

# Motors - Fixed Displacement

## Gear

PGM 500, 600



- Superior performance
- High efficiency
- Low noise operation at high operating pressures
- International mounts and connections
- Integrated valve capabilities
- Common inlet multiple pump configurations



Frame size PGM 511	0060	0080	0100	0110	0140	0160	0190	0230	0270	0310	0330	
Displacement (cm <sup>3</sup> /rev)	6	8	10	11	14	16	19	23	27	31	33	
Max cont pressure (bar)	250	250	250	250	250	250	250	225	190	165	155	
Max operating speed (rpm)	3500	3500	3500	3500	3500	3500	3250	2750	2350	2100	2000	
Input power (kW)	4.5	6.0	7.5	8.3	10.5	12.0	14.3	14.7	14.9	16.7	17.3	
Weight (kg)	3.40	3.47	3.55	3.57	3.71	3.79	3.91	4.06	4.21	4.37	4.45	

Frame size PGM 620	0160	0190	0210	0230	0260	0290	0330	0360	0410	0440	0460	0500	0520
Displacement (cm <sup>3</sup> /rev)	16.0	19.0	21.0	23.0	26.0	29.0	33.0	36.0	41.0	44.0	46.0	50.0	52.0
Max cont pressure (bar)	275	275	275	275	275	275	275	250	220	210	210	210	210
Max operating speed [rpm]	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3000	3000
Weight (kg)	12.0	12.1	12.1	12.2	12.3	12.6	12.7	12.8	13.0	13.1	13.2	13.3	13.4

Frame size PGM 640	0300	0350	0400	0450	0500	0550	0600	0650	0700	0750	0800	
Displacement (cm <sup>3</sup> /rev)	30.0	35.0	40.0	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	
Max cont pressure (bar)	310	310	310	310	310	310	290	265	245	225	210	
Max operating speed [rpm]	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	
Weight (kg)	21.0	21.0	22.0	22.0	23.0	23.0	24.0	24.0	25.0	25.0	25.0	



# Motors - Fixed Displacement

## Vane

Single



- High overall efficiency
- High starting torque
- Very low noise
- Low ripple torque
- Various mounting pads, threaded ports & porting configurations
- Wide range of built-in valves options on uni-rotational motors

**DENISON®**



zvp 01

Frame size M3B	009	012	018	027	036
Displacement (cm <sup>3</sup> /rev)	9.2	12.3	18.5	27.8	37.1
Max cont pressure (bar)	175	210	210	210	210
Max operating speed <sup>1</sup> (rpm)	3000	3000	3000	3000	3000
Output torque <sup>2</sup> (Nm)	4.3	5.8	10.0	16.3	21.1
Output power <sup>2</sup> (kW)	19.7	26.7	46.6	77.4	102.0
Weight (kg)	8.0	8.0	8.0	8.0	8.0

Frame size M4C	024	027	031	043	055	067	075
Displacement (cm <sup>3</sup> /rev)	24.4	28.2	34.5	46.5	58.8	71.1	80.1
Max cont pressure (bar)	230	230	230	230	210	210	175
Max operating speed <sup>1</sup> (rpm)	2500	2500	2500	2500	2500	2500	2500
Output torque <sup>2</sup> (Nm)	60.5	70.0	86.8	120.0	149.0	170.0	198.0
Output power <sup>2</sup> (kW)	12.7	14.7	18.0	25.1	31.2	35.6	41.5
Weight (kg)	15.4	15.4	15.4	15.4	15.4	15.4	15.4

Frame size M4D	062	074	088	102	113	128	138
Displacement (cm <sup>3</sup> /rev)	65.1	76.8	91.1	105.5	116.7	132.4	144.4
Max cont pressure (bar)	230	230	230	210	210	190	175
Max operating speed <sup>1</sup> (rpm)	2500	2500	2500	2500	2500	2500	2500
Output torque <sup>2</sup> (Nm)	165.0	200.0	236.0	264.0	300.0	340.0	372.0
Output power <sup>2</sup> (kW)	34.6	41.9	49.4	55.3	62.8	71.2	77.9
Weight (kg)	27.0	27.0	27.0	27.0	27.0	27.0	27.0

Frame size M4E	153	185	214
Displacement (cm <sup>3</sup> /rev)	158.5	191.6	222.0
Max cont pressure (bar)	190	180	175
Max operating speed <sup>1</sup> (rpm)	2500	2500	2500
Output torque <sup>2</sup> (Nm)	398	484	567
Output power <sup>2</sup> (kW)	83.4	101.4	118.8
Weight (kg)	45.0	45.0	45.0

Frame size M5B*	012	018	023	028	036	045	050
Displacement (cm <sup>3</sup> /rev)	12.0	18.0	23.0	28.0	36.0	45.0	50.0
Max cont pressure (bar)	290	290	290	290	290	260	260
Max operating speed <sup>1</sup> (rpm)	4000	4000	3000	3000	3000	2500	2500
Output torque <sup>2</sup> (Nm)	50.6	81.2	117.1	132.1	172.8	190.0	211.0
Output power <sup>2</sup> (kW)	10.6	17.0	24.5	27.7	36.2	39.8	44.0
Weight (kg)	18.5	18.5	18.5	18.5	18.5	18.5	18.5

1) Max. shaft speed at max. pressure, continuous

2) Output at 2000 rpm, 24 cSt & M5B\* at 320 bar, 045 & 050 at 280 bar, M3B & M4\* at 175 bar

Double



- 49 possible displacement combinations (see above M4C & M4D data)
- Three different possible speeds for each combination
- Three different possible torques for each combination
- Bi-rotational technology
- Low noise
- Low ripple torque

# Motors - Fixed Displacement

## Vane

Fan – M5



- Heavy duty bearing
- High overall efficiency
- Integrated valves possible (anti cavitation check, proportional pressure relief valve, ...)
- Low noise
- Bi-rotational technology
- Internal or external drain possible with the uni-rotational option

**DENISON®**



zvp 01

Frame size M5AF	006	010	012	016	018	025	M5BF	012	018	023	028	036	045	050
Displacement (cm <sup>3</sup> /rev)	6.3	10.0	12.5	16.0	18.0	25.0		12.0	18.0	23.0	28.0	36.0	45.0	50.0
Max cont pressure (bar)	300	300	300	300	300	280		290	290	290	290	290	260	260
Max operating speed <sup>1</sup> (rpm)	4000	4000	4000	4000	4000	2500		4000	4000	3000	3000	3000	2500	2500
Max output torque <sup>2</sup> (Nm)	26.1	43.8	55.7	72.4	82.0	107.5		50.6	81.2	117.1	132.1	172.8	190.0	211.0
Output power <sup>2</sup> (kW)	5.5	9.1	11.7	15.1	17.1	22.5		10.6	17.0	24.5	27.7	36.2	39.8	44.0
Weight (kg)	15.0	15.0	15.0	15.0	15.0	15.0		18.5	18.5	18.5	18.5	18.5	18.5	18.5

1) Max shaft speed at max pressure

2) Output at 2000 rpm, 24 cSt & M5B\* at 320 bar, 045 & 050 at 280 bar, M5AF at 300 bar

## Gerotor

TE



- High volumetric efficiency
- Long life
- Full flow spline cooling
- High pressure shaft seal
- High flow shaft seal cooling
- High starting torque
- High side load capacity
- Balanced performance in both directions of rotation



zm 03

Frame size TE	0036	0045	0050	0065	0080	0100	0130	0165	0195	0230	0260	0295	
Displacement (cm <sup>3</sup> /rev)	36	41	49	65	82	98	130	163	195	228	260	293	
Max cont pressure (bar)	140	140	140	140	140	140	140	140	140	120	110	100	
Max operating speed (rpm)	1141	1024	1020	877	695	582	438	348	292	328	287	256	
Max cont output torque (Nm)	55	71	90	125	160	190	255	310	390	380	400	428	
Weight, code L and H (kg)	6.7	6.8	6.9	7.0	7.1	7.2	7.6	7.8	8.1	8.3	8.6	8.8	

  

Frame size TE	0330	0365	0390
Displacement (cm <sup>3</sup> /rev)	328	370	392
Max cont pressure (bar)	100	95	85
Max operating speed (rpm)	228	203	191
Max cont output torque (Nm)	443	467	445
Weight, code L and H (kg)	9.1	9.4	9.6

TF



- High volumetric efficiency
- Long life
- Full flow spline cooling
- High pressure shaft seal
- High flow shaft seal cooling
- High starting torque
- High side load capacity



zm 05

Frame size TF	0080	0100	0130	0140	0170	0195	0240	0280	0360	0405	0475	
Displacement (cm <sup>3</sup> /rev)	81	100	128	141	169	197	238	280	364	405	477	
Max cont pressure (bar)	207	155	138	138	138	138	138	138	130	128	113	
Max operating speed (rpm)	693	749	583	530	444	381	394	334	258	231	195	
Max cont output torque (Nm)	220	195	230	255	315	365	425	510	595	655	680	
Weight code H and V (kg)	14.0	14.0	14.2	14.3	14.6	14.9	15.3	15.6	16.3	17.0	17.5	

# Motors - Fixed Displacement

## Gerotor

TG



- High volumetric efficiency
- Long life
- Full flow spline cooling
- High pressure shaft seal
- High flow shaft seal cooling
- High starting torque
- High side load capacity



zm 06

Frame size TG	0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
Displacement (cm <sup>3</sup> /rev)	141	169	195	238	280	310	337	405	477	528	623	786	959
Max cont pressure (bar)	207	207	207	207	207	207	207	172	138	138	121	103	69
Max operating speed (rpm)	660	554	477	393	334	303	277	232	237	213	182	143	118
Max cont output torque (Nm)	390	475	555	675	795	924	965	940	885	980	985	1045	775
Weight code H and V (kg)	14.6	14.8	15.1	15.5	15.9	16.1	16.3	16.9	17.5	18.3	19.0	20.5	22.2

BG



- High volumetric efficiency
- Long life
- Full flow spline cooling
- High pressure shaft seal
- High flow shaft seal cooling
- High starting torque
- High side load capacity



zm 04

Frame size BG	0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
Displacement (cm <sup>3</sup> /rev)	141	169	195	238	280	310	337	405	477	528	623	786	959
Max cont pressure (bar)	207	207	207	207	207	207	207	172	138	138	121	103	69
Max operating speed (rpm)	660	554	477	393	334	303	277	232	237	213	182	143	118
Max cont output torque (Nm)	390	475	555	675	795	924	965	940	885	980	985	1045	775
Brake holding capacity (Nm)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Weight (kg)	14.6	14.8	15.1	15.5	15.9	16.1	16.3	16.9	17.5	18.3	19.0	20.5	22.2

TH



- High volumetric efficiency
- Long life
- Full flow spline cooling
- High pressure shaft seal
- High flow shaft seal cooling
- High starting torque
- High side load capacity



zm 07

Frame size TH	0140	0170	0195	0240	0280	0310	0335	0405	0475	0530	0625	0785	0960
Displacement (cm <sup>3</sup> /rev)	141	169	195	238	280	310	337	405	477	528	623	786	959
Max cont pressure (bar)	207	207	207	207	207	207	207	172	138	138	121	103	69
Max operating speed (rpm)	660	554	477	393	334	303	277	232	237	213	182	143	118
Max cont output torque (Nm)	390	475	555	675	795	924	965	940	885	980	985	1045	775
Weight code B.X.L.A.Y. (kg)	16.9	17.2	17.4	17.8	18.2	18.4	18.6	19.2	19.8	20.6	21.3	22.9	24.5

TK



- High volumetric efficiency
- Flow through internal spline and shaft seal cooling
- High pressure shaft seal / no drainline
- High starting torque
- High side load capacity
- Long life



zm 08

Frame size TK	0250	0315	0400	0500	0630	0800	1000
Displacement (cm <sup>3</sup> /rev)	250	315	400	500	630	800	1000
Max cont pressure (bar)	241	241	207	207	207	190	172
Max operating speed (rpm)	523	413	373	298	237	276	218
Max cont output torque (Nm)	814	1029	1153	1439	1617	1916	2413
Weight (kg)	30.8	31.4	32.3	33.2	34.5	36.0	37.9

# Motors - Fixed Displacement

## Axial Piston

F1



- Pressures up to 350 bar
- Positive synchronization with timing gear
- Shaft end and mounting flange meet the ISO standard for all sizes
- Very low weight
- High overall efficiency withstand high acceleration



zp 16

Frame size F1	25-M	41-M	51-M	61-M	81-M	101-M	121-M
Displacement (cm <sup>3</sup> /rev)	25.6	40.9	51.1	59.5	81.6	102.9	118.5
Max cont pressure (bar)	250	250	250	250	250	250	250
Max operating speed (rpm)	3000	2700	2400	2200	2000	1800	1700
Output torque at 200 bar (Nm)	81	130	162	189	259	327	376
Output power (kW)	20	27	31	34	41	48	51
Weight (kg)	8.5	8.5	8.5	8.5	12.5	12.5	12.5

F11



- Very high operating speeds and fast accelerations
- Anti cavitation valve available
- Pressures up to 420 bar
- High overall efficiency (low losses)
- Accept high external shaft loads
- Good resistance to vibrations and temperature shocks
- Proven reliability
- Easy to service
- CETOP, ISO and SAE versions available



zp 21

Frame size* F11	05	10	12	14	19	150	250
Displacement (cm <sup>3</sup> /rev)	4.9	9.8	12.5	14.3	19.0	150.0	242.0
Max cont pressure (bar)	350	350	350	350	350	350	350
Max operating speed (rpm)	12800	10200	9400	9000	8100	3200	2700
Output torque at 100 bar (Nm)	7.8	15.6	19.8	22.7	30.2	238	384
Weight (kg)	5	7.5	8.2	8.3	11	70	77

\* Use F12 for medium range displacement

F12



- Very high operating speeds and fast accelerations
- Pressures up to 480 bar
- High starting torque
- Very high power capability
- High overall efficiency
- Small envelope size
- Accessory valves available
- ISO, SAE and cartridge versions available
- Proven reliability
- Easy to service
- Super-shockless swing relief valve



zp 21

Frame size F12	30	40	60	80	90	110	125
Displacement (cm <sup>3</sup> /rev)	30.0	40.0	59.8	80.4	93.0	110.1	125
Max cont pressure (bar)	420	420	420	420	350	420	420
Max operating speed (rpm)	6700	6100	5300	4800	4600	4400	4200
Output torque at 100 bar (Nm)	47.6	63.5	94.9	128	148	175	198
Weight (kg)	12	16,5	21	26	26	36	36

# Motors - Fixed Displacement

## Radial Piston

MRT/MRTE/MRTF

MRD/MRDE

MR/MRE


**CALZONI®**

- Double displacement motor (MRD, MRDE)
- High starting torque: from 90 % to 95 % of theoretical
- High control at very low speed
- High volumetric efficiency: up to 98 %
- Low noise
- Resistance to thermal shocks
- Reversibility
- Long bearing life
- Speed accessories, brakes....



Frame size MR	33	57	73	93	110	125	160	190	200	250	300	350	450	600	700	1100
Displacement (cm <sup>3</sup> /rev)	32	56	73	93	109	125	160	192	199	251	304	350	452	608	707	1126
Max cont pressure (bar)	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
Max operating speed (rpm)	1400	1300	1200	1150	1100	900	900	850	800	800	750	640	600	520	500	330
Max power (kW)	10	17	20	25	28	25	30	36	38	48	53	62	75	84	97	119

Frame size MR	1600	1800	2400	2800	3600	4500	6500	7000
Displacement (cm <sup>3</sup> /rev)	1598	1810	2393	2792	3637	4503	6460	6967
Max cont pressure (bar)	250	250	250	250	250	250	250	250
Max operating speed (rpm)	260	250	220	215	180	170	130	130
Max power (kW)	144	153	183	194	185	210	240	250

Frame size MRE	330	500	800	1400	2100	3100	5400	8200
Displacement (cm <sup>3</sup> /rev)	332	498	804	1370	2091	3104	5401	8226
Max cont pressure (bar)	210	210	210	210	210	210	210	210
Max operating speed (rpm)	750	600	450	280	250	215	160	120
Max power (kW)	49	70	93	102	148	190	210	250

Frame size MRD	300	450	700	1100	1800	2800	4500	7000
Displacement (cm <sup>3</sup> /rev)	304	452	707	1126	1810	2792	4503	6967
Max cont pressure (bar)	250	250	250	250	250	250	250	250
Max operating speed (rpm)	750	600	500	330	250	215	170	130
Max power (kW)	53	75	97	119	157	194	210	250

Frame size MRDE	330	500	800	1400	2100	3100	5400	8200
Displacement (cm <sup>3</sup> /rev)	332	498	804	1370	2091	3104	5401	8226
Max cont pressure (bar)	210	210	210	210	210	210	210	210
Max operating speed (rpm)	750	600	450	280	250	215	160	120
Max power (kW)	49	70	93	102	148	190	210	250

Frame size MRT	7100	9000	14000	17000	19500		MRTE	8500	10800	16500	20000	23000
Displacement (cm <sup>3</sup> /rev)	7104	9005	14010	16759	19508			8517	10802	16543	19788	23034
Max cont pressure (bar)	250	250	250	250	250			210	210	210	210	210
Max operating speed (rpm)	150	130	80	70	60			120	110	70	60	50
Max power (kW)	330	370	355	371	371			290	310	308	316	306

Frame size MRTF	7800	9900	15500	18000	21500
Displacement (cm <sup>3</sup> /rev)	7808	9904	15277	18025	21271
Max cont pressure (bar)	210	210	210	210	210
Max operating speed (rpm)	130	120	75	65	55
Max power (kW)	280	300	305	320	311



# Motors - Variable Displacement

## Axial Piston

T12



- Designed specifically for track drives
- Very high operating speeds
- Pressures up to 480 bar
- Very high power capability
- High starting torque
- Low weight
- High overall efficiency
- Axial or side ports
- Two-position control
- Cartridge version available
- Service-friendly



Frame size T12	60	80
Displacement max at 35° (cm <sup>3</sup> /rev)	60	80
Displacement min at 10° (cm <sup>3</sup> /rev)	18	24
Max continuous pressure (bar)	420	420
Max operating speed (rpm)	7000	6250
Corner power cont (kW)	235	280
Weight (kg)	26	30.5

V12



- Very high operating speeds
- Displacement ratio 5:1
- Pressures up to 480 bar
- Very high power capability
- High starting torque
- Low weight
- High overall efficiency
- Axial or side ports
- Controls available for most needs
- ISO, SAE and cartridge versions



Frame size V12	60	80
Displacement max at 35° (cm <sup>3</sup> /rev)	60	80
Displacement min at 6.5° (cm <sup>3</sup> /rev)	12	16
Max cont pressure (bar)	420	420
Max operating speed (rpm)	7000	6250
Corner power cont (kW)	235	280
Weight (kg)	28	33

V14



- Operating pressures up to 480 bar
- High speeds thanks to low weight pistons with laminated piston rings and a very compact design of the rotating parts
- High over all efficiency throughout the entire displacement range
- 9 pistons provide high start-up torque and smooth operation
- Wide displacement range – 5:1
- Small envelope size and high power-to-weight ratio
- Low noise levels due to the compact, sturdy design and smooth fluid passages
- Positive piston locking, strong synchronizing shaft, heavy-duty bearings and a small number of parts add up to a very robust motor with long service life and proven reliability



Frame size V14	110	160
Displacement max at 35° (cm <sup>3</sup> /rev)	110	160
Displacement min at 6.5° (cm <sup>3</sup> /rev)	22	32
Max cont pressure (bar)	420	420
Max operating speed (rpm)	5700	5000
Corner power cont (kW)	440	560
Weight (kg)	54	68



# Motors - Variable Displacement

## Radial Piston

CALZONI®

MRV/MRVE



- Variable displacement motor
- Customizable displacements
- High starting torque: from 90 % to 95 % of theoretical
- High control at very low speed
- High volumetric efficiency: up to 98 %
- Low noise
- Resistance to thermal shocks
- Reversibility
- Long bearing life
- Speed accessories, brakes....



zm 30

<b>Frame size MRV</b>	<b>450</b>	<b>700</b>	<b>1100</b>	<b>1800</b>	<b>2800</b>	<b>4500</b>	<b>7000</b>	
Displacement (cm <sup>3</sup> /rev)	452	707	1126	1810	2792	4503	6967	
Max cont pressure (bar)	250	250	250	250	250	250	250	
Max operating speed (rpm)	600	500	330	250	215	170	130	
Max power (kW)	75	97	119	157	194	210	250	
<b>Frame size MRVE</b>	<b>800</b>	<b>1400</b>	<b>2100</b>	<b>3100</b>	<b>5400</b>	<b>8200</b>		
Displacement (cm <sup>3</sup> /rev)	804	1370	2091	3104	5401	8226		
Max cont pressure (bar)	210	210	210	210	210	210		
Max operating speed (rpm)	450	280	250	215	160	120		
Max power (kW)	93	102	148	190	210	250		