THREE-PHASE SYNCHRONOUS GENERATOR

TCU368F

Datasheet For 4 Poles - 50Hz @ 1500rpm / 60Hz @ 1800rpm

Ambient Temperature	40 ℃	**Excitation**	Brushless	**Short Circuit Current Capacity (with PMG)**	≥300%
Temperature Rise	125 ℃	**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**				
Round per minute	**rpm**	**1500**			**1800**				
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**	665	**700**	675	665	725	770	800	840
	kW	532	**560**	540	532	580	616	640	672
Efficiency at Class H (P.F.=0.8)	**4/4%**	94.8	**94.9**	94.9	94.7	94.8	94.9	95.1	95.2
	3/4%	95.0	**95.1**	95.1	94.9	95.0	95.1	95.3	95.4
	2/4%	94.6	**94.7**	94.7	94.4	94.5	94.6	94.8	94.9
Efficiency at Class H (P.F.=1.0)	**4/4%**	95.8	**95.9**	95.9	95.7	95.8	95.9	96.1	96.2
	3/4%	96.0	**96.1**	96.1	95.9	96.0	96.1	96.3	96.4
	2/4%	95.6	**95.7**	95.7	95.4	95.5	95.6	95.8	95.9
Reactance (%) at Class H									
Short-circuit ratio	**Kcc**	0.3450	**0.3630**	0.4050	0.2870	0.3200	0.3330	0.3500	0.3630
Direct axis synchronous reactance unsaturated	**Xd**	2.9011	**2.7560**	2.4689	3.4810	3.1645	3.0063	2.8600	2.7560
Quadrature axis synchronous reactance unsaturated	**Xq**	1.4889	**1.4145**	1.2672	1.7866	1.6241	1.5430	1.4679	1.4145
Direct axis transient reactance saturated	**X'd**	0.1724	**0.1638**	0.1467	0.2069	0.1881	0.1787	0.1700	0.1638
Direct axis subtransient reactance saturated	**X"d**	0.1354	**0.1286**	0.1152	0.1624	0.1477	0.1403	0.1335	0.1286
Quadrature axis subtransient reactance saturated	**X"q**	0.1681	**0.1597**	0.1431	0.2017	0.1834	0.1742	0.1657	0.1597
Zero sequence reactance unsaturated	**X0**	0.0240	**0.0228**	0.0204	0.0288	0.0262	0.0249	0.0237	0.0228
Leakage reactance	**X_L**	0.0916	**0.0870**	0.0779	0.1099	0.0999	0.0949	0.0903	0.0870
Negative sequence reactance saturated	**X2**	0.1517	**0.1441**	0.1291	0.1820	0.1655	0.1572	0.1495	0.1441

Open circuit time constant (sec.)	**T'do**	2.2164	
Short-circuit transient time constant (sec.)	**T'd**	0.0990	
Subtransient time constant (sec.)	**T"d**	0.0148	
Armature time constant (sec.)	**Tα**	0.0273	
No load excitation current	**io(A)**	0.6	0.6
Full load excitation current	**ic(A)**	2	1.9
Full load excitation voltage	**uc(V)**	50	48
Stator Winding Resistance (20°C)	**ohm**	0.003717	
Rotor Winding Resistance (20°C)	**ohm**	1.424	
Exciter Stator Resistance (20°C)	**ohm**	18.54	
Exciter Rotor Phase resistance	**ohm**	0.0375	
Cooling air requirement	**m^3/sec**	1.105	1.326

Configuration	**Single Bearing**	**Double Bearing**
Type of Construction	**B2 - SAE**	**IM B34**
Inertia (J) [kgm2]	11.54	11.43
Total Weight	1552	1584
Drive end bearing / Lubrication	Not supply	6222 C3-2Z / Prelubricated - sealed for life
Non-drive end bearing / Lubrication	6316 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.