THREE-PHASE SYNCHRONOUS GENERATOR

TCU288AS

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-1	**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**	165	**175**	167.5	165	181	190	200	210
	kW	132	**140**	134	132	145	152	160	168
Efficiency at Class H (P.F.=0.8)	**4/4%**	91.9	**92**	91.9	91.9	92.0	92.1	92.3	92.5
	3/4%	92.5	**92.6**	92.5	92.6	92.7	92.8	93.0	93.2
	2/4%	92.3	**92.4**	92.3	92.2	92.3	92.4	92.6	92.8
Efficiency at Class H (P.F.=1.0)	**4/4%**	93.6	**93.7**	93.6	93.6	93.7	93.8	94.0	94.2
	3/4%	94.3	**94.4**	94.3	94.3	94.4	94.5	94.7	94.9
	2/4%	94.0	**94.1**	94.0	93.9	94.0	94.1	94.3	94.5
Reactance (%) at Class H									
Short-circuit ratio	**Kcc**	0.3700	**0.3860**	0.4350	0.3080	0.3370	0.3590	0.3720	0.3860
Direct axis synchronous reactance unsaturated	**Xd**	2.7037	**2.5880**	2.3013	3.2442	2.9716	2.7864	2.6856	2.5880
Quadrature axis synchronous reactance unsaturated	**Xq**	1.8189	**1.7410**	1.5481	2.1824	1.9990	1.8745	1.8067	1.7410
Direct axis transient reactance saturated	**X'd**	0.2351	**0.2250**	0.2001	0.2820	0.2583	0.2422	0.2335	0.2250
Direct axis subtransient reactance saturated	**X"d**	0.1964	**0.1880**	0.1672	0.2357	0.2159	0.2024	0.1951	0.1880
Quadrature axis subtransient reactance saturated	**X"q**	0.2246	**0.2150**	0.1912	0.2695	0.2469	0.2315	0.2231	0.2150
Zero sequence reactance unsaturated	**X0**	0.0387	**0.0370**	0.0329	0.0464	0.0425	0.0398	0.0384	0.0370
Leakage reactance	**X_L**	0.1421	**0.1360**	0.1209	0.1705	0.1562	0.1464	0.1411	0.1360
Negative sequence reactance saturated	**X2**	0.2110	**0.2020**	0.1796	0.2532	0.2319	0.2175	0.2096	0.2020

Open circuit time constant (sec.)	**T'do**	1.3130	
Short-circuit transient time constant (sec.)	**T'd**	0.0740	
Subtransient time constant (sec.)	**T"d**	0.0084	
Armature time constant (sec.)	**Tα**	0.0184	
No load excitation current	**io(A)**	0.5	0.5
Full load excitation current	**ic(A)**	1.6	1.5
Full load excitation voltage	**uc(V)**	41	39
Stator Winding Resistance (20°C)	**ohm**	0.02973	
Rotor Winding Resistance (20°C)	**ohm**	0.9237	
Exciter Stator Resistance (20°C)	**ohm**	17.12	
Exciter Rotor Phase resistance	**ohm**	0.06603	
Cooling air requirement	**m^3/sec**	0.379	0.455

Configuration	**Single Bearing**	**Double Bearing**
Type of Construction	**B2 - SAE**	**IM B34**
Inertia (J) [kgm2]	2.27	2.13
Total Weight	528	535
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.