maranello alternator

M650

CONT 600 kVA

THREE-PHASE SYNCHRONOUS GENERATOR

Datasheet for 4 poles -50Hz @ 1500rpm/ 60Hz @ 1800rpm

Ambient Temperature	40℃	Method of Cooling	Air cooling
Temperature Rise	125℃	Direction of Rotation	Clockwise
Insulation Class	H	Maximum Over-speed	2250r/min
Power Factor	0.8	Degree of Protection / Enclosure	IP23
Excitation	Brushless	Altitude	1000m
Winding Pitch	2/3	Stator winding	DLL
Pole	4	Number of Terminal	12
Duty	S1- Continuous	Rotor	With damping cage
Waveform	TIF<50	THF<2%	
Waveform distortion	BS EN 61000-6-2&BS EN 61000-6-4,VDE 0875G,VDE0874N		
Radio interference	Noload<1.5%,Non-distorting balanced linear load<5%		

AVR MODEL AVR	Standard	Selection		PMG		
	AS440	KRS440		MX341B	MX321	
Voltage Regulation - in steady state condition	±1.0	±1.0		±0.5	±0.5	
Short Circuit Current Capacity	Control does not sustain a short circuit current			2600A		

Electrical Characteristic

Frequency	Hz	50				60			
Voltage (series star) Y	V	380/220	400/231	415/240	440/254	416/240	440/254	460/266	480/277
Voltage (parallel star) YY	V	190/110	200/115	208/120	220/127	208/120	220/127	230/133	240/138
Voltage (series delta) Δ	V	220	230	240	254	240	254	266	277
Rated power at Class H (125 ºC) temperature rise	kVA	600	610	600	600	681	713	731	750
	kW	480.0	488.0	480.0	480.0	544.8	570.4	584.8	600.0
Efficiency at Class H (P.F.=0.8)	4/4%	94.7	94.9	95	95.1	94.8	94.9	95	95
	3/4%	95.3	95.4	95.5	95.5	95.3	95.4	95.4	95.4
	2/4%	95.4	95.4	95.3	95.2	95.2	95.2	95.2	95.2
Efficiency at Class H (P.F.=1.0)	4/4%	95.9	96	96.1	96.2	95.9	96	96	96
	3/4%	96.4	96.4	96.5	96.5	96.3	96.4	96.4	96.4
	2/4%	96.4	96.4	96.3	96.2	96.2	96.2	96.2	96.2
Reactances (%) at Class H									
Direct axis synchronous reactance unsaturated	Xd	3.14	2.88	2.63	2.34	3.53	3.3	3.1	2.92
Direct axis transient reactance saturated	X'd	0.17	0.15	0.14	0.12	0.17	0.16	0.15	0.14
Direct axis subtransient reactance saturated	X"d	0.12	0.11	0.1	0.09	0.12	0.11	0.11	0.1
Quadrature axis synchronous reactance unsaturated	Xq	2.45	2.25	2.05	1.82	2.82	2.64	2.48	2.33
Quadrature axis subtransient reactance saturated	X"q	0.26	0.24	0.22	0.2	0.34	0.32	0.3	0.28
Leakage reactance	X1	0.06	0.05	0.05	0.04	0.06	0.06	0.05	0.05
Negative sequence reactance saturated	X2	0.18	0.16	0.15	0.13	0.23	0.22	0.2	0.19
Zero sequence reactance unsaturated	X0	0.08	0.08	0.07	0.06	0.1	0.09	0.09	0.08
Short-circuit ratio	Kcc	0.3185	0.3472	0.3802	0.4274	0.2833	0.3030	0.3226	0.3425

Short-circuit transient time constant (sec.)	T'd	0.08							
Subtransient time constant (sec.)	T"d	0.012							
Open circuit time constant (sec.)	T'do	2.5							
Armature time constant (sec.)	Tα	0.019							
Stator Winding Resistance (20℃)	ohm	0.0043							
Rotor Winding Resistance (20℃)	ohm	1.96							
Exciter Stator Resistance (20℃)	ohm	17							
Exciter Rotor Phase resistance	ohm	0.092							
No load excitation current	io (A)	0.59	0.6	0.63	0.64	0.59	0.6	0.61	0.64
Full load excitation current	ic(A)	2.4	2.4	2.5	2.5	2.4	2.4	2.5	2.5
Cooling air requirement	m^3/sec	1.035m3/s 2202cfm				1.312m3/s 2780cfm			

Mechanical Characteristic

Configuration	Single Bearing	Double Bearing
Type of Construction	B2-SAE	IM B34
Total Weight - kgs	1459	1440
Weight wound stator - kgs	684	684
Weight wound rotor - kgs	617	588
Inertia (J) [kgm2]	8.9828kgm2	8.7049kgm2
Drive end bearing / Lubrication		BALL.6220-2RS(ISO)
Non-drive end bearing / Lubrication	BALL.6314-2RS(ISO)	BALL.6314-2RS(ISO)
Packing crate size（cm）	138X80X115	149X80X115

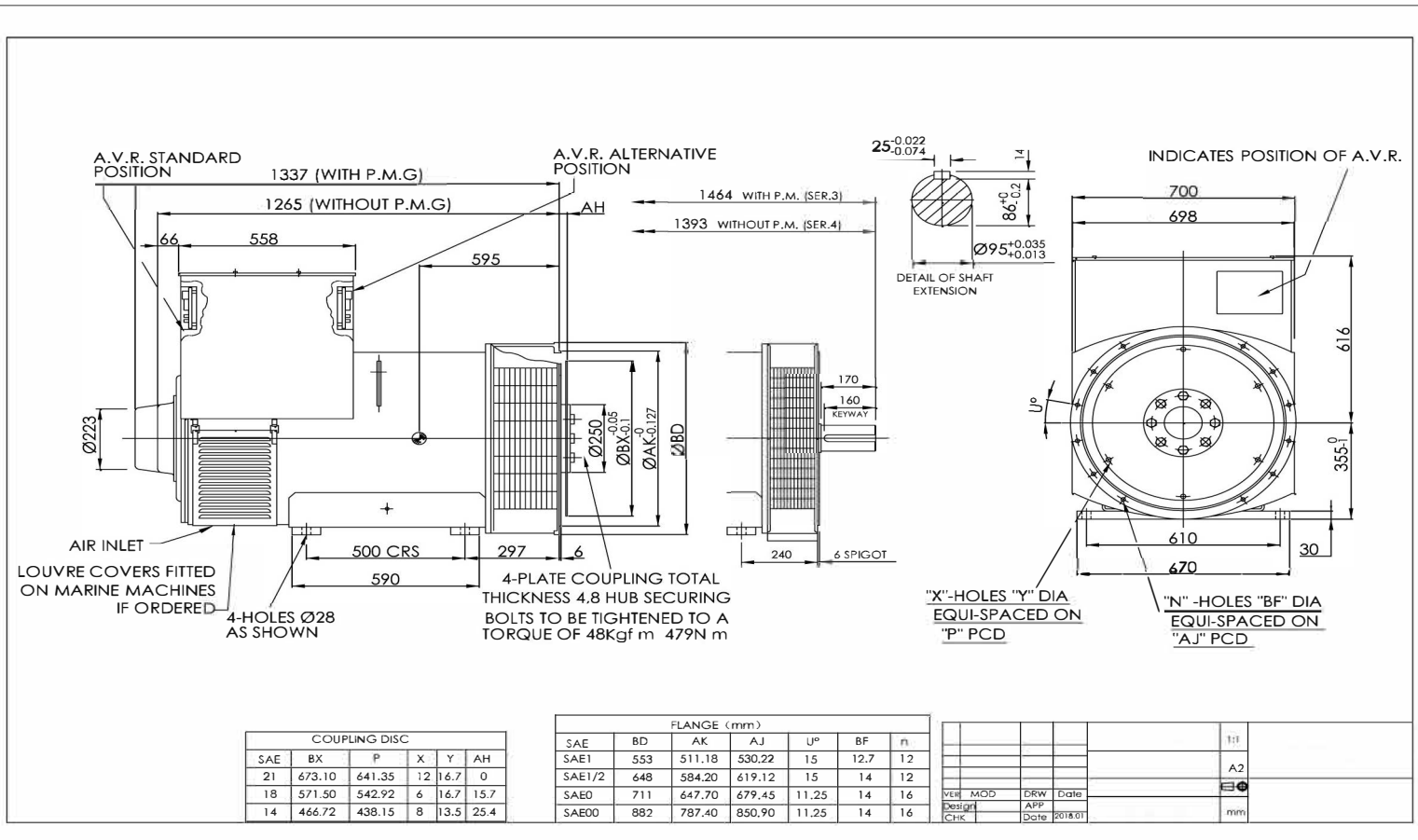
Winding 311 0.8 Power Factor

RATINGS

	Class - Temp Rise	Cont. F - 105/40°C				Cont. H - 125/40°C				Standby - 150/40°C				Standby - 163/27°C			
50 Hz	Series Star (V)	380	400	415	440	380	400	415	440	380	400	415	440	380	400	415	440
	Parallel Star (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	550	560	550	550	600	610	600	600	636	640	636	636	660	665	660	660
	kW	440	448	440	440	480	488	480	480	509	512	509	509	528	532	528	528
	Efficiency (%)	95.0	95.1	95.2	95.3	94.7	94.9	95.0	95.2	94.5	94.7	94.8	95.0	94.3	94.5	94.7	94.9
	kW Input	463	471	462	462	507	514	505	504	538	541	537	536	560	563	558	556

60 Hz	Series Star (V)	416	440	460	480	416	440	460	480	416	440	460	480	416	440	460	480
	Parallel Star (V)	208	220	230	240	208	220	230	240	208	220	230	240	208	220	230	240
	Delta (V)	240	254	266	277	240	254	266	277	240	254	266	277	240	254	266	277
	kVA	625	650	663	675	681	713	731	750	719	750	780	800	738	769	798	819
	kW	500	520	530	540	545	570	585	600	575	600	624	640	590	615	638	655
	Efficiency (%)	95.0	95.1	95.2	95.3	94.8	94.9	95.0	95.0	94.6	94.7	94.8	94.8	94.5	94.6	94.7	94.8
	kW Input	526	547	557	567	575	601	616	632	608	634	658	675	625	650	674	691

DIMENSIONS



COUPLING DISC					
SAE	BX	P	X	Y	AH
21	673.10	641.35	12	16.7	0
18	571.50	542.92	6	16.7	15.7
14	466.72	438.15	8	13.5	25.4

FLANGE (mm)						
SAE	BD	AK	AJ	U°	BF	n
SAE1	553	511.18	530.22	15	12.7	12
SAE1/2	648	584.20	619.12	15	14	12
SAE0	711	647.70	679.45	11.25	14	16
SAE00	882	787.40	850.90	11.25	14	16

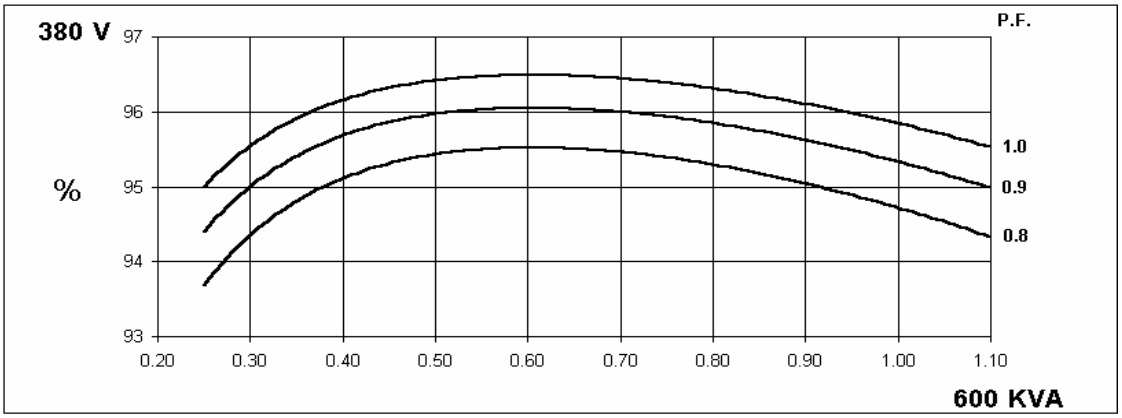
VER	MOD	DRW	Date
Design		APP	
CHK		Date	2018.01

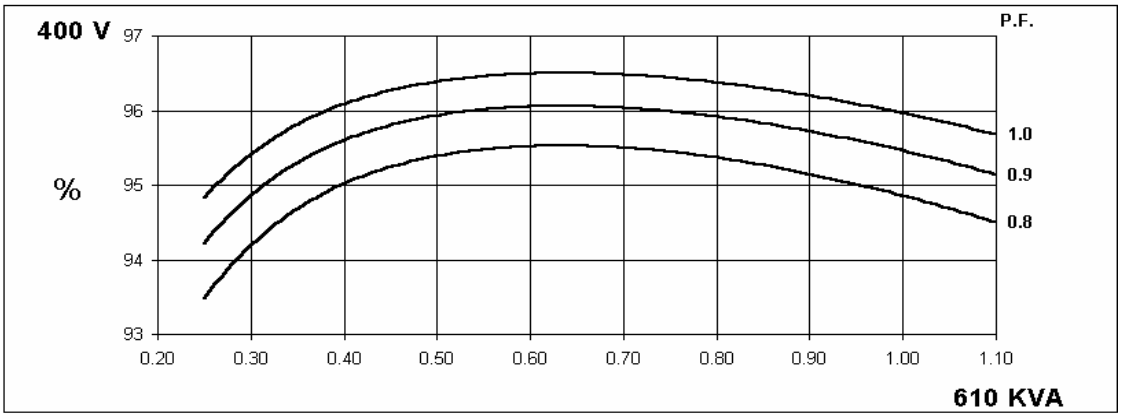
1:1 A2 mm

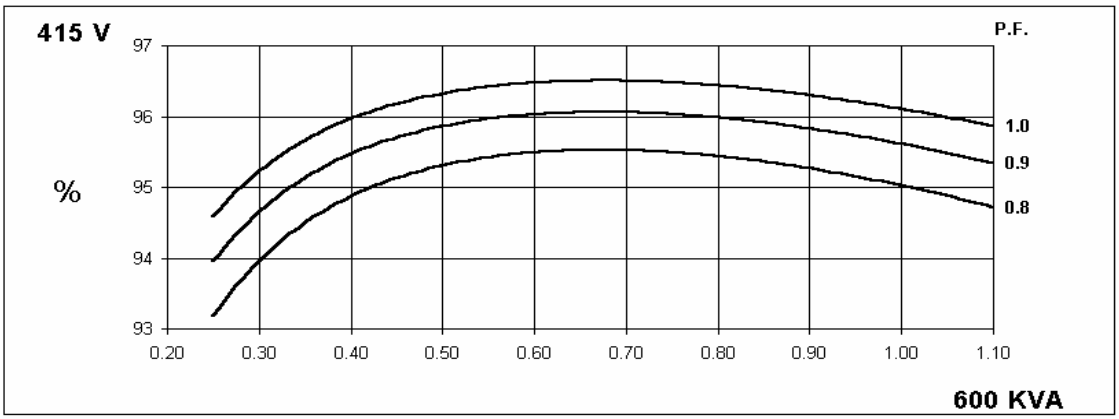
50 Hz

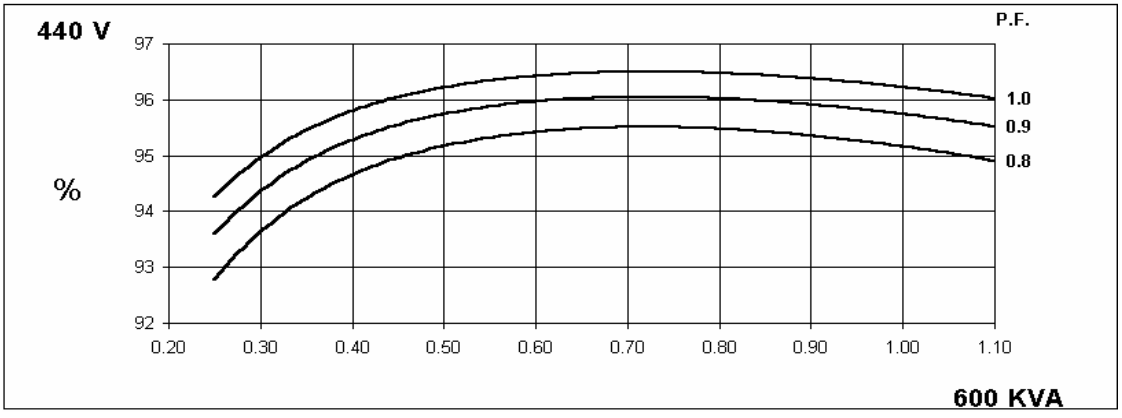
Winding 311

THREE PHASE EFFICIENCY CURVES





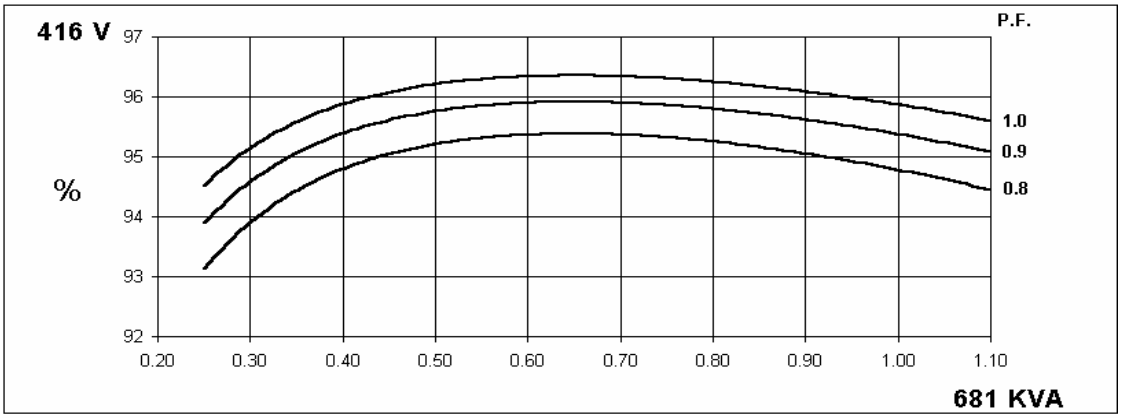


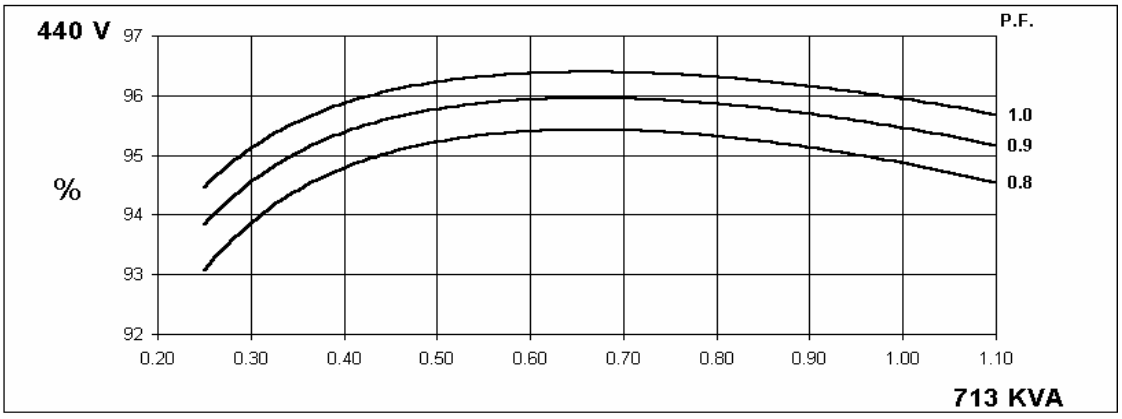


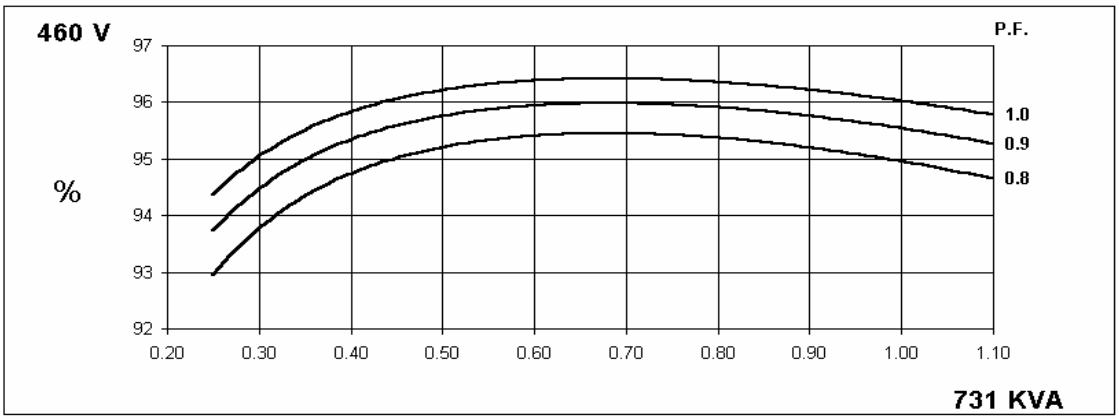
60 Hz

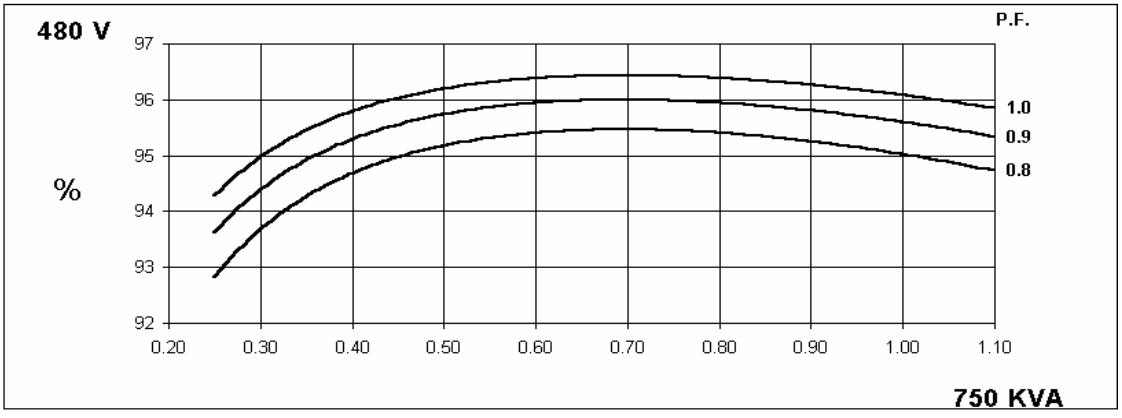
Winding 311

THREE PHASE EFFICIENCY CURVES



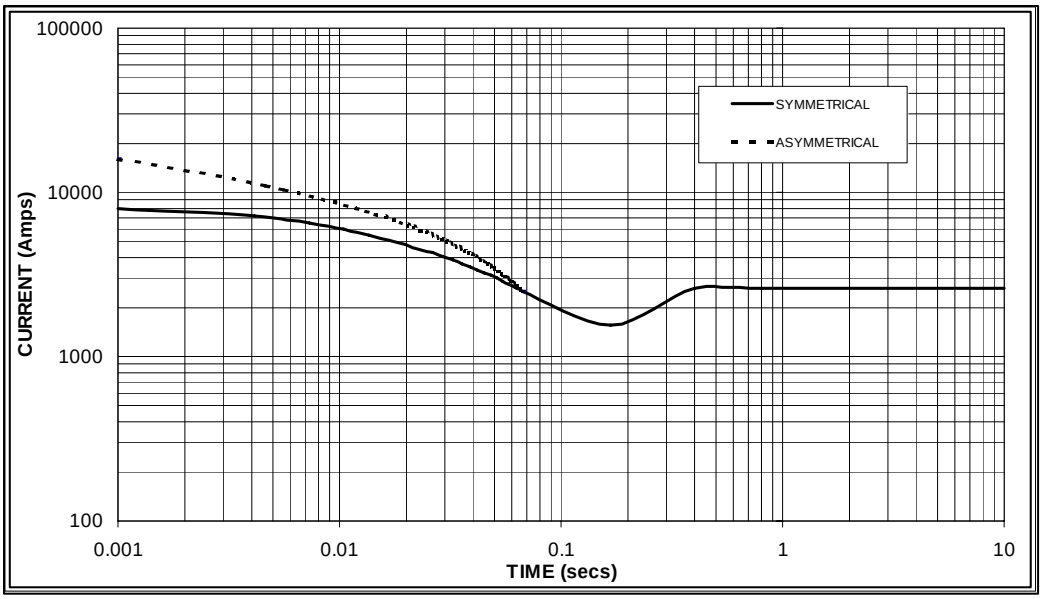






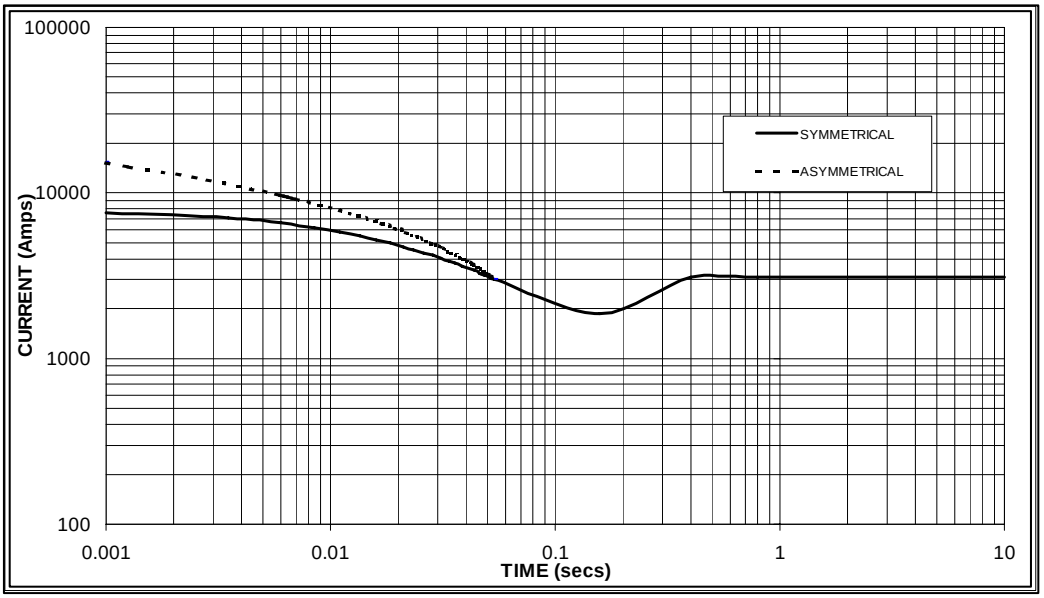
Three-phase Short Circuit Decrement Curve. No-load Excitation at Rated Speed
Based on star (wye) connection.

50 Hz



Sustained Short Circuit = 2,600 Amps

60 Hz



Sustained Short Circuit = 3,100 Amps

Note 1

The following multiplication factors should be used to adjust the values from curve between time 0.001 seconds and the minimum current point in respect of nominal operating voltage :

50Hz		60Hz	
Voltage	Factor	Voltage	Factor
380v	X 1.00	416v	X 1.00
400v	X 1.06	440v	X 1.06
415v	X 1.09	460v	X 1.12
440v	X 1.12	480v	X 1.20

The sustained current value is constant irrespective of voltage level

Note 2

The following multiplication factor should be used to convert the values calculated in accordance with NOTE 1 to those applicable to the various types of short circuit :

	3-phase	2-phase L-L	1-phase L-N
Instantaneous	x 1.00	x 0.87	x 1.30
Minimum	x 1.00	x 1.80	x 3.20
Sustained	x 1.00	x 1.50	x 2.50
Max. sustained duration	10 sec.	5 sec.	2 sec.

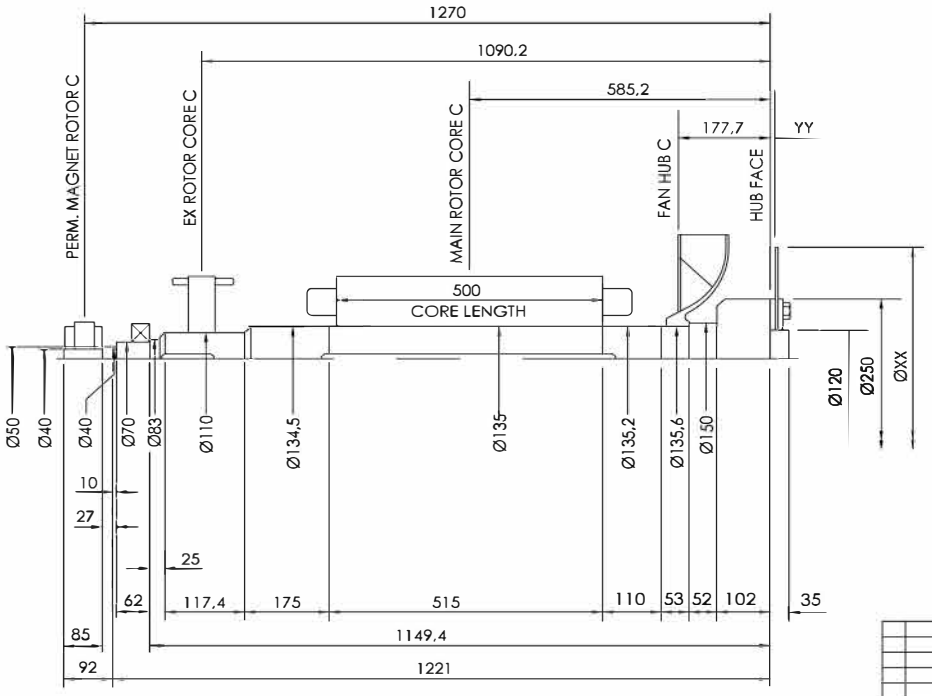
All other times are unchanged

Note 3

Curves are drawn for Star (Wye) connected machines. For other connection the following multipliers should be applied to current values as shown :

Parallel Star = Curve current value X 2

Series Delta = Curve current value X 1.732



COMPONENT	Wt kg	J kgm^2
EX. ROTOR	31,290	0,5100
MAIN ROTOR	411.7	7.529
FAN	12.53	0,393
SHAFT	129.664	0,287
HUB	23.922	0,2455
TOTAL	609.106	8.9645
PERM. MAG.	7.899	0,0183
TOTAL	617.005	8.9828

COUPLING SAE No	COUPLING DIMEN's		COUPLING ASSEMBLY WEIGHT kg	COUPLING DISC J kgm^2
	XX	YY		
11,5	352	23,8	12,08	0,055
14	467	9,5	11,66	0,172
18	572	0,0	12,07	0,386

					1:1
VER	MOD	DRW	Date		
Design		APP			
CHK		Date	2018.01		mm

Şerifali, Tavukçuyolu Cd No:200, 34775 Ümraniye/İstanbul
+90 216 312 79 79
www.maranellogenerators.com
info@maranellogenerators.com