



# THREE-PHASE SYNCHRONOUS GENERATOR

**TCU288J**

## 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	<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	300	<b>315</b>	302.5	300	325	345	360	378
	kW	240	<b>252</b>	242	240	260	276	288	302
Efficiency at Class H (P.F.=0.8)	4/4%	93.4	<b>93.5</b>	93.5	93.2	93.3	93.5	93.7	93.9
	3/4%	93.9	<b>94</b>	94	93.6	93.7	93.9	94.1	94.3
	2/4%	93.7	<b>93.8</b>	93.8	93.4	93.5	93.7	93.9	94.1
Efficiency at Class H (P.F.=1.0)	4/4%	95.0	<b>95.1</b>	95.1	94.8	94.9	95.1	95.3	95.5
	3/4%	95.4	<b>95.5</b>	95.5	95.1	95.2	95.4	95.6	95.8
	2/4%	95.2	<b>95.3</b>	95.3	94.9	95.0	95.2	95.4	95.6

#### Reactance (%) at Class H

	Kcc	0.3809	<b>0.4000</b>	0.4505	0.3174	0.3514	0.3701	0.3873	0.4025
Short-circuit ratio									
Direct axis synchronous reactance unsaturated	X <sub>d</sub>	2.6255	<b>2.4880</b>	2.2197	3.1503	2.8458	2.7022	2.5818	2.4847
Quadrature axis synchronous reactance unsaturated	X <sub>q</sub>	1.6346	<b>1.5490</b>	1.3819	1.9614	1.7718	1.6824	1.6074	1.5470
Direct axis transient reactance saturated	X' <sub>d</sub>	0.1678	<b>0.1590</b>	0.1419	0.2013	0.1819	0.1727	0.1650	0.1588
Direct axis subtransient reactance saturated	X'' <sub>d</sub>	0.1351	<b>0.1280</b>	0.1142	0.1621	0.1464	0.1390	0.1328	0.1278
Quadrature axis subtransient reactance saturated	X'' <sub>q</sub>	0.1667	<b>0.1580</b>	0.1410	0.2001	0.1807	0.1716	0.1640	0.1578
Zero sequence reactance unsaturated	X <sub>0</sub>	0.0306	<b>0.0290</b>	0.0259	0.0367	0.0332	0.0315	0.0301	0.0290
Leakage reactance	X <sub>L</sub>	0.0876	<b>0.0830</b>	0.0740	0.1051	0.0949	0.0901	0.0861	0.0829
Negative sequence reactance saturated	X <sub>2</sub>	0.1509	<b>0.1430</b>	0.1276	0.1811	0.1636	0.1553	0.1484	0.1428

Open circuit time constant (sec.)	T' <sub>do</sub>	1.8060							
Short-circuit transient time constant (sec.)	T' <sub>d</sub>	0.0800							
Subtransient time constant (sec.)	T'' <sub>d</sub>	0.0118							
Armature time constant (sec.)	T <sub>α</sub>	0.0251							
No load excitation current	io(A)	0.5			0.5				
Full load excitation current	ic(A)	1.9			1.8				
Full load excitation voltage	uc(V)	48			46				
Stator Winding Resistance (20°C)	ohm	0.01099							
Rotor Winding Resistance (20°C)	ohm	1.396							
Exciter Stator Resistance (20°C)	ohm	17.12							
Exciter Rotor Phase resistance	ohm	0.06603							
Cooling air requirement	m <sup>3</sup> /sec	0.535			0.64				

Configuration	Single Bearing	Double Bearing
Type of Construction	<b>B2 - SAE</b>	<b>IM B34</b>
Inertia (J) [kgm <sup>2</sup> ]	3.6	3.5
Total Weight	788	795
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