



THREE-PHASE SYNCHRONOUS GENERATOR

TCU168B

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	10.6	11.3	10.8	10.6	11.8	12.5	13.0	13.5
	kW	8.5	9	8.6	8.5	9.4	10	10.4	10.8
Efficiency at Class H (P.F.=0.8)	4/4%	79.2	79.5	79.6	78.6	78.7	78.9	79.1	79.3
	3/4%	80.6	80.9	81	80.2	80.3	80.5	80.7	80.9
	2/4%	80.0	80.3	80.4	79.6	79.7	79.9	80.1	80.3
Efficiency at Class H (P.F.=1.0)	4/4%	82.5	82.8	82.9	82.7	82.8	83.0	83.2	83.4
	3/4%	84.0	84.3	84.4	84.5	84.6	84.8	85.0	85.2
	2/4%	83.8	84.1	84.2	84.2	84.3	84.5	84.7	84.9

Reactance (%) at Class H

	Kcc	0.3980	0.4170	0.4700	0.3300	0.3600	0.3780	0.3970	0.4170
Short-circuit ratio									
Direct axis synchronous reactance unsaturated	X _d	2.5100	2.3985	2.1292	3.0117	2.7772	2.6428	2.5166	2.3985
Quadrature axis synchronous reactance unsaturated	X _q	1.5167	1.4494	1.2866	1.8199	1.6782	1.5970	1.5207	1.4494
Direct axis transient reactance saturated	X' _d	0.1864	0.1781	0.1581	0.2237	0.2062	0.1963	0.1869	0.1781
Direct axis subtransient reactance saturated	X'' _d	0.1787	0.1708	0.1516	0.2145	0.1978	0.1882	0.1792	0.1708
Quadrature axis subtransient reactance saturated	X'' _q	0.2081	0.1989	0.1765	0.2497	0.2303	0.2191	0.2087	0.1989
Zero sequence reactance unsaturated	X ₀	0.0472	0.0451	0.0401	0.0567	0.0523	0.0497	0.0474	0.0451
Leakage reactance	X _L	0.1494	0.1427	0.1267	0.1792	0.1653	0.1573	0.1498	0.1427
Negative sequence reactance saturated	X ₂	0.1934	0.1848	0.1641	0.2321	0.2140	0.2037	0.1939	0.1848

Open circuit time constant (sec.)	T' _{do}			0.2770					
Short-circuit transient time constant (sec.)	T' _d			0.0160					
Subtransient time constant (sec.)	T'' _d			0.0080					
Armature time constant (sec.)	T _α			0.0069					
No load excitation current	io(A)	0.5				0.5			
Full load excitation current	ic(A)	1.4				1.3			
Full load excitation voltage	uc(V)	36				35			
Stator Winding Resistance (20°C)	ohm			1.559					
Rotor Winding Resistance (20°C)	ohm			0.4943					
Exciter Stator Resistance (20°C)	ohm			21.6					
Exciter Rotor Phase resistance	ohm			0.04131					
Cooling air requirement	m ³ /sec	0.071				0.09			

Configuration	Single Bearing	Double Bearing
Type of Construction	B2 - SAE	IM B34
Inertia (J) [kgm ²]	0.097	0.109
Total Weight	94	97
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