ABAT系列蓄电池在线监测系统

ABAT series battery online monitoring system

安科瑞电气股份有限公司

Content

1 Overview

Acrel's ABAT series battery on-line monitoring system is an industry-leading on-line battery monitoring product, which can provide early warning and battery balancing for failed batteries, meeting the requirements of the ANSI/TIA-942 standard. The system has the function of monitoring the voltage, internal resistance and internal temperature of the battery, which is very convenient for installation, maintenance and access. The system is mainly composed of ABAT-S module, ABAT-C module and collector. The collector can query alarms and real-time data, set parameters, etc., and can choose a monitoring platform to realize centralized network management.

2 module

| model	Function
ABAT-M-02 collector	AC220V input, can manage up to six strings of batteries, each string is up to 300 cells, the total is up to 960 cells, with display and buttons
ABAT-M-06 collector	AC220V input, can manage up to six strings of batteries, each string up to 360, with display and buttons
ABAT-S-02	Monitor a 2V battery, monitor battery voltage, internal resistance and negative electrode temperature
ABAT-S-06	Monitor a 6V battery, monitor battery voltage, internal resistance and negative electrode temperature
ABAT-S-12	Monitor a 12V battery, monitor battery voltage, internal resistance and negative electrode temperature
ABAT-C-500	Monitor a charge and discharge current and an ambient temperature, the maximum current range is 1000A
ABAT-CS-210	Hall sensor

3 product manual

3.1 ABAT-M-02 collector

Management and data processing analysis

➢ Used to manage and collect the data of the front-end distributed single battery monitoring module, and , analysis, alarm generation, saving and uploading

➢ One collector can manage up to six strings of batteries

➢ Automatic data analysis and processing, which can estimate the remaining capacity of the battery

➢ Support MODBUS and SNMP protocol, easy access to third-party monitoring system

Introduction

The collector plays the role of a management host, which is used to read the battery monitoring data of the front-end single battery monitoring sub-module, analyze and process the data, and estimate the remaining capacity of each cell and the entire battery group. All operating parameters can be set directly through the module panel, and the collected data can be viewed directly. The collector will automatically and regularly save key battery data, and can upload it to a third-party monitoring system through the RS485 port or network port. One collector can manage up to six strings of batteries, and the maximum number of manageable modules is 960.
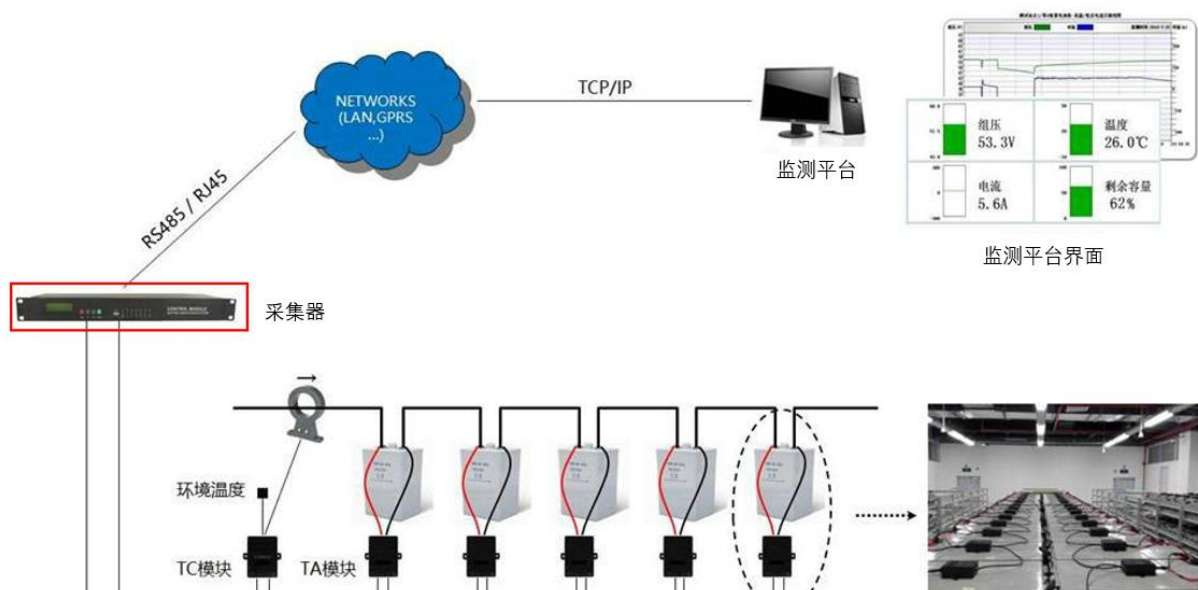
Battery remaining capacity

can automatically obtain the remaining capacity of the battery according to the monitored battery data

Supports multiple communication

The collector has RS485 and network ports, supports MODBUS/RTU, MODBUS/TCP and SNMP protocols

WEB configuration function

With WEB remote parameter configuration function

local data storage

Key data such as alarm records, event records, and discharge records can be saved.

High stability

The long-term operation of the product is reliable and stable, and it has been applied and verified on millions of batteries.

ABAT-M-02 collector

: **specification**

working environment

Operating temperature: −10℃～50℃
Relative humidity: 5%～95%
atmospheric pressure: 80～110kPa

management ability

Each string has a maximum of 300 cells, one collector manages up to six strings of batteries, and the maximum total number of batteries that can be monitored is 960 cells

Power supply

85～264VAC (standard), DC48V or DC110～370V (optional), 15W

Communication

With RS485 and 10/100M network port, support MODBUS/RTU, MODBUS/TCP and SNMP protocol

Display

LCD

Insulation withstand voltage

2000VAC
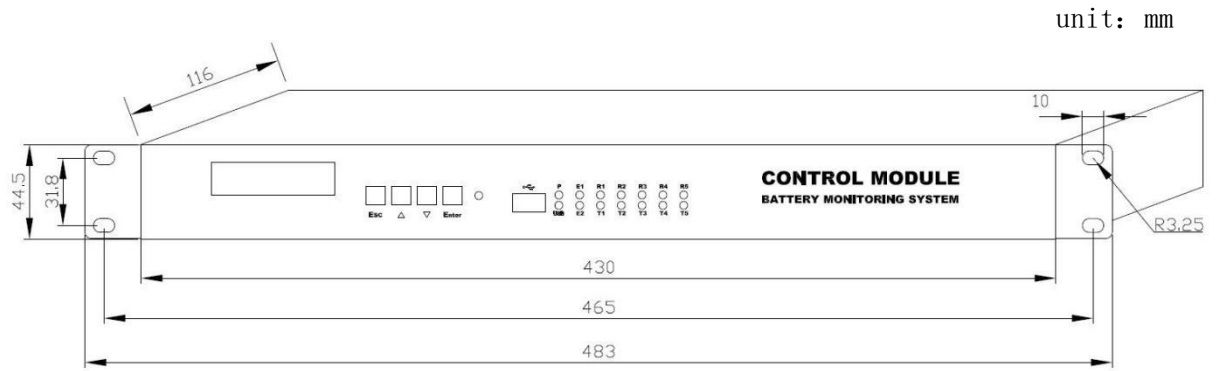
Installation method

Fixed on cabinet or battery rack

Weight

1.8Kg

Reliability

Auto-restart trigger: built-in WDT
MTBF: 100,000 hours

unit: mm

模块嵌入式安装开口尺寸

$436^{+2.0}_{-0.0}$

$45.5^{+2.0}_{-0.0}$

3.2 ABAT-M-06 collector

Management and data processing

➢ Used to manage and collect the data of the front-end distributed single battery monitoring module, and perform data processing, analysis, alarm generation, saving and uploading

➢ One collector can manage 360 batteries

➢ Automatic data analysis and processing, which can estimate the remaining capacity of the battery

➢ Support MODBUS and SNMP protocols

➢ Low cost solution

The collector plays the role of a management host, which is used to read the battery monitoring data of the front-end single battery monitoring sub-module, analyze and process the data, and estimate the remaining capacity of each cell and the entire battery group. All operating parameters can be set directly through the module panel, and the collected data can be viewed directly. The collector will automatically and regularly save key battery data, and can upload it to a third-party monitoring system through the RS485 port or network port. One collector can manage up to six groups of batteries, and the maximum number of battery modules is 360
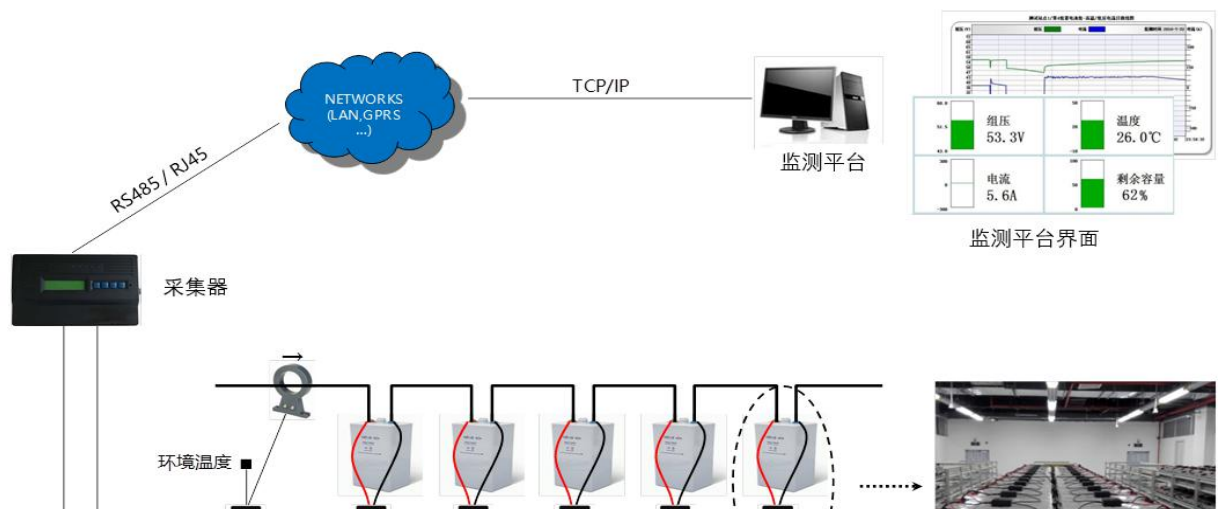
local data check
With display and operation buttons, support local data query

Battery capacity estimation
Built-in capacity estimation model, which can automatically obtain the remaining capacity of the battery according to the monitored battery data

Supports multiple communication protocols
The collector has RS485 and network ports, supports MODBUS/RTU, MODBUS/TCP and SNMP protocols

WEB configuration function
With WEB remote parameter configuration function
With WEB remote real-time data query function

local data storage
Key data such as alarm records, event records, and discharge records can be saved

High stability
The product runs reliably and stably for a long time, and has been applied and verified on millions of batteries

ABAT-M-06 collector

指示灯　　　　　　　　显示　　　　　　　　按键

子模块通信口

网口

RS485

干接点

DC12V输出

电源输入

working environment

Operating temperature： −10℃～50℃

Relative humidity： 5%～95%

atmospheric pressure： 80～110kPa

management ability

One collector manages up to six strings of batteries, and the maximum total number of batteries that can be monitored is 360

Power supply

100～240VAC (standard) or DC48V (optional), 15W

Communication Interface

With RS485 and 10/100M network port, support MODBUS/RTU, MODBUS/TCP and SNMP protocol

Display

LCD

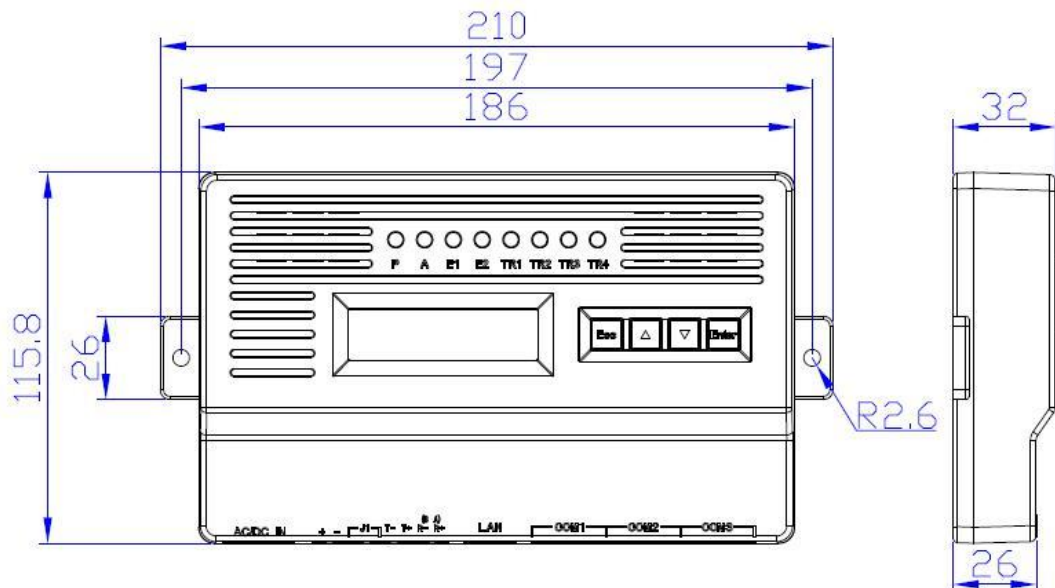## Insulation withstand voltage

2000VAC

Installation method

Battery rack mount or in-cabinet mount

Weight

0.6Kg

尺寸

单位:mm

3.3 ABAT-S battery monitoring module

Battery voltage internal resistance temperature

➢ Online monitoring 24 hours a day
➢ Each module monitors a battery, monitoring voltage, internal resistance and negative temperature
➢ Support MODBUS protocol, easy access to third-party monitoring system
➢ Using advanced power consumption reduction technology, the operating current is as low as 3mA

：introduce

ABAT-S battery monitoring module (S module for short) is an industry-leading online battery monitoring sensor, which can be embedded into the existing monitoring system to achieve online monitoring of the voltage, internal resistance and battery negative temperature of each backup battery, monitoring system Control and read data by sending MODBUS command to S module, and perform internal resistance test, each S module has a settable address. The installation and wiring of the S module is extremely simple and convenient. It can be directly attached to the battery, and the detachable connecting wire is used, so that the operation of the battery will not be affected during construction.
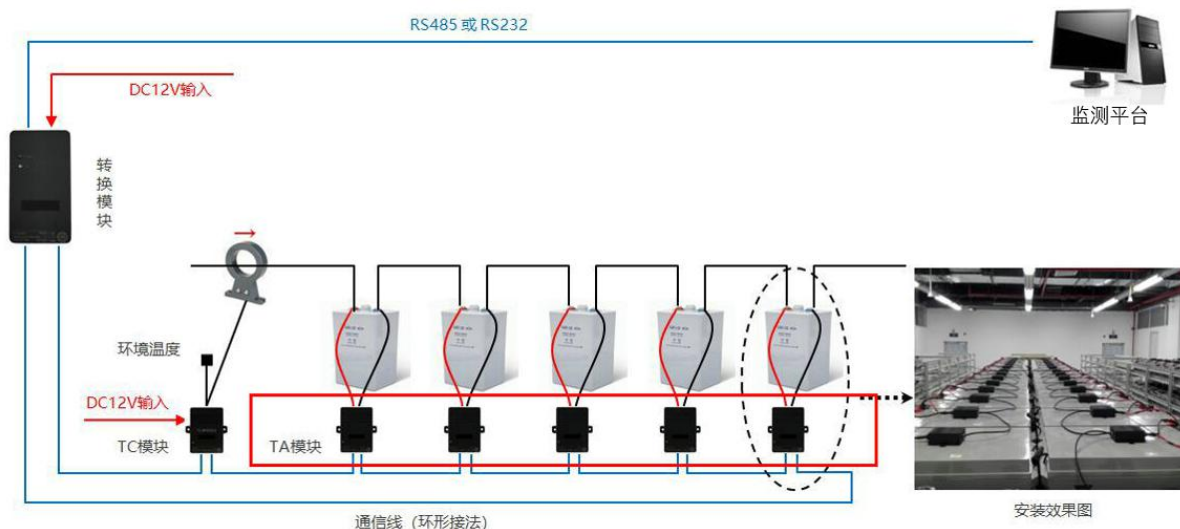
High precision design
The internal resistance measurement error is as low as 1%, leading the industry.

High stability
The long-term operation of the product is reliable and stable, and it has been applied and verified on millions of batteries.

Strong anti-interference
It can block the ripple interference of high-power and high-frequency UPS.

Battery internal resistance test
The internal resistance of each battery is automatically and periodically measured by command control.

temperature monitoring
Compared with the temperature of the battery shell, the temperature of the negative electrode is closer to the internal temperature of the battery battery in time.

low power design
S module draws as low as 3mA from the battery

Standard Communication Protocol
Support standard MODBUS protocol, access development is extremely simple.

Simple and convenient installation
The module can be directly attached to the battery and adopts a detachable connecting wire, which will not affect the operation of the battery during construction.

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outward

S module

通信口

电池接口   指示灯

working environment

Operating temperature: −10℃～50℃

Relative humidity: 5%～95%

atmospheric pressure: 80～110kPa

Monitoring capability

One S module monitors one battery.

Monitoring range

2V, 6V, 12V batteries, capacity less than 3000AH

Power requirements

Directly draw power from the monitored battery. The 2V module draws a current of 7mA during normal operation, and the maximum current is not more than 13mA. When the 6V and 12V modules work normally, the current draw is 3mA, and the maximum is not more than 7mA.

Insulation withstand voltage
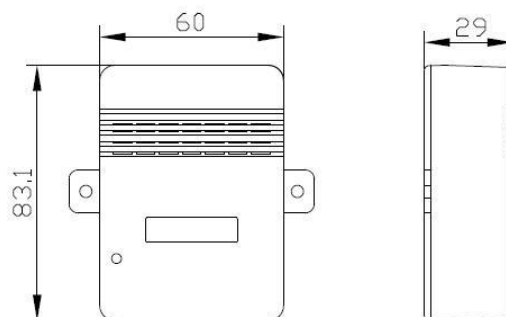
2000VAC

Installation method

Glue to battery or mount to retaining bar

weight

ABAT−S module 80g

尺寸

单位：mm

60

29

83.1

S模块

3.4 ABAT-C module

Charge and discharge current and environmental monitoring

- ➢ On-line monitoring of charge and discharge current and ambient temperature 24 hours a day
- ➢ With photoelectric isolation, support MODBUS protocol, easy access to third-party monitoring system
- ➢ The performance is high, reliable and stable, and has been applied to millions of batteries

introduct

The current temperature monitoring module (C module for short) is an industry-leading on-line battery monitoring sensor, which can be embedded into the existing monitoring system to realize on-line monitoring of the charging and discharging current and ambient temperature of the battery pack. The monitoring system controls and reads data by sending MODBUS commands to the C module, each C module has an address that can be set. The installation and wiring of the C module is extremely simple and convenient. It can be directly attached to the battery, and the detachable connecting wire is used, so that the operation of the battery will not be affected during construction.
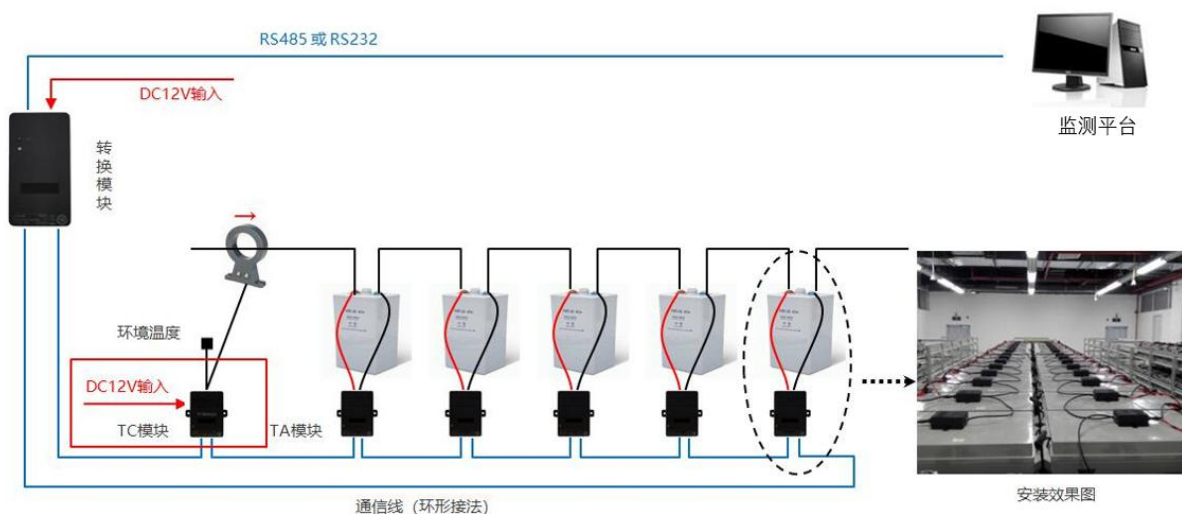
The C module must be converted into a standard RS485 interface through a converter before it can be connected to the monitoring system, and a current transformer needs to be additionally configured. The module needs to be powered by external DC12V.

High stability

The long-term operation of the product is reliable and stable, and it has been applied and verified on millions of batteries.

Strong anti-interference

High anti-interference design can block the ripple interference of high-power and high-frequency UPS.

Standard Communication Protocol

Support standard MODBUS protocol, access development is extremely simple.

Simple and convenient installation

The module can be directly attached to the battery and adopts a detachable connecting wire, which will not affect the operation of the battery during construction.

outward

C module

CT接口   指示灯   通信口   电源输入
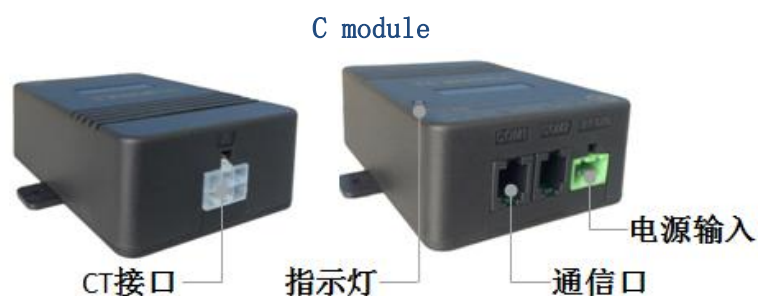
working environment

Operating temperature: -5℃～50℃

Relative humidity: 5%～90%

atmospheric pressure: 80～110kPa

Monitoring capability

C module monitors the charge and discharge current and ambient temperature of a group of batteries.

Monitoring range

2V、6V、12V battery string

Power supply

DC8～13V, 1W

Communication Interface

UART port, support MODBUS protocol

Insulation withstand voltage
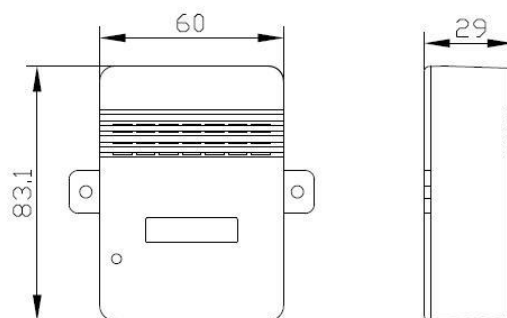
2000VAC

Installation method

Glue directly to the battery or mount to the retaining bar

Weight

75g

Size

unit: mm

C module

3.4 Hall sensor ABAT-CS-210

I$_P$=500A

产品特点Products Features

安装方便
Easy mounting
体积小，节省空间
Small size and space saving
无插入损耗
No insertion losses
抗干扰能力强

应用领域Applications

交流变速驱动器
AC variable speed drives
直流电机驱动静态转换器
Static converters for DC motor drives
通讯电源
Battery supplied applications
不间断电源（UPS）
Uninterruptible Power Supplies
开关电源（SMPS）
SWITCHED Mode Power Supplies
电焊机
Power supplies for welding applications

注意Remarks

错误的接线可能导致传感器损坏。
The false wiring may result in the damage of the sensor.
Ip方向与产品箭头方向一致时，输出电压为正极。
VOUT is positive when IP flows in the direction of the arrow.
当初级导体完全充满初级孔径时动态表现（di/dt和响应时间）为最佳效果。
Dynamic performances (di/dt and response time) are best with a single bar completely filling the primary hole.
初级导体的温度不应超过100℃。
Temperature of the primary conductor should not exceed 100°C.
这是一个标准的产品，需要其他规格（测量电流、电源电压、输出电压、连接器、转换比率等）请联系我们。
This is a standard model. For different versions (IP,supply voltages, output voltages,connection of secondary,turns

电气参数Electrical data　　ABAT-CS-210

除非另有说明，否则环境参数均为@ T_A = 25 °C,　R_L = 10 kΩ

型号 Type	ABAT-CS-210
额定测量电流I_P Rated input	±500A
测量范围 I_{PM} Measure range	±1000A
额定输出电压 V_{OUT} Rated output voltage	±4V
零点失调电压V_O Offset voltage	±20mV
电源电压V_C Supply voltage	±12VDC～±15VDC（± 5%）
绝缘耐压 V_D Galvanic isolation	50Hz，1min，3KV
负载电阻 R_M Load resistance	≥10KΩ
线性度 $ε_L$ Linearity	≤1%FS
总体精度 X Overall accuraty	±1%
零点失调电压温漂V_{OUT} Offset voltage drift	±0.5mV/℃
幅度电压温度漂移V_{OUT} Amplitude voltage temperature drift	≤0.1%/℃
静态电流消耗I_C Current consumption	≤15mA
响应时间T_R Response time	<7μs
频带宽度BW Frequency bandwidth-3db	DC～25KHz
di/dt跟随精度 di/dt accurately followed	>50A/μS
工作环境温度T_A Ambient operating temperature	-40～+85℃
储存环境温度T_S Ambient storage temperature	-40～+125℃
质量 m Mass	≈65g
执行标准 Standards	SJ 20790-2000；JB/T 7490-2007

3.5 Hall sensor ABAT-CS-405

I$_P$=500A

产品特点Products Features

安装方便
Easy mounting
体积小，节省空间
Small size and space saving
无插入损耗
No insertion losses
抗干扰能力强

应用领域Applications

交流变速驱动器
AC variable speed drives
直流电机驱动静态转换器
Static converters for DC motor drives
通讯电源
Battery supplied applications
不间断电源（UPS）
Uninterruptible Power Supplies
开关电源（SMPS）
SWITCHED Mode Power Supplies
电焊机
Power supplies for welding applications

注意Remarks

错误的接线可能导致传感器损坏。
The false wiring may result in the damage of the sensor.
Ip方向与产品箭头方向一致时，输出电压为正极。
VOUT is positive when IP flows in the direction of the arrow.
当初级导体完全充满初级孔径时动态表现（di/dt和响应时间）为最佳效果。
Dynamic performances (di/dt and response time) are best with a single bar completely filling the primary hole.
初级导体的温度不应超过100℃。
Temperature of the primary conductor should not exceed 100°C.
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This is a standard model. For different versions (IP,supply voltages, output voltages,connection of secondary,turns ratios...),please contact us.

电气参数Electrical data　　　ABAT-CS-405

除非另有说明，否则环境参数均为@ T_A = 25 °C, R_L = 10 kΩ

型号 Type	ABAT-CS-405
额定测量电流I_P Rated input	±500A
测量范围 I_{PM} Measure range	±1000A
额定输出电压 V_{OUT} Rated output voltage	±4V
零点失调电压V_O Offset voltage	±20mV
电源电压V_C Supply voltage	±12VDC～±15VDC（±5%）
绝缘耐压 V_D Galvanic isolation	50Hz，1min，3KV
负载电阻 R_M Load resistance	≥10KΩ
线性度 ε_L Linearity	≤1%FS
总体精度 X Overall accuraty	±1%
零点失调电压温漂V_{OUT} Offset voltage drift	±0.5mV/℃
幅度电压温度漂移V_{OUT} Amplitude voltage temperature drift	≤0.1%/℃
静态电流消耗I_C Current consumption	≤15mA
响应时间T_R Response time	<7μs
频带宽度BW Frequency bandwidth-3db	DC～25KHz
di/dt跟随精度 di/dt accurately followed	>50A/μS
工作环境温度T_A Ambient operating temperature	-40～+85℃
储存环境温度T_S Ambient storage temperature	-40～+125℃
质量 m Mass	≈65g
执行标准 Standards	SJ 20790-2000；JB/T 7490-2007

电气参数Electrical data　　　ABAT-CS-405