Uninterruptible Power Supplies 3RPQ Range

The 3RPQ Range of Uninterruptible Power Supplies (UPS) supply 60Hz three phase output to ships loads. The UPS consists of a transformer isolated rectifier, battery, an inverter and static switch. The batteries can be supplied nets either combined with the UPS or as stand alone cabinets

The rectifier in the UPS is supplied by the ship's 440V 3phase 60Hz supply and provides power to supply the inverter and recharge the battery.

In normal operation, the rectifier float charges the battery and supplies the DC input to the inverter. The inverter supplies the output. When the input supply fails the battery supplies the DC input to the inverter that continues to supply the output. When the mains returns the rectifier recharges the battery.
As required for naval applications the UPS is designed to meet the necessary ruggedness in terms of shock, vibration and EMC requirements.

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ELECTRICAL CHARACTERISTICS

Input
440 volts 3 phase 3 wire 60Hz in accordance with STANAG 1008 Edition 8

Input Rated Voltage	440V
Input Current THD	<4%
Power Factor	0.99
Inrush Current	<Inom

Option: Alternative input supply
Option: ACH 115V or 230V

Battery

Valve Regulated Sealed Lead Acid type,
Capacity

Output
440V 3 phase, 60Hz

Waveform	Sinusoidal
THD	<2%
Static voltage regulation	± 1%
Dynamic voltage regulation	± 5%
Frequency stability	± 0.1%.

Load
10, 15, 20, 30, 40kVA

Options
Earth isolation monitor
Output distribution
Auxiliary 24V DC Output
Individual Battery monitoring
Alternative output voltages 415V, 230V or 115V

Efficiency >90 %

Protection
Input fused. Output short circuit and over current protection. Over voltage and over temperature trips are also provided to afford general protection to the unit. Battery cut off at the end of discharge, battery overvoltage protection.

Local Controls and Indications.
Supply ON/OFF selector switch, Supply available LED, Rectifier LED Battery LED, Inverter LED, Liquid Crystal Display with scroll pushbuttons to view the parameters

Remote Indications.
RS232 interface gives status/fault information plus the parameter values of supply voltage, supply current, Output Voltage, Output Current, Battery Voltage, Battery charge/discharge current, Temperature, Battery Capacity

MECHANICAL FEATURES

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

Cable Entry
Top/bottom via gland plate.
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 suitable for electrical equipment compartment
IP54 suitable for machinery spaces

Cooling
The UPS 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 – Lift off hinged doors for access.

Internal wiring
Low fire hazard cross linked polyolefin RADOX 125.

Earth
For safety the chassis of the UPS must be earthed. An external M10 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
< 65dbA. @ 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.

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°

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