

QYI354E

THREE-PHASE SYNCHRONOUS GENERATOR WINDING QY311 Datasheet for 4 poles -50Hz @ 1500rpm/ 60Hz @ 1800rpm

THREE-PHASE SYNCHRONOUS GENERATOR									
WINDING QY311 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 °C) 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	X _d	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	X _q	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	X _l	0.06	0.05	0.05	0.04	0.06	0.06	0.05	0.05
Negative sequence reactance saturated	X ₂	0.18	0.16	0.15	0.13	0.23	0.22	0.2	0.19
Zero sequence reactance unsaturated	X ₀	0.08	0.08	0.07	0.06	0.1	0.09	0.09	0.08
Short-circuit ratio	K _{cc}	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.)	T _α	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	i _o (A)	0.59	0.6	0.63	0.64	0.59	0.6	0.61	0.64
Full load excitation current	i _c (A)	2.4	2.4	2.5	2.5	2.4	2.4	2.5	2.5
Cooling air requirement	m ³ /sec	1.035m ³ /s 2202cfm				1.312m ³ /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) [kgm ²]	8.9828kgm ²				8.7049kgm ²				
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				

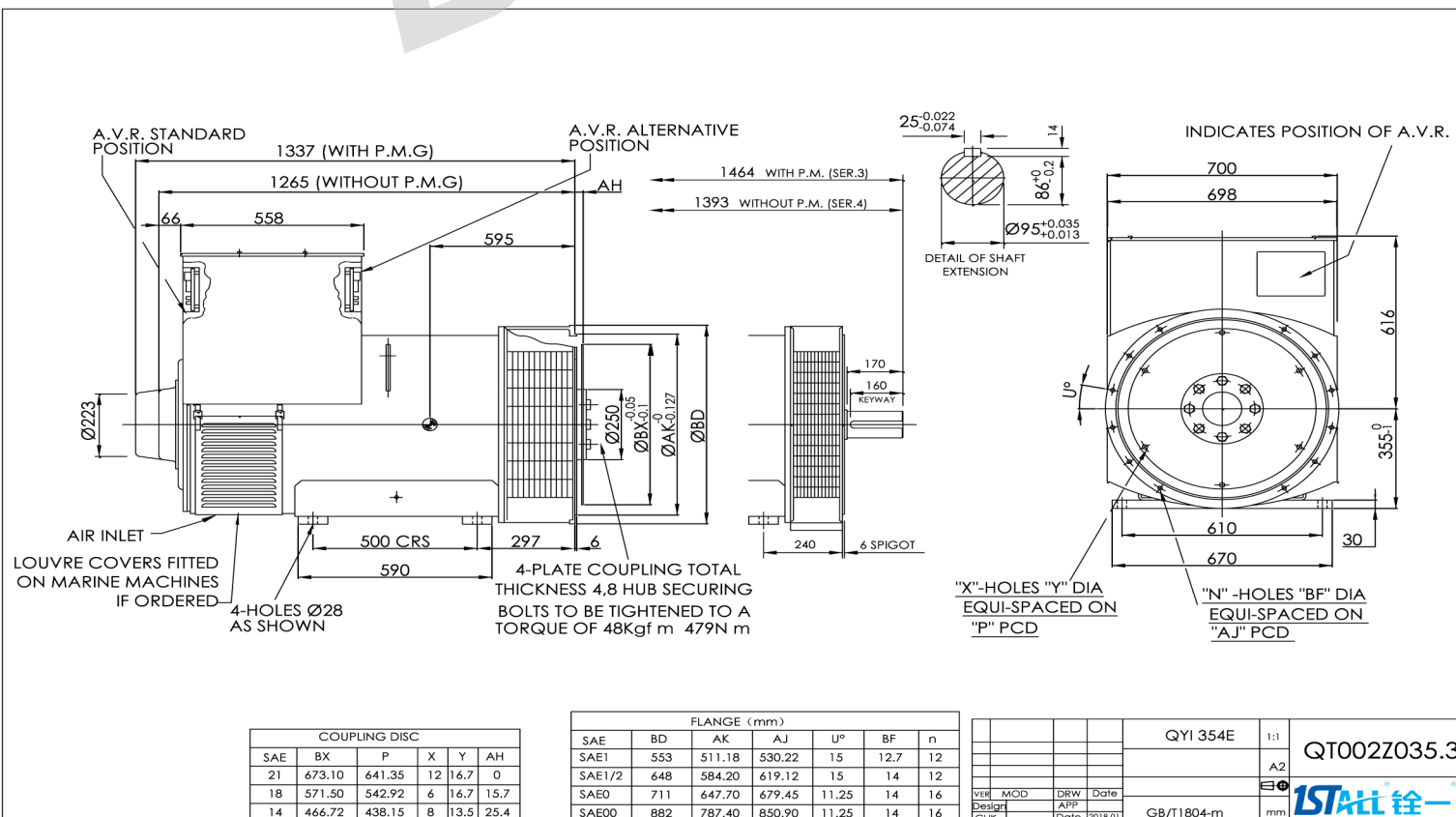
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Winding 311 0.8 Power Factor

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

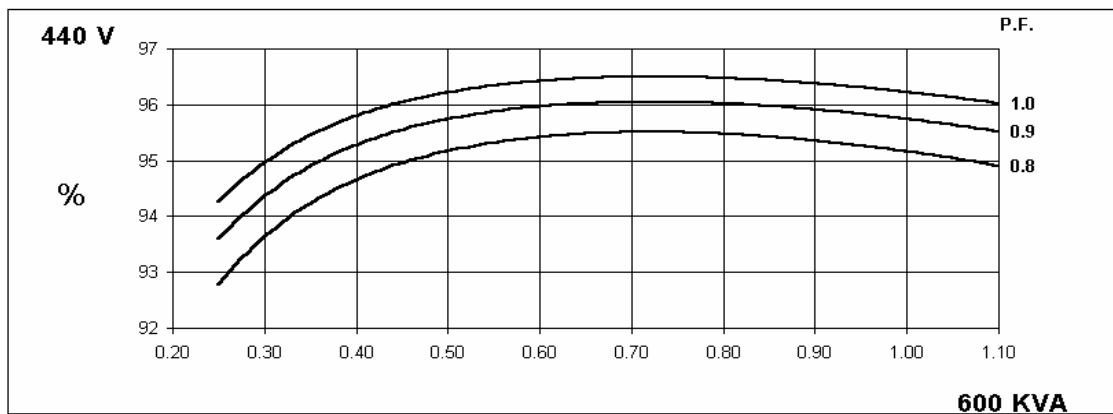
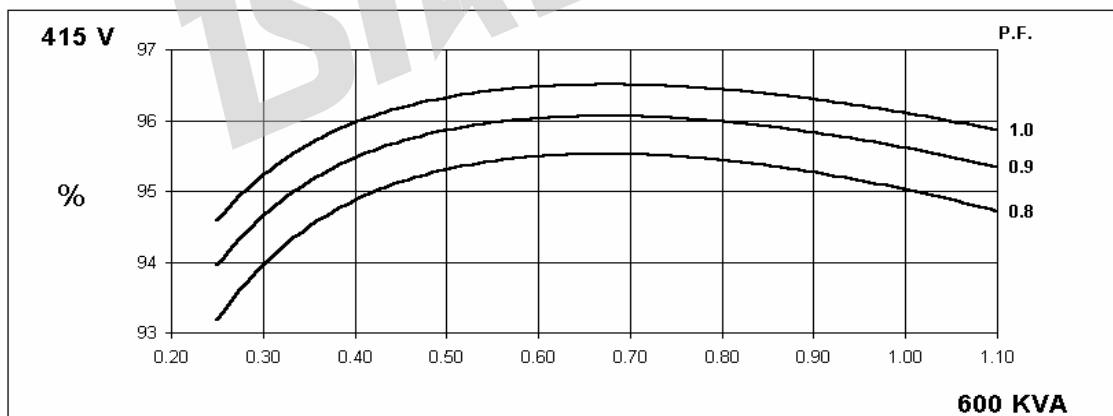
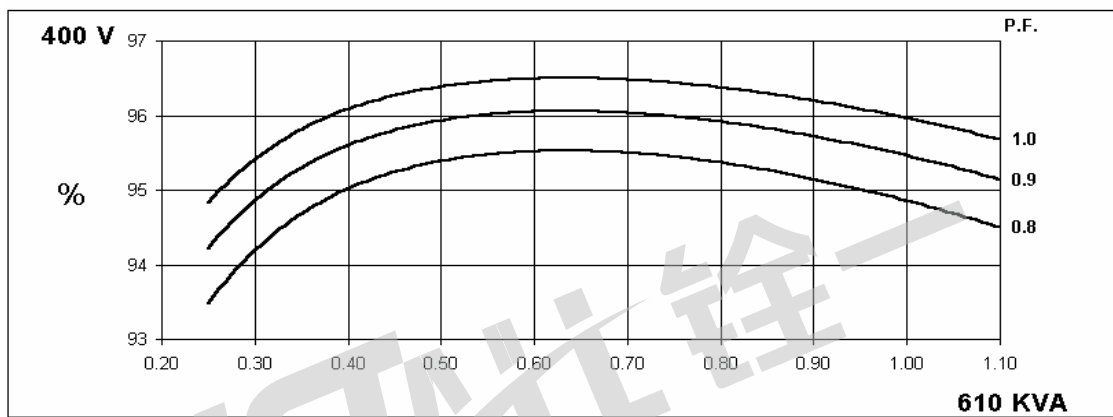
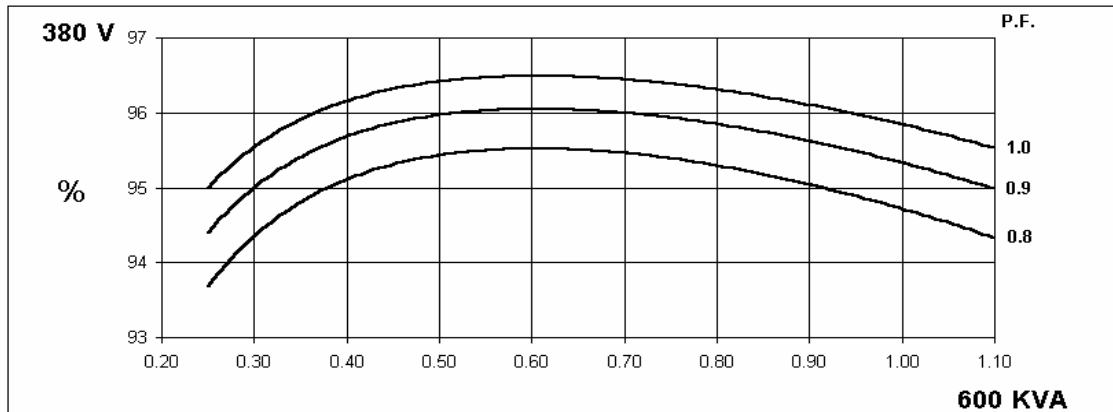
DIMENSIONS



50
Hz

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Winding 311

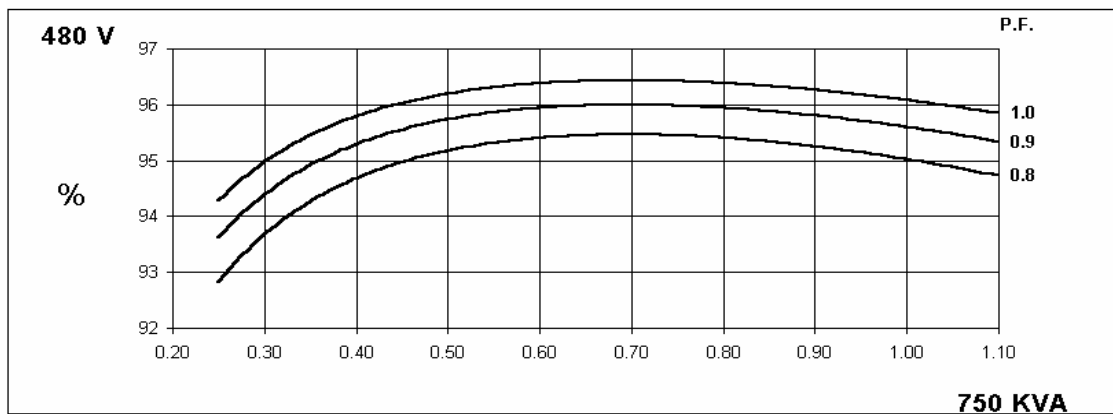
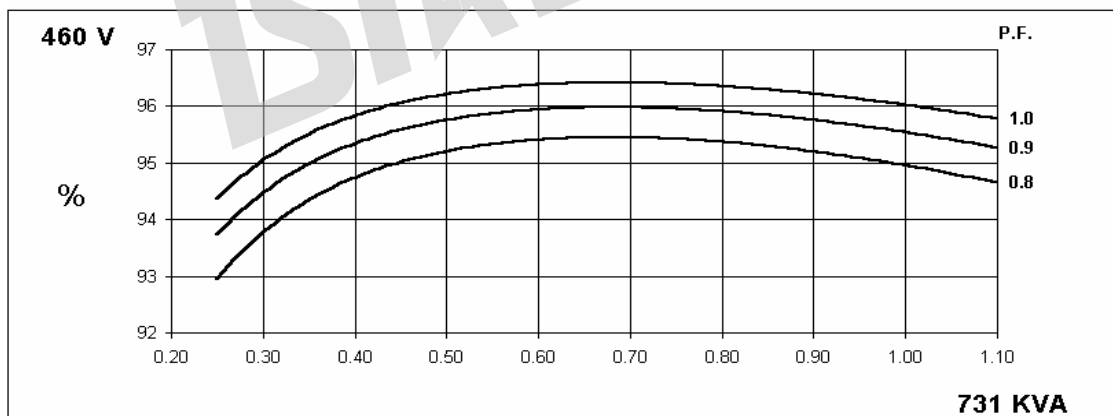
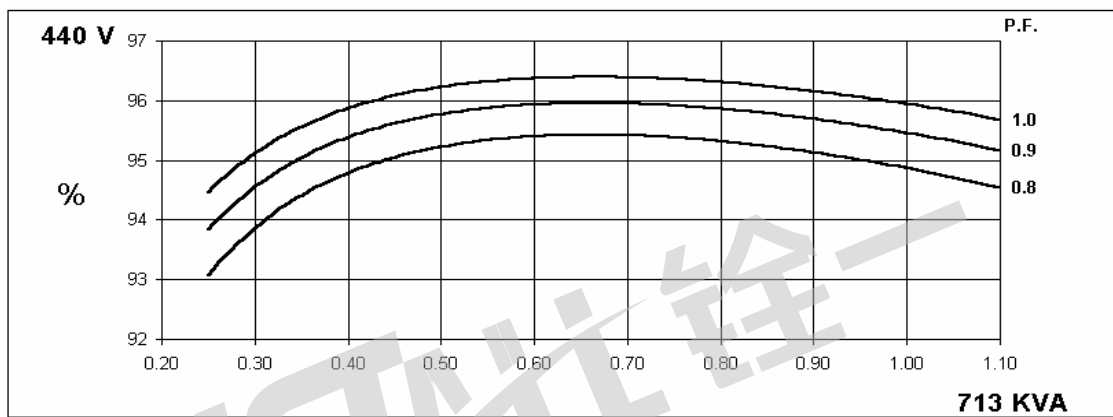
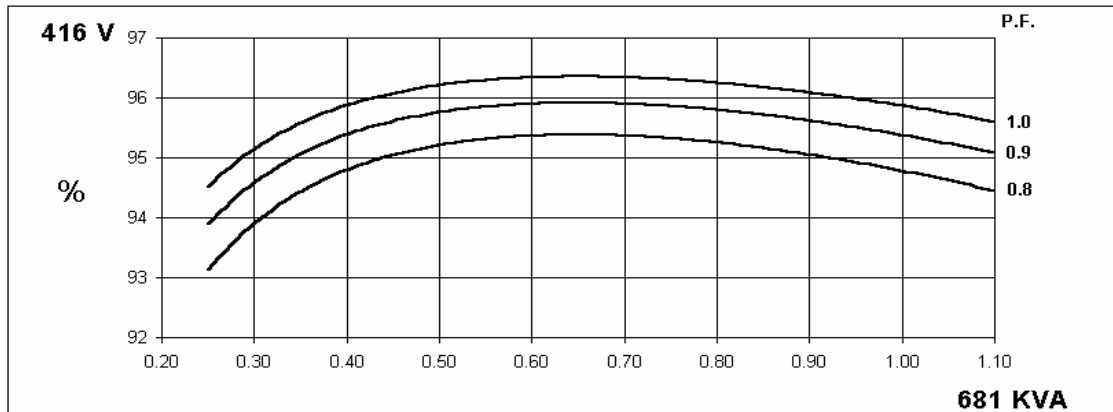
THREE PHASE EFFICIENCY CURVES



60
Hz

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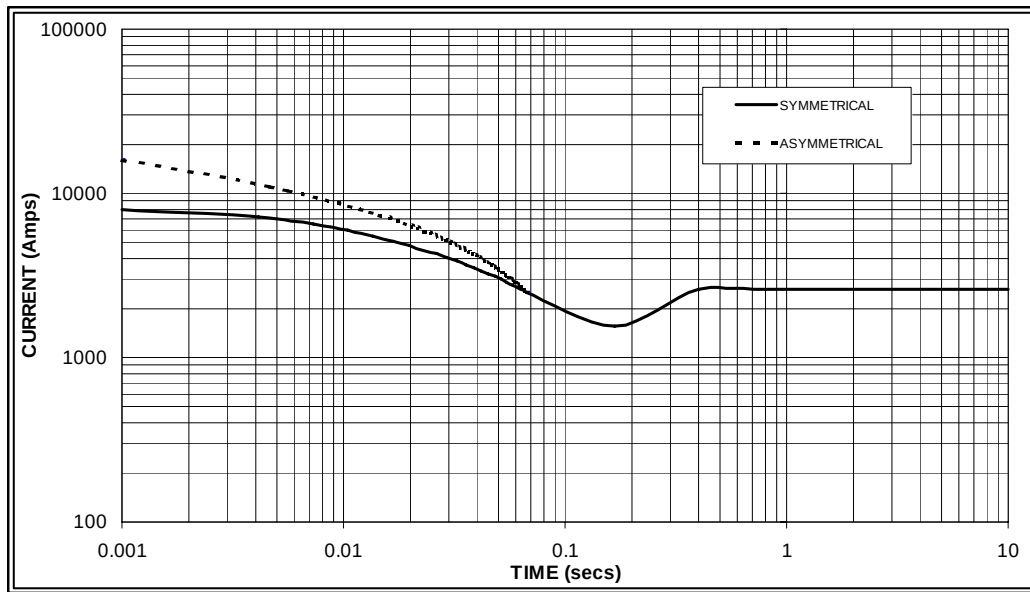
THREE PHASE EFFICIENCY CURVES



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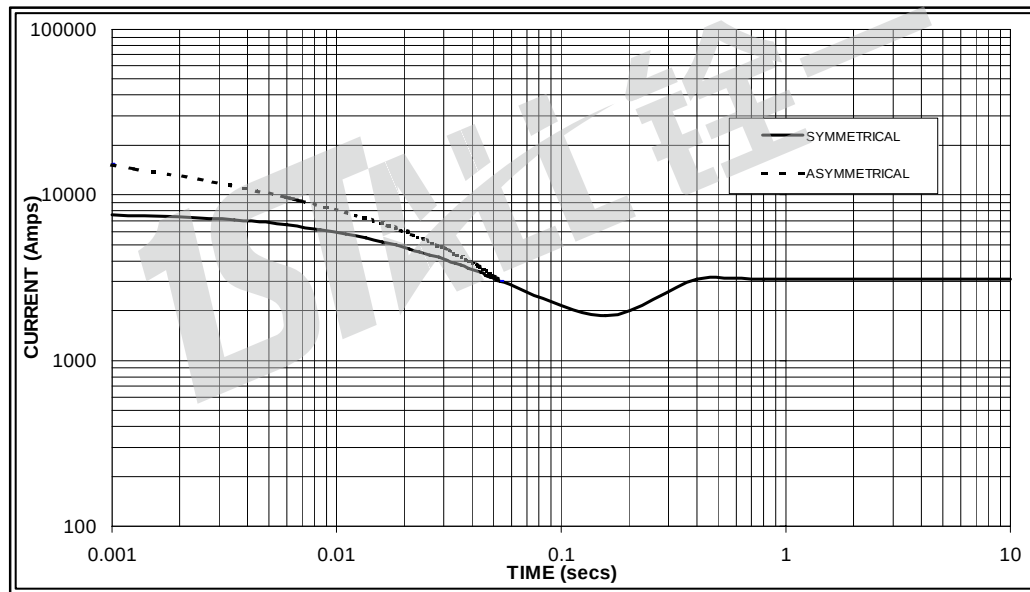
Three-phase Short Circuit Decrement Curve. No-load Excitation at Rated Speed Based on star (wye) connection.

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

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INERTIA

