



AG MATRIX™ SERIES FRAMELESS PERMANENT MAGNET ALTERNATORS



The AG Matrix™ Series alternators are used in applications that require high power density. The designs are optimized for maximum output power and maximum efficiency. Utilizing high energy rare earth magnets and dense slot fills, the AG Series achieves higher AC output power. This provides the highest performance per volume and minimizes the alternators footprint within the system.

The alternators are supplied as a direct drive rotor / stator frameless part set that is directly attached to the load. This form of attachment eliminates backlash and increases stiffness for an optimized direct drive system.

The AG Matrix Series is a family of alternators consisting of a wide range of sizes, outside diameters from 5.25 to 22 inches (133.35 mm to 558.8 mm) with multiple stack sizes and winding options for each diameter.

Along with our standard Matrix alternators, our engineers design custom solutions. If our existing models don't meet your needs, we will tailor them or provide options for a best value solution to meet your exact requirements.

FEATURES

- Compact
- Continuous AC output power from 345 W to over 36 kW
- Double insulated high temp magnet wire minimizes leakage current and provides good thermal resistance
- Stable high temp encapsulation material minimizes movement or working of windings under large temperature variations.
- Rare earth magnets
- High power density
- Large through bores

TYPICAL APPLICATIONS

- Auxiliary power generation
- Wind energy
- Onboard power generation for manned and unmanned vehicles

AG MATRIX™ SERIES OVERVIEW

A permanent magnet alternator is a power generating device that produces a sinusoidal output when a mechanical input to its hub or shaft is applied. This device is constructed very much like a brushless motor with the appropriate selection of insulation materials and winding to match the environment and application. Essentially, a permanent magnet alternator is to a brushless motor what a tachometer is to a brush-type motor except that the alternator's application is power generation instead of rate feedback.

Design Considerations

All diameters listed have finished ground lamination surfaces. They can be complemented with rings and hubs for mounting convenience. If you require a housing that may also include bearings, torquer motor, synchro, potentiometer, or similar components, we can design the entire assembly to meet your mechanical dimensions and performance requirements.

Mounting Considerations

Since torque motors are normally delivered in kit form, you provide the mounting surfaces and bearings. When you design the mechanics of the mount, be sure to observe these rules:

1. Eccentricities from the inner member mounting surface should not exceed 0.004 inches for rare earth motor designs.
2. The bore of the mounting surface should be perpendicular to the mounting seat within 0.002 inches for rare earth designs.

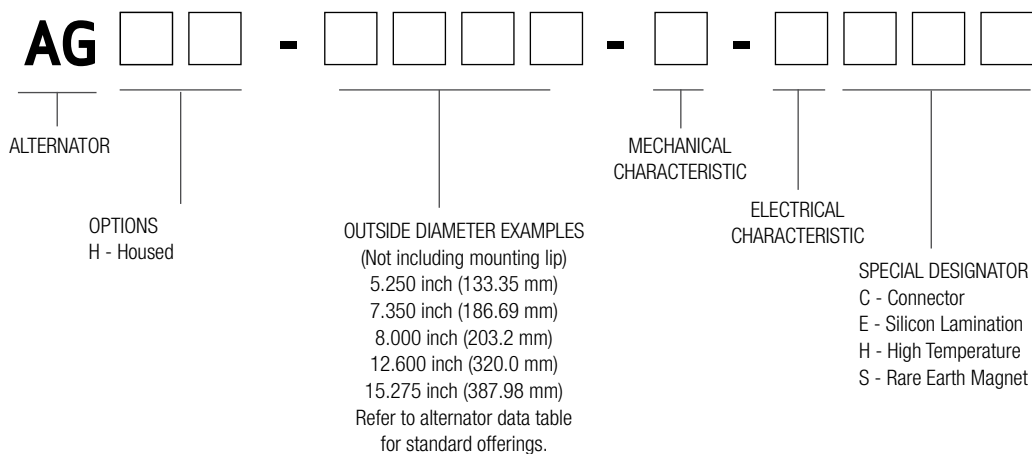
Electrical Considerations

For each mechanical configuration shown, different winding designs to modify AC output voltage, output power or speed can be supplied by Moog to suit your system requirement. In each case, you have the option of selecting one of the existing designs or specifying a new winding designed to meet your exact requirements.

OPTIONS

- Winding options to adjust the output power and output voltage
- Varying stack lengths from 0.10 to over 30 inches (2.54 to 762 mm)
- Mounting flanges, hubs, mounting holes and connectors may be added as required

PART NUMBERING SYSTEM GUIDE



The following frame sizes represent only a small sampling of the total range manufactured. Consult factory for additional designs. Refer to our online documentation for product updates.

Note: Additional alternator products available, see GES Alternators at www.moog.com.

AG-5250 SERIES SPECIFICATIONS

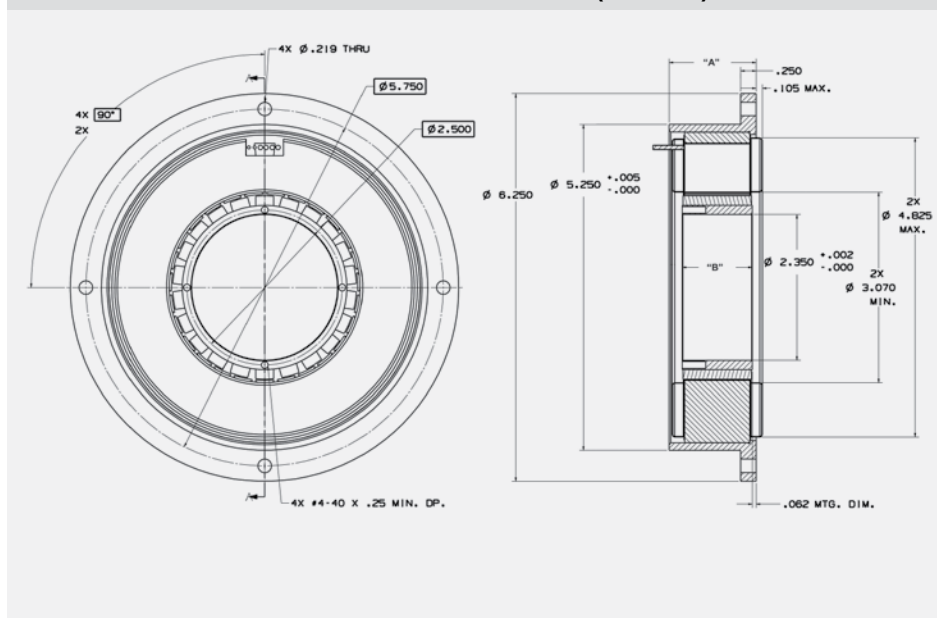
MOTOR CHARACTERISTICS @ 25° C

Specification	Units	AG-5250 A-1ES	AG-5250 B-1ES	AG-5250 C-1ES	AG-5250 D-1ES	AG-5250 E-1ES	AG-5250 F-1ES
Continuous Rated Power	w	345	529	717	903	1031	1400
Rated Speed Power	rpm	650	650	650	650	650	650
Voltage at Rated Power	V rms	237	242	244	247	247	250
Current at Rated Power	Amps rms	0.84	1.26	1.74	2.11	2.42	3.23
Efficiency at Rated Power	%	78	80	82	84	85	86
Input Torque at Rated Speed	lb.ft (n.m)	5.06 (6.86)	7.39 (10.02)	9.76 (13.24)	12.10 (16.41)	13.80 (18.71)	18.40 (24.95)
Weight	lb (Kg)	5.2 (2.36)	7.2 (3.27)	9.1 (4.13)	10.9 (4.94)	12.7 (5.76)	16.5 (7.48)
OD*	inches (mm)	5.250 (133.35)	5.250 (133.35)	5.250 (133.35)	5.250 (133.35)	5.250 (133.35)	5.250 (133.35)
ID	inches (mm)	2.35 (59.69)	2.35 (59.69)	2.35 (59.69)	2.35 (59.69)	2.35 (59.69)	2.35 (59.69)

MOTOR CHARACTERISTICS @ 25° C

Specification	Units	AG-5250 A-2ES	AG-5250 B-2ES	AG-5250 C-2ES	AG-5250 D-2ES	AG-5250 E-2ES	AG-5250 F-2ES
Continuous Rated Power	w	1000	1411	1895	2343	2708	3590
Rated Speed Power	rpm	1500	1500	1500	1500	1500	1500
Voltage	V rms	260	260	238	260	263	259
Current	Amps rms	2.24	3.13	4.29	5.20	5.94	8.01
Efficiency	%	90	90	90	91	90	91
Input Torque at Rated Speed	lb.ft (n.m)	5.44 (7.38)	7.55 (10.204)	10.10 (13.70)	12.40 (16.81)	14.30 (19.39)	18.90 (25.63)
Weight	lb (Kg)	5.2 (2.36)	7.2 (3.247)	9.1 (4.13)	10.9 (4.94)	12.8 (5.80)	16.6 (7.53)
OD*	inches (mm)	5.250 (133.35)	5.250 (133.35)	5.250 (133.35)	5.250 (133.35)	5.250 (133.35)	5.250 (133.35)
ID	inches (mm)	2.35 (59.69)	2.35 (59.69)	2.35 (59.69)	2.35 (59.69)	2.35 (59.69)	2.35 (59.69)

MECHANICAL DIMENSIONS (INCHES)



LENGTH DIMENSIONS

Modular	"A" inches (mm)	"B" inches (mm)
AG-5250-A-1ES	1.4 (35.56)	1.125 (28.575)
AG-5250-A-2ES	1.4 (35.56)	1.125 (28.575)
AG-5250-B-1ES	1.9 (48.26)	1.625 (41.275)
AG-5250-B-2ES	1.9 (48.26)	1.625 (41.275)
AG-5250-C-1ES	2.4 (60.96)	2.125 (53.975)
AG-5250-C-2ES	2.4 (60.96)	2.125 (53.975)
AG-5250-D-1ES	2.9 (73.66)	2.725 (69.215)
AG-5250-D-2ES	2.9 (73.66)	2.725 (69.215)
AG-5250-E-1ES	3.4 (86.36)	3.225 (81.915)
AG-5250-E-2ES	3.4 (86.36)	3.225 (81.915)
AG-5250-F-1ES	4.4 (111.76)	4.225 (107.315)
AG-5250-F-2ES	4.4 (111.76)	4.225 (107.315)

AG-7350 SERIES SPECIFICATIONS

MOTOR CHARACTERISTICS @ 25° C

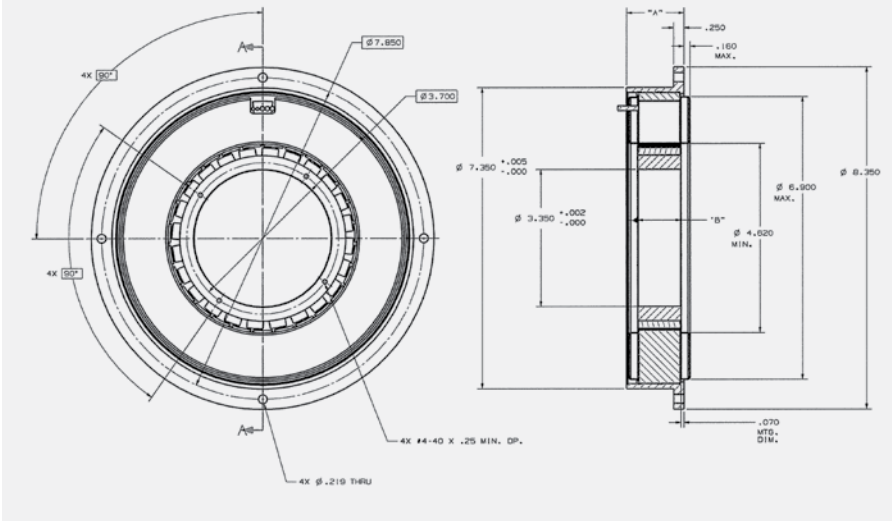
Specification	Units	AG-7350 A-1ES	AG-7350 B-1ES	AG-7350 C-1ES	AG-7350 D-1ES	AG-7350 E-1ES	AG-7350 F-1ES	AG-7350 G-1ES	AG-7350 H-1ES
Continuous Rated Power	w	868	1304	1727	2177	2603	3027	3319	4181
Rated Speed Power	rpm	600	600	600	600	600	600	600	600
Voltage	V rms	232	229	230	227	231	227	231	227
Current	Amps rms	4.08	3.29	4.33	5.53	6.51	7.69	8.31	10.6
Efficiency	%	85	87	88	89	89	90	90	90
Input Torque at Rated Speed	lb.ft (n.m)	12.40 (16.81)	18.00 (24.41)	23.60 (32.00)	29.40 (39.87)	34.90 (47.32)	40.40 (54.78)	44.3 (60.07)	55.5 (75.26)
Weight	lb (Kg)	10.5 (4.76)	14.5 (6.58)	18.0 (8.17)	22.0 (9.98)	25.5 (11.57)	30.0 (13.61)	33.0 (14.97)	40.0 (18.14)
OD*	inches (mm)	7.350 (186.69)	7.350 (186.69)	7.350 (186.69)	7.350 (186.69)	7.350 (186.69)	7.350 (186.69)	7.350 (186.69)	7.350 (186.69)
ID	inches (mm)	3.350 (85.09)	3.350 (85.09)	3.350 (85.09)	3.350 (85.09)	3.350 (85.09)	3.350 (85.09)	3.350 (85.09)	3.350 (85.09)

MOTOR CHARACTERISTICS @ 25° C

Specification	Units	AG-7350 A-2ES	AG-7350 B-2ES	AG-7350 C-2ES	AG-7350 D-2ES	AG-7350 E-2ES	AG-7350 F-2ES	AG-7350 G-2ES	AG-7350 H-2ES
Continuous Rated Power	w	1904	2872	3751	4561	5421	6360	7356	8550
Rated Speed Power	rpm	1200	1200	1200	1200	1200	1200	1200	1200
Voltage	V rms	230	230	233	236	238	239	228	229
Current	Amps rms	1.79	7.22	8.95	11.2	13.1	15.3	18.6	21.6
Efficiency	%	91	92	92	92	92	92	92	92
Input Torque at Rated Speed	lb.ft (n.m)	12.50 (16.95)	18.70 (25.36)	23.60 (32.00)	29.50 (40.00)	35.00 (47.46)	41.00 (55.60)	47.4 (64.27)	55.1 (74.72)
Weight	lb (Kg)	10.5 (4.76)	14.5 (6.58)	18.0 (8.17)	22.0 (9.98)	25.5 (11.57)	30.0 (13.61)	33.0 (14.97)	40.0 (18.14)
OD*	inches (mm)	7.350 (186.69)	7.350 (186.69)	7.350 (186.69)	7.350 (186.69)	7.350 (186.69)	7.350 (186.69)	7.350 (186.69)	7.350 (186.69)
ID	inches (mm)	3.350 (85.09)	3.350 (85.09)	3.350 (85.09)	3.350 (85.09)	3.350 (85.09)	3.350 (85.09)	3.350 (85.09)	3.350 (85.09)

AG-7350 SERIES SPECIFICATIONS

MECHANICAL DIMENSIONS (INCHES)



MOUNTING DIMENSIONS

Modular	"A" Inches	"B" Inches
AG-7350-A-1ES	1.40 (35.56)	1.050 (26.67)
AG-7350-A-2ES	1.40 (35.56)	1.050 (26.67)
AG-7350-B-1ES	1.90 (48.26)	1.550 (39.37)
AG-7350-B-2ES	1.90 (48.26)	1.550 (39.37)
AG-7350-C-1ES	2.40 (60.96)	2.075 (52.705)
AG-7350-C-2ES	2.40 (60.96)	2.075 (52.705)
AG-7350-D-1ES	2.890 (73.406)	2.757 (70.028)
AG-7350-D-2ES	2.890 (73.406)	2.757 (70.028)
AG-7350-E-1ES	3.40 (86.36)	3.075 (78.105)
AG-7350-E-2ES	3.40 (86.36)	3.075 (78.105)
AG-7350-F-1ES	3.90 (99.06)	3.600 (91.44)
AG-7350-F-2ES	3.90 (99.06)	3.600 (91.44)
AG-7350-G-1ES	4.40 (111.76)	4.100 (104.14)
AG-7350-G-2ES	4.40 (111.76)	4.100 (104.14)
AG-7350-H-1ES	5.40 (137.16)	5.125 (130.175)
AG-7350-H-2ES	5.40 (137.16)	5.125 (130.175)

AG-8000 SERIES SPECIFICATIONS

MOTOR CHARACTERISTICS @ 25° C

Specification	Units	AG-8000 A-1ES	AG-8000 B-1ES	AG-8000 C-1ES	AG-8000 D-1ES	AG-8000 E-1ES	AG-8000 F-1ES
Continuous Rated Power	w	1249	2529	3819	5068	6434	7722
Rated Speed Power	rpm	3600	3600	3600	3600	3600	3600
Voltage	V rms	208	210	212	211	218	218
Current	Amps rms	3.48	6.96	10.4	13.9	17.0	20.4
Efficiency	%	88.5	91.5	92.2	92.5	92.5	92.5
Input Torque at Rated Speed	lb.ft (n.m)	2.9 (3.9)	5.7 (7.7)	8.5 (11.5)	11.2 (15.2)	193.0 (261.71)	227.0 (307.81)
Weight	lb (Kg)	8.000 (203.2)	8.000 (203.2)	8.000 (203.2)	8.000 (203.2)	8.000 (203.2)	8.000 (203.2)
OD*	inches (mm)	3.00 (76.2)	3.00 (76.2)	3.00 (76.2)	3.00 (76.2)	3.00 (76.2)	3.00 (76.2)
ID	inches (mm)	8.2 (3.72)	13.0 (5.90)	19.0 (8.62)	24.0 (10.89)	29.0 (13.15)	35.0 (15.88)

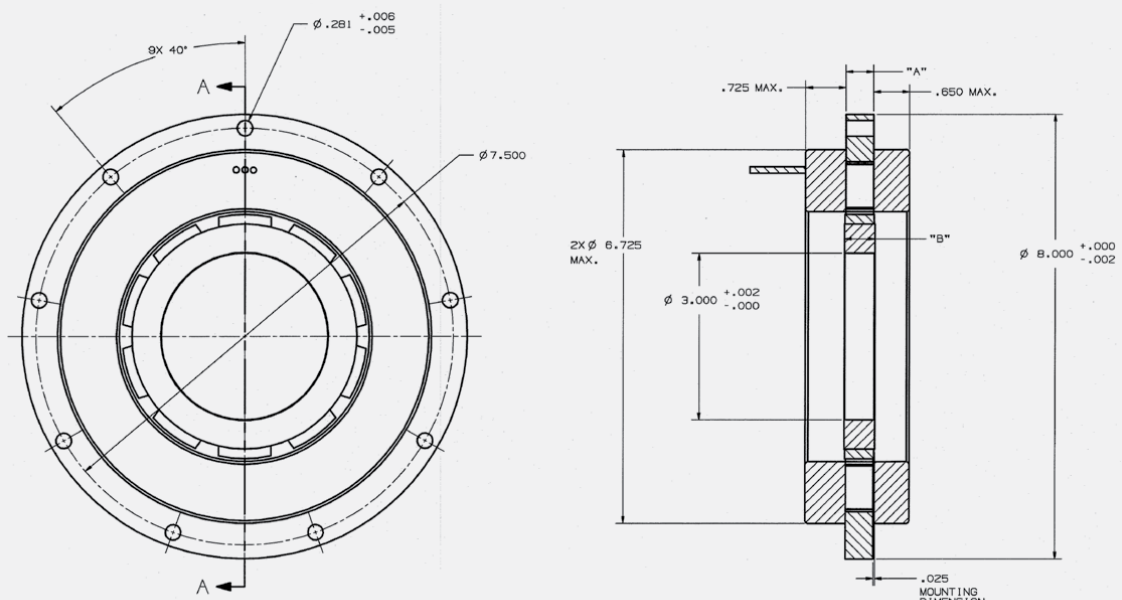
MOTOR CHARACTERISTICS @ 25° C

Specification	Units	AG-8000 G-1ES	AG-8000 G-1ES
Continuous Rated Power	w	10061	12780
Rated Speed Power	rpm	3600	3600
Voltage	V rms	215	219
Current	Amps rms	27.0	33.7
Efficiency	%	92.5	92.3
Input Torque at Rated Speed	lb.ft (n.m)	22.2 (30.1)	28.2 (38.2)
Weight	lb (Kg)	8.000 (203.2)	8.000 (203.2)
OD*	inches (mm)	3.00 (76.2)	3.00 (76.2)
ID	inches (mm)	45.0 (20.41)	55.0 (24.95)

MOUNTING DIMENSIONS

Modular	"A" Inches	"B" Inches
AG-8000-A-1ES	.500 (12.7)	.550 (13.97)
AG-8000-B-2ES	1.000 (25.4)	1.050 (26.67)
AG-8000-C-1ES	1.500 (38.1)	1.550 (39.37)
AG-8000-D-2ES	2.000 (50.8)	2.050 (52.07)
AG-8000-E-1ES	2.500 (63.5)	2.050 (52.07)
AG-8000-F-2ES	3.000 (76.2)	3.050 (77.47)
AG-8000-G-1ES	4.000 (101.6)	4.050 (102.87)
AG-8000-H-2ES	5.000 (127)	5.050 (128.27)

MECHANICAL DIMENSIONS (INCHES)



AG-15275 SERIES SPECIFICATIONS

MOTOR CHARACTERISTICS @ 25° C

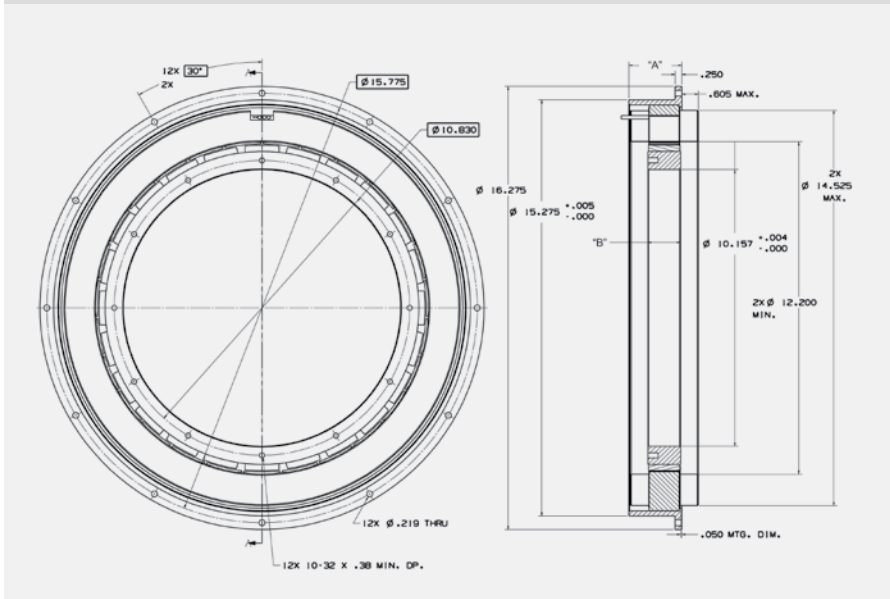
Specification	Units	AG-15275 A-1ES	AG-15275 B-1ES	AG-15275 C-1ES	AG-15275 D-1ES	AG-15275 E-1ES	AG-15275 F-1ES	AG-15275 G-1ES	AG-15275 H-1ES
Continuous Rated Power	w	1631	3594	5653	7392	9401	11141	12707	15042
Rated Speed Power	rpm	220	220	220	220	220	220	220	220
Voltage	V rms	248	307	293	289	260	298	263	285
Current	Amps rms	3.8	6.75	11.2	14.7	20.9	21.6	27.8	30.5
Efficiency	%	82	87	82	84	85	85	86	86
Input Torque at Rated Speed	lb.ft (n.m)	65.7 (89.09)	135.0 (183.06)	207.0 (280.96)	269.0 (364.76)	340.0 (461.04)	402.0 (545.11)	458.0 (621.05)	539.0 (730.88)
Weight	lb (Kg)	38.0 (17.24)	65.0 (29.48)	92.0 (41.73)	120.0 (54.43)	150.0 (68.04)	175.0 (79.38)	200.0 (90.72)	230.0 (104.34)
OD*	inches (mm)	15.275 (387.99)	15.275 (387.99)	15.275 (387.99)	15.275 (387.99)	15.275 (387.99)	15.275 (387.99)	15.275 (387.99)	15.275 (387.99)
ID	inches (mm)	10.157 (257.99)	10.157 (257.99)	10.157 (257.99)	10.157 (257.99)	10.157 (257.99)	10.157 (257.99)	10.157 (257.99)	10.157 (257.99)

MOTOR CHARACTERISTICS @ 25° C

Specification	Units	AG-15275 A-2ES	AG-15275 B-2ES	AG-15275 C-2ES	AG-15275 D-2ES	AG-15275 E-2ES	AG-15275 F-2ES	AG-15275 G-2ES	AG-15275 H-2ES
Continuous Rated Power	w	6892	14706	21282	29237	32922	32960	31121	36526
Rated Speed Power	rpm	800	800	800	800	700	600	500	500
Voltage	V rms	267	322	289	291	283	288	281	280
Current	Amps rms	15.1	26.5	4.3	58.0	65.8	66	63.2	75.2
Efficiency	%	90	90	90	90	91	90	90	90
Input Torque at Rated Speed	lb.ft (n.m)	67.4 (91.99)	141.0 (191.20)	205.0 (277.98)	283.0 (383.75)	363.0 (492.23)	423.0 (573.59)	479.0 (649.52)	562.0 (762.07)
Weight	lb (Kg)	38.0 (17.24)	65.0 (29.48)	92.0 (41.73)	120.0 (54.43)	150.0 (68.04)	175.0 (79.38)	200.0 (90.72)	230.0 (104.34)
OD*	inches (mm)	15.275 (387.99)	15.275 (387.99)	15.275 (387.99)	15.275 (387.99)	15.275 (387.99)	15.275 (387.99)	15.275 (387.99)	15.275 (387.99)
ID	inches (mm)	10.157 (257.99)	10.157 (257.99)	10.157 (257.99)	10.157 (257.99)	10.157 (257.99)	10.157 (257.99)	10.157 (257.99)	10.157 (257.99)

AG-15275 SERIES SPECIFICATIONS

MECHANICAL DIMENSIONS (INCHES)



MOUNTING DIMENSIONS

Modular	"A" Inches	"B" Inches
AG-15275-A-1ES	1.95 (49.53)	1.2 (30.48)
AG-15275-A-2ES	1.95 (49.53)	1.2 (30.48)
AG-15275-B-1ES	3.05 (77.47)	2.3 (58.42)
AG-15275-B-2ES	3.05 (77.47)	2.3 (58.42)
AG-15275-C-1ES	4.15 (105.41)	3.45 (87.63)
AG-15275-C-2ES	4.15 (105.41)	3.45 (87.63)
AG-15275-D-1ES	5.25 (133.35)	4.575 (119.21)
AG-15275-D-2ES	5.25 (133.35)	4.575 (119.21)
AG-15275-E-1ES	6.35 (161.29)	5.7 (144.78)
AG-15275-E-2ES	6.35 (161.29)	5.7 (144.78)
AG-15275-F-1ES	7.45 (189.23)	6.825 (173.36)
AG-15275-F-2ES	7.45 (189.23)	6.825 (173.36)
AG-15275-G-1ES	8.55 (217.17)	7.95 (201.93)
AG-15275-G-2ES	8.55 (217.17)	7.95 (201.93)
AG-15275-H-1ES	9.65 (245.11)	9.075 (230.51)
AG-15275-H-2ES	9.65 (245.11)	9.075 (230.51)