

## 24V DC SYSTEMS



A DC system typically consists of TRUs (Transformer Rectifier Units), batteries and distribution, either as separate units or combined together dependent on the user requirements

The TRU can either be from the 3RC range of 12 pulse thyristor rectifiers or the 3RP range of equipment that utilises switch-mode rectifier modules.

Valve regulated lead acid batteries are used to support ships essential DC supplies via output circuit breakers. Batteries of various sizes can be selected to meet the user's required load and autonomy time.

The distribution typically consists of output circuit breakers and charger/battery isolators.



### TRANSFORMER RECTIFIERS

#### Input

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

High input power factor with rectifier modules

Option: Normal/Emergency input supply with automatic changeover

Option: 415/230/115V, 3phase, 60Hz

Option: single phase input

#### Output

27.4V DC nominal      26-32V adjustment

#### Load

Output Power:      1, 2, 3, 4, 5, 7.5, 10, 12.5, 15kW

#### Protection

Inputs fused, output current limited, over-voltage trip, over-temperature trip. Fan failure monitoring.

#### Local Controls and Indications

Supply ON/OFF selector switch

Output Voltmeter

Output Ammeter

Supply available LED

ACH On LED

Output On LED

Fault LED

#### Remote Indications

Fault, Output ON, and Alarm remote indication by means of volt free contacts. Other alarm conditions available



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## BATTERY BOXES

### Batteries

Valve Regulated Lead Acid  
Nominal voltage: 24V  
Nominal capacity dependant on autonomy time, typically 5min, 30min or 1hr  
Specified lifetime 7-10yrs at 20°C.  
Recommended normal operating temperature range 20 to 25degC.

### Meters

Analogue or digital meters for output voltage and charge/discharge current

### Indications

Battery Available  
Discharge  
Over Voltage  
Low Voltage  
H2 > 1%  
ACH on  
Earth Fault

### Remote Indications

Summary Alarm NO/C/NC Changeover contacts.

### Battery monitoring

Extensive battery monitoring: Overvoltage, low voltage, excess hydrogen and short circuit cell detection.

### Temperature compensation/remote sense

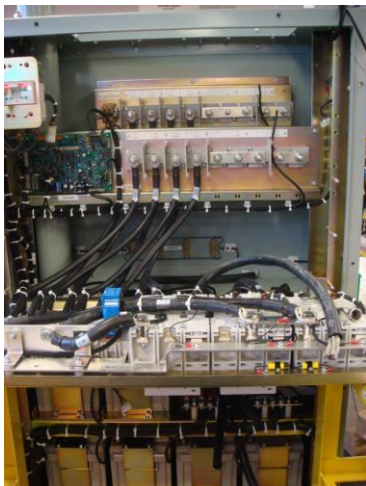
The battery boxes have the facility for a remote sense connection that can be used for float voltage temperature compensation.



## DISTRIBUTION

Charger Circuit Breaker, output circuit breakers, Link circuit breaker  
Battery Isolator, TRU Isolator, ACH On switch, Meter Selection, LED  
Test pushbutton, Reset Alarm push button

Option: Earth isolation monitor



## ENVIRONMENTAL CHARACTERISTICS

### Shock

15g (25ms half sine). For installed shock levels in excess of this shock mounts should be fitted.

### Vibration

Meets shipboard vibration requirements. Typically: 5 to 33Hz +/- 0.125mm

### Noise

<60dbA.

### Electromagnetic Compatibility.

Equipment designed to comply with the requirements of Def Stan 59-411. Emissions and susceptibility (Below deck limits)

### Ambient Temperature.

0°C to + 45°C.

Batteries are temperature dependent. The batteries have been selected for operation at a nominal ambient temperature of 20°C.

### Relative Humidity

10% to 95% non-condensing.

All PCBs have a conformal coat to protect against the effects of condensation.

### Ingress Protection

IP23- suitable for electrical compartment

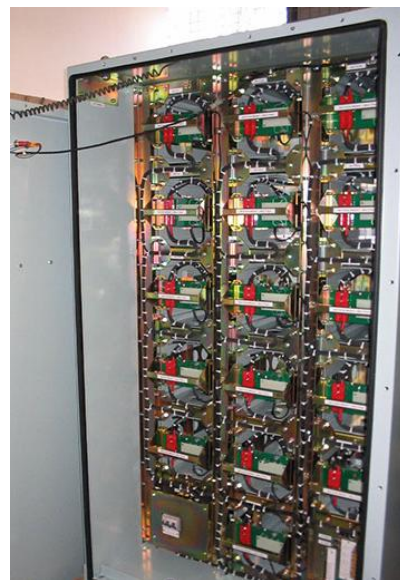
IP44- suitable for machinery space

IP54- fitted with dust filters

### 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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