



THREE-PHASE SYNCHRONOUS GENERATOR

TCU288H

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-1	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	285	300	290	285	313	330	345	360
	kW	228	240	232	228	250	264	276	288
Efficiency at Class H (P.F.=0.8)	4/4%	93.1	93.2	93.2	93.1	93.2	93.4	93.6	93.8
	3/4%	93.5	93.6	93.6	93.6	93.7	93.9	94.1	94.3
	2/4%	93.3	93.4	93.4	93.3	93.4	93.6	93.8	94
Efficiency at Class H (P.F.=1.0)	4/4%	94.8	94.9	94.9	94.6	94.7	94.9	95.1	95.3
	3/4%	95.2	95.3	95.3	95.1	95.2	95.4	95.6	95.8
	2/4%	95.0	95.1	95.1	94.7	94.8	95.0	95.2	95.4

Reactance (%) at Class H

	Kcc	0.3200	0.3370	0.3751	0.2667	0.2917	0.3088	0.3226	0.3368
Short-circuit ratio									
Direct axis synchronous reactance unsaturated	X _d	3.1253	2.9690	2.6663	3.7500	3.4286	3.2387	3.1002	2.9690
Quadrature axis synchronous reactance unsaturated	X _q	1.9074	1.8120	1.6273	2.2886	2.0925	1.9766	1.8921	1.8120
Direct axis transient reactance saturated	X' _d	0.2053	0.1950	0.1751	0.2463	0.2252	0.2127	0.2036	0.1950
Direct axis subtransient reactance saturated	X'' _d	0.1663	0.1580	0.1419	0.1996	0.1825	0.1724	0.1650	0.1580
Quadrature axis subtransient reactance saturated	X'' _q	0.2021	0.1920	0.1724	0.2425	0.2217	0.2094	0.2005	0.1920
Zero sequence reactance unsaturated	X ₀	0.0368	0.0350	0.0314	0.0442	0.0404	0.0382	0.0365	0.0350
Leakage reactance	X _L	0.1105	0.1050	0.0943	0.1326	0.1213	0.1145	0.1096	0.1050
Negative sequence reactance saturated	X ₂	0.1842	0.1750	0.1572	0.2210	0.2021	0.1909	0.1827	0.1750

Open circuit time constant (sec.)	T' _{do}	1.7060							
Short-circuit transient time constant (sec.)	T' _d	0.0790							
Subtransient time constant (sec.)	T'' _d	0.0110							
Armature time constant (sec.)	T _α	0.0243							
No load excitation current	io(A)	0.5			0.5				
Full load excitation current	ic(A)	2			1.9				
Full load excitation voltage	uc(V)	50			48				
Stator Winding Resistance (20°C)	ohm	0.01268							
Rotor Winding Resistance (20°C)	ohm	1.268							
Exciter Stator Resistance (20°C)	ohm	17.12							
Exciter Rotor Phase resistance	ohm	0.06603							
Cooling air requirement	m ³ /sec	0.535			0.64				

Configuration	Single Bearing	Double Bearing
Type of Construction	B2 - SAE	IM B34
Inertia (J) [kgm ²]	3.5	3.36
Total Weight	730	737
Drive end bearing / Lubrication	Not supply	6218 C3-2Z / Prelubricated - sealed for life
Non-drive end bearing / Lubrication	6311 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