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DDSY1352-NK/DTSY1352-NK
内控型预付费电能表使用说明书
Controlled Prepayment Electricity Meter

安装使用说明书 V1.4

User's Manual

(V1.4)

安科瑞电气股份有限公司
Acrel Electric Co., Ltd.

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1 概述 Overview

DDSY1352-NK 单相内控型预付费电能表、DTSY1352-NK 三相内控型预付费电能表分别用于计量额定频率 50Hz 的单、三相交流有功电能，具有预付费、负载控制及 RS485 通信等功能，性能指标符合 GB/T17215.321-2008 标准。是改革传统用电体制，提高用电管理水平的理想计表。产品符合企业标准 Q31/0114000129C035-2017《导轨式安装电能表企业标准》的要求。

DDSY1352-NK single-phase controlled prepayment electricity meter and DTSY1352-NK three-phase controlled prepayment electricity meter are used to measure the single-phase and three-phase AC active energy at the rated frequency of 50Hz respectively. They boast several functions such as tariff prepayment, load control and RS485 communication. The performance indexes meet provisions of GB/T17215.321-2008. They are ideal for restructuring the conventional power utilization system and improving the power utilization management. The products comply with the requirements of enterprise standard Q31/0114000129C035-2017 《enterprise standard for guide-mounted electricity meters》

2 产品规格 Product specification

型　号 Model	精度等级 Accuracy class	额定电压（V） Rated voltage, V	电流规格（A） Current, A	脉冲常数 Pulse constant （imp/kWh）
DDSY1352-NK	1 级 Class 1	220V	10（60）A	1600
DTSY1352-NK	1 级 Class 1	3×220/380V	3×1.5（6）A	6400
DTSY1352-NK	1 级 Class 1	3×220/380V	3×10（60）A	400

3 主要功能 Main functions

功能名称 Function	功能说明 Description		功能配置 Configuration
	DDSY1352-NK	DTSY1352-NK	
电能计量	单相总有功电能计量（反向计入正向存储）		■

Energy measurement	Measure the total single-phase active energy (reverse energy input into the forward energy)		
参数测量 Parameter measurement	U、I 测量 U, I measurement		■
预付费 Tariff prepayment	通过 RS485 通信进行预付费充值，数据加密 Make the tariff prepayment by RS485 communication, data encryption		■
控制 Control	内置大容量磁保持继电器实现负载通断控制 Built-in large-capacity magnetic latching relay for on-off control of load		■
LCD 显示 LCD display	8 位段式 LCD 显示 In the form of 8-bit field		■
通信 Communication	RS485 接口；MODBUS-RTU 协议、DL/T645-2007 规约 RS485 port, MODBUS-RTU protocol, DL/T645-2007 protocol		■
复费率 Multi- tariff	4 费率、14 时段 4 tariffs, 14 periods	4 费率、14 时段 4 tariffs, 14 periods	□F

4 技术参数 Technical parameters

4.1 电气特性 Electrical properties

技术参数 Technical parameters			DDSY1352-NK	DTSY1352-NK
电压输入 Voltage input		额定电压 Rated voltage	220V	3×220/380V
		参比频率 Reference frequency	50Hz	
		功耗 Power consumption	<5VA（每相） <5VA (per phase)	
电流输入 Current input		输入电流 Input current	10(60)A（基本电流 Ib：10A；最大电流 Imax：60A） 10(60)A (basic current Ib: 10A; maximum current Imax: 60A)	
		起动电流 Starting current	直接接入 Direct connection 0.004Ib	
		功耗 Power consumption	<4VA (最大电流) <4VA (maximum current)	
测量性能 Measurement performance		测量精度 Measurement accuracy	1.0 级 Class 1.0	
时钟精度 Clock accuracy			误差≤0.5s/d Deviation ≤0.5s/d	
脉冲 Pulse		脉冲宽度 Pulse width	80ms±20ms	
		脉冲常数 Pulse constant	1600imp/kWh	400imp/kWh

通信 Communication	接口 Port	RS485(A+、B-)
	介质 Medium	屏蔽双绞线 Shielded twisted pair
	协议 Protocol	MODBUS-RTU、DL/T 645-07

4.2 机械特性 Mechanical properties

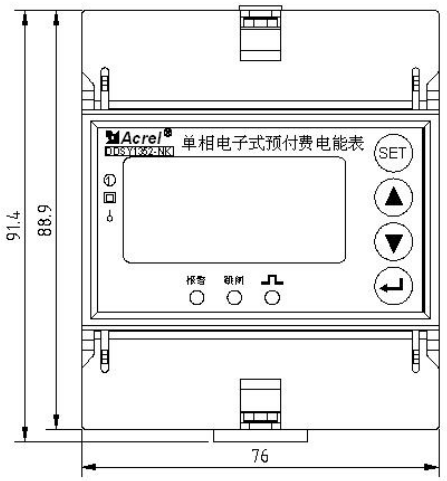
机械特性 Mechanical properties		DDSY1352-NK	DTSY1352-NK
外形尺寸 Overall dimensions	长×宽×高 LxWxH	76mm×89mm×74mm	144mm×85mm×74mm
最大接线能力 Max. wiring capacity	柔性电缆 Flexible cable	25mm^2	25mm^2

4. 3 环境条件 Environmental conditions

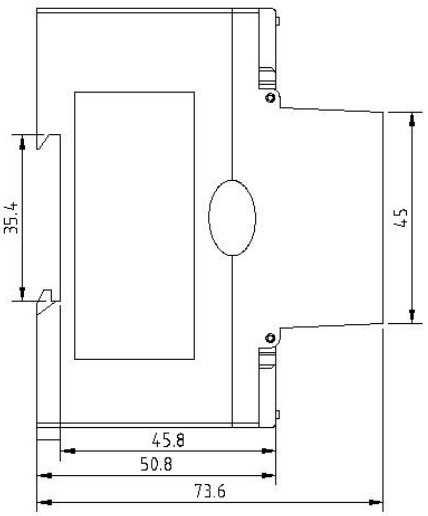
温度范围 Temperature range	工作温度 Working temperature	-20℃~60℃
	存储温度 Storage temperature	-25℃~70℃
湿度 Humidity		≤95%（无凝露）≤95% (without condensation)
海拔 Altitude		<2000m

5 外形及安装尺寸（单位：mm）Overall and installation dimensions (unit: mm)

DDSY1352-NK

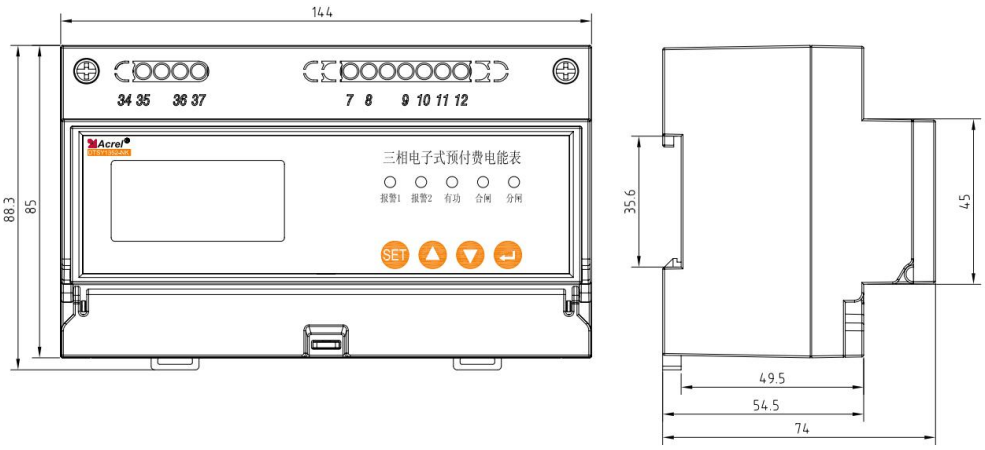


正视
Front View



左视
Left View

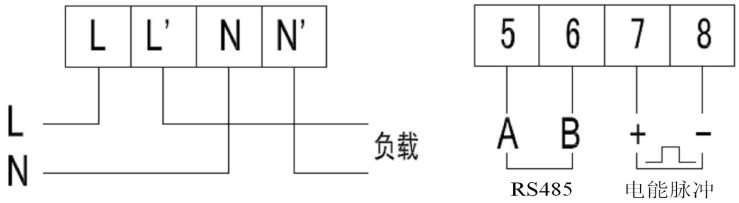
DTSY1352-NK



正视 左视

Front View Left View

6 接线与安装 Wiring and installation



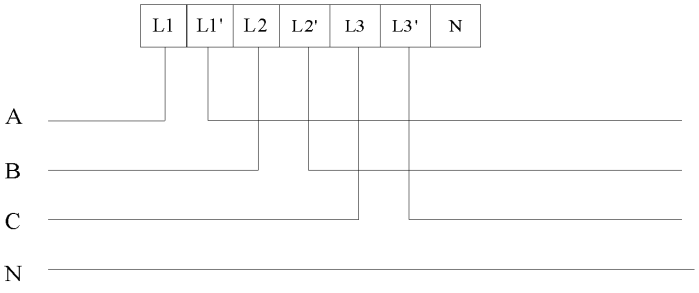
DDSY1352-NK 接线图

Wiring Diagram of DDSY1352-NK

Load Electric energy pulse

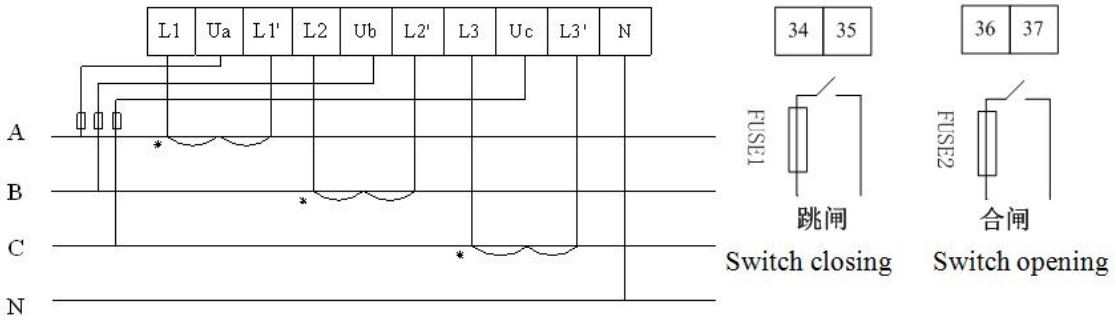
注：7、8 为时钟与有功脉冲复用端子，默认为有功脉冲输出。

Note: Terminals 7 and 8 are common terminals for clock and active pulse. The default is active pulse output.



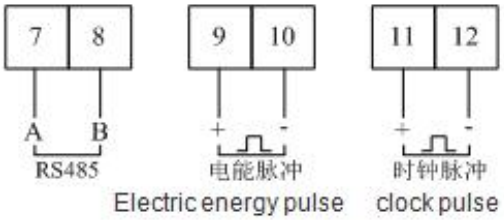
DTSY1352-NK 直接接入接线图

DTSY1352-NK Direct access wiring diagram



DTSY1352-NK 经互感器接入接线图

DTSY1352-NK Transformer access wiring diagram



注：以下 3 点为 DTSY1352-NK 经互感器接入时注意事项：

1：跳闸时需往 34 引入电压，35 接对应断路器控制端；

2：36、37 合闸端子可用于控制电操机构等特定装置合闸；

3：34、36 端子接的保险丝耐压值应大于当前系统的电压等级，额定电流为 3-5A；

Note: The following 3 points are matters needing attention when the DTSY1352-NK is connected with the transformer:

1: When tripping, voltage should be introduced to 34 and 35 should be connected to the corresponding circuit breaker control end;

2: 36, 37 closing terminal can be used to control the electric operation mechanism and other specific closing device;

3: Fuses connected to terminals 34 and 36 shall have a voltage withstand value greater than the current system voltage rating, rated current 3-5A.

7 费控管理说明 Instructions of tariff control management

内部控制回路通断，可配合安科瑞 ACRT 集中充值终端或其他电能管理系统实现预付费功能。控制方式包括两种：本地预付费、远程遥控。

They can control the loop on/off independently. To operate the prepayment function, they may be equipped with Acrel ACRT central prepayment terminal or integrated with other energy management systems. There are two control modes, i.e. local prepayment and remote control.

7.1 本地预付费 Local prepayment

7.1.1 用户购电 Energy purchase

从仪表方面，充值购电操作及其他的预付费参数设置都是通过 485 通信完成的，如仪表配合安科瑞 ACRT 集中充值终端则需要用户充值后到终端上刷卡,后由终端下发充值命令完成充值，如用其他电能管理系统则直接由其系统进行充值操作。

In respect of meter, the energy purchase and other prepayment parameter settings are done by RS485 communication. If the meter is equipped with Acrel ACRT central prepayment terminal, a user shall swipe the electricity card on the terminal. The prepayment is made successfully until the terminal sends a prepayment command. If it is integrated into another energy management system, make the prepayment directly in such system.

若用户所购电量与表内原剩余电量之和大于表内囤积电量值时，电能表则拒绝接受购电量。

When the sum of purchased energy and the available energy in the meter exceeds the energy storage capacity of meter, the purchased energy will be rejected.

7.1.2 有功电能计量 Measurement of active energy

用户用电时，电能表累加计量用户总用电量，并递减计量用户剩余电量。当用户剩余电量为 0kWh 时，电能表自动拉闸断电，并显示剩余电量 000000.00kWh，只有用户购电后才可恢复用电。

The meter will add up the energy consumed by user when decreasing the surplus energy available. It will switch off the power supply and indicate the surplus energy available of 000000.00kWh when the surplus energy available is 0kWh. The power supply will be recovered until the user purchases the energy.

7.1.3 报警及预跳闸 Alarm and pre-tripping

电表具有两级电量报警控制功能。

The meter provides two alarm levels.

报警电量 1 为要求用户购电的第一次提醒。当电能表中的剩余电量小于报警电量 1 时，电能表上的“报警”灯亮，以提醒用户剩余电量不足，需要购电。

The alarm energy 1 is the first reminder of energy purchase. The alarm light will turn on when the surplus energy available is less than the alarm energy 1. It reminds the user of insufficient energy and to purchase the energy.

报警电量 2 又称为预跳电量，为要求用户购电的最后一次提醒。当电能表中的剩余电量小于预跳电量时，“分闸”灯同时亮，电能表内部磁保持继电器跳闸。用户可拿未充值的卡重新刷卡（使用 ACRT 方案），恢复供电后“报警”指示灯点亮。或者在表上按回车键亦可解除预跳报警。

The alarm energy 2 is also called the pre-tripping energy. It is the second and final reminder of energy purchase. The tripping light will turn on and the magnetic latching relay will trip out when the surplus energy available is less than the pre-tripping energy. In such case, the user can swipe the electricity card (before making the prepayment) if ACRT is equipped. The alarm light will turn on when the power supply is recovered. Alternatively, press  to clear the pre-tripping alarm.

7.2 远程遥控 Remote control

7.2.1 遥控命令 Remote control command

遥控方式可通过通信或按键的方式开启，当遥控方式开启后，电能表将不再根据剩余电量做相应判断而是根据控制命令字进行通断控制。

The remote control mode may be activated by communication or keys. In the remote control mode, the meter will be controlled by remote control command other than the energy available in the meter.

7.2.2 功率越限跳闸 Over-power tripping

仪表可设置功率阈值，当实际功率大于设定值时，仪表自动跳闸并将控制类型转为远程遥控模式，如需解除越限跳闸需由后台下发恢复预付费或闭合命令。

The power threshold setting is permitted. When the actual power is above the setting, the meter will trip out automatically and switch over to the remote control mode. To clear the over-power tripping, the background must send a prepayment recovery command or closing command.

8 显示与操作 Operation and display

8.1 显示举例 Screen example

剩余电量 Surplus energy available

总用电量 Accumulated energy consumed

电压显示 Voltage indication

电流显示 Current indication

表号（高 6 位）Meter No. (higher 6 bits)

表号（低 6 位）Meter No. (lower 6 bits)

报警电量 1 Alarm energy 1

报警电量 2 Alarm energy 2

8.2 显示切换操作 Screen changing

上电后默认显示剩余金额。可通过三类查看键实现翻屏显示。各类显示界面顺序说明如下：

The balance will be displayed as default when the meter is connected to the power supply. Change screens by three access keys. All screens are listed as below:

▲：电压、电流、有功功率、日期、时间、通信地址、版本号、全显检测

: voltage, current, active power, date, time, communication address, version No., full inspection

▼：总用电量、尖用电量、峰用电量、平用电量、谷用电量、表号、报警金额 1、报警金额 2、当前电价、购电次数、功率阈值

: total energy consumed, energy consumption during the peak-peak period, energy consumption during the peak period, energy consumption during the normal period, energy consumption during the valley period, meter No., alarm amount 1, alarm amount 2, current tariff, energy purchase times, power threshold

8.3 按键编程 Programming by keys

在测量显示菜单中的任一显示项下，按 SET 显示“0000”，提示输入密码后再按 ↵，若密码输入错误，则返回初始界面；若密码输入正确，则可进行参数设置。设置完成后按 SET 进入“SAvE”界面，再按 ↵ 出现“YES”、“no”选项，“YES”下按 ↵ 则保存后退出，

“no”下按  则不保存直接退出。编程菜单列表如下

When  is pressed at any of items in the measurement and display menu, “0000” will be shown. Display a request for password. Input the password and press  . If the password is wrong, return to the startup screen. If the password is correct, proceed with the parameter setting. After completion of parameter setting, press  to enter “SAvE” screen. Re-press  to show options “YES” and “no”. Select “YES” and press  to save the setting and exit. Select “no” and press  to cancel the setting and exit. The programming menu is listed as below:

序号 No.	一级菜单 Primary menu		二级菜单 Secondary menu		
	符号 Symbol	含义 Meaning	符号 Symbol	含义 Meaning	范围 Scope
1	bUS	通讯设置 Communication configuration	Addr	通讯地址设置 Communication address configuration	1-247
			ID-H	表号高 6 位 Higher 6 bits of meter No.	
			ID-H	表号低 6 位 Lower 6 bits of meter No.	
			bAUd	波特率选择 Baud rate option	9600、4800、2400、1200
			PArit	校验位选择 Check bit option	None、 Even
2	SyS	系统设置	PL	线制选择 Wiring system option	3P4L:三相四线 3P4L: 3-phase, 4-line 3P3L:三相三线 3P3L: 3-phase, 3-line
			EF.E	复费率选择 Multi-tariff option	EF:复费率 EF: multi-tariff E:非复费率 E: single-tariff

			CodE	密码设置 Password setting	0-9999
			PULS-oUt	有功脉冲和时钟脉冲切换 Switchover between the active pulse and the clock pulse	CLK:电能脉冲 E:时钟脉冲 CLK: energy pulse E: clock pulse
			MAnuAL	远程遥控 Remote control	On：开启 oFF：关闭 On: open oFF: close
			PMAX	功率阈值设置 Power threshold setting	单位为 W Unit: W

9 通信说明 Communication instructions

9.1 通信协议 Communication protocol

本电能表采用 MODBUS-RTU 协议及 DL/T645 规约。具体协议格式请参照相关协议标准，此处不再赘述。当复费率功能 F 未选用时，对应的复费率数据项无意义。

The meter complies with MODBUS-RTU protocol and DL/T645 protocols. Please refer to related protocol standards for detailed format. The data items relating to the multi-tariff will be invalid if the option F is not made.

9.2 MODBUS 通信地址表 MODBUS communication address table

DDSY1352-NK 通信地址表

Communication address table of DDSY1352-NK

起始地址 Start address	数据名称 Description of data	长度 Length	读/写 R/W	备注 Remark
0000H	当前总有功电能 Current total active energy	4	R	无符号整型 Unsigned integer 单位 0.01kWh Unit: 0.01kWh
0002H	当前总有功峰电能 Current total active energy	4	R	

	during the peak period			
0004H	当前总有功平电能 Current total active energy during the normal period	4	R	
0006H	当前总有功谷电能 Current total active energy during the valley period	4	R	
0008H	保留 Reserved	4	R	
000AH	密码 Password	2	R/W	
000BH	电压 U Voltage U	2	R	无符号整型 ，单位 0.1V Unsigned integer, unit: 0.1V
000CH	电流 I Current I	2	R	无符号整型，单位 0.01A Unsigned integer, unit: 0.01A
000DH	有功功率 P Active power P	2	R	有符号整型，单位 0.001kW Signed integer, unit: 0.001kW
000EH	无功功率 Q Reactive power Q	2	R	有符号整型，单位 0.001kvar Signed integer, unit: 0.001kvar
000FH	视在功率 S Apparent power S	2	R	无符号整型，单位 0.001kVA Unsigned integer, unit: 0.001kVA
0010H	功率因数 PF Power factor PF	2	R	有符号整型，单位 0.001 Signed integer, unit: 0.001
0011H	频率 F Frequency F	2	R	无符号整型，单位 Hz Unsigned integer, unit: Hz
0012H	年月 Month-year	2	R/W	
0013H	日时 Day-hour	2	R/W	
0014H	分秒 Minute-second	2	R/W	
0015H	通信地址波特率 Baud rate of communication address	2	R/W	通信地址 communication address：1~247 波特率 baud rate： 1:9600 2:4800 3:2400 4:1200

0016H	时段表 Periods： 第 1 时段费率号 Tariff code during the period 1 第 1 时段起始时间：分 Start time of period 1: minute 第 1 时段起始时间：时 Start time of period 1: hour … 第 8 时段费率号 Tariff code during the period 8 第 8 时段起始时间：分 Start time of period 8: minute 第 8 时段起始时间：时 Start time of period 8: hour	24	R/W	费率号： Tariff code 1：尖 Peak-peak 2：峰 Peak 3：平 Normal 4：谷 Valley
003CH	当前正向有功总电能 Current total forward active energy	4	R	
003EH	当前反向有功总电能 Current total reverse active energy	4	R	

DTSY1352-NK 通信地址表

Communication address table of DTSY1352-NK

起始地址 Start address	数据名称 Description of data	长度 Length	读/写 R/W	备注 Remark
0000H	当前总有功电能 Current total active energy	4	R	整型 Integer 保留 2 位小数 Two decimals 单位 kWh Unit: kWh
0002H	当前总有功电能 Current total active energy	4	R	
0004H	当前总有功电能 Current total active energy	4	R	
0006H	当前总有功电能 Current total active energy	4	R	
0008H	当前总有功电能 Current total active energy	4	R	
000AH	日期时间 Date and time	6	R/W	秒分时日月年 s:m:h, D/M/Y
000DH 高字节	通信地址	1	R/W	1～247

	Communication address			
000DH 低字节	波特率 Baud rate	1	R/W	1：9600pbs 2：4800pbs 3：2400pbs 4：1200pbs
000EH	第一套时段表： Periods 1: 第 1 时段费率号 Tariff code during the period 1 第 1 时段起始时间：分 Start time of period 1: minute 第 1 时段起始时间：时 Start time of period 1: hour … 第 8 时段费率号 Tariff code during the period 8 第 8 时段起始时间：分 Start time of period 8: minute 第 8 时段起始时间：时 Start time of period 8: hour	3×8	R/W	费率号： Tariff code 1：尖 Peak-peak 2：峰 Peak 3：平 Normal 4：谷 Valley 0：无费率 None
0001AH	第二套时段表： Periods 2: 第 1 时段费率号 Tariff code during the period 1 第 1 时段起始时间：分 Start time of period 1: minute 第 1 时段起始时间：时 Start time of period 1: hour … 第 8 时段费率号 Tariff code during the period 8 第 8 时段起始时间：分 Start time of period 8: minute 第 8 时段起始时间：时 Start time of period 8: hour	3×9	R/W	费率号： Tariff code 1：尖 Peak-peak 2：峰 Peak 3：平 Normal 4：谷 Valley 0：无费率 None
0028H	时区表： Time zones: 第 1 时区时段表号 Periods code of time zone 1 第 1 时区起始日期：日 Start date of time zone 1: day 第 1 时区起始日期：月 Start date of time zone 1: month	3×4	R/W	时段表号： Periods code: 1：第一套时段表 Periods 1 2：第二套时段表 Periods 2

	… 第 4 时区时段表号 Periods code of time zone 4 第 4 时区起始日期：日 Start date of time zone 4: day 第 4 时区起始日期：月 Start date of time zone 4: month			
002EH	A 相电压 Voltage of phase A	2	R	整型 Integer 电压保留 1 位小数 Voltage: one decimal 电流保留 2 位小数 Current: two decimals
002FH	B 相电压 Voltage of phase B	2	R	
0030H	C 相电压 Voltage of phase C	2	R	
0031H	A 相电流 Current of phase A	2	R	
0032H	B 相电流 Current of phase B	2	R	
0033H	C 相电流 Current of phase C	2	R	

有关控制类的命令下发由于篇幅原因不在说明书中详述，如有需要请联系我司客服。

For conciseness, the Manual contains no information on how to send commands. If such information is required, please contact our customer service staff.

总部：安科瑞电气股份有限公司

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