



Smarter Monitoring.  
Reliable Power.

**Power Cable Sheath Circulation And Partial Discharge Integrated  
Online monitoring device  
SCYC-HLJC2304**

**电缆护层环流、局放综合在线监测装置**



**四川亚辰电气有限公司**  
Sichuan Yachen Electric Co., Ltd.

**High-Voltage Cable Circulating Current and Partial Discharge Integrated Online Monitoring Device**

# Sichuan Yachen Electric

## 四川亚辰电气



**Sichuan Yachen Electric Co., Ltd.** is a technology-driven manufacturing enterprise headquartered in Mianyang, Sichuan Province—known as China's "City of Science and Technology." Since its establishment in 2004, the company has specialized in the R&D and production of electromagnetic pulse (EMP) protection products, power transmission network monitoring equipment, lightning protection systems, instrumentation, high/low voltage electrical switches, and medical isolated power (IT) systems.

Our solutions are widely deployed across diverse sectors, including construction, electric power, telecommunications, railways, healthcare, and defense. Leveraging a robust R&D team, significant capital investment, and state-of-the-art infrastructure, Yachen Electric maintains long-term strategic partnerships with leading universities and research institutions. This commitment to collaboration ensures continuous technological optimization and innovation. To date, the company holds numerous invention and utility model patents, and all products have been rigorously tested and certified by authoritative Chinese industry bodies.

Our unwavering focus on advanced R&D, stringent quality control, and exceptional product reliability has earned Yachen Electric extensive recognition and acclaim from clients worldwide.

**Mission:** To enhance global power reliability through cutting-edge intelligent monitoring technology and innovative protection solutions. (使命：通过尖端的智能监测技术和创新的防护方案，提升全球电力的可靠性。)

### Core Values:

**Precision:** In every sensor and every data point. (精准：对待每一个传感器和数据点。)

**Integrity:** Building trust through reliable infrastructure. (正直：通过可靠的基础设施建立信任。)

**Innovation:** Solving tomorrow's grid challenges today. (创新：今日即解决明天的电网挑战。)

# Sichuan Yachen Electric

## 四川亚辰电气



**Corporate Qualifications & Certifications:** Yachen Electric is committed to operational excellence and holds several international management certifications, including:

- ▶ **ISO 9001:2015** (Quality Management System)
- ▶ **ISO 45001:2018** (Occupational Health and Safety Management System)
- ▶ **ISO 14001:2015** (Environmental Management System)
- ▶ **AAA-rated Credit Enterprise** (since 2011) and **AAA-rated Quality & Integrity Excellence Unit** (since 2012)

Furthermore, the company serves as the Vice Chairman Unit of the Electromagnetic Pulse and Lightning Protection Technology Professional Committee of the Sichuan Institute of Electronics, and a Director Unit of the Southwest Construction Electrical Information Network. We are also a selected supplier for military-grade products.

To ensure superior customer experience, Yachen Electric maintains a strong presence across major regions in China, providing rapid and high-quality technical support and after-sales service. Our global reach is further extended through an extensive network of authorized distributors.

We sincerely welcome domestic and international partners to explore collaborative opportunities and achieve mutual growth.

Circulating current, partial discharge, main cable current, return line current, vibration, temperature, induced voltage

1 Measurement System Introduction

2 Equipment appearance

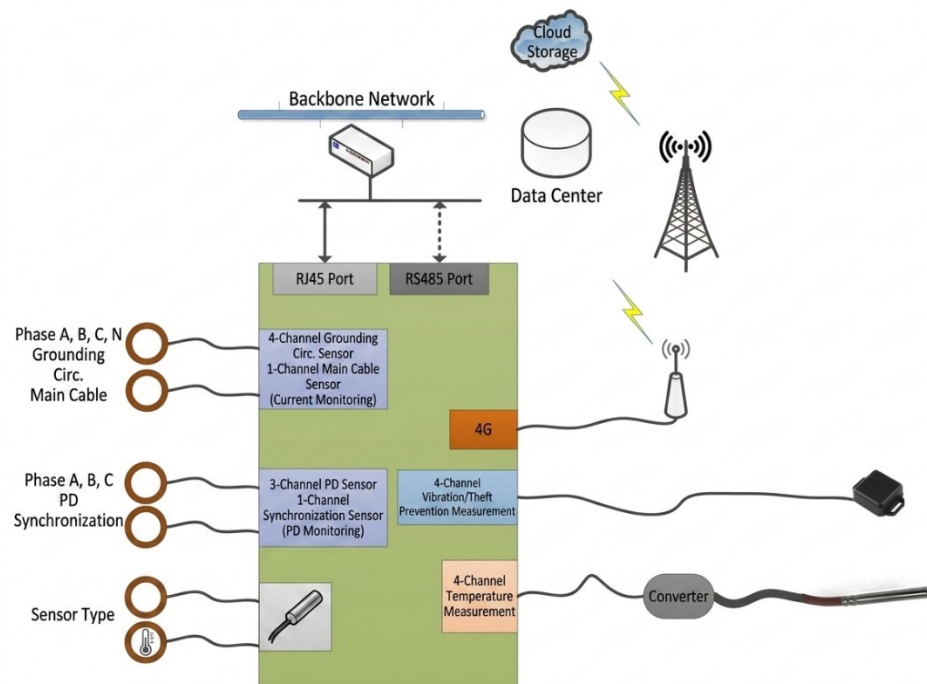
3 Measurement System Introduction

4 On-site installation photos

## 1

# Power Cable Sheath Circulation And Partial Discharge Integrated Online monitoring device System Composition

The Power Cable Sheath Circulation And Partial Discharge Integrated Online monitoring device consists of a monitoring host, current transformers, partial discharge sensors, temperature sensors, and anti-theft sensors. Open-type current transformers are installed on the cable sheath grounding wire and the main cable, converting the signal into a secondary signal before introducing it into the monitoring device. Temperature sensors are used to monitor cable temperature, and anti-theft sensors monitor the circulating grounding wire for anti-theft operations. All of the above monitoring interfaces can be added or removed according to customer needs.



## 1

# Power Cable Sheath Circulation And Partial Discharge Integrated Online monitoring device installation diagram

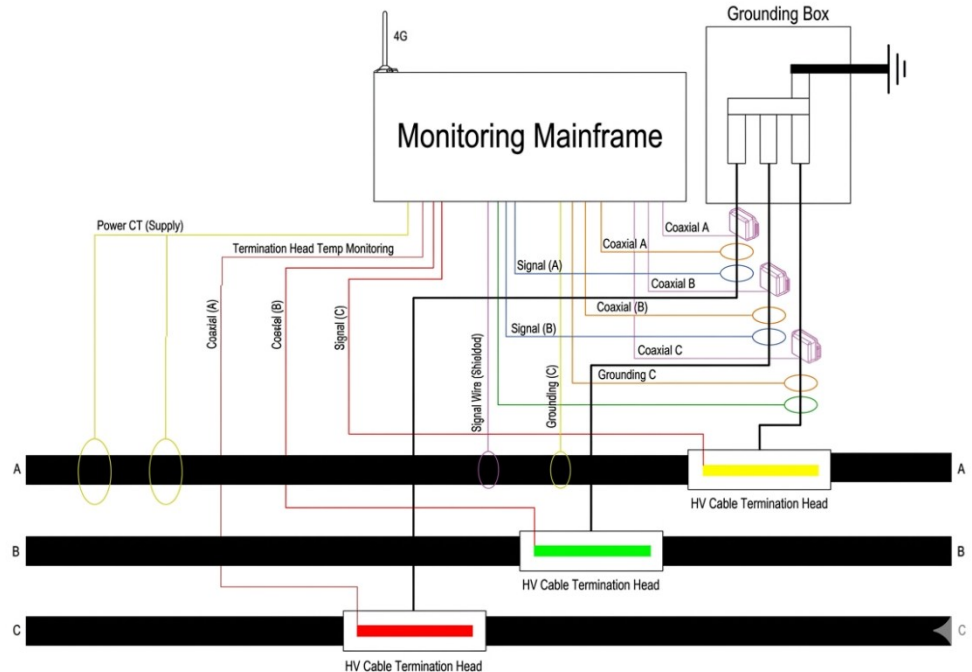
The grounding current detection transformer and the partial discharge monitoring transformer are installed on the grounding wire;

The operating current transformer is installed on any phase of the main cable (the current in the three-phase main cable is balanced).

A temperature sensor is installed at the cable joint to measure the joint temperature.

The anti-theft and cutting detection device is installed on the grounding wire;

The CT power supply is installed on the main cable for easy power access.



# 1 Power Cable Sheath Circulation And Partial Discharge Integrated Online monitoring device Features

- ( 1 ) Real-time monitoring of the sheath grounding current, total grounding current and operating current of any phase main cable of the three-phase cable;
- ( 2 ) Real-time monitoring of the temperature of the three-phase cable joints;
- ( 3 ) Real-time monitoring of the anti-theft and anti-cutting of cable sheath grounding wire;
- ( 4 ) Real-time monitoring of partial discharge in three-phase cables;
- ( 5 ) The monitoring time interval can be set;
- ( 6 ) Alarm parameters and whether to allow corresponding monitoring parameters to generate alarms can be set;
- ( 7 ) Calculate the maximum, minimum, and average values within the set time period;
- ( 8 ) Monitor the ratio of the maximum and minimum values of single-phase grounding current within the statistical period in real time and perform alarm processing;
- ( 9 ) Monitor the ratio of grounding current to load in real time within the statistical period and perform alarm processing;
- ( 10 ) Monitor the rate of change of single-phase grounding current within the statistical period in real time and perform alarm processing;

# 1

## Power Cable Sheath Circulation And Partial Discharge Integrated Online monitoring device Features

- ( 11 ) All monitoring data have time tags to ensure the uniqueness of the data;
- ( 12 ) All monitoring sensors can be added or removed according to user requirements;
- ( 13 ) Multiple data transmission interfaces: RS485 interface, GPRS , GSM SMS,  
One or more data transmission modes can be used simultaneously;
- ( 14 ) Supports remote maintenance and upgrades;
- ( 15 ) It adopts a low-power design and supports multiple power supply methods: CT induction power supply, AC-DC power supply, DC power supply and battery power supply;

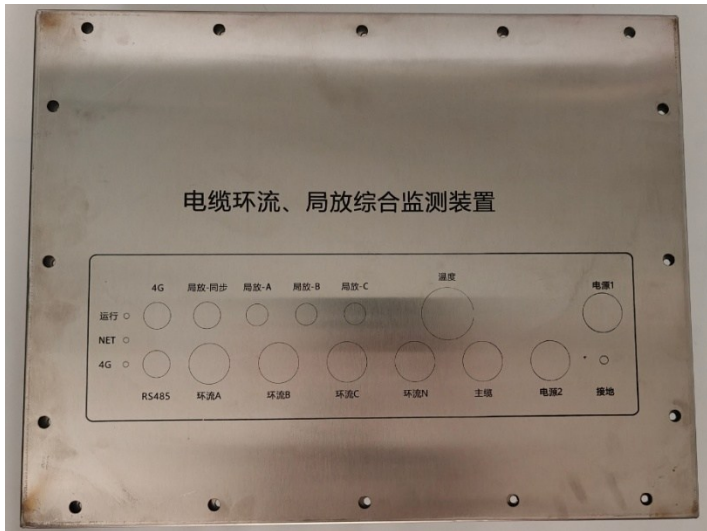
# 1

## Power Cable Sheath Circulation And Partial Discharge Integrated Online monitoring device Features

- ( 16 ) All components are industrial grade, with good reliability and stability;
- ( 17 ) The modular, fully enclosed structure design is easy to install, and all components are secured with locking mechanisms.  
It has good vibration resistance and is easy to replace and disassemble;
- ( 18 ) Fully enclosed structure: epoxy resin enclosed, no exposed components, no water ingress, perfectly supports IP68 protection level.
- ( 19 ) High reliability and maintenance-free.



# High-Voltage Cable Circulating Current and Partial Discharge Integrated Online Monitoring Device Equipment appearance



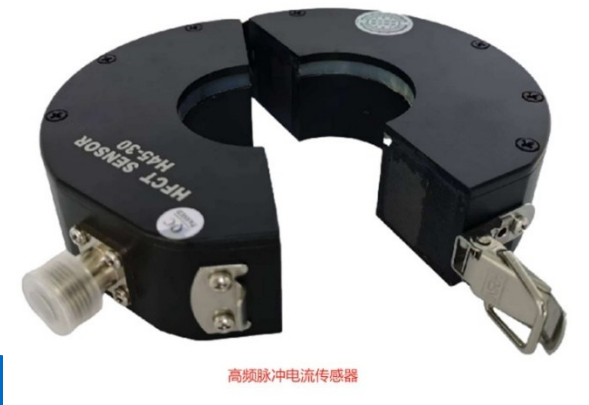
Stainless steel enclosure:

All components were encapsulated with epoxy resin.  
Uses highly reliable waterproof aviation connectors.



# High-Voltage Cable Circulating Current and Partial Discharge Integrated Online Monitoring Device

## Equipment appearance and Internal



高频脉冲电流传感器



高频脉冲电流传感器



Category	Parameter	Specification
Current Measurement	Operating Current	1 channel, 0.1A~3000A (Customizable)
	Sheath Grounding Current	4 channels, 0.1A~300A (Customizable)
	Return Line Current	1 channel, 0.1A~300A (Customizable)
	Accuracy	Measurement error not exceeding $\pm(1\%$ of reading + 0.5A)
	Measurement Cycle	1s~260s (Configurable)
Partial Discharge	PD Interface Qty	4 channels sync detection (Phase A, B, C + 1 Power Frequency)
	Bandwidth	0.1 ~ 50MHz
	Min. Discharge	5pC
	AD Resolution	14-bit
Temperature	Range	4 channels, -40°C~+130°C
	Accuracy	$\pm 1^\circ\text{C}$ ; Response time (PT100) is 1 min 10 s
	Measurement Cycle	10s~260s (Configurable)
	Others	Sensor disconnection detection; RS-485 transmission
Vibration	Range	4 channels, freq. 1 ~500 times/sec
	Alarm Range	10~250 times/sec (Configurable)
	Alarm Duration	1~600s (Configurable)
	Others	Sensor disconnection detection
Voltage Monitoring	Induced Sheath Voltage	3 channels, 0~500V (Customizable)

Test Item	Level & Standard
Electrostatic Discharge	Level 4 : IEC 61000-4-2 (Equivalent to GB/T 17626.2)
Radiated RF Immunity	Level 3 : IEC 61000-4-3 (Equivalent to GB/T 17626.3)
EFT/Burst Immunity	Level 4 : IEC 61000-4-4 (Equivalent to GB/T 17626.4)
Surge Immunity	Level 4 : IEC 61000-4-5 (Equivalent to GB/T 17626.5)
Conducted RF Immunity	Level 3 : IEC 61000-4-6 (Equivalent to GB/T 17626.6)
Power Frequency Magnetic Field	Level 5 : IEC 61000-4-8 (Equivalent to GB/T 17626.8)
Pulse Magnetic Field	Level 5 : IEC 61000-4-9 (Equivalent to GB/T 17626.9)
Damped Oscillatory Magnetic Field	Level 5 : IEC 61000-4-10 (Equivalent to GB/T 17626.10)
Voltage Variations Immunity	Level 3 : IEC 61000-4-11 (Equivalent to GB/T 17626.11)

RS485 interface:

Baud rate: 2400bps , 9600bps , 19200bps (configurable )

Data length: 8 bits;

Start bit: 1 bit;

Stop bit: 1 bit;

Verification: No verification.

RS485 interface currently supports the following protocols:

1. Our company's proprietary protocol (open to the public, providing PC testing programs, open source);
2. Supports the standard Modbus RTU protocol;

Currently, the GPRS data interface supports the following protocols:

1. Our company's proprietary protocol (open to the public, providing PC testing programs, open source);
2. Chinese SMS protocol (for situations where setting up a network is inconvenient);
3. Alibaba Cloud IoT Cloud Platform;
4. Guangdong Power Grid Transmission Line Condition Monitoring System Protocol V1.3

#### GSM/ GPRS interface

Operating frequency bands: 4 bands, 850 MHz/900 MHz/1800 MHz/1900 MHz ;

GSM SMS messages in both Chinese and English;

GPRS class 10 , maximum downlink speed of 85.6 kbit /s , maximum uplink speed of 42.8 kbit /s , supports TCP/IP , UDP , FTP , and HTTP protocols.

### Fiber optic interface

Two 100Base - FX optical ports;

Supports ring network redundancy technology and various ring network structures;

Network fault self-healing time < 20ms ;

### Ethernet interface

Speed: 10/100 Mbps , automatic switching between MDI/MDIX cross-connect direct connection;

Protection: 1.5KV electromagnetic isolation;

Network protocols: TCP , UDP , ARP , ICMP , DHCP , DNS , HTTPD Client ;

The following protocols are supported by fiber optic and Ethernet interfaces:

1. Supports protocols similar to GPRS links;
2. Modbus TCP protocol;

AC power supply method

Voltage: 85~305VAC ;

Frequency: 47~63Hz ;

Power:  $\leq 8W$

It has the following characteristics:

1. Overvoltage and overcurrent protection;
2. Surge protection performance meets Level 4 standard;
3. Operating temperature range:  $-40^{\circ}C$  to  $+85^{\circ}C$  ;

3

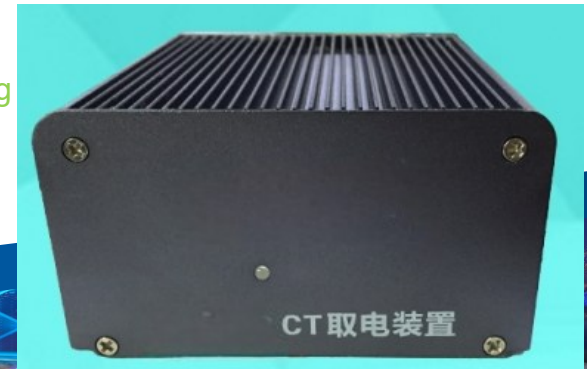
# High-Voltage Cable Circulating Current and Partial Discharge Integrated Online Monitoring Device Power supply method

CT power supply method  
Starting current: > 25A ;

It has the following characteristics:

1. Low starting current; the equipment can operate normally when the main cable current reaches
2. Maximum continuous load current 1200A ;
2. It can withstand a large inrush current, 30kA for 4 seconds;
3. Set up overheat and overload protection;
4. Multiple CTs can be used to draw power, increasing output power;

This CT power supply device has been widely used in traveling wave ranging products for power transmission lines.

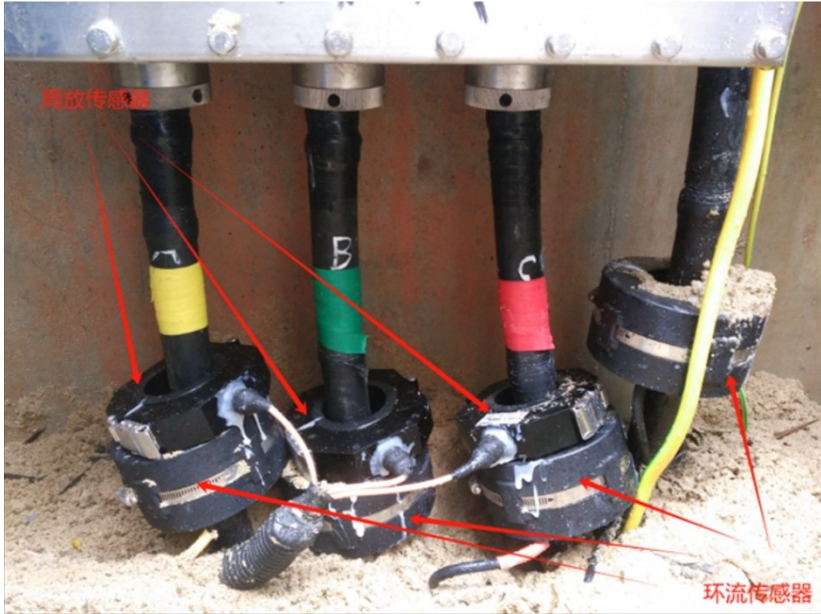




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# High-Voltage Cable Circulating Current and Partial Discharge Integrated Online Monitoring Device

## On-site installation photos---underground cable trench





## On-site installation photos--- Overhead line to underground cable





More to come



THANK YOU

Smarter Monitoring, Reliable Power.

(For China market):  
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