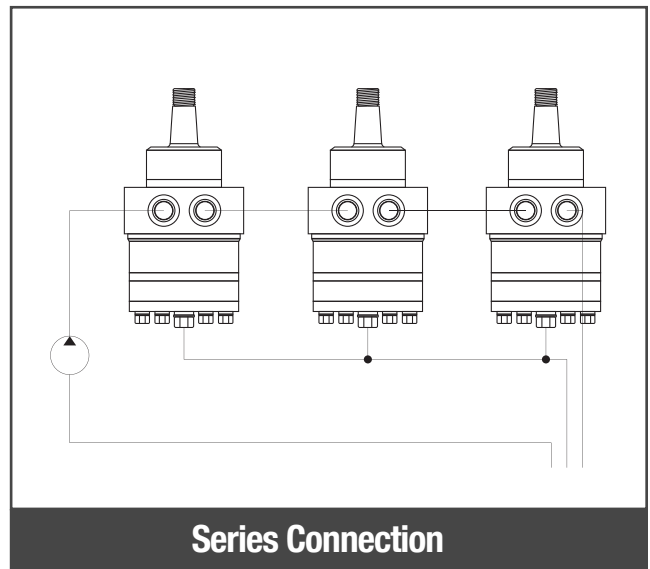
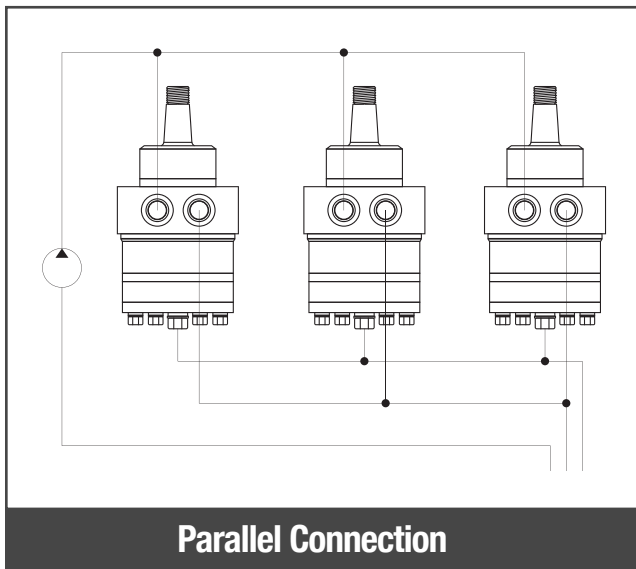
Technical Information - All Series

Case Drain Information

All Genuine Metaris motors will be supplied with a case drain and shipped with a Steel Hex Socket Plug installed

- Advantages provided by use of a case drain
 - Contamination control - flushing the motor case
 - Cooler operating temperatures - exiting oil draws motor heat away
 - Extended motor seal life - maintains lower case pressure (due to the fact of a pre-installed preset restriction valve)

Plumbing Diagrams



Technical Information - All Series

Motor Testing

- Motors are tested prior to painting
 - Tested
 - Cleaned
 - Heated and dried
 - Painted while warm
- Test report provided with each unit
- High quality standards maintained
 - Volumetric efficiency 85% or higher
 - 10% re-tested by QC Department

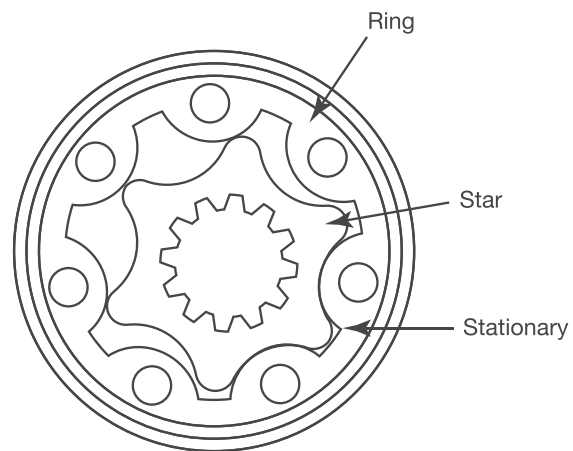
Geroter vs Roller-Star

- All Genuine Metaris Orbital Motors incorporate Roller-Star design
- Roller-Star technology at Geroter prices
- Provides longer operational life

Geroter

Fixed Lobes on Ring:

- Higher Friction
- Lower Mechanical Efficiency
- Lower Start-up Torque
- Jerky Low Speed Operation
- Greater Wear on Lobes = Shorter Life
- Lower Price Point

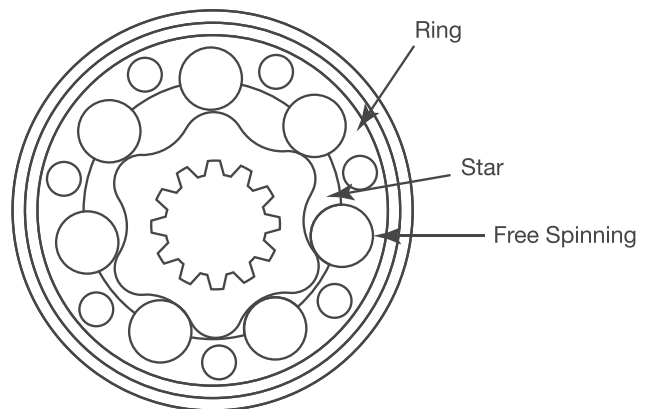


Roller-Star

Rotating Rollers on Ring:

- Lower Friction
- Higher Mechanical Efficiency
- Higher Start-up Torque
- Smooth Low Speed Operation
- Less Wear on Rollers = Longer Life
- Higher Price Point*

(*Metaris offers the Roller-Star version at the Geroter Price Point.)

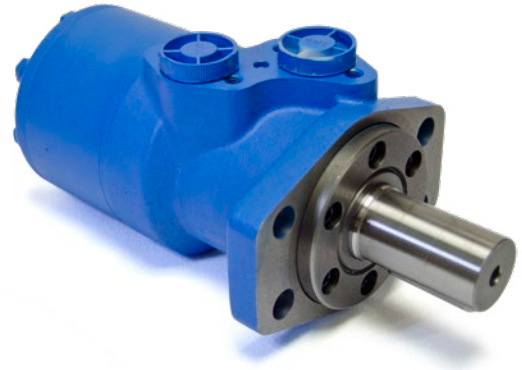


MMPS Series

Features

MMPS series motors are spool valve motors that can be used in parallel or series configurations. A diverse offering of mounting flanges, shafts, ports, and displacements allow for easy installation, product replacement or OEM application.

- Advanced Roller-Star technology, requiring lower pressure at start-up and providing smoother operation at all speeds
- High efficiency shaft bearing, which allows higher pressure, speed and radial force
- High pressure shaft seal, which allows for higher back pressures and an increased ability to handle high pressure spike conditions
- Internal integrated check valve, which limits case pressure by blocking the high pressure port side and allowing the motor housing to drain into the outlet (low pressure) port
- Motors connected in series will utilize the case drain



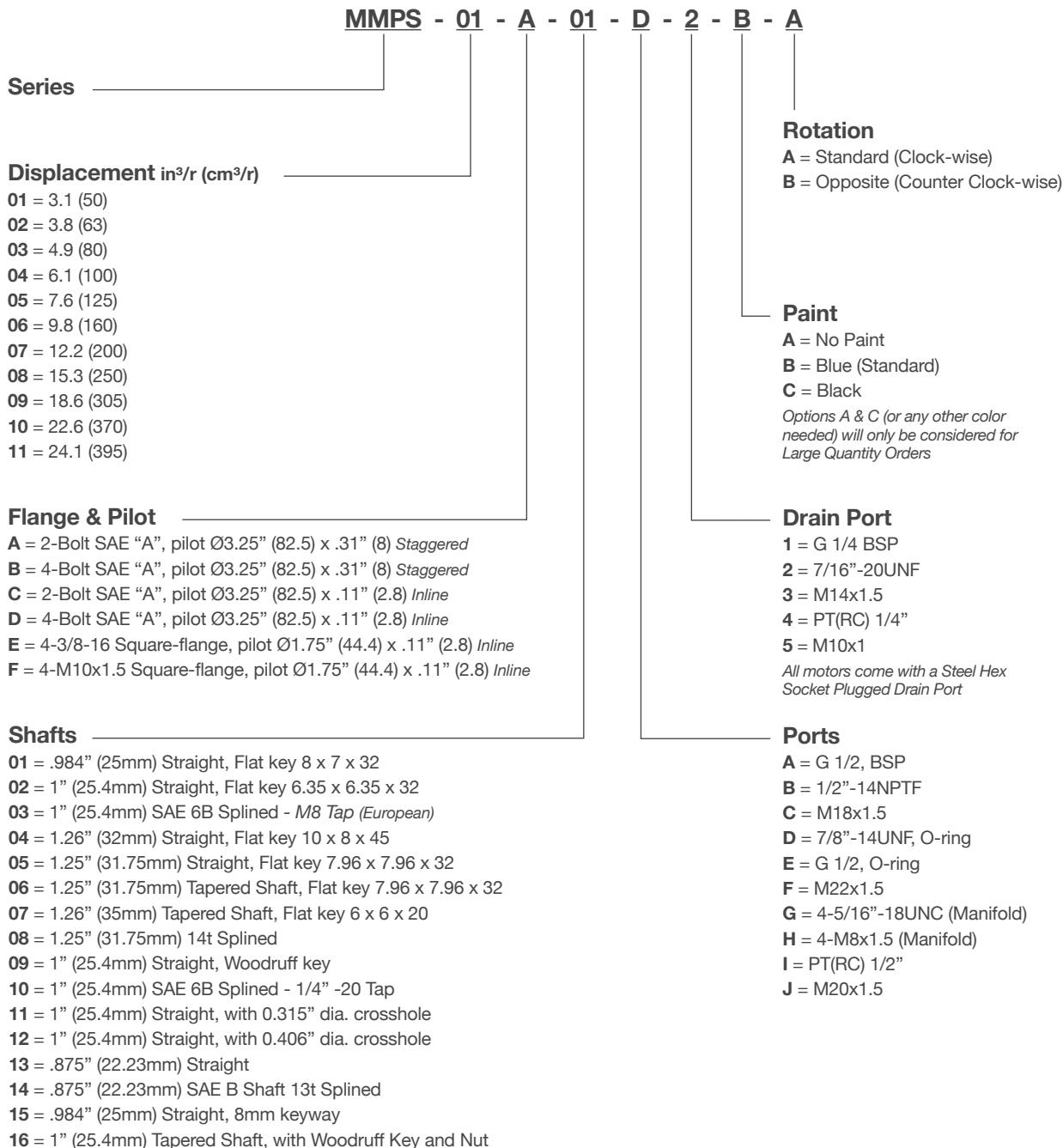
Specifications

MODEL CODE (DISPLACEMENT)		01	02	03	04	05	06	07	08	09	10	11	
Displ.	cm ³ /r	50	63	80	100	125	160	200	250	305	370	395	
	in ³ /r	3.1	3.8	4.9	6.1	7.6	9.8	12.2	15.3	18.6	22.6	24.1	
Flow	LPM	Cont.	38	53	53	53	53	53	53	53	53	53	53
		Int.	45	57	57	57	57	57	57	57	57	57	57
	GPM	Cont.	10.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
		Int.	11.9	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1
Max Speed	RPM	Cont.	750	778	635	510	430	329	266	213	171	142	133
		Int.	875	832	680	537	420	347	281	226	182	150	141
Pressure	ΔBar	Cont.	138	138	138	138	138	124	124	124	103	83	83
		Int.	155	155	155	155	155	138	138	127	110	90	90
	ΔPSI	Cont.	2002	2002	2002	2002	2002	1798	1798	1798	1494	1204	1204
		Int.	2248	2248	2248	2248	2248	2002	2002	1842	1595	1305	1305
Torque	NM	Cont.	93	123	155	196	230	271	328	401	417	402	429
		Int.	105	138	174	219	256	297	359	410	441	427	458
	LBF-IN	Cont.	823	1089	1372	1735	2036	2399	2903	3549	3691	3558	3797
		Int.	929	1221	1540	1938	2266	2629	3177	3629	3903	3779	4054

• Simultaneous maximum torque & maximum speed **NOT** recommended.
 • Continuous Rating ▶ (Cont.) motor may be run continuously at these ratings.
 • Intermittent Operation ▶ (Int.) 10% of every minute.
 • Δ - True pressure difference between inlet port and outlet port.
 • Maximum case pressure without case drain -- 1" Shaft = 125 Bar (1813 psi) | Greater than 1" Shaft 75 Bar (1088 psi).

MMPS Series

Model Code Breakdown

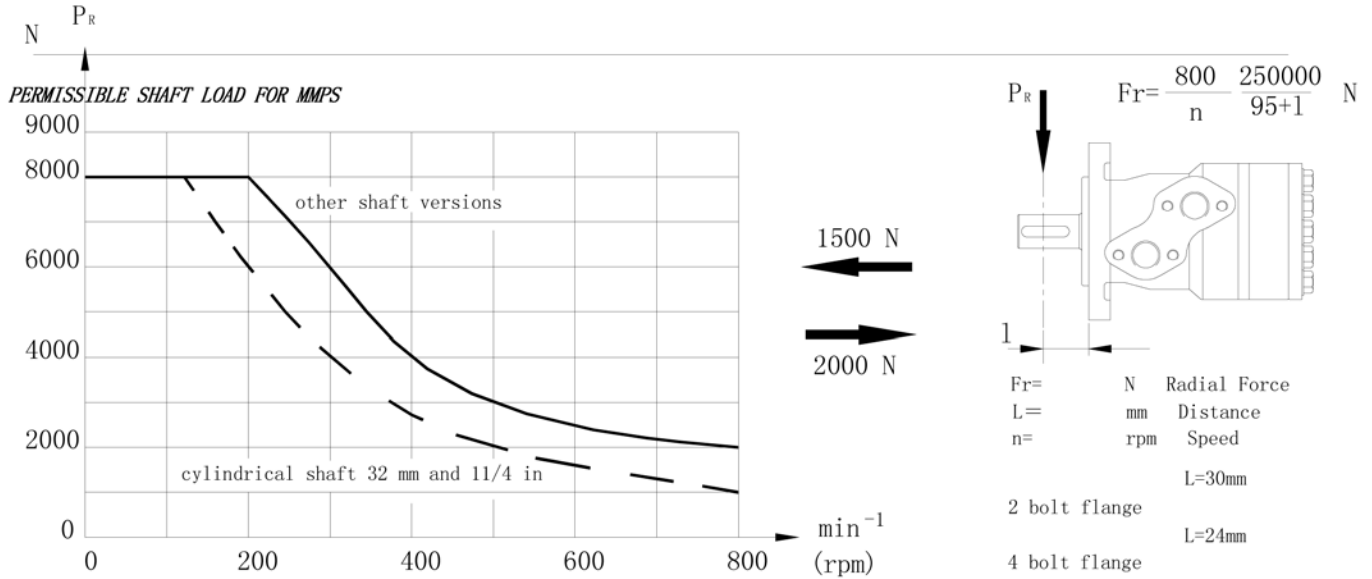


MMPS Series

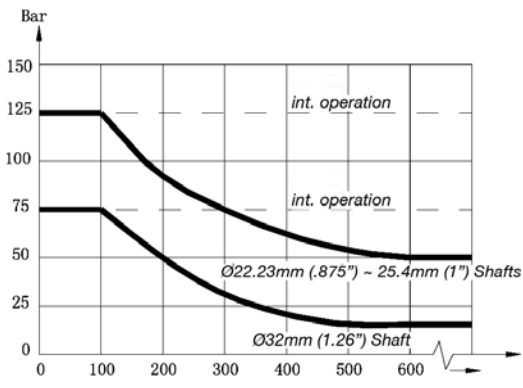
Performance Information

To assure best motor life, run motor for approximately one hour at 30% of rated pressure before applying full load.
 Fill motor with equipment manufacturer's recommended fluid prior to any load application and startup.

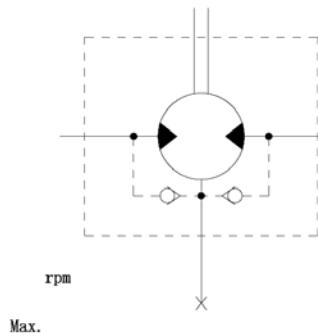
Side Load



Shaft Seal



Standard Shaft Seal = Genuine Metaris High Pressure Shaft Seal



MMPS with standard shaft seal, check valves and with drain connection:
 The shaft seal pressure equals the pressure on the drain line


MMPS with standard shaft seal, check valves and without use of drain connection:
 The pressure on the shaft seal never exceeds the pressure in the return line

MMPS Series

Performance Information

50 cc/r

		Δ PRESSURE BAR							
		28	55	69	97	110	124	138	155
FLOW LPM	7.6	18 152	37 147	46 142	64 134	72 124			
	15.1	18 298	37 290	47 276	66 265	75 261	84 245	93 243	
FLOW LPM	22.7	17 450	37 438	47 434	66 419	75 410	84 407	93 389	105 373
	30.3	14 603	35 590	44 583	64 584	74 554	83 545	92 536	104 520
FLOW LPM	37.9	14 750	34 738	44 732	64 713	73 702	83 696	92 682	104 661
	45.4			43 875	62 859	72 844	81 835	91 819	102 804

 Continuous
 Intermittent

63 cc/r

		Δ PRESSURE BAR							
		28	55	69	97	110	124	138	155
FLOW LPM	7.6	22 111	47 107	59 105	80 96	91 92			
	15.1	24 229	50 216	62 212	87 194	99 190	110 186	122 183	
FLOW LPM	22.7	22 343	48 334	60 321	86 319	99 315	111 291	123 288	138 276
	30.3	21 451	47 442	60 431	86 419	98 415	111 401	123 401	138 386
FLOW LPM	37.9	18 565	45 552	58 547	84 532	97 525	110 512	122 504	137 496
	45.4	18 678	44 665	57 658	82 641	95 635	109 623	121 612	137 601
FLOW LPM	53.0		42 778	55 771	81 753	95 746	107 733	120 723	135 711
	56.8		40 832	53 826	80 806	93 800	106 786	119 779	135 766

80 cc/r

		Δ PRESSURE BAR							
		28	55	69	97	110	124	138	155
FLOW LPM	7.6	30 90	61 83	77 80	106 70	119 63			
	15.1	30 185	62 179	78 175	109 166	124 162	140 156	155 150	
FLOW LPM	22.7	29 275	61 267	77 265	109 253	124 248	140 240	155 232	174 221
	30.3	27 367	60 359	76 354	108 343	124 338	139 333	155 324	174 313
FLOW LPM	37.9	26 460	58 450	74 446	106 435	122 428	138 420	153 412	173 399
	45.4	24 552	56 543	72 537	105 523	121 515	136 509	152 500	172 487
FLOW LPM	53.0		54 635	70 630	102 616	118 609	134 599	150 592	170 578
	56.8		52 680	69 673	101 660	117 650	133 642	149 634	168 619

100 cc/r

		Δ PRESSURE BAR							
		28	55	69	97	110	124	138	155
FLOW LPM	7.6	39 71	79 66	98 83	135 83	152 51	171 46		
	15.1	38 146	79 141	99 138	139 131	158 128	177 124	195 118	
FLOW LPM	22.7	37 217	78 211	98 208	139 199	158 195	178 180	196 184	219 174
	30.3	36 290	76 284	97 280	137 217	157 267	177 262	195 255	218 245
FLOW LPM	37.9	33 363	74 355	95 351	135 343	155 337	174 332	193 325	217 315
	45.4	31 436	72 429	92 424	133 414	153 409	173 402	192 395	215 384
FLOW LPM	53.0	27 510	69 501	90 497	130 487	150 482	170 475	189 469	213 456
	56.8		67 537	88 532	128 522	148 516	168 510	187 502	211 490

27
(Torque Nm)
510
(Speed RPM)

125 cc/r

		Δ PRESSURE BAR							
		28	55	69	97	110	124	138	155
FLOW LPM	7.6	48 56	96 51	121 50	166 44	189 40	212 34		
	15.1	48 114	95 111	121 110	166 107	189 105	211 98	240 90	
FLOW LPM	22.7	47 172	95 171	120 168	166 157	188 155	212 151	240 145	271 130
	30.3	46 230	96 225	120 220	165 216	187 212	213 206	239 200	270 190
FLOW LPM	37.9	45 287	95 283	120 278	165 272	185 267	210 260	237 253	270 240
	45.4	44 345	94 341	118 335	162 328	183 323	210 317	235 310	269 300
FLOW LPM	53.0	38 405	90 401	115 395	154 390	180 384	202 378	228 371	260 358
	56.8		82 426	108 424	143 420	170 415	195 410	210 404	245 390

160 cc/r


		Δ PRESSURE BAR						
		28	55	69	97	110	124	138
FLOW LPM	7.6	61 45	123 42	153 40	209 34	235 30	261 25	
	15.1	61 95	124 91	155 90	214 85	242 82	269 78	295 73
FLOW LPM	22.7	59 140	123 136	155 134	215 129	243 125	271 271	297 114
	30.3	57 187	121 183	152 181	213 175	242 172	270 166	296 259
FLOW LPM	37.9	53 234	117 230	149 227	209 209	239 218	266 266	293 203
	45.4	49 282	114 277	146 274	206 269	235 265	263 257	291 248
FLOW LPM	53.0	45 329	109 323	141 321	201 316	230 311	259 304	287 296
	56.8		107 347	139 344	198 339	228 334	257 327	284 318

MMPS Series

Performance Information Cont.

200 cc/r

		Δ PRESSURE BAR						
		28	55	69	97	110	124	138
FLOW LPM	7.6	76 36	152 33	187 31	253 25	283 20		
	15.1	76 77	154 73	191 73	259 68	292 65	324 61	355 55
	22.7	74 113	154 110	192 109	263 104	294 100	328 95	359 87
	30.3	72 151	150 148	189 146	260 142	293 139	326 132	359 123
	37.9	67 189	146 186	185 184	255 181	290 176	323 166	355 156
	45.4	62 228	142 224	182 222	251 219	286 213	320 204	353 192
	53.0	56 266	137 261	176 259	246 256	291 251	315 242	348 229
	56.8		133 281	172 279	242 275	278 269	313 260	346 247

 Continuous
 Intermittent

250 cc/r

		Δ PRESSURE BAR							
		28	55	69	97	110	114	125	127
FLOW LPM	7.6	94 29	187 26	230 24	306 17				
	15.1	95 62	192 59	235 59	319 55	359 50	368 49		
	22.7	93 91	191 89	236 88	321 82	361 78	371 76	401 72	410 71
	30.3	89 122	187 120	233 119	319 113	359 108	369 106	399 101	408 99
	37.9	84 152	182 150	288 148	313 143	356 136	366 134	396 127	406 125
	45.4	78 183	175 180	222 179	309 175	351 166	361 161	392 156	402 153
	53.0	71 213	169 211	216 209	302 202	345 195	356 193	386 185	397 182
	56.8		165 226	212 224	298 217	341 209	352 207	383 200	394 197

305 cc/r

		Δ PRESSURE BAR							
		28	41	55	69	83	97	103	110
FLOW LPM	7.6	117 23	176 22	230 21	283 19	329 16	366 11		
	15.1	119 49	180 48	237 48	289 47	342 47	391 44	416 41	
	22.7	116 74	178 72	237 72	290 71	342 69	391 64	417 62	441 60
	30.3	110 98	172 97	232 97	285 96	339 94	390 89	414 86	438 83
	37.9	105 122	166 121	226 120	280 120	334 117	385 112	410 108	435 104
	45.4	98 146	159 145	216 145	271 145	326 142	379 136	404 131	428 127
	53.0	89 171	151 170	209 170	264 169	318 165	371 159	397 154	423 150
	56.8			204 182	258 181	313 177	366 171	393 165	419 160

370 cc/r

		Δ PRESSURE BAR						
		14	28	41	55	69	83	90
FLOW LPM	7.6	67 20	140 19	210 18	272 17	334 15		
	15.1	66 41	143 41	215 40	283 40	342 39	402 38	430 37
	22.7	65 61	141 60	214 60	283 59	342 58	400 57	428 56
	30.3	56 82	131 81	206 80	277 79	336 78	397 77	427 77
	37.9	50 102	126 102	199 101	270 101	331 100	393 97	424 96
	45.4	38 122	120 121	191 120	255 119	318 119	383 118	416 116
	53.0	26 142	108 141	182 140	249 139	310 138	375 137	408 134
	56.8				242 150	303 149	370 147	403 146

26
(Torque Nm)
 142
(Speed RPM)

395 cc/r

		Δ PRESSURE BAR						
		14	28	41	55	69	83	90
FLOW LPM	7.6	71 18	150 17	224 17	290 16	356 14		
	15.1	70 38	152 38	229 37	302 37	365 36	429 36	458 35
	22.7	69 57	150 57	228 57	302 55	385 54	427 53	456 52
	30.3	62 77	140 76	220 75	295 74	358 73	423 72	455 72
	37.9	53 96	134 96	212 95	288 95	353 94	419 91	452 90
	45.4	40 114	129 113	204 112	272 111	339 111	408 110	444 108
	53.0	28 133	115 132	194 131	267 130	330 129	400 128	435 125
	56.8				258 141	323 140	394 138	430 137

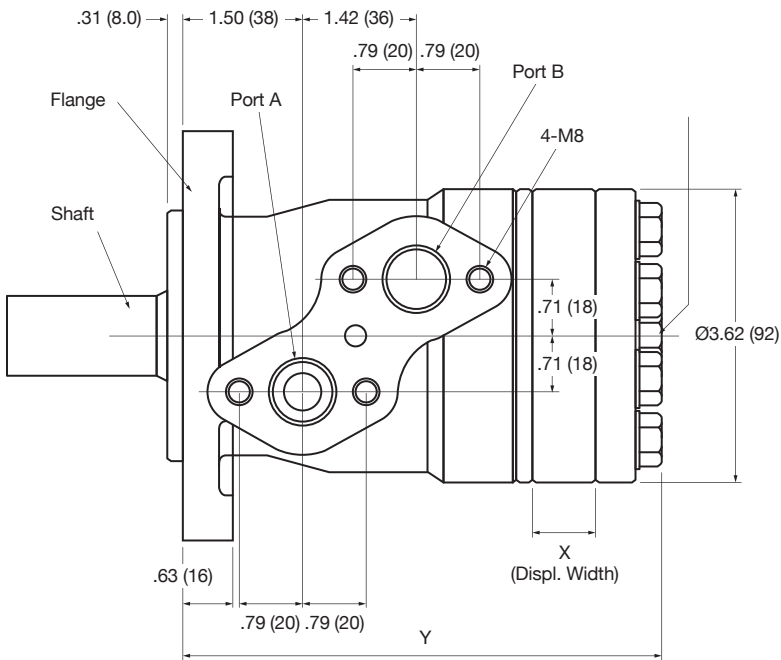
Individual Performance Data Graph Information:

- Motors run with high efficiency in all areas designed with a number for torque and speed.
- However, for best motor life, select a motor to run with a torque and speed range shown in the light gray area (Continuous).
- Performance data is typical at 120 SUS (25.2 cSt).
- Actual data may vary slightly from unit to unit in production.

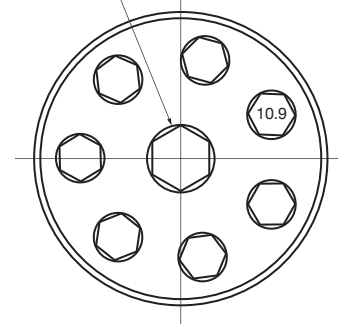
MMPS Series

Dimensions - Staggered Ports (Flanges A & B)

DISPLACEMENT CM ³ /R	50	63	80	100	125	160	200	250	305	370	395	
X	Inches	.35	.45	.57	.71	.90	1.14	1.40	1.76	2.21	2.67	2.84
	Millimeters	(9)	(11.5)	(14.4)	(18.1)	(22.8)	(29.0)	(35.6)	(44.7)	(56.0)	(68.0)	(72.0)
Y	Inches	5.64	5.74	5.85	6.00	6.19	6.43	6.69	7.04	7.49	7.96	8.12
	Millimeters	(143.3)	(145.8)	(148.7)	(152.4)	(157.1)	(163.2)	(170.0)	(178.9)	(190.3)	(202.2)	(206.3)



Case Drain Port:
None
or M14x1.5
or G1/4"
or 7/16-20UNF



PORT

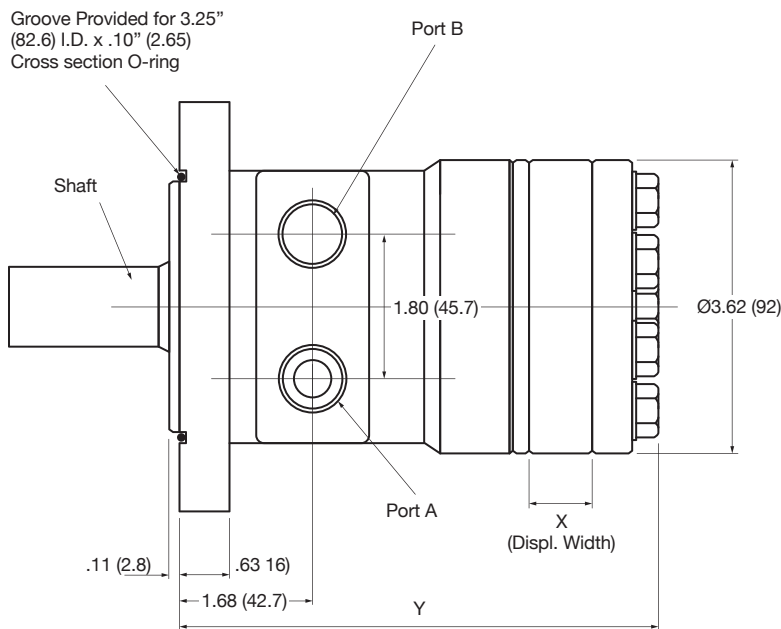
2-7/8-14UNF O-ring	2-M18x1.5
2-1/2-14NPTF	2-M20x1.5
2-G1/2 (BSP)	2-M22x1.5
2-3/4-16 O-ring	2-PT1/2

Dimensions are in inches (millimeters).

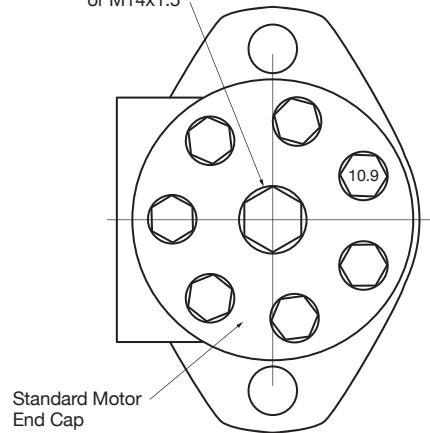
MMPS Series

Dimensions - Aligned Ports (Flanges C, D, E, F, G, H, I, J)

DISPLACEMENT CM ³ /R	50	63	80	100	125	160	200	250	305	370	395	
X	Inches	.35	.45	.57	.71	.90	1.14	1.40	1.76	2.21	2.67	2.84
	Millimeters	(9)	(11.5)	(14.4)	(18.1)	(22.8)	(29.0)	(35.6)	(44.7)	(56.0)	(68.0)	(72.0)
Y	Inches	5.76	5.86	5.97	6.12	6.30	6.54	6.81	7.17	7.61	8.08	8.24
	Millimeters	(146.3)	(148.8)	(151.7)	(155.4)	(160.1)	(166.2)	(173.0)	(182.0)	(193.3)	(205.2)	(209.3)

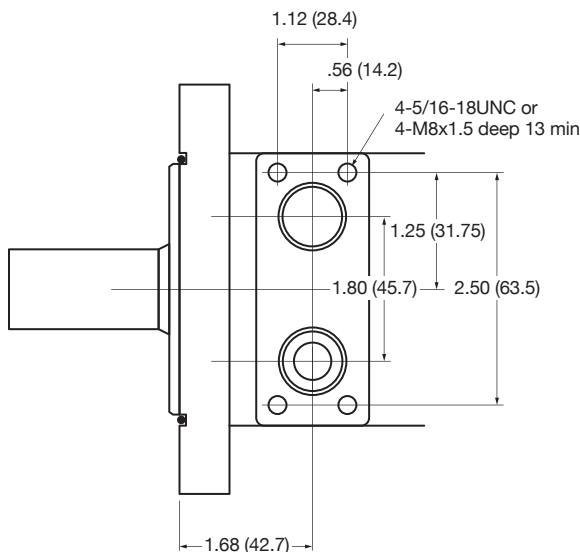


Case Drain Port:
 G1/4" (BSP)
 or 7/16-20 O-ring
 or M14x1.5



PORTS - C, D, E, F, I & J

2-7/8-14UNF O-ring	2-M18x1.5
2-1/2-14NPTF	2-M20x1.5
2-G1/2 (BSP)	2-M22x1.5
2-3/4-16 O-ring	2-PT1/2



PORTS - G & H

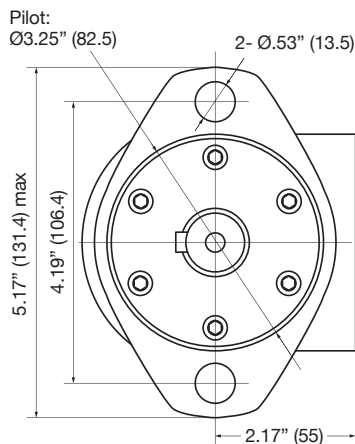
4-5/16-18UNC
4-M8x1.5 deep 13 min
2-G1/2 (BSP)
2-3/4-16 O-ring

Dimensions are in inches (millimeters).

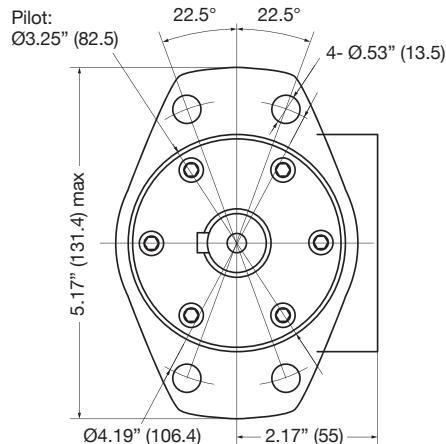
MMPS Series

Mounting Flanges

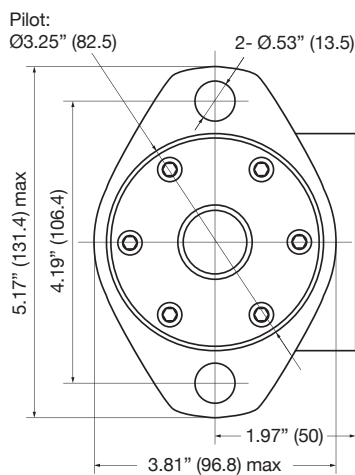
A = 2-Bolt SAE "A", Long Pilot .31" (8mm)



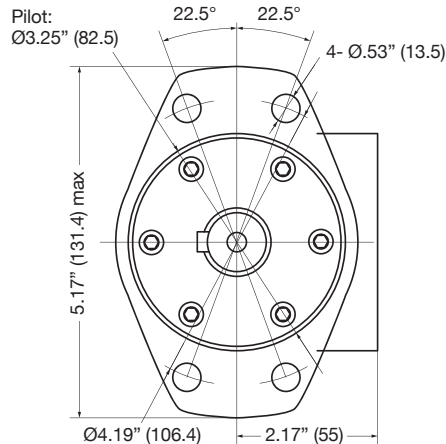
B = 4-Bolt SAE "A", Long Pilot .31" (8mm)



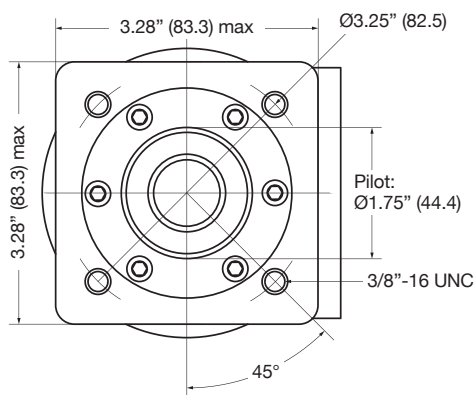
C = 2-Bolt SAE "A", Pilot .11" (2.8mm)



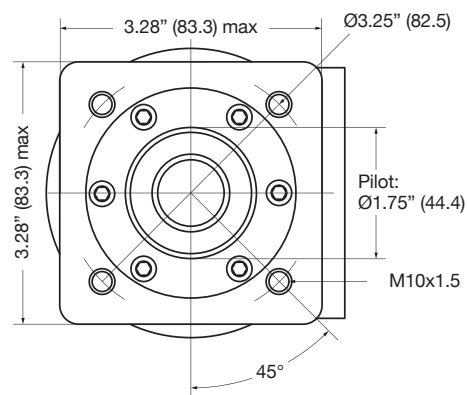
D = 4-Bolt SAE "A", Pilot .11" (2.8mm)



E = 4-3/8"-16 Square-flange



F = 4-M10x1.5 Square-flange



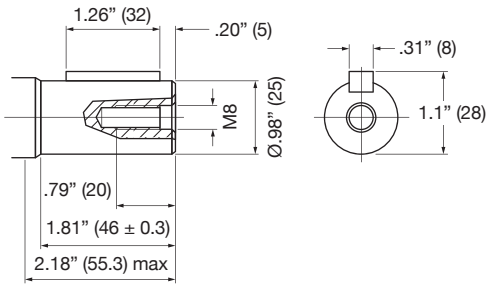
Dimensions are in inches (millimeters).

MMPS Series

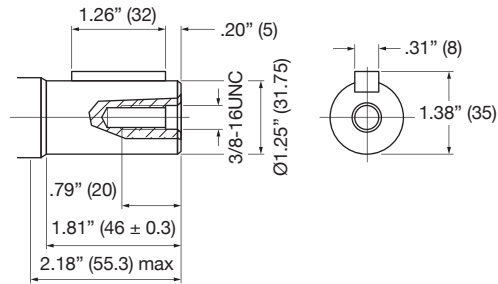
Shafts

Dimensions are in inches (millimeters).

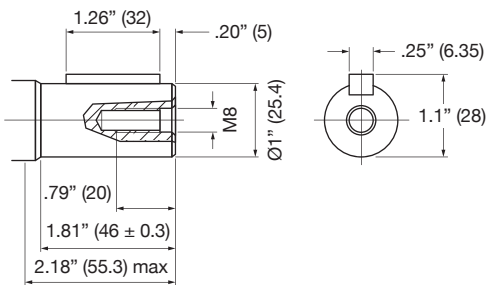
1 = .984" (25mm) Straight, Flat Key 8x7x32



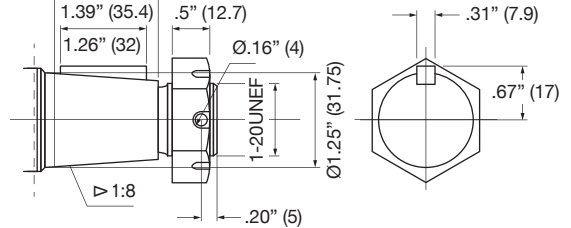
5 = 1.25" (31.75mm) Straight, Flat Key 7.96x7.96x32



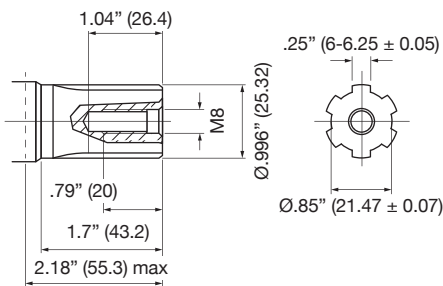
2 = 1" (25.4mm) Straight, Flat Key 6.35x6.35x32



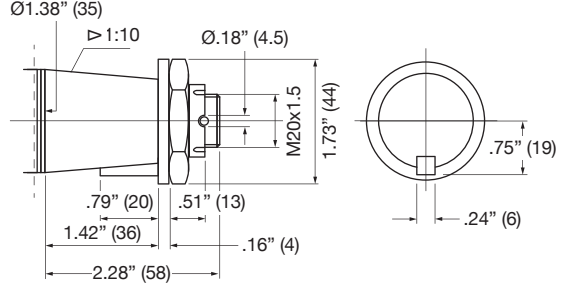
6 = 1.25" (31.75mm) Tapered, Flat Key 7.96x7.96x32



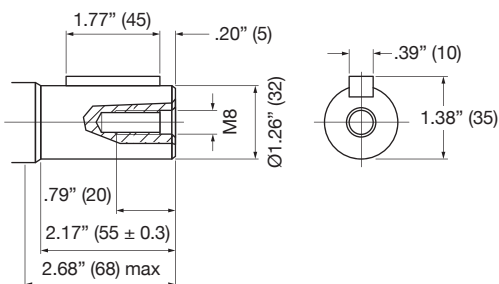
3 = 1" (25.4mm) SAE, 6B Splined



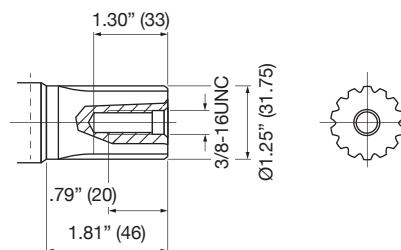
7 = 1.38" (35mm) Tapered, Flat Key 6x6x20



4 = 1.26" (32mm) Straight, Flat Key 10x8x45



8 = 1.25" (31.75mm) 14t Splined

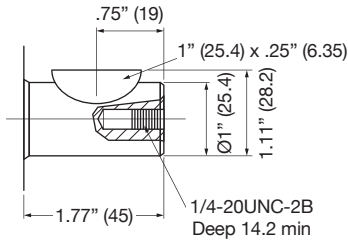


MMPS Series

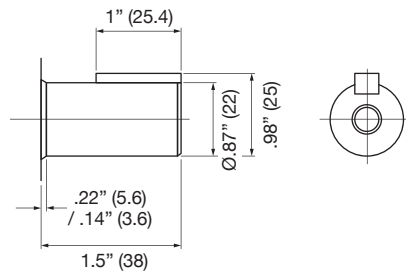
Shafts Cont.

Dimensions are in inches (millimeters).

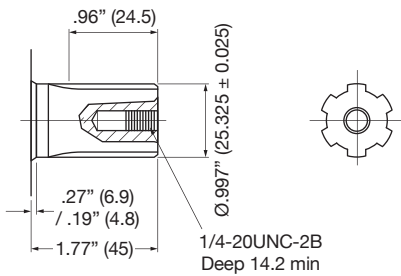
9 = 1" (25.4mm) Straight, Woodruff Key



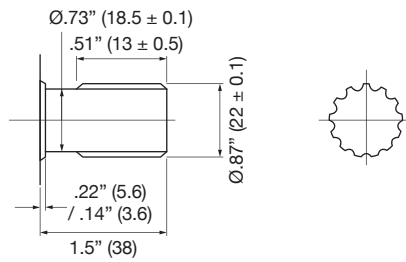
13 = .875" (22.23mm) Straight, Flat Key 6.35x6.35x32



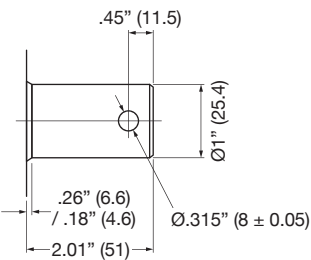
10 = 1" (25.4mm) SAE 6B Splined



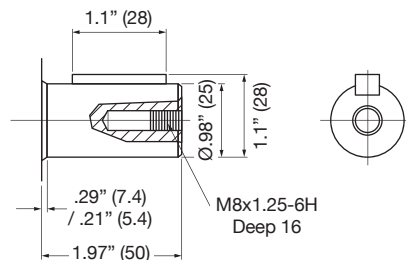
14 = .875" (22.23mm) SAE B 13t Splined



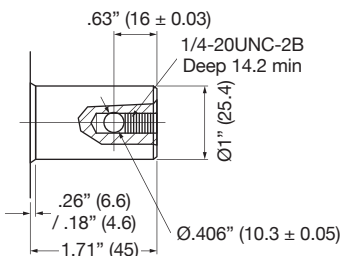
11 = 1" (25.4mm) Straight with .315 dia. Crosshole



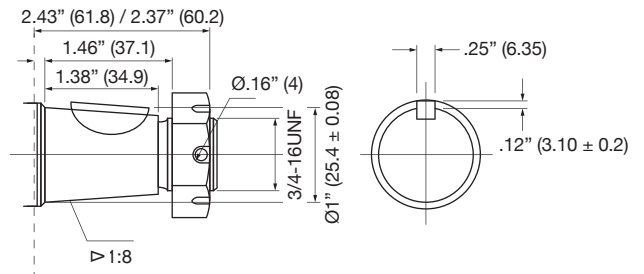
15 = .984" (25mm) Straight, 8mm Keyway



12 = 1" (25.4mm) Straight with .406 dia. Crosshole



16 = 1" (25.4mm) Tapered, Woodruff Key & Nut



MMRSW Series

Features

MMRSW series wheel motors are spool valve motors that can be used in parallel or series configurations. A diverse offering of mounting flanges, shafts, ports, and displacements allow for easy installation, product replacement or OEM application.

- Advanced Roller-Star technology, requiring lower pressure at start-up and providing smoother operation at all speeds
- Dual high efficiency tapered roller bearings, providing excellent low speed and high speed operation with high side load capabilities
- High pressure shaft seal, which allows for higher back pressures and an increased ability to handle high pressure spike conditions
- Internal integrated check valve, which limits case pressure by blocking the high pressure port side and allowing the motor housing to drain into the outlet (low pressure) port
- Motors connected in series will utilize the case drain



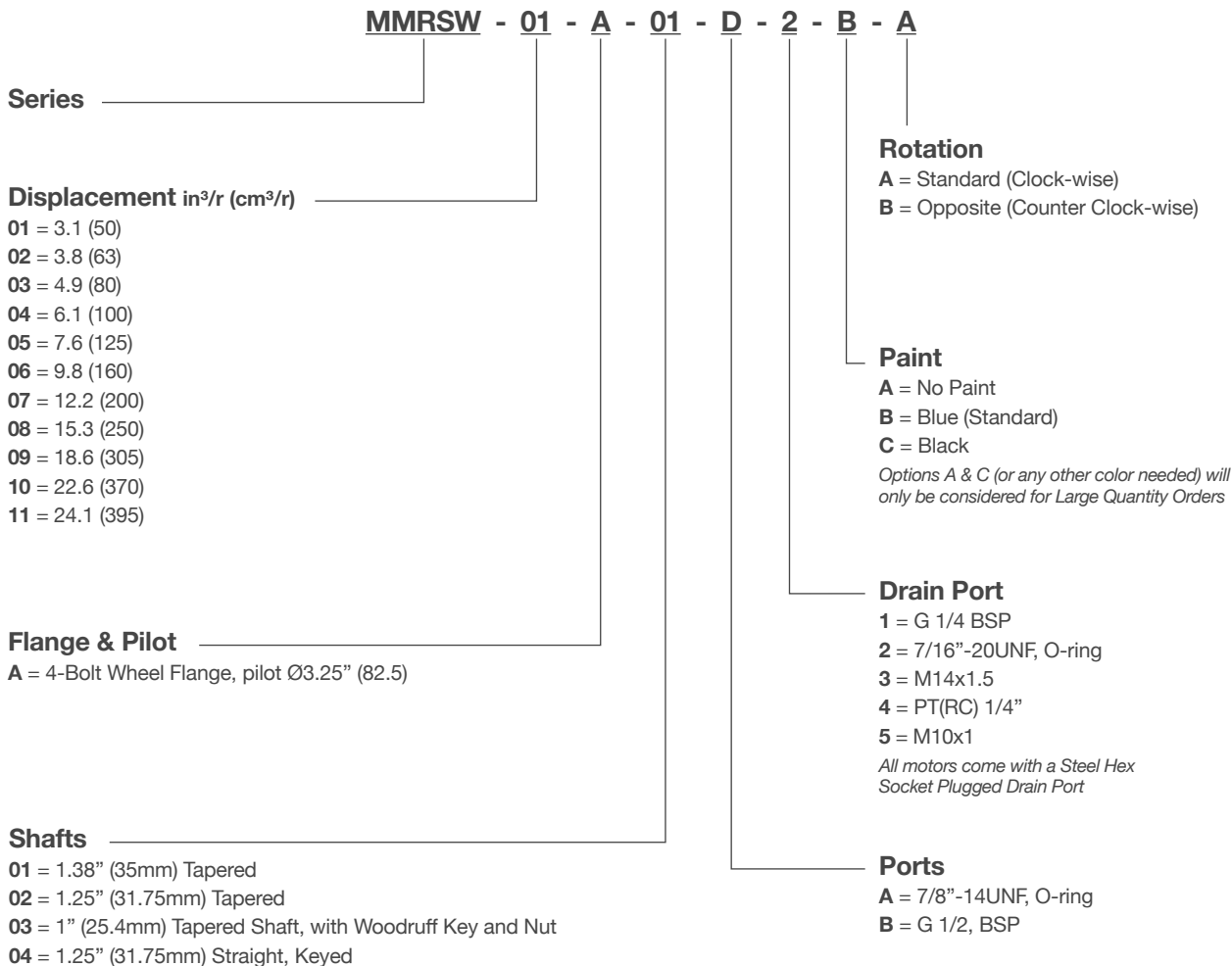
Specifications

MODEL CODE (DISPLACEMENT)		01	02	03	04	05	06	07	08	09	10	11	
Displ.	cm ³ /r	50	63	80	100	125	160	200	250	305	370	395	
	in ³ /r	3.1	3.8	4.9	6.1	7.6	9.8	12.2	15.3	18.6	22.6	24.1	
Flow	LPM	Cont.	40	50	60	60	60	60	60	60	60	60	60
		Int.	50	60	75	75	75	75	75	75	75	75	75
	GPM	Cont.	10.6	13.2	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
		Int.	13.2	15.9	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8
Max Speed	RPM	Cont.	775	760	750	600	475	375	300	240	190	160	150
		Int.	970	950	940	750	600	470	375	300	240	200	185
Pressure	ΔBar	Cont.	140	140	175	175	175	175	175	175	135	115	115
		Int.	175	175	200	200	200	200	200	200	175	150	150
	ΔPSI	Cont.	2031	2031	2538	2538	2538	2538	2538	2538	1958	1668	1668
		Int.	2538	2538	2901	2901	2901	2901	2901	2901	2538	2176	2176
Torque	NM	Cont.	100	126	195	240	300	380	450	540	550	580	620
		Int.	130	163	220	280	340	430	500	610	690	690	735
	LBF-IN	Cont.	885	1115	1726	2124	2655	3363	3983	4779	4868	5133	5487
		Int.	1151	1443	1947	2478	3009	3806	4425	5399	6107	6107	6505

• Simultaneous maximum torque & maximum speed **NOT** recommended.
 • Continuous Rating ▶ (Cont.) motor may be run continuously at these ratings.
 • Intermittent Operation ▶ (Int.) 10% of every minute.
 • Δ - True pressure difference between inlet port and outlet port.
 • Maximum case pressure without case drain -- 1" Shaft = 125 Bar (1813 psi) | Greater than 1" Shaft 75 Bar (1088 psi).

MMRSW Series

Model Code Breakdown

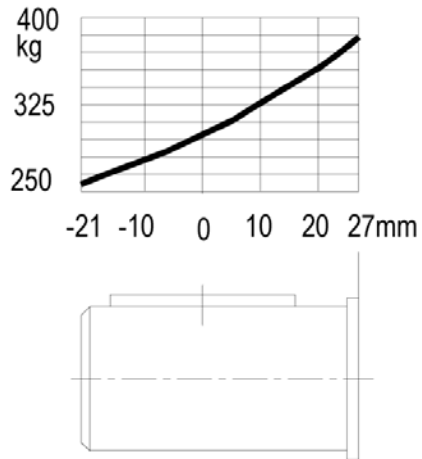


MMRSW Series

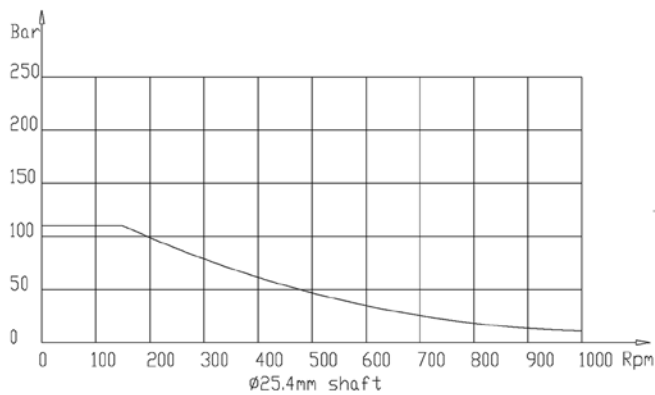
Performance Information

To assure best motor life, run motor for approximately one hour at 30% of rated pressure before applying full load. Fill motor with equipment manufacturer's recommended fluid prior to any load application and startup.

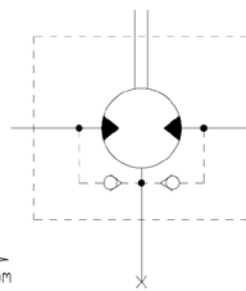
Side Load



Shaft Seal



Standard Shaft Seal = Genuine Metaris High Pressure Shaft Seal



MMRSW with standard shaft seal, check valves and with drain connection:
 The shaft seal pressure equals the pressure on the drain line

MMRSW with standard shaft seal, check valves and without use of drain connection:
 The pressure on the shaft seal never exceeds the pressure in the return line

MMRSW Series

Performance Information

50 cc/r

		Δ PRESSURE BAR							
		28	55	69	97	110	124	138	155
FLOW LPM	7.6	18 152	37 147	46 142	64 134	72 124			
	15.1	18 298	37 290	47 276	66 265	75 261	84 245	93 243	
FLOW LPM	22.7	17 450	37 438	47 434	66 419	75 410	84 407	93 389	105 373
	30.3	14 603	35 590	44 583	64 584	74 554	83 545	92 536	104 520
FLOW LPM	37.9	14 750	34 738	44 732	64 713	73 702	83 696	92 682	104 661
	45.4			43 875	62 859	72 844	81 835	91 819	102 804



Continuous

Intermittent

63 cc/r

		Δ PRESSURE BAR							
		28	55	69	97	110	124	138	155
FLOW LPM	7.6	22 111	47 107	59 105	80 96	91 92			
	15.1	24 229	50 216	62 212	87 194	99 190	110 186	122 183	
FLOW LPM	22.7	22 343	48 334	60 321	86 319	99 315	111 291	123 288	138 276
	30.3	21 451	47 442	60 431	86 419	98 415	111 401	123 401	138 386
FLOW LPM	37.9	18 565	45 552	58 547	84 532	97 525	110 512	122 504	137 496
	45.4	18 678	44 665	57 658	82 641	95 635	109 623	121 612	137 601
FLOW LPM	53.0		42 778	55 771	81 753	95 746	107 733	120 723	135 711
	56.8		40 832	53 826	80 806	93 800	106 786	119 779	135 766

80 cc/r

		Δ PRESSURE BAR							
		28	55	69	97	110	124	138	155
FLOW LPM	7.6	30 90	61 83	77 80	106 70	119 63			
	15.1	30 185	62 179	78 175	109 166	124 162	140 156	155 150	
FLOW LPM	22.7	29 275	61 267	77 265	109 253	124 248	140 240	155 232	174 221
	30.3	27 367	60 359	76 354	108 343	124 338	139 333	155 324	174 313
FLOW LPM	37.9	26 460	58 450	74 446	106 435	122 428	138 420	153 412	173 399
	45.4	24 552	56 543	72 537	105 523	121 515	136 509	152 500	172 487
FLOW LPM	53.0		54 635	70 630	102 616	118 609	134 599	150 592	170 578
	56.8		52 680	69 673	101 660	117 650	133 642	149 634	168 619

100 cc/r

		Δ PRESSURE BAR							
		28	55	69	97	110	124	138	155
FLOW LPM	7.6	39 71	79 66	98 83	135 83	152 51	171 46		
	15.1	38 146	79 141	99 138	139 131	158 128	177 124	195 118	
FLOW LPM	22.7	37 217	78 211	98 208	139 199	158 195	178 180	196 184	219 174
	30.3	36 290	76 284	97 280	137 217	157 267	177 262	195 255	218 245
FLOW LPM	37.9	33 363	74 355	95 351	135 343	155 337	174 332	193 325	217 315
	45.4	31 436	72 429	92 424	133 414	153 409	173 402	192 395	215 384
FLOW LPM	53.0	27 510	69 501	90 497	130 487	150 482	170 475	189 469	213 456
	56.8		67 537	88 532	128 522	148 516	168 510	187 502	211 490

27
(Torque Nm)
510
(Speed RPM)

125 cc/r

		Δ PRESSURE BAR							
		28	55	69	97	110	124	138	155
FLOW LPM	7.6	48 56	96 51	121 50	166 44	189 40	212 34		
	15.1	48 114	95 111	121 110	166 107	189 105	211 98	240 90	
FLOW LPM	22.7	47 172	95 171	120 168	166 157	188 155	212 151	240 145	271 130
	30.3	46 230	96 225	120 220	165 216	187 212	213 206	239 200	270 190
FLOW LPM	37.9	45 287	95 283	120 278	165 272	185 267	210 260	237 253	270 240
	45.4	44 345	94 341	118 335	162 328	183 323	210 317	235 310	269 300
FLOW LPM	53.0	38 405	90 401	115 395	154 390	180 384	202 378	228 371	260 358
	56.8		82 426	108 424	143 420	170 415	195 410	210 404	245 390

160 cc/r

		Δ PRESSURE BAR						
		28	55	69	97	110	124	138
FLOW LPM	7.6	61 45	123 42	153 40	209 34	235 30	261 25	
	15.1	61 95	124 91	155 90	214 85	242 82	269 78	295 73
FLOW LPM	22.7	59 140	123 136	155 134	215 129	243 125	271 271	297 114
	30.3	57 187	121 183	152 181	213 175	242 172	270 166	296 259
FLOW LPM	37.9	53 234	117 230	149 227	209 209	239 218	266 266	293 203
	45.4	49 282	114 277	146 274	206 269	235 265	263 257	291 248
FLOW LPM	53.0	45 329	109 323	141 321	201 316	230 311	259 304	287 296
	56.8		107 347	139 344	198 339	228 334	257 327	284 318

MMRSW Series

Performance Information Cont.

200 cc/r

		Δ PRESSURE BAR						
		28	55	69	97	110	124	138
FLOW LPM	7.6	76 36	152 33	187 31	253 25	283 20		
	15.1	76 77	154 73	191 73	259 68	292 65	324 61	355 55
	22.7	74 113	154 110	192 109	263 104	294 100	328 95	359 87
	30.3	72 151	150 148	189 146	260 142	293 139	326 132	359 123
	37.9	67 189	146 186	185 184	255 181	290 176	323 166	355 156
	45.4	62 228	142 224	182 222	251 219	286 213	320 204	353 192
	53.0	56 266	137 261	176 259	246 256	291 251	315 242	348 229
	56.8		133 281	172 279	242 275	278 269	313 260	346 247

 Continuous
 Intermittent

250 cc/r

		Δ PRESSURE BAR							
		28	55	69	97	110	114	125	127
FLOW LPM	7.6	94 29	187 26	230 24	306 17				
	15.1	95 62	192 59	235 59	319 55	359 50	368 49		
	22.7	93 91	191 89	236 88	321 82	361 78	371 76	401 72	410 71
	30.3	89 122	187 120	233 119	319 113	359 108	369 106	399 101	408 99
	37.9	84 152	182 150	288 148	313 143	356 136	366 134	396 127	406 125
	45.4	78 183	175 180	222 179	309 175	351 166	361 166	392 156	402 153
	53.0	71 213	169 211	216 209	302 202	345 195	356 193	386 185	397 182
	56.8		165 226	212 224	298 217	341 209	352 207	383 200	394 197

305 cc/r

		Δ PRESSURE BAR							
		28	41	55	69	83	97	103	110
FLOW LPM	7.6	117 23	176 22	230 21	283 19	329 16	366 11		
	15.1	119 49	180 48	237 48	289 47	342 47	391 44	416 41	
	22.7	116 74	178 72	237 72	290 71	342 69	391 64	417 62	441 60
	30.3	110 98	172 97	232 97	285 96	339 94	390 89	414 86	438 83
	37.9	105 122	166 121	226 120	280 120	334 117	385 112	410 108	435 104
	45.4	98 146	159 145	216 145	271 145	326 142	379 136	404 131	428 127
	53.0	89 171	151 170	209 170	264 169	318 165	371 159	397 154	423 150
	56.8			204 182	258 181	313 177	366 171	393 165	419 160

370 cc/r

		Δ PRESSURE BAR						
		14	28	41	55	69	83	90
FLOW LPM	7.6	67 20	140 19	210 18	272 17	334 15		
	15.1	66 41	143 41	215 40	283 40	342 39	402 38	430 37
	22.7	65 61	141 60	214 60	283 59	342 58	400 57	428 56
	30.3	56 82	131 81	206 80	277 79	336 78	397 77	427 77
	37.9	50 102	126 102	199 101	270 101	331 100	393 97	424 96
	45.4	38 122	120 121	191 120	255 119	318 119	383 118	416 116
	53.0	26 142	108 141	182 140	249 139	310 138	375 137	408 134
	56.8				242 150	303 149	370 147	403 146

26
(Torque Nm)
 142
(Speed RPM)

395 cc/r

		Δ PRESSURE BAR						
		14	28	41	55	69	83	90
FLOW LPM	7.6	71 18	150 17	224 17	290 16	356 14		
	15.1	70 38	152 38	229 37	302 37	365 36	429 36	458 35
	22.7	69 57	150 57	228 57	302 55	385 54	427 53	456 52
	30.3	62 77	140 76	220 75	295 74	358 73	423 72	455 72
	37.9	53 96	134 96	212 95	288 95	353 94	419 91	452 90
	45.4	40 114	129 113	204 112	272 111	339 111	408 110	444 108
	53.0	28 133	115 132	194 131	267 130	330 129	400 128	435 125
	56.8				258 141	323 140	394 138	430 137

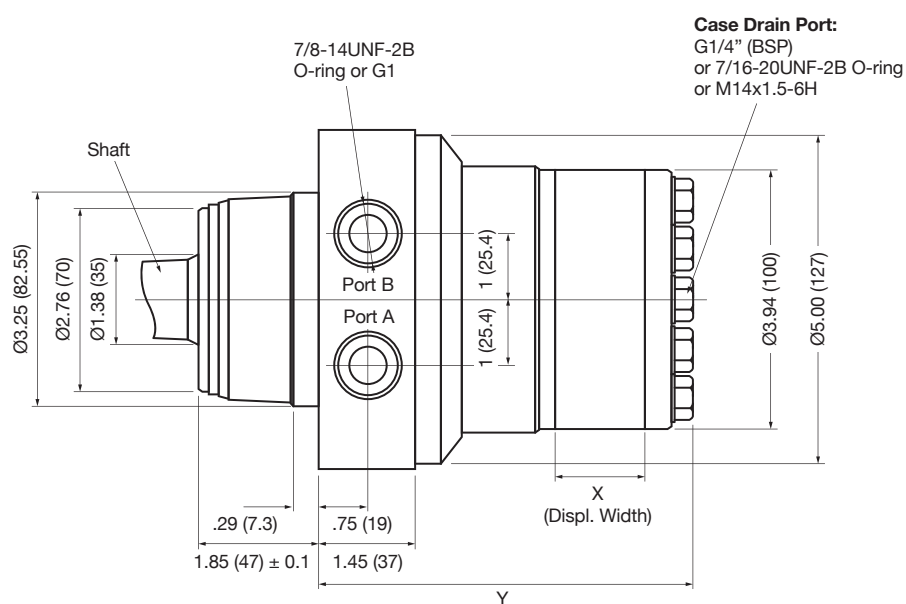
Individual Performance Data Graph Information:

- Motors run with high efficiency in all areas designed with a number for torque and speed.
- However, for best motor life, select a motor to run with a torque and speed range shown in the light gray area (Continuous).
- Performance data is typical at 120 SUS (25.2 cSt).
- Actual data may vary slightly from unit to unit in production.

MMRSW Series

Dimensions - Aligned Ports

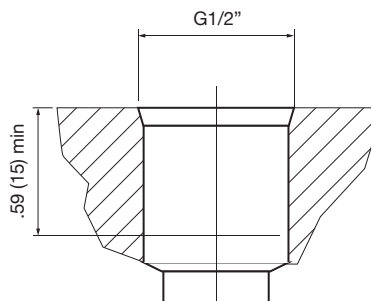
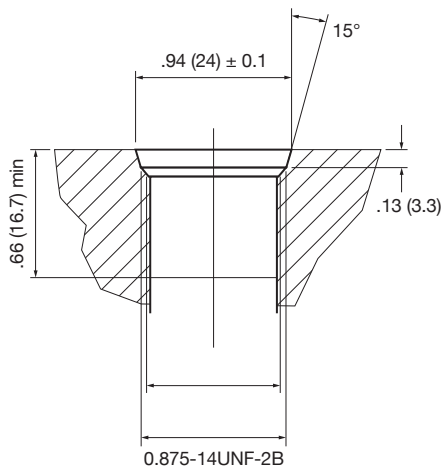
DISPLACEMENT CM ³ /R		50	63	80	100	125	160	200	250	305	370	395
X	Inches	.35	.45	.57	.71	.90	1.14	1.40	1.76	2.21	2.67	2.84
	Millimeters	(9)	(11.5)	(14.4)	(18.1)	(22.8)	(29.0)	(35.6)	(44.7)	(56.0)	(68.0)	(72.0)
Y	Inches	4.70	4.80	4.91	5.05	5.24	5.48	5.74	6.10	6.55	7.02	7.18
	Millimeters	(119.3)	(121.8)	(124.7)	(128.3)	(133.1)	(139.1)	(145.9)	(154.9)	(166.3)	(178.3)	(182.3)



Port Thread Versions

A = 7/8"-14UNF, O-ring

B = G1/2, BSP

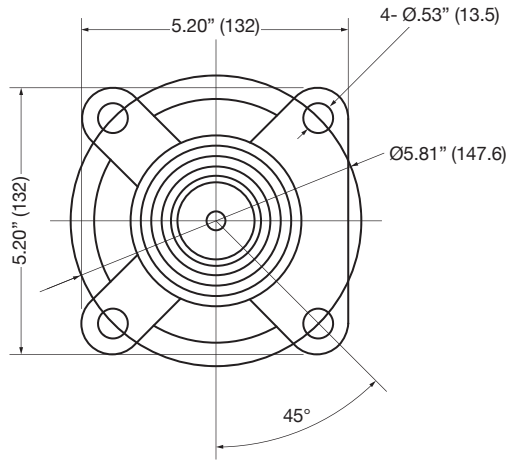


Dimensions are in inches (millimeters).

MMRSW Series

Mounting Flanges

A = 4-Bolt Wheel Flange, Pilot 3.25" (82.6)



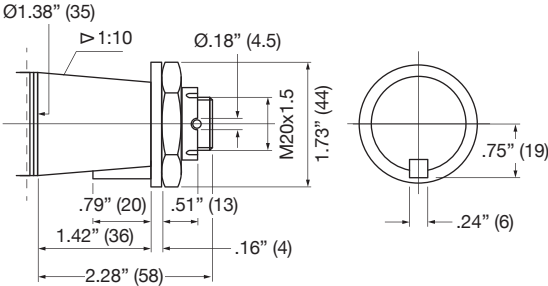
Dimensions are in inches (millimeters).

MMRSW Series

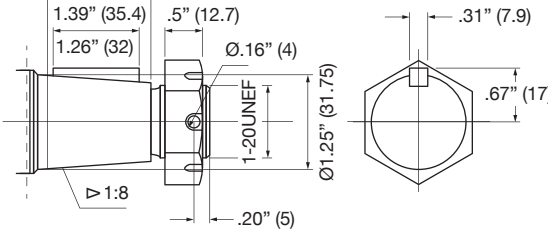
Shafts

Dimensions are in inches (millimeters).

1 = 1.38" (35mm) Tapered, Flat Key 6x6x20



2 = 1.25" (31.75mm) Tapered, Flat Key 7.96x7.96x32



MMH Series

Features

MMH series motors are spool valve motors that can be used in parallel or series configurations. A diverse offering of mounting flanges, shafts, ports, and displacements allow for easy installation, product replacement or OEM application.

- Advanced Roller-Star technology, requiring lower pressure at start-up and providing smoother operation at all speeds
- Dual needle bearings provide high side load capacity with extended operating life
- High pressure shaft seal, which allows for higher back pressures and an increased ability to handle high pressure spike conditions
- Internal integrated check valve, which limits case pressure by blocking the high pressure port side and allowing the motor housing to drain into the outlet (low pressure) port
- Motors connected in series will utilize the case drain



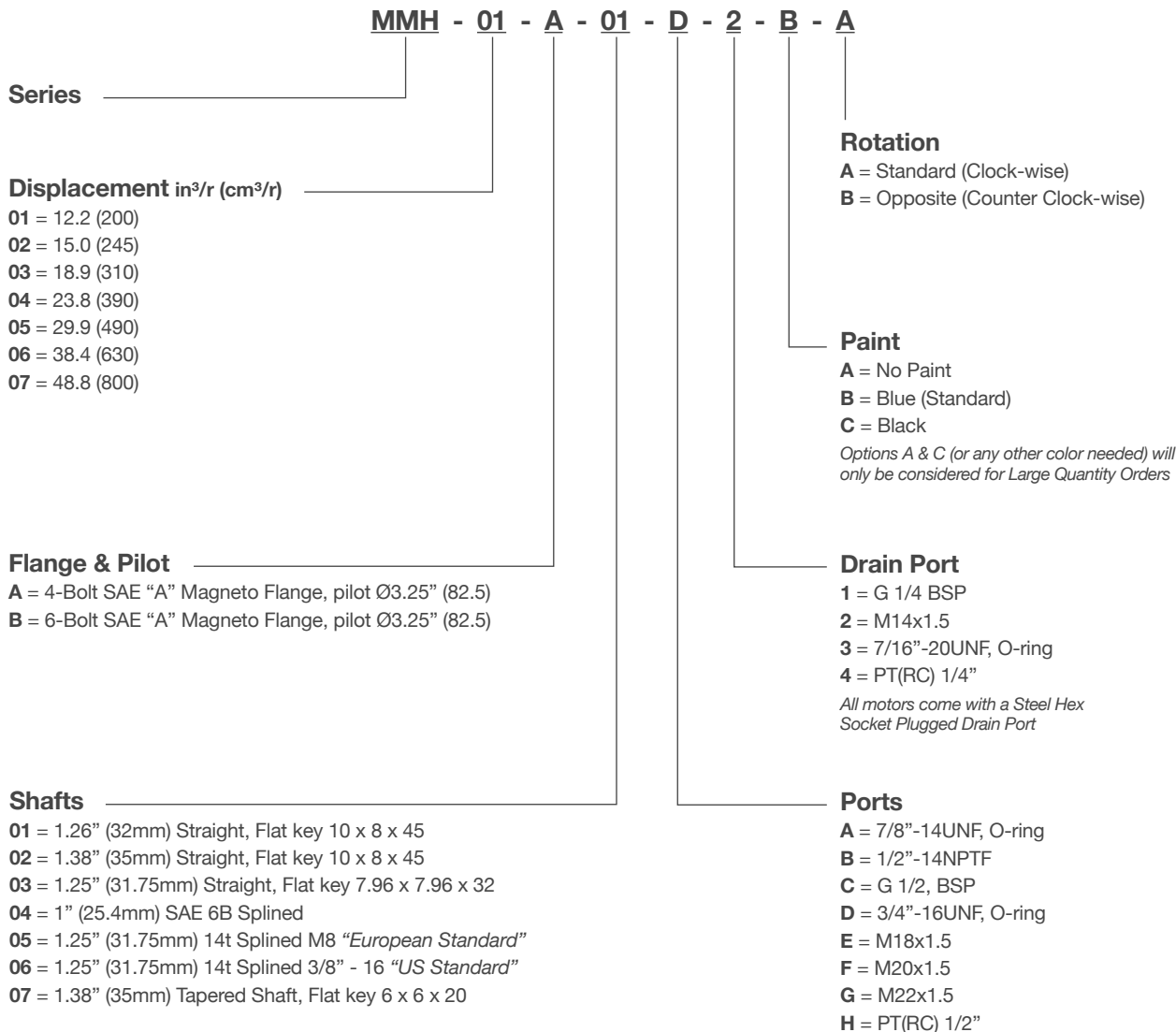
Specifications

MODEL CODE (DISPLACEMENT)		01	02	03	04	05	06	07
Displ.	cm ³ /r	200	245	310	390	490	630	800
	in ³ /r	12.2	15.0	18.9	23.8	29.9	38.4	48.8
Flow	LPM	Cont.	80	80	80	80	80	80
		Int.	100	100	100	100	100	100
	GPM	Cont.	21.1	21.1	21.1	21.1	21.1	21.1
		Int.	26.4	26.4	26.4	26.4	26.4	26.4
Max Speed	RPM	Cont.	360	320	250	200	156	120
		Int.	470	390	300	240	200	150
Pressure	ΔBar	Cont.	175	175	175	155	125	125
		Int.	200	200	200	190	150	150
	ΔPSI	Cont.	2538	2538	2538	2248	1813	1813
		Int.	2901	2901	2901	2756	2176	2176
Torque	NM	Cont.	500	614	777	866	877	1128
		Int.	573	700	888	1061	1053	1350
	LBF-IN	Cont.	4425	5434	6877	7665	7762	9984
		Int.	5071	6196	7859	9391	9320	11949

• Simultaneous maximum torque & maximum speed **NOT** recommended.
 • Continuous Rating ▶ (Cont.) motor may be run continuously at these ratings.
 • Intermittent Operation ▶ (Int.) 10% of every minute.
 • Δ - True pressure difference between inlet port and outlet port.
 • Maximum case pressure without case drain -- 1" Shaft = 125 Bar (1813 psi) | Greater than 1" Shaft 75 Bar (1088 psi).

MMH Series

Model Code Breakdown



- 01 = 12.2 (200)
- 02 = 15.0 (245)
- 03 = 18.9 (310)
- 04 = 23.8 (390)
- 05 = 29.9 (490)
- 06 = 38.4 (630)
- 07 = 48.8 (800)

- A = 4-Bolt SAE "A" Magneto Flange, pilot Ø3.25" (82.5)
- B = 6-Bolt SAE "A" Magneto Flange, pilot Ø3.25" (82.5)

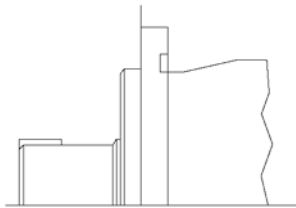
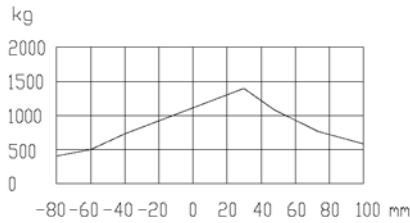
- 01 = 1.26" (32mm) Straight, Flat key 10 x 8 x 45
- 02 = 1.38" (35mm) Straight, Flat key 10 x 8 x 45
- 03 = 1.25" (31.75mm) Straight, Flat key 7.96 x 7.96 x 32
- 04 = 1" (25.4mm) SAE 6B Splined
- 05 = 1.25" (31.75mm) 14t Splined M8 "European Standard"
- 06 = 1.25" (31.75mm) 14t Splined 3/8" - 16 "US Standard"
- 07 = 1.38" (35mm) Tapered Shaft, Flat key 6 x 6 x 20

MMH Series

Performance Information

To assure best motor life, run motor for approximately one hour at 30% of rated pressure before applying full load. Fill motor with equipment manufacturer's recommended fluid prior to any load application and startup.

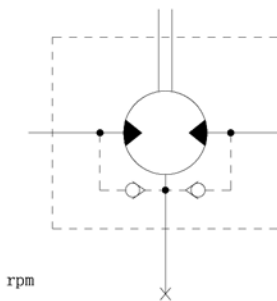
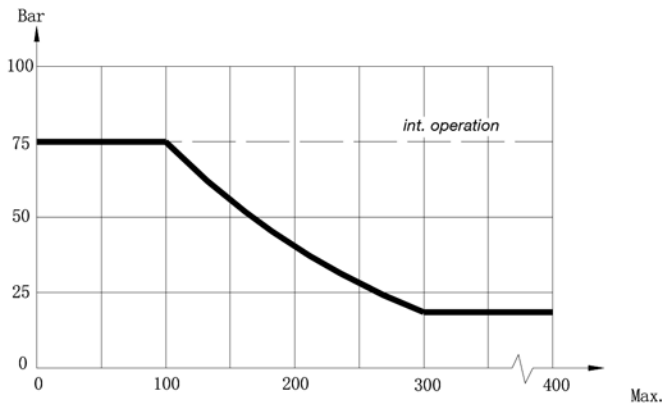
Side Load



Standard Motor 1-1/4 Inch and 35 mm straight shaft

Shaft Seal

Standard Shaft Seal = Genuine Metaris High Pressure Shaft Seal

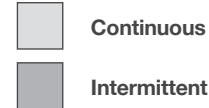


MMH with standard shaft seal, check valves and without use of drain connection:
 The pressure on the shaft seal never exceeds the pressure in the return line

MMH with standard shaft seal, check valves and with drain connection:
 The shaft seal pressure equals the pressure on the drain line

MMH Series

Performance Information



200 cc/r

		Δ PRESSURE BAR					
		35	70	105	140	175	200
FLOW LPM	10	89 48	178 46	268 45	357 40	446 33	
	20	89 96	178 92	268 90	356 80	445 65	510 50
	30	89 144	178 138	268 135	358 120	442 98	509 75
	40	89 192	179 184	268 180	354 160	440 130	508 100
	50	89 240	181 230	268 225	357 200	439 163	508 125
	60	89 288	180 276	268 270	355 240	438 195	508 150
	70	89 336	179 322	268 315	356 280	437 228	509 175
	75	89 360	178 345	267 338	358 300	436 244	507 188
	80	89 384	176 368	264 360	357 320	435 260	
	90	89 432	175 414	261 405	352 360	436 293	

245 cc/r

		Δ PRESSURE BAR					
		35	70	105	140	175	200
FLOW LPM	10	109 39	218 38	328 37	437 33	546 27	
	20	109 78	218 75	328 73	437 65	546 53	624 41
	30	109 118	218 113	328 110	437 98	546 80	624 61
	40	111 157	221 150	332 147	442 131	553 106	632 82
	50	109 196	218 188	328 184	437 163	546 133	624 102
	60	108 235	216 225	324 220	431 196	539 159	616 122
	70	108 274	216 263	324 257	431 229	539 186	616 143
	75	108 294	216 282	324 276	431 245	539 199	616 153
	80	108 313	216 300	324 294	431 261	539 212	
	90	108 353	216 338	324 331	431 294	539 239	

310 cc/r

		Δ PRESSURE BAR					
		35	70	105	140	175	200
FLOW LPM	20	138 62	276 59	415 58	553 52	691 42	
	30	138 93	276 89	415 87	553 77	691 63	790 48
	40	138 124	276 119	415 116	553 103	691 84	790 65
	50	140 155	280 148	420 145	560 129	700 105	800 81
	60	138 186	276 178	415 174	553 155	691 126	790 97
	70	136 217	273 203	409 203	546 181	682 147	780 113
	75	136 232	273 223	409 218	546 194	682 157	780 121
	80	136 248	273 237	409 232	546 206	682 168	
	90	136 279	273 267	409 261	546 232	682 189	

390 cc/r

		Δ PRESSURE BAR					
		35	70	105	140	155	190
FLOW LPM	20	174 49	348 47	522 46	696 41	770 33	
	30	174 74	348 71	522 69	696 62	770 50	944 38
	40	174 98	348 94	522 92	696 82	770 67	944 51
	50	176 123	352 118	528 115	704 103	780 83	956 64
	60	174 148	348 142	522 138	696 123	770 100	944 77
	70	172 172	343 165	515 162	687 144	760 117	932 90
	75	172 185	343 177	515 173	687 154	760 125	932 96
	80	172 197	343 189	515 185	687 164	760 133	
	90	172 222	343 212	515 208	687 185	760 150	

490 cc/r

		Δ PRESSURE BAR				
		35	70	105	125	160
FLOW LPM	20	218 39	437 38	655 37	780 33	
	30	218 59	437 56	655 55	780 49	999 40
	40	218 78	437 75	655 73	780 65	999 53
	50	221 98	442 94	664 92	790 82	1011 66
	60	218 118	437 113	655 110	780 98	999 80
	70	216 137	431 131	647 129	771 114	986 93
	75	216 147	431 141	647 138	771 122	986 99
	80	216 157	431 150	647 147	771 131	
	90	216 176	431 169	647 165	771 147	

630 cc/r

		Δ PRESSURE BAR				
		35	70	105	125	150
FLOW LPM	20	281 30	562 29	843 29	1003 25	
	30	281 46	562 44	843 43	1003 38	1204 31
	40	281 61	562 58	843 57	1003 51	1204 41
	50	284 76	569 73	853 71	1016 63	1219 52
	60	281 91	562 88	843 86	1003 76	1204 62
	70	277 107	555 102	832 100	991 89	1189 72
	75	277 114	555 110	832 107	991 95	1189 77
	80	277 122	555 117	832 114	991 102	
	90	277 137	555 131	832 129	991 114	

172
(Torque Nm)
185
(Speed RPM)

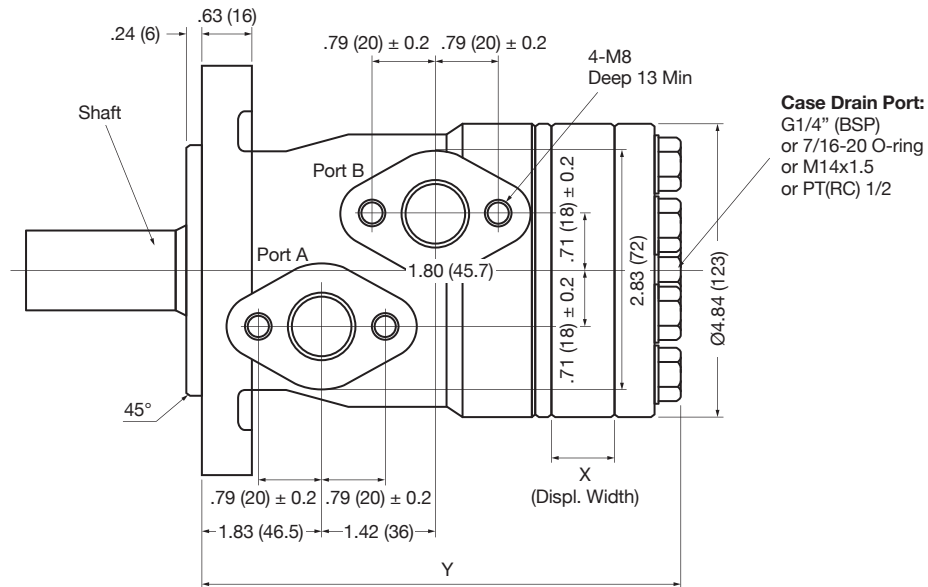
Individual Performance Data Graph Information:

- Motors run with high efficiency in all areas designed with a number for torque and speed.
- However, for best motor life, select a motor to run with a torque and speed range shown in the light gray area (Continuous).
- Performance data is typical at 120 SUS (25.2 cSt).
- Actual data may vary slightly from unit to unit in production.

MMH Series

Dimensions - Staggered Ports

DISPLACEMENT CM ³ /R		200	245	310	390	490	630	800
X	Inches	.88	1.08	1.36	1.71	2.15	2.73	3.51
	Millimeters	(22.4)	(27.4)	(34.6)	(43.4)	(54.5)	(69.2)	(89.1)
Y	Inches	6.77	6.98	7.27	7.61	8.05	8.63	9.41
	Millimeters	(172)	(177.4)	(184.6)	(193.4)	(204.5)	(219.2)	(239.1)



PORT	
7/8-14UNF O-ring	M18x1.5
1/2-14NPTF	M20x1.5
G1/2 (BSP)	M22x1.5
3/4-16 O-ring	PT1/2

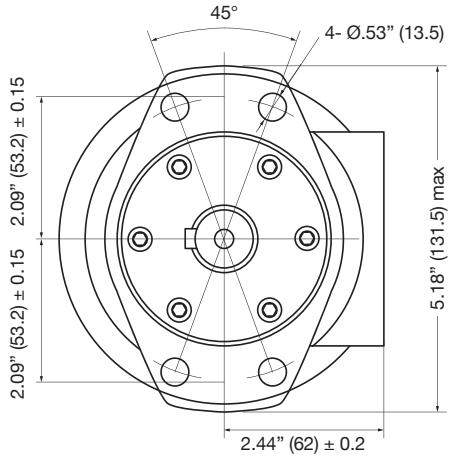
CASE DRAIN PORT
G1/4
M14x1.5
7/16-20UNF
PT(RC) 1/2
None

Dimensions are in inches (millimeters).

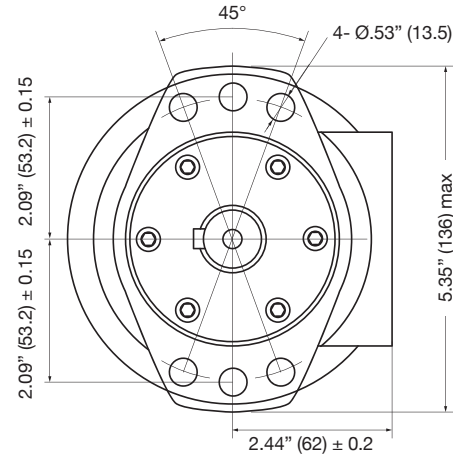
MMH Series

Mounting Flanges

A = 4-Bolt SAE "A", Magneto Flange Pilot 3.25" (82.5)



B = 6-Bolt SAE "A", Magneto Flange Pilot 3.25" (82.5)



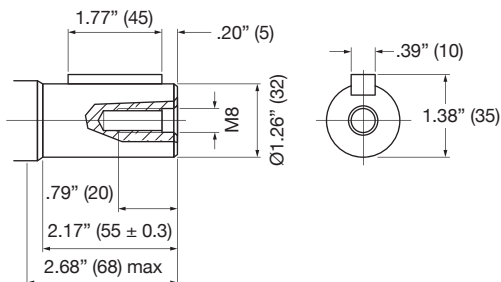
Dimensions are in inches (millimeters).

MMH Series

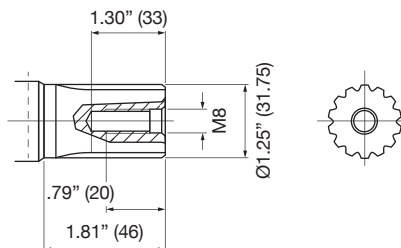
Shafts

Dimensions are in inches (millimeters).

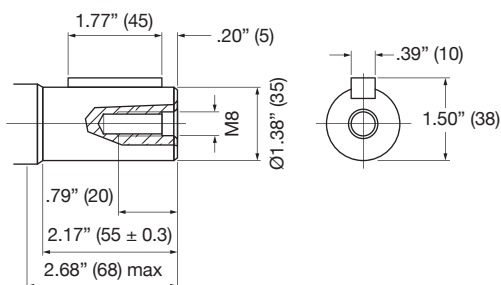
1 = 1.26" (32mm) Straight, Flat Key 10x8x45



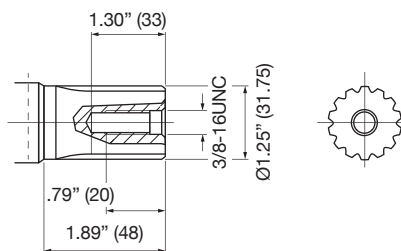
5 = 1.25" (31.75mm) 14t Splined, M8



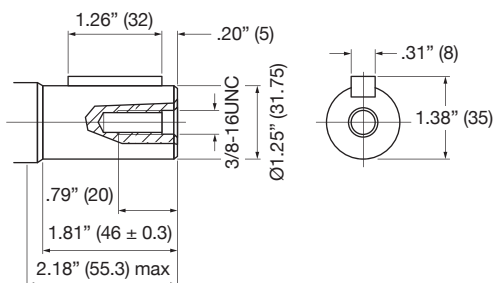
2 = 1.38" (35mm) Straight, Flat Key 10x8x45



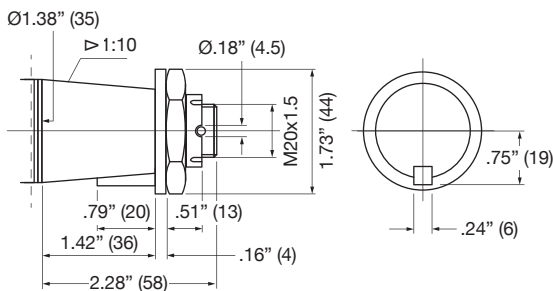
6 = 1.25" (31.75mm) 14t Splined, 3/8"-16



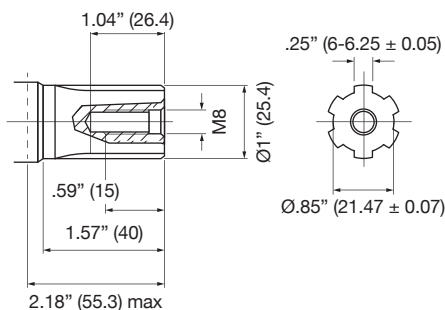
3 = 1.25" (31.75mm) Straight, Flat Key 7.96x7.96x32



7 = 1.38" (35mm) Tapered, Flat Key 6x6x20



4 = 1" (25.4mm) SAE, 6B Splined



MMW Series

Features

MMH series motors are spool valve motors that can be used in parallel or series configurations. A diverse offering of mounting flanges, shafts, ports, and displacements allow for easy installation, product replacement or OEM application.

- Advanced Roller-Star technology, requiring lower pressure at start-up and providing smoother operation at all speeds
- Dual needle bearings provide high side load capacity with extended operating life
- High pressure shaft seal, which allows for higher back pressures and an increased ability to handle high pressure spike conditions
- Internal integrated check valve, which limits case pressure by blocking the high pressure port side and allowing the motor housing to drain into the outlet (low pressure) port
- Motors connected in series will utilize the case drain



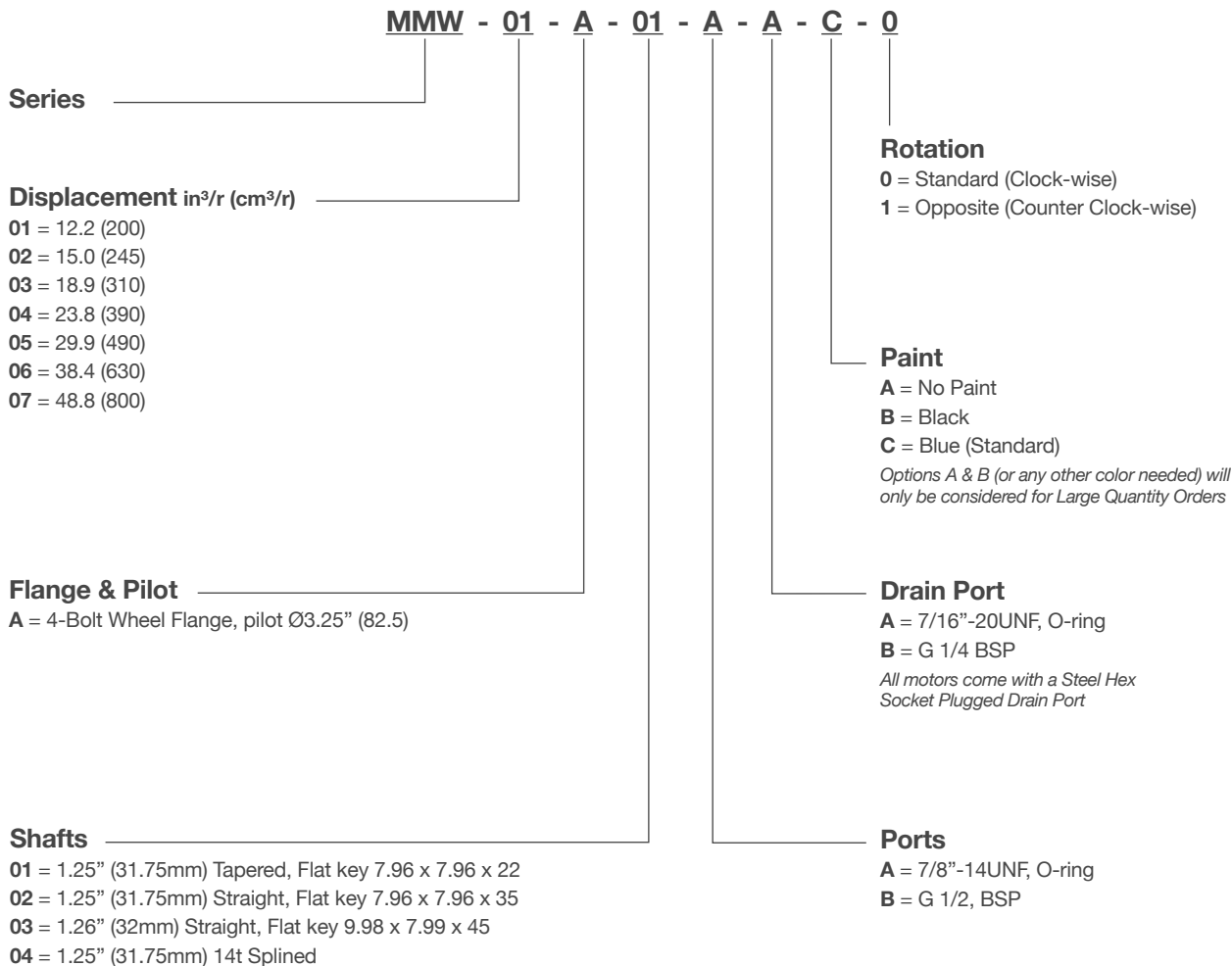
Specifications

MODEL CODE (DISPLACEMENT)		01	02	03	04	05	06	07
Displ.	cm ³ /r	200	245	310	390	490	630	800
	in ³ /r	12.2	15.0	18.9	23.8	29.9	38.4	48.8
Flow	LPM	Cont.	80	80	80	80	80	80
		Int.	100	100	100	100	100	100
	GPM	Cont.	21.1	21.1	21.1	21.1	21.1	21.1
		Int.	26.4	26.4	26.4	26.4	26.4	26.4
Max Speed	RPM	Cont.	360	320	250	200	156	120
		Int.	470	390	300	240	200	150
Pressure	ΔBar	Cont.	175	175	175	155	125	125
		Int.	200	200	200	190	150	150
	ΔPSI	Cont.	2538	2538	2538	2248	1813	1813
		Int.	2901	2901	2901	2756	2176	2176
Torque	NM	Cont.	500	614	777	866	877	1128
		Int.	573	700	888	1061	1053	1350
	LBF-IN	Cont.	4425	5434	6877	7665	7762	9984
		Int.	5071	6196	7859	9391	9320	11949

• Simultaneous maximum torque & maximum speed **NOT** recommended.
 • Continuous Rating ▶ (Cont.) motor may be run continuously at these ratings.
 • Intermittent Operation ▶ (Int.) 10% of every minute.
 • Δ - True pressure difference between inlet port and outlet port.
 • Maximum case pressure without case drain -- 1" Shaft = 125 Bar (1813 psi) | Greater than 1" Shaft 75 Bar (1088 psi).

MMW Series

Model Code Breakdown

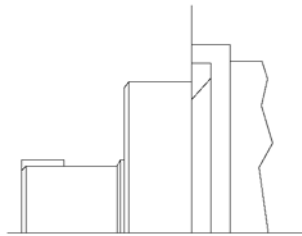
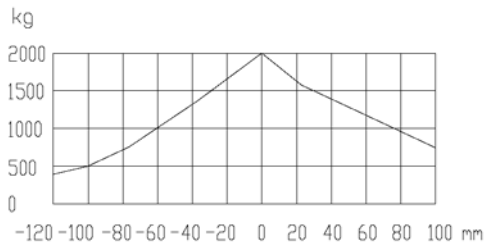


MMW Series

Performance Information

To assure best motor life, run motor for approximately one hour at 30% of rated pressure before applying full load. Fill motor with equipment manufacturer's recommended fluid prior to any load application and startup.

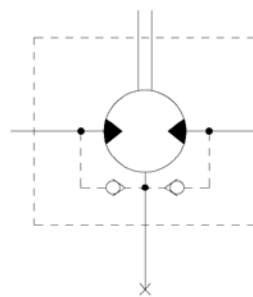
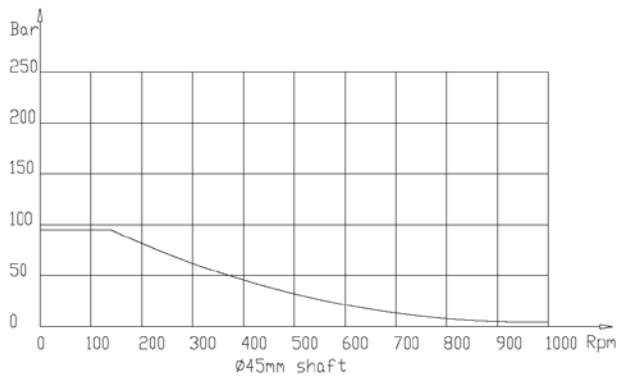
Side Load



Standard Motor 1-1/4 Inch and 35 mm straight shaft

Shaft Seal

Standard Shaft Seal = Genuine Metaris High Pressure Shaft Seal



MMW with standard shaft seal, check valves and with drain connection:
 The shaft seal pressure equals the pressure on the drain line

MMW with standard shaft seal, check valves and without use of drain connection:
 The pressure on the shaft seal never exceeds the pressure in the return line

MMW Series

Performance Information



200 cc/r

		Δ PRESSURE BAR					
		35	70	105	140	175	200
FLOW LPM	10	89 48	178 46	268 45	357 40	446 33	
	20	89 96	178 92	268 90	356 80	445 65	510 50
	30	89 144	178 138	268 135	358 120	442 98	509 75
	40	89 192	179 184	268 180	354 200	440 163	508 125
	50	89 240	181 230	268 225	357 200	439 163	508 125
	60	89 288	180 276	268 270	355 240	438 195	508 150
	70	89 336	179 322	268 315	356 280	437 228	509 175
	75	89 360	178 345	267 338	358 300	436 244	507 188
	80	89 384	176 368	264 360	357 320	435 260	
	90	89 432	175 414	261 405	352 360	436 293	

245 cc/r

		Δ PRESSURE BAR					
		35	70	105	140	175	200
FLOW LPM	10	109 39	218 38	328 37	437 33	546 27	
	20	109 78	218 75	328 73	437 65	546 53	624 41
	30	109 118	218 113	328 110	437 98	546 80	624 61
	40	111 157	221 150	332 147	442 131	553 106	632 82
	50	109 196	218 188	328 184	437 163	546 133	624 102
	60	108 235	216 225	324 220	431 196	539 159	616 122
	70	108 274	216 263	324 257	431 229	539 186	616 143
	75	108 294	216 282	324 276	431 245	539 199	616 153
	80	108 313	216 300	324 294	431 261	539 212	
	90	108 353	216 338	324 331	431 294	539 239	

310 cc/r

		Δ PRESSURE BAR					
		35	70	105	140	175	200
FLOW LPM	20	138 62	276 59	415 58	553 52	691 42	
	30	138 93	276 89	415 87	553 77	691 63	790 48
	40	138 124	276 119	415 116	553 103	691 84	790 65
	50	140 155	280 148	420 145	560 129	700 105	800 81
	60	138 186	276 178	415 174	553 155	691 126	790 97
	70	136 217	273 208	409 203	546 181	682 147	780 113
	75	136 232	273 223	409 218	546 194	682 157	780 121
	80	136 248	273 237	409 232	546 206	682 168	
	90	136 279	273 267	409 261	546 232	682 189	

390 cc/r

		Δ PRESSURE BAR					
		35	70	105	140	155	190
FLOW LPM	20	174 49	348 47	522 46	696 41	770 33	
	30	174 74	348 71	522 69	696 62	770 50	944 38
	40	174 98	348 94	522 92	696 82	770 67	944 51
	50	176 123	352 118	528 115	704 103	780 83	956 64
	60	174 148	348 142	522 138	696 123	770 100	944 77
	70	172 172	343 165	515 162	687 144	760 117	932 90
	75	172 185	343 177	515 173	687 154	760 125	932 96
	80	172 197	343 189	515 185	687 164	760 133	
	90	172 222	343 212	515 208	687 185	760 150	

490 cc/r

		Δ PRESSURE BAR				
		35	70	105	125	160
FLOW LPM	20	218 39	437 38	655 37	780 33	
	30	218 59	437 56	655 55	780 49	999 40
	40	218 78	437 75	655 73	780 65	999 53
	50	221 98	442 94	664 92	790 82	1011 66
	60	218 118	437 113	655 110	780 98	999 80
	70	216 137	431 131	647 129	771 114	986 93
	75	216 147	431 141	647 138	771 122	986 99
	80	216 157	431 150	647 147	771 131	
	90	216 176	431 169	647 165	771 147	

630 cc/r

		Δ PRESSURE BAR				
		35	70	105	125	150
FLOW LPM	20	281 30	562 29	843 29	1003 25	
	30	281 46	562 44	843 43	1003 38	1204 31
	40	281 61	562 58	843 57	1003 51	1204 41
	50	284 76	569 73	853 71	1016 63	1219 52
	60	281 91	562 88	843 86	1003 76	1204 62
	70	277 107	555 102	832 100	991 89	1189 72
	75	277 114	555 110	832 107	991 95	1189 77
	80	277 122	555 117	832 114	991 102	
	90	277 137	555 131	832 129	991 114	

172
(Torque Nm)
185
(Speed RPM)

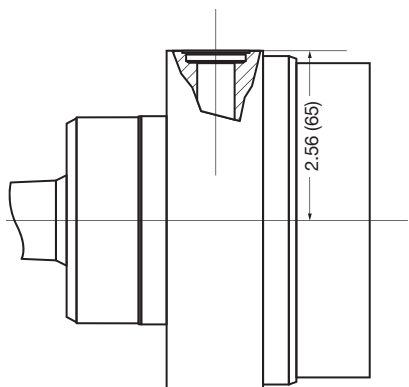
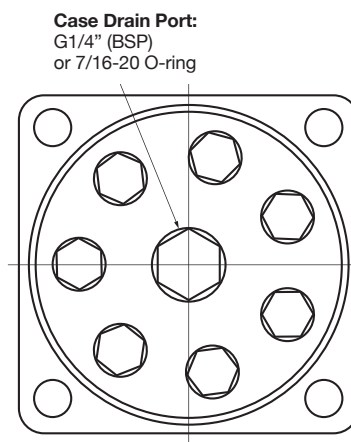
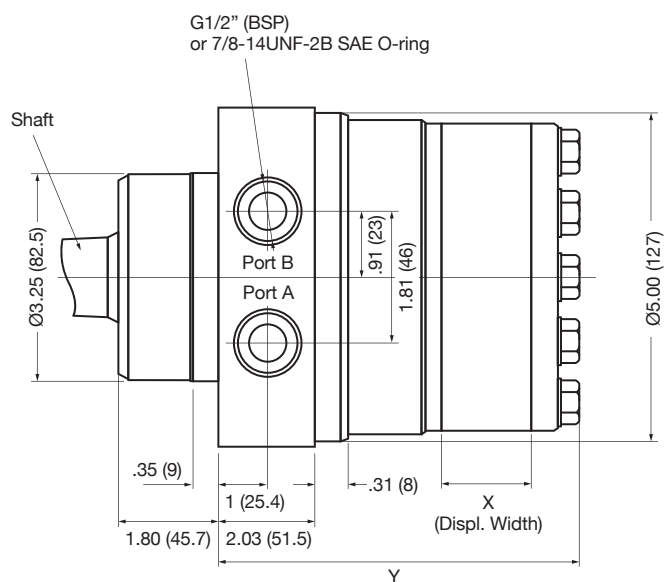
Individual Performance Data Graph Information:

- Motors run with high efficiency in all areas designed with a number for torque and speed.
- However, for best motor life, select a motor to run with a torque and speed range shown in the light gray area (Continuous).
- Performance data is typical at 120 SUS (25.2 cSt).
- Actual data may vary slightly from unit to unit in production.

MMW Series

Dimensions - Aligned Ports

DISPLACEMENT CM ³ /R		200	245	310	390	490	630	800
X	Inches	.88	1.08	1.36	1.71	2.15	2.73	3.51
	Millimeters	(22.4)	(27.4)	(34.6)	(43.4)	(54.5)	(69.2)	(89.1)
Y	Inches	5.92	6.12	6.41	6.75	7.19	7.77	8.55
	Millimeters	(150.4)	(155.5)	(162.7)	(171.5)	(182.6)	(197.3)	(217.2)

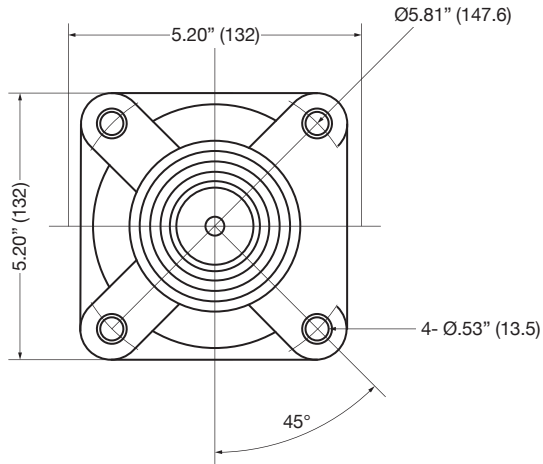


Dimensions are in inches (millimeters).

MMW Series

Mounting Flanges

A = 4-Bolt Wheel Flange, Pilot 3.25" (82.6)



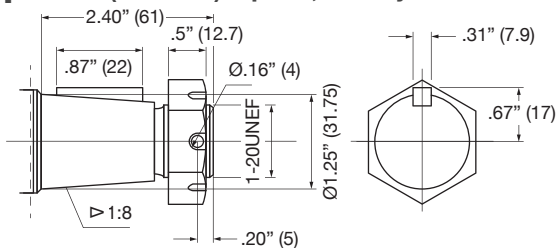
Dimensions are in inches (millimeters).

MMW Series

Shafts

Dimensions are in inches (millimeters).

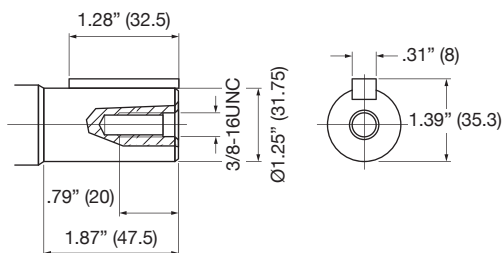
1 = 1.25" (31.75mm) Tapered, Flat Key 7.96x7.96x22



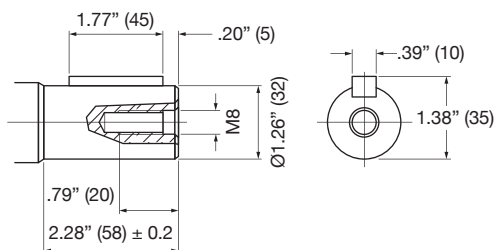
Taper per Meter:
 125.0 ± 0.17/m

Recommended Torque:
 (373 Nm [275 lb-ft] Dry)
 (305 Nm [225 lb-ft] Lub)
 Plus torque required to align the slotted nut with shaft crosshole.

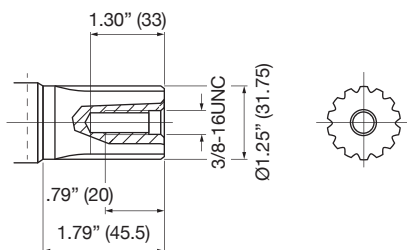
2 = 1.25" (31.75mm) Straight, Flat Key 7.96x7.96x35



3 = 1.26" (32mm) Straight, Flat Key 9.98x7.99x45



4 = 1.25" (31.75mm) 14t Splined



MMS Series

Features

MMS series motors are disc valve motors that can be used in parallel or series configurations. A diverse offering of mounting flanges, shafts, ports, and displacements along with wheel and bearingless motors allow for easy installation, product replacement or OEM application.

- Advanced Roller-Star technology, requiring lower pressure at start-up and providing smoother operation at all speeds
- Disc valve technology, providing greater speed and efficiency for medium duty applications
- Dual high efficiency tapered roller bearings, providing excellent low speed and high speed operation with high side load capabilities
- High pressure shaft seal, which allows for higher back pressures and an increased ability to handle high pressure spike conditions (no shaft seal on bearingless motors)
- Internal integrated check valve, which limits case pressure by blocking the high pressure port side and allowing the motor housing to drain into the outlet (low pressure) port
- Motors connected in series will utilize the case drain



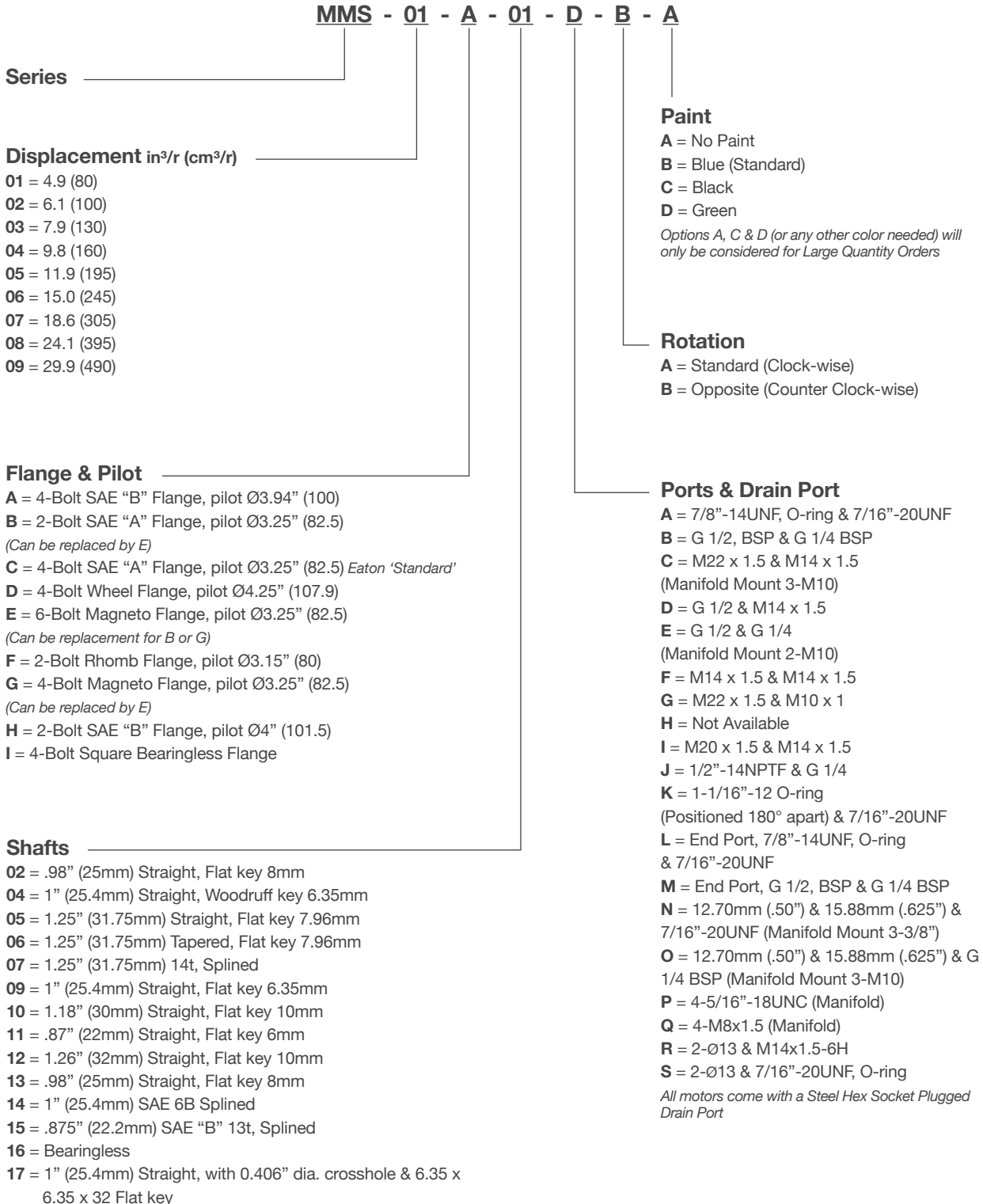
Specifications

MODEL CODE (DISPLACEMENT)		01	02	03	04	05	06	07	08	09	
Displ.	cm ³ /r	80	100	130	160	195	245	305	395	490	
	in ³ /r	4.9	6.1	7.9	9.8	11.9	15	18.6	24.1	29.9	
Flow	LPM	Cont.	75	75	75	75	75	75	75	75	
		Int.	75	95	95	115	115	115	115	130	130
	GPM	Cont.	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8
		Int.	19.8	25.1	25.1	30.4	30.4	30.4	30.4	34.3	34.3
Max Speed	RPM	Cont.	799	742	576	477	385	308	246	191	153
		Int.	908	924	720	713	577	462	365	335	230
Pressure	ΔBar	Cont.	170	170	170	170	170	170	140	140	120
		Int.	275	275	275	240	240	240	205	170	170
	ΔPSI	Cont.	2466	2466	2466	2466	2466	2466	2031	2031	1740
		Int.	3989	3989	3989	3481	3481	3481	2973	2466	2031
Torque	NM	Cont.	195	245	315	380	455	555	560	700	845
		Int.	305	395	505	530	625	765	805	890	930
	LBF-IN	Cont.	1726	2168	2788	3363	4027	4912	4956	6196	7479
		Int.	2700	3496	4470	4691	5532	6771	7125	7877	8231

• Simultaneous maximum torque & maximum speed **NOT** recommended.
 • Continuous Rating ▶ (Cont.) motor may be run continuously at these ratings.
 • Intermittent Operation ▶ (Int.) 10% of every minute.
 • Δ - True pressure difference between inlet port and outlet port.
 • Maximum case pressure without case drain -- 1" Shaft = 125 Bar (1813 psi) | Greater than 1" Shaft 75 Bar (1088 psi).

MMS Series

Model Code Breakdown

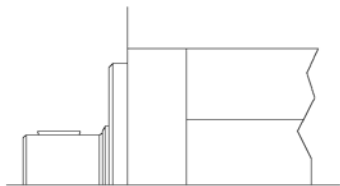
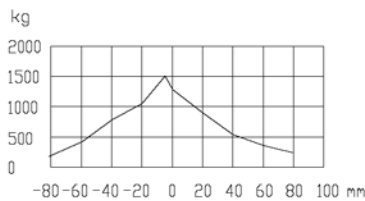


MMS Series

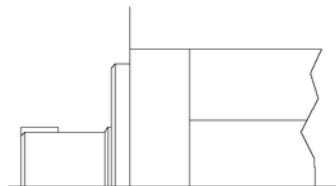
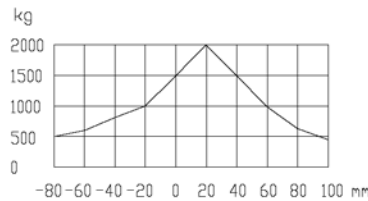
Performance Information

To assure best motor life, run motor for approximately one hour at 30% of rated pressure before applying full load. Fill motor with equipment manufacturer's recommended fluid prior to any load application and startup.

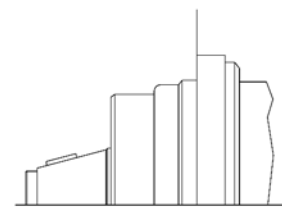
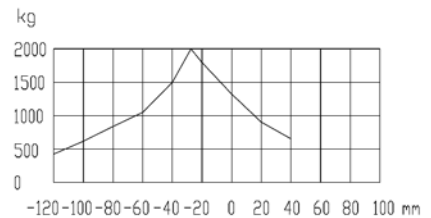
Side Load



Standard Motor 1 Inch straight shaft

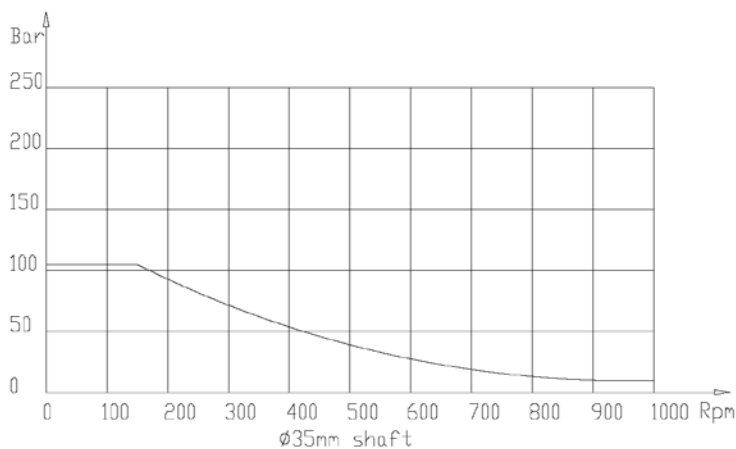


Standard Motor 1-1/4 Inch and 32 mm straight shaft

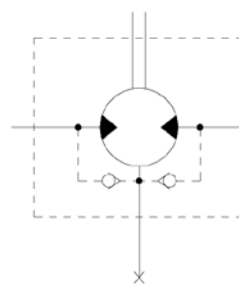


Wheel Motor Tapered Shaft

Shaft Seal



Standard Shaft Seal = Genuine Metaris High Pressure Shaft Seal



MMS with standard shaft seal, check valves and with drain connection:
 The shaft seal pressure equals the pressure on the drain line

MMS with standard shaft seal, check valves and without use of drain connection:
 The pressure on the shaft seal never exceeds the pressure in the return line

MMS Series

Performance Information



80 cc/r

FLOW LPM	Δ PRESSURE BAR							
	35	70	105	140	170	205	240	275
0.95	25 3	45 1						
1.90	30 17	50 8	85 3					
3.80	35 44	75 40	110 37	145 34	175 28	205 22	220 14	240 2
7.50	35 90	75 85	110 81	150 78	180 72	210 65	235 57	265 49
15.0	35 182	75 176	115 170	150 166	185 159	215 152	250 140	280 128
23.0	35 273	75 267	115 259	150 254	185 246	225 238	255 223	290 207
30.0	35 365	75 375	115 349	150 341	190 333	230 325	265 306	300 286
38.0	35 456	75 448	115 439	155 429	190 420	230 411	270 388	305 364
45.0	30 547	70 537	115 530	155 516	195 507	235 497	270 470	305 442
53.0	30 638	70 629	110 622	150 603	195 593	235 584	270 553	305 521
61.0	30 729	70 720	110 714	150 689	190 679	230 670	270 635	305 599
68.0	25 818	65 810	110 795	150 775	190 765	230 756	265 717	300 677
76.0	25 908	65 901	105 880	145 861	185 851	225 842	260 799	295 755

185
(Torque Nm)
851
(Speed RPM)

100 cc/r

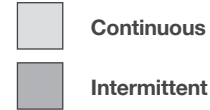
FLOW LPM	Δ PRESSURE BAR							
	35	70	105	140	170	205	240	275
0.95	30 2							
1.90	35 9	70 5	105 2					
3.80	45 34	95 31	135 28	175 23	210 15	240 6		
7.50	45 71	95 68	140 63	180 59	215 51	250 38	285 24	315 14
15.0	45 145	90 141	140 136	185 131	225 121	270 104	310 94	355 80
23.0	45 219	90 215	140 209	190 202	235 192	280 172	325 163	370 149
30.0	40 294	90 288	140 281	190 273	240 261	290 243	340 231	385 216
38.0	40 368	90 362	145 354	195 344	245 330	295 316	340 300	390 283
45.0	40 442	90 436	145 427	195 415	245 399	295 389	345 369	395 350
53.0	35 516	90 509	140 500	195 486	245 469	295 463	345 437	395 417
61.0	35 591	90 583	140 573	195 558	245 540	295 537	345 506	395 485
68.0	35 665	85 657	140 646	190 630	240 611	290 609	340 574	390 552
76.0	30 739	80 731	135 715	185 703	235 684	290 662	335 643	390 619
83.0	30 813	80 805	135 794	185 777	235 758	280 749	330 712	380 687
91.0	30 887	80 879	130 868	175 852	230 834	280 814	330 782	375 754
95.0	25 924	75 916	125 905	175 890	225 873	275 846	325 817	

Individual Performance Data Graph Information:

- Motors run with high efficiency in all areas designed with a number for torque and speed.
- However, for best motor life, select a motor to run with a torque and speed range shown in the light gray area (Continuous).
- Performance data is typical at 120 SUS (25.2 cSt).
- Actual data may vary slightly from unit to unit in production.

MMS Series

Performance Information Cont.



130 cc/r

		Δ PRESSURE BAR							
		35	70	105	140	170	205	240	275
FLOW LPM	0.95								
	1.90	45 8	100 2						
	3.80	60 27	120 23	180 19	230 16	285 13	330 9	375 3	
	7.50	60 56	120 53	180 47	235 42	290 39	330 36	375 21	410 3
	15.0	55 113	120 111	185 104	245 97	300 95	350 92	400 85	450 77
	23.0	55 171	120 169	185 161	245 153	310 149	370 146	425 132	485 118
	30.0	55 224	120 222	185 219	250 210	315 204	375 201	435 192	495 184
	38.0	55 286	120 282	185 276	250 269	315 261	385 255	445 243	505 231
	45.0	50 344	120 338	185 333	250 327	315 317	380 307	440 295	500 284
	53.0	50 402	115 395	185 391	250 385	340 373	380 360	440 348	500 336
	61.0	45 460	115 452	180 447	250 443	315 430	375 411	440 397	500 384
	68.0	45 517	110 509	180 504	245 500	310 484	375 471	435 456	500 440
	76.0	45 575	110 568	175 560	240 551	305 539	370 524	435 508	
	83.0	40 633	105 624	170 619	235 604	305 597	365 579	430 560	
	91.0	35 691	105 682	170 676	235 665	300 651	365 633	425 616	
	95.0	35 719	100 712	165 705	230 692	295 679	360 682	420 656	

240
(Torque Nm)
551
(Speed RPM)

160 cc/r

		Δ PRESSURE BAR							
		15	35	70	105	140	170	205	240
FLOW LPM	0.95	25 3							
	1.90	25 9	55 7	110 5	175 3	240 1			
	3.80	30 23	65 21	130 19	195 17	260 13	320 8	375 3	430 2
	7.50	35 46	70 45	135 42	200 39	265 35	330 34	395 33	460 28
	15.0	35 93	70 92	140 89	215 85	285 79	360 77	430 75	505 59
	23.0	35 142	75 140	145 137	220 131	295 124	370 118	445 113	520 104
	30.0	35 190	75 187	150 184	225 178	300 170	375 166	450 164	525 153
	38.0	35 237	70 235	150 231	230 226	320 217	385 212	455 205	530 193
	45.0	30 286	70 283	150 279	230 274	305 265	380 254	455 246	530 235
	53.0	25 334	65 331	145 326	230 322	312 312	380 305	455 297	530 286
	61.0	25 382	65 378	145 374	225 369	300 360	375 349	455 339	530 326
	68.0	20 429	60 426	140 422	220 416	300 407	375 394	450 387	
	76.0	20 477	60 474	135 469	215 462	300 451	375 440	445 473	
	83.0	15 525	55 522	130 517	210 510	295 501	370 484	445 473	
	91.0	15 572	50 569	130 564	210 556	290 546	370 531	440 522	
	95.0	10 596	50 593	130 587	210 580	290 566	365 553	440 544	
	114.0		35 713	120 706	200 696	280 682	355 672	430 658	

Individual Performance Data Graph Information:

- Motors run with high efficiency in all areas designed with a number for torque and speed.
- However, for best motor life, select a motor to run with a torque and speed range shown in the light gray area (Continuous).
- Performance data is typical at 120 SUS (25.2 cSt).
- Actual data may vary slightly from unit to unit in production.

MMS Series

Performance Information Cont.



195 cc/r

		Δ PRESSURE BAR							
		15	35	70	105	140	170	205	240
FLOW LPM	0.95	25 4	65 2						
	1.90	35 8	70 6	150 2					
	3.80	45 17	80 16	160 14	200 11	305 7	370 4	430 2	490 1
	7.50	45 37	85 35	165 33	250 31	325 26	415 21	510 19	575 14
	15.0	45 76	90 74	175 72	260 70	345 64	430 61	510 57	595 51
	23.0	45 115	90 113	180 110	270 108	360 102	445 99	530 94	615 87
	30.0	45 154	90 151	185 148	275 146	370 140	455 135	540 130	625 123
	38.0	45 193	95 190	185 187	280 184	375 177	465 173	545 168	630 160
	45.0	40 231	90 229	185 226	280 221	375 218	465 211	550 204	
	53.0	35 269	85 267	185 264	280 260	380 254	465 248	550 241	
	61.0	30 308	80 306	185 303	275 296	375 290	465 283	550 276	
	68.0	30 346	80 345	180 342	270 334	375 327	465 315		
	76.0	25 385	75 384	175 380	270 372	370 367	460 359		
	83.0	20 424	70 423	170 418	265 410	365 404	460 395		
	91.0	15 462	65 461	165 457	260 449	360 441	450 432		
	95.0	15 484	60 482	160 476	260 469	355 459	445 449		
	114.0		45 577	145 571	240 562	330 550			

245 cc/r

		Δ PRESSURE BAR							
		15	35	70	105	140	170	205	240
FLOW LPM	0.95								
	1.90	45 4	95 2						
	3.80	50 14	105 13	210 11	315 9	410 6	515 4	615 3	715 1
	7.50	50 29	110 28	215 26	325 23	425 20	540 18	640 15	740 12
	15.0	55 60	115 59	225 56	340 53	450 49	555 47	660 46	765 44
	23.0	50 91	115 90	230 87	350 83	465 78	570 73	675 69	780 65
	30.0	50 122	115 121	235 118	360 113	475 108	585 104	690 101	
	38.0	50 153	115 152	240 148	360 144	480 139	560 135	705 103	
	45.0	45 184	110 183	235 180	360 175	480 170	600 165		
	53.0	40 215	105 214	235 211	355 207	480 201	585 195		
	61.0	40 246	95 245	230 242	355 238	470 232	580 223		
	68.0	30 277	90 276	225 327	345 269	465 263	575 253		
	76.0	30 308	90 306	215 302	340 298	465 291			
	83.0	25 339	80 337	210 334	330 330	455 323			
	91.0	15 370	75 369	200 364	325 360	445 353			
	95.0	15 385	75 384	200 379	325 375	445 367			
	114.0		60 462	185 458	305 453	430 447			

75
(Torque Nm)
369
(Speed RPM)

Individual Performance Data Graph Information:

- Motors run with high efficiency in all areas designed with a number for torque and speed.
- However, for best motor life, select a motor to run with a torque and speed range shown in the light gray area (Continuous).
- Performance data is typical at 120 SUS (25.2 cSt).
- Actual data may vary slightly from unit to unit in production.

MMS Series

Performance Information Cont.



305 cc/r

FLOW LPM	Δ PRESSURE BAR						
	15	35	70	105	140	170	205
0.95							
1.90	55 4	120 2					
3.80	70 12	135 11	260 10	390 9	500 6	610 1	
7.50	70 24	135 24	270 22	395 20	520 18	640 15	765 11
15.0	75 49	140 49	280 47	415 45	545 42	675 38	805 34
23.0	70 74	145 74	290 72	430 69	560 64	695 58	825 52
30.0	70 98	145 98	295 96	440 93	575 86	705 80	
38.0	65 123	140 122	295 120	440 117	580 110	720 102	
45.0	60 148	140 147	295 144	440 142	580 133	720 124	
53.0	55 172	135 172	290 168	440 165	580 156		
61.0	50 196	125 196	280 192	440 188	575 178		
68.0	40 221	120 221	275 217	440 212	570 202		
76.0	35 246	110 245	265 241	420 236	565 226		
83.0	25 271	105 270	260 266	400 260	545 255		
91.0	20 296	100 294	255 290	385 285	525 280		
95.0	15 308	95 307	250 303	375 298	510 293		
114.0		75 365	230 360	355 356			

395 cc/r

FLOW LPM	Δ PRESSURE BAR							
	15	35	70	105	120	140	155	170
0.95								
1.90	65 4	150 3						
3.80	85 9	175 9	350 8	505 7	585 7	665 6	745 5	820 4
7.50	90 18	180 18	360 17	530 16	615 15	700 14	775 13	845 11
15.0	90 37	190 37	375 36	560 35	650 34	740 33	815 31	890 28
23.0	90 57	190 56	385 55	575 52	670 50	765 49	840 47	905 45
30.0	90 76	190 75	390 74	580 71	675 69	770 68		
38.0	90 95	190 94	395 93	585 90	680 88	775 86		
45.0	85 114	190 113	390 112	580 109	675 106	770 103		
53.0	85 133	185 132	390 131	580 127	675 124			
61.0	80 153	180 152	380 150	570 146	670 144			
68.0	70 172	170 171	375 170	565 167	665 164			
76.0	65 191	165 190	370 189	560 186	660 184			
83.0	60 210	155 209	360 208	550 206				
91.0	50 230	150 229	350 227	540 224				
98.0	40 249	140 248	340 246	535 242				
114.0	20 287	120 286	320 283	515 277				
132.0		95 335	300 333					

350
 (Torque Nm)
227
 (Speed RPM)

Individual Performance Data Graph Information:

- Motors run with high efficiency in all areas designed with a number for torque and speed.
- However, for best motor life, select a motor to run with a torque and speed range shown in the light gray area (Continuous).
- Performance data is typical at 120 SUS (25.2 cSt).
- Actual data may vary slightly from unit to unit in production.

MMS Series

Performance Information Cont.



490 cc/r

		Δ PRESSURE BAR							
		15	35	50	70	85	105	120	140
FLOW LPM	1.90	75 2	180 1						
	3.80	105 7	225 6	340 5	440 4	550 2			
	7.50	105 14	235 13	350 12	460 10	575 9	715 7		
	15.0	110 30	240 29	365 28	480 27	605 26	720 24	835 22	900 20
	23.0	110 45	240 44	365 43	485 42	605 41	725 39	845 37	930 35
	30.0	110 61	240 60	365 59	490 58	610 57	730 55	855 52	
	38.0	105 76	230 75	360 74	485 73	610 72	730 72	855 68	
	45.0	95 91	225 90	355 90	480 89	605 87	730 85	855 84	
	53.0	90 106	220 105	345 105	475 104	600 102	725 100		
	61.0	80 122	210 121	340 120	465 119	590 118	715 116		
	68.0	70 153	190 152	315 151	445 150	570 149	700 146		
	76.0	60 153	190 152	315 151	445 150	570 149	700 146		
	83.0	50 168	175 168	305 167	435 165	560 164	685 161		
	91.0	40 184	165 184	295 183	420 181	550 179	675 177		
	98.0	30 199	155 195	285 195	410 192	540 190			
	106.0		140 212	270 211	400 209	525 207			
	114.0		125 230	255 229	385 277	510 224			

285
 (Torque Nm)
 195
 (Speed RPM)

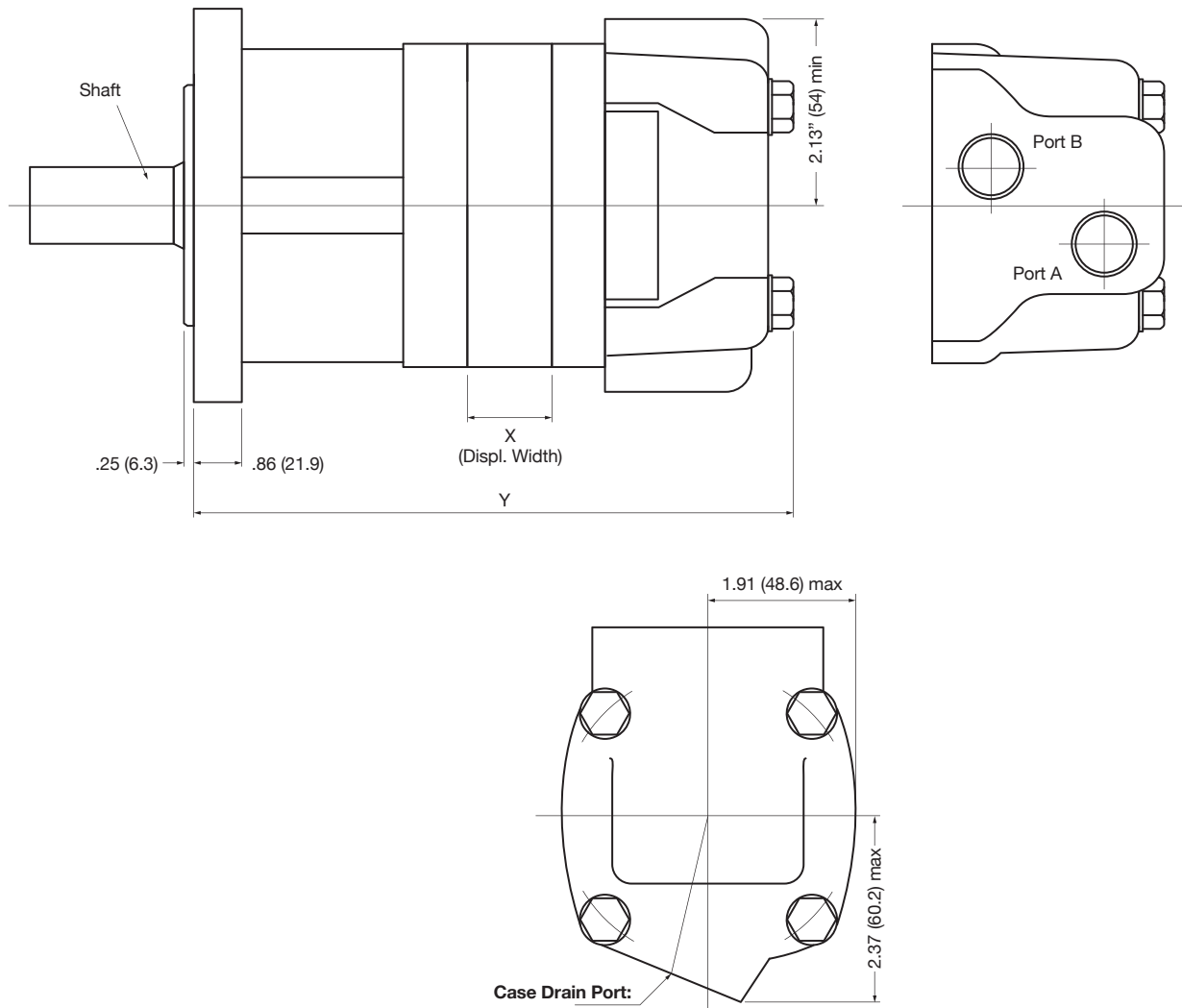
Individual Performance Data Graph Information:

- Motors run with high efficiency in all areas designed with a number for torque and speed.
- However, for best motor life, select a motor to run with a torque and speed range shown in the light gray area (Continuous).
- Performance data is typical at 120 SUS (25.2 cSt).
- Actual data may vary slightly from unit to unit in production.

MMS Series

Dimensions - Staggered Ports

DISPLACEMENT CM ³ /R		80	100	130	160	195	245	305	395	490
X	Inches	.57	.70	.89	1.14	1.40	1.76	2.20	2.83	3.52
	Millimeters	(14.4)	(17.8)	(22.5)	(28.9)	(35.6)	(44.7)	(56.0)	(72.0)	(89.3)
Y	Inches	7.24	7.44	7.68	7.68	7.95	8.31	8.78	9.41	10.08
	Millimeters	(184)	(189)	(195)	(195)	(202)	(211)	(223)	(239)	(256)

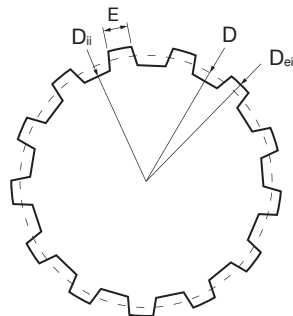
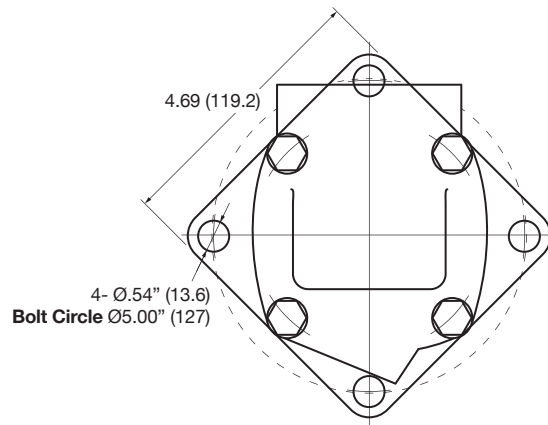
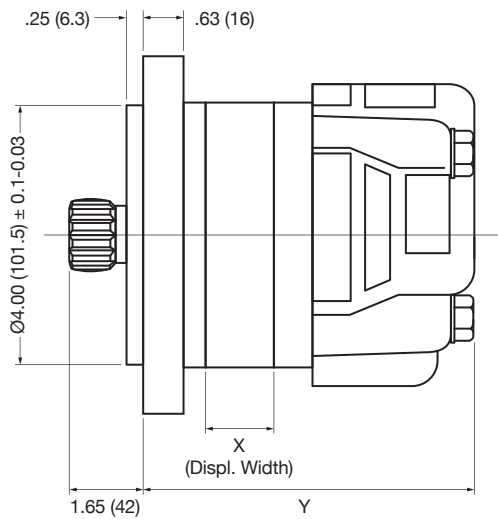


Dimensions are in inches (millimeters).

MMS Series

Dimensions - Bearingless (Flange I, Shaft Code 16)

DISPLACEMENT CM ³ /R		80	100	130	160	195	245	305	395	490
X	Inches	.57	.70	.89	1.14	1.40	1.76	2.20	2.83	3.52
	Millimeters	(14.4)	(17.8)	(22.5)	(28.9)	(35.6)	(44.7)	(56.0)	(72.0)	(89.3)
Y	Inches	5.00	5.16	5.43	5.43	5.71	6.06	6.50	7.13	7.80
	Millimeters	(127)	(131)	(138)	(138)	(145)	(154)	(165)	(181)	(198)



SHAFT CODE 16 - DIMENSIONS

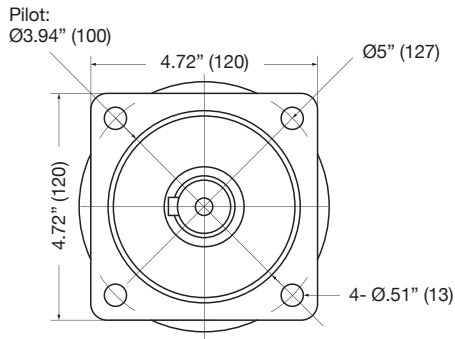
Parameter	Symbol	Value
Fillet Root Side Fit		mm
Number of Teeth	Z	12
Diametral Pitch	DP	12/24
Pressure Angle	D	30
Pitch Dia.	D	Ø25.4
Major Dia.	D _{ei}	Ø28
Minor Dia.	D _{ii}	Ø23
Space Width	E	4.308

Dimensions are in inches (millimeters).

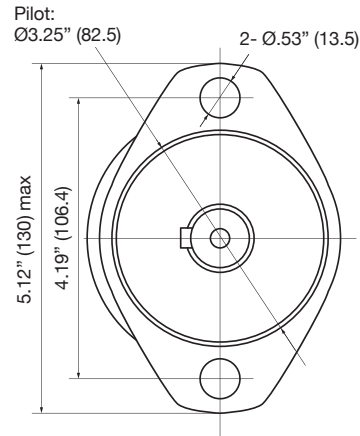
MMS Series

Mounting Flanges

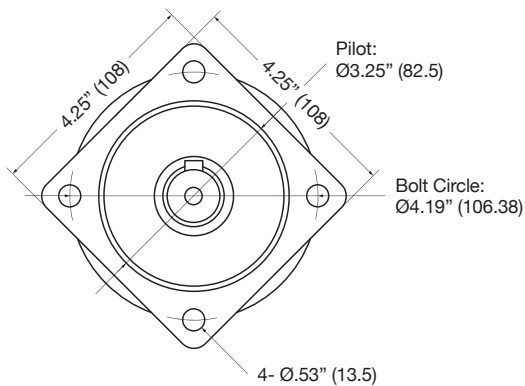
A = 4-Bolt SAE "B" Flange, Pilot 3.94" (100)



B = 2-Bolt SAE "A" Flange, Pilot 3.25" (82.5)



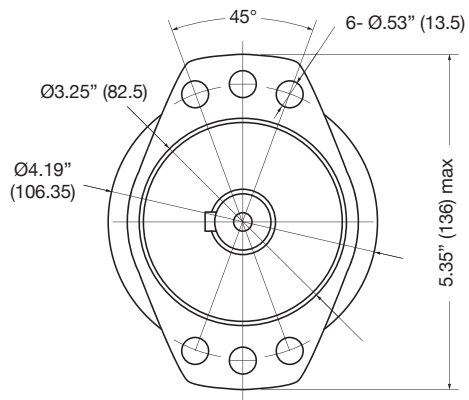
C = 4-Bolt SAE "A" Flange, Pilot 3.25" (82.5)



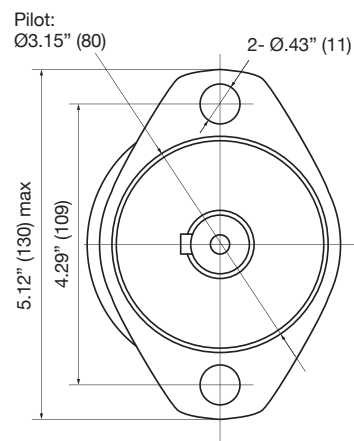
D = 4-Bolt Wheel Flange, Pilot 4.25" (107.9)

(For dimensions see page 47)

E = 6-Bolt Magneto Flange, Pilot 3.25" (82.5)



F = 2-Bolt Rhomb Flange, Pilot 3.15" (80)

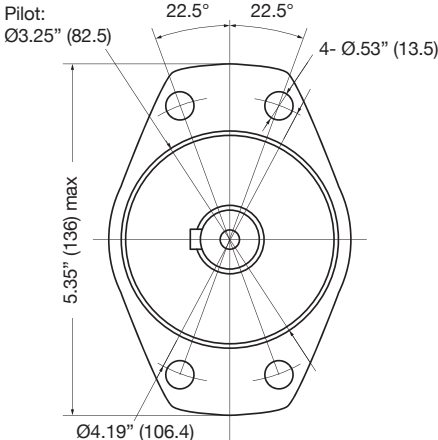


Dimensions are in inches (millimeters).

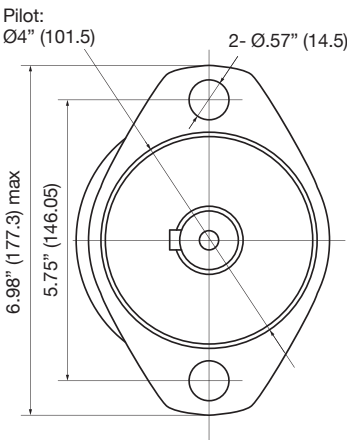
MMS Series

Mounting Flanges Cont.

G = 4-Bolt Magneto Flange, Pilot 3.25" (82.5)



H = 2-Bolt SAE "B" Flange, Pilot 4" (101.5)



I = 4-Bolt Square Flange, Pilot 4" (101.5)

Bearingless
 (For dimensions see page 48)

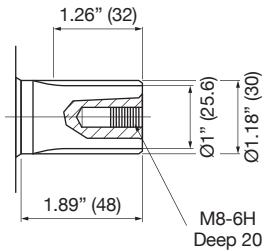
Dimensions are in inches (millimeters).

MMS Series

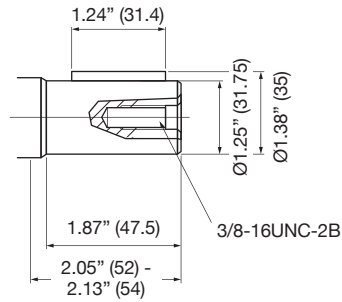
Shafts

Dimensions are in inches (millimeters).

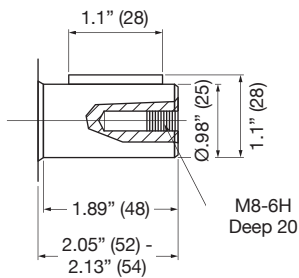
1 = 1" (25.6mm) Square Splined, 6D 30x26x8



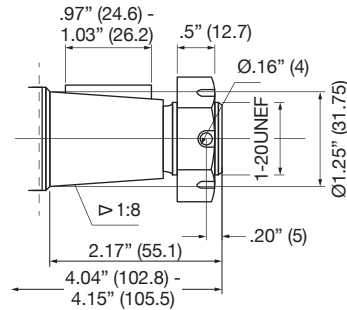
5 = 1.25" (31.75mm) Straight, Flat Key 7.96x7.96x32



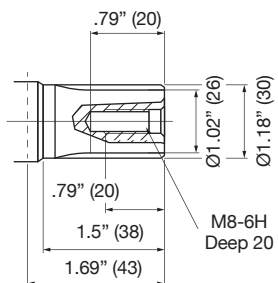
2 = .98" (25mm) Straight, Flat Key 8mm



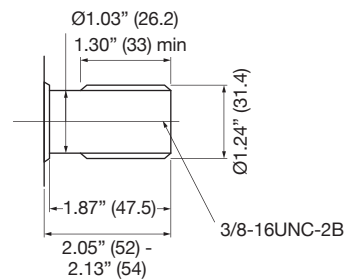
6 = 1.25" (31.75mm) Tapered, Flat Key 7.96x7.96x32



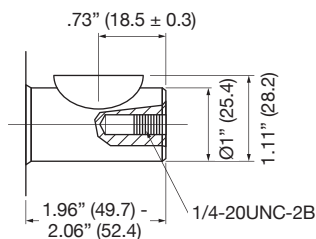
3 = 1.02" (26mm) Square Splined, 6D 30x26x6



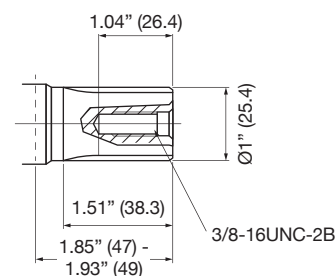
7 = 1.25" (31.75mm) 14t Splined



4 = 1" (25.4mm) Straight, Woodruff Key 6.35mm



8 = 1" (25.4mm) Square Splined, 6D 25.4x21.5x6.25

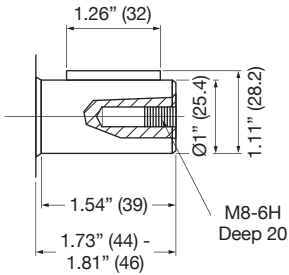


MMS Series

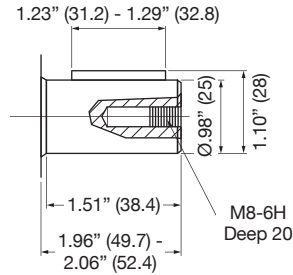
Shafts Cont.

Dimensions are in inches (millimeters).

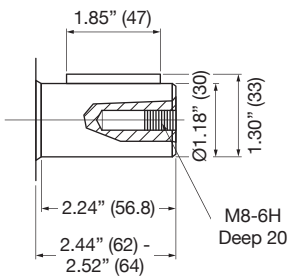
9 = 1" (25.4mm) Straight, Flat Key 6.35mm



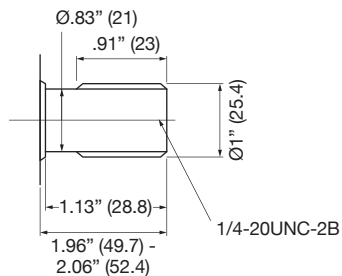
13 = .98" (25mm) Straight, Flat Key 8mm



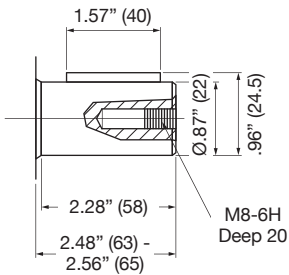
10 = 1.18" (30mm) Straight, Flat Key 10mm



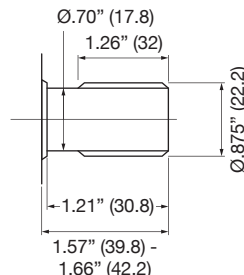
14 = 1" (25.4mm) SAE, 6B Splined



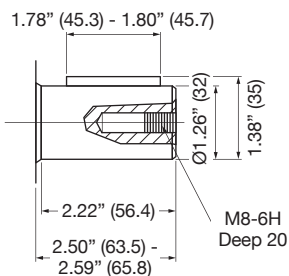
11 = .87" (22mm) Straight, Flat Key 6mm



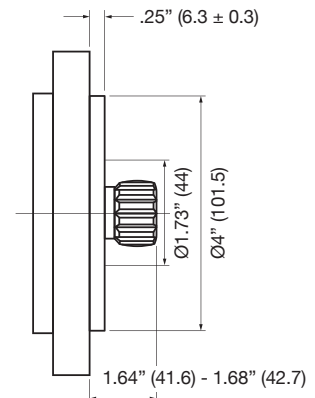
15 = .875" (22.2mm) SAE B, 13t Splined



12 = 1.26" (32mm) Straight, Flat Key 10mm



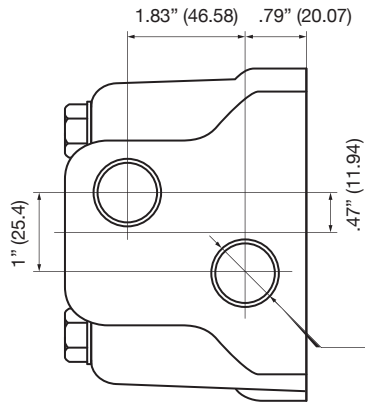
16 = Bearingless



MMS Series

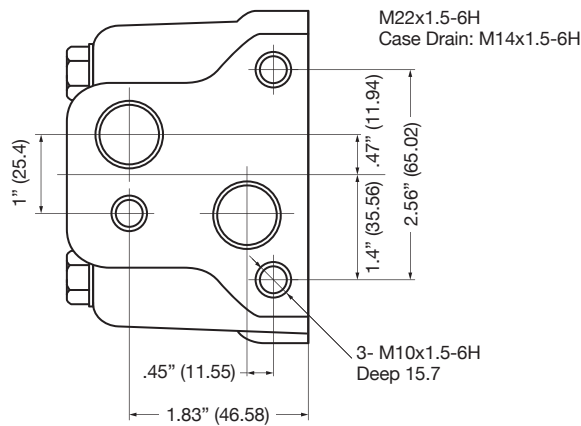
Port Dimensions

Multiple Options

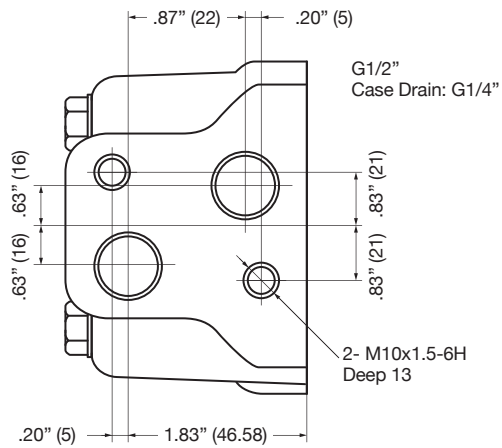


- A** = 0.875-14UNF-2B O-ring
Case Drain: 0.4375-20UNF O-ring
- B** = G1/2"
Case Drain: G1/4"
- D** = G1/2"
Case Drain: M14x1.5-6H
- G** = M22x1.5-6H
Case Drain: M10x1-6H
- I** = M20x1.5
Case Drain: M14x1.5-6H
- J** = NPTF 1/2"
Case Drain: G1/4"

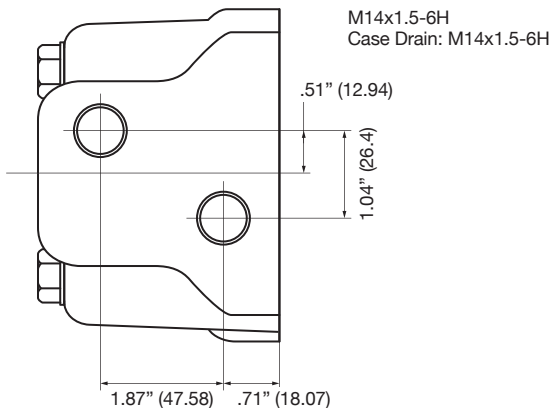
C = M22x1.5 & M14x1.5



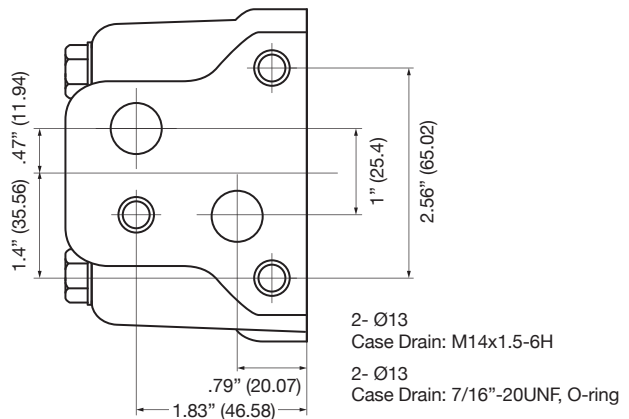
E = G1/2\" & G1/4\"



F = M14x1.5 & M14x1.5



R = 2- Ø13 & M14x1.5-6H S = 2- Ø13 & 7/16\"-20UNF, O-ring



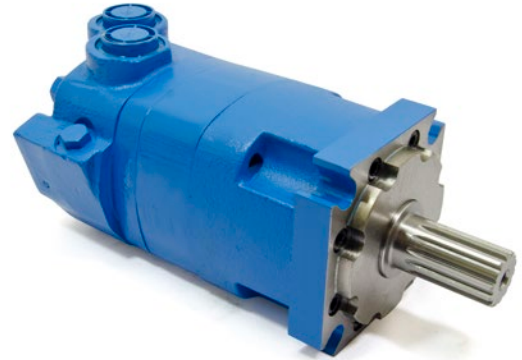
Dimensions are in inches (millimeters).

MMK Series

Features

MMK series motors are disc valve motors that can be used in parallel or series configurations. A diverse offering of mounting flanges, shafts, ports, and displacements along with wheel and bearingless motors allow for easy installation, product replacement or OEM application.

- Advanced Roller-Star technology, requiring lower pressure at start-up and providing smoother operation at all speeds
- Disc valve technology, providing greater speed and efficiency for medium duty applications
- Dual high efficiency tapered roller bearings, providing excellent low speed and high speed operation with high side load capabilities
- High pressure shaft seal, which allows for higher back pressures and an increased ability to handle high pressure spike conditions (no shaft seal on bearingless motors)
- Internal integrated check valve, which limits case pressure by blocking the high pressure port side and allowing the motor housing to drain into the outlet (low pressure) port
- Motors connected in series will utilize the case drain



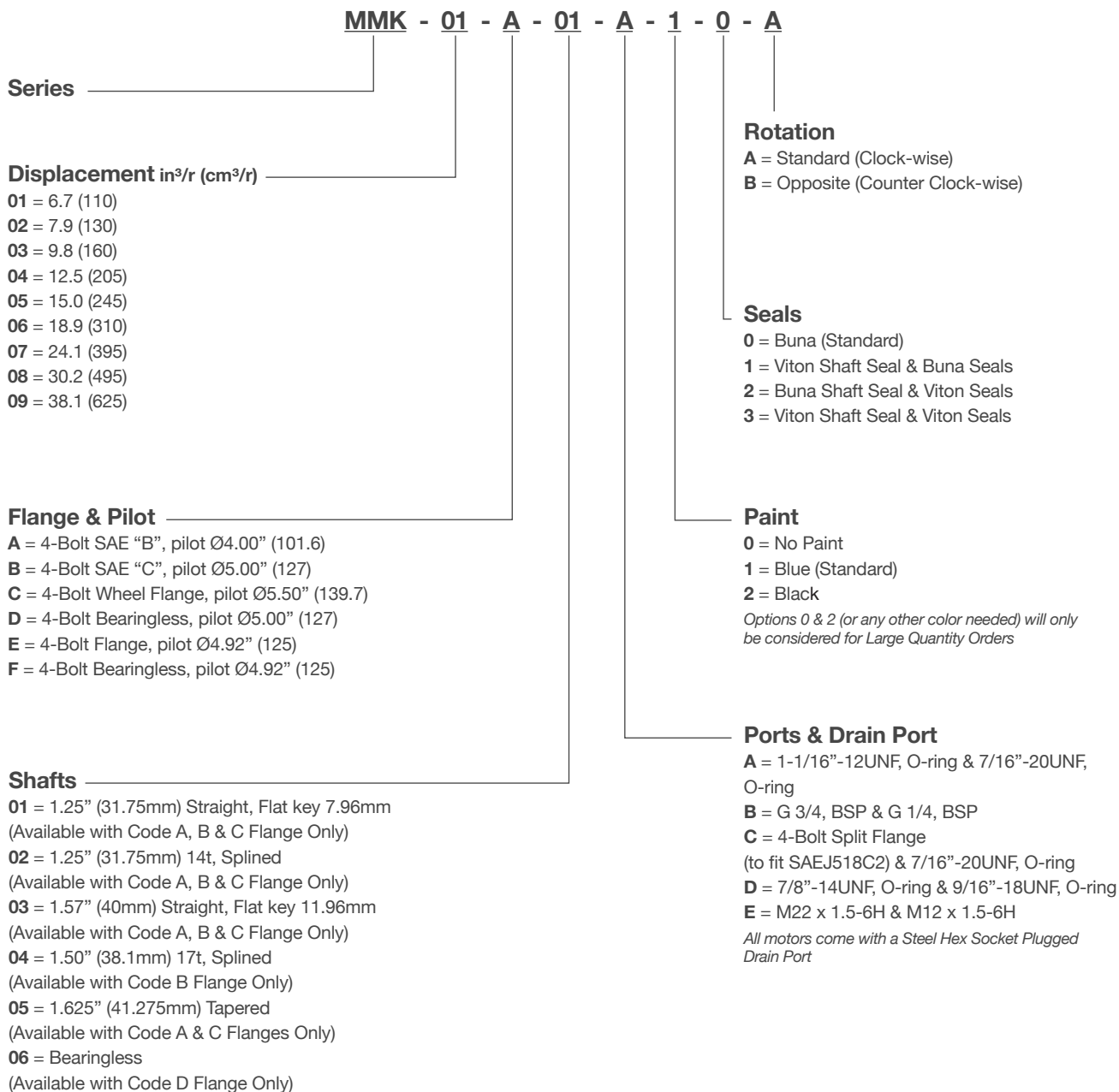
Specifications

MODEL CODE (DISPLACEMENT)		01	02	03	04	05	06	07	08	09
Displ.	cm ³ /r	110	130	160	205	245	310	395	495	625
	in ³ /r	6.7	7.9	9.8	12.5	15.0	18.9	24.1	30.2	38.1
Flow	LPM	Cont.	75	95	95	95	95	95	95	95
		Int.	95	115	115	115	130	130	150	150
	GPM	Cont.	19.8	25.1	25.1	25.1	25.1	25.1	25.1	25.1
		Int.	25.1	30.4	30.4	30.4	34.4	34.4	39.6	39.6
Max Speed	RPM	Cont.	697	722	582	459	383	303	239	191
		Int.	868	862	693	546	532	422	376	305
Pressure	ΔBar	Cont.	205	205	205	205	205	205	190	140
		Int.	310	310	310	310	260	260	240	170
	ΔPSI	Cont.	2973	2973	2973	2973	2973	2973	2756	2031
		Int.	4496	4496	4496	4496	3771	3771	3481	2466
Torque	NM	Cont.	320	375	485	600	705	850	930	945
		Int.	470	560	705	800	845	1065	1185	1170
	LBF-IN	Cont.	2832	3319	4293	5310	6240	7523	8231	8364
		Int.	4160	4956	6240	7081	7479	9426	10488	10355

• Simultaneous maximum torque & maximum speed **NOT** recommended.
 • Continuous Rating ▶ (Cont.) motor may be run continuously at these ratings.
 • Intermittent Operation ▶ (Int.) 10% of every minute.
 • Δ - True pressure difference between inlet port and outlet port.
 • Maximum case pressure without case drain -- 1" Shaft = 125 Bar (1813 psi) | Greater than 1" Shaft 75 Bar (1088 psi).

MMK Series

Model Code Breakdown

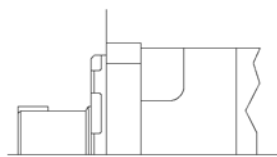
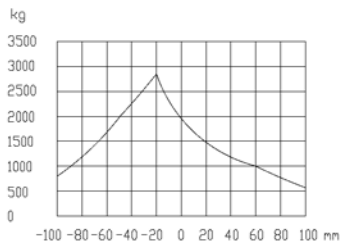


MMK Series

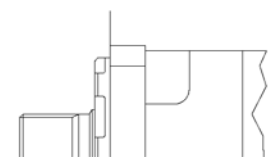
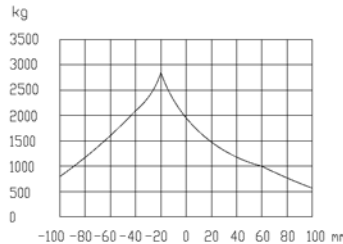
Performance Information

To assure best motor life, run motor for approximately one hour at 30% of rated pressure before applying full load. Fill motor with equipment manufacturer's recommended fluid prior to any load application and startup.

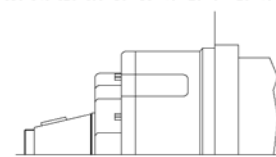
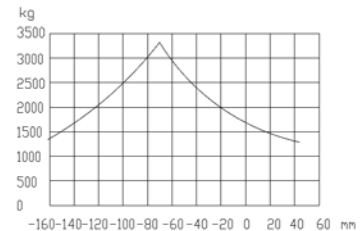
Side Load



Standard Motor 1-1/4 Inch and 40 mm straight shaft

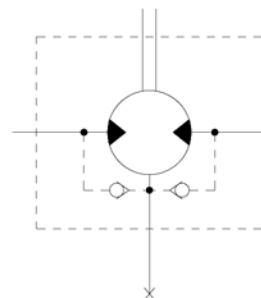
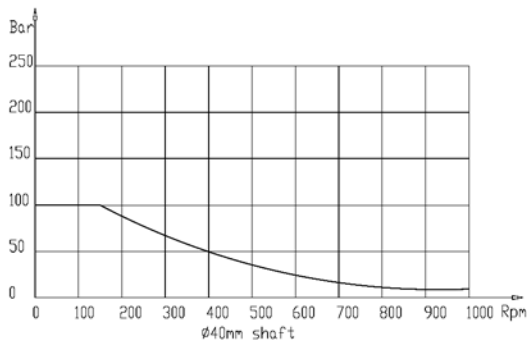


Standard Motor 1-1/4 Inch 14 Tooth splined shaft



Wheel Motor Tapered Shaft

Shaft Seal



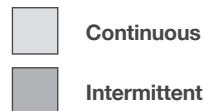
Standard Shaft Seal = Genuine Metaris High Pressure Shaft Seal

MMK with standard shaft seal, check valves and with drain connection:
 The shaft seal pressure equals the pressure on the drain line

MMK with standard shaft seal, check valves and without use of drain connection:
 The pressure on the shaft seal never exceeds the pressure in the return line

MMK Series

Performance Information



110 cc/r

FLOW LPM	Δ PRESSURE BAR									
	15	35	70	105	140	170	205	240	275	310
1.90	15 14	45 10	95 5	145 2						
3.80	20 34	50 33	100 31	155 28	210 25	255 22	305 18	350 11		
7.50	20 68	50 67	105 62	155 56	210 50	260 44	305 36	355 28	390 18	
15.0	20 138	50 136	105 123	160 110	210 97	260 84	310 70	355 56	400 42	440 28
23.0	25 207	55 204	110 200	160 193	210 184	260 174	310 163	360 150	410 136	455 121
30.0	20 277	50 274	105 270	160 262	210 253	265 241	315 241	365 213	415 196	455 179
38.0	20 347	50 344	105 340	160 331	215 322	265 308	320 292	370 274	420 255	460 236
45.0	20 417	50 414	105 410	160 400	210 390	265 370	320 355	370 313	420 292	460 282
53.0	15 487	50 484	105 480	160 469	210 458	265 440	320 419	370 446	420 471	465 348
61.0	15 556	50 553	105 549	160 537	210 525	265 505	320 482	375 455	425 428	465 404
68.0	10 626	50 622	105 618	160 606	210 593	265 570	320 545	375 516	425 485	465 460
76.0	10 697	50 694	100 690	155 677	210 664	265 638	320 611	375 579	430 545	470 518
95.0		45 868	95 861	155 838	210 816	260 792	320 767	375 729	425 690	

130 cc/r

FLOW LPM	Δ PRESSURE BAR									
	15	35	70	105	140	170	205	240	275	310
1.90	35 12	60 9	120 5	180 2						
3.80	35 30	60 28	120 25	180 19	240 14	300 13	345 12	390 4		
7.50	30 57	60 56	125 53	185 47	240 42	300 40	360 38	405 29	455 20	460 12
15.0	30 116	60 114	125 111	185 105	250 100	305 95	365 90	415 70	465 50	515 37
23.0	25 173	60 170	125 167	185 161	250 156	305 149	365 142	420 123	470 104	525 91
30.0	25 228	60 225	120 222	185 216	250 210	310 202	370 194	425 176	480 158	535 145
38.0	25 283	60 281	120 278	185 272	250 266	310 256	375 246	430 229	490 212	545 189
45.0	25 341	55 338	120 335	185 329	250 323	310 312	375 300	435 282	495 263	550 237
53.0	20 400	55 396	120 392	185 386	250 380	310 368	375 355	435 335	495 315	550 286
61.0	20 457	55 453	120 449	185 443	250 437	310 424	375 410	435 388	495 366	555 335
68.0	15 516	55 511	120 506	185 500	250 494	310 480	375 465	435 442	500 418	560 384
76.0	10 574	55 569	120 564	185 559	250 551	310 536	375 520	440 495	500 470	
83.0	10 633	50 628	115 624	180 615	245 606	310 590	375 573	440 547	500 520	
95.0	5 722	50 718	115 714	180 702	245 690	305 672	375 653	435 625	500 595	
114.0		45 862	105 855	170 842	235 827	300 806	360 783	425 749		

245
(Torque Nm)
690
(Speed RPM)

160 cc/r

FLOW LPM	Δ PRESSURE BAR									
	15	35	70	105	140	170	205	240	275	310
1.90	35 8	75 7	150 5	230 3	310 1					
3.80	35 23	80 22	155 20	235 19	315 18	375 16	445 15	500 8	560 2	
7.50	35 46	80 45	155 41	235 40	315 37	375 32	450 29	510 27	575 25	630 13
15.0	35 93	80 92	160 90	240 88	320 84	385 76	455 73	520 62	590 51	645 35
23.0	35 137	80 135	160 134	240 131	320 126	395 120	470 114	540 90	605 75	665 57
30.0	30 184	80 182	165 180	245 176	330 171	400 163	480 154	550 138	620 122	680 100
38.0	30 232	80 229	165 226	250 221	335 216	410 206	485 194	555 182	630 169	695 142
45.0	25 277	80 274	165 272	245 266	330 260	405 250	485 238	555 224	630 209	700 182
53.0	25 321	75 319	160 318	245 311	325 304	405 294	480 282	555 266	630 249	700 222
61.0	25 366	75 364	160 362	240 356	325 348	400 338	480 326	555 308	630 289	705 262
68.0	20 410	75 409	155 407	235 401	320 392	400 382	480 370	555 350	635 329	705 302
76.0	15 460	70 458	150 456	235 448	315 440	395 429	480 417	555 396	635 373	
83.0	15 509	70 506	150 502	235 494	315 484	396 473	475 461	555 438	635 413	
95.0	10 582	70 578	150 573	230 563	315 552	395 540	475 526	555 501	630 474	
114.0		65 693	145 687	225 675	305 661	390 647	450 630	525 600		

Individual Performance Data Graph Information:

- Motors run with high efficiency in all areas designed with a number for torque and speed.
- However, for best motor life, select a motor to run with a torque and speed range shown in the light gray area (Continuous).
- Performance data is typical at 120 SUS (25.2 cSt).
- Actual data may vary slightly from unit to unit in production.

MMK Series

Performance Information Cont.



205 cc/r

FLOW LPM	Δ PRESSURE BAR									
	15	35	70	105	140	170	205	240	275	310
1.90	45 8	90 5	170 1							
3.80	45 17	95 17	180 16	250 15	325 14	435 12	515 11	610 9	625 3	
7.50	45 36	95 35	190 34	270 32	355 29	460 27	540 25	619 22	680 16	700 8
15.0	50 73	100 73	200 71	295 70	385 68	480 61	570 57	645 45	715 35	760 23
23.0	50 107	100 106	205 105	295 103	400 101	495 98	585 90	665 81	745 74	800 65
30.0	45 144	100 143	205 142	300 138	400 136	500 132	590 125	680 116	765 109	
38.0	45 182	95 180	205 179	305 174	405 170	505 166	600 160	690 152	780 143	
45.0	40 217	95 216	205 215	305 211	405 202	500 200	600 194	690 185		
53.0	35 256	95 254	200 252	300 248	400 243	500 237	600 229	690 219		
61.0	35 291	95 290	200 289	300 284	400 280	500 272	595 264	690 253		
68.0	30 329	90 327	200 325	300 321	400 316	495 308	595 298	690 287		
76.0	25 366	90 364	195 362	295 358	395 353	495 345	595 334	690 321		
83.0	20 402	90 400	190 398	295 394	395 389	495 380	595 368			
95.0	15 459	85 456	185 453	290 448	395 442	495 434	590 421			
114.0		80 546	175 542	285 537	380 529	475 520	570 504			

540
(Torque Nm)
25
(Speed RPM)

245 cc/r

FLOW LPM	Δ PRESSURE BAR														
	15	35	50	70	85	105	120	140	155	170	190	205	225	240	260
1.90	50 5	110 2													
3.80	55 14	110 14	170 14	225 13	280 13	335 12	385 12	435 11	480 11	530 10	565 4				
7.50	55 30	115 30	170 29	230 28	285 27	345 26	385 26	445 24	500 23	555 22	600 20	650 18	695 16	750 14	810 11
15.0	60 61	115 61	175 60	235 60	295 59	355 59	410 58	465 56	525 53	580 49	630 47	680 44	730 42	775 39	830 36
23.0	60 91	120 90	175 90	235 89	295 88	355 88	415 86	475 83	530 80	590 75	645 70	695 67	750 63	795 63	840 59
30.0	55 121	115 121	175 120	240 119	295 118	355 117	415 115	475 113	535 111	595 106	645 103	700 99	755 96	800 91	845 87
38.0	55 152	115 151	175 150	235 148	295 148	355 147	415 145	480 143	540 141	600 137	650 133	705 129	760 125	805 120	
45.0	50 183	110 182	175 180	235 179	295 178	355 178	415 176	475 173	540 170	595 166	650 161	705 157	755 152		
53.0	45 213	110 212	170 211	235 210	295 209	355 208	415 206	475 203	535 200	595 195	650 190	705 185			
61.0	45 244	105 243	170 242	230 241	290 240	355 239	415 236	475 232	535 229	595 225	650 219	705 213			
68.0	45 275	105 274	165 273	230 272	290 270	350 269	415 266	470 262	530 269	590 254	645 248	700 241			
76.0	40 305	105 305	165 304	225 303	290 302	350 300	410 296	470 292	530 288	590 283	645 276				
83.0	36 337	100 336	160 335	225 334	280 332	345 330	405 326	465 323	530 319	590 313	640 306				
95.0	30 383	95 382	155 381	220 380	280 378	335 376	400 372	460 369	525 365	585 357					
114.0		75 457	140 456	210 455	270 453	330 450	390 445	445 442	505 437	560 427					
132.0			125 532	195 531	255 528	315 525	375 519	440 515	495 509						

MMK Series

Performance Information Cont.



310 cc/r

		Δ PRESSURE BAR														
		15	35	50	70	85	105	120	140	155	170	190	205	225	240	260
FLOW LPM	1.90	70 4	130 2													
	3.80	70 11	145 11	215 11	290 10	360 10	425 10	485 9	555 9	620 9	685 8	755 8	820 7	890 7	960 6	1025 5
	7.50	70 23	145 23	220 22	295 22	365 21	435 21	505 20	575 20	640 19	710 18	780 18	850 17	920 17	995 16	1065 15
	15.0	70 47	145 47	220 46	300 46	370 45	445 45	520 44	590 44	665 43	735 42	810 42	880 41	955 41	1030 40	
	23.0	75 71	145 71	225 70	300 70	375 69	450 69	530 68	600 67	675 66	750 64	825 64	895 63			
	30.0	70 96	145 96	225 95	300 95	380 94	455 94	530 93	605 92	680 91	755 89	825 89				
	38.0	70 121	145 120	225 120	300 119	375 119	460 118	535 117	610 116	685 115	760 112	835 109				
	45.0	70 145	140 144	220 144	295 143	375 142	455 141	535 140	610 139	685 139	760 135					
	53.0	65 169	140 169	215 168	295 168	375 167	450 167	530 165	610 164	685 163	760 159					
	61.0	60 193	140 193	215 192	290 192	370 190	450 189	530 188	610 187	685 185						
	68.0	55 217	135 217	210 216	290 216	365 214	445 213	530 211	605 209	680 207						
	76.0	50 242	135 242	210 242	285 241	365 240	440 238	530 236	605 234	680 232						
	83.0	45 267	130 266	205 266	285 265	360 264	440 262	525 260	600 258							
	95.0	40 303	120 303	200 302	285 301	355 300	430 299	520 296	595 293							
	114.0		115 363	190 362	275 360	350 359	420 358	510 354	580 351							
	132.0			180 422	265 420	335 419	400 418	495 413								

850
(Torque Nm)
17
(Speed RPM)

395 cc/r

		Δ PRESSURE BAR														
		15	35	50	70	85	105	120	140	155	170	190	205	225	240	
FLOW LPM	1.90	80 4	150 2													
	3.80	85 9	160 9	240 8	315 8	390 8	470 7	550 7	635 7	715 5	790 4	870 2				
	7.50	90 18	170 18	260 17	340 17	435 16	520 15	600 15	680 14	765 13	845 13	930 12	1015 11	1100 10	1185 8	
	15.0	95 38	185 38	280 37	375 36	465 36	555 35	635 35	720 34	810 34	890 33	990 32				
	23.0	95 57	190 57	285 56	385 55	470 54	565 53	655 52	745 50	835 49	930 47					
	30.0	95 76	190 76	290 75	385 74	480 73	575 72	665 70	750 68	845 66						
	38.0	90 95	190 95	290 94	385 93	480 92	575 91	670 89	760 86	855 84						
	45.0	85 114	190 114	285 113	380 112	480 111	575 110	665 108	755 105							
	53.0	85 133	185 133	280 132	380 131	480 130	575 129	665 127	750 124							
	61.0	80 153	185 153	280 152	380 151	480 149	575 147	660 145								
	68.0	75 172	180 172	275 171	375 170	475 168	570 166	655 164								
	76.0	70 192	180 191	270 190	375 189	475 187	570 185	655 183								
	83.0	65 211	170 210	265 209	365 208	470 206	565 204	650 201								
	95.0	55 239	155 238	255 237	350 236	460 235	560 233	645 230								
	114.0		120 285	185 284	255 282	340 281	435 279									
	132.0			170 331	240 330	325 328	425 325									
	151.0				230 376	315 374	410 371									

MMK Series

Performance Information Cont.



495 cc/r

FLOW LPM	Δ PRESSURE BAR									
	15	35	50	70	85	105	120	140	155	170
1.90	90 3	200 1								
3.80	100 7	210 6	325 6	430 5	540 4	645 3	755 2	860 1		
7.50	100 18	220 17	335 17	450 16	565 15	680 12	790 11	905 10	1015 8	
15.0	105 30	225 29	345 28	470 27	595 26	710 23	830 21	945 19	1060 17	1170 14
23.0	105 45	225 44	350 43	475 42	595 40	715 37	840 35	955 32	1070 30	
30.0	100 61	230 60	355 59	475 57	600 55	720 52	845 49	960 46		
38.0	100 76	225 75	350 74	475 72	600 70	720 66	845 63	960 59		
45.0	95 91	225 90	350 89	475 87	600 85	720 81	845 77			
53.0	95 106	220 105	345 104	470 102	595 100	720 96	840 92			
61.0	90 122	215 120	340 119	465 117	595 115	715 111	840 107			
68.0	85 137	210 136	335 134	465 132	590 130	715 125	835 121			
76.0	75 153	205 152	330 150	460 147	590 145	710 140				
95.0	65 191	190 189	315 187	455 184	590 182	695 177				
114.0		170 228	300 226	425 223	550 220	675 215				
132.0			270 265	395 263						
151.0			245 305	370 303						

790
(Torque Nm)
11
(Speed RPM)

625 cc/r

FLOW LPM	Δ PRESSURE BAR									
	15	35	50	70	85	105	110	115	125	140
1.90	115 2									
3.80	120 5	265 5	405 5	550 4	690 4	830 3	885 3	935 2	990 2	
7.50	125 14	270 14	415 14	565 13	715 12	860 11	915 10	970 9	1030 8	1140 7
15.0	125 23	275 23	425 23	585 22	745 21	895 19	950 18	1015 17	1085 16	1180 14
23.0	125 35	280 35	430 35	590 34	750 33	900 31	950 30	1005 29	1070 28	
30.0	125 48	280 48	440 47	595 46	750 45	905 43	955 43	1010 42		
38.0	130 60	290 60	450 59	600 58	755 57	910 54	970 53	1035 52		
45.0	130 72	295 72	460 71	605 70	755 69	915 65	980 64			
53.0	125 84	285 84	450 83	600 82	755 81	910 77	975 76			
61.0	120 96	280 95	440 95	595 94	755 93	910 89	970 88			
68.0	110 108	270 107	430 107	590 105	750 104	830 100				
76.0	105 121	265 120	425 120	590 118	750 116					
95.0	85 151	245 150	405 149	565 147	725 146					
114.0	60 181	225 180	385 179	530 177	700 176					
132.0			355 210	515 208						
151.0			320 241	485 239						

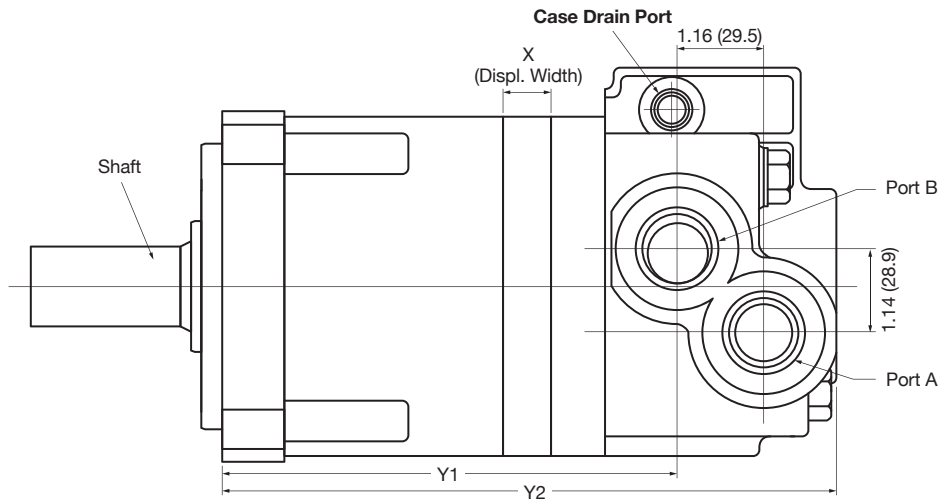
Individual Performance Data Graph Information:

- Motors run with high efficiency in all areas designed with a number for torque and speed.
- However, for best motor life, select a motor to run with a torque and speed range shown in the light gray area (Continuous).
- Performance data is typical at 120 SUS (25.2 cSt).
- Actual data may vary slightly from unit to unit in production.

MMK Series

Dimensions - Configuration Flange A

DISPLACEMENT CM ³ /R		110	130	160	205	245	310	395	495	625
X	Inches	.57	.67	.83	1.06	1.26	1.60	2.03	2.54	3.20
	Millimeters	(14.4)	(17.1)	(21.1)	(26.8)	(32.1)	(40.6)	(51.5)	(64.5)	(81.4)
Y1	Inches	6.02	6.14	6.30	6.54	6.73	7.09	7.48	7.99	8.66
	Millimeters	(153)	(156)	(160)	(166)	(171)	(180)	(190)	(203)	(220)
Y2	Inches	8.23	8.35	8.50	8.74	8.94	9.29	9.69	10.20	10.86
	Millimeters	(209)	(212)	(216)	(222)	(227)	(236)	(246)	(259)	(276)

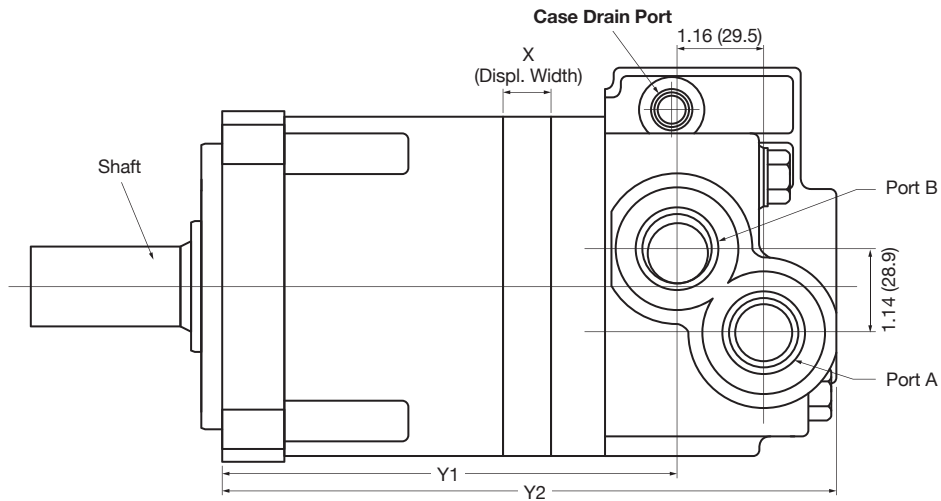


Dimensions are in inches (millimeters).

MMK Series

Dimensions - Configuration Flange B

DISPLACEMENT CM ³ /R		110	130	160	205	245	310	395	495	625
X	Inches	.57	.67	.83	1.06	1.26	1.60	2.03	2.54	3.20
	Millimeters	(14.4)	(17.1)	(21.1)	(26.8)	(32.1)	(40.6)	(51.5)	(64.5)	(81.4)
Y1	Inches	6.22	6.30	6.46	6.69	6.89	7.24	7.64	8.15	9.21
	Millimeters	(158)	(160)	(164)	(170)	(175)	(184)	(194)	(207)	(224)
Y2	Inches	8.43	8.50	8.66	8.90	9.09	9.45	9.84	10.35	11.02
	Millimeters	(214)	(216)	(220)	(226)	(231)	(240)	(250)	(263)	(280)

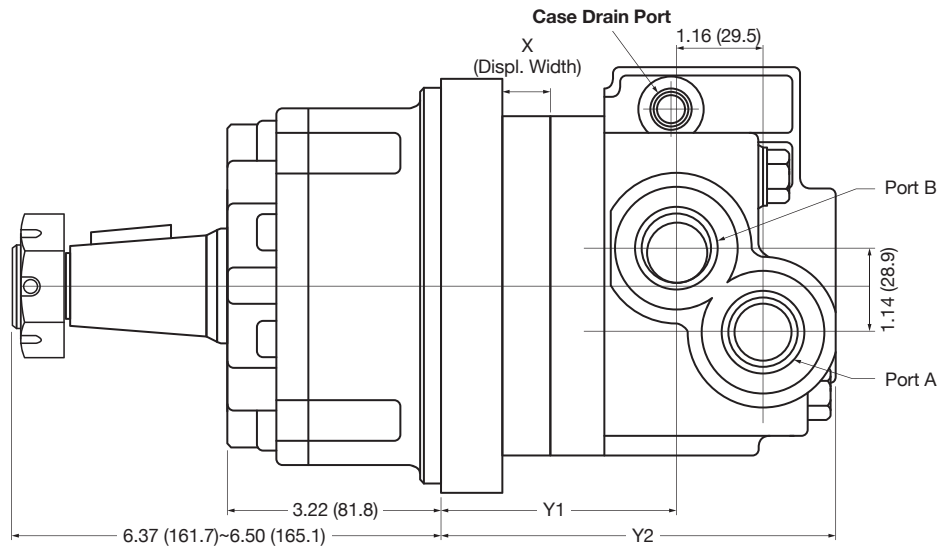


Dimensions are in inches (millimeters).

MMK Series

Dimensions - Configuration Wheel Mount Flange C

DISPLACEMENT CM ³ /R		110	130	160	205	245	310	395	495	625
X	Inches	.57	.67	.83	1.06	1.26	1.60	2.03	2.54	3.20
	Millimeters	(14.4)	(17.1)	(21.1)	(26.8)	(32.1)	(40.6)	(51.5)	(64.5)	(81.4)
Y1	Inches	3.12	3.23	3.39	3.61	3.81	4.15	4.58	5.09	5.76
	Millimeters	(79)	(82)	(86)	(92)	(97)	(106)	(116)	(129)	(146)
Y2	Inches	5.33	5.43	5.59	5.81	6.02	6.36	6.79	7.30	7.96
	Millimeters	(135)	(138)	(142)	(148)	(153)	(162)	(172)	(185)	(202)

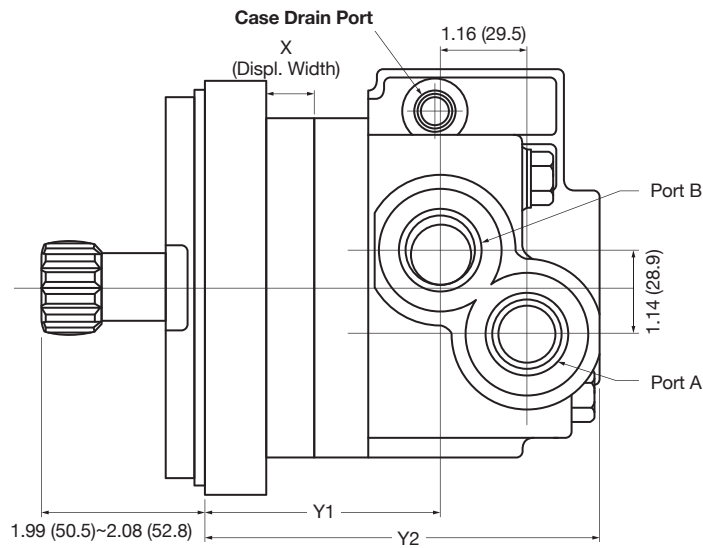


Dimensions are in inches (millimeters).

MMK Series

Dimensions - Configuration Bearingless Flange D

DISPLACEMENT CM ³ /R		110	130	160	205	245	310	395	495	625
X	Inches	.57	.67	.83	1.06	1.26	1.60	2.03	2.54	3.20
	Millimeters	(14.4)	(17.1)	(21.1)	(26.8)	(32.1)	(40.6)	(51.5)	(64.5)	(81.4)
Y1	Inches	3.32	3.43	3.58	3.81	4.02	4.35	4.78	5.29	5.96
	Millimeters	(84)	(87)	(91)	(97)	(102)	(111)	(121)	(134)	(151)
Y2	Inches	5.52	5.63	5.79	6.01	6.22	6.56	6.98	7.50	8.16
	Millimeters	(140)	(143)	(147)	(153)	(158)	(167)	(177)	(190)	(207)

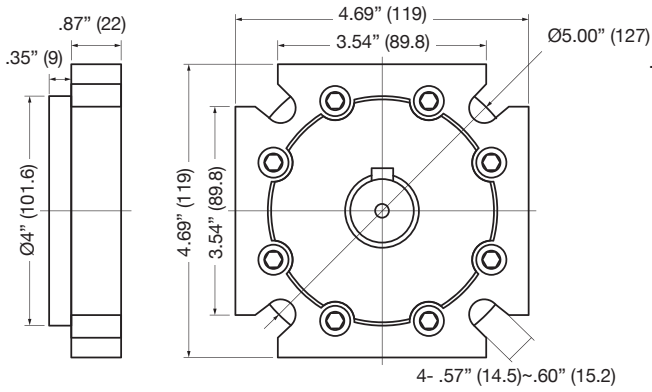


Dimensions are in inches (millimeters).

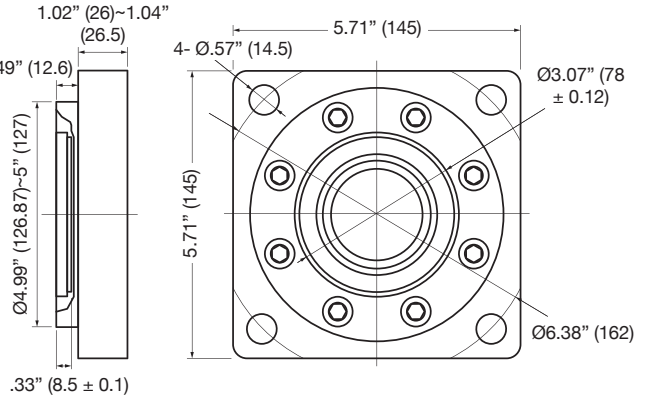
MMK Series

Mounting Flanges

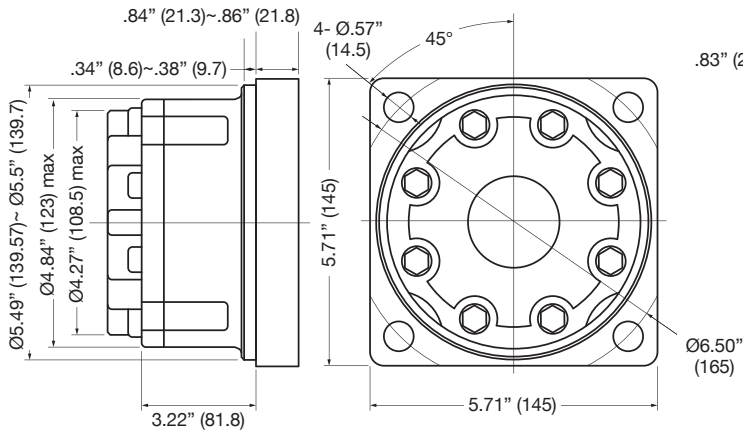
A = 4-Bolt SAE "B", Pilot 4" (101.6)



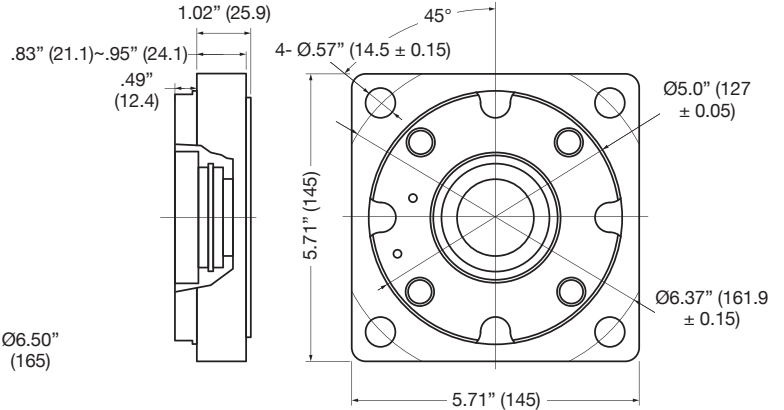
B = 4-Bolt SAE "C", Pilot 5" (127)



C = 4-Bolt Wheel Flange, Pilot 5.50" (139.7)



D = 4-Bolt Bearingless, Pilot 5" (127)



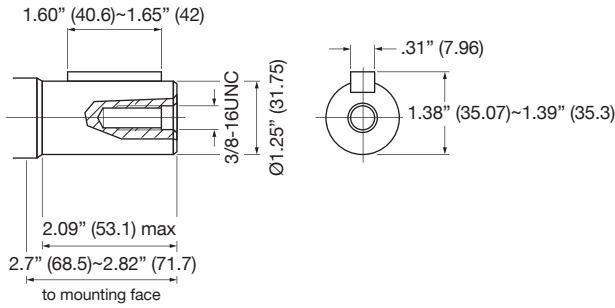
Dimensions are in inches (millimeters).

MMK Series

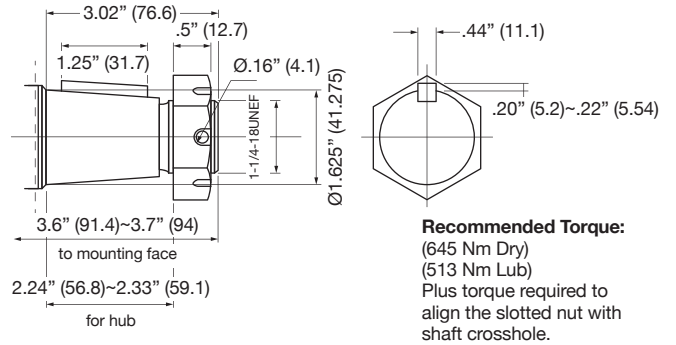
Shafts

Dimensions are in inches (millimeters).

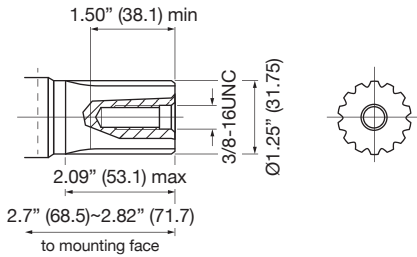
1 = 1.25" (31.75mm) Straight, Flat Key 7.96mm Available with Code A Flange Only



5 = 1.625" (41.275mm) Tapered Available with Code A & C Flanges Only



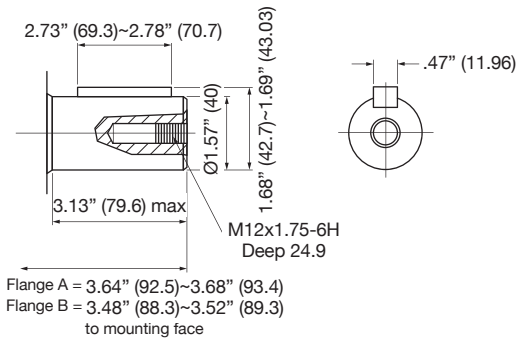
2 = 1.25" (31.75mm) 14t Splined Available with Code A Flange Only



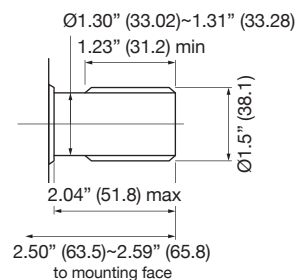
6 = Bearingless Available with Code D Flange Only

(For dimensions see page 64)

3 = 1.57" (40mm) Straight, Flat Key 11.96mm Available with Code A & B Flanges Only



4 = 1.50" (38.1mm) 17t Splined Available with Code B Flange Only



MMT Series

Features

MMT series motors are disc valve motors that can be used in parallel or series configurations. A diverse offering of mounting flanges, shafts, ports, and displacements along with wheel and bearingless motors allow for easy installation, product replacement or OEM application.

- Advanced Roller-Star technology, requiring lower pressure at start-up and providing smoother operation at all speeds
- Disc valve technology, providing greater speed and efficiency for medium duty applications
- Dual high efficiency tapered roller bearings, providing excellent low speed and high speed operation with high side load capabilities
- High pressure shaft seal, which allows for higher back pressures and an increased ability to handle high pressure spike conditions (no shaft seal on bearingless motors)
- Internal integrated check valve, which limits case pressure by blocking the high pressure port side and allowing the motor housing to drain into the outlet (low pressure) port
- Motors connected in series will utilize the case drain



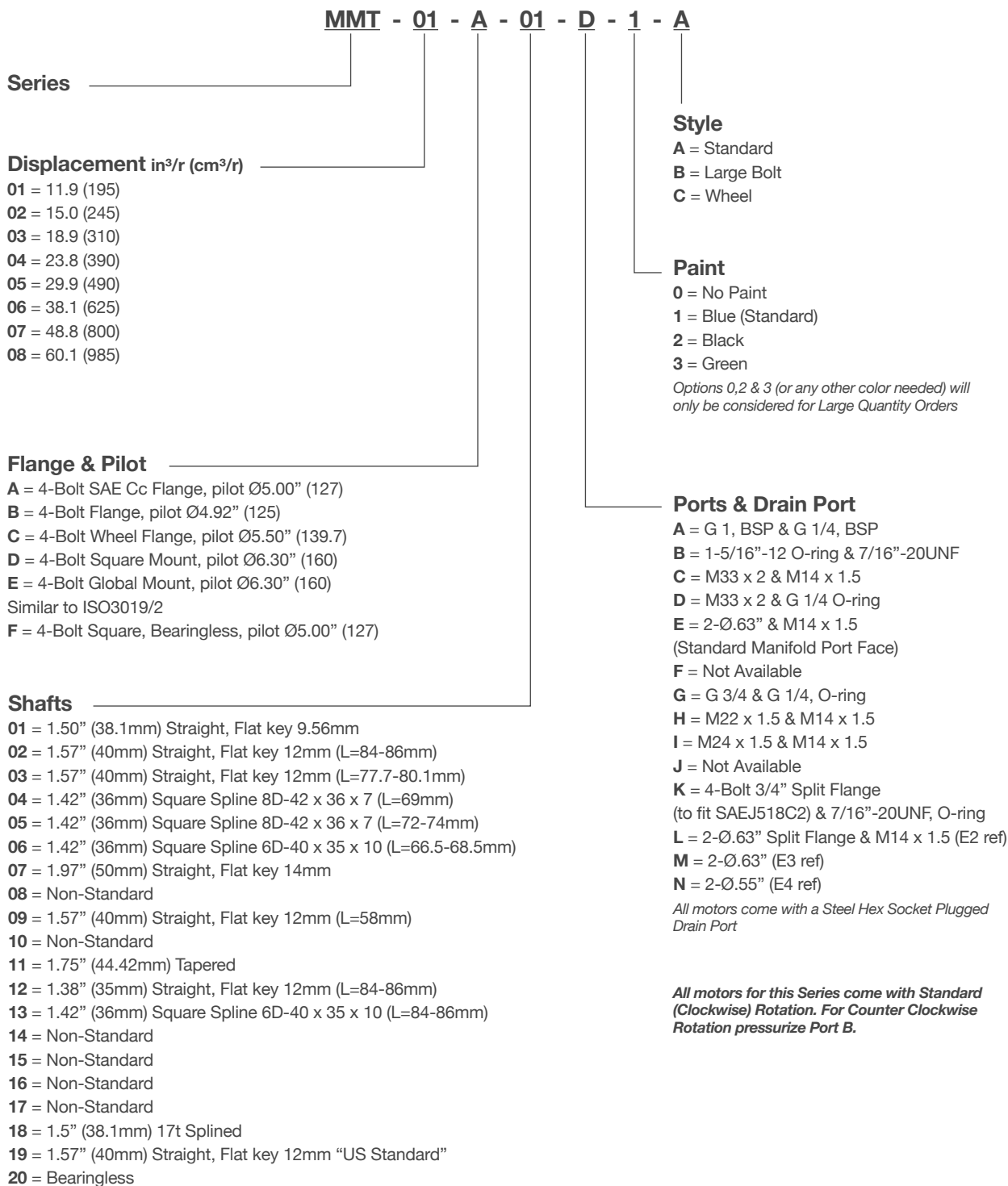
Specifications

MODEL CODE (DISPLACEMENT)		01	02	03	04	05	06	07	08
Displ.	cm ³ /r	195	245	310	390	490	625	800	985
	in ³ /r	11.9	15.0	18.9	23.8	29.9	38.1	48.8	60.1
Flow	LPM	Cont.	150	150	150	150	150	150	150
		Int.	170	210	225	225	225	225	225
	GPM	Cont.	39.6	39.6	39.6	39.6	39.6	39.6	39.6
		Int.	44.9	55.5	59.4	59.4	59.4	59.4	59.4
Max Speed	RPM	Cont.	775	615	485	387	306	240	184
		Int.	866	834	698	570	454	355	278
Pressure	ΔBar	Cont.	170	170	170	170	170	120	120
		Int.	275	275	275	275	240	140	140
	ΔPSI	Cont.	2466	2466	2466	2466	2466	1740	1740
		Int.	3989	3989	3989	3989	3481	2031	2031
Torque	NM	Cont.	475	615	775	965	1215	1125	1308
		Int.	770	980	1225	1455	1685	1330	1650
	LBF-IN	Cont.	4204	5443	6859	8541	10754	9957	11577
		Int.	6815	8674	10842	12878	14914	11772	14604

• Simultaneous maximum torque & maximum speed **NOT** recommended.
 • Continuous Rating ▶ (Cont.) motor may be run continuously at these ratings.
 • Intermittent Operation ▶ (Int.) 10% of every minute.
 • Δ - True pressure difference between inlet port and outlet port.
 • Maximum case pressure without case drain -- 1" Shaft = 125 Bar (1813 psi) | Greater than 1" Shaft = 75 Bar (1088 psi).

MMT Series

Model Code Breakdown

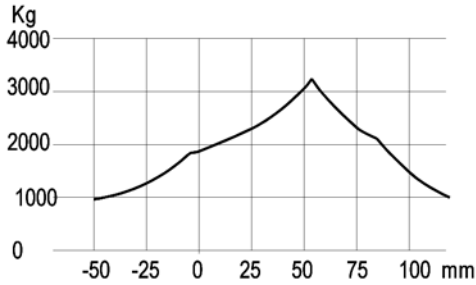


MMT Series

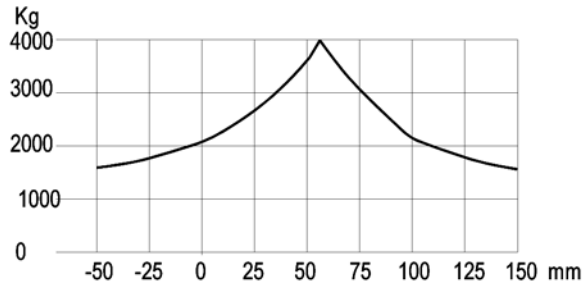
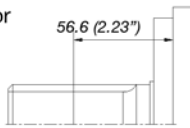
Performance Information

To assure best motor life, run motor for approximately one hour at 30% of rated pressure before applying full load. Fill motor with equipment manufacturer's recommended fluid prior to any load application and startup.

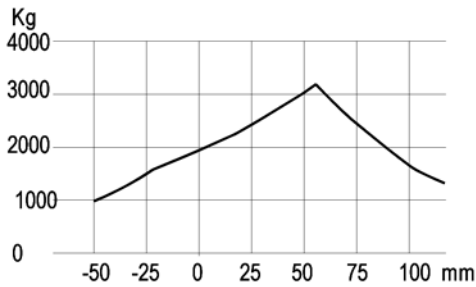
Side Load



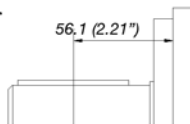
Standard Motor
Splined Shaft



Wheel Motor
Tapered Shaft

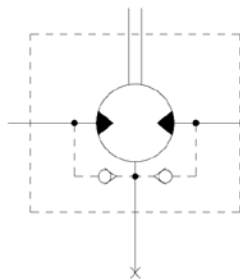
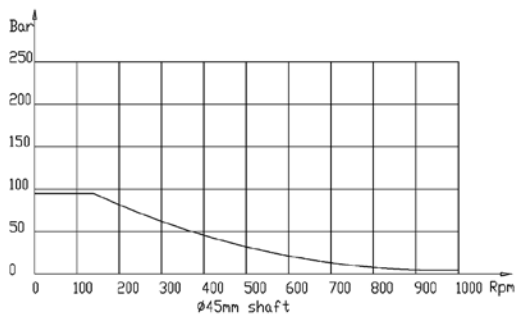


Standard Motor
Straight Shaft



Shaft Seal

Standard Shaft Seal = Genuine Metaris High Pressure Shaft Seal



MMT with standard shaft seal, check valves and with drain connection:
 The shaft seal pressure equals the pressure on the drain line

MMT with standard shaft seal, check valves and without use of drain connection:
 The pressure on the shaft seal never exceeds the pressure in the return line

MMT Series

Performance Information

195 cc/r

		Δ PRESSURE BAR							
		35	70	105	140	170	205	240	275
FLOW LPM	1.9	75 7	165 5	260 2					
	7.5	75 37	170 35	265 34	350 30	440 26	470 18		
	15	80 76	175 74	270 72	365 66	455 62	520 46	590 32	655 18
	30	85 153	180 148	275 144	370 131	465 119	545 116	625 99	705 83
	45	85 230	180 225	280 221	375 212	475 203	565 186	655 167	750 148
	61	80 307	180 303	280 300	375 291	475 283	575 258	665 236	760 214
	76	80 384	180 379	280 374	380 365	480 356	575 332	670 306	770 280
	91	80 462	175 456	275 450	375 440	475 429	575 413	670 388	770 363
	106	75 539	175 532	270 526	375 514	475 502	570 476	670 448	770 421
	121	70 617	170 609	270 602	370 589	470 576	570 542	670 511	765 480
	136	70 692	165 683	265 674	365 659	465 645	565 601	665 564	765 527
	151	70 770	165 759	260 746	365 733	465 718	560 666	660 624	
	170	65 866	160 854	260 843	360 825	460 808	555 749	655 702	

 Continuous
 Intermittent

230
(Torque Nm)
301
(Speed RPM)

245 cc/r

		Δ PRESSURE BAR							
		35	70	105	140	170	205	240	275
FLOW LPM	1.9	95 4	215 1						
	7.5	100 29	220 26	340 24	445 21	555 17	670 11	670 6	
	15	105 60	225 56	345 54	460 48	575 42	640 39	750 30	855 12
	30	110 120	235 116	355 113	475 104	595 104	700 81	800 67	905 53
	45	110 182	235 178	360 174	480 165	605 157	720 141	840 125	955 109
	61	110 244	235 240	360 236	485 228	610 221	730 202	845 184	960 165
	76	105 306	230 301	355 297	485 287	615 277	735 257	855 238	980 218
	91	105 365	230 361	355 358	480 348	610 338	735 316	860 294	980 271
	106	100 426	225 421	350 416	480 404	610 376	730 358	855 340	980 322
	121	90 489	215 481	345 475	470 461	600 448	725 423	850 398	975 373
	136	80 549	210 543	335 537	460 524	580 509	710 482	840 456	
	151	80 612	200 606	330 599	455 585	580 570	700 540	800 510	
	170	65 688	200 682	325 674	445 685	575 641	685 608	755 574	
	189		195 758	315 749	440 731	555 712	670 676		
	208		190 834	310 824	430 804	550 783	665 744		

310 cc/r

		Δ PRESSURE BAR							
		35	70	105	140	170	205	240	275
FLOW LPM	1.9	60 6	125 4	275 1					
	7.5	130 23	280 22	410 20	540 17	645 14	755 10	880 4	
	15	135 47	290 45	430 42	570 38	685 32	800 24	935 17	1025 10
	30	140 95	300 91	450 87	595 81	730 73	870 64	985 55	1105 46
	45	140 143	305 140	460 135	610 129	760 121	910 111	1045 99	1185 88
	61	140 192	300 188	460 184	615 178	770 167	920 156	1060 141	1205 126
	76	135 241	295 236	455 232	615 226	770 216	925 201	1075 184	1225 167
	91	130 289	295 282	455 279	615 273	775 260	930 248	1080 232	1230 215
	106	130 336	290 333	450 328	610 320	770 308	930 295	1075 276	1225 257
	121	125 384	285 381	445 375	600 368	765 354	920 341	1065 320	
	136	120 430	275 421	435 416	590 410	750 396	915 383	1055 360	
	151	115 478	270 466	425 461	580 456	745 441	905 427	1040 403	
	189	110 597	245 582	385 576	525 570	685 551	840 534		
	227		220 698	365 691	515 684	650 661	800 641		

Individual Performance Data Graph Information:

- Motors run with high efficiency in all areas designed with a number for torque and speed.
- However, for best motor life, select a motor to run with a torque and speed range shown in the light gray area (Continuous).
- Performance data is typical at 120 SUS (25.2 cSt).
- Actual data may vary slightly from unit to unit in production.

390 cc/r

		Δ PRESSURE BAR							
		35	70	105	140	170	205	240	275
FLOW LPM	3.8	175 2	365 1						
	7.5	180 18	370 17	555 16	730 14	875 12	1025 9	1195 4	
	15	185 38	375 37	560 35	740 33	920 29	1080 22	1275 14	1370 5
	30	185 76	380 74	575 72	760 68	950 65	1135 55	1315 45	1455 33
	45	185 115	385 112	580 109	770 105	965 100	1150 91	1340 81	1540 79
	61	180 154	380 151	580 147	770 143	965 132	1155 126	1345 116	
	76	180 193	380 189	580 187	775 182	970 175	1160 162	1355 152	
	91	170 230	370 229	570 225	765 220	965 212	1155 204		
	106	165 268	365 266	565 261	760 256	960 248	1150 236		
	121	160 306	355 305	555 299	750 292	945 282	1145 269		
	136	155 346	340 340	545 536	730 730	930 917	1130 101		
	151	150 386	325 380	535 375	730 368	915 359			
189	130 482	300 475	515 469	730 460	910 449				
227		280 570	500 562	720 552	890 538				

MMT Series

Performance Information Cont.

490 cc/r

		Δ PRESSURE BAR						
		35	70	105	140	170	205	240
FLOW LPM	3.8	235 7	480 5	695 3				
	7.5	240 14	480 13	710 12	945 11	1175 8	1370 3	
	15	235 30	485 29	725 28	960 27	1195 25	1410 21	1645 17
	30	235 60	485 59	735 57	975 54	1215 51	1445 45	1685 38
	45	235 91	485 89	735 87	975 84	1220 79	1455 71	
	61	235 122	480 121	730 118	975 114	1220 109	1460 100	
	76	225 152	470 150	725 147	975 144	1220 139		
	91	220 184	470 180	720 180	970 176	1215 171		
	106	210 214	460 211	710 208	960 204	1210 198		
	121	195 244	450 241	700 237	950 232	1205 226		
	136	175 275	435 272	685 265	940 260	1175 255		
	151	160 306	425 303	675 295	920 290	1150 284		
	189	130 382	365 379	590 369	860 362			
	227		325 454	550 442	805 435			

 Continuous
 Intermittent

445
(Torque Nm)
93
(Speed RPM)

625 cc/r

		Δ PRESSURE BAR						
		35	50	70	85	105	120	140
FLOW LPM	3.8	250 5	380 4	510 4	640 3	755 2		
	7.5	260 12	395 13	535 13	670 10	795 10	925 8	1060 6
	15	275 24	425 24	570 24	710 22	850 21	955 18	1060 6
	30	295 45	450 44	605 44	755 44	925 42	1095 39	1270 37
	45	295 72	450 71	610 71	765 70	920 68	1125 66	1330 64
	61	285 94	445 93	605 92	760 91	915 89	1120 87	1325 85
	76	280 119	440 118	595 117	755 116	915 115	1120 112	1325 110
	91	265 143	430 142	585 140	745 139	905 138	1110 135	1320 132
	106	255 168	415 166	575 165	735 164	895 162	1105 159	1315 156
	121	240 192	400 190	560 188	720 187	880 185	1090 182	1300 179
	136	220 216	380 214	540 213	700 212	855 210	1050 207	
	151	200 240	360 239	520 238	680 237	835 236	1015 233	
	189		310 298	470 296	630 294	790 290		
	227		255 355	430 353	590 350	745 345		

800 cc/r

		Δ PRESSURE BAR						
		35	50	70	85	105	120	140
FLOW LPM	3.8	420 4	590 4	776 3	960 2			
	7.5	420 4	594 8	790 8	972 7	1176 6	1344 5	1568 4
	15	435 18	608 17	840 17	1020 16	1204 15	1308 14	1650 13
	30	420 36	396 35	830 35	1005 34	1204 33	1415 31	1610 29
	45	380 55	565 55	795 54	972 54	1190 53	1362 51	
	61	340 75	520 74	760 72	940 71	1172 70		
	76	325 93	500 92	730 90	900 89	1140 87		
	91	315 111	470 110	700 109	860 108	1080 105		
	106	310 129	450 128	650 127	800 125	1020 123		
	121	280 148	420 146	610 145	750 143			
	136	270 166	400 165	550 165	700 164			
	151	250 184	350 183	500 182	635 180			
	189		300 230	440 228	580 225			
	227			380 276	520 273			

Individual Performance Data Graph Information:

- Motors run with high efficiency in all areas designed with a number for torque and speed.
- However, for best motor life, select a motor to run with a torque and speed range shown in the light gray area (Continuous).
- Performance data is typical at 120 SUS (25.2 cSt).
- Actual data may vary slightly from unit to unit in production.

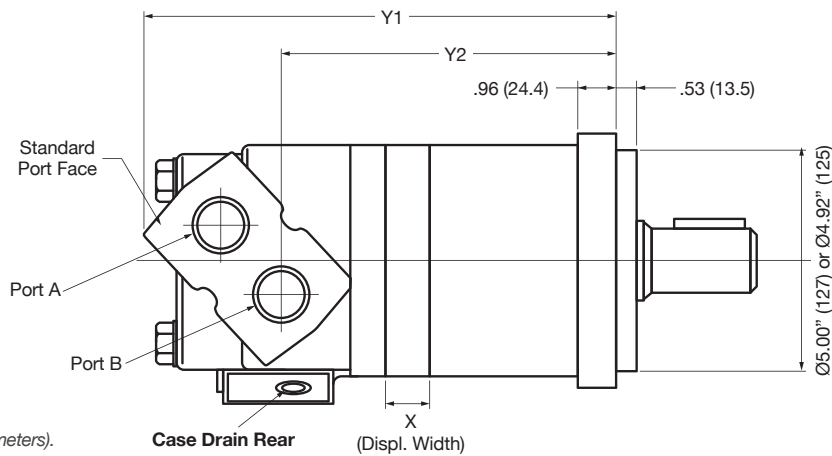
985 cc/r

		Δ PRESSURE BAR							
		15	35	50	70	85	105	120	140
FLOW LPM	3.8	215 3	465 3	645 2	865 2	1080 1			
	7.5	215 8	470 8	710 7	940 7	1175 6	1410 5	1565 4	1685 3
	15	225 15	485 15	775 15	965 14	1205 14	1445 13	1570 13	1790 13
	30	230 30	495 30	750 30	995 29	1235 28	1480 27	1640 26	1875 25
	45	230 45	495 45	750 45	1000 44	1250 43	1495 42	1700 41	
	61	225 61	490 61	740 61	995 60	1245 59	1500 58		
	76	215 77	475 77	730 76	985 76	1235 75	1485 74		
	91	205 92	460 92	705 92	960 91	1220 90	1470 89		
	106	185 107	445 107	700 107	950 106	1200 105	1450 103		
	121	165 123	425 123	675 122	925 121	1160 120			
	136	130 138	395 138	645 138	895 137	1125 135			
	151	95 153	365 153	610 152	868 151	1085 150			
	189		325 191	585 190	830 189	1050 188			
	227			525 230	810 229	1025 226			

MMT Series

Dimensions - Configuration Flanges A & B

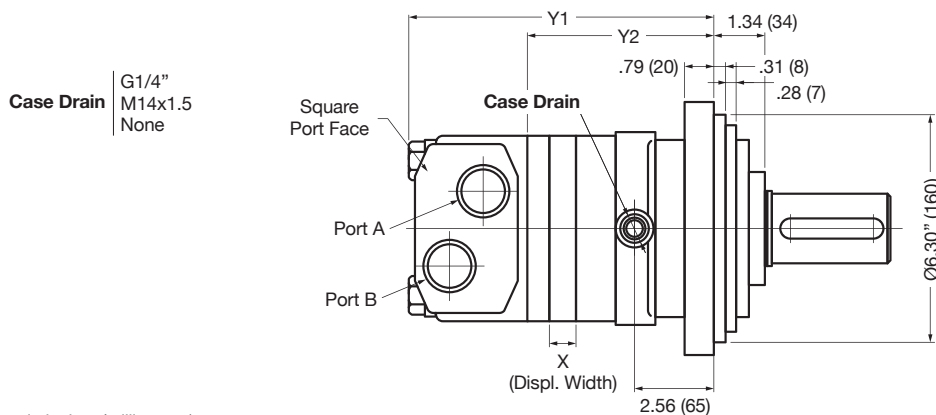
DISPLACEMENT CM ³ /R	195	245	310	390	490	625	800	985	
X	Inches	.86	1.08	1.36	1.71	2.14	2.72	3.50	4.29
	Millimeters	(22)	(27)	(35)	(44)	(54)	(69)	(89)	(109)
Y1	Inches	10.63	10.87	11.14	11.50	11.93	12.52	13.11	14.09
	Millimeters	(270)	(276)	(283)	(292)	(303)	(318)	(333)	(358)
Y2	Inches	5.91	6.14	6.42	6.77	7.20	7.80	8.43	9.33
	Millimeters	(150)	(156)	(163)	(172)	(183)	(198)	(214)	(237)



Dimensions are in inches (millimeters).

Dimensions - Configuration Flanges D & E

DISPLACEMENT CM ³ /R	195	245	310	390	490	625	800	985	
X	Inches	.86	1.08	1.36	1.71	2.14	2.72	3.50	4.29
	Millimeters	(22)	(27)	(35)	(44)	(54)	(69)	(89)	(109)
Y1	Inches	9.06	9.25	9.69	9.88	10.35	10.91	11.54	12.48
	Millimeters	(230)	(235)	(246)	(251)	(263)	(277)	(293)	(317)
Y2	Inches	5.31	5.55	5.83	6.18	6.61	7.20	7.83	8.74
	Millimeters	(135)	(141)	(148)	(157)	(168)	(183)	(199)	(222)

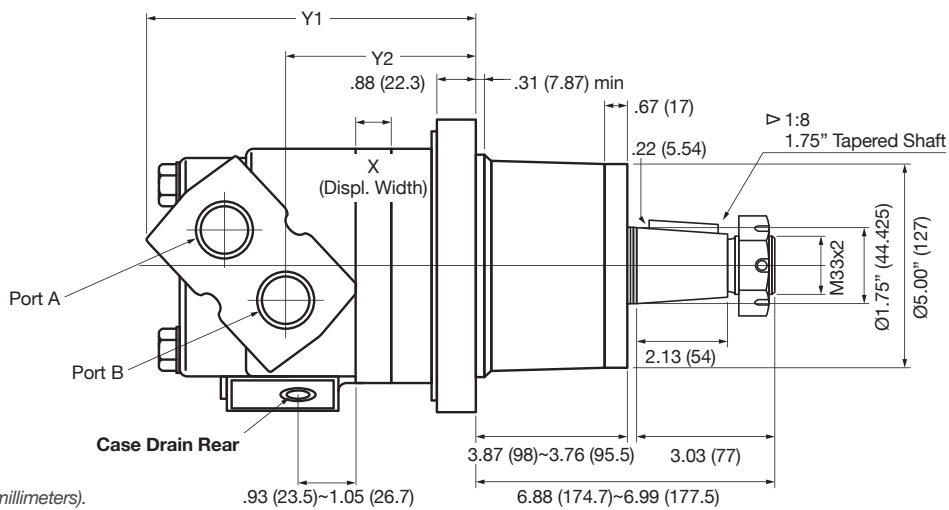


Dimensions are in inches (millimeters).

MMT Series

Dimensions - Wheel Mount Flange C, Shaft Code 11

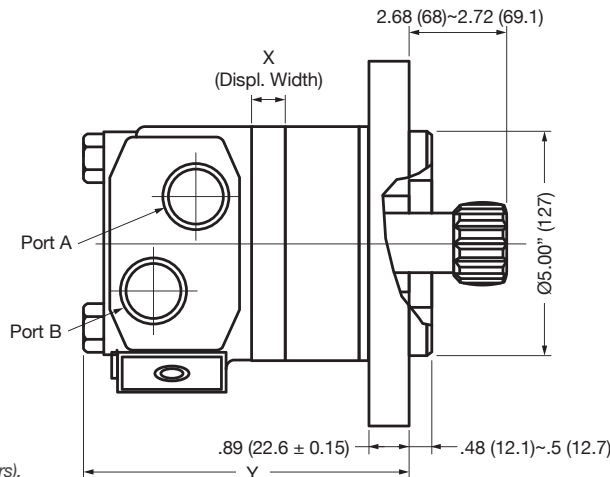
DISPLACEMENT CM ³ /R	195	245	310	390	490	625	800	985	
X	Inches	.86	1.08	1.36	1.71	2.14	2.72	3.50	4.29
	Millimeters	(22)	(27)	(35)	(44)	(54)	(69)	(89)	(109)
Y1	Inches	7.28	7.52	7.80	8.15	8.58	9.17	9.80	10.75
	Millimeters	(185)	(191)	(198)	(207)	(218)	(233)	(249)	(273)
Y2	Inches	4.06	4.25	4.57	4.88	5.35	5.91	7.01	7.48
	Millimeters	(103)	(108)	(116)	(124)	(136)	(150)	(178)	(190)



Dimensions are in inches (millimeters).

Dimensions - Bearingless Flange F, Shaft Code 20

DISPLACEMENT CM ³ /R	195	245	310	390	490	625	800	985	
X	Inches	.86	1.08	1.36	1.71	2.14	2.72	3.50	4.29
	Millimeters	(22)	(27)	(35)	(44)	(54)	(69)	(89)	(109)
Y1	Inches	7.01	7.20	7.52	7.87	8.31	8.90	9.88	10.43
	Millimeters	(178)	(183)	(191)	(200)	(211)	(226)	(251)	(265)



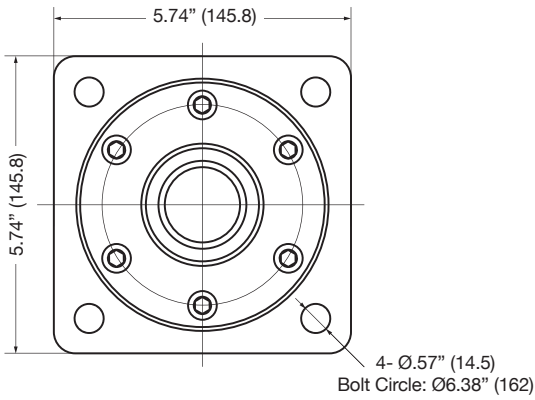
Dimensions are in inches (millimeters).

SHAFT CODE 20 - DIMENSIONS	
Number of Teeth	12
Diametral Pitch	8.5/17
Pressure Angle	30
Major Dia.	Ø38.4
Minor Dia.	Ø31.5
Space Width	5.7

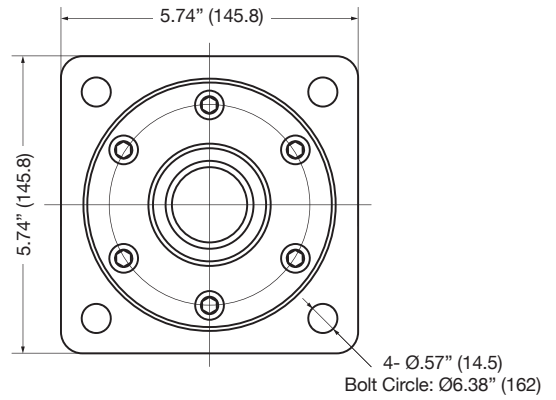
MMT Series

Mounting Flanges

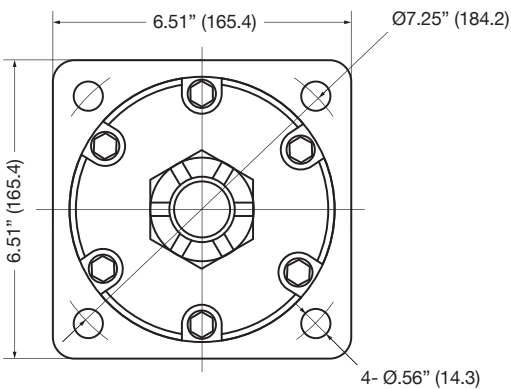
A = 4-Bolt SAE "Cc" Flange, Pilot 5.00" (127)



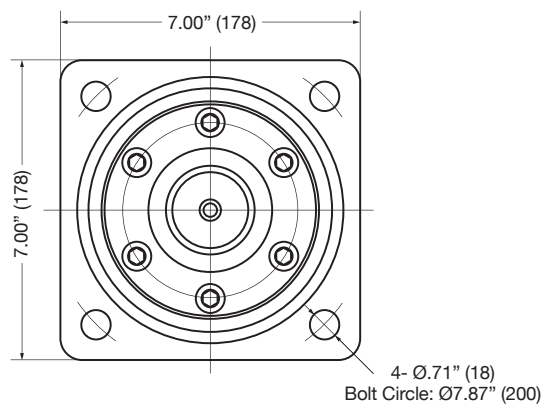
B = 4-Bolt Flange, Pilot 4.92" (125)



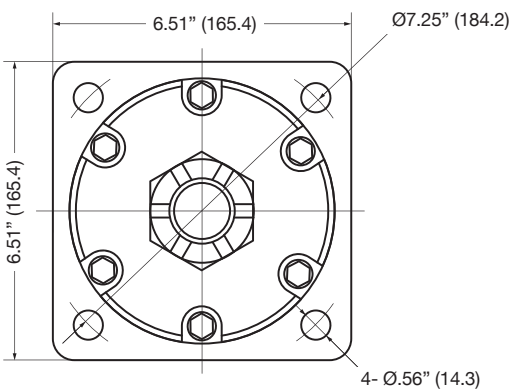
C = 4-Bolt Wheel Flange, Pilot 5.50" (139.7)



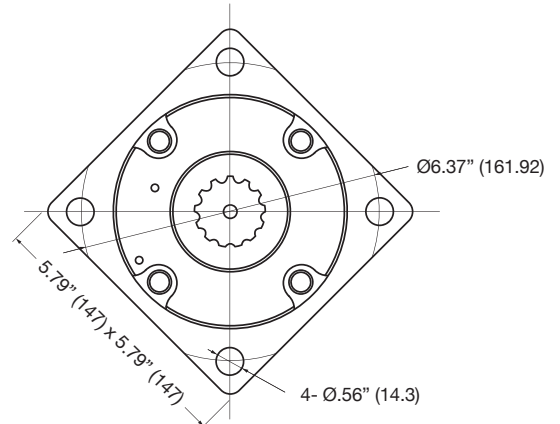
D = 4-Bolt Square Mount, Pilot 6.30" (160)



E = 4-Bolt Global Mount, Pilot 6.30" (160)
 (Similar to ISO3019/2)



F = 4-Bolt Square Flange, Pilot 5.00" (127)



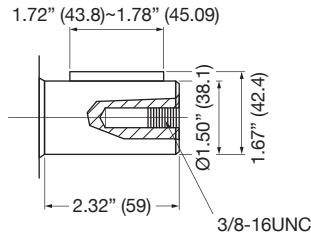
Dimensions are in inches (millimeters).

MMT Series

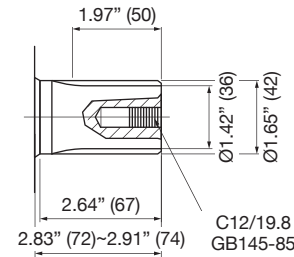
Shafts

Dimensions are in inches (millimeters).

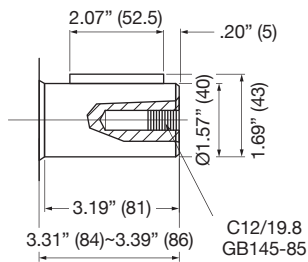
1 = 1.50" (38.1mm) Straight, Flat Key 9.56mm



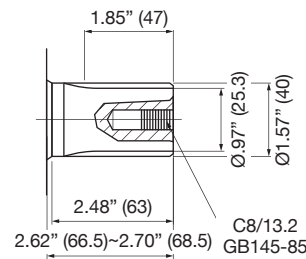
5 = 1.42" (36mm) Square Splined, 8D 42x36x7



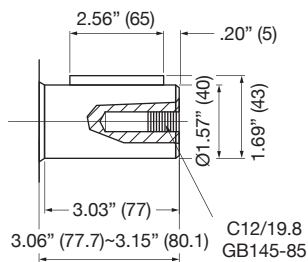
2 = 1.57" (40mm) Straight, Flat Key 12mm



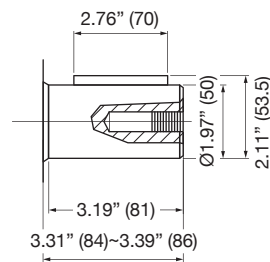
6 = 1.42" (36mm) Square Splined, 6D 40x35x10



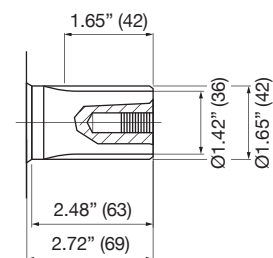
3 = 1.57" (40mm) Straight, Flat Key 12mm



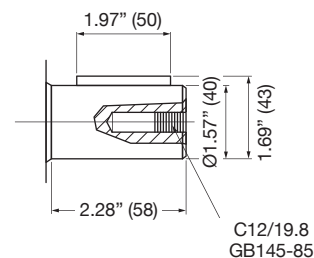
7 = 1.97" (50mm) Straight, Flat Key 14mm



4 = 1.42" (36mm) Square Splined, 8D 42x36x7



9 = 1.57" (40mm) Straight, Flat Key 12mm



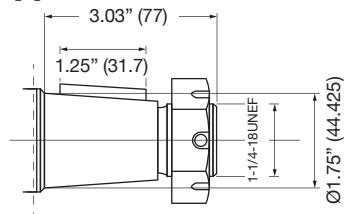
08 = Non-Standard Shaft Code

MMT Series

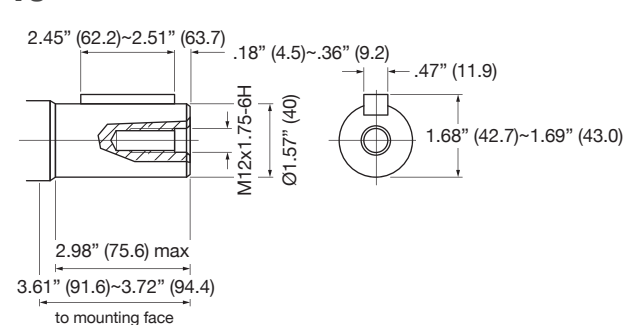
Shafts Cont.

Dimensions are in inches (millimeters).

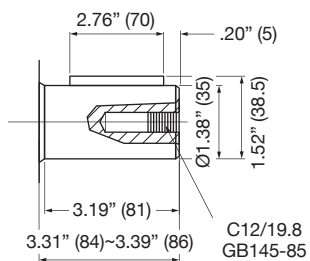
11 = 1.75" (44.42mm) Tapered



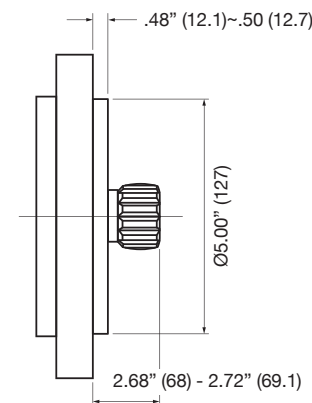
19 = 1.57" (40mm) Straight, Flat Key 12mm



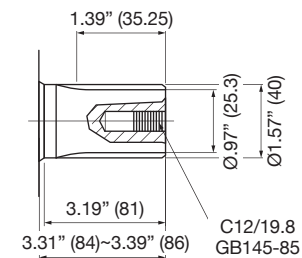
12 = 1.38" (35mm) Straight, Flat Key 12mm



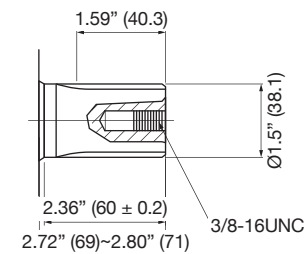
20 = Bearingless



13 = 1.42" (36mm) Square Splined, 6D 40x35x10



18 = 1.50" (38.1mm) 17t Splined

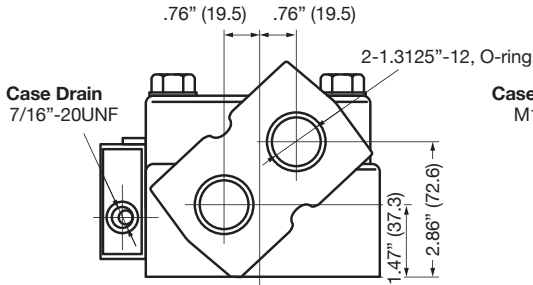


10, 14, 15, 16 & 17 = Non-Standard Shaft Codes

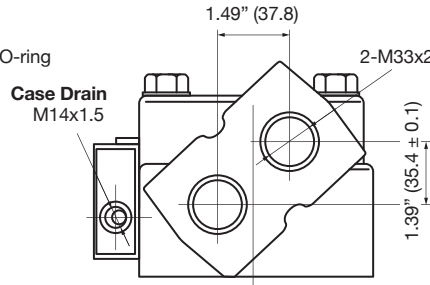
MMT Series

Port Dimensions

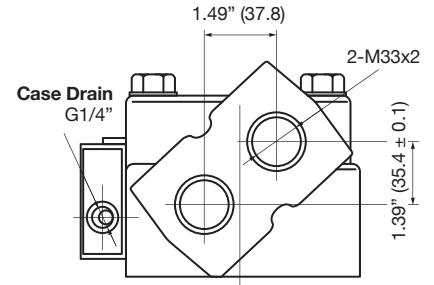
B = 1-5/16"-12 O-ring & 7/16"-20UNF



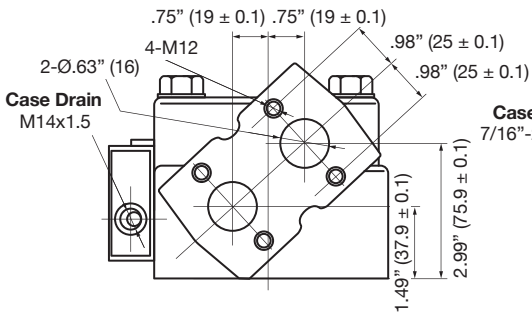
C = M33 x 2 & M14 x 1.5



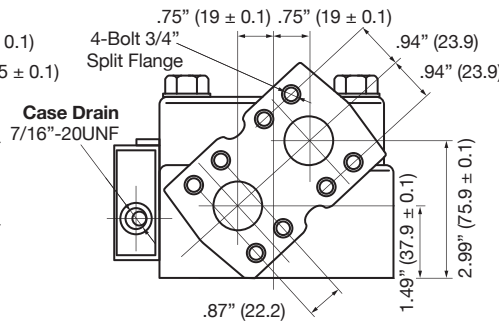
D = M33 x 2 & G 1/4 O-ring



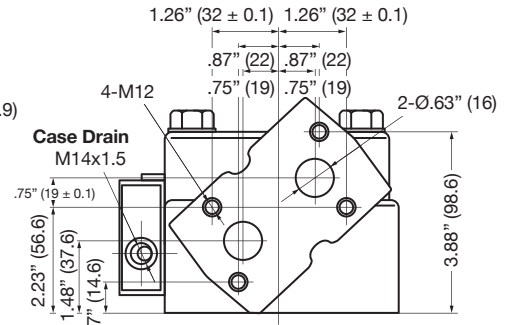
**E = 2-Ø.63" & M14 x 1.5
(Standard Manifold Port Face)**



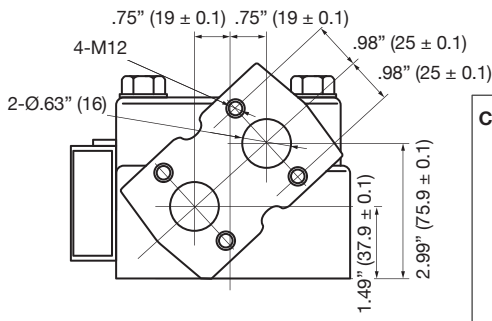
K = 4-Bolt 3/4" Split Flange



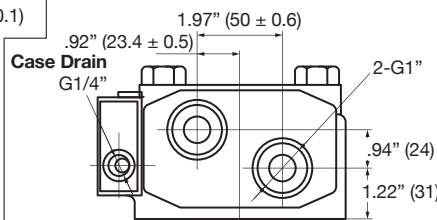
L = 2-Ø.63" Split Flange & M14 x 1.5



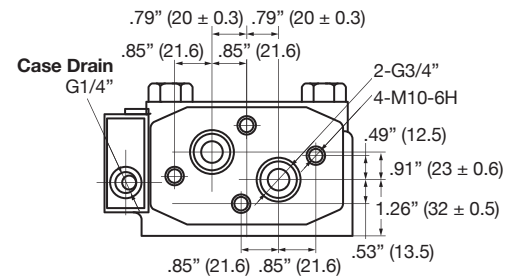
M = 2-Ø.63"



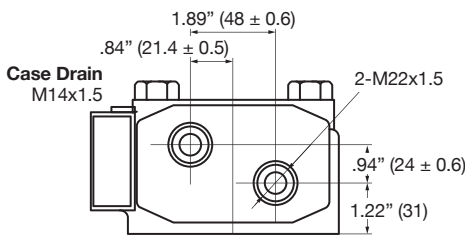
A = G 1" BSP & G 1/4" BSP



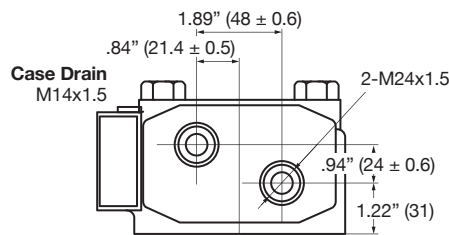
G = G 3/4" & G 1/4", O-ring



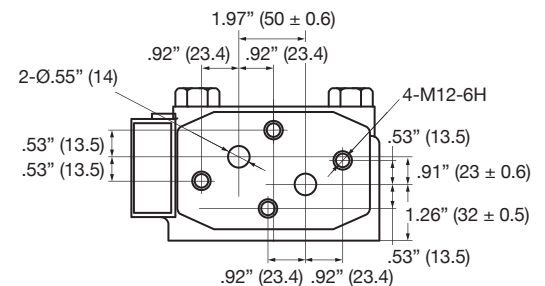
H = M22 x 1.5 & M14 x 1.5



I = M24 x 1.5 & M14 x 1.5



N = 2-Ø.55"



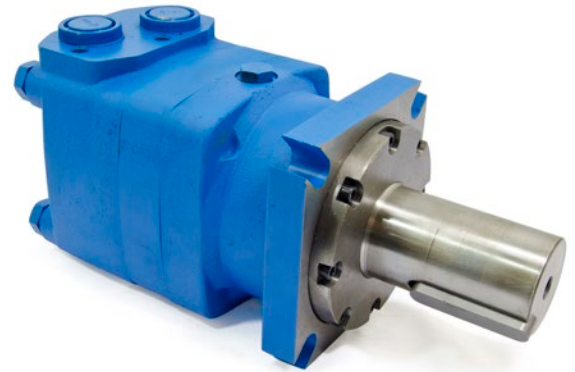
Dimensions are in inches (millimeters).

MMV Series

Features

MMV series motors are disc valve motors that can be used in parallel or series configurations. A diverse offering of mounting flanges, shafts, ports, and displacements along with wheel and bearingless motors allow for easy installation, product replacement or OEM application.

- Advanced Roller-Star technology, requiring lower pressure at start-up and providing smoother operation at all speeds
- Disc valve technology, providing greater speed and efficiency for medium duty applications
- Dual high efficiency tapered roller bearings, providing excellent low speed and high speed operation with high side load capabilities
- High pressure shaft seal, which allows for higher back pressures and an increased ability to handle high pressure spike conditions (no shaft seal on bearingless motors)
- Internal integrated check valve, which limits case pressure by blocking the high pressure port side and allowing the motor housing to drain into the outlet (low pressure) port
- Motors connected in series will utilize the case drain



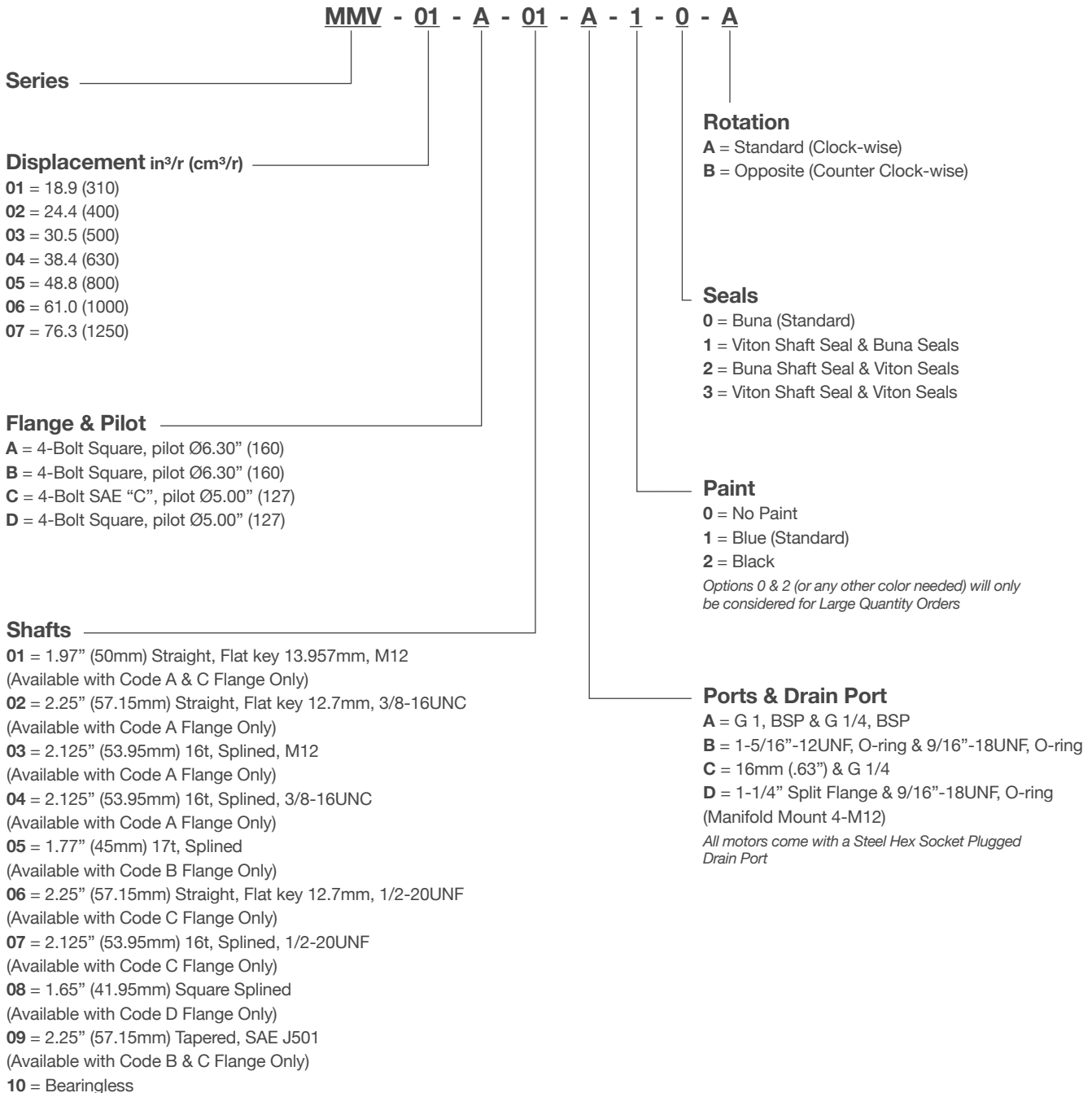
Specifications

MODEL CODE (DISPLACEMENT)		01	02	03	04	05	06	07
Displ.	cm ³ /r	310	400	500	630	800	1000	1250
	in ³ /r	18.9	24.4	30.5	38.4	48.8	61.0	76.3
Flow	LPM	Cont.	160	200	200	200	200	200
		Int.	200	240	240	240	240	240
	GPM	Cont.	42.3	52.8	52.8	52.8	52.8	52.8
		Int.	52.8	63.4	63.4	63.4	63.4	63.4
Max Speed	RPM	Cont.	510	500	400	315	250	200
		Int.	630	600	480	380	300	240
Pressure	ΔBar	Cont.	200	200	200	180	160	160
		Int.	240	240	240	210	180	180
	ΔPSI	Cont.	2901	2901	2901	2611	2321	2321
		Int.	3481	3481	3481	3046	2611	2611
Torque	NM	Cont.	920	1180	1460	1660	1880	2340
		Int.	1110	1410	1760	1940	2110	2640
	LBF-IN	Cont.	8143	10444	12922	14692	16639	20711
		Int.	9824	12480	15577	17170	18675	23366

• Simultaneous maximum torque & maximum speed **NOT** recommended.
 • Continuous Rating ▶ (Cont.) motor may be run continuously at these ratings.
 • Intermittent Operation ▶ (Int.) 10% of every minute.
 • Δ - True pressure difference between inlet port and outlet port.
 • Maximum case pressure without case drain -- 1" Shaft = 125 Bar (1813 psi) | Greater than 1" Shaft 75 Bar (1088 psi).

MMV Series

Model Code Breakdown

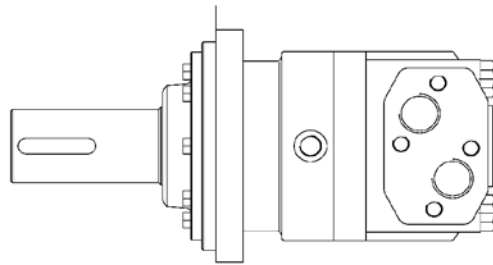
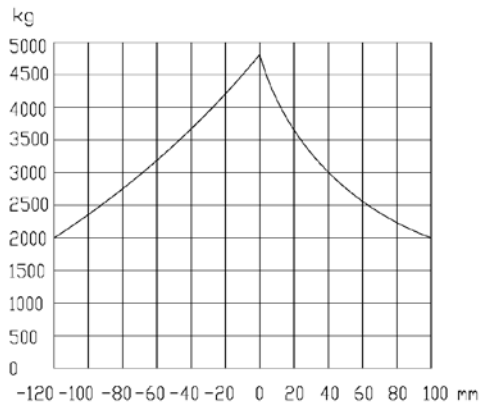


MMV Series

Performance Information

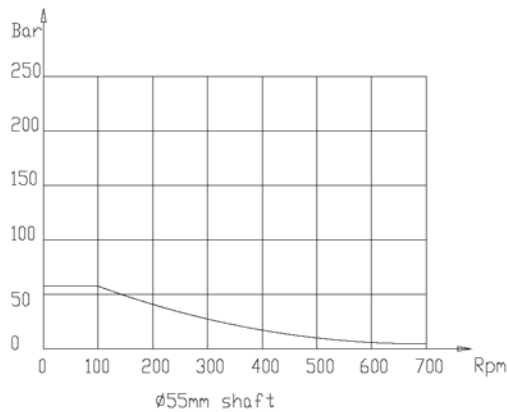
To assure best motor life, run motor for approximately one hour at 30% of rated pressure before applying full load. Fill motor with equipment manufacturer's recommended fluid prior to any load application and startup.

Side Load

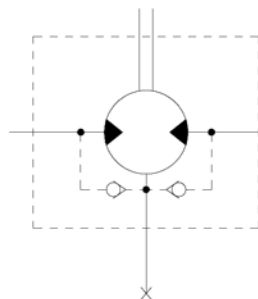


Standard Motor for all shaft

Shaft Seal



Standard Shaft Seal = Genuine Metaris High Pressure Shaft Seal



MMV with standard shaft seal, check valves and with drain connection:
 The shaft seal pressure equals the pressure on the drain line

MMV with standard shaft seal, check valves and without use of drain connection:
 The pressure on the shaft seal never exceeds the pressure in the return line

MMV Series

Performance Information

310 cc/r

FLOW LPM	Δ PRESSURE BAR						
	35	70	105	140	175	200	240
10	140 27	283 23	430 16	581 10			
25	140 78	283 74	430 71	581 68	734 64	839 59	1019 55
50	140 160	283 153	430 148	581 144	734 137	839 134	1019 127
75	140 237	283 235	430 227	581 223	734 218	839 213	1019 206
100	140 319	283 313	430 306	581 300	734 294	839 290	1019 287
125	140 399	283 391	430 383	581 375	734 371	839 367	1019 363
150	140 479	283 469	430 465	581 460	734 455	839 450	1019 440
160	140 511	283 501	430 495	581 490	734 485	839 480	1019 475
200	140 639	283 626	430 619	581 613	734 606		

 Continuous
 Intermittent

400 cc/r

FLOW LPM	Δ PRESSURE BAR						
	35	70	105	140	175	200	240
10	181 21	366 18	555 13	749 8			
25	181 61	366 58	555 55	749 53	947 49	1083 46	1315 43
50	181 124	366 119	555 115	749 111	947 106	1083 104	1315 99
75	181 184	366 182	555 176	749 173	947 169	1083 165	1315 159
100	181 248	366 243	555 238	749 233	947 228	1083 225	1315 223
125	181 309	366 303	555 297	749 293	947 288	1083 284	1315 281
150	181 371	366 364	555 360	749 356	947 353	1083 349	1315 341
175	181 433	366 424	555 420	749 416	947 411	1083 407	1315 403
200	181 495	366 485	555 480	749 475	947 470	1083 465	1315 460
240	181 594	366 582	555 576	749 570	947 564		

500 cc/r

FLOW LPM	Δ PRESSURE BAR						
	35	70	105	140	175	200	240
10	226 17	457 14	694 10	936 6			
25	226 49	457 46	694 44	936 42	1184 40	1354 37	1643 34
50	226 99	457 95	694 92	936 89	1184 85	1354 83	1643 79
75	226 147	457 146	694 141	936 138	1184 135	1354 132	1643 128
100	226 198	457 194	694 190	936 186	1184 182	1354 180	1643 178
125	226 248	457 243	694 238	936 233	1184 230	1354 228	1643 225
150	226 297	457 291	694 288	936 285	1184 282	1354 279	1643 273
175	226 347	457 340	694 336	936 333	1184 329	1354 326	1643 322
200	226 396	457 388	694 384	936 380	1184 376	1354 372	1643 368
240	226 475	457 466	694 461	936 456	1184 451		

630 cc/r

FLOW LPM	Δ PRESSURE BAR						
	30	60	90	120	150	180	210
10	244 13	494 11	749 8				
25	244 38	494 37	749 35	1011 33	1279 31	1535 29	1812 27
50	244 79	494 75	749 73	1011 71	1279 67	1535 66	1812 63
75	244 117	494 115	749 112	1011 110	1279 107	1535 105	1812 101
100	244 157	494 154	749 151	1011 148	1279 144	1535 143	1812 141
125	244 196	494 192	749 188	1011 185	1279 183	1535 181	1812 179
150	244 236	494 231	749 229	1011 226	1279 224	1535 221	1812 217
175	244 275	494 269	749 267	1011 264	1279 261	1535 258	1812 256
200	244 314	494 308	749 305	1011 302	1279 298	1535 295	1812 292
240	244 377	494 370	749 366	1011 362	1279 358	1535 354	

494
(Torque Nm)
154
(Speed RPM)

MMV Series

Performance Information Cont.

800 cc/r

FLOW LPM	Δ PRESSURE BAR						
	25	50	75	100	130	160	180
12	258 12	522 11	793 8				
25	258 30	522 29	793 28	1070 26	1408 25	1732 23	1972 21
50	258 62	522 59	793 58	1070 56	1408 53	1732 52	1972 49
75	258 92	522 91	793 88	1070 86	1408 84	1732 83	1972 80
100	258 124	522 121	793 119	1070 116	1408 114	1732 113	1972 111
125	258 155	522 152	793 148	1070 145	1408 144	1732 142	1972 141
150	258 186	522 182	793 180	1070 178	1408 176	1732 174	1972 171
175	258 217	522 212	793 210	1070 208	1408 206	1732 203	1972 201
200	258 248	522 243	793 240	1070 238	1408 235	1732 233	1972 230
240	258 297	522 291	793 288	1070 285	1408 282	1732 279	

 Continuous
 Intermittent

1000 cc/r

FLOW LPM	Δ PRESSURE BAR						
	25	50	75	100	130	160	180
15	322 12	653 11	991 8				
25	322 24	653 23	991 22	1338 21	1760 20	2166 18	2465 17
50	322 50	653 48	991 46	1338 45	1760 43	2166 42	2465 40
75	322 74	653 73	991 71	1338 69	1760 68	2166 66	2465 64
100	322 99	653 97	991 95	1338 93	1760 91	2166 90	2465 89
125	322 124	653 121	991 119	1338 116	1760 115	2166 114	2465 113
150	322 149	653 146	991 144	1338 143	1760 141	2166 140	2465 137
175	322 173	653 170	991 168	1338 166	1760 165	2166 163	2465 161
200	322 198	653 194	991 192	1338 190	1760 188	2166 186	2465 184
240	322 238	653 233	991 230	1338 228	1760 226	2166 223	

1250 cc/r

FLOW LPM	Δ PRESSURE BAR						
	25	50	75	100	130	160	180
25	403 19	653 18	1156 17	1672 14	2199 13	2538 12	2910 11
50	403 40	653 38	1156 37	1672 36	2199 34	2538 33	2910 32
75	403 59	653 58	1156 56	1672 55	2199 54	2538 53	2910 51
100	403 79	653 78	1156 76	1672 74	2199 73	2538 72	2910 71
125	403 99	653 97	1156 95	1672 93	2199 92	2538 91	2910 90
150	403 119	653 116	1156 115	1672 114	2199 113	2538 112	2910 109
175	403 139	653 136	1156 134	1672 133	2199 132	2538 130	2910 129
200	403 158	653 155	1156 154	1672 154	2199 150	2538 149	2910 147
240	403 190	653 186	1156 184	1672 182	2199 180	2538 179	

2538
(Torque Nm)
72
(Speed RPM)

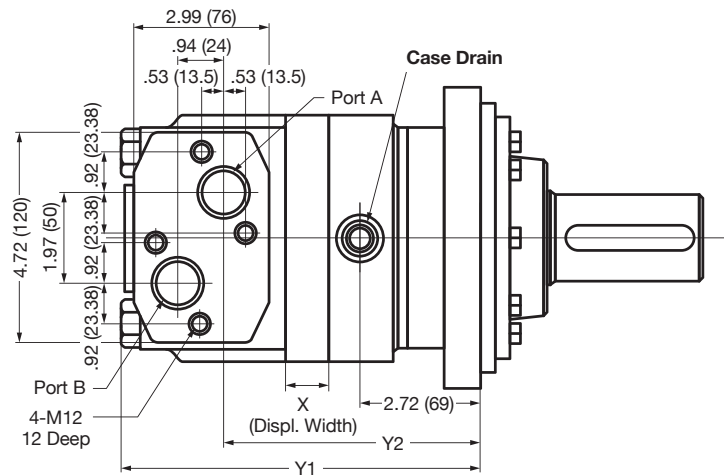
Individual Performance Data Graph Information:

- Motors run with high efficiency in all areas designed with a number for torque and speed.
- However, for best motor life, select a motor to run with a torque and speed range shown in the light gray area (Continuous).
- Performance data is typical at 120 SUS (25.2 cSt).
- Actual data may vary slightly from unit to unit in production.

MMV Series

Dimensions - Configuration Flanges A & B

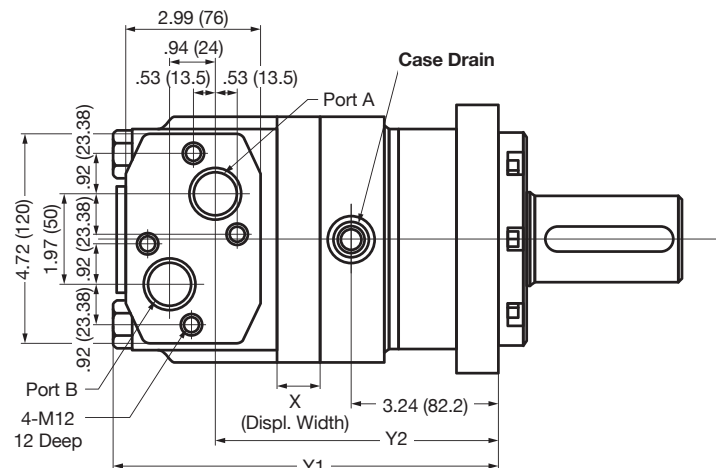
DISPLACEMENT CM ³ /R		310	400	500	630	800	1000	1250
X	Inches	.67	.93	1.30	1.69	2.24	2.87	3.50
	Millimeters	(17)	(24)	(33)	(43)	(57)	(73)	(89)
Y1	Inches	7.95	8.19	8.58	8.98	9.53	10.16	10.79
	Millimeters	(202)	(208)	(218)	(228)	(242)	(258)	(274)
Y2	Inches	5.67	5.91	6.30	6.69	7.24	7.87	8.50
	Millimeters	(144)	(150)	(160)	(170)	(184)	(200)	(216)



Dimensions are in inches (millimeters).

Dimensions - Configuration Flange C

DISPLACEMENT CM ³ /R		310	400	500	630	800	1000	1250
X	Inches	.67	.93	1.30	1.69	2.24	2.87	3.50
	Millimeters	(17)	(24)	(33)	(43)	(57)	(73)	(89)
Y1	Inches	8.35	8.58	8.98	9.37	9.92	10.55	11.18
	Millimeters	(212)	(218)	(228)	(238)	(252)	(268)	(284)
Y2	Inches	6.18	6.42	6.81	7.20	7.76	8.39	9.02
	Millimeters	(157)	(163)	(173)	(183)	(197)	(213)	(229)

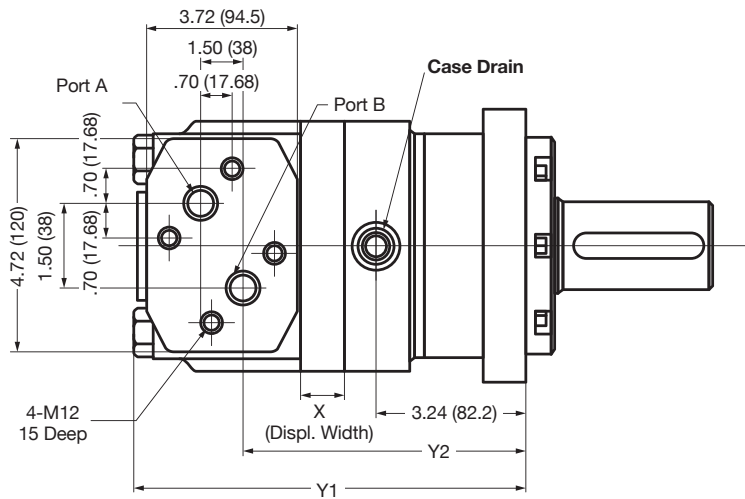


Dimensions are in inches (millimeters).

MMV Series

Dimensions - Configuration Flange D

DISPLACEMENT CM ³ /R		310	400	500	630	800	1000	1250
X	Inches	.67	.93	1.30	1.69	2.24	2.87	3.50
	Millimeters	(17)	(24)	(33)	(43)	(57)	(73)	(89)
Y1	Inches	8.54	8.78	9.17	9.57	10.12	10.75	11.38
	Millimeters	(217)	(223)	(233)	(243)	(257)	(273)	(289)
Y2	Inches	5.79	6.02	6.42	6.81	7.36	7.99	8.62
	Millimeters	(147)	(153)	(163)	(173)	(187)	(203)	(219)

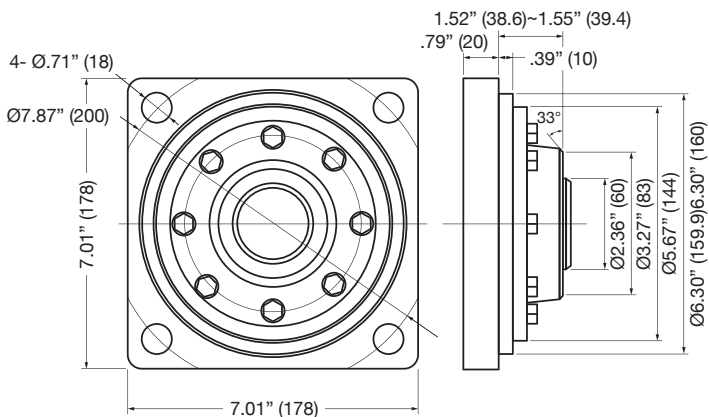


Dimensions are in inches (millimeters).

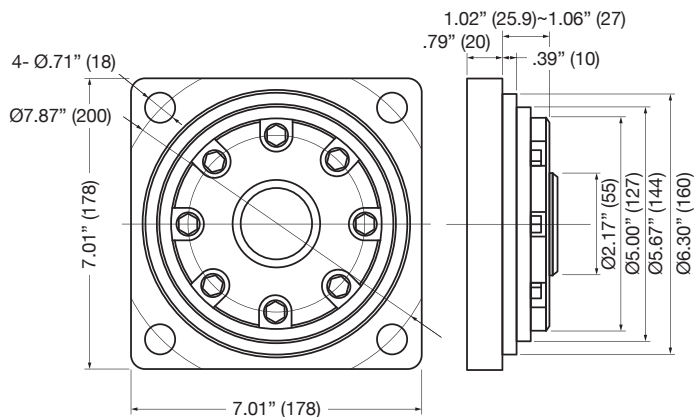
MMV Series

Mounting Flanges

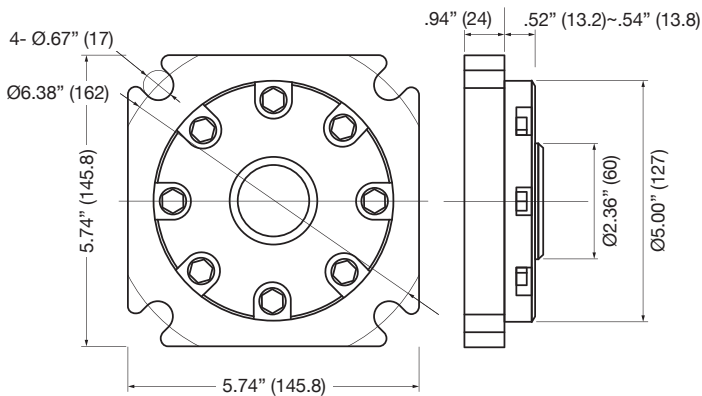
A = 4-Bolt Square, Pilot 6.30" (160)



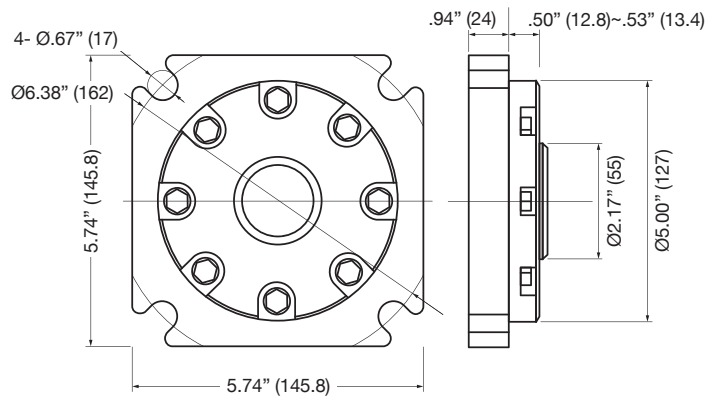
B = 4-Bolt Square, Pilot 6.30" (160)



C = 4-Bolt Wheel Flange, Pilot 5.50" (139.7)
 (U.S. Standard)



D = 4-Bolt Bearingless, Pilot 5" (127)



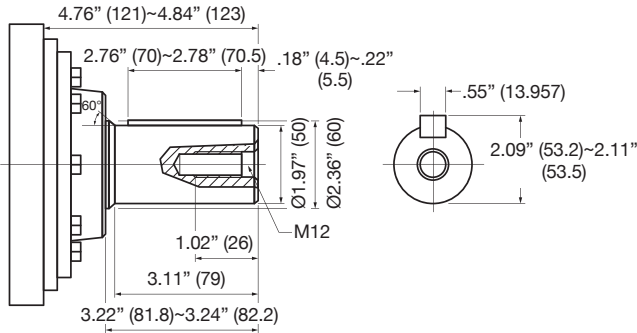
Dimensions are in inches (millimeters).

MMV Series

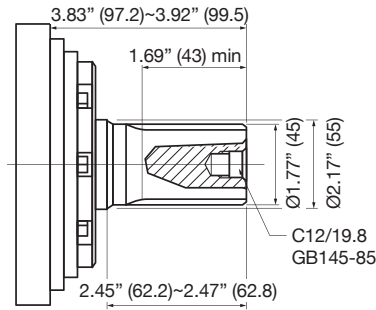
Shafts

Dimensions are in inches (millimeters).

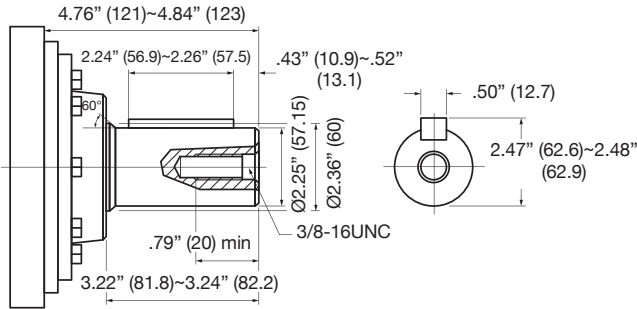
1 = 1.97" (50mm) Straight, Flat Key 13.957mm
 Available with Code A Flange Only



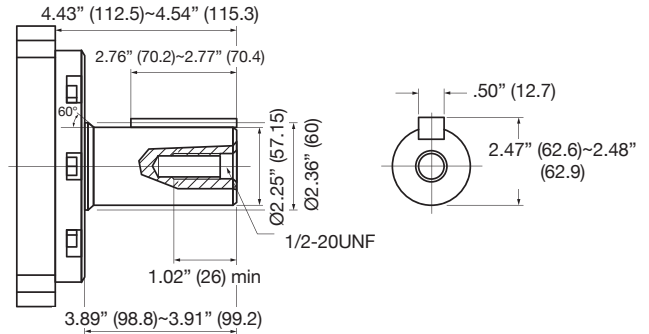
5 = 1.77" (45mm) 17t Splined
 Available with Code B Flange Only



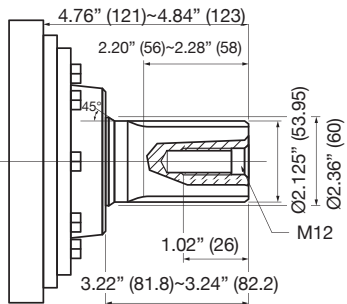
2 = 2.25" (57.15mm) Straight, Flat Key 12.7mm
 Available with Code A Flange Only



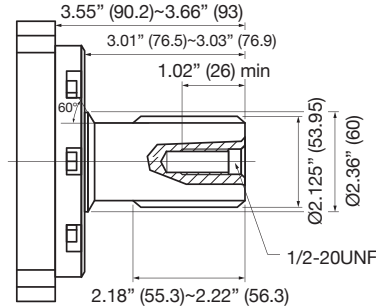
6 = 2.25" (57.15mm) Straight, Flat Key 12.7mm
 Available with Code C Flange Only



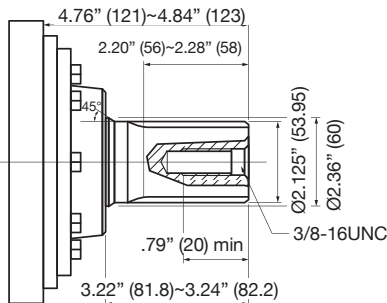
3 = 2.125" (53.95mm) 16t Splined
 Available with Code A Flange Only



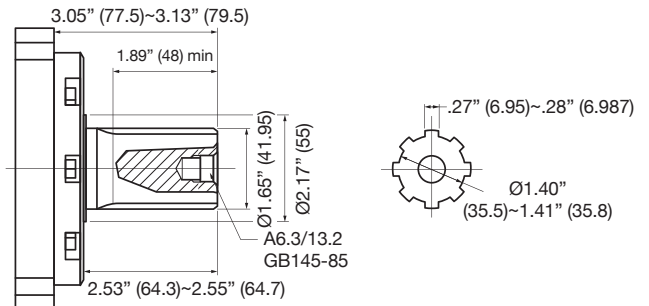
7 = 2.125" (53.95mm) 16t Splined
 Available with Code C Flange Only



4 = 2.125" (53.95mm) 16t Splined
 Available with Code A Flange Only

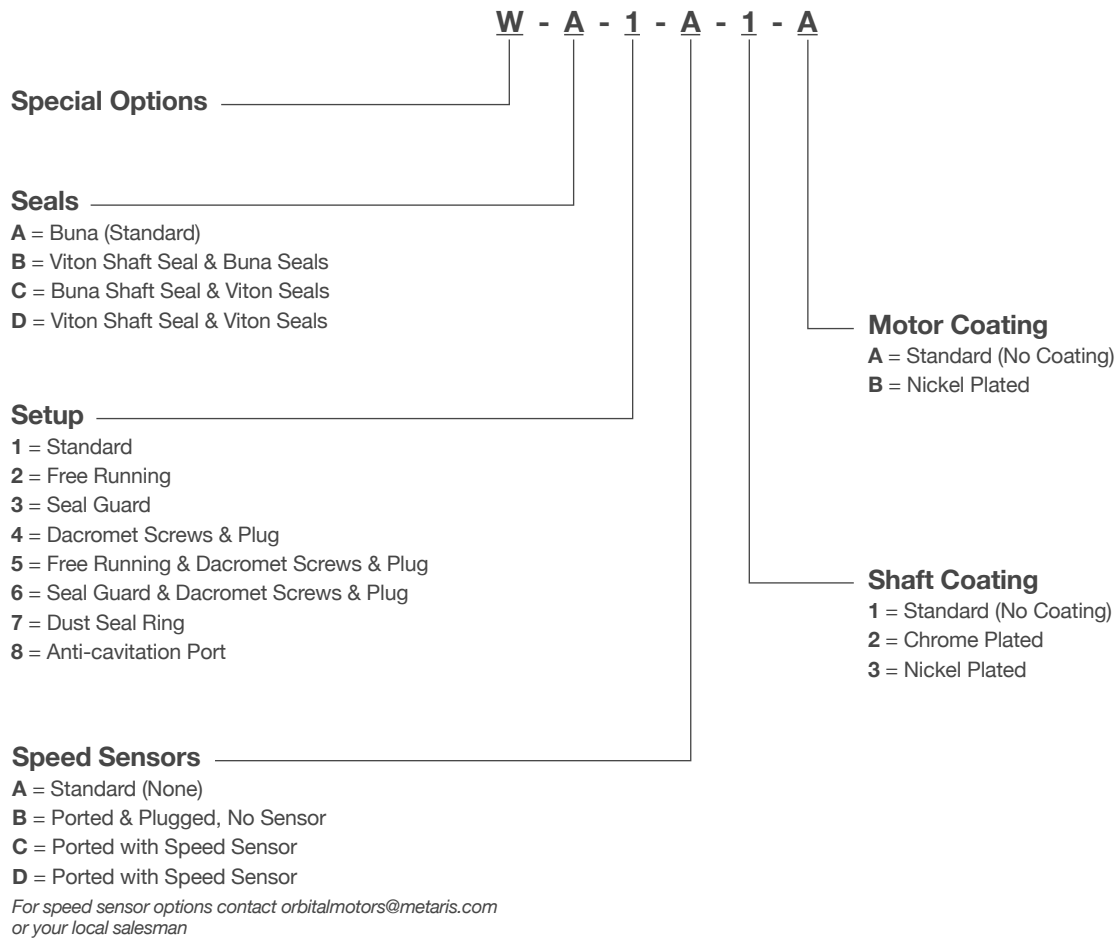


8 = 1.65" (41.95mm) Square Splined
 Available with Code D Flange Only



All Series Special Options

Model Code Breakdown



Above options are **non-stock**. Please call or email for availability.

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Hydraulex Corporate
48175 Gratiot Ave
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sales@hydraulex.com
sales@metarisusa.com
seattlesales@hydraulex.com
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