



THREE-PHASE SYNCHRONOUS GENERATOR

TCU288C

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	177.5	187.5	180	177.5	195	206	215	225
	kW	142	150	144	142	156	165	172	180
Efficiency at Class H (P.F.=0.8)	4/4%	92.2	92.3	92.2	92.0	92.1	92.2	92.4	92.6
	3/4%	92.9	93	92.9	92.7	92.8	92.9	93.1	93.3
	2/4%	92.6	92.7	92.6	92.3	92.4	92.5	92.7	92.9
Efficiency at Class H (P.F.=1.0)	4/4%	93.8	93.9	93.8	93.7	93.8	93.9	94.1	94.3
	3/4%	94.5	94.6	94.5	94.4	94.5	94.6	94.8	95
	2/4%	94.2	94.3	94.2	94.0	94.1	94.2	94.4	94.6

Reactance (%) at Class H

	Kcc	0.3220	0.3360	0.3740	0.2690	0.2930	0.3110	0.3230	0.3400
Short-circuit ratio									
Direct axis synchronous reactance unsaturated	X _d	3.0960	2.9800	2.6730	3.7161	3.4176	3.2201	3.0977	2.9457
Quadrature axis synchronous reactance unsaturated	X _q	1.8700	1.8020	1.6164	2.2471	2.0666	1.9472	1.8732	1.7813
Direct axis transient reactance saturated	X' _d	0.2380	0.2290	0.2054	0.2856	0.2626	0.2475	0.2380	0.2264
Direct axis subtransient reactance saturated	X'' _d	0.1990	0.1917	0.1720	0.2391	0.2198	0.2071	0.1993	0.1895
Quadrature axis subtransient reactance saturated	X'' _q	0.2270	0.2193	0.1967	0.2735	0.2515	0.2370	0.2280	0.2168
Zero sequence reactance unsaturated	X ₀	0.0390	0.0378	0.0339	0.0471	0.0434	0.0408	0.0393	0.0374
Leakage reactance	X _L	0.1420	0.1373	0.1232	0.1712	0.1575	0.1484	0.1427	0.1357
Negative sequence reactance saturated	X ₂	0.2130	0.2055	0.1843	0.2563	0.2357	0.2221	0.2136	0.2031

Open circuit time constant (sec.)	T' _{do}	1.3290							
Short-circuit transient time constant (sec.)	T' _d	0.0740							
Subtransient time constant (sec.)	T'' _d	0.0085							
Armature time constant (sec.)	T _α	0.0211							
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)	53			47				
Stator Winding Resistance (20°C)	ohm	0.02641							
Rotor Winding Resistance (20°C)	ohm	0.9336							
Exciter Stator Resistance (20°C)	ohm	17.56							
Exciter Rotor Phase resistance	ohm	0.06603							
Cooling air requirement	m ³ /sec	0.406			0.49				

Configuration	Single Bearing	Double Bearing
Type of Construction	B2 - SAE	IM B34
Inertia (J) [kgm ²]	2.4	2.32
Total Weight	536	543
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