



A.R.K164D DATA SHEET



SPECIFICATIONS & OPTIONS

Standards

- A.R.K series alternator conforms to the major international standards and specifications, including:
 - IEC60034, GB755, BS5000, VDE0530, NEMA, MG1-22, C22.2-100, CSA, AS1359 standard, etc.
- A.R.K series alternator is certified by ISO9001 quality system.
- A.R.K series alternator can be used for the generator set of CE mark.
- Other standards and certification can be based on customer requirements.

Electrical characteristics

- Insulation & Impregnating
Class H insulation.
All wound components are impregnated with material and processes designed specially to provide protection against harsh environments encountered in generator application. Resin based materials are selected and developed to provide the high build required for static windings and the high mechanical strength required for rotating components.
- 3-phase reconnectable with 12 ends brought out to the terminals.
- 2/3 pitch, can eliminate triple (3rd, 9th, 15th ...) harmonics on the voltage waveform and is found to be the optimum design for trouble-free supply of non-linear loads.
- Telephone interference
THF(as defined by IEC 60034-1) is less than 2%, TIF(as defined by NEMA MG1-32) is less than 50.
- Radio interference
Brushless device and the high quality AVR ensure low levels of interference with radio transmissions. RFI suppression module may be installed if required.
- High efficiency and motor startup capability.

Mechanical properties

- Steel structure.
- Cast aluminum for front and rear cover.
- Rigid assembly, effectively reduces the vibration during running.
- All rotors are dynamically balanced to conform with BS6861.
- Half key dynamic balance is applied in double bearing structure.
- Non-maintenance sealed-for-life ball bearing.
- 120% overspeed ability.
- Standard
Protection grade
- A.R.K series alternator protection level is IP23.
- Suitable for environment with 95% relative humidity.
- optional
 - Inlet and filter, power reduced by 5%.
 - Inlet and outlet filter, power reduced by 10% (IP44)
 - Anti-condensation heater.
 - Stator winding, bearing overheating protection.
 - Outlet line design of outlet box.
 - Center height can be customized according to requirements.

Excitation and voltage regulation system

MODEL	16 series	18 series	22 series	27 series	4 series	5 series	6 series	7 series
AVR								
SX460	Standard	Standard	Standard	Standard				
AS440(parallel optional)	Optional	Optional	Optional	Optional				
SX440(parallel optional)			Optional	Optional	Standard	Standard		
MX341(with PMG)			Optional	Optional	Optional	Optional		
MX321(with PMG)							Standard	Standard

With the self-excited system, the main stator provides power via the automatic voltage regulator(AVR) to the exciter stator. The high efficiency AVR ensures the voltage maintaining at the rated level.

The exciter rotor output is fed to the main rotor through a three phase full wave bridge rectifier. The rectifier is protected by surge suppressor from voltage spikes of short circuit or phase mismatching.

Application

Prime power, rental, telecom, mobile power station, lighting tower, railway, refrigeration and standby power.

Quality assurance

A.R.K series alternators are manufactured using production procedures having a quality assurance level to ISO 9001.

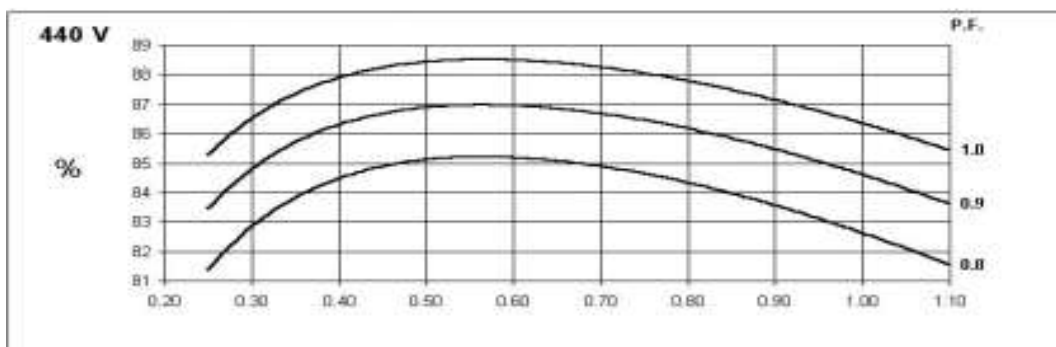
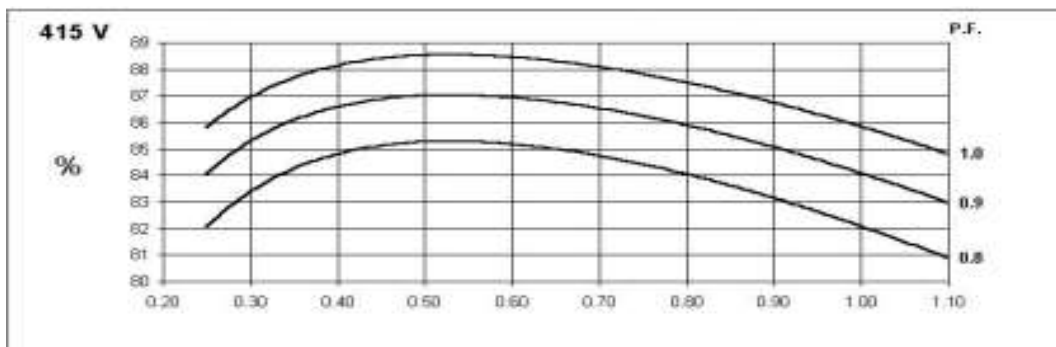
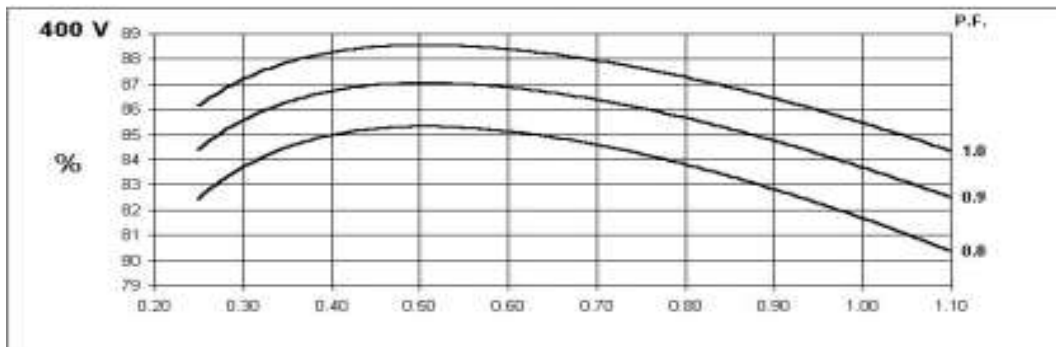
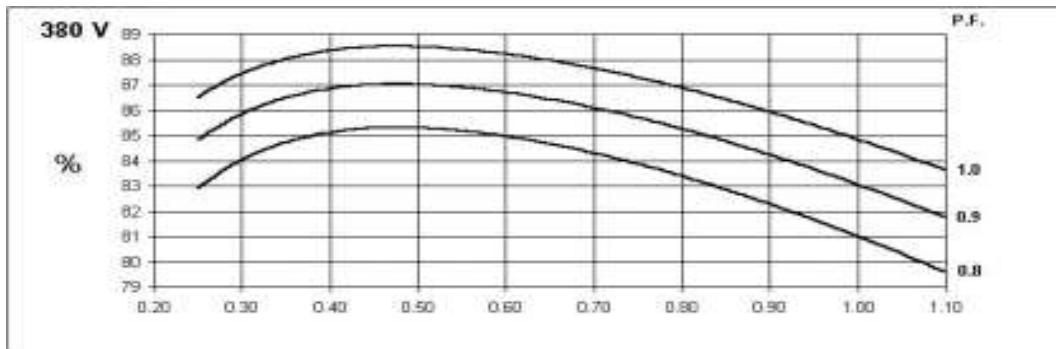
Note: Continuous development of our products entitles us to change specification details without notice, therefore they must not be regarded as binding.

A.R.K164D
Parameters (WINDING 311)

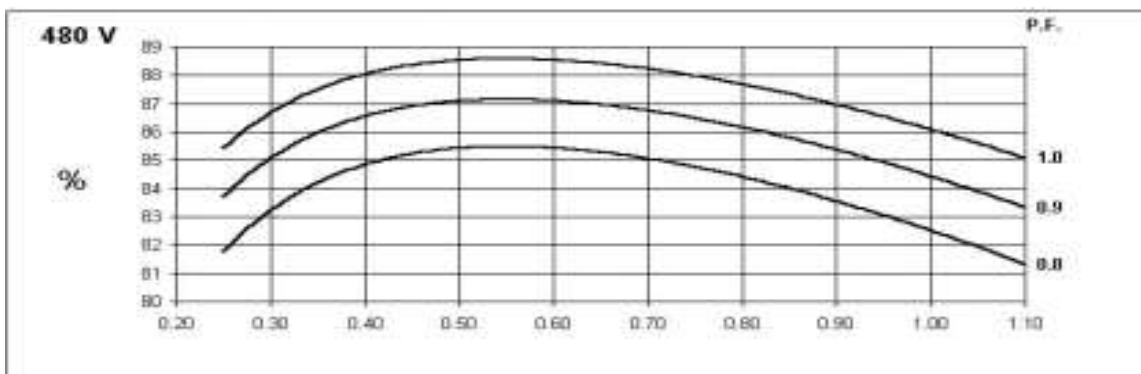
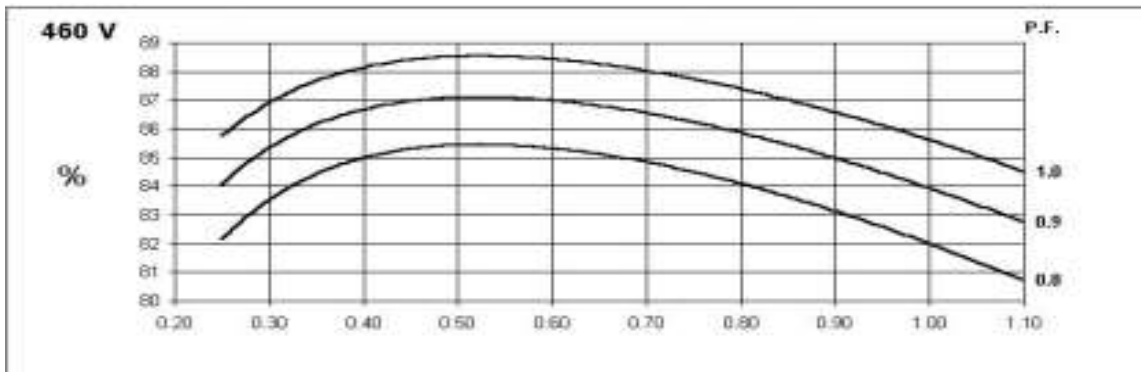
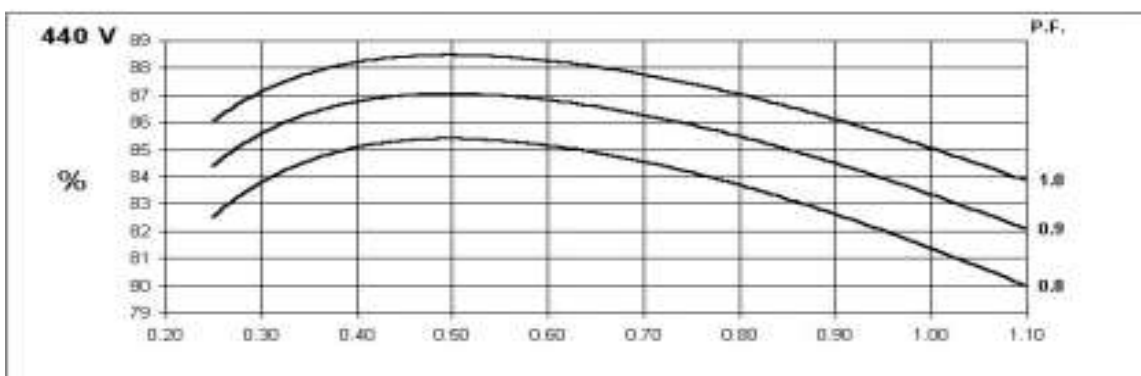
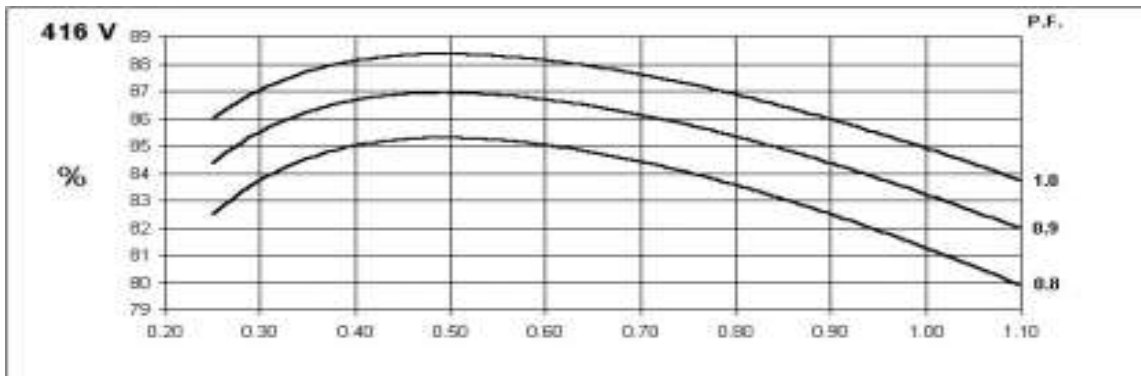
CONTROL SYSTEM	SELF EXCITED
A.V.R.	OPTIONAL SX440
VOLTAGE REGULATION	± 1.0 %
SUSTAINED SHORT CIRCUIT	>300% OF RATED CURRENT

INSULATION SYSTEM	H							
RATED POWER FACTOR	0.8							
PROTECTION	IP23							
STATOR WINDING	DOUBLE LAYER WITH AUXILIARY WINDING							
ROTOR WINDING	WITH DAMPING CAGE							
PITCH	2/3							
WINDING LEADS	12							
STATOR WDG. RESISTANCE	0.645 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED							
ROTOR WDG. RESISTANCE	0.56 Ohms at 22°C							
R.F.I. SUPPRESSION	BS EN 61000-6-2 & BS EN 61000-6-4,VDE 0875G, VDE 0875N. refer to factory for others							
WAVEFORM DISTORTION	NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%							
MAXIMUM OVERSPEED	2250 Rev/Min							
BEARING DRIVE END	BALL. 6309 - 2RS. (ISO)							
BEARING NON-DRIVE END	BALL. 6306 - 2RS. (ISO)							
	1 BEARING				2 BEARING			
WEIGHT COMP. GENERATOR	109 kg				112 kg			
WEIGHT WOUND STATOR	34.5 kg				34.5 kg			
WEIGHT WOUND ROTOR	33.72 kg				34.5 kg			
WR² INERTIA	0.1278 kgm2				0.1279 kgm2			
SHIPPING WEIGHTS in a crate	116 kg				122 kg			
PACKING CRATE SIZE	64 x 54 x 72 (cm)				64 x 54 x 72 (cm)			
	50HZ				60HZ			
TELEPHONE INTERFERENCE	THF<2%				TIF<50			
COOLING AIR	0.071 m³/sec 150 cfm				0.09 m³/sec 191 cfm			
VOLTAGE SERIES STAR	380/220	400/231	415/240	440/254	416/240	440/254	460/266	480/277
VOLTAGE PARALLEL STAR	190/110	200/115	208/120	220/127	208/120	220/127	230/133	240/138
VOLTAGE SERIES DELTA	220/110	230/115	240/120	254/127	240/120	254/127	266/133	277/138
kVA BASE RATING FOR REACTANCE VALUES	16	16	16	13.5	18.9	20	20	20
Xd DIR. AXIS SYNCHRONOUS	1.921	1.734	1.611	1.698	2.272	2.149	1.966	1.806
X'd DIR. AXIS TRANSIENT	0.196	0.177	0.164	0.173	0.231	0.219	0.200	0.184
X" d DIR. AXIS SUBTRANSIENT	0.123	0.111	0.103	0.109	0.146	0.138	0.126	0.116
Xq QUAD. AXIS REACTANCE	0.954	0.861	0.800	0.844	1.129	1.068	0.977	0.897
X"q QUAD. AXIS SUBTRANSIENT	0.220	0.199	0.185	0.194	0.260	0.246	0.225	0.207
X L LEAKAGE REACTANCE	0.078	0.070	0.065	0.068	0.092	0.087	0.079	0.073
X 2 NEGATIVE SEQUENCE	0.184	0.166	0.154	0.162	0.218	0.206	0.188	0.173
X 0 ZERO SEQUENCE	0.083	0.075	0.070	0.073	0.098	0.093	0.085	0.078
REACTANCES ARE SATURATED	VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED							
T'd TRANSIENT TIME CONST.	0.014s							
T" d SUB-TRANSTIME CONST.	0.0035s							
T'do O.C. FIELD TIME CONST.	0.25s							
Ta ARMATURE TIME CONST.	0.004s							
SHORT CIRCUIT RATIO	1/Xd							

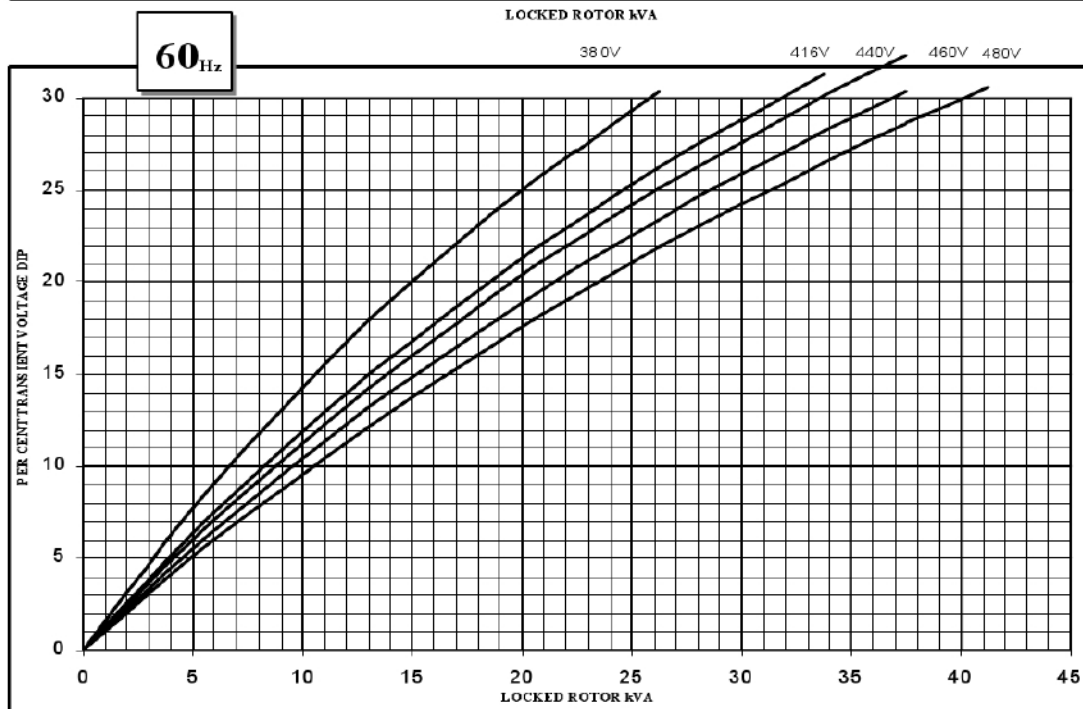
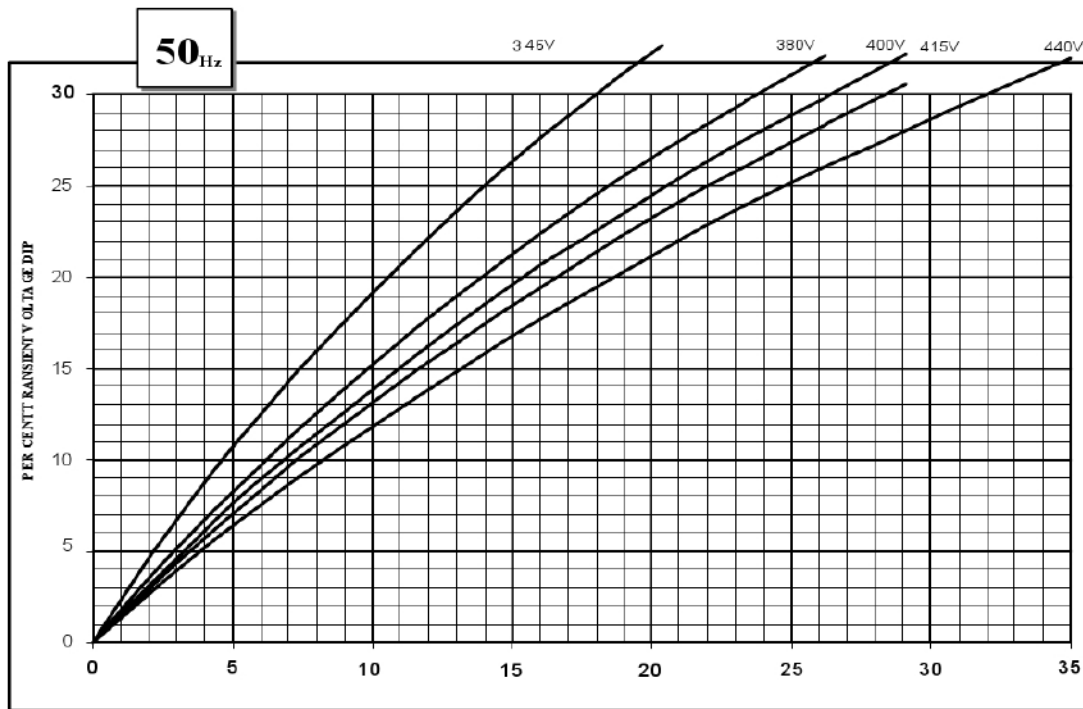
A.R.K164D
Three Phase Efficiency Curves (WINDING 311) 50HZ



A.R.K164D
Three Phase Efficiency Curves (WINDING 311) 60HZ



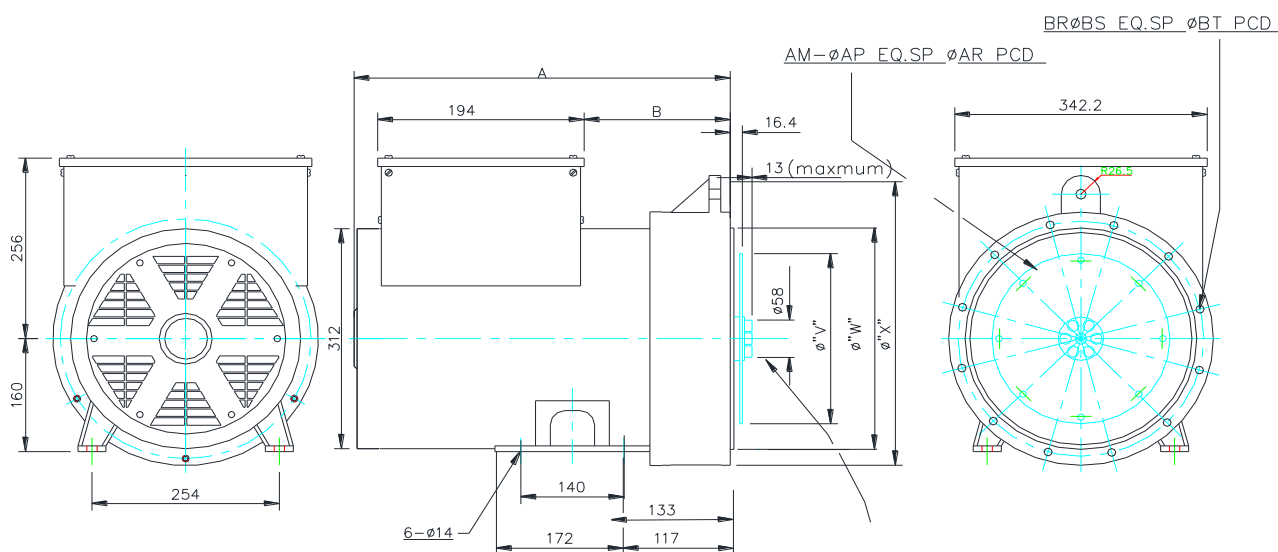
A.R.K164D
Locked Rotor Motor Starting Curve (Winding 311)



RATINGS

Class - Temp Rise				Cont. F - 105/40°C				Cont. H - 125/40°C				Standby - 150/40°C				Standby - 163/27°C			
50HZ	Series Star (V)			380	400	415	440	380	400	415	440	380	400	415	440	380	400	415	440
	Parallel S tar (V)			190	200	208	220	190	200	208	220	190	200	208	220	190	200	208	220
	Series Delta (V)□			220	230	240	254	220	230	240	254	220	230	240	254	220	230	240	254
	kVA			15.0	15.0	15.0	12.7	16.0	16.0	16.0	13.5	17.5	17.5	17.5	17.0	18.9	18.9	18.9	18.4
	kW			12.0	12.0	12.0	10.2	12.8	12.8	12.8	10.8	14.0	14.0	14.0	13.6	15.1	15.1	15.1	14.7
Efficiency (%)				81.8	82.4	82.8	83.2	81.0	81.7	82.1	82.6	78.1	78.6	78.8	79.3	77.5	78.1	78.4	79.0
Class - Temp Rise				Cont. F - 105/40°C				Cont. H - 125/40°C				Standby - 150/40°C				Standby - 163/27°C			
60HZ	Series Star (V)			416	440	460	480	416	440	460	480	416	440	460	480	416	440	460	480
	Parallel S tar (V)			208	220	230	240	208	220	230	240	208	220	230	240	208	220	230	240
	Series Delta (V)□			240	254	266	277	240	254	266	277	240	254	266	277	240	254	266	277
	kVA			17.8	18.8	18.8	18.8	18.9	20.0	20.0	20.0	19.0	20.1	20.1	20.1	20.5	21.8	21.8	21.8
	kW			14.2	15.0	15.0	15.0	15.1	16.0	16.0	16.0	15.2	16.1	16.1	16.1	16.4	17.4	17.4	17.4
Efficiency (%)				82.0	82.2	82.7	83.2	81.3	81.4	82.0	82.5	15.2	16.1	16.1	16.1	16.4	17.4	17.4	17.4

DIMENSIONS



		SAE 3		
		MODEL	"A"	"B"
2 POLE 4 POLE	164 A	374,5	103	
	164 B	374,5	103	
	164 C	401,5	117	
	164 D	401,5	117	
	162 D	374,5	103	
	162 E	374,5	103	
	162 F	426,5	142	
	162 G	426,5	142	

2 POLE 4 POLE	SAE 4/5		
	MODEL	"A"	"B"
	164 A	364,5	93
	164 B	364,5	93
	164 C	391,5	107
	164 D	391,5	107
	162 D	364,5	93
	162 E	364,5	93
2 POLE 6 POLE	162 F	416,5	132
	162 G	416,5	132

ADAPTOR									
S.A.E.NO	BR	BS	BT	W	X	U	C	N	AW
3	8	11	428.6	409.5	451	15*	145	129	105
4	8	11	381.0	361.9	402	15*	133	117	93
5	8	11	333.3	314.3	356	22.5*	133	117	93

COUPLING DISC					
SAE	"AN"	"AM"	"AP"	"AR"	"V"
6,5	30,16	6	8,7	200,0	215,8
7,5	30,16	8	8,7	222,2	241,2
8	61,9	6	10,3	244,5	263,4
10	53,98	8	10,3	295,3	314,2
11.5	39,68	8	11	333,3	352,3