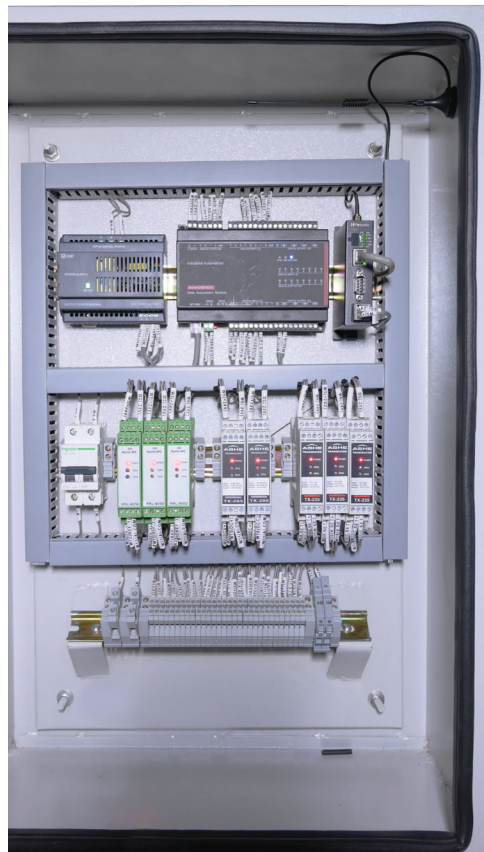




**PTSTR**

# PTSTR International Pvt. Ltd.

*(Smart Cathodic Protection Solution)*



# ABOUT US

**PTSTR International Pvt. Ltd.** is an ISO 9001:2015 certified company, specializing in manufacture of very high quality Smart Cathodic Protection Rectifier, Smart remote Monitoring & control panel (RMCP), Portable Current Interrupters & Smart Data logger for Cathodic Protection application.

**PTSTR International Pvt. Ltd.**, formerly known as Troubleshooting Technology, underwent a significant transformation in its corporate structure by transitioning from a Sole Proprietary Firm to a Private Limited Company.

Since 2014, **TROUBLESHOOTING TECHNOLOGY, MATHURA** has established a strong reputation in the industry. It has garnered recognition as an approved vendor by prestigious clients and Public Sector Undertakings (PSUs) within the Oil & Gas sector.

## WHY US

### Our Vision:

The implementation of the Remote Monitoring and Control Panel (RMCP) elevates the reliability of the cathodic protection system through the facilitation of remote monitoring, data logging, and control capabilities, effectively mitigating the inherent risks stemming from irregular inperson inspection schedules.

### Mission:

Our mission is to enhance and modernize existing cathodic protection rectifiers by integrating our Remote Monitoring and Control Panel. This innovative solution empowers our clients to remotely oversee, regulate and analyze critical parameters such as PSP, voltage, current and interrupters for all rectifiers. This remote accessibility ensures efficient operation and maintenance, enabling our clients to manage their cathodic protection systems conveniently from their control room or any location of their choice, eliminating the need for physical on-site presence

## Certificates & Registrations with the Indian Government as Troubleshooting Technology

S.No	DESCRIPTION	REGISTRATION NO
1	MINISTRY OF COMMERCE AND INDUSTRY NOIDA EPZ	CXZPK4189G
2	FEDERATION OF INDIAN EXPORT ORGANIZATIONS	KNP/115/2021-2022
3	COMMERCIAL TAXES DEPARTMENT, UTTAR PRADESH	09427405230
4	GOODS AND SERVICES TAX	09CXZPK4189G2ZI
5	MINISTRY OF MICRO, SMALL AND MEDIUM ENTERPRISES	UDYAM-UP-54-0000865
6	GOVERNMENT E-MARKET PLACE	D1FE200001163539
7	DIRECTORATE GENERAL OF FOREIGN TRADE GOVERNMENT OF INDIA	CXZPK4189G

## Certificates & Registrations with the Indian Government as PTSTR International Pvt. Ltd.

S.No	DESCRIPTION	REGISTRATION NO
1	CERTIFICATE OF INCORPORATION	U31103UP2022PTC163750
2	ISO 9001:2015	Q-162420052022
3	GOODS AND SERVICES TAX	09AAMCP8868J1ZE
4	MINISTRY OF MICRO, SMALL AND MEDIUM ENTERPRISES	UDYAM-UP-54-0019516
5	DEPARTMENT FOR PROMOTION OF INDUSTRY AND INTERNAL TRADE (START-UP INDIA)	DIPP106423
6	DIRECTORATE GENERAL OF FOREIGN TRADE GOVERNMENT OF INDIA	AAMCP8868J
7	INCOME TAX DEPARTMENT OF INDIA	AGRP13185E



## **Er. Mukesh Kumar**

*Founder & CEO, PTSTR*

A dynamic professional with over twelve years of rich experience in Servicing, Analogue testing, Inspection, Repairing, Maintenance & troubleshooting of Cathodic Protection Transformer Rectifier.

A professional expert in design and manufacture of Power conversion equipment specially multi range & multiple types of the rectifiers like SMPS rectifiers, transformer rectifiers, switch mode rectifiers & IGBT rectifiers in several industry like Indian railway, Telecom, Power, oil & gas etc.



# PTSTR HISTORY

## 2014

- Registration with Commercial Taxes Department, Uttar Pradesh as Troubleshooting Technology, Sikandra Rao, Hathras-204215 (U.P.)
- Worked with Indian Railways & Telecommunication industry.

## 2018

- Registration with Goods & Service Taxes Department, Uttar Pradesh as Troubleshooting Technology, Mathura-281204(U.P.)
- Registration with Ministry of Micro, Small and Medium Enterprises.
- Vendor Registration with Indian Oil Corporation Limited.

## 2019

- Vendor Registration with BPCL, HPCL,OIL INDIA, GAIL INDIA, GAIL GAS, IPPL,SUPERGAS,PPGCL & Ramco Industries Ltd.
- Development GPS sync Current Interrupter timer for the CP system.
- Development of Auto, CVCC & Manual cathodic protection rectifier inbuilt RMCP with SMS alarm system.

## 2020

- First order for Supply & Installation of Auto, CVCC & Manual cathodic protection rectifier with inbuilt RMCP and SMS alarm system at IOCL bottling plant.
- First order for Supply of GPS sync portable Current Interrupter for the CP system.
- Supply & installation of TLP & reference cell for the remote monitoring systems.
- Pipeline coating integrity surveys for IOCI Pipelines.

## 2022

- Design, manufacture & supply of Remote Monitoring & Control system for mounded vessels for NRL refinery.
- Design, manufacture, supply & installation of Remote Monitoring system for mounded bullets for IOCL Dimapur Bottling plant.
- Design, manufacture of Remote Monitoring system for mounded bullets for IOCL Bangalore Bottling plant.
- Registration at MINISTRY OF CORPORATE AFFAIRS as PTSTR International Pvt. Ltd.
- Registration at Goods & service tax department as PTSTR International Pvt. Ltd.
- Registration at MSME as PTSTR International Pvt. Ltd
- Recognition at DIPP (Start-UP India) as PTSTR International Pvt. Ltd
- Obtained ISO 9001:2015 certification as PTSTR International Pvt. Ltd

## 2023

- Innovation & development of Smart cathodic protection rectifier.
- Innovation & development of wireless Remote monitoring & control system.
- Up gradation of Portable current interrupter.
- Innovation & development of wireless smart Data logger for AC/DC Interference surveys

# PRODUCTS



## SMART CATHODIC PROTECTION RECTIFIER

- a. Remote Wireless communication (Can be Access wirelessly from anywhere)**
  - i. Auto, CVCC & Manual control cathodic protection rectifier.*
  - ii. Auto & CVCC control cathodic protection rectifier.*
  - iii. CVCC & Manual control cathodic protection rectifier.*
  - iv. CVCC control cathodic protection rectifier.*
- b. LOCAL ACCESS CATHODIC PROTECTION RECTIFIER**
  - i. CVCC control cathodic protection rectifier.*
  - ii. CVCC & Manual control cathodic protection rectifier.*
  - iii. Manual control cathodic protection rectifier*



## REMOTE MONITORING & CONTROL PANEL (RMCP)

- a. Wireless communication (Can be Access wirelessly from anywhere)**
  - i. Remote Monitoring Unit (V-1.0) BASIC*
  - ii. Remote Monitoring & Control System (V-2.0) ADVANCED*
  - iii. Remote Monitoring & Control System (V-3.0) PREMIUM*
  - iv. Remote Monitoring & Control System (V-4.0) PREMIUM HYBRID*
  - v. Remote Monitoring & Control System for mounded vessels (V-5.0)*
  - vi. Remote Monitoring & Control System for (3 CPTR/3Bullets) (V-5.1)*
- b. Wire communication (Can be Access from control room only)**
  - i. Remote Monitoring Unit (V-1.0) BASIC*
  - ii. Remote Monitoring & Control System (V-2.0) ADVANCED*
  - iii. Remote Monitoring & Control System (V-3.0) PREMIUM*
  - iv. Remote Monitoring & Control System (V-4.0) PREMIUM HYBRID*
  - v. Remote Monitoring & Control System for (1 CPTR/3Bullets) (V-5.0)*
  - vi. Remote Monitoring & Control System for (3 CPTR/3Bullets) (V-5.1)*



## CURRENT INTERRUPTER

- a. GPS Clock Sync real time on/off Current Interrupter**
  - i. Panel mount current interrupter*
  - ii. Portable current interrupter (Standard)*
  - iii. Portable current interrupter (Premium)*



## SMART DATALOGGER

- a. AC Voltage, AC Current, DC Voltage & DC current four parameters measure & logging with real time clock & GPS location coordinates**

# SMART CATHODIC PROTECTION TRANSFORMER RECTIFIER

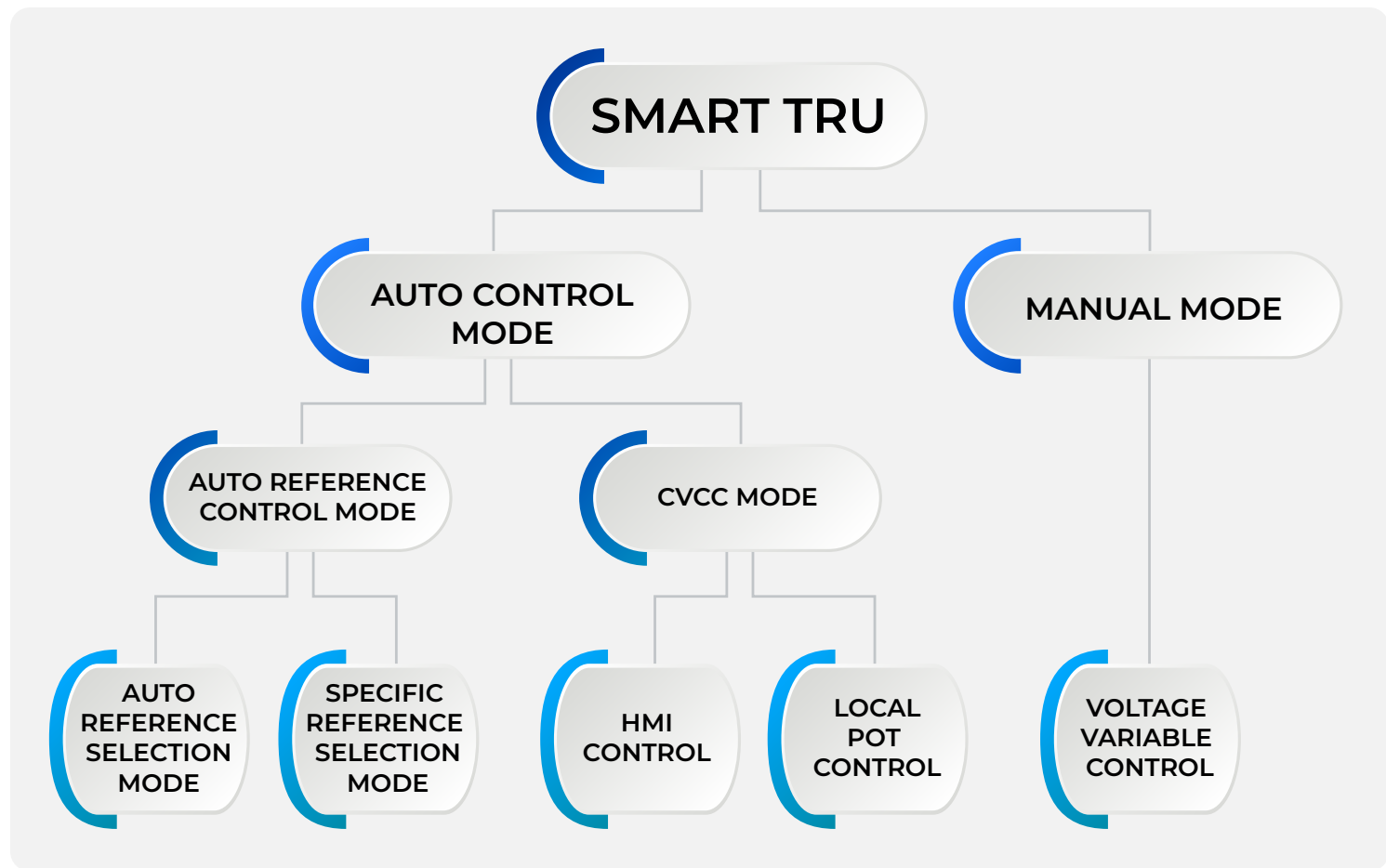


- Cathodic Protection Transformer Rectifier unit (TRU) is a crucial component in safeguarding submerged metallic structures from corrosion. These structures can include buried pipelines, concrete structures (e.g., bridges buildings, sea ports) and storage tanks at terminals/ refineries.
- The primary goal of a TRU is to superimpose direct current (DC) onto the steel structure, opposing the galvanic corrosion currents, thus preserving the structure.

- TRUs are available in various control modes: Auto, Constant Voltage Constant Current (CVCC) and manual control. To ensure optimal protection, TRUs continuously adjust the impressed current, maintaining a constant protective potential at the structure. This ongoing monitoring and control are typically automated to maintain effective cathodic protection.



# WORKING PRINCIPAL



## FEATURES AND BENEFITS

### 1. TYPE OF UNIT

- a) Natural Air Cooled
- b) Oil Cooled
- c) indoor or Outdoor type

### 2. OPERATIONAL CLIMATIC CONDITION

a) TRUs are designed to work under severe environmental conditions with maximum ambient temperature of 55°C and humidity of 95% (noncondensing). Enclosure conforming to class IP 55 degree of protection

### 3. TRANSFORMER

a) All the Transformers used in TRUs are designed to give high efficiency giving low loss. The coils are wound with high conductivity, annealed, insulated electrolytic copper and core material is high permeability, low loss CRGO. The insulation material used is of high standard Class H.

#### 4. RECTIFIER

a) Rectifiers are based on international quality standards and reputed make Diodes / Silicon Controlled Rectifiers. Rectifier circuits have different topology depending upon the load requirements.

#### 5. CONTROL ELEMENT

a) The DC Output will be controlled through latest solid state Silicon Controlled Rectifiers (SCRs) with plug in type control card & a specialized industrial minicomputer with programmable logic controller.

#### 6. PROTECTION

a) Normally we provide following protections:

- MCBs with HRC Fuses in AC Input & DC Output
- Surge protection device (SPD) in AC Input & DC Output
- Over current limit & short circuit protection through electronic controller
- Glass cartridge fuses in the all auxiliary power lines to control circuit

#### 7. MODES OF OPERATIONS

**a) Auto Reference Mode:** *The operation of the TRUs in this mode will be fully automatic and will be controlled by reference electrode feedback. The unit will automatically maintain reference voltage or P.S.P. within high precision  $\pm 10$  mv of the set value under all conditions.*

- **Auto reference cell selection Mode:** *TRU will autonomously prioritize the selection of the lowest reference cell to ensure that all reference cell values remain consistently above the predetermined threshold.*
- **Specific Reference selection Mode:** *The client has the option to manually select any reference cell connected to the TRU and the system prioritizes the chosen reference cell to ensure values consistently exceed the predetermined threshold.*

**b) CVCC MODE:** *The unit will be operated in Constant Voltage or Constant Current mode.*

- **Smart Control Mode:** *The DC output voltage and current limit can be precisely set anywhere between 0 and their respective rated values using a touch keyboard input on the HMI.*
- **Local Pot Control Mode:** *DC output voltage & Current limit could be settable from 0 to rated value in high precision stepless manner by means of voltage adjustable pot.*

**c) MANUAL MODE:** *The DC output voltage of the TRU will be precisely and continuously controlled using a separate variable transformer for fine-tuning.*



## 8. ENCLOSURES

a) Enclosures are fabricated from 2.5 mm / 2.0mm / 1.5 mm CRCA sheet and confirming to IP55 degree of protection. Lockable doors shall be provided in the Front and Back. Polycarbonate window is provided viewing HMI parameters and indications.

## 9. FINISH

a) Powder coating / Paint of required shade and thickness with proper treatment to suit corrosive/site conditions.

## 10. AC INPUTS

a) Single phase or three phase, 50 Hz/ 60 Hz

**11. HUMAN MACHINE INTERFACE (HMI):** *A seven-inch touchscreen specialized industrial minicomputer equipped with built-in 4G IIOT and programmable controller capabilities ensures remote accessibility for comprehensive monitoring and control of all parameters from any location as following.*

### a) Monitoring Parameters

- AC Input Voltage
- AC Input current
- DC Output Voltage
- DC Output Current
- Reference cell -1
- Reference cell -2
- Reference cell -3
- Mains ON

### a) Controlling Parameters

- Auto Ref set (Int PSP)
- DC output voltage set
- DC Current limit set
- Current Interrupter

## 12. INDICATIONS LAMP

a) Auto

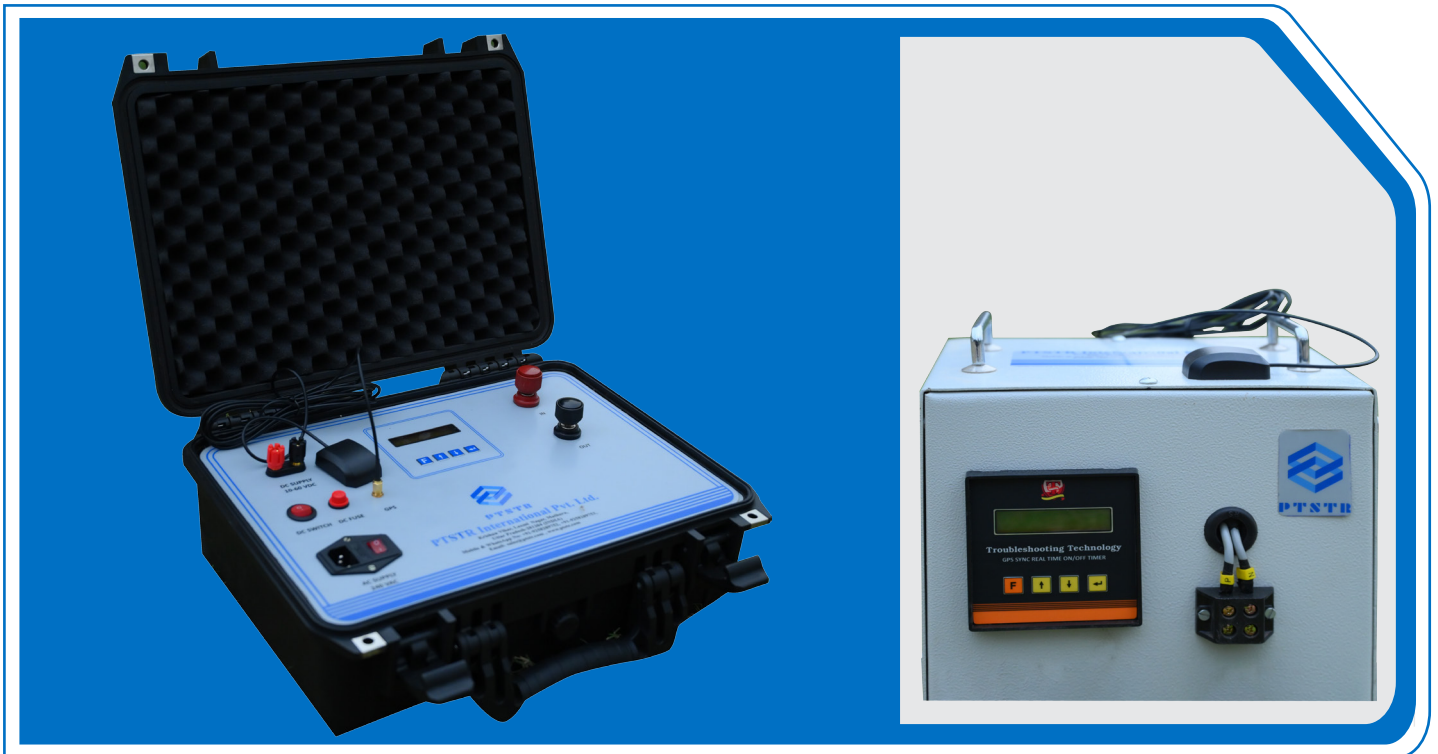
b) Manual

c) Current Limit

## 13. ADDITIONAL FEATURES

**a) Interrupter Timer:** *The Interrupter timer is programed in HMI sync with internet server clock used for carrying out ON /OFF CP survey using the current interruption technique.*

# GPS SYNCHRONIZE PORTABLE CURRENT INTERRUPTER



*The GPS based Timer is designed for applications requiring Time Synchronized events at multiple locations. The units consist of a GPS module with an external antenna to communicate with satellite based GPS system. The internal Real Time Clock (RTC) is synchronized within 1 millisecond accuracy with the GPS clock signal at regular intervals*

- 1) GPS Based current interrupter timer size (96X96mm)
- 2) Real time on/off Timer with High Accuracy for perfect synchronization.
- 3) Specially designed Timer for carrying out on/Off Cathodic Protection surveys using the current interruption technique
- 4) LCD display and 4-key keypad for ease of programming and for displaying the information about various modes & time periods is provided on the front panel.
- 5) Facility for programming of ON & OFF cycle time of DC current interruption from 0.1 sec to 99.9 seconds.
- 6) Micro-controller based Digital Circuitry
- 7) The Start and Stop of the timing cycle is also programmable and is controlled by the built-in real time clock in the Timer
- 8) Interruption START and STOP time is user programmable.
- 9) Interruption START and STOP time is remote PLC/RTU control.

S.No.	DESCRIPTION	STANDARD	PREMIUM
1	Power Supply	230VAC & 12-60 VDC (Both)	230VAC & 12-60 VDC (Both)
2	Timer's feature	GPS Synchronization, Real Time Clock (START/STOP by PLC/RTU optional)	GPS Synchronization, Real Time Clock, (START/STOP by PLC/RTU optional)
3	Real Time Clock (ON/OFF)	0.01 Second to 3540 Seconds	0.01 Second to 3540 Seconds
4	Switching Device	SOLID STATE (CE certified)	SOLID STATE (IGBT/SSR)
5	D. C. Voltage Range	0-60 VDC	0-600 VDC
6	D. C. Current Range	0-60 ADC	0-200 ADC
7	Isolation	2500 VAC/60 Seconds	4000 VAC/60 Seconds
8	Switching Temperature	20 to 80 C°	20 to 80 C°
9	AC Power Supply Accessories	2 Pin Terminal Block	3 MTR 3 Pin 18 AWG Cord with fuse
10	DC Power Supply Accessories	2 Pin Terminal Block	Banana Jack with fuse (Red & Black)
11	Enclosure	200x200x200 mm Metallic Box	Hard Plastic ABS tool case Box
12	Warranty/ Guarantee	Warranty for 1 year	Guarantee for 2 year

# REMOTE MONITORING & CONTROL SYSTEM (RMCP)



*PTSTR make remote monitoring & control system is specially designed for the monitoring & controlling of the complete cathodic protection system from the remote location.*



## FEATURES AND BENEFITS

### 1. TYPE OF UNITS

**a) Remote Monitoring Unit (V-1.0) BASIC:** Remote Monitoring Unit meticulously designed to cater to the monitoring and logging requirements of cathodic protection (CP) systems. This sophisticated unit excels in capturing and recording a comprehensive array of parameters such as PSP (pipe-to-soil potential), voltage, current, and all digital alarms associated with CP systems.

**b) Remote Monitoring & Control System (V-2.0) ADVANCED:** *In additional to all the features mentioned in the above variant (V-1.0) this variant provides the capability to control the DC voltage and DC current of the rectifiers*

**c) Remote Monitoring & Control System (V-3.0) PREMIUM:** *In additional to all the features mentioned in the above variant (V-2.0), this variant provides the empowerment the users the ability to exercise precise control over the Auto reference mode, DC voltage, and DC current of the rectifiers. The special feature in this variant is the control in Auto ref mode, which is rarely offered in the industry*

**d) Remote Monitoring & Control System (V-4.0) PREMIUM HYBRID:** *Our premium hybrid remote monitoring and control system has been carefully designed to meet the complex demands of comprehensive monitoring, controlling, and logging in cathodic protection (CP) systems. It is specifically tailored to facilitate upgrades, modifications, and rectifications necessary for operating in auto reference mode, without the need for any additional analog circuit or outdated control card.*

**e) Remote Monitoring & Control System (V-5.0) for mounded vessels:** *Remote Monitoring & control system designed to cater to the monitoring and logging requirements of cathodic protection (CP) systems of mounded vessels with wire/ofc communication. This variant provides the empowerment the users the ability to exercise precise control over the DC voltage, and DC current of the rectifiers from specified PC having SCADA software.*

## 2. OPERATIONAL CLIMATIC CONDITION

a) RMCPs are designed to work under severe environmental conditions with maximum ambient temperature of 50°C and humidity of 95% (non condensing).

## 3. PROTECTION

a) Normally we provide following protections:

- MCBs with HRC Fuses in AC Input power supply.
- Glass cartridge fuses in the all auxiliary power lines to control circuit
- Isolated Signal converter transducer used for the entire Monitoring & control interface.

## 4. ENCLOSURES

a) Enclosures are fabricated from 2.5 mm / 2.0mm / 1.5 mm CRCA sheet and confirming to IP55 degree of protection. Lockable doors shall be provided in the Front and Back. Polycarbonate window is provided viewing meters and indications.



## 5. FINISH

a) Powder coating / Paint of required shade and thickness with proper treatment to suit corrosive/site conditions.

## 6. AC INPUTS

a) Single phase 50 Hz/ 60 Hz

## 7. MONITORING PARAMETERS (AS PER CUSTOMER CHOICE)

### a) Analogue Parameters:-

- CP System Input Voltage : 0 to 750 V AC
- Input current : as with suitable Cts
- Output Voltage: As per output rating
- Output Current : As with suitable shunt
- Cathodic protection Potential : 0 to  $\pm 19.99$  V DC (up to 50 Nos Reference Cell)

### b) Digital Parameters:-

- |                  |                          |
|------------------|--------------------------|
| ■ Mains ON       | ■ Under protection Alarm |
| ■ Auto Mode      | ■ Over protection Alarm  |
| ■ Manual Mode    | ■ All Ref. Fail Alarm    |
| ■ Auto Ref. mode | ■ Current Limit Alarm    |
| ■ CVCC mode      |                          |

## 8. CONTROLLING PARAMETERS (AS PER CUSTOMER CHOICE)

### a) Analogue Parameters:-

- DC Output Voltage: As per rating
- DC Output Current : As per rating
- Automated cyclic Current interrupters

### b) Digital Parameters:-

- |                             |                           |
|-----------------------------|---------------------------|
| ■ Mains ON (Optional)       | ■ Current Limit Alarm     |
| ■ Auto Mode (Optional)      | ■ External cyclic Current |
| ■ Auto Ref. mode (Optional) | ■ Interrupters            |
| ■ CVCC mode (Optional)      |                           |

# DATA LOGGER TECHNICAL SPECIFICATION



- 1) Voltage Range DC 0-1000V with auto ranging from mV volt to V.
- 2) Voltage Range AC 0-1000V with auto ranging from mV to V.
- 3) Current Range DC 0-10 amp.
- 4) Current Range AC 0-10 amp.
- 5) In built GPS for Time stamp and location.
- 6) External SD card storage for Data Logging upto 32GB supported (FAT32 format only).
- 7) Alphanumeric LCD for complete Information display and Parameter setting.
- 8) LCD color white backlit and black characters.
- 9) Easy to use interface for setting parameters using four switches.

- 10) Powered by a 3.7V Li ion rechargeable battery.
- 11) Auto sleep Function.
- 12) Data logging rate @ 1 second
- 13) Sampling rate 100ms i.e. 10 samples logged every second.
- 14) External GPS antenna Connection for remote areas and offsite locations.
- 15) NOTE: It's highly recommended to attach the antenna before switching on the device.





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**MSME**

MICRO, SMALL & MEDIUM ENTERPRISES  
सूक्ष्म, लघु एवं मध्यम उद्यम  
OUR STRENGTH • हमारी शक्ति

Ministry of MSME, Govt. of India



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