



THREE-PHASE SYNCHRONOUS GENERATOR

TCU288F

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	237.5	250	240	237.5	260	275	287.5	300
	kW	190	200	192	190	208	220	230	240
Efficiency at Class H (P.F.=0.8)	4/4%	92.7	92.8	92.7	92.8	92.9	93.1	93.3	93.5
	3/4%	93.4	93.5	93.4	93.5	93.6	93.8	94.0	94.2
	2/4%	93.1	93.2	93.1	93.2	93.3	93.5	93.7	93.9
Efficiency at Class H (P.F.=1.0)	4/4%	94.2	94.3	94.2	94.2	94.3	94.5	94.7	94.9
	3/4%	94.9	95	94.9	94.9	95.0	95.2	95.4	95.6
	2/4%	94.6	94.7	94.6	94.6	94.7	94.9	95.1	95.3

Reactance (%) at Class H

	Kcc	0.3323	0.3500	0.3922	0.2769	0.3034	0.3206	0.3350	0.3498
Short-circuit ratio	X _d	3.0095	2.8590	2.5498	3.6111	3.2963	3.1187	2.9854	2.8590
Direct axis synchronous reactance unsaturated	X _q	1.8116	1.7210	1.5349	2.1737	1.9842	1.8773	1.7971	1.7210
Quadrature axis synchronous reactance unsaturated	X' _d	0.2031	0.1929	0.1720	0.2436	0.2224	0.2104	0.2014	0.1929
Direct axis transient reactance saturated	X'' _d	0.1664	0.1581	0.1410	0.1997	0.1823	0.1725	0.1651	0.1581
Direct axis subtransient reactance saturated	X'' _q	0.1989	0.1890	0.1686	0.2387	0.2179	0.2062	0.1974	0.1890
Quadrature axis subtransient reactance saturated	X ₀	0.0358	0.0340	0.0303	0.0429	0.0392	0.0371	0.0355	0.0340
Zero sequence reactance unsaturated	X _L	0.1158	0.1100	0.0981	0.1389	0.1268	0.1200	0.1149	0.1100
Leakage reactance	X ₂	0.1827	0.1736	0.1548	0.2193	0.2002	0.1894	0.1813	0.1736
Negative sequence reactance saturated	T'do				1.6212				
Open circuit time constant (sec.)	T'd				0.0784				
Short-circuit transient time constant (sec.)	T''d				0.0104				
Subtransient time constant (sec.)	T _α				0.0224				
Armature time constant (sec.)	io(A)	0.5			0.5				
No load excitation current	ic(A)	1.9			1.8				
Full load excitation current	uc(V)	48			46				
Full load excitation voltage	ohm				0.01688				
Stator Winding Resistance (20°C)	ohm				1.144				
Rotor Winding Resistance (20°C)	ohm				17.12				
Exciter Stator Resistance (20°C)	ohm				0.06603				
Exciter Rotor Phase resistance	m ³ /sec	0.47			0.565				
Cooling air requirement	Configuration	Single Bearing			Double Bearing				
Type of Construction		B2 - SAE			IM B34				
Inertia (J) [kgm ²]		2.9			2.8				
Total Weight		644			652				
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