



# THREE-PHASE SYNCHRONOUS GENERATOR

## TCU368H

### 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	IP23
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	<b>400</b>	415	380	416	440	460	480
Voltage ( YY Connection ) - Parallel Star	V	190	<b>200</b>	208	190	208	220	230	240
Voltage ( Δ Connection ) - Series Delta	V	220	<b>230</b>	240	220	240	254	266	277
Voltage ( ΔΔ Connection ) - Parallel Delta	V	110	<b>115</b>	120	110	120	127	133	138
Rated power at Class H (125 °C) temperature rise	kVA	760	<b>800</b>	770	760	830	880	920	960
	kW	608	<b>640</b>	616	608	664	704	736	768
Efficiency at Class H (P.F.=0.8)	4/4%	94.8	<b>94.9</b>	94.9	94.9	95.0	95.1	95.2	95.4
	3/4%	95.1	<b>95.2</b>	95.2	95.1	95.2	95.3	95.4	95.6
	2/4%	94.5	<b>94.6</b>	94.6	94.8	94.9	95.0	95.1	95.3
Efficiency at Class H (P.F.=1.0)	4/4%	95.6	<b>95.7</b>	95.7	96.0	96.1	96.2	96.3	96.5
	3/4%	95.8	<b>95.9</b>	95.9	96.2	96.3	96.4	96.5	96.7
	2/4%	95.2	<b>95.3</b>	95.3	95.9	96.0	96.1	96.2	96.4

#### Reactance (%) at Class H

	Kcc	0.33	<b>0.34</b>	0.38	0.27	0.30	0.31	0.32	0.34
Short-circuit ratio									
Direct axis synchronous reactance unsaturated	X <sub>d</sub>	3.059	<b>2.906</b>	2.598	3.670	3.342	3.259	3.170	2.906
Quadrature axis synchronous reactance unsaturated	X <sub>q</sub>	1.609	<b>1.529</b>	1.367	1.931	1.759	1.565	1.668	1.529
Direct axis transient reactance saturated	X' <sub>d</sub>	0.188	<b>0.179</b>	0.160	0.226	0.206	0.180	0.195	0.179
Direct axis subtransient reactance saturated	X'' <sub>d</sub>	0.147	<b>0.140</b>	0.125	0.177	0.161	0.141	0.153	0.140
Quadrature axis subtransient reactance saturated	X'' <sub>q</sub>	0.182	<b>0.173</b>	0.155	0.219	0.199	0.176	0.189	0.173
Zero sequence reactance unsaturated	X <sub>0</sub>	0.026	<b>0.025</b>	0.022	0.032	0.029	0.026	0.027	0.025
Leakage reactance	X <sub>L</sub>	0.100	<b>0.095</b>	0.085	0.120	0.109	0.094	0.104	0.095
Negative sequence reactance saturated	X <sub>2</sub>	0.165	<b>0.157</b>	0.140	0.198	0.181	0.158	0.171	0.157

Open circuit time constant (sec.)	T'do	2.1920							
Short-circuit transient time constant (sec.)	T'd	0.0980							
Subtransient time constant (sec.)	T''d	0.0148							
Armature time constant (sec.)	T <sub>α</sub>	0.0291							
No load excitation current	io(A)	0.6			0.6				
Full load excitation current	ic(A)	2.1			2				
Full load excitation voltage	uc(V)	53			50				
Stator Winding Resistance (20°C)	ohm	0.003193							
Rotor Winding Resistance (20°C)	ohm	1.484							
Exciter Stator Resistance (20°C)	ohm	18.54							
Exciter Rotor Phase resistance	ohm	0.0375							
Cooling air requirement	m <sup>3</sup> /sec	1.105			1.326				

Configuration	Single Bearing	Double Bearing
Type of Construction	<b>B2 - SAE</b>	<b>IM B34</b>
Inertia (J) [kgm <sup>2</sup> ]	12.06	11.95
Total Weight	1621	1652
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.

Data and Technical Specification are subject to change in order to update or improve the products, without prior notice