



THREE-PHASE SYNCHRONOUS GENERATOR

TCU368E

Datasheet For 4 Poles - 50Hz @ 1500rpm / 60Hz @ 1800rpm

Ambient Temperature	40 °C	Excitation	Brushless	Short Circuit Current Capacity (with PMG)	≥300%
Temperature Rise	125 °C	Winding Pitch	2 / 3	Method of Cooling	IC01
Service Duty	Continuous	Power Factor	0.8	Direction of Rotation	Counter-clockwise
Phase	3	Insulation Class	Class H	Maximum Over-speed	2250 rpm
Pole	4	Waveform : TIF	<50	Degree of Protection	IP21
Voltage Regulation	+/- 0.5%	Waveform : THF	<2%	Radio interference	Class B Group 1
AVR Model	ETC-2	Altitude	≤1000 m.a.s.l	Total Harmonic Content	< 3% - At no load

Electrical and Mechanical Characteristic

Frequency	Hz	50			60				
		1500			1800				
Round per minute	rpm								
Voltage (Y Connection) - Series Star	V	380	400	415	380	416	440	460	480
Voltage (YY Connection) - Parallel Star	V	190	200	208	190	208	220	230	240
Voltage (Δ Connection) - Series Delta	V	220	230	240	220	240	254	266	277
Voltage (ΔΔ Connection) - Parallel Delta	V	110	115	120	110	120	127	133	138
Rated power at Class H (125 °C) temperature rise	kVA	640	675	650	640	700	740	775	810
	kW	512	540	520	512	560	592	620	648
Efficiency at Class H (P.F.=0.8)	4/4%	94.7	94.8	94.8	94.5	94.6	94.7	94.8	94.9
	3/4%	94.9	95	95	94.7	94.8	94.9	95.0	95.1
	2/4%	94.5	94.6	94.6	94.2	94.3	94.4	94.5	94.6
Efficiency at Class H (P.F.=1.0)	4/4%	95.8	95.9	95.9	95.7	95.8	95.9	96.0	96.1
	3/4%	96.0	96.1	96.1	95.9	96.0	96.1	96.2	96.3
	2/4%	95.6	95.7	95.7	95.4	95.5	95.6	95.7	95.8

Reactance (%) at Class H

	Kcc	0.3448	0.3620	0.4049	0.2873	0.3150	0.3332	0.3474	0.3622
Short-circuit ratio									
Direct axis synchronous reactance unsaturated	X _d	2.9007	2.7610	2.4700	3.4805	3.1743	3.0016	2.8784	2.7610
Quadrature axis synchronous reactance unsaturated	X _q	1.6431	1.5640	1.3992	1.9716	1.7981	1.7003	1.6305	1.5640
Direct axis transient reactance saturated	X' _d	0.1996	0.1900	0.1700	0.2395	0.2184	0.2066	0.1981	0.1900
Direct axis subtransient reactance saturated	X'' _d	0.1576	0.1500	0.1342	0.1891	0.1725	0.1631	0.1564	0.1500
Quadrature axis subtransient reactance saturated	X'' _q	0.1923	0.1830	0.1637	0.2307	0.2104	0.1989	0.1908	0.1830
Zero sequence reactance unsaturated	X ₀	0.0273	0.0260	0.0233	0.0328	0.0299	0.0283	0.0271	0.0260
Leakage reactance	X _L	0.1082	0.1030	0.0921	0.1298	0.1184	0.1120	0.1074	0.1030
Negative sequence reactance saturated	X ₂	0.1749	0.1665	0.1490	0.2099	0.1914	0.1810	0.1736	0.1665

Open circuit time constant (sec.)	T' _{do}	2.1130							
Short-circuit transient time constant (sec.)	T' _d	0.0990							
Subtransient time constant (sec.)	T'' _d	0.0140							
Armature time constant (sec.)	T _α	0.0277							
No load excitation current	io(A)	0.6			0.6				
Full load excitation current	ic(A)	2			1.9				
Full load excitation voltage	uc(V)	51			48				
Stator Winding Resistance (20°C)	ohm	0.004298							
Rotor Winding Resistance (20°C)	ohm	1.364							
Exciter Stator Resistance (20°C)	ohm	18.54							
Exciter Rotor Phase resistance	ohm	0.0375							
Cooling air requirement	m ³ /sec	1.105			1.326				

Configuration	Single Bearing	Double Bearing
Type of Construction	B2 - SAE	IM B34
Inertia (J) [kgm ²]	10.96	10.85
Total Weight	1440	1456
Drive end bearing / Lubrication	Not supply	6222 C3-2Z / Prelubricated - sealed for life
Non-drive end bearing / Lubrication	6316 C3-2Z / Prelubricated - sealed for life	
Recovery time - sec.	0.5	
Stator winding	DOUBLE LAYER CONCENTRIC	
Number of Terminal	12	
Rotor	with damping cage	
Overload	110% rated load for 1 hour	

STANDARD COMPLIANCE - IEC 60034-1; CEI 2-3; BS 4999-5000; VDE 0530; NF 51-100,111; OVE M-10, NEMA MG 1.22.

Data and Technical Specification are subject to change in order to update or improve the products, without prior notice