



THREE-PHASE SYNCHRONOUS GENERATOR

TCU188D

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-A1	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	30.0	31.3	30.0	30.0	32.5	34.0	36.0	37.5
	kW	24	25	24	24	26	27.2	28.8	30
Efficiency at Class H (P.F.=0.8)	100%	85.5	85.6	85.7	85.2	85.3	85.5	85.7	85.9
	75%	86.6	86.7	86.8	86.5	86.6	86.8	87.0	87.2
	50%	86.0	86.1	86.2	85.8	85.9	86.1	86.3	86.5
Efficiency at Class H (P.F.=1.0)	100%	88.7	88.8	88.9	88.6	88.7	88.9	89.1	89.3
	75%	89.9	90	90.1	90.0	90.1	90.3	90.5	90.7
	50%	89.3	89.4	89.5	89.3	89.4	89.6	89.8	90

Reactance (%) at Class H

	Kcc	0.3661	0.3900	0.4366	0.3051	0.3377	0.3609	0.3723	0.3894
Short-circuit ratio									
Direct axis synchronous reactance unsaturated	X _d	2.7316	2.5680	2.2903	3.2777	2.9608	2.7707	2.6862	2.5680
Quadrature axis synchronous reactance unsaturated	X _q	1.4137	1.3290	1.1853	1.6963	1.5323	1.4339	1.3902	1.3290
Direct axis transient reactance saturated	X' _d	0.1989	0.1870	0.1668	0.2387	0.2156	0.2018	0.1956	0.1870
Direct axis subtransient reactance saturated	X'' _d	0.1766	0.1660	0.1480	0.2119	0.1914	0.1791	0.1736	0.1660
Quadrature axis subtransient reactance saturated	X'' _q	0.2127	0.2000	0.1784	0.2553	0.2306	0.2158	0.2092	0.2000
Zero sequence reactance unsaturated	X ₀	0.0447	0.0420	0.0375	0.0536	0.0484	0.0453	0.0439	0.0420
Leakage reactance	X _L	0.1159	0.1090	0.0972	0.1391	0.1257	0.1176	0.1140	0.1090
Negative sequence reactance saturated	X ₂	0.1947	0.1830	0.1632	0.2336	0.2110	0.1974	0.1914	0.1830

Open circuit time constant (sec.)	T'do	0.4750							
Short-circuit transient time constant (sec.)	T'd	0.0300							
Subtransient time constant (sec.)	T''d	0.0060							
Armature time constant (sec.)	T _α	0.0115							
No load excitation current	io(A)	0.6			0.6				
Full load excitation current	ic(A)	1.9			1.8				
Full load excitation voltage	uc(V)	35			33				
Stator Winding Resistance (20°C)	ohm	0.2516							
Rotor Winding Resistance (20°C)	ohm	0.7932							
Exciter Stator Resistance (20°C)	ohm	16.51							
Exciter Rotor Phase resistance	ohm	0.07234							
Cooling air requirement	m ³ /sec	0.119			0.143				

Configuration	Single Bearing	Double Bearing
Type of Construction	B2 - SAE	IM B34
Inertia (J) [kgm ²]	0.275	0.269
Total Weight	159	164
Drive end bearing / Lubrication	Not supply	6309 C3-2Z / Prelubricated - sealed for life
Non-drive end bearing / Lubrication	6306 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