

Static Frequency Converter

3CT40KD



The 3CT40KD Static Frequency Converter (SFC) is designed to supply 3 phase 115V, 400Hz to ships loads with low distortion and high stability when connected to the main 440 volt 3 phase 60Hz supply.

As required for naval applications the SFC is designed to meet the necessary ruggedness in terms of shock and vibration and naval EMC requirements.

The SFC consists of a rectifier and an inverter.

The rectifier converts the incoming ac supply to an internal DC voltage. It is a rugged thyristor rectifier with an input current THD of 14% and power factor of 0.9 at full load.

The inverter converts the internal DC voltage to the 400Hz ac output. It is a three phase high frequency PWM IGBT inverter and has an isolation transformer to provide full galvanic isolation between input and output.

ELECTRICAL CHARACTERISTICS

Input

440 volts 3 phase 3 wire 60Hz in accordance with STANAG 1008 Edition 9

Input kVA	43.9kVA
Input Power	39.5kW
Input Rated Voltage	440V
Input Rated Current	58A/phase
Power Factor	> 0.9 (@full load)
Input current harmonic distortion	20%(typical @full load)
Inrush Current	<I _{nom}

Option: Anti-condensation heater 115V or 230V

Output

115V/phase, 3 phase, 400Hz, 40kVA,32kW

Waveform	Sinusoidal
THD(linear load)	<3%
Static voltage regulation	± 1%
Dynamic voltage regulation	± 6%
Load power factor	0.3lag to 0.3 lead
Crest factor	3:1
Frequency stability	± 0.1%.

Option: Earth isolation monitor

Load 40kVA, 32kW

Overload 120% continuous, 121% for 2 minutes,160% for 5s

Wild heat 3.55kW

Efficiency >84%

Protection

Input circuit breaker. Output short circuit and over current protection. Over/under voltage, low DC and over temperature trips are also provided to afford general protection to the unit. Output phase failure protection.

Local Controls and Indications

Supply ON/OFF selector switch
Supply available LED
Output On LED
Alarm LED
Fault LED
Mimic with diagnostic display

Remote Indications

Fault, Output ON, and Alarm remote indication by means of volt free contacts.

MECHANICAL FEATURES

Enclosure

Fabricated mild steel folded and welded for strength. Deck mounted with top steadies. Lifting eyes are provided.

Dimensions

1500 x 815 x 670 (O/A)(h x w x d) mm

A clearance of at least 100 mm should be allowed around the unit (including base) to allow proper ventilation.

Fixings

4 holes 21mm dia. Centres 710(w) x 370(d) mm
2 holes 21mm dia. Centres 720(w) x 1460(h) mm

Weight 590kg

Finish Lt Adm Grey BS381c Shade697:semigloss

Cable Entry

Top via gland plate. Effective aperture size 350mm x 300mm
User connections are made to internal rail mounted and stud terminals. Access for the cables is by a gland plate that can be drilled or punched as required for glands.

Ingress Protection Rating

IP23

Cooling

The Static Frequency Converter is designed for natural cooling by convection and louvres of sufficient size are provided for this purpose. Individual cooling fans for power assemblies are provided. Unrestricted airflow should be allowed around the unit.

Maintenance

Front maintenance - Hinged door for access.

Internal wiring

Low fire hazard cross linked polyolefin RADOX 125

Earth

For safety the chassis of the Static Frequency Converters must be earthed. An external M10 (x1.5) earth stud is situated adjacent to the gland plate.

ENVIRONMENTAL CHARACTERISTICS

Shock

The equipment is designed to meet a shock requirement of a maximum vertical acceleration (half sine-wave pulse) of amplitude 117.7m/s² (12g) and of duration 9ms (rise time to peak velocity) and 24ms (fall time to zero velocity). For installed shock levels in excess of this shock mounts should be fitted.

Vibration

The unit, when 'hard' mounted, is designed to meet shipboard vibration. Typically: 5 to 33Hz +/- 0.125mm

Noise

< 60dbA. @ 1m

Electromagnetic Compatibility

The equipment is designed to comply with the requirements of Def Stan 59-41. Emissions and susceptibility (Below deck limits)

Ambient Temperature

0°C to + 45°C

Relative Humidity

10% to 95% non-condensing

All PCBs are conformally coated to protect against the effects of humidity.

Ships Motion

The equipment is designed to withstand, without damage or degradation of performance or spillage of fluids, ship motion due to the action of the sea and weather as well as accelerations and velocities deriving from deliberate ship manoeuvres. Typically:

Roll angles	± 30°
Pitch angles	± 10°
Steady list angles	± 15°
Steady trim angles	± 5°