



THREE-PHASE SYNCHRONOUS GENERATOR

TCU428G

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 (Δ Connection) - Series Delta	V	220	230	240	220	240	254	266	277
Rated power at Class H (125 °C) temperature rise	kVA	1425	1500	1445	1425	1560	1650	1725	1800
	kW	1140	1200	1156	1140	1248	1320	1380	1440
Efficiency at Class H (P.F.=0.8)	4/4%	95.7	95.9	95.8	95.6	95.7	95.8	96.0	96.2
	3/4%	96.0	96.2	96.1	95.9	96.0	96.1	96.3	96.5
	2/4%	95.6	95.8	95.7	95.5	95.6	95.7	95.9	96.1
Efficiency at Class H (P.F.=1.0)	4/4%	96.4	96.6	96.5	96.3	96.4	96.5	96.7	96.9
	3/4%	96.7	96.9	96.8	96.6	96.7	96.8	97.0	97.2
	2/4%	96.4	96.5	96.4	96.2	95.6	96.4	96.6	96.8

Reactance (%) at Class H

	Kcc	0.3451	0.3500	0.4059	0.2876	0.3151	0.3330	0.3479	0.3500
Short-circuit ratio	X _{cc}	0.3451	0.3500	0.4059	0.2876	0.3151	0.3330	0.3479	0.3500
Direct axis synchronous reactance unsaturated	X _d	2.8979	2.8440	2.4638	3.4772	3.1741	3.0031	2.8747	2.8440
Quadrature axis synchronous reactance unsaturated	X _q	1.9032	1.8220	1.6181	2.2836	2.0846	1.9722	1.8879	1.8220
Direct axis transient reactance saturated	X' _d	0.1905	0.1820	0.1620	0.2286	0.2087	0.1974	0.1890	0.1820
Direct axis subtransient reactance saturated	X'' _d	0.1358	0.1290	0.1154	0.1629	0.1487	0.1407	0.1347	0.1290
Quadrature axis subtransient reactance saturated	X'' _q	0.1632	0.1550	0.1387	0.1958	0.1787	0.1691	0.1619	0.1550
Zero sequence reactance unsaturated	X ₀	0.0263	0.0250	0.0224	0.0316	0.0288	0.0273	0.0261	0.0250
Leakage reactance	X _L	0.0884	0.0840	0.0752	0.1061	0.0968	0.0916	0.0877	0.0840
Negative sequence reactance saturated	X ₂	0.1495	0.1420	0.1271	0.1794	0.1637	0.1549	0.1483	0.1420

Open circuit time constant (sec.)	T' _{do}	2.8390							
Short-circuit transient time constant (sec.)	T' _d	0.1250							
Subtransient time constant (sec.)	T'' _d	0.0114							
Armature time constant (sec.)	T _α	0.0373							
No load excitation current	io(A)	0.8				0.8			
Full load excitation current	ic(A)	2.3				2.2			
Full load excitation voltage	uc(V)	63				60			
Stator Winding Resistance (20°C)	ohm	0.001342							
Rotor Winding Resistance (20°C)	ohm	2.097							
Exciter Stator Resistance (20°C)	ohm	21.06							
Exciter Rotor Phase resistance	ohm	0.0439							
Cooling air requirement	m ³ /sec	1.82				2.18			

Configuration	Single Bearing	Double Bearing
Type of Construction	B2 - SAE	IM B34
Inertia (J) [kgm ²]	30.4	30.3
Total Weight	2735	2764
Drive end bearing / Lubrication	Not supply	6228 C3-2Z / Prelubricated - sealed for life
Non-drive end bearing / Lubrication	6321 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