



THREE-PHASE SYNCHRONOUS GENERATOR

TCU288B

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	170	181	175	170	187.5	197.5	207.5	215
	kW	136	145	140	136	150	158	166	172
Efficiency at Class H (P.F.=0.8)	4/4%	92.0	92.1	92.0	92.0	92.1	92.2	92.3	92.5
	3/4%	92.6	92.7	92.6	92.7	92.8	92.9	93.0	93.2
	2/4%	92.4	92.5	92.4	92.3	92.4	92.5	92.6	92.8
Efficiency at Class H (P.F.=1.0)	4/4%	93.8	93.9	93.8	93.7	93.8	93.9	94.0	94.2
	3/4%	94.5	94.6	94.5	94.4	94.5	94.6	94.7	94.9
	2/4%	94.2	94.3	94.2	94.0	94.1	94.2	94.3	94.5

Reactance (%) at Class H

	Kcc	0.3345	0.3480	0.3875	0.2787	0.3031	0.3217	0.3344	0.3516
Short-circuit ratio									
Direct axis synchronous reactance unsaturated	X _d	2.9899	2.8770	2.5806	3.5876	3.2995	3.1088	2.9907	2.8439
Quadrature axis synchronous reactance unsaturated	X _q	1.9091	1.8370	1.6478	2.2907	2.1067	1.9850	1.9096	1.8159
Direct axis transient reactance saturated	X' _d	0.2453	0.2360	0.2117	0.2943	0.2707	0.2550	0.2453	0.2333
Direct axis subtransient reactance saturated	X'' _d	0.2047	0.1970	0.1767	0.2457	0.2259	0.2129	0.2048	0.1947
Quadrature axis subtransient reactance saturated	X'' _q	0.2338	0.2250	0.2018	0.2806	0.2580	0.2431	0.2339	0.2224
Zero sequence reactance unsaturated	X ₀	0.0405	0.0390	0.0350	0.0486	0.0447	0.0421	0.0405	0.0386
Leakage reactance	X _L	0.1476	0.1420	0.1274	0.1771	0.1629	0.1534	0.1476	0.1404
Negative sequence reactance saturated	X ₂	0.2193	0.2110	0.1893	0.2631	0.2420	0.2280	0.2193	0.2086

Open circuit time constant (sec.)	T' _{do}	1.3840							
Short-circuit transient time constant (sec.)	T' _d	0.0770							
Subtransient time constant (sec.)	T'' _d	0.0085							
Armature time constant (sec.)	T _α	0.0197							
No load excitation current	io(A)	0.5			0.5				
Full load excitation current	ic(A)	1.8			1.7				
Full load excitation voltage	uc(V)	44			42				
Stator Winding Resistance (20°C)	ohm	0.02905							
Rotor Winding Resistance (20°C)	ohm	0.9241							
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) [kgm ²]	2.3	2.15
Total Weight	530	537
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