



THREE-PHASE SYNCHRONOUS GENERATOR

TCU318D

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 | 425 | 450 | 432.5 | 425 | 467.5 | 495 | 515 | 540 |
| | kW | 340 | 360 | 346 | 340 | 374 | 396 | 412 | 432 |
| Efficiency at Class H (P.F.=0.8) | 4/4% | 94.2 | 94.3 | 94.3 | 94.0 | 94.2 | 94.3 | 94.5 | 94.7 |
| | 3/4% | 94.5 | 94.6 | 94.6 | 94.3 | 94.5 | 94.6 | 94.8 | 95 |
| | 2/4% | 93.8 | 93.9 | 93.9 | 93.6 | 93.8 | 93.9 | 94.1 | 94.3 |
| Efficiency at Class H (P.F.=1.0) | 4/4% | 95.4 | 95.5 | 95.5 | 95.1 | 95.3 | 95.4 | 95.6 | 95.8 |
| | 3/4% | 95.7 | 95.8 | 95.8 | 95.3 | 95.5 | 95.6 | 95.8 | 96 |
| | 2/4% | 95.1 | 95.2 | 95.2 | 94.8 | 95.0 | 95.1 | 95.3 | 95.5 |

Reactance (%) at Class H

| | Kcc | 0.3190 | 0.3300 | 0.3740 | 0.2660 | 0.2900 | 0.3060 | 0.3210 | 0.3340 |
|---|------------------|--------|---------------|--------|--------|--------|--------|--------|--------|
| Short-circuit ratio | | | | | | | | | |
| Direct axis synchronous reactance unsaturated | X _d | 3.1342 | 2.9950 | 2.6742 | 3.7607 | 3.4494 | 3.2670 | 3.1123 | 2.9950 |
| Quadrature axis synchronous reactance unsaturated | X _q | 2.2321 | 2.1330 | 1.9045 | 2.6783 | 2.4566 | 2.3267 | 2.2165 | 2.1330 |
| Direct axis transient reactance saturated | X' _d | 0.2260 | 0.2160 | 0.1929 | 0.2712 | 0.2488 | 0.2356 | 0.2245 | 0.2160 |
| Direct axis subtransient reactance saturated | X'' _d | 0.1800 | 0.1720 | 0.1536 | 0.2160 | 0.1981 | 0.1876 | 0.1787 | 0.1720 |
| Quadrature axis subtransient reactance saturated | X'' _q | 0.2187 | 0.2090 | 0.1866 | 0.2624 | 0.2407 | 0.2280 | 0.2172 | 0.2090 |
| Zero sequence reactance unsaturated | X ₀ | 0.0377 | 0.0360 | 0.0321 | 0.0452 | 0.0415 | 0.0393 | 0.0374 | 0.0360 |
| Leakage reactance | X _L | 0.1214 | 0.1160 | 0.1036 | 0.1457 | 0.1336 | 0.1265 | 0.1205 | 0.1160 |
| Negative sequence reactance saturated | X ₂ | 0.1978 | 0.1890 | 0.1688 | 0.2373 | 0.2177 | 0.2062 | 0.1964 | 0.1890 |

| | | | | | | | | | |
|--|---------------------|----------|--|--|-------|--|--|--|--|
| Open circuit time constant (sec.) | T' _{do} | 2.0960 | | | | | | | |
| Short-circuit transient time constant (sec.) | T' _d | 0.0940 | | | | | | | |
| Subtransient time constant (sec.) | T'' _d | 0.0120 | | | | | | | |
| Armature time constant (sec.) | T _α | 0.0299 | | | | | | | |
| No load excitation current | io(A) | 0.5 | | | 0.5 | | | | |
| Full load excitation current | ic(A) | 2 | | | 1.9 | | | | |
| Full load excitation voltage | uc(V) | 50 | | | 48 | | | | |
| Stator Winding Resistance (20°C) | ohm | 0.008081 | | | | | | | |
| Rotor Winding Resistance (20°C) | ohm | 1.06 | | | | | | | |
| Exciter Stator Resistance (20°C) | ohm | 16.32 | | | | | | | |
| Exciter Rotor Phase resistance | ohm | 0.0374 | | | | | | | |
| Cooling air requirement | m ³ /sec | 0.722 | | | 0.866 | | | | |

| Configuration | Single Bearing | Double Bearing |
|-------------------------------------|--|--|
| Type of Construction | B2 - SAE | IM B34 |
| Inertia (J) [kgm ²] | 5.7 | 5.59 |
| Total Weight | 1028 | 1047 |
| Drive end bearing / Lubrication | Not supply | 6319 C3-2Z / Prelubricated - sealed for life |
| Non-drive end bearing / Lubrication | 6314 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