171

ARCM300 型
电气火灾监控探测器
ARCM300
Electrical Fire Monitoring Detector

安装使用说明书 V1.2

Installation and operation instruction V1.2

江苏安科瑞电器制造有限公司

Jiangsu Acrel Electrical Manufacturing Co., LTD.

申　　明

DECLARATION

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目录 Catalog

1. 概述 General

ARCM300 型电气火灾监控探测器是针对 0.4kV 以下的 TT、TN 系统设计的，通过对配电回路的剩余电流、导线温度等火灾危险参数实施监控和管理，从而预防电气火灾的发生。

产品采用先进的微控制器技术，集成度高，体积小巧，安装方便，集智能化，数字化，网络化于一身，是建筑电气火灾预防监控、系统绝缘老化预估等的理想选择。

产品符合 GB14287.2-2014《电气火灾监控系统 第 2 部分：剩余电流式电气火灾监控探测器》、GB14287.3-2014《电气火灾监控系统 第 3 部分：测温式电气火灾监控探测器》的标准要求。

ARCM300 electrical fire monitoring detector is designed for TT and TN systems below 0.4kV. It monitors and manages fire risk parameters such as residual current and wire temperature in the distribution circuit to prevent electrical fires.

The product adopts advanced microcontroller technology, high integration, small size, easy installation, intelligent, digital, and networked. It is an ideal choice for building electrical fire prevention monitoring, system insulation aging estimation, etc.

The product complies with GB14287.2-2014 "Electrical Fire Monitoring System Part 2: Residual Current Electrical Fire Monitoring Detector" and GB14287.3-2014 "Electrical Fire Monitoring System Part 3: Temperature Measuring Electrical Fire Monitoring Detector" standard requirement.

2. 产品型号 Product model

ARCM 300 - □

可选功能代号：J1：监测一路剩余电流和四路温度，一路继电器输出
J4：监测四路剩余电流和一路温度，四路继电器输出

产品系列号： 300

产品种类号： 安科瑞电气火灾监控探测器

ARCM 300 - □

Optional function code:
J1：Monitor one channel of residual current and four channels of temperature, one channel relay output
J4：Monitor four residual currents and one temperature, four relays electrical output

Product serial number: 300

Product Type Number: Acrel Electric Fire Monitoring Detector

3. 技术参数 Technical parameter

表 1 Table 1

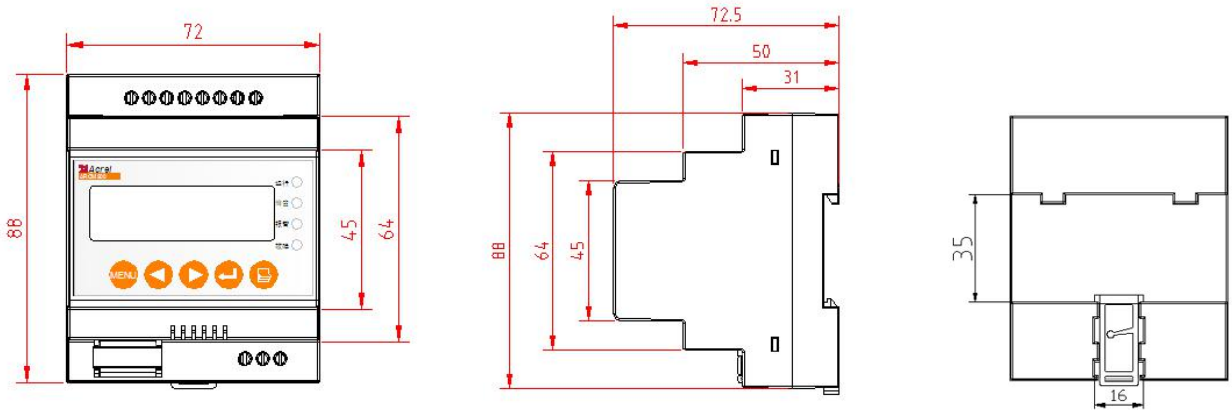
技术参数 Technical parameter		ARCM300
输入 Input	网络 Network	三相 TT、TNS、TN-C-S 或 TNC(局部 TT)系统 Three-phase TT, TNS, TN-C-S, or TNC (local TT) systems
	频率 Frequency	50Hz
	剩余电流测量范围 Resiaining current measurement range	10mA ~ 3000mA

	温度监测范围 Temperature monitoring range	NTC 型热敏电阻（0℃ ~ 120℃） NTC type thermistor (0℃ ~ 120℃)
输出 Output	通讯 Communication	RS485 接口，MODBUS-RTU 协议，波特率可设 (4800/9600/19200/38400bps) RS485 interface, MODBUS-RTU protocol, baud rate can be set (4800 / 9600 / 19200 / 38400bps)
	报警方式 The alarm way	声光报警 Sound and light alarm
	事件记录 Incident record	20 条报警记录、20 条故障记录、20 条开关记录 20 alarm records, 20 fault records and 20 switch records
报警设置 Report to the police set up	额定动作电流值 Rated action current value	300mA～1000mA（步长为 1mA） 300mA~1000mA (step size is 1mA)
	温度报警 Temperature alarm	45℃～110℃（步长为 1℃） 45℃～110℃ (step size is 1℃)
	音响器件声压值 Sound pressure value of the sound device	大于 70dB，小于 115dB（蜂鸣器前方 1m 处，A 计权） Greater than 70dB, less than 115dB (1m in front of buzzer, A)
测量精度 Measurement accuracy		剩余电流 1 级，温度±1℃ Residual current level 1, temperature ± 1℃
工作电源 working power supply		AC/DC 85~270V, 功耗≤ 5W AC / DC 85~270V, with a power consumption of 5W
继电器输出 relay output		输出方式:1 路或 4 路继电器常开触点输出，机械触点，触点容量 Output mode: 1 way or 4 way relay often open contact output, mechanical contact, contact capacity AC 220V/1A, DC 30V/1A
工频耐压 Power frequency and pressure resistance		电源与信号输入、继电器输出、通讯端子之间 2 kV/min； 信号输入与继电器输出、通讯端子之间 1.5 kV/min 2 kV / min between power supply and signal input, relay output and communication terminals; Signal input and relay output, 1.5 kV / min between the communication terminal
环境 environment		工作温度：-10℃～+45℃；储存温度：-20℃～+70℃ 相对湿度：5%～95%不结露；海拔高度：≤2500m Operating temperature: -10℃ ~ + 45℃; storage temperature: -20℃ ~ + 70℃ Relative humidity: 5%~95% uncovered; altitude: 2500m

4. 安装与接线 Installation and wiring

4.1 外形及安装尺寸（单位 mm）Appearance and installation dimensions (unit mm)

ARCM300 外形及安装尺寸 ARCM300 Appearance and installation dimensions



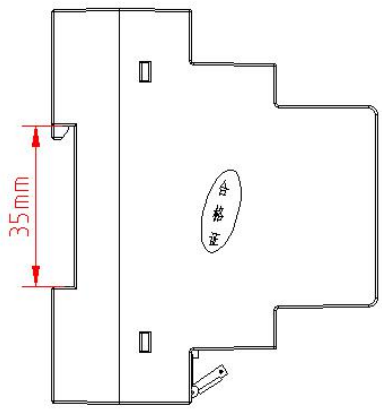
正视图 Face view　　侧视图 side view　　底视图 bottom view

图 1　Fig 1

4.2 安装方式 Installation method

ARCM300 安装方式为导轨式安装，固定方式为卡扣式，示意图如下：

The installation method of ARCM300 is rail type installation, and the fixing method is snap type. The schematic diagram is as follows:



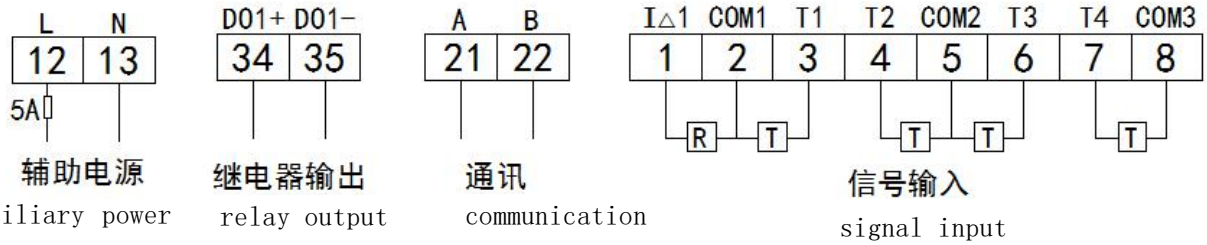
35mm 标准导轨安装 35mm standard rail installation

图 2　Fig 2

4.3 接线说明（注：R 表示剩余电流信号；T 表示温度信号）

Wiring description (Note: R indicates residual current signal; T indicates temperature signal)

4.3.1　J1 型接线端子　J1 type terminal

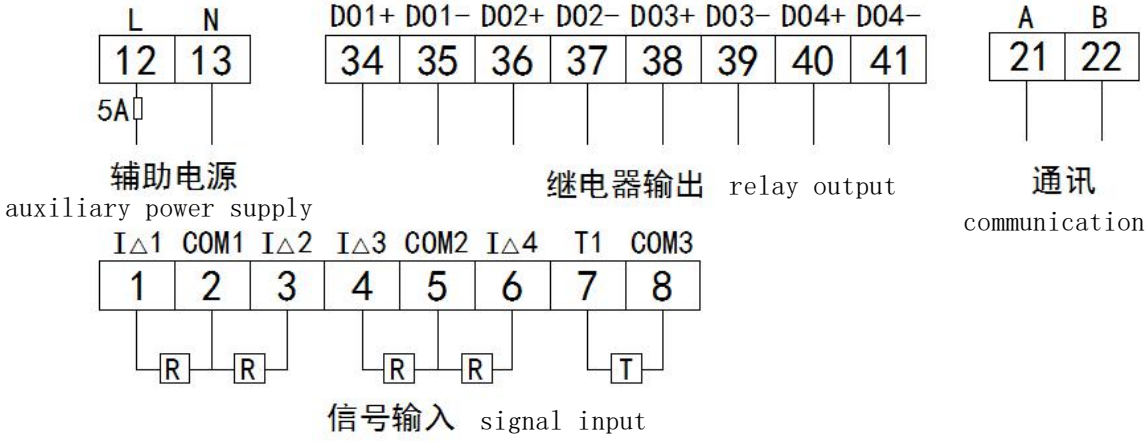


辅助电源 auxiliary power supply　　继电器输出 relay output　　通讯 communication　　信号输入 signal input

注：“12、13”为辅助电源(保险丝：5A)；“34、35”为继电器输出；“21、22”为通讯；“1、2、3、4、5、6、7、8”为剩余电流信号和温度信号输入。（公共端 COM1、COM2 和 COM3 不可短接）

Note: "12,13" is the auxiliary power supply (fuse: 5A); "34,35" is the relay output; "21,22" is the communication; and "1,2,3,4,5,6,7,8" is the residual current signal and temperature signal input.(Common end COM1, COM2, and COM3 No short connection)

4.3.2 J4 型接线端子 J 4-type wiring terminals



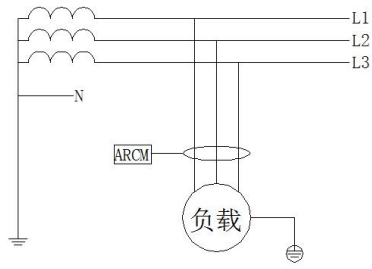
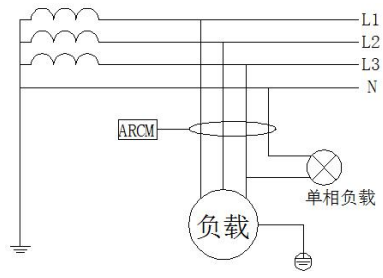
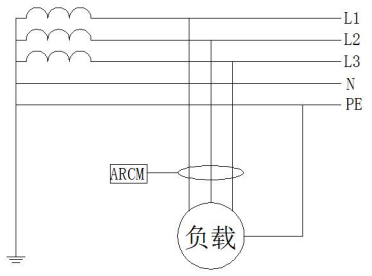
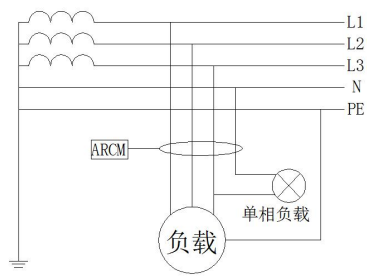
注：“12、13”为辅助电源(保险丝：5A)；“34、35、36、37、38、39、40、41”为继电器输出， “21、22”为通讯； “1、2、3、4、5、6、7、8”为剩余电流信号和温度信号输入。（公共端 COM1、COM2、COM3 不可短接）

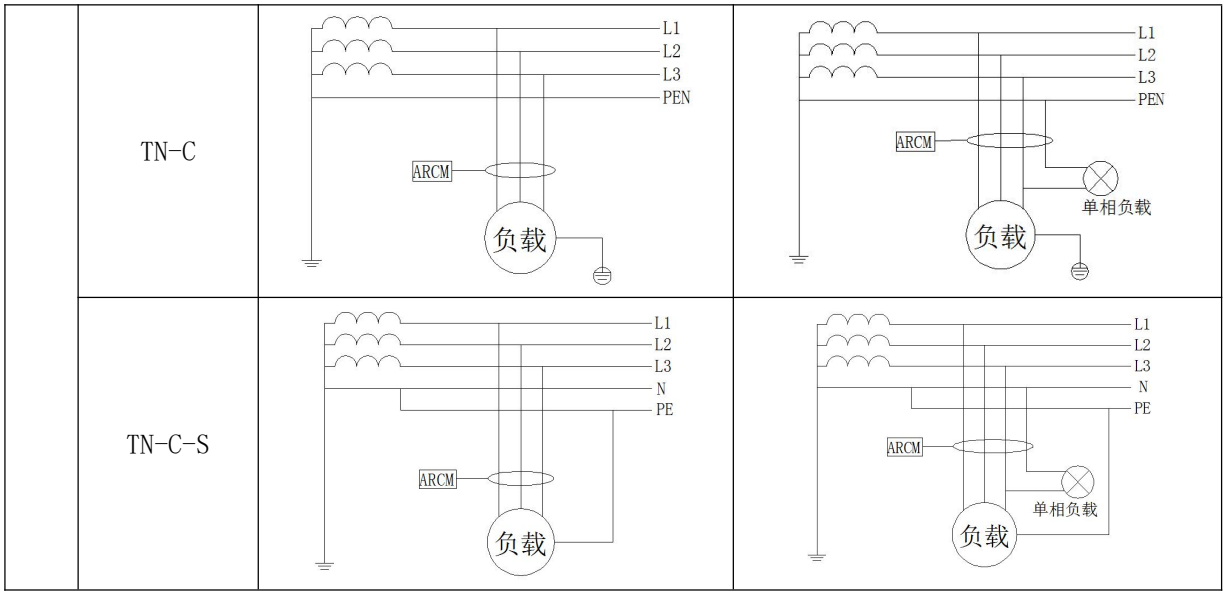
Note: "12,13" is the auxiliary power supply (fuse: 5A); "34,35,36,37,38,39,40,41" is the relay output, "21,22" is the communication; "1,2,3,4,5,6,7,8" is the residual current signal and temperature signal input.(COM1, COM2, C O M and COM3 are not acceptable)

4.4 注意事项 Precautions

4.4.1 剩余电流互感器接法 Method of residual current transformer

表 2 Table 2

相别 / 接线图 / 接地方式		三相三线	三相四线
TT			
TN	TN-S		



Translation:

相别: phase line	接地方式:ground way	三相三线:3 phase 3 wire	单相负载:
接线图: wiring diagram	负载: load	三相四线:3 phase 4 wire	single phase load

注：如上表中，剩余电流互感器安装时，必须严格区分 N 线和 PE 线，三相四线制中 N 线必须穿入剩 余电流互感器。通过剩余电流互感器的 N 线，不得作为 PE 线，不得重复接地或接设备外露可接近导体。PE 线不得穿入剩余电流互感器。在 TN-C 系统中，必须先将系统改造形成局部 TT 系统，或改造成 TN-C-S 系统，再按上表接线。

Note: In the above table, when the residual current transformer is installed, N wire must be installed and PE line must be strictly distinguished, and N wire must be worn into the residual current transformer into the three-phase four wire system. The N wire passing through the remaining current transformer shall not be used as a PE wire, without repeated grounding or connecting the equipment is exposed to access the conductor.The PE line shall not pass into the residual current transformer. In the TN-C system, the system must first be modified to form into a local TT system, or transformed into a TN-C-S system, and then according to the above table wiring.

4.4.2 辅助电源接法 Auxiliary power supply connection method

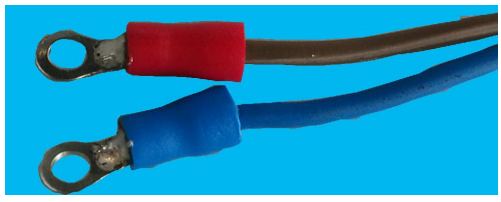


图 3 Figure 3

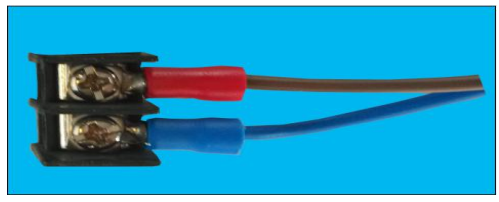


图 4 Figure 4

结合上图，连接辅助电源时，需按上图 3 的方式做线，做线时，先用压线头压紧，之后用锡固定好；接线如图 4 所示，插入端子排中，用螺丝刀拧紧，保证电源的正常运行。

Combined with the figure above, when connecting the auxiliary power supply, the line should be made according to the way in Figure 3 above. When making the line, press the wire head first and fix it with tin; as shown in Figure 4, insert into the terminal row and tighten with a screwdriver to ensure the normal operation of the power supply.

4.4.3 通讯接线 Communication wiring

探测器提供异步半双工 RS485 通讯接口，采用 MODBUS-RTU 协议，各种数据信息均可在通讯线路上传送。理论上在一条线路上可以同时连接多达 32 个探测器，每个探测器均可设定其通讯地址和通讯速率。通讯连接线建议使用 NH-RVVSP2*1.5mm2，分别接 A、B，屏蔽层单点接大地或悬空，布线时应使通讯线远离强电电缆或者其它强电磁环境。

The detector provides an asynchronous half-duplex RS485 communication interface, using the MODBUS-RTU protocol, and various data and information can be transmitted on the communication line. In theory, up to 32 detectors can be connected simultaneously on one line, each to set its communication address and rate. Communication cables recommend using the NH-RVVSP2*1.5mm2Connect A and B respectively, the shielding layer is separately connected to the earth or suspended, and the communication line should be kept away from the strong electric cable or other strong electromagnetic environment.

4.4.4 传感器匹配及安装 Sensor matching and installation

外置传感器有两种，剩余电流互感器和温度传感器，均为定制产品，不可随意替换其它厂商产品使用。接线时，剩余电流互感器二次信号不区分电流方向。安装时温度探头应紧贴线缆、母排表面或线缆接头处安装，安装时以尼龙扎带扎紧即可。另外，根据客户需求，温度探头也可悬空或紧贴柜体安装，用以测量环境或柜体的温度。

There are two kinds of external sensors, the residual current transformer and the temperature sensor, which are customized products, and can not be replaced by other manufacturers' products arbitrarily. When wiring, the secondary signal of the remaining current transformer does not distinguish between the current direction. During installation, the temperature probe should be installed close to the cable, the bus surface or the cable joint, and it can be tightened with a nylon tie belt during installation. In addition, according to customer needs, the temperature probe can also be suspended or close to the cabinet installation, to measure the temperature of the environment or cabinet.

5. 编程与使用 Programming and Use

5.1 测量项目及面板说明 Description of measurement items and panel

J1、J4 型可同时监控剩余电流和温度,并根据剩余电流和温度的大小决定作出报警指令。并且当输入信号达到报警设置时，发出声光报警。

The J1 and J4 models can simultaneously monitor the remaining current and temperature, and make the alarm instructions according to the size of the remaining current and temperature. And when the input signal reaches the alarm setting, the sound and light alarm is issued.

5.2 LED 指示说明 LED instructions

共有 4 个 LED 指示灯用于说明探测器状况：

“运行”（绿色）状态：探测器处于正常运行时，运行指示灯闪烁，闪烁频率大约为一秒一次。

“消音”（绿色）状态：探测器处于消音状态时，消音指示灯亮。

“报警”（红色）状况：探测器处于报警状态时，报警指示灯亮。

“故障”（黄色）状况：探测器处于故障时，故障指示灯常亮。(故障为外部线路故障，而不是装置本身的故障）

There are 4 LED indicators used to indicate the detector status:

"Operation" (green) state: When the detector is in normal operation, the operation indicator flashes at about one second.

Silencer (green) state: when the detector is silenced.

"Alarm" (red) condition: the alarm indicator is on when the detector is in the alarm state.

"Fault" (yellow) condition: the fault indicator is always on when the detector is faulty. (The fault is an external line fault, not that of the device itself)

5.3 按键编程说明 button button programming instructions

ARCM300 共有 5 个按键，从左至右分别为：MENU 菜单键、◀ 左键、▶右键、↵回车键和翻页键。

ARCM300 has five buttons, from left to right are: MENU menu single button, ◀ left button, ▶right button, ↵return button and page turning button.

表 3 Table 3

MENU 菜单键 MENU menu button	非编程模式下：按该键进入编程模式，装置提示输入密码，或返回上一级菜单； 编程模式下：用于返回上一级菜单，或退出编程模式。 Non-programming mode: press the button to enter the programming mode, the device prompts for the password, or return to the previous level menu; Programming mode: Return to the previous level menu, or exit the programming mode.

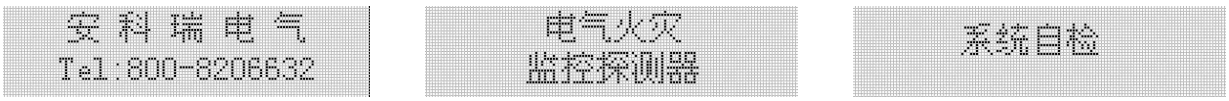
◀左键、▶右键 ◀Left button, ▶right button	非编程模式下：用于切换显示界面； 编程模式下：用于同级菜单的切换和光标的移位。 Unprogramming mode: for switching the display interface; Programming mode: for peer menu switching and cursor shift.
↵ 回车键 return button	用于菜单项目的选择确认，及进入下一级菜单； 或者用于报警状态下的解除报警。 For selection confirmation of menu items and entering the next level of menu; Or used to remove the alarm in the alarm state.
翻页键 Turn the page button	非编程模式下：用于进入功能设置界面，或输入密码时，用于数值的累加； 编程模式下：用于当前设置内容的更改或数值的累加。 Non-programming mode: used to enter the function setting interface or enter the password; Programming mode: Changes to the current settings content or the accumulation of numerical values.

5.4 液晶显示 LCD display

1、开机、关机与自检： Power-on, shutdown and self-test:

打开相关联电源设备，上电瞬间，探测器界面显示如左下图所示，所有指示灯同时变亮，探测器进行自检，界面如右下图所示，所有指示灯依次熄灭，最终运行指示灯闪烁，探测器进入正常监控状态。

Turn the associated power supply equipment on, and the detector interface is shown in the bottom figure on the left. All indicator lights turn on at the same time. The detector conducts

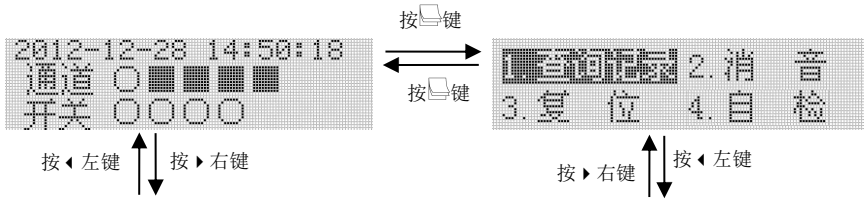


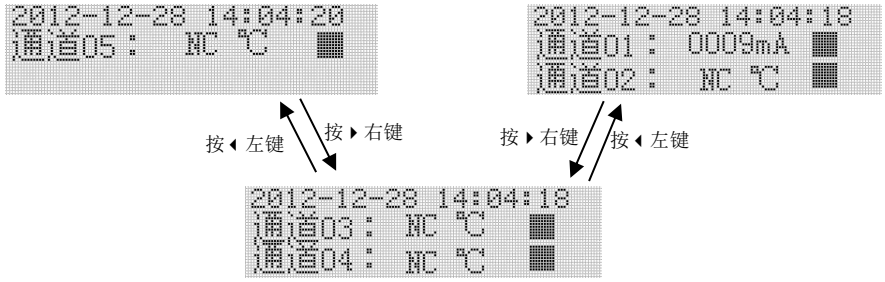
Translation：

安科瑞电气： Acrel Electric	电气火灾监控探测器： Electrical Fire Monitoring Detectors	系统自检： System self-check:

2、自检完毕进入通道状态显示界面，分别显示通道状态和继电器输出状态。其中□表示通道断开，■表示通道关闭；○表示通道状态正常，●表示通道发生报警，◐表示通道断线，◑表示通道短路（**注：断线和短路针对探测器主体与剩余电流互感器或温度传感器之间的连接线**）。

After the self-check, enter the channel status display interface, and display the channel status and the relay output status respectively. Where □ indicates channel break, ■ indicates channel close; ○ indicates normal channel status, ● indicates channel alarm, ◐ indicates channel break, ◑ indicates channel short circuit (note: break and short circuit for the connection between the detector body and the remaining current transformer or temperature sensor).





Translation：

通道： aisle	查询记录： Search record	复位： Reset	按◀左键： Press ◀ the left button
开关： Switching	消音： Muffler	自检： Self-test	按▶右键： Press ▶ the right button

3、在功能设置界面下，用户可以选择所需的功能，设备具有查询记录、消音、复位、自检功能。

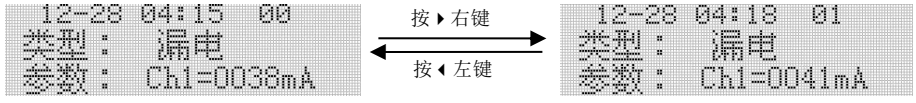
Under the function setting interface, users can select the required functions, and the equipment has the functions of query and recording, silencing, reset and self-inspection.

Translation：

查询记录： Search record	复位： Reset	报警记录： Alarm record	开关记录： Switch record	按 MENU 键 Press the MENU button
消音： Muffler	自检： Self-test	故障记录： Broken record	按↵键 Press ↵ button	/

①如若想查看报警记录，按↵键进入报警记录界面，由下图可查看具体的报警类型、参数与时间，右上角的数据“00”表示第 1 条数据，之后若有更多的报警记录可依次为“01、02……19”（最多 20 条），按◀左键或▶右键进行界面切换，方便工作人员正确的处理或做好应对措施。具体操作如下图所示：

If you want to view the alarm record, press the ↵ button to enter the alarm record interface, from the following figure can view the specific alarm type, parameters and time, the "00" data in the upper right corner indicates the article 1 data, then if more alarm records can be "01,02 … 19" (up to 20 bars), press the ◀ left button or the ▶right button for the interface switch, to facilitate the staff to correctly handle or take countermeasures. The specific operation is shown in the figure below:

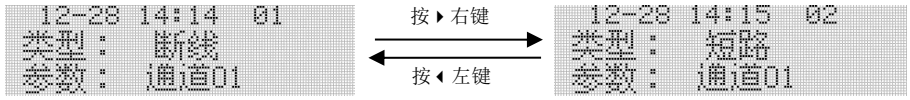


Translation：

类型： type	参数： parameter	按◀左键： Press ◀ the left button
漏电： Leakage	按▶右键： Press ▶ the right button	/

②如若想查看故障记录，按左键或右键选择“2.故障记录”，按↵键进入故障记录界面可查看故障类型、参数与时间，右上角的数据“00”表示第 1 条数据，之后若有更多的故障记录可依次为“01、02……19”（最多 20 条），按◂左键或▸右键进行界面切换，从而更容易去解决问题。具体操作如下图所示：

If you want to view the fault record, press the left button or right button to select "2. Failure record", press the ↵button to enter the fault record interface to view the fault type, parameters and time, "00" data in the upper right corner indicates article 1 data, if more fault records can be "01,02... 19" (up to 20), press the◂ left button or ▸right button to make the interface switch, so that it is easier to solve the problem. The specific operation is shown in the figure below:

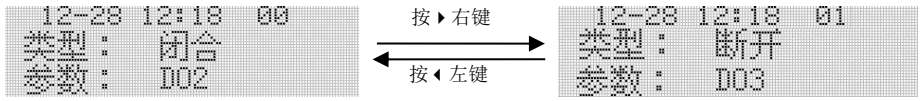


Translation：

类型： type	参数： parameter	按◂左键： Press ◂ the left button	通道 01： Channel 01
断线： Disconnect	按▸右键： Press ▸ the right button	短路： Short circuit	/

③如若想查看开关记录，按左键或右键选择“3.开关记录”，按↵键进入开关记录界面可查看开关类型、参数与时间，右上角的数据“00”表示第 1 条数据，之后若有更多的开关记录可依次为“01、02……19”（最多 20 条），按◂左键或▸右键进行界面切换，对开关的现有状态一目了然。具体操作如下图所示：

If you want to view the switch record, press the left button or right button to choose "3. Switrecord",↵ button into the switch record interface to view the switch type, parameters and time, the upper right corner data "00" indicates the article 1 data, after more switch record "01,02... 19" (up to 20), press the ◂ left button or ▸right button to switch the interface, to the existing state of the switch at a glance. The specific operation is shown in the figure below

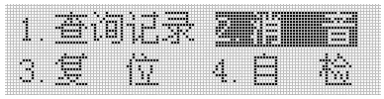


Translation：

类型： type	闭合： closure	按◂左键： Press ◂ the left button
参数： parameter	按▸右键： Press ▸ the right button	断开： disconnect

4、当发生报警时，功能设置界面下，按左键或右键选择“2.消音”，按↵键消除装置的报警声音，同时消音指示灯点亮，报警指示灯不会熄灭。具体显示界面如下：

When an alarm occurs, press the left or right button and select "2. Silencer" under the function button to eliminate the alarm sound of the device, and the silencer indicator will light on, and the alarm indicator will not go out. The specific display interface is as follows:

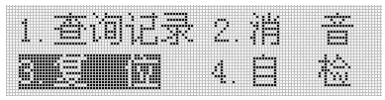


Translation：

查询记录： Search record	消音： Muffler	复位： Reset	自检： Self-test

5、当解除报警或故障后，功能设置界面下，按左键或右键选择“3.复位”，按↵键复位。具体显示界面如下：

When the alarm or fault is removed, press the left button or the right button to select "3. reset", and the ↵button is reset. The specific display interface is as follows:

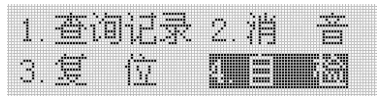


Translation：

查询记录： Search record	消音： Muffler	复位： Reset	自检： Self-test

6、如若想查看当前状态下设备是否完好，功能设置界面下，按左键或右键选择“4.自检”，按↵键使装置进入自检状态。具体显示界面如下：

If you want to check whether the equipment is in good condition under the current state, press the left-button or right-button to select "4. Self-test", and press the ↵button to make the device enter the self-test state. The specific display interface is as follows:



Translation：

查询记录： Search record	消音： Muffler	复位： Reset	自检： Self-test

5.5 编程 Programming

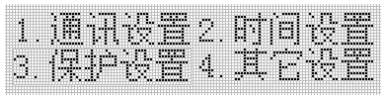
按 MENU 键，进入编程密码界面：通过按左右键，输入用户密码(默认密码为 0001，万能密码为 0008)，输好后按↵回车键进入。若此时又不想进行编程设置，再按 MENU 键便可以退回非编程界面。

Press the MENU button to enter the programming password interface: enter the user password by pressing the left and right button, enter the user password (default password is 0001, universal password is 0008), and enter. If you don't want to do the programming setup again, then press the MENU button to return to the non-programming interface.↵

Translation： 密码：password

1、密码正确后进入设置界面，在此模式下按左右键选择需要的菜单，按↵回车键进入下一级菜单进行设置。如下图所示：

After the password is correct, enter the setting interface. In this mode, press the left and right keys to select the required menu, and press the ↵ return key to enter the next level menu for setting. As shown in the figure below:



Translation：

通讯设置： Communication Settings	时间设置： Time Settings	保护设置： Protection Settings	其他设置： Other Settings

2、“通讯设置”界面下，可以对地址和波特率进行修改或设置；

“时间设置”界面下，可对日期、时间进行修改或设置；

“保护设置”界面下，可对报警参数和保护类型进行修改或设置；

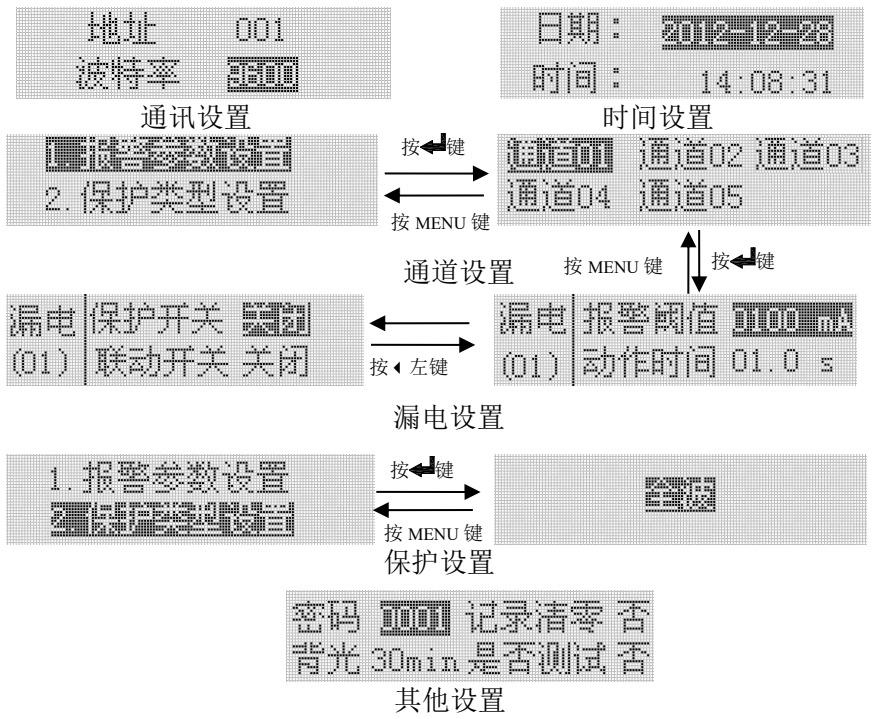
“其它设置”界面下，可对密码、背光进行修改或设置，以及是否记录清零和是否测试进行设置。

Under the "Communication Settings" interface, the address and port rate can be modified or set;

Under the "Time Settings" interface, the date and time can be modified or set;

Under the "Protection Settings" interface, the alarm parameters and protection types can be modified or set;

Under the "Other Settings" interface, the password, the backlight is modified or set, and whether the record is reset and whether the test is set.



Translation:

地址: Address	通讯设置: Communication Settings	按 MENU 键: Press the MENU button	保护开关: Protection switch	漏电设置: Leakage settings
波特率: Baud rate	报警参数设置: Alarm parameter setting	时间设置: Time Settings	联动开关: Linkage switch	报警阈值: Alarm threshold
时间: Time	保护类型设置: Protection Type Setting	通道: Channel	关闭: close	动作时间: Action time
日期: Date	按↵键 Press the ↵ button	漏电: Leakage	按◀左键 Press the ◀ left button	全波: Full wave
密码: Password	背光: Backlight	清零记录: Clear Record	是否测试: Whether Test	否: No
保护设置: Protection Settings:	其他设置: Other Settings	/	/	/

设置完成后按回车键确认，再按 Menu 键返回，直到是否保存设置界面时，此时通过按◀、▶键来进行是否选择保存数据，按回车键确认并退出设置界面。

After the setting is completed, press the return key to confirm, and then press the Menu key to return until whether to save the setting interface. Now, press and press the ◀、▶key to select whether to save the data, press the return key to confirm and exit the setting interface.

6. 功能应用 Functional application

6.1 剩余电流监测 Residual current monitoring

在线监测配电线路的剩余电流，当超过剩余电流报警设定值时，且持续时间超过延时设定值后，执行报警或者断开断路器的操作。可以根据线路正常漏电流的大小设定报警设定值 I△n，在该值的设置上应遵循不小于被保护电气线路正常泄漏电流最大值的两倍，且不大于 1000mA。对装设二级或多级剩余电流保护的场所，上一级的剩余电流报警设定值必须大于下一级的剩余电流报警设定值；并且上一级的延时要大于下一级的延时。

Monitor the residual current of the distribution line online, and perform the alarm or break the circuit breaker when the residual current alarm setting value is exceeded and the duration exceeds the delay set value. The alarm setting value I △ n can be set according to the size of the normal leakage current of the line, which is not less than twice the maximum normal leakage current of the protected electrical line, and no more than 1000mA. For places where secondary or multiple residual current protection is installed, the residual current alarm at the next level must be greater than the residual current alarm setting value of the next level; and the delay of the next level must be greater than the delay of the next level.

参数 parameter	范围 scope	步长 step
剩余电流报警设定值 Residual current alarm setting value	20～1000mA	1mA
动作延时时间 Action delay time	0.1～60.0S	0.1S
保护方式 Protection method	关闭/打开 Close / Open	
联动开关 Cupled switch	无/DO1 No / DO1	

保护方式：剩余电流保护方式可以设置为关闭、打开，联动可以设置为无、DO1。在保护方式打开和联动开关处于 DO1 状态下当检测到剩余电流值超过报警值时，报警 LED 灯常亮，达到动作延时后触发相应动作。若在延时过程中，剩余电流值小于剩余电流报警值时，不会动作。

Protection mode: The residual current protection mode can be set to close and open, and the linkage can be set to None and DO 1. When the protection mode is opened and the linkage switch is in DO 1 state, when the remaining current value exceeds the alarm value, the alarm LED light is always on, and the corresponding action is triggered after the action delay is reached. If in the delay process, the residual current value is less than the residual current alarm value, it will not act.

出厂默认剩余电流报警设定值为 300mA，动作延时时间为 10.0S，保护方式为关闭。

The factory default residual current alarm setting value is 300mA, the action delay time is 10.0S, and the protection mode is off.

6.2 温度保护 Temperature protection

通过温度传感器监测配电箱、线缆或线缆连接处的温度，超过温度动作设定值时，延时一定时间，执行报警或者断开断路器的操作。温度传感器的安装必须固定稳定，防止跌落造成线路短路。

Monitor the temperature of the distribution box, cable or cable connection through the temperature sensor, and delay the temperature action setting value for a certain time to perform the alarm or break the circuit breaker. The temperature sensor must be fixed and stable to prevent short circuit of the line.

参数 parameter	范围 scope	步长 step
温度动作设定值 Temperature action Setpoint	45.0～110.0℃	1℃
动作延时时间 Action delay time	0.1～60.0S	0.1S
保护方式 Protection method	关闭/打开 Close / Open	
联动开关 cupled switch	无/DO1 No / DO1	

保护方式：温度保护模式可以设置为关闭、打开，联动可以设置为无、DO1。在保护方式打开和联动开关处于 DO1 状态下当检测到温度值超过动作设定值时延时，达到动作延时后触发动作。在延时过程中，温度值下降到温度设定值以下时，不会动作。

Protection mode: The temperature protection mode can be set to close, open, and the linkage can be set to None, DO1. When the protection mode is opened and the linkage switch is in the DO 1 state, the delay occurs when the temperature value exceeds the action setting value, and the action is triggered after the action delay is reached. During the delay, the temperature value drops below the temperature setting.

出厂默认温度报警设定值是 60℃，动作延时时间为 1.0S，保护方式为关闭。

The factory default temperature alarm setting value is 60℃, the action delay time is 1S, and the protection mode is off..0

6.3 消防联动功能 Fire-fighting linkage function

当发生火灾时，消防联动系统发出指令，通过装置使断路器脱扣，强制切断非消防设备的电源。装置接收到消防联动信号时，将跟根据相应的动作设置做出相应的保护动作。

In case of fire, the fire control linkage system issues instructions to unbuckle the circuit breaker through the device and force it to cut off the power supply of non-fire fighting equipment. When the device receives the fire control linkage signal, it will make the corresponding protection action according to the corresponding action setting.

出厂默认保护方式为关闭。

The factory default protection mode is shutdown.

6.4 自检和试验功能 Self-test and test function

装置具备自检和试验功能，在没有故障或报警时，在“报警记录”界面下长时按住回车键进入自检状态，按试验组合键进入试验状态，查看设备是否完好。

The device has the function of self-inspection and test. When there is no fault or alarm, hold down the return key under the "alarm record" interface, press the test combination key to enter the test state, and check whether the equipment is in good condition.

6.5 集中监控 Centralized monitoring

集中监控计算机通过 RS485，接受现场采集信号，发出报警信号及控制指令，及时断开故障线路。采用 Modbus-RTU 协议通讯，通讯距离为 1.2 公里，同一链路可监控 32 台装置。

The centralized monitoring computer receives the field acquisition signals, issues alarm signals and control instructions, and can disconnect the fault line in time. Using Modbus-RTU protocol communication, communication distance of 1.2 km, the same link can monitor 32 devices.

6.6 报警复位（解除报警）Alarm reset (remove the alarm)

当发生报警时，可以按动←回车键来消除报警声音和复位继电器输出状态；如果在进行复位操作后未排除报警故障，装置将再次进入故障报警或脱扣状态。

When the alarm occurs, the return key can be pressed to eliminate the alarm sound and the reset relay output state; if the alarm fault is not eliminated after the reset operation, the device will enter the fault alarm or unbuckled state again.

7. 通讯协议 Communication agreement

7.1 通讯协议概述 Overview of the communication protocol

该装置使用 Modbus-RTU 通讯协议，Modbus 协议详细定义了校验码、数据序列等，这些都是特定数据交换的必要内容。Modbus 协议在一根通讯线上使用主从应答式连接（半双工），这意味着在一根单独的通讯线上信号沿着相反的两个方向传输。首先，主计算机的信号寻址到一台唯一的终端设备（从机），然后，终端设备发出的应答信号以相反的方向传输给主机。

The device uses the Modbus-RTU communication protocol, and the Modbus protocol defines in the verification code, data sequence, etc., which are necessary for a specific data exchange.The Modbus protocol uses a master-slave response connection (half-duplex) on a communication line, which means that the signal is transmitted in two opposite directions on a separate communication line. First, the signal of the host computer is addressed to a unique terminal device (slave machine), and then the response signal from the terminal device is transmitted to the host in the opposite direction.

Modbus 协议只允许在主机（PC 等）和终端设备之间通讯，而不允许独立的终端设备之间的数据交换，这样各终端设备不会在它们初始化时占据通讯线路，而仅限于响应到达本机的查询信号。**（默认通信设置值：地址为 0001，波特率为 9600）**

The Modbus protocol only allows for communication between the host machine (PC, etc.) and the terminal devices, but does not allow for data exchange between the separate terminal devices, so that the terminal devices do not occupy the communication lines when they are initialized, but only respond to the query signals reaching the host machine.(Default communication settings: address 0001, baud rate 9600)

7.1.1 传输方式 Transmission mode

信息传输为异步方式，并以字节为单位，在主机和从机之间传递的通讯信息是 11 位格式，包含 1 个起始位、8 个数据位（最低的有效位先发送）、无奇偶校验位、1 个停止位。

Information transmission is asynchronous, and in bytes, the communication information transmitted between the host and the slave is in an 11-bit format, including 1 starting bit, 8 data bits (the lowest effective bit is sent first), no parity bit, 1 stop bit.

7.1.2 信息帧格式 Information frame format

地址码 Address code	功能码 Function code	数据区 Data field	CRC 校验码 CRC check code
1 字节 1 Bytes	1 字节 1 Bytes	n 字节 n Bytes	2 字节 2 Bytes

地址码：地址码在帧的开始部分，由一个字节（8 位二进制码）组成，十进制为 0～255。这些位标明了用户指定的终端设备的地址，该设备将接收来自与之相连的主机数据。每个终端设备的地址必须是唯一的，仅被寻址到的终端会响应包含了该地址的查询。当终端发送回一个响应，响应中的从机地址数据便告诉了主机哪台终端正与之进行通信。

Address code: The address code, at the beginning of the frame, consists of a single byte (8-bit binary code), ranging in decimal order from 0~255. These bits indicate the address of the user-specified terminal device that will receive host data from being connected to it. Each terminal device's address must be unique, and only the addressed terminals will respond to a query containing

that address. When the terminal sends back a response, the slave address data in the response tells the host which terminal is communicating with it.

功能码：功能码告诉了被寻址到的终端执行何种功能。下表列出了该系列仪表用到的功能码，以及它们的意义和功能。

Function code: The function code tells the addressed terminal what function to perform. The following table lists the function codes used in the series of instruments, and their meaning and functions.

功能 Function	定义 Definition	操作 Operate
03H/04H	读数据寄存器 Read the data register	获得一个或多个寄存器的当前二进制值 Get the current binary value for one or more registers
10H	预置多寄存器 Preset multiple registers	设定二进制值到一系列多寄存器中 Set the binary values into a series of multiple registers

数据区：数据区包含了终端执行特定功能所需要的数据或者终端响应查询时采集到的数据。这些数据的内容可能是数值、参考地址或者设置值。例如：功能码告诉终端读取一个寄存器，数据区则需要指明从哪个寄存器开始及读取多少个数据，内嵌的地址和数据依照类型和从机之间的不同内容而有所不同。

Data zone: The data zone contains the data required for the terminal to perform specific functions or the data collected when the terminal responds to the query. The contents of these data may be numerical values, reference addresses, or set values. For example, the function code tells the terminal to read a register, and the data area needs to indicate which register to start from and how many data to read. The embedded address and data vary according to the type and the slave.

CRC 校验码：错误校验（CRC）域占用两个字节，包含了一个 16 位的二进制值。CRC 值由传输设备计算出来，然后附加到数据帧上，接收设备在接收数据时重新计算 CRC 值，然后与接收到的 CRC 域中的值进行比较，如果这两个值不相等，就发生了错误。

CRC check code: The Error check (CRC) domain takes up two bytes and contains a 16-bit binary value. The CRC values are calculated by the transmission device and then attached to the data frame, where the receiving device recalculates the CRC values when receiving the data and then compared with the values in the received CRC domain, and an error occurs if the two values are not equal.

生成一个 CRC 的流程为：

1、预置一个 16 位寄存器为 0FFFFH（全 1），称之为 CRC 寄存器。

2、把数据帧中的第一个字节的 8 位与 CRC 寄存器中的低字节进行异或运算，结果存回 CRC 寄存器。

3、将 CRC 寄存器向右移一位，最高位填以 0，最低位移出并检测。

4、如果最低位为 0，重复第三步（下一次移位）；如果最低位为 1，将 CRC 寄存器与一个预设的固定值（0A001H）进行异或运算。

5、重复第三步和第四步直到 8 次移位，这样处理完了一个完整的八位。

6、重复第 2 步到第 5 步来处理下一个八位，直到所有的字节处理结束。

7、最终 CRC 寄存器的值就是 CRC 的值。

此外还有一种利用预设的表格计算 CRC 的方法，它的主要特点是计算速度快，但是表格需要较大的存储空间，该方法此处不再赘述，请参阅相关资料。

The process for generating a CRC is:

1. Preset a 16-bit register as OFFFFH (full 1), called the CRC register.

2. Count the 8 bits of the first byte in the data frame with the low byte in the CRC register, and save the results back to the CRC register.

3. Move the CRC register to the right, the highest to 0, and the lowest out and detected.

4. If the lowest bit is 0, repeat the third step (next shift); if the lowest bit is 1, compare the CRC register with a preset fixed value (OA001H).

5. Repeat steps 3 and 4 until 8 shifts, completing a complete octet.

6. Repeat steps 2 through 5 to process the next octet until all bytes are processed.

7. The value of the final CRC register is the value of the CRC.

In addition, there is a method of calculating the CRC by using a preset table. Its main feature is the fast calculation speed, but the table needs a large storage space. This method will not be repeated here, please refer to the relevant information.

7.2 功能码简介 Introduction to the function code

7.2.1 功能码 03H：读寄存器 Function code 03H: Read the register

此功能允许用户获得设备采集与记录的数据及系统参数。主机一次请求的数据个数没有限制，但不能超出定义的地址范围。

This function allows users to obtain the data collected and recorded by the equipment and the system parameters. There is no limit on the number of data requested by the host at a time, but it cannot exceed the defined address range.

下面的例子是从地址为 01 号仪表 ARCM300 读 3 个采集到的基本数据（数据帧中每个地址占用 2 个字节）回路 1~3 的保护设定值，其中回路 1 保护设定值的地址为 1033H，回路 2 保护设定值的地址为 1034H，回路 3 保护设定值的地址为 1035H。

The following example is the protection set value of the loop 1 to 3 (each address occupies 2 bytes in the data frame) read from the address 01 instrument ARCM 300, where the address of the loop 1 protection set value is 1033H, the address of the loop 2 protection set value is 1034H, and the address of the loop 3 protection set value is 1035H.

主机发送 Host sent		发送信息 Transmitted information
地址码 Address code		01H
功能码 Function code		03H
起始 地址	高字节	10H

从机返回 Return from the machine	返回信息 Return informatio
地址码 Address code	01H
功能码 Function code	03H
字节数	06H

Start address	High byte	
	低字节 Lower byte	33H
寄存器数量 Number of registers	高字节 High byte	00H
	低字节 Lower byte	03H
CRC 校验码 CRC, check code	低字节 Lower byte	F1H
	高字节 High byte	04H

Byte number		
寄存器 1033 数据 Register 1033 data	高字节 High byte	00H
	低字节 Lower byte	2DH
寄存器 1034 数据 Register 1034 data	高字节 High byte	00H
	低字节 Lower byte	37H
寄存器 1035 数据 Register 1035 data	高字节 High byte	00H
	低字节 Lower byte	41H
CRC 校验码 CRC, check code	低字节 Lower byte	FCH
	高字节 High byte	8DH

7.2.2 功能码 10H：写寄存器 Function code 10H: Write the register

功能码 10H 允许用户改变多个寄存器的内容，该仪表中时间日期可用此功能号写入。主机一次最多可以写入 16 个（32 字节）数据。

The function code 10H allows the user to change the content of multiple registers, and the time date in the instrument may be written with this function number. The host can write up to 16 (32 bytes) of data at a time.

下面的例子是预置地址为 01 的装置日期和时间为 18 年 01 月 01 日，11 点 59 分 59 秒。

The following example is the preset device date and time of 01,01.01,11:59:59 seconds.

主机发送 Host sent		发送信息 Transmitted information
地址码 Address code		01H
功能码 Function code		10H
起始地址 Start address	高字节 High byte	11H
	低字节 Lower byte	00H
寄存器数量 Number of registers	高字节 High byte	00H
	低字节 Lower byte	03H
字节数 Byte number		06H
1100H 待写入数据 Data to be written	高字节 High byte	12H
	低字节 Lower byte	01H
1101H 写入数据 Data to be written	高字节 High byte	01H
	低字节 Lower byte	0BH

从机返回 Return from the machine		返回信息 Return informatio
地址码 Address code		01H
功能码 Function code		10H
起始 地址 Start address	高字节 High byte	11H
	低字节 Lower byte	00H
寄存器数量 Number of registers	高字节 High byte	00H
	低字节 Lower byte	03H
CRC 校验码 CRC, check code	低字节 Lower byte	85H
	高字节 High byte	34H

1102H 待写入数据 Data to be written	高字节 High byte	3BH
	低字节 Lower byte	3BH
CRC 校验码 CRC, check code	低字节 Lower byte	AAH
	高字节 High byte	D3H

7.3 探测器参数地址表 Probe parameter address table

7.3.1 电气火灾相关参数寄存器地址表，起始地址 0x1000：

Register address table of electrical fire related parameters, starting address 0x1000:

序号 Order number	地址 Address	参数 Parameter	读/写 Read / Write	数值范围 Value range	类型 Type
1	0x1000	预留 Obligate			
2	0x1001	断线状态 Broken line state	R	B0~B4，表示回路 1~回路 5； Bit0 = 1：回路 1 断线；Bit0 = 0：回路 1 不断线。 … B0~B4, indicating the circuit from loop 1 to loop 5; Bit0 = 1: Circuit 1 disconnected; Bit0 = 0: Circuit 1. …	Word
3	0x1002	短路状态 short-circuit condition	R	B0~B4，表示回路 1~回路 5； Bit0 = 1：回路 1 短路；Bit0 = 0：回路 1 不短路。 … B0~B4, indicating the circuit from loop 1 to loop 5; Bit0 = 1: short circuit to circuit 1; Bit0 = 0: circuit 1 does not. …	Word
4	0x1003	报警状态 Alarm status	R	B0~B4，表示回路 1~回路 5； Bit0 = 1：回路 1 报警；Bit0 = 0：回路 1 不报警。 … B0~B4, indicating the circuit from loop 1 to loop 5; Bit0 = 1: Circuit 1 alarm; Bit0 = 0: Circuit 1 does not alarm. …	Word
5	0x1004	预留 obligate			
6	0x1005	漏电测量值 Leakage measurement	R	测量范围：漏电-300~9999； 表示回路 1 实时漏电电流测量值； 注（J1 只有 1 路漏电，J4 有 4 路漏电） Measurement range: electricity leakage-300~9999; It ote the real-time leakage current measurement of circuit 1; Note (J1 has only 1 road leakage, J4 has 4 road leakage)	Short
7	0x1006	温度/漏电测量值 Temperature / electric leakage measurement	R	测量范围：漏电-300~9999，（温度 0~1200，为 1 位小数）；表示回路 2 实时测量值； Measurement range: leakage-300~9999, (temperature 0~1200,1 decimal place); indicates the real-time measurement value of circuit 2;	
8	0x1007	温度/漏电测量值 Temperature / electric leakage measurement	R	测量范围：漏电-300~9999，（温度 0~1200，为 1 位小数）；表示回路 3 实时测量值； Measurement range: leakage-300~9999, (temperature 0~1200,1 decimal place); indicates the real-time measurement value of loop 3;	
9	0x1008	温度/漏电测量值 Temperature / electric leakage measurement	R	测量范围：漏电-300~9999，（温度 0~1200，为 1 位小数）；表示回路 4 实时测量值； Measurement range: leakage-300~9999, (temperature 0~1200,1 decimal place); indicating the real-time measurement value of loop 4;	
10	0x1009	温度测量值	R	测量范围：0~1200（温度为 1 位小数）；表示回路 5 实时测量值； Measurement range: 0~1200 (temperature is 1 decimal place); indicates the real-time measurement value of loop 5;	
11~21	0x1010~ 0x1014	预留 obligate			
22	0x1015	漏电报警值 Leakage alarm value	R	测量范围：0~9999；表示回路 1 实时漏电报警值； Measurement range: 0~9999; indicates the real-time leakage alarm value of circuit 1;	Word
23	0x1016	温度/漏电报警值 Temperature / electric leakage alarm value	R	测量范围：漏电-300~9999，（温度 0~1200，为 1 位小数）；表示回路 2 报警值； Measurement range: leakage-300~9999, (temperature 0~1200,1 decimal place); indicates the circuit 2 alarm value;	Word
24	0x1017	温度/漏电报警值 Temperature / electric leakage alarm value	R	测量范围：漏电-300~9999，（温度 0~1200，为 1 位小数）；表示回路 3 报警值； Measurement range: leakage-300~9999, (temperature 0~1200,1 decimal place); indicates the loop 3 alarm value;	Word

25	0x1018	温度/漏电报警测量值 Temperature / leakage alarm measurement value	R	测量范围：漏电-300~9999，（温度 0~1200，为 1 位小数）；表示回路 4 报警值； Measurement range: electricity leakage-300~9999, (temperature 0~1200,1 decimal place); indicates the alarm value of loop 4;	Word
26	0x1019	温度报警值 Temperature alarm value	R	测量范围：0~1200（温度为 1 位小数）；表示回路 5 报警值； Measurement range: 0~1200 (temperature is 1 decimal place); indicates the alarm value of circuit 5;	Word
27~41	0x1020~ 0x1028	预留 obligate			
42	0x1029	D0 状态 D0 state	R/W	B0~B3，表示 DO1~DO4； Bit0=0：DO1 打开；Bit0=1：DO1 闭合。 … 注：J1 型只有 1 路 DO，J4 型有 4 路 DO。 B0~B3, representation DO1~DO4; Bit0=0: DO1 open; Bit0=1: DO1 closed. … Note: J1 has 1-way DO, J4 has 4-way DO.	Word
43~47	0x102A~ 0x102E	预留 obligate			
48	0x102F	DO 关联 DO relevance	R/W	B0~B3，表示回路 1~回路 4； Bit0 = 1：回路 1 报警时关联 DO1； Bit0 = 0：回路 1 报警时未关联 DO1。 … 注：J1 型报警时回路 1-4 只关联 DO1， J4 型报警时回路 1-4 与 DO1-4 一一对应。 B0~B3, indicating the circuit from loop 1 to loop 4; Bit0 = 1: associated DO1 when loop 1 alarms; Bit0 = 0: DO1 is not associated when loop 1 alarms. … Note: Circuit 1-4 is only associated with DO1, Circuit 1-4 corresponds to type 1-4 and DO1-4.	Word
49	0x1030	预留 obligate			
50	0x1031	保护开关 protection switch	R/W	B0~B5，表示回路 1~回路 5； Bit0 = 1：回路 1 打开报警； Bit0 = 0：回路 1 关闭报警。 …… B0~B5, indicating the circuit from loop 1 to loop 5; Bit0 = 1: Circuit 1 opens the alarm; Bit0 = 0: Circuit 1 closes the alarm. ……	Word
51	0x1032	保护类型 Protection type	R/W	基波保护：FFFF；全波保护：0000。 Basal wave protection: FFFF; full wave protection: 0000.	Word
52	0x1033	漏电保护设定值 Leakage protection set point	R/W	设置范围：-300~9999；表示回路 1 保护设定值； Setting range: -300~9999; indicates the loop 1 protection settings;	Word
53	0x1034	温度/漏电保护设定值 Temperature / leakage protection Setpoint	R/W	设置范围：漏电-300~9999，（温度 0~1200，为 1 位小数）；表示回路 2 保护设定值； Setting range: leakage-300~9999, (temperature 0~1200,1 decimal place); indicating the protection setting value of circuit 2;	Word
54	0x1035	温度/漏电保护设定值 Temperature / leakage protection Setpoint	R/W	设置范围：漏电-300~9999，（温度 0~1200，为 1 位小数）；表示回路 3 保护设定值 Setting range: electricity leakage-300~9999, (temperature 0~1200,1 decimal place); indicates the protection set value of loop 3	Word
55	0x1036	温度/漏电保护设定值 Temperature / leakage protection Setpoint	R/W	设置范围：漏电-300~9999，（温度 0~1200，为 1 位小数）；表示回路 4 保护设定值 Setting range: electricity leakage-300~9999, (temperature 0~1200,1 decimal place); indicates the protection setting value of circuit 4	Word
56	0x1037	温度保护设定值 Temperature Protection SetPoint	R/W	设置范围：漏电-300~9999，（温度 0~1200，为 1 位小数）；表示回路 5 保护设定值 Setting range: leakage-300~9999, (temperature 0~1200,1 decimal place); indicates the protection setting value of circuit 5	Word
57~67	0x1038~ 0x1042	预留 obligate			
68	0x1043	漏电保护延时 Leakage protection delay	R/W	设置范围：1~600（小数点为 1 位小数，单位为 s）； 表示回路 1 保护延时值； Setting range: 1~600 (decimal point is 1 decimal place in s); Indicates the circuit 1 protection delay value;	Word
69	0x1044	温度/漏电保护延时 Temperature / leakage protection delay	R/W	设置范围：1~600（小数点为 1 位小数，单位为 s）； 表示回路 2 保护延时值； Setting range: 1~600 (decimal point is 1 decimal place in s); It represents the protection delay value of circuit 2;	Word
70	0x1045	温度/漏电保护延时 Temperature / leakage protection	R/W	设置范围：1~600（小数点为 1 位小数，单位为 s）； 表示回路 3 保护延时值； Setting range: 1~600 (decimal point is 1 decimal place in s);	Word

		delay		It represents the protection delay value of circuit 3;	
71	0x1046	温度/漏电保护延时 Temperature / leakage protection delay	R/W	设置范围：1~600（小数点为 1 位小数，单位为 s）； 表示回路 4 保护延时值; Setting range: 1~600 (decimal point is 1 decimal place in s); Represents the protection delay value of circuit 4;	Word
72	0x1047	温度/漏电保护延时 Temperature / leakage protection delay	R/W	设置范围：1~600（小数点为 1 位小数，单位为 s）； 表示回路 5 保护延时值; Setting range: 1~600 (decimal point is 1 decimal place in s); Represents the circuit 5 protection delay value;	Word
73~99	0x1048~ 0x1062	预留 obligate			
100	0x1063	Clear	R/W	读取数值为 0； 写入 0x1234 时，清除报警（复位）； 写入 0x4321 时，自检。 Read the numerical value is 0; When writing to 0x1234, clear the alarm (reset); BIT when writing to the 0x 4321.	Word

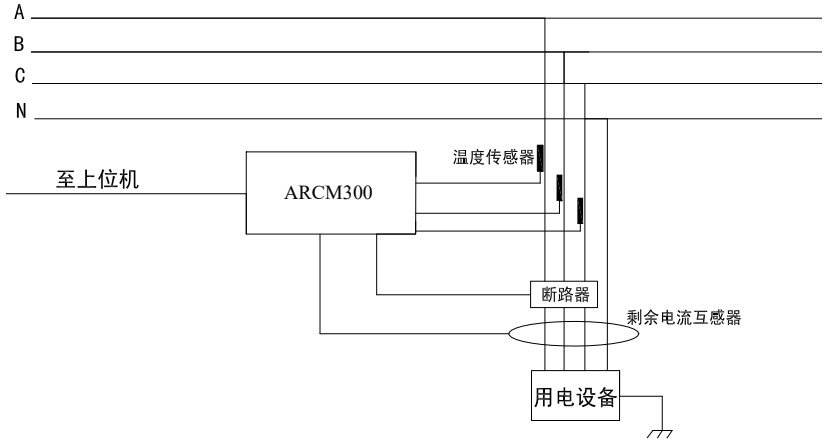
7.3.2 系统设置信息相关参数寄存器地址表，起始地址 0x1100：

Register address table of system setting information, starting address 0x1100:

序号 Order number	地址 Address	参数 Parameter	读/写 Read / write	数值范围 Value range	类型 Type
1	0x1100 高位	年 year	R/W	00-99	Word
	0x1100 低位	月 moon	R/W	1-12	Word
2	0x1101 高位	日 day	R/W	1-31	Word
	0x1101 低位	时 time	R/W	0-23	Word
3	0x1102 高位	分 component	R/W	00-59	Word
	0x1102 低位	秒 second	R/W	00-59	Word
4~5	0x1103~ 0x1104	预留 obligate			
6	0x1105	通讯 1 地址 Communication 1 address	R/W	1-247	Word
7	0x1106	通讯 1 波特率 Communication 1 Pot rate	R/W	4800、9600、19200、38400	Word
8~9	0x1107~ 0x1108	预留 obligate			
10	0x1109	密码 password	R/W	1-9999	Word
11	0x110A	背光时间 Backlit time	R/W	0-99 min 0 表示常亮 0-99 min 0 indicates constant bright	Word
12	0x110B	液晶对比度 LCD contrast	R/W	20-40，默认 30 At 20-40, the default is at 30	Word

8. 典型应用及附件 Typical Applications and Accessories

8.1 典型接线图 Typical wiring diagram



Translation:

至上机位： Top seat	断路器： Breaker	剩余电流互感器： Residual current transformer
温度传感器： Temperature Sensor	用电设备： Electrical equipment	/

8.2 分级保护应用原则 Principles of hierarchical protection application

系统应用中常有分级保护，常见 2～3 级，上下级的选择性原则：

1）动作电流方面，上级设备的设置必须最少是下级设备的两倍；

2）脱扣时间方面，上级设备的延迟时间应大于下一级剩余电流保护装置的动作时间，且动作时间差不得小于0.2 s。

In system applications, there are often hierarchical protection, common level 2~3, upper and lower selective principles:

1) In terms of action current, the setting of the superior equipment must be at least twice that of the subordinate equipment;

2) In terms of tripping time, the delay time of the superior equipment shall be greater than the operation time of the next level of residual current protection device, and the action time difference shall not be less than 0.2s.

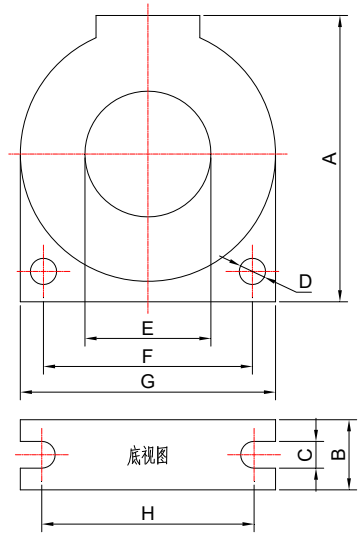
8.3 AKH-0.66L 系列剩余电流互感器选型（选购时应按实际需求确定此附件型号）

Selection of AKH-0.66L series residual current transformer (this attachment model shall be determined according to actual requirements)

型号 model	额定电流（A） rated current	A/mm	B/mm	C/mm	D/mm	E/mm	F/mm	G/mm	H/mm	重量/kg weight
L45	16~100	74	22.5	4.5	4	45	65	75	64.5	0.18
L 80	100~250	120	23	4.5	4	80	105	120	104.5	0.42
L 100	250~400	140	23	4.5	4	100	124	140	123.5	0.50
L 150	400~800	204	24	4.5	6	150	160	197	173.5	1.32
L 200	800~1500	246	28	4.5	6	200	210	241	213.5	1.94

配套传感器的型号将根据回路的额定电流和导线粗细来选择相应规格的剩余电流互感器；如果对互感器的外形和量程有特殊需求可以来电洽谈。

The model of the supporting sensor will be selected based on the rated current of the circuit and the thickness of the wire select the residual current transformer of the corresponding specification; if the shape and range of the transformer are special demand can be negotiated by call.



底视图：Bottom view

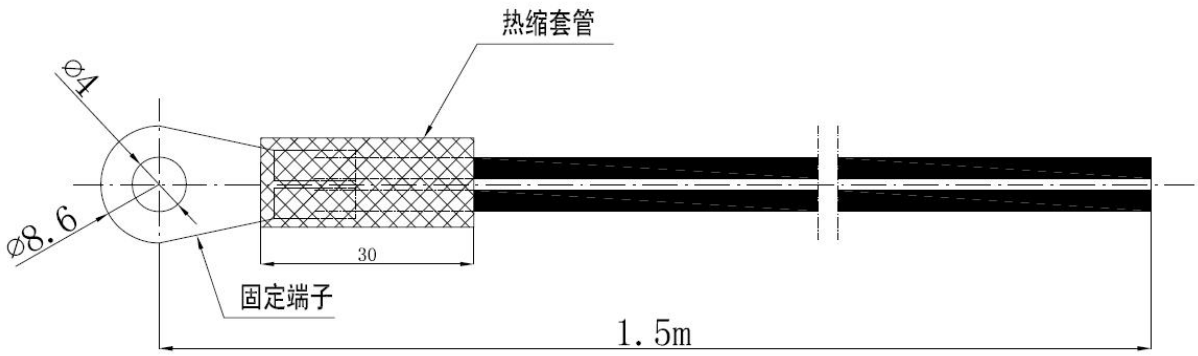
8.4 NTC 温度传感器 NTC Temperature Sensor

温度传感器为本公司定制的NTC热敏电阻,它为探测器提供0℃～120℃的温度监控信号，可以用来监测线缆或配电箱体的温度，实现温度保护。

The temperature sensor is the company customized NTC thermistor, which provides the detector with 0℃ ~120℃ temperature monitoring signal, which can be used to monitor the temperature of the cable or distribution box body, to achieve temperature protection.

其外形尺寸如下(单位mm)：

Its external dimensions are as follows (in mm):



固定端子：Fixed terminal
热缩套管：Thermal casing

9. 注意事项 Precautions

1、该探测器主要安装于建筑、工业等低压配电 TN、TT 系统。其剩余电流电保护功能适用于 TN-C-S 系统、TN-S 系统及局部 TT 系统，不宜设置在 IT 系统的配电线路和消防配电线路中。

The detector is mainly installed in low-voltage distribution TN and TT systems. Its residual current and electric protection function is applicable to TN-C-S system, TN-S system and local TT system, and should not be set in the distribution line and fire distribution line of IT system.

2、电气火灾监控系统的设置不应影响供电系统的正常工作，不宜自动切断供电电源。

The setting of the electrical fire monitoring system should not affect the normal work of the power supply system, and it is not appropriate to automatically cut off the power supply.

3、该探测器应以设置在低压配电系统首端为基本原则，宜设置在第一级配电柜（箱）的出线端。在供电线路泄露电流大于 500mA 时，宜在下一级配电柜（箱）设置。

The detector should be set at the first end of the low-voltage power distribution system as the basic principle, and should be set at the outlet end of the first level of power distribution cabinet (box). When the leakage current of the power supply line is greater than 500mA, it should be set in the next level of power distribution cabinet (box).

4、电气火灾监控系统应符合《剩余电流动作保护装置的安装和运行》GB13955。为了避免大面积停电，应采用分级保护，即电源端或分支线路上的剩余电流保护装置应与末端的剩余电流保护装置的动作特性应当

协调配合，从而实现具有动作选择性的分级保护。

The electrical fire monitoring system shall comply with the GB13955 for Installation and Operation of Residual Current Action Protection Device. In order to avoid large-scale power failure, hierarchical protection should be adopted, that is, the residual current protection device on the power supply end or branch line should be coordinated with the action characteristics of the residual current protection device at the end, so as to achieve graded protection with action selectivity.

一般情况下，在电源进线端或分支主回路上，应选用低灵敏度延时型的剩余电流保护装置。而在末端，剩余电流动作值 I△n<30mA，额定动作时间 Tn<0.1s，主要用于防人身触电保护，与电气火灾监控系统是互补关系。建筑各楼层总进线处可安装一台或若干台该探测器，但应根据正常泄漏电流大小，正确设定动作参数。一般总进线处的剩余电流为 200~500mA。重要负荷：包括消防、安防、应急电源、通道照明线路及不允许断电的场所，根据 GB139554.6 规定，应将探测器设置为报警方式保护；在采集漏电电流、过电流等信号，超过报警值时，只发出声光报警信号，不切断电源，同时将采集的信号通过总线方式，传送到控制中心，可设置手动断电模式，既保证了用电安全，又保证了供电的不间断性。

In general, the low sensitivity and delay type of residual current protection device should be selected in the power supply inlet end or in the branch main circuit. At the end, the remaining current action value I △ n <30mA, the rated action time Tn<0.1s, is mainly used for personal electric shock protection, and is complementary to the electrical fire monitoring system. One or more such detectors can be installed at the main inlet line of each floor of the building, but the action parameters should be correctly set, according to the normal leakage current size. The residual current at the total inlet line is 200~500mA. Important load: including fire protection, security, emergency power supply, channel lighting lines and places not allowing power off, the detector should be set as alarm mode protection according to GB139554.6; when collecting leakage current, overcurrent and other signals, exceeding the alarm value, only the acoustic and light alarm signal, not cut off the power supply, and the collected signal through the bus to the control center, manual power off mode can be set to ensure the safety of power supply and the uninterrupted power supply.

5、剩余电流互感器可安装在断路器的进线端或出线端。安装时，必须严格区分 N 线和 PE 线，N 线应通过剩余电流火灾监控系统的剩余电流互感器。通过探测器的剩余电流互感器的 N 线不得作为 PE 线，不得重复接地或接设备外露可接近导体。PE 线不得介入电气火灾监控装置。

The remaining current transformer can be installed at the incoming line or outlet end of the circuit breaker. During installation, N lines and PE lines must be strictly distinguished, and N lines shall pass through the residual current transformer of the residual current fire monitoring system. The N wire of the remaining current transformer passing through the detector shall not be used as a PE wire, and repeated grounding or connecting the equipment shall not be exposed to access the conductor.The PE line shall not intervene in the electrical fire monitoring device.

装设了该探测器的支路，其工作零线只能作为本回路的零线，禁止与其它回路工作零线相连，其它线路或设备也不能借用已采用剩余电流保护器后的线路或设备的工作零线。

The branch road of the detector is installed, and the working zero line can only be used as

the zero line of this loop. It is forbidden to connect with other loop working zero line, and other lines or equipment can not borrow the working zero line or equipment after using the remaining current protector.

6、安装完毕后应由专业技术人员设定参数符合现场实际要求，同时要进行操作实验，保证探测器的正常运行。

After the installation, the professional and technical personnel should set the parameters to meet the actual requirements of the site, and the operation experiment should be carried out to ensure the normal operation of the detector

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