ARMIN's 63 Step Manual Controlled Cathodic Protection TR Units (Oil-Cooled) are specially designed for safe and long term operation in environments such as desert and tropical locations.

The transformer rectifier components are housed in steel enclosures divided into two main sections, namely oil tank and control cabinet.

The transformer rectifier is supplied complete with bolted type base frame and fixing bolts for plinth mounting. The outdoor control cabinets are normally provided with sunshade.

**Standard Features of the 63 Step Manual Controlled Rectifiers**

1) Manual voltage control over the 63 steps of nominal rated voltage.

2) Coarse, medium and fine adjustment by 3 X 4 step tap changer switches, rated to operate while system is energized, even on full load condition.

3) Compact design and easy to use and installation.

4) Minimum maintenance requirements and long operation time.

5) Weather proof construction and corrosion resistive finish by hot dip galvanized.

6) Ac input voltage, DC output voltage and current monitoring by moving coil analogical meters.

7) Over voltage and current protection for both of AC and DC sides.

8) Surge protection on D.C. side, lightning protection on Ac side.

9) Cooling by natural convention of transformer oil.

10) Suitable for either 3 wire or 4 wire connection for 3 Phase 380/440 Volt 50 and/or 60 Hz systems.
ARMIN's SCR Controlled Cathodic Protection TR Units (Oil-Cooled) are specially designed for safe and long term operation in environments such as desert and tropical locations.

The transformer rectifier components are housed in steel enclosures divided into two main sections, namely oil tank and control cabinet.

The transformer rectifier is supplied complete with bolted type base frame and fixing bolts for plinth mounting. The outdoor control cabinets are normally provided with sunshade.

**Features of the SCR Controlled Conventional Rectifiers**

1) Automatic constant voltage with current limitation and constant current with voltage limitation

2) Stepless control over the full range of nominal output ratings.

3) Precision control with phase angle control of power SCR unit.

4) 2 units of external one turn potentiometer only for setting output voltage and output current.

5) Cooling by natural convention of oil.

6) Intelligent anode current limiting preventing over current protection.

7) Suitable to be supplied by 3 Phase 3 wire and/or 4 wire 50/60 Hz.

8) Surge protection on D.C. side, lightning protection on Ac side.
ARMIN's SCR Controlled Multi Channel Cathodic Protection TR Units (Oil-Cooled) are specially designed for safe and long term operation where more than a single structure within different protective current would be subject of cathodic protection from a single multi channel CP station.

**Features of the SCR Controlled Conventional Rectifiers**

1) Modular multi channel DC output structure built-in a single enclosure

2) Automatic constant voltage with current limitation and constant current with voltage limitation for each output channel

3) Stepless control over the full range of nominal output ratings.

4) Precision control with phase angle control of power SCR unit.

5) Two units of external one turn potentiometer only for setting output voltage and output current.

6) Cooling by natural convention of oil.

7) Intelligent anode current limiting preventing over current protection for each channel

8) Suitable to be supplied by 3 Phase 3 wire and/or 4 wire 50/60 Hz.

9) Surge protection on D.C. side, lightning protection on AC side.
ARMIN's SCR Controlled Cathodic Protection TR Units (Air-Cooled) are specially designed for safe and long term operation for indoor locations & Controlled environments.

The transformer rectifier components are housed in steel enclosures divided into two main sections, namely Power Cabinet and Control Cabinet.

The Air cooled systems with natural conventions reduces the maintenance requirements of the system to absolutely minimum, during the operational life time of the Cathodic Protection system.

**Features of the SCR Controlled Conventional Rectifiers**

1) Automatic constant voltage with current limitation and constant current with voltage limitation.

2) Stepless control over the full range of nominal output ratings.

3) Precision control with phase angle control of power SCR unit.

4) Two units of external one turn potentiometer only for setting output voltage and output Current.

5) Cooling by natural convention without requirement.

6) Intelligent anode current limiting preventing over current protection.

7) Three Wire connection only for 3Phase systems without requirement of Neutral connection.

8) Surge Protection on D.C. side, lightning protection on Ac side.
ARMIN's Co. Variac Controlled Manual Cathodic Protection TR Units are specially designed for safe and long term operation in environments such as deserts, tropical and coastal locations.

The Air-Cooled Variac Controlled Transformer rectifier components installed on a rigid chase are housed in steel cabinet and caring out the following specifications.

**Features of the Variac Controlled Rectifiers**

1) Step less control of DC output voltage.

2) Compact and easy to use and installation.

3) Minimum maintenance requirements and long operation time.

4) Weather proof construction and corrosion resistive finish with UV protection.

5) Ac input voltage, DC output voltage and current monitoring by moving coil analogical meters.

6) Over voltage and current protection for both of AC and DC sides.

7) Surge protection on DC side, lightning protection on AC side.
**RRU Series of Automatic CP Rectifier**

**(ATRO Model, Oil-Cooled)**

Digital technology ensures superb reliability and provides flexibility to meet the requirements of today’s different fields of industry in the most efficient and cost effective manner.

Embedding of intelligent control systems based on the digital and micro-processor technology enables the functions of Impressed Current Cathodic Protection systems to be monitored and controlled remotely across of the SCADA (Supervisory Control and Data Acquisition) systems. ARMIN Industries Co. has the pleasure of producing these kinds of intelligent and smart rectifiers in case of both standard and custom design in the various capacities.

**Features of the SCADA Based Rectifiers**

1) Full Micro-processor based control, Intuitive control with LCD display and SCADA system.

2) Automatic operation (Referring Actual Potential of Cathode) with manual over-ride (Constant Current or Constant Voltage) facilities.

3) Precision control with phase angle control of power SCR unit.

4) Fully adjustable settings with operator interface and remote SCADA system over full ranges of reference electrode potential or output voltages and currents.

5) Direct RTU connectivity via 4-20 mA signal converters.

6) Intelligent Anode current limiting preventing over current protection.

7) Internal maintenance and diagnostics

8) Surge Protection on D.C. side, lightning protection on Ac side.
RRU Series of Automatic Rectifier  
(*ATRA Model, Air-Cooled*)

Digital technology ensures superb reliability and provides flexibility to meet the requirements of today’s different fields of industry in the most efficient and cost effective manner.

Embedding of intelligent control systems based on the digital and micro-processor technology enables the functions of Impressed Current Cathodic Protection systems to be monitored and controlled remotely across of the SCADA (Supervisory Control and Data Acquisition) systems. ARMIN Industries Co. has the pleasure of producing these kinds of intelligent and smart rectifiers in case of both standard and custom design in the various capacities.

**Features of the SCADA Based Rectifiers**

1) Full Micro-processor based control, Intuitive control with LCD display and SCADA system.

2) Automatic operation (referring actual potential of cathode) with manual over-ride (Constant Current or Constant Voltage) facilities.

3) Precision control via PWM power modulator Unit.

4) Fully adjustable settings with operator interface and remote SCADA system over full ranges of reference electrode potential or output voltages and currents.

5) Direct RTU connectivity via 4-20 mA signal converters.

6) Intelligent anode current limiting preventing over current protection.

7) Internal maintenance and diagnostics

8) Surge protection on D.C. side, lightning protection on A.C. side.
CP Remote Monitoring Units

The RMU series of cathodic protection (CP) remote monitoring units have been designed using modern techniques of monitoring cathodic protection effectiveness of the outer and inner surface of the structure to be cathodically protected. RMU series of CP monitoring units have been designed to be easily connected to the wide range of communication physical layers (Dedicated leased lines, Wireless, GSM, Optical Fiber, and Satellite) and supporting various industrial communication protocols for reliable system integrities.

**CP Remote Monitoring Units (RMUs) Can Be Used to Monitor the Following Parameters:**

- **Structure-to-soil “on” potential:** This is the potential of the protected of the protected structure with the CP current applied. This potential is usually referenced to a copper-copper sulphate (Cu/CuSO₄) reference electrode depending on the project.
- **Structure-to-soil “instant off” potential:** This is the potential of the protected structure immediately after the CP current is interrupted. This potential is usually referenced to a copper-copper sulphate (Cu/CuSO₄) reference electrode depending on the project.
- **Structure Internal surface potential:** This is the potential of the internal surface of the protected structure. This potential is usually referenced to a silver-silver chloride (Ag/AgCl) or Zinc reference electrode depending on the project.
- **Rectifier DC voltage:** This is the output voltage of the rectifier (Just for ICCP systems) as measured across the output terminals.
- **Rectifier DC current:** This is the output current of the rectifier (Just for ICCP systems). It is usually determined by measuring the voltage drop across a shunt of known resistance and applying Ohm’s law.
The CP remote Control and monitoring software have been designed for remotely real-time and/or periodical monitoring of the Smart T/R units. CP SCADA System have capability to communicated within any dedicated Leased lines, Fiber optics or wireless backbones supporting real-time control and monitoring of up to 255 T/R Units.

**Features of the CP Control and Monitoring Software shall be as Follow:**

- Continuously real-time control for set points such as nominal potential set points, Maximum current limitation, operating mode (switching between constant current mode, Constant voltage mode or automatic operating modes).
- Continuously real-time monitoring of reference electrodes, test coupons current and voltage outputs of each T/R unit.
- Data analysis and charting
- Single-Master/Multi-Slave communication protocol
- Standard data base interfaces such as ABC and SQL
- Export and import data through standard interfaces such as DDE, OLE and API