

QYI354D

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					2400A			
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 ℃) temperature rise	kVA	500	550	500	500	575	594	625	644
	kW	400.0	440.0	400.0	400.0	460.0	475.2	500.0	515.2
Efficiency at Class H (P.F.=0.8)	4/4%	94.4	94.3	94.8	94.9	94.4	94.6	94.7	94.7
	3/4%	95.1	95.1	95.2	95.2	95	95.1	95.1	95.1
	2/4%	95.1	95.1	95	94.9	94.9	94.9	94.9	94.9
Efficiency at Class H (P.F.=1.0)	4/4%	95.6	95.6	95.9	96	95.6	95.8	95.8	95.8
	3/4%	96.2	96.2	96.2	96.2	96	96.1	96.1	96.1
	2/4%	96.1	96.2	96	96	95.9	95.9	96	96
Reactances (%) at Class H									
Direct axis synchronous reactance unsaturated	Xd	3.02	2.99	2.53	2.25	3.52	3.25	3.13	2.96
Direct axis transient reactance saturated	X'd	0.16	0.15	0.13	0.12	0.17	0.16	0.15	0.14
Direct axis subtransient reactance saturated	X''d	0.11	0.11	0.09	0.08	0.12	0.11	0.11	0.1
Quadrature axis synchronous reactance unsaturated	Xq	2.48	2.46	2.08	1.85	2.87	2.65	2.55	2.41
Quadrature axis subtransient reactance saturated	X''q	0.27	0.28	0.23	0.2	0.31	0.29	0.28	0.26
Leakage reactance	Xl	0.05	0.04	0.04	0.04	0.06	0.06	0.05	0.05
Negative sequence reactance saturated	X2	0.19	0.19	0.16	0.14	0.22	0.2	0.2	0.19
Zero sequence reactance unsaturated	X0	0.1	0.1	0.08	0.07	0.1	0.09	0.09	0.08
Short-circuit ratio	Kcc	0.3311	0.3344	0.3953	0.4444	0.2841	0.3077	0.3195	0.3378
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	2.2							
Armature time constant (sec.)	Tα	0.018							
Stator Winding Resistance (20℃)	ohm	0.00485							
Rotor Winding Resistance (20℃)	ohm	1.77							
Exciter Stator Resistance (20℃)	ohm	17							
Exciter Rotor Phase resistance	ohm	0.092							
No load excitation current	io (A)	0.6	0.61	0.65	0.65	0.6	0.6	0.62	0.65
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	m³/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	1363				1340				
Weight wound stator - kgs	635				635				
Weight wound rotor - kgs	563				535				
Inertia (J) [kgm2]	8.0068kgm2				7.7289kgm2				
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

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	450	495	450	450	500	550	500	500	515	575	515	515	550	590	550	530
	kW	360	396	360	360	400	440	400	400	412	460	412	412	440	472	440	424
	Efficiency (%)	94.8	94.7	95.0	95.1	94.5	94.3	94.8	94.9	94.4	94.1	94.7	94.9	94.1	94.0	94.5	94.8
	kW Input	380	418	379	379	423	467	422	421	436	489	435	434	468	502	466	447
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	519	538	563	588	575	594	625	644	588	625	655	675	606	644	673	694
	kW	415	430	450	470	460	475	500	515	470	500	524	540	485	515	538	555
	Efficiency (%)	94.7	94.8	94.9	94.9	94.5	94.6	94.6	94.7	94.4	94.4	94.5	94.5	94.3	94.3	94.4	94.4
	kW Input	438	454	475	496	487	502	529	544	498	530	554	571	514	546	570	588

Technical Drawing of QT002Z035.2 Coupling

Front View Dimensions:

- Overall Width: 1337 (WITH P.M.G), 1265 (WITHOUT P.M.G)
- Overall Height: 616
- Internal Width: 1464 (WITH P.M. (SER.3)), 1393 (WITHOUT P.M. (SER.4))
- Internal Height: 355
- Flange Thickness: 30
- Keyway Width: 160
- Spigot Length: 240
- Spigot Diameter: 6
- Shaft Extension Detail: $25^{+0.022}_{-0.074}$, 14 , $8c^{+0.035}_{-0.013}$, $\varnothing 95^{+0.035}_{-0.013}$

Side View Dimensions:

- Overall Width: 700
- Overall Height: 616
- Internal Width: 698
- Internal Height: 355
- Flange Thickness: 30
- Keyway Width: 160
- Spigot Length: 240
- Spigot Diameter: 6

Details and Notes:

- A.V.R. STANDARD POSITION** and **A.V.R. ALTERNATIVE POSITION** are indicated for the shaft extension.
- DETAIL OF SHAFT EXTENSION** shows the shaft diameter and keyway dimensions.
- INDICATES POSITION OF A.V.R.** points to the alternative position on the front view.
- "X"-HOLES "Y" DIA EQUI-SPACED ON "P" PCD** and **"N"-HOLES "BF" DIA EQUI-SPACED ON "AJ" PCD** are noted on the side view.
- 4-PLATE COUPLING TOTAL THICKNESS 4.8 HUB SECURING BOLTS TO BE TIGHTENED TO A TORQUE OF 48Kg f m 479 N m** is specified for the coupling disc.
- 4-HOLES $\varnothing 28$ AS SHOWN** are located on the coupling disc.
- AIR INLET** and **LOUVRE COVERS FITTED ON MARINE MACHINES IF ORDERED** are shown on the side view.

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** **2018.01**
GB/T1804-m

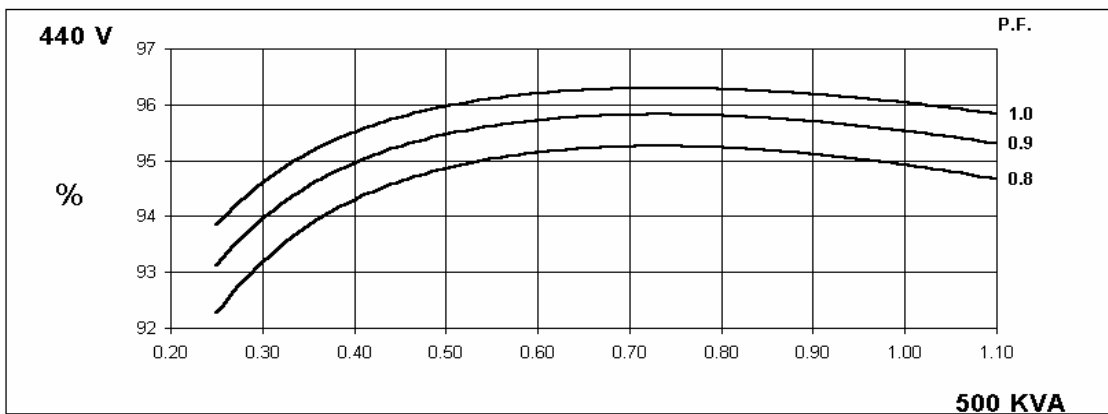
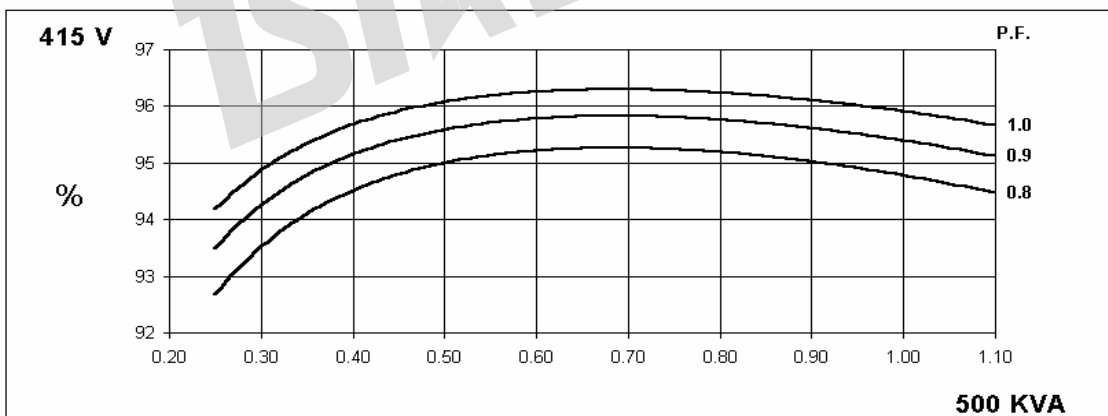
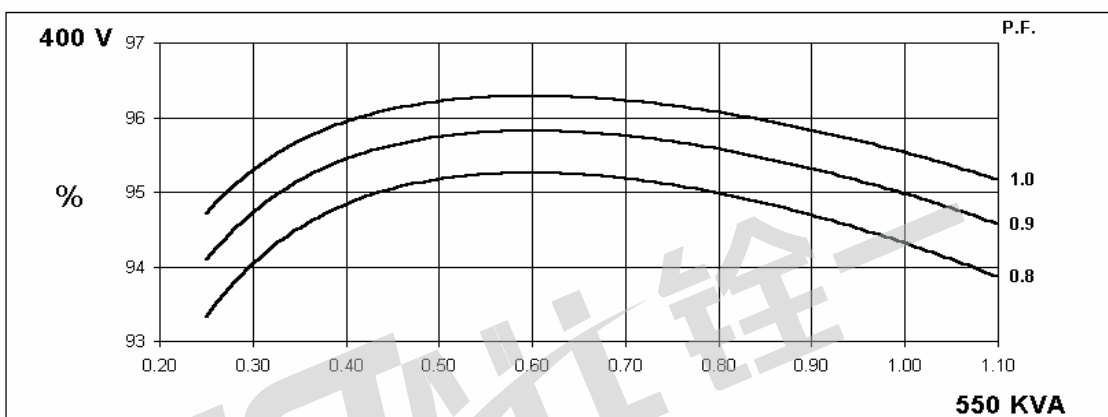
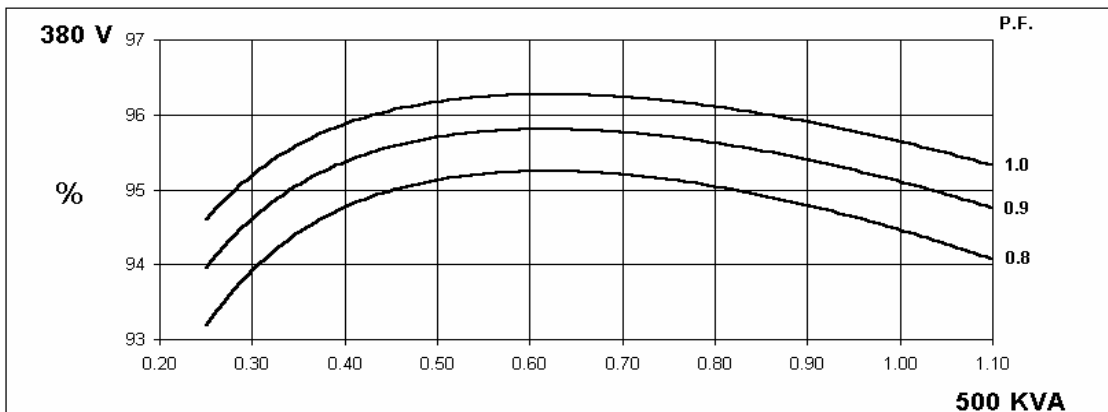
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50
Hz

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Winding 311

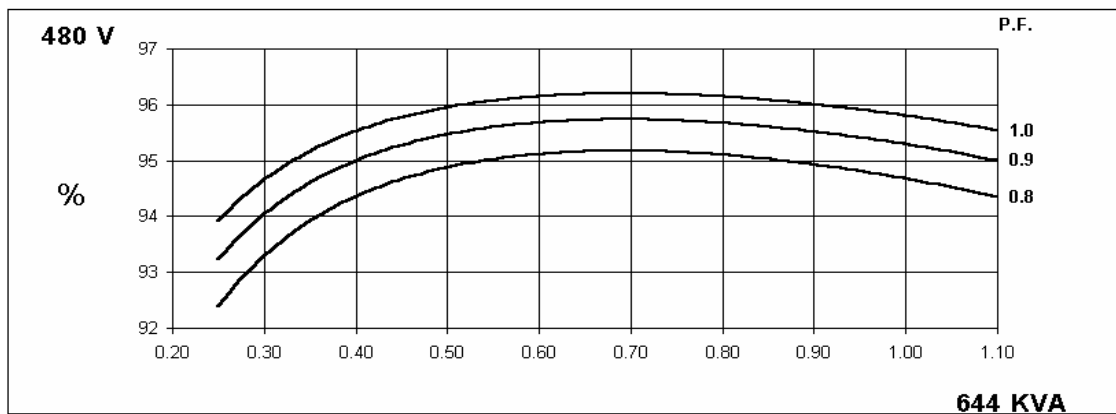
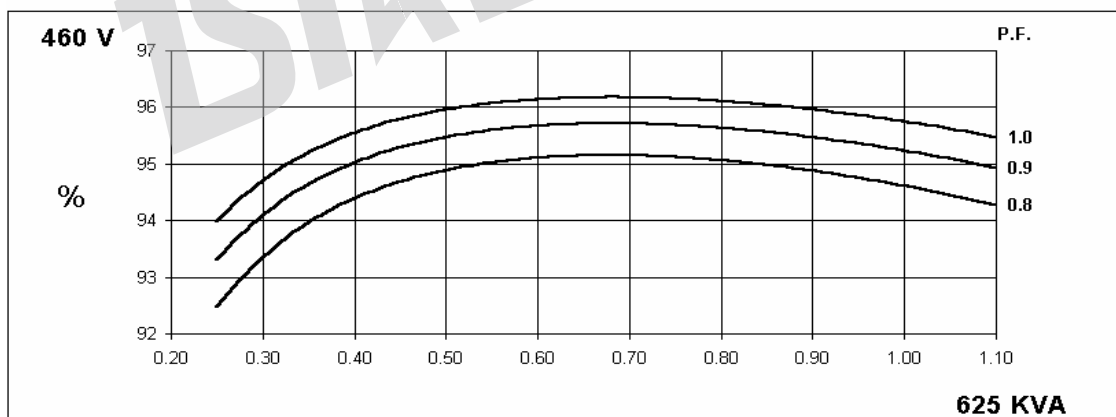
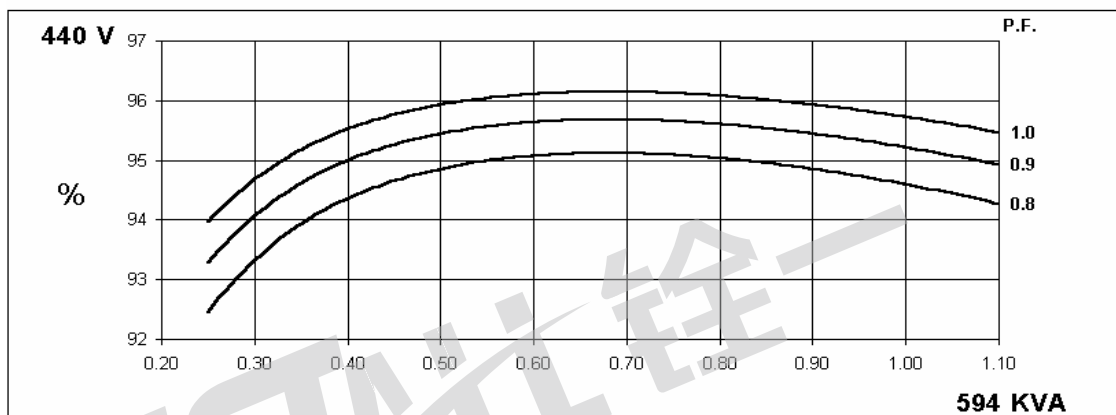
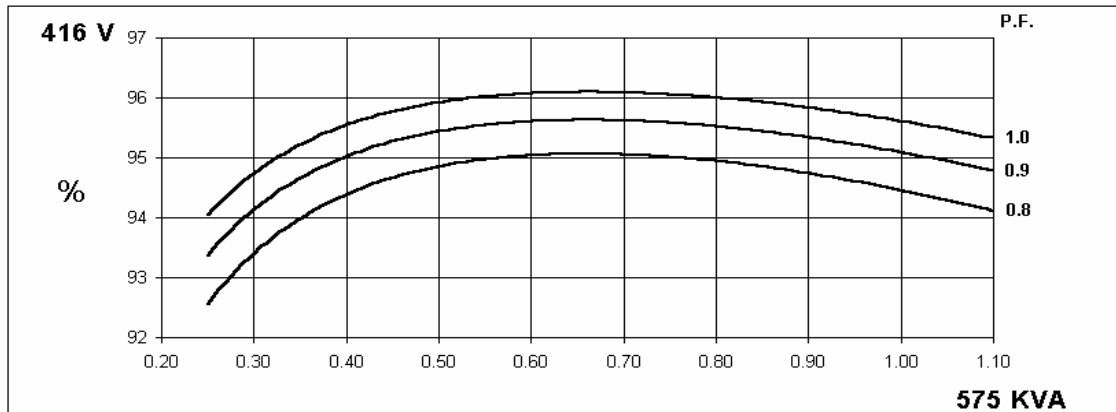
THREE PHASE EFFICIENCY CURVES



60
Hz

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Winding 311

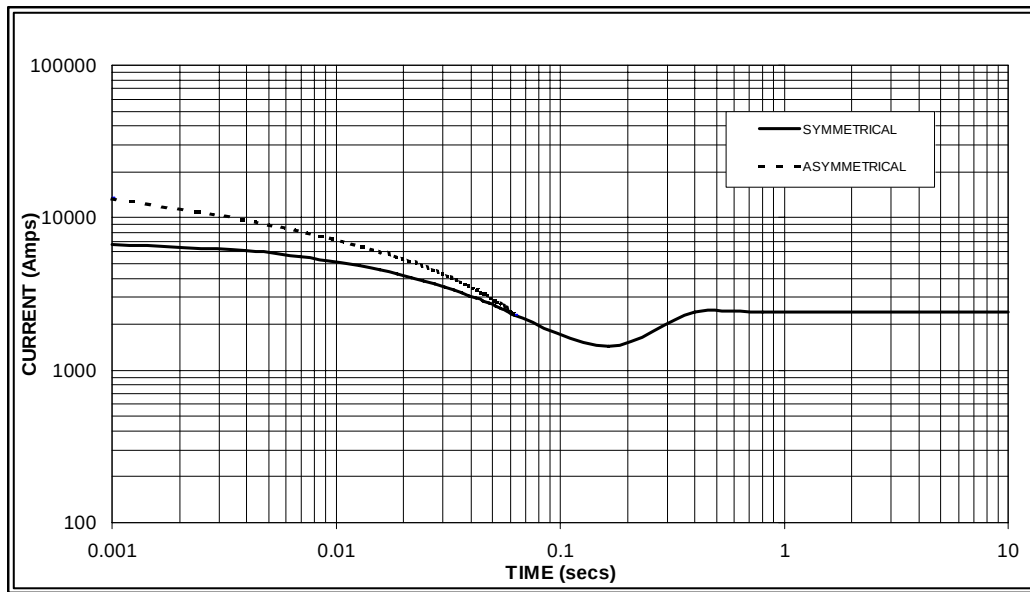
THREE PHASE EFFICIENCY CURVES



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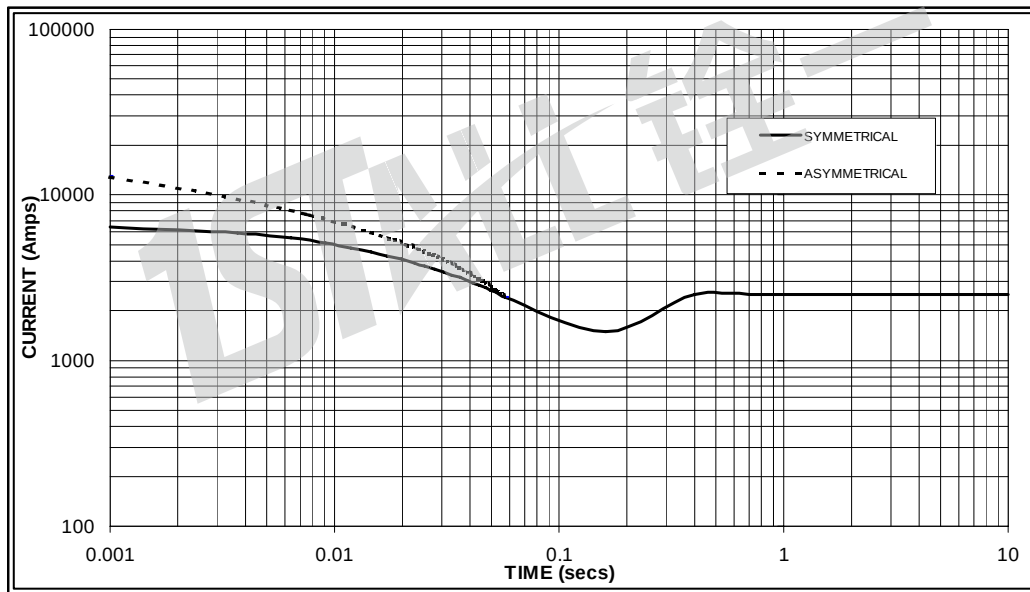
Three-phase Short Circuit Decrement Curve. No-load Excitation at Rated Speed Based on star (wye) connection.

50
Hz



Sustained Short Circuit = 2,400 Amps

60
Hz



Sustained Short Circuit = 2,500 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 connections 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

