



THREE-PHASE SYNCHRONOUS GENERATOR

TCU428E

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	1188	1250	1200	1188	1300	1375	1435	1500
	kW	950	1000	960	950	1040	1100	1148	1200
Efficiency at Class H (P.F.=0.8)	4/4%	95.5	95.6	95.6	95.4	95.5	95.6	95.8	95.9
	3/4%	95.8	95.9	95.9	95.6	95.7	95.8	96.0	96.1
	2/4%	95.3	95.4	95.4	95.2	95.3	95.4	95.6	95.7
Efficiency at Class H (P.F.=1.0)	4/4%	96.2	96.3	96.3	96.0	96.1	96.2	96.4	96.5
	3/4%	96.4	96.5	96.5	96.2	96.3	96.4	96.6	96.7
	2/4%	96.0	96.1	96.1	95.8	95.9	96.0	96.2	96.3

Reactance (%) at Class H

	Kcc	0.3680	0.3870	0.4340	0.3070	0.3360	0.3550	0.3710	0.3870
Short-circuit ratio	X _{cc}	0.3680	0.3870	0.4340	0.3070	0.3360	0.3550	0.3710	0.3870
Direct axis synchronous reactance unsaturated	X _d	2.7189	2.5830	2.3037	3.2625	2.9781	2.8176	2.6925	2.5830
Quadrature axis synchronous reactance unsaturated	X _q	1.8000	1.7100	1.5251	2.1598	1.9716	1.8653	1.7825	1.7100
Direct axis transient reactance saturated	X' _d	0.1842	0.1750	0.1561	0.2210	0.2018	0.1909	0.1824	0.1750
Direct axis subtransient reactance saturated	X'' _d	0.1326	0.1260	0.1124	0.1591	0.1453	0.1374	0.1313	0.1260
Quadrature axis subtransient reactance saturated	X'' _q	0.1579	0.1500	0.1338	0.1895	0.1729	0.1636	0.1564	0.1500
Zero sequence reactance unsaturated	X ₀	0.0253	0.0240	0.0214	0.0303	0.0277	0.0262	0.0250	0.0240
Leakage reactance	X _L	0.0884	0.0840	0.0749	0.1061	0.0968	0.0916	0.0876	0.0840
Negative sequence reactance saturated	X ₂	0.1453	0.1380	0.1231	0.1743	0.1591	0.1505	0.1438	0.1380

Open circuit time constant (sec.)	T' _{do}	2.7800							
Short-circuit transient time constant (sec.)	T' _d	0.1260							
Subtransient time constant (sec.)	T'' _d	0.0107							
Armature time constant (sec.)	T _α	0.0328							
No load excitation current	io(A)	0.8			0.8				
Full load excitation current	ic(A)	2.2			2.1				
Full load excitation voltage	uc(V)	58			56				
Stator Winding Resistance (20°C)	ohm	0.001596							
Rotor Winding Resistance (20°C)	ohm	1.866							
Exciter Stator Resistance (20°C)	ohm	21.06							
Exciter Rotor Phase resistance	ohm	0.0439							
Cooling air requirement	m ³ /sec	1.68			2.01				

Configuration	Single Bearing	Double Bearing
Type of Construction	B2 - SAE	IM B34
Inertia (J) [kgm ²]	27.2	27.1
Total Weight	2458	2495
Drive end bearing / Lubrication	Not supply	6228 C3-2Z / Pre-lubricated - sealed for life
Non-drive end bearing / Lubrication	6321 C3-2Z / Pre-lubricated - 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