

QYI314E

THREE-PHASE SYNCHRONOUS GENERATOR

WINDING QY311 Datasheet for 4 poles -50Hz @ 1500rpm/ 60Hz @ 1800rpm

Ambient Temperature	40 °C					Method of Cooling	Air cooling							
Temperature Rise	125 °C					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	No load<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				1500A									
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	350	350	350	350	400	420	440	440					
	kW	280.0	280.0	280.0	280.0	320.0	336.0	352.0	352.0					
Efficiency at Class H (P.F.=0.8)	4/4%	93.2	93.4	93.6	93.8	93.3	93.4	93.4	93.7					
	3/4%	94.2	94.3	94.3	94.3	94.3	94.3	94.4	94.4					
	2/4%	94.3	94.5	94.4	94.2	94.4	94.4	94.4	0.3					
Efficiency at Class H (P.F.=1.0)	4/4%	94.6	94.8	95	95.1	94.8	94.8	94.9	95					
	3/4%	95.5	95.7	95.6	95.7	95.5	95.6	95.6	95.7					
	2/4%	95.6	95.8	95.7	95.6	95.7	95.7	95.7	95.7					
Reactances (%) at Class H														
Direct axis synchronous reactance unsaturated	Xd	3.01	2.71	2.52	2.24	3.47	3.26	3.12	2.87					
Direct axis transient reactance saturated	X'd	0.2	0.18	0.17	0.15	0.21	0.2	0.19	0.17					
Direct axis subtransient reactance saturated	X''d	0.14	0.13	0.12	0.11	0.15	0.14	0.13	0.12					
Quadrature axis synchronous reactance unsaturated	Xq	2.58	2.33	2.16	1.92	2.92	2.74	2.63	2.41					
Quadrature axis subtransient reactance saturated	X''q	0.36	0.32	0.3	0.27	0.41	0.38	0.37	0.34					
Leakage reactance	X1	0.07	0.06	0.06	0.05	0.08	0.08	0.07	0.07					
Negative sequence reactance saturated	X2	0.24	0.22	0.2	0.18	0.28	0.26	0.25	0.23					
Zero sequence reactance unsaturated	X0	0.1	0.09	0.08	0.07	0.1	0.09	0.09	0.08					
Short-circuit ratio	Kcc	0.3322	0.3690	0.3968	0.4464	0.2882	0.3067	0.3205	0.3484					
Short-circuit transient time constant (sec.)	T'd	0.08												
Subtransient time constant (sec.)	T''d	0.019												
Open circuit time constant (sec.)	T'do	1.7												
Armature time constant (sec.)	Tα	0.018												
Stator Winding Resistance (20°C)	ohm	0.009												
Rotor Winding Resistance (20°C)	ohm	1.17												
Exciter Stator Resistance (20°C)	ohm	18												
Exciter Rotor Phase resistance	ohm	0.068												
No load excitation current	io (A)	0.5	0.52	0.6	0.6	0.5	0.51	0.6	0.6					
Full load excitation current	ic(A)	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.2					
Cooling air requirement	m³/sec	0.8m³/s 1700cfm				0.99m³/s 2100cfm								
Mechanical Characteristic														
Configuration	Single Bearing				Double Bearing									
Type of Construction	B2-SAE				IM B34									
Total Weight - kgs	970				956									
Weight wound stator - kgs	455				455									
Weight wound rotor - kgs	387				365									
Inertia (J) [kgm²]	4.6331kgm²				4.4343kgm²									
Drive end bearing / Lubrication	BALL.6317-2RS(ISO)				BALL.6317-2RS(ISO)									
Non-drive end bearing / Lubrication	BALL.6314-2RS(ISO)				BALL.6314-2RS(ISO)									
Packing crate size (cm)	122X70X104				133X70X104									

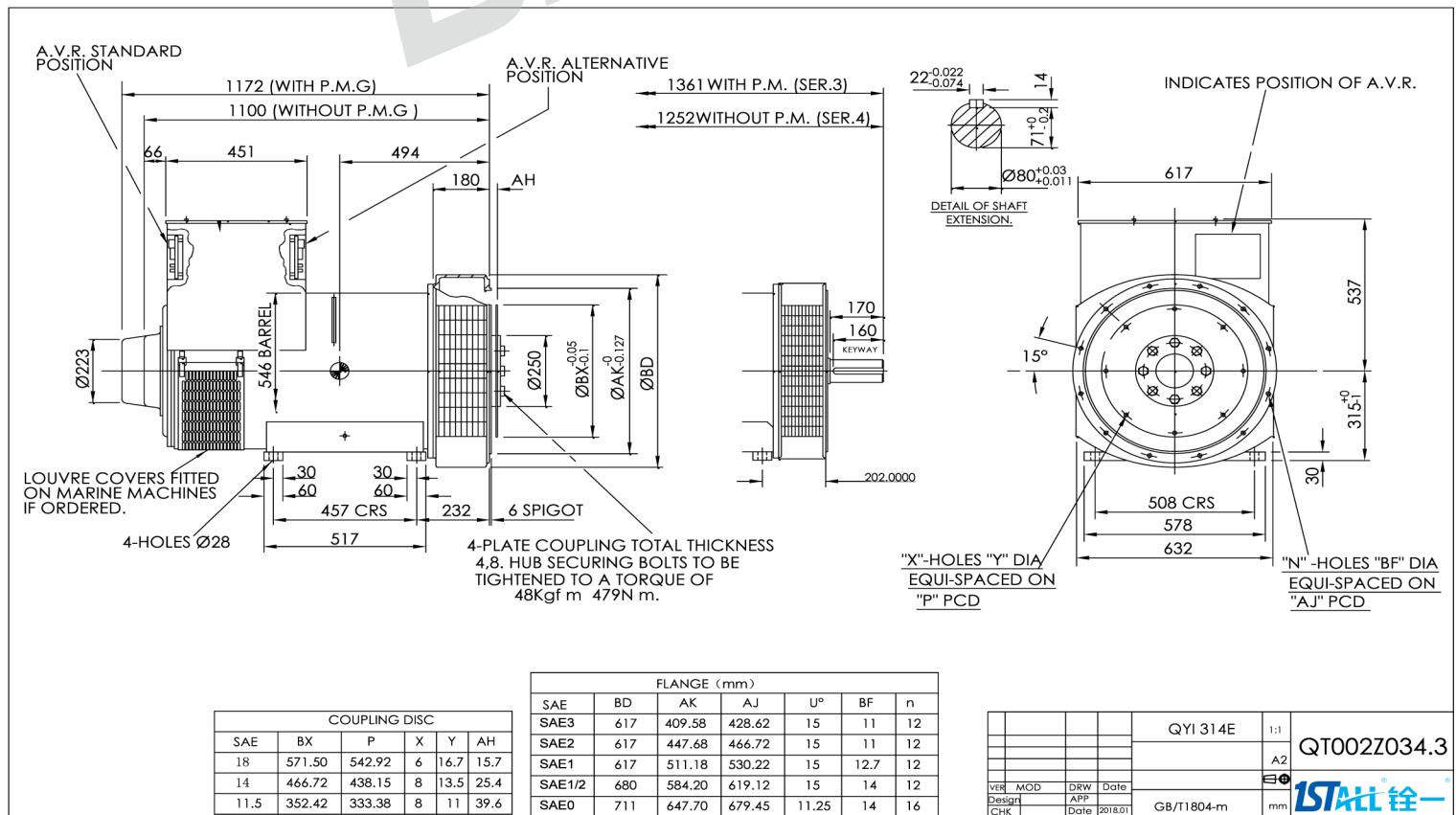
QYI314E
Winding 311 / 0.8 Power Factor

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	320	320	320	320	350	350	350	350	370	370	370	370	380	400	380	380
	kW	256	256	256	256	280	280	280	280	296	296	296	296	304	320	304	304
	Efficiency (%)	93.6	93.8	94.0	94.1	93.2	93.5	93.6	93.8	92.9	93.2	93.4	93.6	92.7	92.7	93.2	93.5
	kW Input	274	273	272	272	300	299	299	299	319	318	317	316	328	345	326	325

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
	Series Delta (V)	240	254	266	277	240	254	266	277	240	254	266	277	240	254	266	277
	kVA	365	385	400	400	400	420	440	440	420	445	460	460	435	455	475	475
	kW	292	308	320	320	320	336	352	352	336	356	368	368	348	364	380	380
	Efficiency (%)	93.8	93.8	93.9	94.0	93.4	93.5	93.5	93.7	93.1	93.2	93.2	93.5	92.9	93.0	93.1	93.3
	kW Input	311	328	341	340	343	359	376	376	361	382	395	394	375	391	408	407

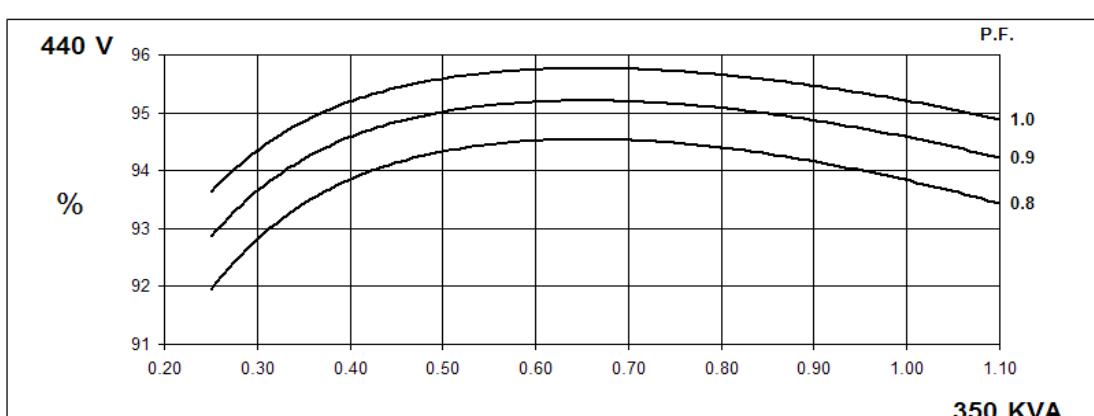
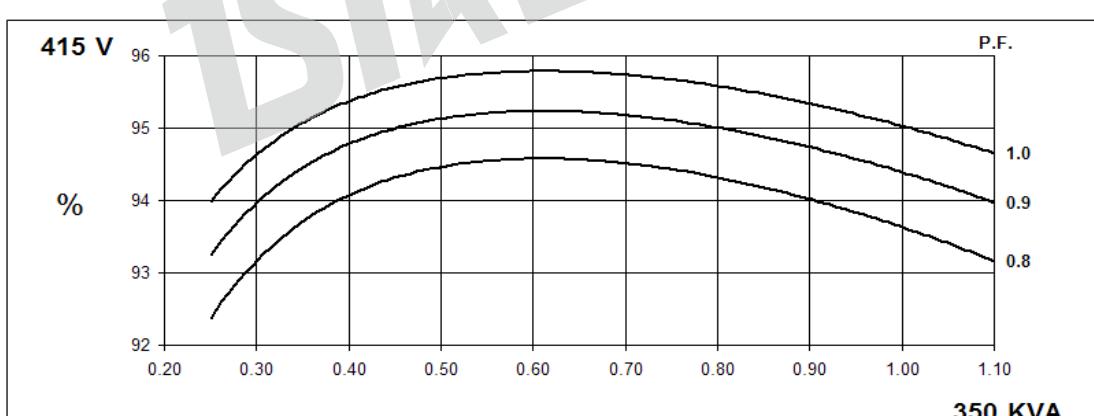
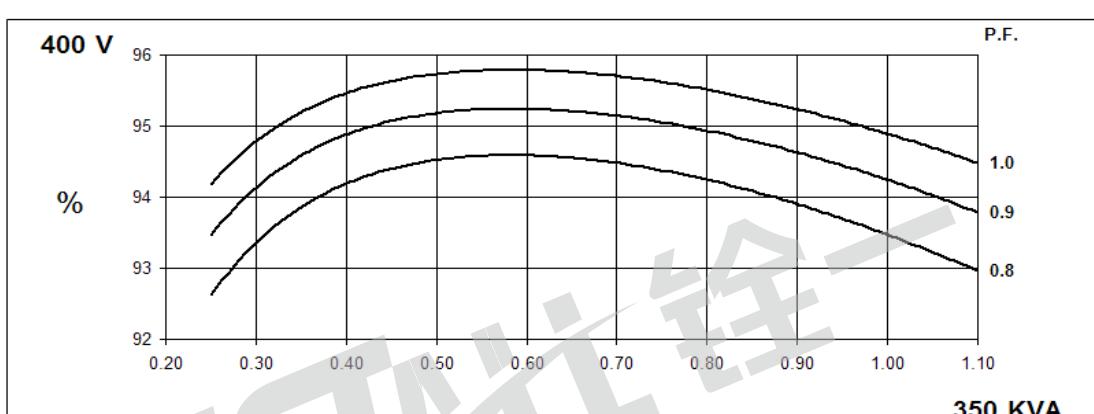
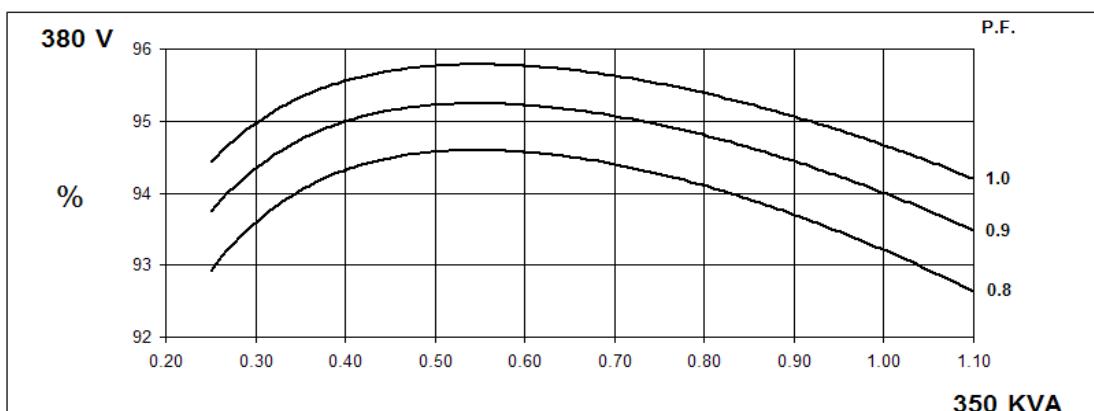
DIMENSIONS



50
Hz

QYI314E
Winding 311

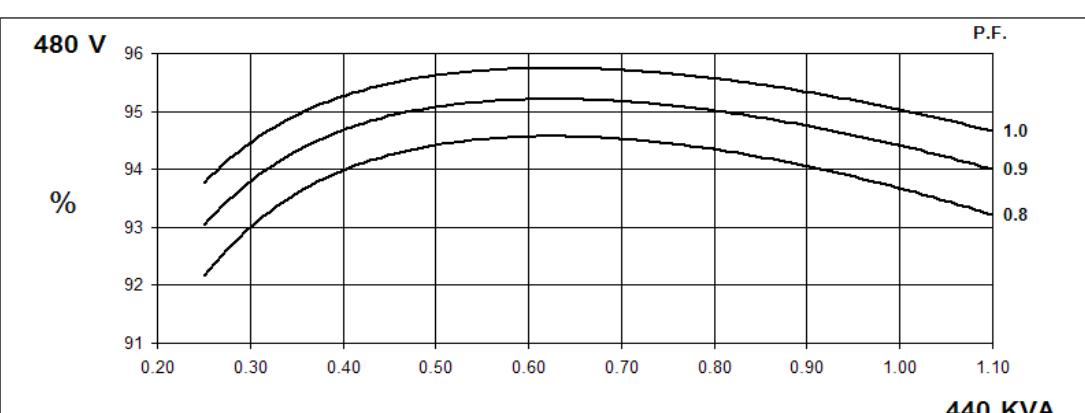
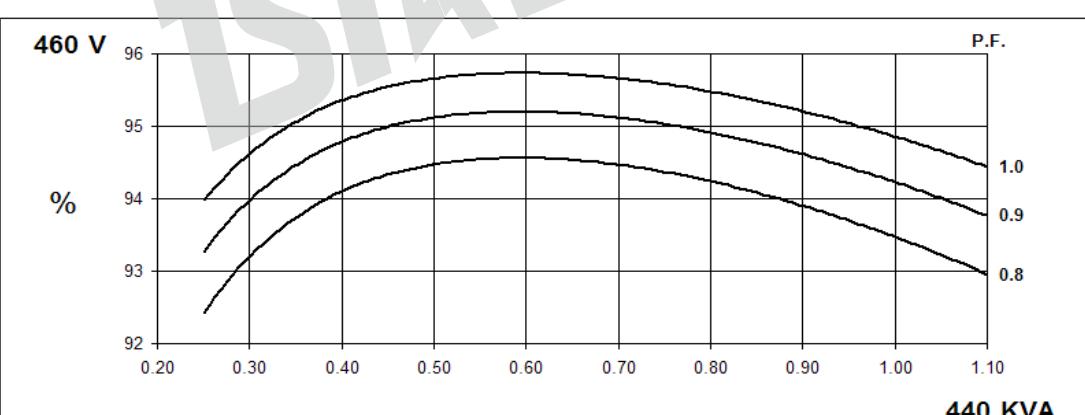
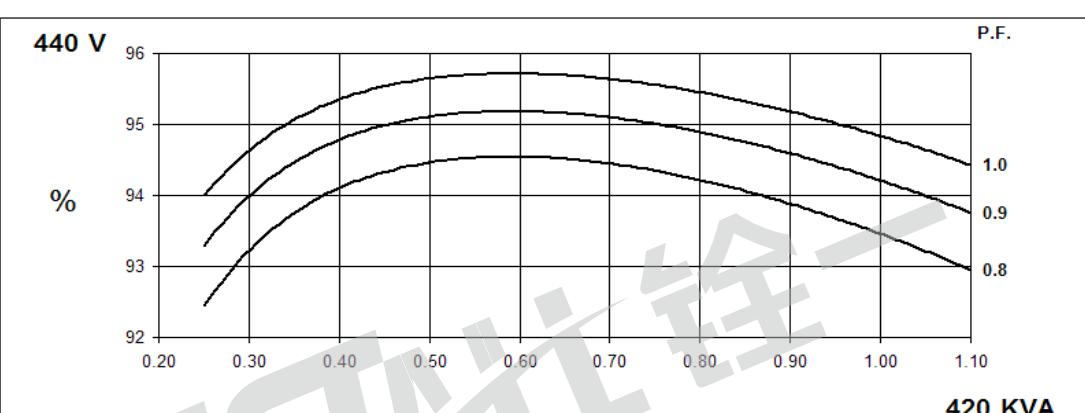
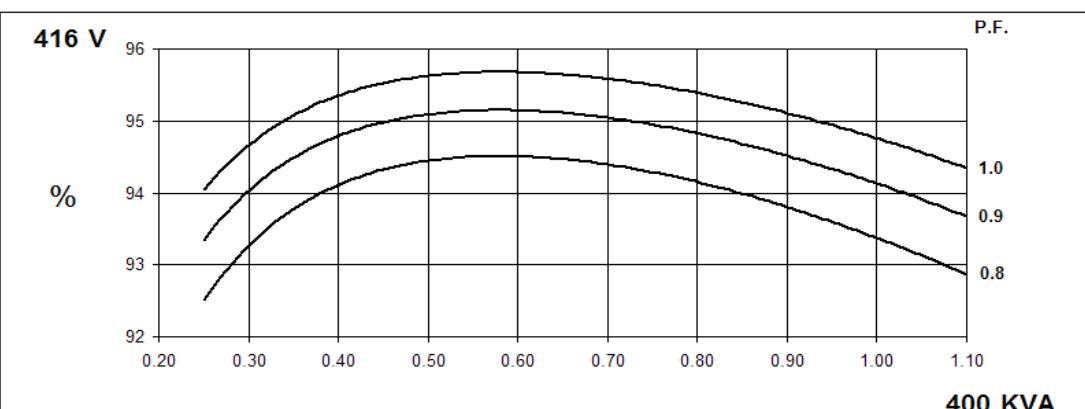
THREE PHASE EFFICIENCY CURVES



**60
Hz**

**QYI314E
Winding 311**

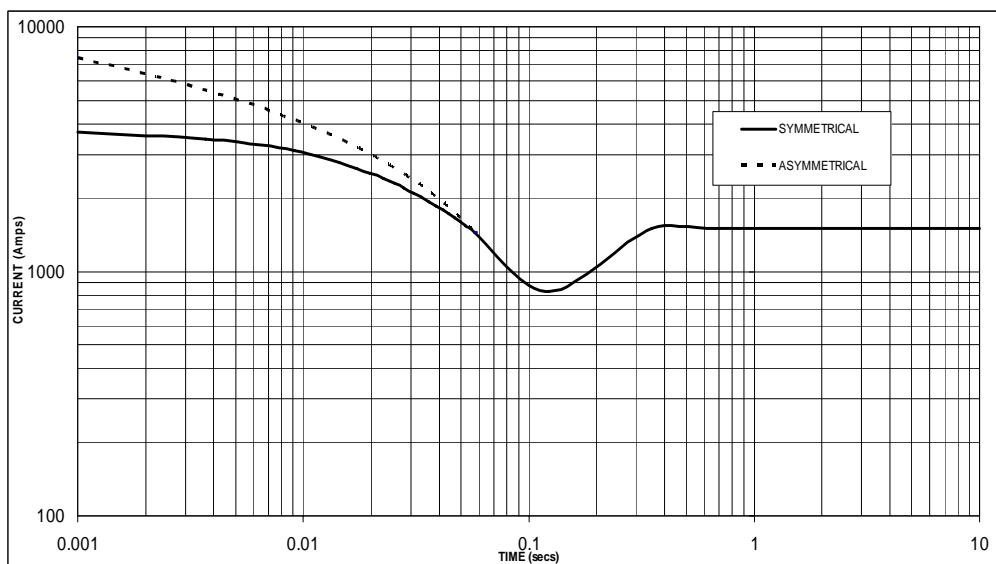
THREE PHASE EFFICIENCY CURVES



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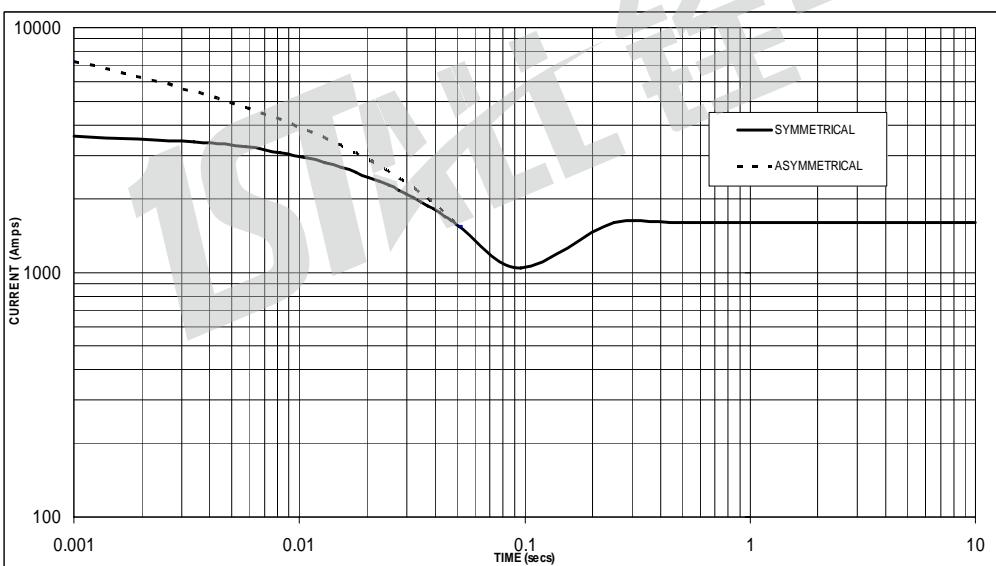
Three-phase Short Circuit Decrement Curve. No-load Excitation at Rated Speed Based on star (wye) connection.

50
Hz



Sustained Short Circuit = 1,500 Amps

60
Hz



Sustained Short Circuit = 1,600 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 1.05	440v	X 1.06
415v	X 1.10	460v	X 1.10
440v	X 1.16	480v	X 1.15

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

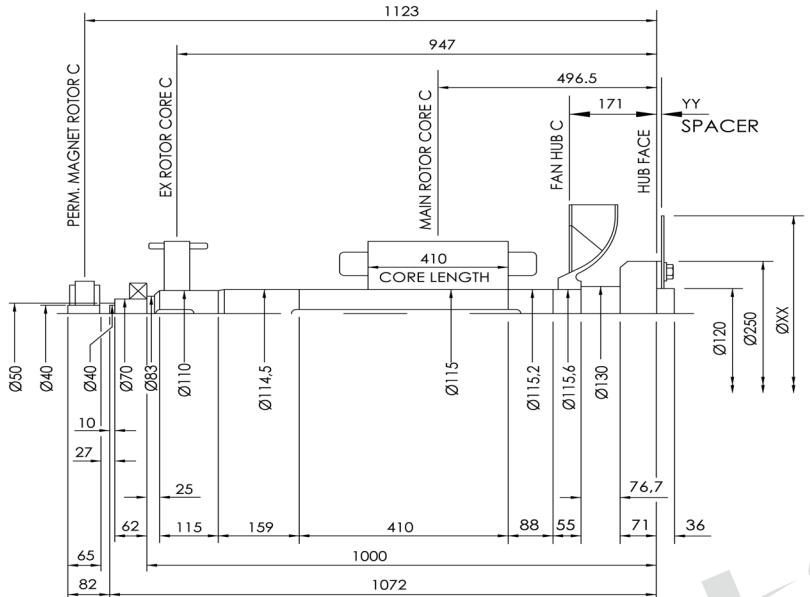
Note 3

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

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Winding 311

INERTIA



COMPONENT	Wt kg	J kgm ²
EX. ROTOR	31.290	0.5100
MAIN ROTOR	248.15	3.525
FAN	9.910	0.2630
SHAFT	87.191	0.1450
HUB	18.507	0.1779
TOTAL	395.048	4.6209
PERM. MAG.	5.215	0.0122
TOTAL	400.263	4.6331

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

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INERTIA

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