

Cathodic Protection

Oil Cooled Transformer Rectifiers



Corrocell Limited

Corrocell Ltd's engineers have extensive experience in the mitigation of corrosion in many industries.

This experience extends to the design and manufacture of Transformer Rectifiers specifically aimed at cathodic protection applications for the control to anode systems in multiple applications

Designed for Impressed Current Cathodic Protection (ICCP) for Platinised Titanium (Pt Ti), Mixed Metal Oxide (MMO) or Silicon Iron anodes. Typical applications include pipelines, below and above grade storage tanks and steel piles in marine environments.

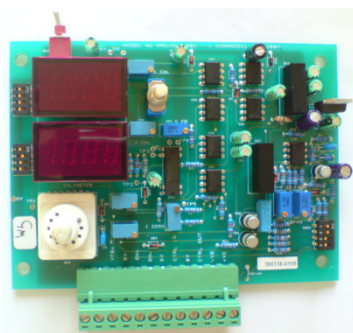


Features

The Corrocell Ltd range of oil cooled transformer rectifiers are manufactured to the highest standards in the UK, using only components in compliance with internationally recognised standards. All equipment is designed for 30 years continuous operation in severe climatic conditions based on the many years of experience gained by our engineering staff.

- Thyristor controlled
- Regulated from zero to full output using a 0-10VDC Control signal.
- Current Ratings from 20A to 500A
- Adjustable Current limit typically 5% -100% of nominal output current.
- Operating temperature from 0°C to +55°C which makes them suitable for high ambient temperature environments.
- Approximately 70-75% efficient depending on the rating.
- Three Phase or Single Phase supply.
- Full remote monitoring and control systems (RMCS) can be integrated into the control enclosures which can be connected to multiple units to provide large networks.
- Tanks manufactured from a minimum of 4mm mild steel reinforced fully welded construction, dye penetrant tested.
- DC Ripple is 5% at full rated output.

Meter Control Card (optional)



* RMCS: Remote Monitoring and Control System

- Manual – Output controlled by potentiometer adjustment.
- Automatic – Output controlled by feedback signals. Adjustable 'set-point' for control level.
- Selectable Constant Current or Constant Voltage.
- Digital or Analogue meters
- Ammeter – Value taken from mV across brass ended 0.5% DC output shunt.
- Digital Reference Electrode display meter.(Not required on RMCS models)
- Current Limit – Adjustable current limit from zero to full output.
- Auto-Control from any one of four selectable reference electrodes.
- SCADA Outputs scalable for Voltage/Current/Reference Electrode potentials.(Not required on *RMCS models)
- DC fail Alarm relay – Volt free contacts .(Not required on RMCS models)
- Error offset adjustment. (Not required on RMCS models)

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Oil Cooled Transformer Rectifier Thyristor controlled specifications

- 0-100% variable control using full wave fully thyristor controlled 1200V Peak Inverse Voltage (PIV) devices in accordance with IEC.747 / BS 4417
- Thyristor high speed semiconductor fuse protection
- Transformer - double wound core type in accordance with BS.171 class A. High efficiency-low heat rise wound insulation, earth shield.
- AC input fuse protection or 'D' type MCB.
- Adjustable DC output current limit
- Digital or analogue meters to display DC output voltage and current
- Constant current, constant voltage and Auto-Potential control models available.
- Automated instant off, depolarisation routines. (RMCS version).
- Full continuous data logging facility for all reference electrodes and DC output current and voltage of TRU viewable in graphical and tabular format. (RMCS version)
- Ambient temperature range -10 to +55°C
- Atmosphere – Marine (saliferous)
- Cyclic timers for interference testing (software or hardwire versions available).
- AC lightning protection across the DC output.
- All equipment is routinely performance tested to BS.171, also for polarity, no load losses, full load losses, and impedance volts and winding resistance. The equipment is CE marked and meets all the appropriate provisions of the relevant legislation implemented by certain European Directives.
- Transformer and rectifier mounted onto removable chassis inside oil tank.

- All circuits and apparatus are subjected to a power frequency voltage test at 2000V for 1 minute between phases and earth. Additionally the following 1000V insulation tests are performed:-
 - Primary to Secondary,
 - Primary to Earth,
 - DC Positive to Earth,
 - DC Negative to Earth.

- Units are connected up and run for at least 24 hours continuously at maximum current and voltage outputs. A 1KV insulation test is repeated immediately following the heat run. Note this test may be carried as a type test for multiple identical units.

Where relevant, the following codes and standards apply:

- BS 148: Specification for mineral insulating oils for transformers and switch gear.
- BS 171: Specification for Power Transformers.
- BS 4800: Specification for paint colours for building purposes.
- BS EN60529: 1992: Specification for the degrees of protection provided by enclosures.
- BS EN ISO: Specification for the corrosion protection of steel structures by protective paint
- 12944: 1998 BS 6004: Specification of PVC insulated cables (non armoured) for electric power and lighting.
- IEC 502: Extruded solid dielectric insulated power cables for rated voltages of 1 kV up to 30 kV.
- IEC 529: Degree of protection provided by enclosures (IP code.)
- IEC 747: Semi-conductor devices; Rectifier diodes.

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The transformer rectifier unit is to be supplied with the following fittings:-

- Lifting lugs.
- Earthing terminal.
- Oil drain valve tap with kick plate.
- Oil tank desiccant breather assembly.
- Oil sight gauge.
- Oil Temperature Gauge.
- Oil filler pipe with screw cap.
- Steel channel mountings.
- Thermocouple oil temperature measurement (RMCS model only).

Tank Paint coat system.

- Shot blast to SA 2.5
- Zinc rich primer (50µm)
- Epoxy Intercoat (60µm)
- Polyurethane Finish(50µm)
- Colour RAL 7032. (other colours available on request)
- Hot Dipped Galvanised on request

All fuses are clearly labelled using permanent indelible labels. Rating plates display a minimum information:

- Manufacturer and Address
- Descriptive Name - "Cathodic Protection Transformer Rectifier"
- Manufacturer's Serial Number
- Date of Manufacture
- Clients Purchase Order Number
- Nominal Voltage
- Frequency Rating(Hz)
- DC Voltage
- DC Current
- Cooling Class: ONAN
- Oil Capacity: Liters

Laminated drawings of circuit diagram, tank and component layout are attached inside control enclosure.

First fill cooling oil is not supplied as standard for all overseas exports unless requested.