



THREE-PHASE SYNCHRONOUS GENERATOR

TCU168C

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	12.5	13.8	13.1	12.5	14.2	15.0	16.0	16.5
	kW	10	11	10.5	10	11.4	12	12.8	13.2
Efficiency at Class H (P.F.=0.8)	4/4%	80.5	80.8	80.9	80.0	80.1	80.3	80.5	80.7
	3/4%	81.7	82	82.1	81.6	81.7	81.9	82.1	82.3
	2/4%	81.3	81.6	81.7	80.9	81.0	81.2	81.4	81.6
Efficiency at Class H (P.F.=1.0)	4/4%	84.0	84.3	84.4	84.1	84.2	84.4	84.6	84.8
	3/4%	85.5	85.8	85.9	85.8	85.9	86.1	86.3	86.5
	2/4%	85.2	85.5	85.6	85.4	85.5	85.7	85.9	86.1

Reactance (%) at Class H

	Kcc	0.3680	0.3850	0.4300	0.3100	0.3300	0.3500	0.3700	0.3850
Short-circuit ratio									
Direct axis synchronous reactance unsaturated	X _d	2.7155	2.5949	2.3036	3.2584	3.0046	2.8592	2.7227	2.5949
Quadrature axis synchronous reactance unsaturated	X _q	1.6265	1.5543	1.3798	1.9517	1.7997	1.7126	1.6308	1.5543
Direct axis transient reactance saturated	X' _d	0.1787	0.1708	0.1516	0.2145	0.1978	0.1882	0.1792	0.1708
Direct axis subtransient reactance saturated	X'' _d	0.1711	0.1635	0.1451	0.2053	0.1893	0.1801	0.1715	0.1635
Quadrature axis subtransient reactance saturated	X'' _q	0.2068	0.1976	0.1755	0.2482	0.2288	0.2178	0.2074	0.1976
Zero sequence reactance unsaturated	X ₀	0.0498	0.0476	0.0422	0.0597	0.0551	0.0524	0.0499	0.0476
Leakage reactance	X _L	0.1404	0.1342	0.1191	0.1685	0.1554	0.1479	0.1408	0.1342
Negative sequence reactance saturated	X ₂	0.1890	0.1806	0.1603	0.2267	0.2091	0.1989	0.1895	0.1806

Open circuit time constant (sec.)	T' _{do}				0.3110				
Short-circuit transient time constant (sec.)	T' _d				0.0160				
Subtransient time constant (sec.)	T'' _d				0.0090				
Armature time constant (sec.)	T _α				0.0068				
No load excitation current	io(A)	0.6			0.6				
Full load excitation current	ic(A)	1.5			1.4				
Full load excitation voltage	uc(V)	38			37				
Stator Winding Resistance (20°C)	ohm				0.7675				
Rotor Winding Resistance (20°C)	ohm				0.5779				
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]	0.104	0.12
Total Weight	100	103
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