

**ARD3T**

**智能电动机保护器**

**Smart Motor Protector ARD3T**

**使用说明书(中英文)V1.0**

**User's Manual v1.0**

安科瑞电气股份有限公司

ACREL Co., Ltd

## 申 明

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## 1 概述 Overview

ARD3T 智能型电动机保护器（以下简称 ARD3T），是上海安科瑞电气股份有限公司 ARD 系列低压电动机保护器的子系列产品。在国内同行业中，ARD3T 是首家采用模块式设计的产品，填补了国内低压电动机保护器在该领域的空白。ARD3T 隶属于国家科技部项目，本项目共取得专利 12 项，计算机著作权 2 项，产品标准备案等诸多荣誉，技术水平国内领先。

ARD3T Intelligent Motor Protector (hereinafter referred to as ARD3T) is sub-family product of ARD series low voltage motor protectors by Shanghai Acrel Co., Ltd. Among the same domestic industry, ARD3T is the first modular design product and supplies a gap in low voltage motor protector field in China. ARD3T belongs to the projects of Ministry of Science and Technology, this project is granted honours including 12 patents, 2 computer copyrights and product standard for record, and etc. ARD3T takes the lead in technology in China.

ARD3T 可划分为主体模块、测量模块、开关量模块、模拟量模块、温度模块、通讯模块、液晶模块共 7 个模块。产品体积小，结构紧凑，适用于额定电压至 AC 660V、额定电流至 AC 800A、额定频率为 50/60Hz 的电动机。在低压控制终端柜和 1/4 模数及以上各种抽屉柜中可直接安装使用，提高了控制回路的可靠性和自动化水平。

ARD3T consists of master module, measurement module, switching value module, analog value module, temperature module, communication module, and LCD module. This product has little volume, compact structure, and is suitable to the motors with the rated voltage up to AC 660V, the rated current up to AC 800A, and 50/60Hz rated frequency. The product can be directly installed for using in low voltage control terminal cabinets or all kinds of drawer cabinets of 1/4 modulus and above, and has improved reliability and automation of the control circuit loop.

产品执行标准：Product executive standard

GB/T14048.1 低压开关设备和控制设备 总则

GB/T14048.1 Low-voltage switchgear and controlgear-Part 1:General rules

GB14048.4 低压开关设备和控制设备 机电式接触器和电动机起动器

GB14048.4 Low-voltage switchgear and controlgear- Electromechanical contactors and motor-starters

JB/T10736—2007 低压电动机保护器

JB/T10736—2007 Low-voltage motor protectors

GB/T20540.1-6—2006 测量和控制数字数据通信工业控制系统用现场总线类型 3：PROFIBUS 规范

GB/T20540.1-6—2006 Digital data communication for measurement and control - Fieldbus for use in industrial systems Type 3: PROFIBUS specification

## 2 产品特点 Features

- 辅助电源支持 AC/DC 110/220V 或 AC 380V（需另配 380V 电源模块）。

Auxiliary power supply supports AC/DC 110/220V or AC 380V (380V power supply module is needed separately)

- 模块式设计，分为主体模块、测量模块、开关量模块、模拟量模块、温度模块、通讯模块、液晶模块等 7 个模块。

Modular design, it consists of master module, measurement module, switching value module, analog value module, temperature module, communication module, and LCD module.

- 模块体积小，支持导轨安装、螺丝固定安装。

Small volume, support guide rail and screw fixed installation

- 附加模块采用总线供电，不需要外接辅助电源。

Additional module adopt bus power supply, do not need external auxiliary power supply

- 带有上位机配置软件，方便客户配置参数，编程设置。

With upper computer configuration software, the product is convenient for customer to set parameter and program.

- DI/DO 可自由编程。

DI/DO programmable freely

- DI 支持干接点（弱电）或湿节点（强电）输入，湿接点可选交流或直流供电。

DI support dry contact(Electronic)or wet contact(Electric) input,and wet contact can choose AC or DC power supply.

■ 标配过载、堵转、阻塞、欠载、断相、不平衡、PTC 保护、外部故障等全面的电动机综合保护功能。

Standard configuration about overall comprehensive motor protection functions such as overload protection, stalling protection, blocking protection, underload protection, phase failure protection, phase unbalance protection, PTC protection, external failure protection, and etc.

■ 标配保护模块模式、直接起动、星三角起动、自耦降压起动、双向起动、单绕组双速起动、双绕组双速起动等多种起动方式，起动方式可现场设定。

Standard configuration about various starting mode such as protection module mode, direct starting, Y- $\Delta$  starting, autotransformer step-down starting, two-directional starting, single winding two-speed starting, duplex winding two-speed starting, and etc.The starting mode can be set at spot.

■ 标配故障记录、运行管理信息，方便查询故障原因，进行电机维护。

Standard configuration about fault record and operation management information, facilitate to find the cause of fault and maintain the motor.

■ 标配自起动功能，可通过附加抗晃电模块实现抗晃电、失压重起功能。

Standard configuration about self-starting function, it can implement anti-interference electricity and voltage off restarting function by using additional anti-interference electricity module.

■ 显示部分采用全中文液晶显示。

Chinese LCD display

■ 可通过添加模拟量模块实现 2 路 4~20mA 输入测量和 2 路 4~20mA 变送输出。4~20mA 变送输出对应参数可自由设定。

Implement 2-channel 4-20mA input test and 2-channel 4-20mA transmitting output by using analog value module.Users can freely set the corresponding parameters of 4-20mA transmitting output.

■ 可通过添加温度模块实现 3 路温度测量保护，可外接传感器类型有：PT100、PT1000、Cu50、PTC、NTC。

Implement 3 channels temperature measure protection by using temperature module, the optional type of external sensor is PT100、PT1000、Cu50、PTC, and NTC.

■ 可通过添加 Profibus 模块实现 Profibus-Dp 通讯。

Implement Profibus-Dp communication by using Profibus module.

### 3 产品组成、功能配置、选型说明 Components, function configuration, type selection description

#### 3.1 产品组成 Components

ARD3T 可以划分为以下模块：测量模块、温度模块、模拟量模块、通讯模块、开关量模块、显示模块、主体。主体和测量模块是必备模块，其它为附加模块。ARD3T 产品组成见图 1、图 2。

ARD3T consists of measurement module, temperature module, analog value module, communication module, switching value module, display module and master module.

Master and measurement module are necessary modules, and others are additional modules.

各模块功能如下： Function introductions of moduals are as follows:

主体负责协调各模块工作，带有 4DI、4DO、对外通讯组网、时钟、故障记录、PTC 测量等功能。可以实现直接起动、双向起动、双速起动、自耦降压起动、星三角起动等多种起动。主体是模块式电动机保护器必备模块。

The master takes charge of coordinating all modules, fitted with 4DI、4DO, outward communication network, clock, fault record and PTC measurement function. It can realize various starting modes including direct starting, two-directional starting, two-speed starting, autotransformer step-down starting, Y- $\Delta$  starting, and etc. Master is the necessary module for modular motor protector.

测量模块可以测量电流、电压、漏电流等电参数。电流范围为 0.4A 至 800A，电压为 AC220V、AC380V、AC660V，频率 45Hz~65Hz，漏电流 50mA~5A/3A~30A。测量用电流互感器采用保护级电流互感器，它具有过载能力强，通常可以达到 10 倍过载不饱和，测量模块也是模块式电动机保护器的必备模块。

Measurement module can measure electric parameters such as current,voltage and leakage current, and etc.The current range is from 0.4A to 800A, the voltage value is AC220V、AC380V、AC660V, the frequency is 45Hz-65Hz, the leakage

current is 50mA~5A/3A~30A. Current transformer used for measurement adopts protection level and has strong overload ability which up to 10-times overload unsaturated value. Measurement module is also the necessary module of module motor protector.

温度模块通过外接 PT100、PT1000、Cu50、PTC/NTC 等传感器实现温度测量。

Temperature module realizes temperature measurement by external sensor such as PT100、PT1000、Cu50、PTC/NTC. 模拟量模块可以实现模拟量输入测量和模拟量变送输出的功能。

Analog value module realizes analog value input measurement and transmitting output.

开关量模块对主体的开关量进行扩展，当主体的开关量点数无法满足使用者需求时，通过外加开关量模块实现产品开关量点数扩展。

Switching value module expands the switching value of master. If switching value points of the master cannot satisfy user's demand, use switching module to implement the expansion about product's switching value points.

通讯模块实现双 MODBUS、PROFIBUS 通讯功能。

Communication module implements both Modbus and Profibus communication function.

主体和测量模块是必备模块，可以称为基本模块，实现基本的测量、保护、控制功能，其它模块作为选配模块，由基本模块加选配模块实现复杂功能。

Master and measurement module are necessary modules, also called basic modules, implement basic measurement, protection and control function; other modules are optional modules. The product can realize complex functions by using basic and optional modules.

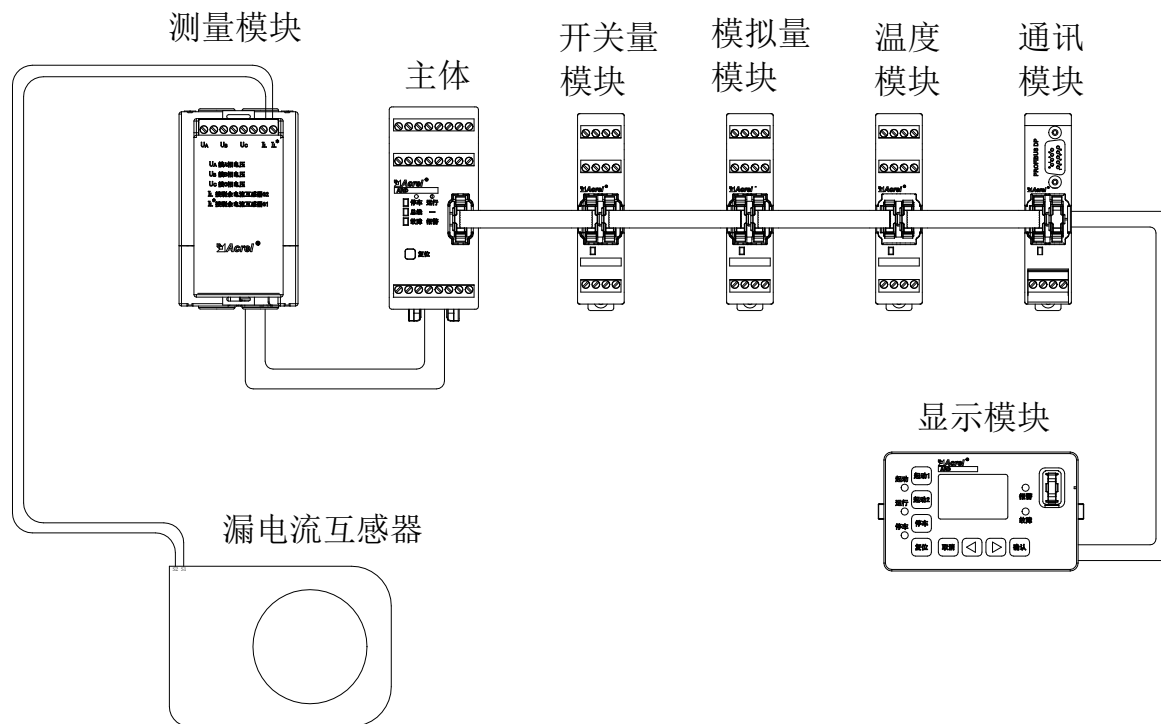


图 1 100A 及以下 ARD3T 产品组成 (测量模块中带有电流互感器)

Figure 1 ARD3T of 100A and below product components (measurement module is fitted with current transformer)

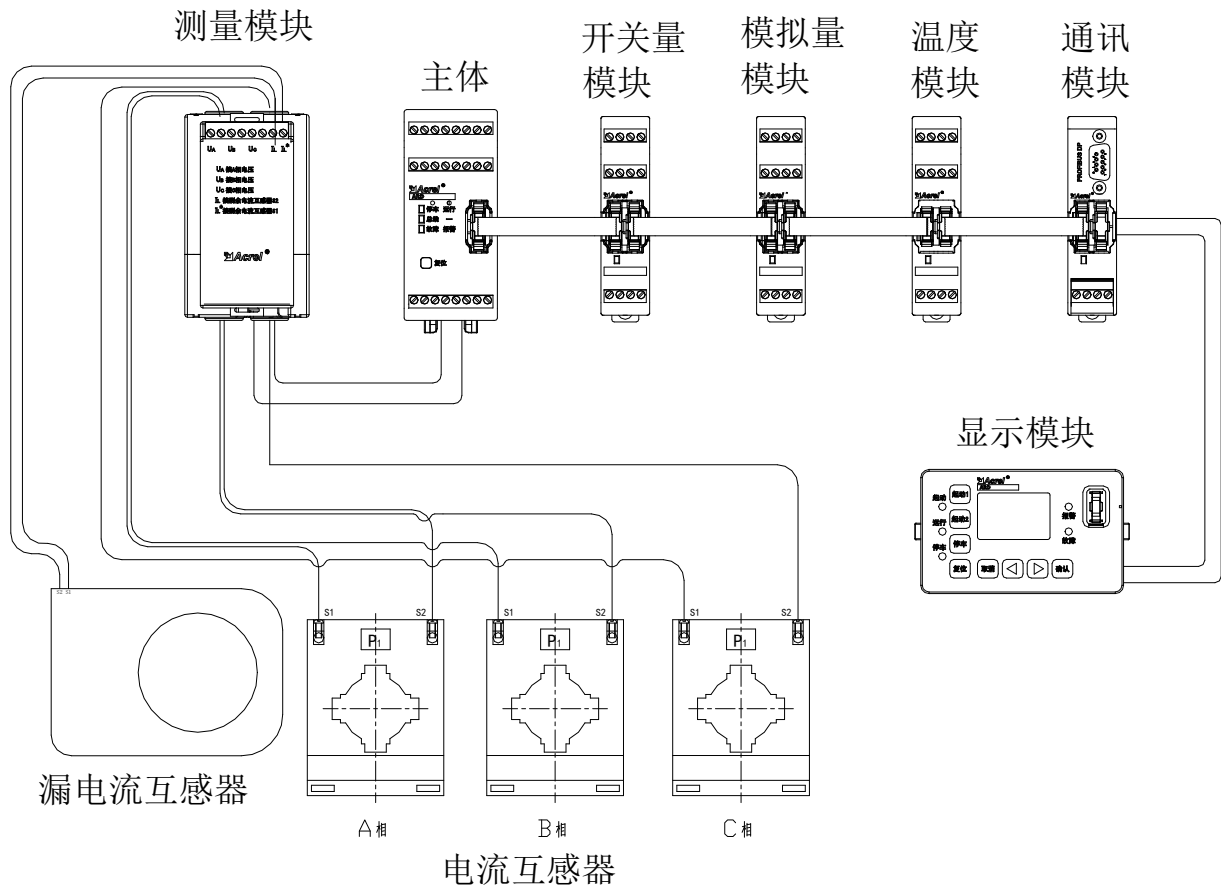


图2 250A、800A ARD3T 产品组成  
Figure 2 ARD3T of 250A, 800A product components

### 3.2 功能配置 Function configuration

ARD3T 功能配置如表 1 所示。Function configuration of ARD3T is as shown in Table 1

表 1 功能配置 Table1 Function configuration

型式 Type		功能配置 Function configuration	
		标配功能 Standard functions	增选功能 Selected functions
功能 Function Protection function	过载 Overload	√	
	断相/不平衡 Phase failure/unbalance	√	
	堵转 Rotor clogged	√	
	阻塞 Blocking	√	
	短路分断 Short circuit breaking	√	
	起动超时 Starting overtime	√	
	欠载 Underload	√	
	反馈超时 Feedback overtime	√	
	主体温度保护 Master temperature protection	√	
	主体温度传感器故障 Master temperature sensor fault	√	
	外部故障 External fault	√	
	模块结构故障 Modular structure fault	√	
	内部故障 Inner fault	√	

	剩余电流 Residual current	接 地 Grounding	√	
		漏 电 Leakage		√ (漏电) (Leakage)
	相序 Phase sequence			√ (电压功能) (Voltage function)
	欠压 Undervoltage			
	过压 Overvoltage			
	欠功率 Underpower			
	tE 时间 tE time			√ (增安保护) (Special safe protection)
	失压重起功能(抗晃电)Voltage off restarting function(anti-interference electricity)			√(失压重起功能 (抗晃电) ) Voltage off restarting function(anti-interference electricity)
	4 ~ 20mA 输入保护 4 ~ 20mA input protection			√ (模拟量模块带有 2 输入功能) (analog module is fitted with 2 input function)
	模块温度保护 Module temperature protection			√ (温度模块) (Temperature module)
模块温度传感器故障 Module temperature sensor fault				
控制功能 Control function	保护模式 Protection mode		√	
	直接起动 Direct starting			
	双向起动 Two-directional starting			
	单绕组双速起动 Single winding two-speed starting			
	双绕组双速 Duplex winding two-speed starting			
	星 / 三角起动 (二继电器) Y-△ starting(two relays)			
	自耦变压器起动 (二继电器) Autotransformer starting (two relays)			
	自起动 Self-starting			
通讯功能 Communication function	Modbus			√ (主体通讯功能) (Master communication function)
	双 Modbus Double Modbus			√ (通讯模块) (Communication module)
	Profibus			√ (通讯模块) (Communication module)
开关量输入、输出 Switching input and output	主体 4DI、4DO Master 4DI、4DO		√	
	开关量模块 4DI、3DO Switching value module			√ (开关量模块) Switching value module ()
模拟量输出 Analog value output	DC 4~20mA			√ (模拟量模块带有输出功能) Analog value module is fitted with output function



故障记录 Fault record	8 条记录, 记录电动机发生故障的原因、时间, 发生故障时电动机各参数 8 records, record the reason, time and various parameters of the motor when fault occur	√	
运行信息 Operation information	记录起动、停车、脱扣次数, 运行时间、停止时间等运行信息 Record operation information such as starting, stopping, numbers of tripping, operating time, stopping time, and etc	√	
逻辑功能 Logic function	定时器 Timer	√	
	计数器 Counter	√	
	真值表 Truth table	√	
测量参数 Testing parameter	三相电流 3-phase current	√	
	漏电流测量 Leakage current measurement		√(漏电功能)(Leakage function)
	三相线电压、功率、功率因数、电能 3-phase line voltage, power, power factor, electric energy		√(电压功能) (Voltage function)
	PTC/NTC	√(主体温度) Master temperature	
	4~20mA 输入 4-20mA input		√(模拟量模块带有 2 输入功能) Analog value module fitted with two input function
	模块测温 Temperature module		√(温度模块)(temperature module)
参数设定、查询 (液晶显示) Parameter setting and query (LCD display)	参数查询 Parameter query	参数测量 Parameter measurement	
		报警查询 Alarm query	
		故障查询 Fault query	
		开关量状态 Switching value status	
		运行信息 Operation information	
	参数设定 Parameters setting	保护设置 Protection setting	
		起动参数设置 Starting parameters setting	
		系统参数设置 System parameters setting	
			√(显示模块) Display module

### 3.3 选型说明 Type selection description

ARD3T 选型型号如图 3 所示, 型号含义见表 2~表 10, 订货时, 请阅读“功能配置”、“注意事项”及“订货范例”以明确产品功能。

ARD3T type selection is as shown in figure 3, model meaning is as shown in table 2-table 10. Please read “function

configuration”, “notice” and “order example” in order to know the product function before ordering.

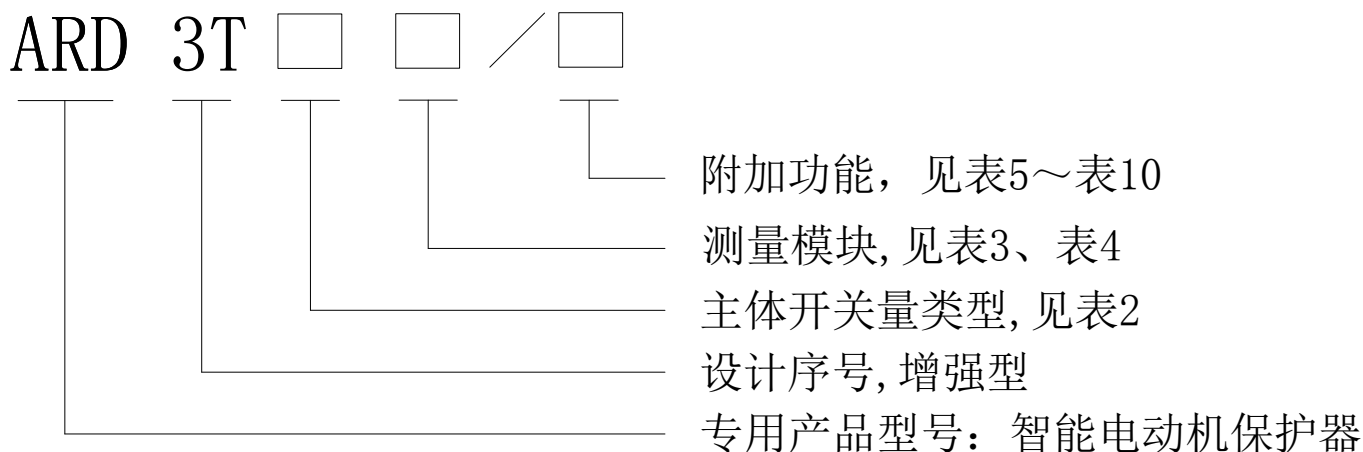


图3 选型说明

Figure 3 Type selection description

专用产品型号 Special product model	智能电动机保护器 intelligent motor protector
设计序号 Design serial number	增强型 enhancement type
主体开关量类型 Master switching value type	见表 2 shown in table 2
测量模块 Measurement module	见表 3, 表 4 shown in table 3 and table 4
附加功能 Additional function	见表 5-表 10 shown in table 5-table 10

主体开关量为 4DI、4DO，主体开关量类型如表 2 所示：

Master switching value is 4DI、4DO, the type of switching value is as shown in table 2:

表 2 主体开关量类型

Table 2 Type of master switching value

主体开关量分类 Classification of master switching value	代号 Code
DI 为干结点, 控制 DO 工作电源为 AC220V DI is dry contact, DO controlled operating power supply is AC 220V	K1
DI 为湿结点, DC110V 输入, 控制 DO 工作电源为 AC220V DI is wet contact, DC 110V input, DO controlled operating power supply is AC 220V	K2
DI 为湿结点, DC220V 输入, 控制 DO 工作电源为 AC220V DI is wet contact, DC 220V input, DO controlled operating power supply is AC 220V	K3
DI 为湿结点, AC220V 输入, 控制 DO 工作电源为 AC220V DI is wet contact, AC 220V input, DO controlled operating power supply is AC 220V	K4

测量模块：测量模块包括电流测量模块和电流/电压测量模块两种。

Measurement module: it includes current measurement module and current/voltage measurement module.

电流测量模块、电流/电压测量模块分类见表 3，电机电流与 ARD3T 电流测量模块对应关系见表 4。

Classification of current measurement module and current/voltage measurement module are as shown in table 3, corresponding relationship between motor current and ARD3T current measurement module is as shown in table 4.

表 3 测量模块分类

Table 3 Measurement module classification

电机电压 (V) Motor voltage	保护器额定电流 Rated current of protector	电流整定范围 (A) Current setting range	电流测量模块型号 Type of current measurement module
无电压测量功能 Without voltage measurement function	1.6	0.40-2.00	A1.6
	6.3	1.6-6.3	A6.3
	25	6.3-25	A25
	100	25-100	A100
	250	63-250	A250
	800	250-800	A800
AC 380V/660V	1.6	0.40-2.00	UA1.6
	6.3	1.6-6.3	UA6.3
	25	6.3-25	UA25
	100	25-100	UA100
	250	63-250	UA250
	800	250-800	UA800

注：660V 电压功能需要特殊标注，默认为 380V。

Notes: 660V voltage function need special mark, otherwise default value is 380V.

表 4 电机电流与测量模块对应关系

Table 4 Corresponding relationship between motor current and measurement module

电动机额定 功率 (kW) Rated power of motor	电动机额定 电流 (A) Rated current of motor	ARD3T 电流 测量模块 ARD3T current measurement module	整定电流范围 (A) Current setting range	电动机额定 功率 (kW) Rated power of motor	电动机额定 电流 (A) Rated current of motor	ARD3T 电 流测量模块 ARD3T current measurement module	整定电流范围 (A) Current setting range
0.12	0.42	A1.6	0.40-2.0	30	57	A 100	25-100
0.37	1	A 1.6	0.40-2.0	37	69	A 100	25-100
0.55	1.5	A 1.6	0.40-2.0	45	81	A 100	25-100
0.75	2	A 6.3	1.6-6.3	55	100	A 100	25-100
1.1	2.5	A 6.3	1.6-6.3	75	135	A 250	63-250
2.2	5	A 6.3	1.6-6.3	90	165	A 250	63-250
3	6.5	A 25	6.3-25	110	200	A 250	63-250
5.5	11	A 25	6.3-25	132	240	A 250	63-250
7.5	14.8	A 25	6.3-25	160	285	A 800	250-800
11	21	A 25	6.3-25	200	352	A 800	250-800
15	28.5	A 100	25-100	220	388	A 800	250-800
18.5	35	A 100	25-100	250	437	A 800	250-800

22	42	A 100	25-100	/	/	/	/
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如需带有电压功能时，将表 4 中“ARD3T 电流测量模块”对应型号更改为“UAXX”，例如：需要电机为 5.5kW，带电压测量功能，根据表 4 查询对应测量模块为“A 25”，直接替换为“UA25”。

从此向下为附加功能，如需下面附加功能，选取对应功能填入型号附加功能处。

If users need voltage function, change the corresponding model about“ARD3T current measurement module” to “UAXX” in table 4.

For example: 5.5KW motor with voltage measurement function. The measurement module is “UA 25” instead of “A 25” according to table 4.

开关量模块：开关量模块分类如表 5 所示：

Switching value module: Classification of switching value is as shown in table 5:

表 5 开关量模块

Table 5 Switching value module

开关量模块分类 Classification of switching value	代号 Code
DI 为干结点，控制 DO 工作电源为 AC220V DI is dry contact, DO controlled operating power supply is AC 220V	K 4 3 (4DI、3DO)
DI 为湿结点，DC110V 输入，控制 DO 工作电源为 AC220V DI is wet contact, DC 110V input, DO controlled operating power supply is AC 220V	K 4 3-DC110
DI 为湿结点，DC220V 输入，控制 DO 工作电源为 AC220V DI is wet contact, DC 220V input, DO controlled operating power supply is AC 220V	K 4 3-DC220
DI 为湿结点，AC220V 输入，控制 DO 工作电源为 AC220V DI is wet contact, AC 220V input, DO controlled operating power supply is AC 220V	K 4 3-AC220

温度模块见表 6:

Temperature module is as shown in table 6:

表 6 温度模块

Table 6 Temperature module

温度模块 Temperature module	代号 Code
连接多种的温度传感器 (PT100、PT1000、Cu50、PTC、NTC) Connect with various temperature sensors (PT100、PT1000、Cu50、PTC、NTC)	T

模拟量模块见表 7:

Analog value module is as shown in table 7:

表 7 模拟量模块

Table 7 Analog value module

模拟量模块 Analog value module	代号 Code
2 路 4~20mA 输出 2-channel 4-20mA output	M2

2 路 4~20mA 输入+ 2 路 4~20mA 输出 2-channel 4-20mA input and 2 channel 4-20mA output	2M2
2 路 4~20mA 输入 2-channel 4-20mA input	2M

显示模块见表 8:

Display module is as shown in table 8:

表 8 显示模块

Table 8 Display module

显示模块 Display module	代号 Code
分体液晶显示, 模块尺寸为 98×60, 开孔 92×55 (单位 mm) Separated LCD display,module size is 98*60, cut out 92*55 (unit mm)	60L

通讯模块见表 9:

Communication module is as shown in table 9:

表 9 通讯模块

Table 9 Communication module

通讯模块 Communication module	代号 Code
PROFIBUS-DP	CP
MODBUS-RTU	C
双 MODBUS-RTU Double MODBUS-RTU	2C

漏电流功能及漏电互感器类型见表 10:

Leakage current fuction and types of leakage transformer are as shown in table 10:

表 10 漏电功能

Table 10 Leakage current function

漏电流类型 Type of leakage current	选配漏电互感器种类 Type of selected leakage transformer	代号 Code
50mA~1A	AKH-0.66/L-35 1A/2mA	L1
	AKH-0.66/L-70 1A/2mA	L2
	AKH-0.66/L-105 1A/2mA	L3
3A~30A	AKH-0.66/L-70 30A/10mA	L4
	AKH-0.66/L-105 30A/10mA	L5

抗晃电功能: SU (包括电压功能)。

Anti- interference electricity function: SU (including voltage function)

注意事项:

Notes:

1、主体、测量模块是必备模块。

The master and measurement module are necessary modules.

2、如不标明主体开关量类型，默认为“K1”DI 为干接点，控制 DO 工作电源为 AC220V。

If users have no special statement about type of master switching value, "K1" DI default as dry contact and DO controlled operating power supply is AC 220V.

3、开关量、温度、模拟量、显示、通讯模块是选配模块，每类模块只能选 1 种。

Switching value, temperature, analog value, display and communication module are optional modules. Users can choose only one kind of each module.

4、标配的模块间连接线长度为 25mm；标配显示模块连接线长度为 1m；标配测量模块连接线长度为 1m。

The connecting line's length between each standard configuration module is 25mm; the connecting line's length of standard configuration display module is 1m; and the connecting line's length of standard configuration measurement module is 1m.

5、显示模块长度可供选择的长度包括：1m、2m、3m，当标配长度 1m 不满足使用要求时，可选用 2m、3m。

The connecting line's length of display module includes 1m, 2m and 3m. Users can choose 2m, 3m if the standard configuration length (1m) cannot meet the using demand.

6、ARD3T 通过连接线连接好后，从第一个模块到最后模块总长度不超过 5m，否则不能保证产品正常工作。

ARD3T connect each module by connection conductor and the total length from the first module to the last is less than 5m, otherwise the product may not work normally.

7、增加电压功能后，可以测量线电压、有功功率、功率因数、视在功率、有功电能。可以实现过压、欠压、相序、欠功率保护。

After adding voltage function, the product can measure line voltage, active power, power factor, apparent power and active electric energy, as well as implement overvoltage, undervoltage, phase sequence and under power protection.

增加模拟量模块后，可以实现 4~20mA 输入测量、4~20mA 变送输出。可以实现 4~20mA 输入保护。变送输出类型包括：A、B、C 相电流；AB、BC、CA 线电压；频率；有功功率；主体 PTC；温度模块三路温度输入；模拟量模块 2 路模拟量输入。

Afer adding analog value module, the product implement 4-20mA input testing ,4-20mA transmitting output, 4-20mA input protection. Types of transmitting output are A, B, C phase current, AB、BC、CA line voltage, frequency, active power, master PTC, 3-channel temperature input of temperature module, 2-channel analog value input of analog value module.

8、增加温度模块后，可以实现 3 路温度测量，可供选择的传感器类型：PT100、PT1000、Cu50、PTC、NTC。

3 路传感器可以是同一类，也可以是不同类型。当传感器类型为：PT100、PT1000、Cu50 时，显示值、保护值单位为℃；当传感器类型为：PTC、NTC 时，显示值、保护值单位为Ω。

After adding temperature module, the product implement 3-channel temperature measurement, the optional sensor's type is PT100、PT1000、Cu50、PTC、NTC. 3-channel sensors belong to the same or different types. If sensor's type is PT100、PT1000、Cu50, unit of display and protection value is ℃; If sensor's type is PTC or NTC, unit of display and protection value is Ω.

9、双 MODBUS 是通过主体带有 1 路 MODBUS，通讯模块带 1 路 MODBUS 来实现。

The product implement double Modbus through master fitted with one channel Modbus and communication module fitted with one channel Modbus.

10、选配漏电功能时，要标注好漏电类型及对应的互感器类型，L35、L70、L105 是指互感器穿孔分别为 35mm、70mm、105mm。

Users shall clearly specify the leadage type and corresponding mutual inductor type when selecting leakage function. L35、L70、L105 refer to the cut out of transformer, and the dimension of cut out is respectively 35mm、70mm、105mm.

11、选配抗晃电功能时，电压功能为标配，不必再选电压功能。

When selecting anti-interference electricity function, users do not need to choose voltage function because this function is standard configuration.

12、上位机配置软件属于标配，可通过光盘、电子邮件发送或公司网站下载。

Upper computer configuration software is standard configuration, users can get it by CD, email sending or company website downloading.

13、 电子档说明书、典型应用原理图可到公司网站下载，网址为：[www.acrel.cn](http://www.acrel.cn)。

Users can obtain E-edition of instruction and typical application schematic diagram from company website [www.acrel.cn](http://www.acrel.cn).

订货范例：Order example:

如需 ARD3T 提供如下功能：If users need ARD3T with the following functions:

保护功能：过载、断相、堵转等；起动方式：保护模式、直接起动、星三角；显示为液晶显示。电机大小：5.5kW。  
Protection function: overload, phase failure, stalling; starting mode: protection mode, direct starting, Y- $\Delta$  starting; LCD display; 5.5kW

对应型号为：“ARD3T- K1 A25-60L”。

The corresponding type is “ARD3T- K1 A25-60L”

保护功能：过载、断相、堵转，欠压、过压保护等；起动方式：保护模式、直接起动、星三角；显示为液晶显示。电机大小：5.5kW，电压为 AC380V。

Protection function: overload, phase failure, stalling, undervoltage, overvoltage; starting mode: protection mode, direct starting, Y- $\Delta$  starting; LCD display; 5.5kW, AC 380V

对应型号为：“ARD3T- K1 UA25-60L 电压为 380V”

The corresponding type is “ARD3T- K1 UA25-60L, voltage is 380V

保护功能：过载、断相、堵转，欠压、过压保护等；起动方式：保护模式、直接起动、星三角；显示为液晶显示。电机大小：5.5kW，电压为 AC660V；通讯功能为 PROFIBUS；带有 4-20mA 变送输出；带有 PT100 测温，用于测量电机绕组、轴承温度，并可做温度过热保护。

Protection function: overload, phase failure, rotot locked, undervoltage, overvoltage; starting mode: protection mode, direct starting, Y- $\Delta$  starting; LCD display; 5.5kW, AC 660V; Profibus communication function; 4-20m transmitting output; with PT100 measuring temperature used for motor winding and bearing temperature measurement ,as well as overheating protection.

对应型号为：“ARD3T- K1 UA25- T M2 CP 60L 电压为 660V”

The corresponding type is “ARD3T- K1 UA25- T M2 CP 60L voltage id 660V”

保护功能：过载、断相、堵转，欠压、过压保护等；起动方式：保护模式、直接起动、星三角；显示为液晶显示。电机大小：5.5kW，电压为 AC660；通讯功能为 PROFIBUS；带有 4-20mA 变送输出；带有 PT100 测温，用于测量电机绕组、轴承温度，并可做温度过热保护；带有漏电保护，测量范围 50mA~1A，需要漏电互感器 AKH-0.66/L-35 1A/2mA。

Protection function: overload, phase failure, stalling, undervoltage, overvoltage; starting mode: protection mode, direct starting, Y- $\Delta$  starting; LCD display; 5.5kW, AC 660V; Profibus communication function; 4-20m transmitting output; PT100 used for motor winding and bear temperature measurement ,as well as overheating protection;leakage protection, measurement range from 50mA to 1A; leakage transformer: AKH-0.66/L-35 1A/2mA

对应型号为：“ARD3T- K1 UA25- T 2M CP L1 60L 电压为 660V”

The corresponding type is “ARD3T- K1 UA25- T 2M CP L1 60L voltage 660V”

#### 4 技术指标 Technical specifications

技术指标如表 11 所示。

Technical specifications are shown in table 11.

表 11 技术指标

Table 11 Technical specifications

技术参数 Technical parameter	技术指标 Technical specifications
ARD3T 辅助电源 ARDT3T auxiliary power supply	AC/DC 110 / 220V 或 AC 380V, 功耗 $\leq$ 15VA
电机额定工作电压 Rated volatage of motor	AC 380V / 660V, 50Hz / 60Hz

电动机额定工作电流 Rated current of motor	1.6 (0.40A-2.00A)	使用测量模块测量 Adopt measurement module
	6.3 (1.6A-6.3A)	
	25 (6.3A-25A)	
	100 (25A-100A)	
	250 (63A-250A)	采用外置电流互感器 + 测量模块 Adopt outlay current transformer and measurement module
	800 (250A-800A)	
漏电 Leakage	50mA-1A	采用测量模块 + 漏电流互感器 Adopt measurement module and leakage current transformer
	3A-30A	
继电器输出触点容量 Relay output contact capacity	阻性负载 Resistive load	AC250V、6A; DC24V、6A
	感性负载 Inductive load	AC250V、2A; DC24V、2A
主体开关量输入、输出 Master switching input and output	4DI、4DO, DI 可以为干节点或湿节点, 具体见选型说明 4DI、4DO, DI is dry contact or wet contact, details are as shown in type selection description	
开关量模块 Switching value module	4DI、3DO, DI 可以为干节点或湿节点, 具体见选型说明 4DI、3DO, DI is dry contact or wet contact, details are as shown in type selection description	
温度模块 Temperature module	外接传感器类型: PT100、PT1000、Cu50、PTC、NTC Type of external sensor: PT100、PT1000、Cu50、PTC、NTC 传感器路数: 3 路 Channel of the sensor: 3 channels 传感器对应测量范围: Sensor's corresponding measurement range : PT100/PT1000: -50°C~+500°C Cu50: -50°C~+150°C PTC/NTC: 100Ω~30kΩ	
模拟量模块 Analog module	可实现: 2 路 4~20mA 输入测量, 2 路 4~20mA 变送输出 Implement 2-channel 4-20mA input test and 2-channel 4-20mA transmitting output 4~20mA 输入测量精度±0.5% Accuracy of 4-20m input measurement accuracy is ±0.5% 4~20mA 输出最大带载能力为≤500Ω Maximum loading capacity of 4-20mA output is less than 500Ω	
主体通讯 Master communication	RS485: Modbus-RTU	
通讯模块 Communication module	RS485: 双 Modbus-RTU、Profibus, 具体见选型说明 RS485: double Modbus-RTU、Profibus, details are as shown in type selection description	
环境 Environment	工作温度 Operating temperature range	-10°C~55°C
	贮存温度 Storage temperature range	-25°C~65°C



	相对湿度 Relative humidity range	≤95% 不结露, 无腐蚀性气体 Non-condensing, no corrosive gas
	海拔 Altitude	≤2000m
污染等级 Pollution degree	3 级 3 class	
防护等级 IP class	主体 IP20, 分体显示模块 IP45 (安装在柜体上) Master IP20, Separated display module IP 45 (installed in device)	
安装类别 Installation category	III 级 III class	

## 5 安装及示意图 Installation and diagram

### 5.1 端子编号 Terminals number

ARD3T 端子编号见表 12。

ARD3T terminal number is as shown in table 12.

表 12 端子编号

Table 12 terminal number

端子 Terminal	功能定义 Function definition	所属模块 module	备注 Remarks	
L	电源输入 L (直流时为+) Power supply is L(DC is +)	主体模块 Master module	辅助电源 AC/DC 110/220V 或 AC 380V 时, 将 AC380V 电源模块出线接入此两端子 When auxiliary power supply is AC/DC 110/220V or AC 380V, insert AC380V power supply module outlet terminals	
N	电源输入 N (直流时为-) Power supply is M(DC is -)			
R1、 R2	PTC/NTC 输入 PTC/NTC input		热电阻输入 Thermal resistance input	
A1、 B1	RS485 通讯接口 RS485 communication interface		通讯接口 communication interface	
DO1	继电器输出 1 Relay output 1		继电器输出 (DO) 可编程 Relay output(DO) programmable	
DO2	继电器输出 2 Relay output 2			
COM2	继电器输出 1、2 公共端 Common terminal about relay 1 and 2			
DO3	继电器输出 3 Relay output 3			
DO4	继电器输出 4 Relay output 3			
COM3	继电器输出 3、4 公共端 Common thermal about relay 3 and 4			
DI1	开关量输入 1 Switching input 1			开关量输入 (DI) 可编程 Switching input (DI) is programmable
DI2	开关量输入 2 Switching input 2			

DI3	开关量输入 3 Switching input 3		点) 时, COM1 接 N 线、电源负极 When switching input is DC+24V(dry contact), COM1 is DC+24V output; When switching input are AC220V/DC220V/DC110V (wet contact), COM1 connects N line,negative electrode.
DI4	开关量输入 4 Switching input 4		
COM1	开关量输入 1~4 公共端 Common thermal about switching input 1 and 4		
IL、IL*	漏电流输入 Leakage current input	测量模块 Measurement module	IL 接漏电流互感器 S2、IL*接漏电流互感器 S1 IL connects leakage current transformer, IL* connects leakage current transformer S1
Ua	Ua 相电压输入 Ua phase voltage input		三相电压输入 Three-phase voltage input
Ub	Ub 相电压输入 Ub phase voltage input		
Uc	Uc 相电压输入 Uc phase voltage input		
AI1+、AI1-	第一路 4~20mA 输入测量 Channel 1 4-20mA input mesurement	模拟量模块 Analog value module	AI1+接输入正、AI1-接输入负 AI1+ connects positive and AI1- connects negative.
AI2+、AI2-	第二路 4~20mA 输入测量 Channel 2 4-20mA input mesurement		AI2+接输入正、AI2-接输入负 AI2+ connects positive and AI2- negative
AO1+、AO1-	第一路 4~20mA 输出 Channel 1 4-20mA output		第一路模拟量输出 Channel 1 analog value output
AO2+、AO2-	第二路 4~20mA 输出 Channel 1 4-20mA output		第二路模拟量输出 Channel 2 analog value output
PE	接地端 Grounding terminal		接地 grounding
1T1	补偿端 Compensation therminal		温度模块 Temperature module
1T2	电阻输入 1 Resistance input 1		
1T3	电阻输入 2 Resistance input 2		
2T1	补偿端 补偿端 Compensation therminal	第二路温度 Channel 2 temperature	
2T2	电阻输入 1 Resistance input 1		
2T3	电阻输入 2 Resistance input 1		
3T1	补偿端 Compensation therminal	第三路温度 Channel 3 temperature	
3T2	电阻输入 1 Resistance input 1		
3T3	电阻输入 2 Resistance input 1		

DO5	继电器输出 5 Relay output 5	开关量模块 Switching value module	继电器输出 (DO) 可编程 Relay output (DO) programmable
DO6	继电器输出 6 Relay output 6		
DO7	继电器输出 7 Relay output 7		
COM5	继电器输出 5、6、7 公共端 Common terminal about relay output 5,6 and 7		开关量为 DC+24V(干节点)时, COM4 为 DC+24V 输出; 开关量为 AC220V/DC220V/DC110V (湿节 点) 时, COM4 接 N 线、电源负极 When switching input is DC+24V(dry contact), COM4 is DC+24V output; When switching input are AC220V/DC220V/DC110V (wet contact), COM4 connects N line,negative electrode
DI5	开关量输入 5 Switching input5		
DI6	开关量输入 6 Switching input 6		
DI7	开关量输入 7 Switching input 7		
DI8	开关量输入 8 Switching input 8		
COM4	开关量输入公共端 Common terminal about switching input		
A2、B2	RS485 通讯接口 RS485 communication interface	通讯模块 Communication module	通讯接口 Communication interface
DB9 接口 DB9 interface	PROFIBUS 通讯 PROFIBUS communication		PROFIBUS 通讯 PROFIBUS communication
PE	接地端 Grounding terminal		接地 Grounding

## 5.2 外形及安装尺寸 Appearance and installation dimensions

主体模块，外形尺寸如图 4 所示： Overall dimensions about master are as shown in figure 4:

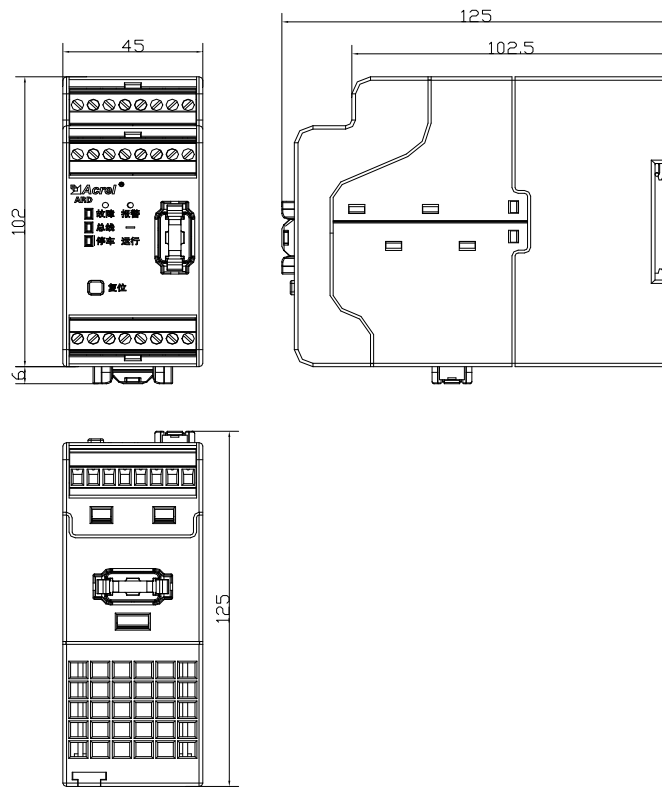


图4 主体模块外形尺寸

Figure 4 Overall dimensions about master

电流测量模块尺寸如图5所示，电流+电压测量模块尺寸如图6所示。

Dimensions about current measurement module are as shown in figure 5. Dimension about current and voltage measurement modules are as shown in figure 6.

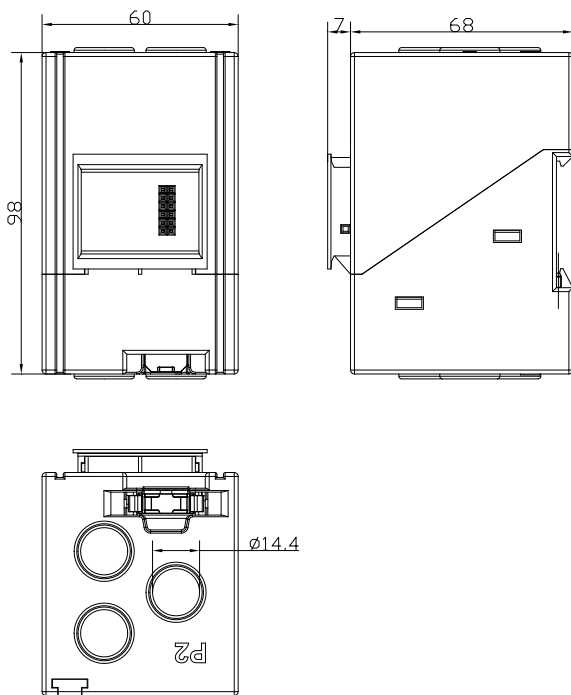


图5 电流测量模块尺寸

Figure 5 Dimensions about current measurement module

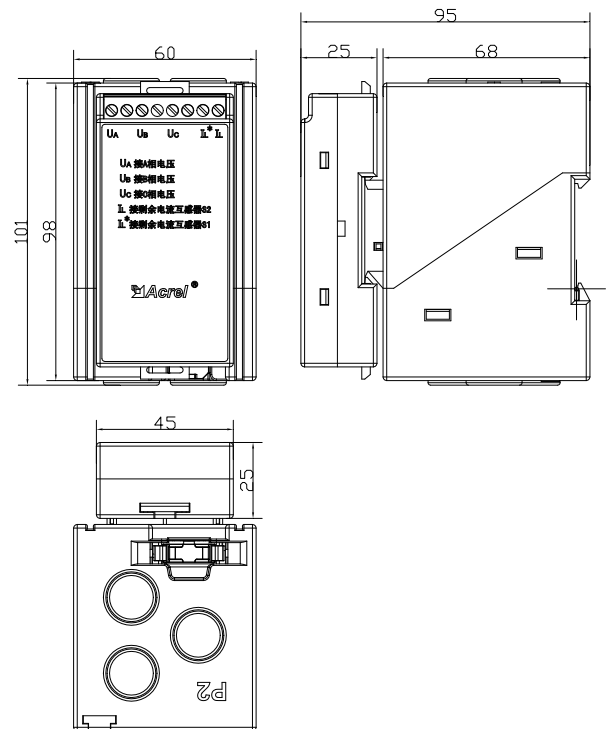


图6 电流+电压测量模块外形尺寸

Figure 6 Overall dimensions about current and voltage measurement modules

250A、800A 外置电流互感器外形尺寸如图7、表13所示所示：

Dimensions about 250A, 800A external current transformer are as shown in figure 7 and table 13:

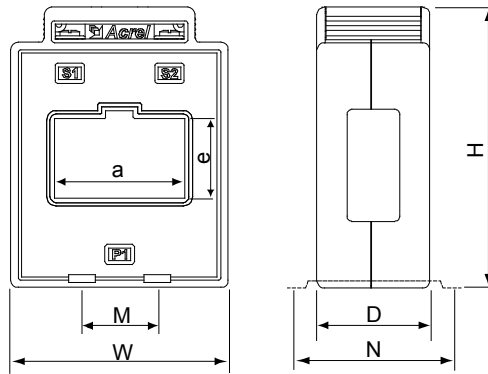


图 7 250A 外置电流互感器外形

Figure 7 Appearance about external current transformer of 250A

表 13 250A、800A 外置电流互感器安装尺寸

Table 13 Installation dimensions about external current transformer of 250A、800A

规格型式 Type	外形尺寸 Overall dimension			穿孔尺寸 Dimension of cut out		安装尺寸 Installation dimension	
	W	H	D	a	c	M	N
250A	78	103	45	43	31.5	48	57.5
800A	102	125	45	61	33	42	57.5

漏电流互感器外形尺寸如图 8、表 14 所示:

Overall dimensions about leakage current transformer are as shown in figure 8 and table 14:

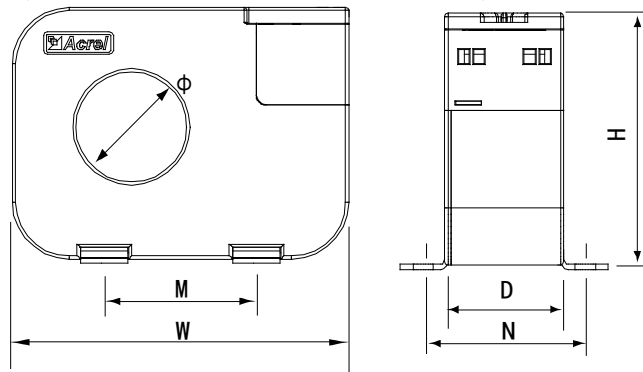


图 8 漏电流互感器外形

Figure 8 Appearance about leakage current transformer

表 14 漏电流互感器安装尺寸

Table 14

Installation dimensions about leakage current transformer

规格型式 Type	外形尺寸 Overall dimension			穿孔尺寸 Dimension of cut out	安装尺寸 Installation dimension	
	W	H	D	Φ	M	N
L-35	106	80	32.5	35	48	51
L-70	136	110	32.5	70	66	51
L-105	176	150	32.5	105	92	51

温度、模拟量、开关量外形尺寸如图 9 所示: 通讯模块外形尺寸如图 10 所示:

Overall dimensions about temperature, analog and switching value modules are shown in figure 9;

Overall dimensions about communication module are as shown in figure 10:

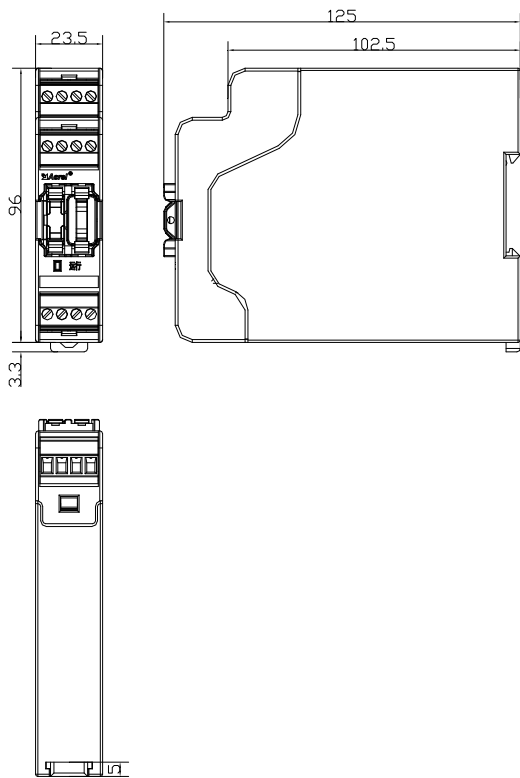


图9 温度、模拟量、开关量外形尺寸

Figure 9 Overall dimensions about temperature, analog and switching value modules

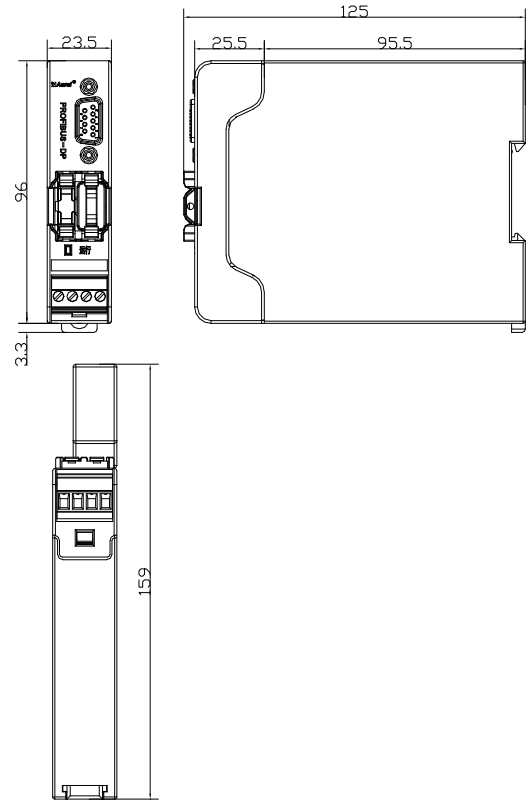


图10 通讯模块外形尺寸

Figure 10 Overall dimensions about communication module

60L 液晶模块外形尺寸如图 11:

Overall dimensions about 60L LCD display module are as shown in figure11:

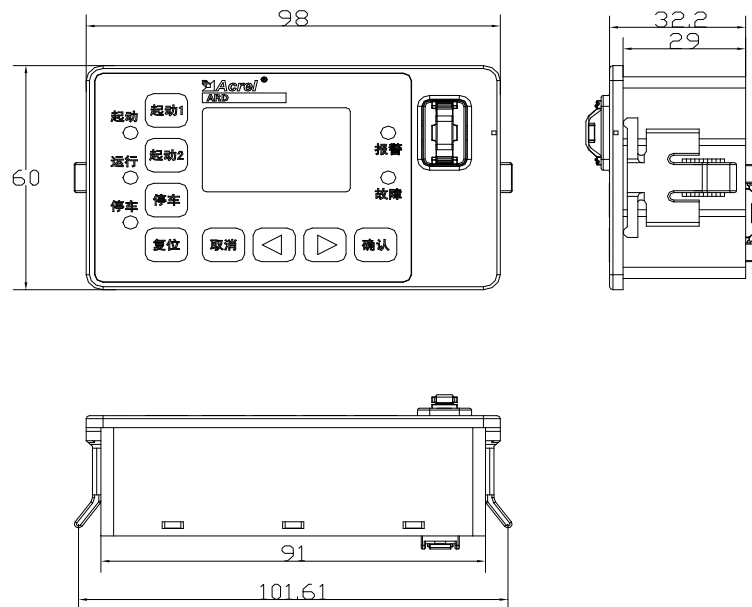


图 11 60L 液晶模块外形尺寸

Figure 11 Overall dimensions about 60L LCD display module

## 6 ARD3T 模块介绍，设置软件使用说明 ARD3T module introduction and setting software instruction

ARD3T 在提供基础的保护功能外，还可以根据用户要求增加 5 种功能模块。

Besides providing basic protection functions, ARD3T can add five kinds of function modules according to users demand.

■开关量模块

Switching value module

■温度模块

Temperature module

■模拟量模块

Analog value module

■通讯模块

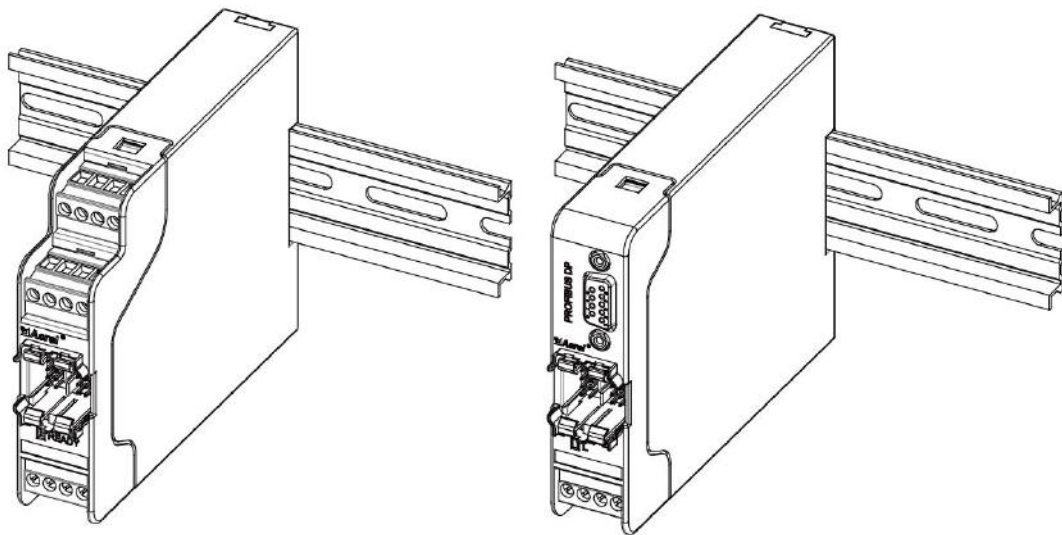
Communication module

■液晶显示模块

LCD display module

图 12、13 是除液晶外，各功能模块安装方式：

The installation of each function module is shown in figure12 and figure 13, except LCD.



开关量、温度、模拟量模块导轨式  
安装示意图

通讯模块导轨式安装示意图

图 12 导轨安装

Figure 12 Guide rail installation

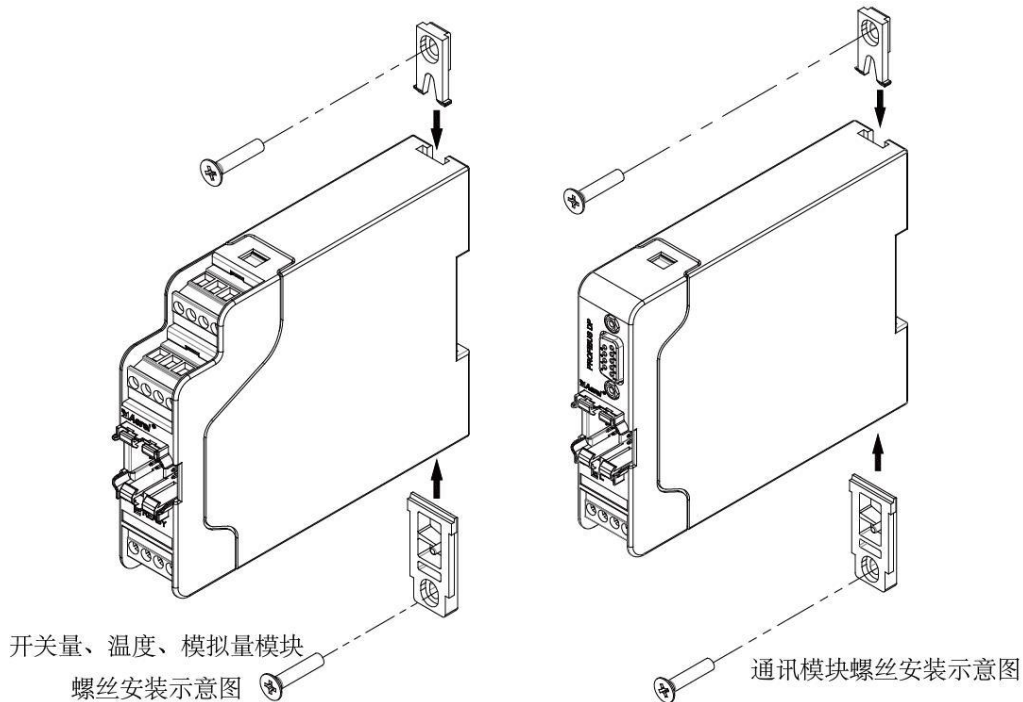


图 13 螺丝固定安装

Figure 13 Screw fixed installation

设置软件使用说明: 将电动机保护器各模块按说明书正确连接后, 打开程序中的 Acrel 检测系统程序, 进入 Acrel 电动机保护设置软件。

Setting software instruction:

After each motor protector properly connected according to instruction, open Acrel detection system program and enter Acrel motor protection setting software.

安装好所有模块后, 连接好通讯下载线后, 在通讯设置中选择配置串口, 选择串口号、设备地址及波特率, 点击 OK, 然后点击连接设备图标, 再点击图中实时状态图标。实时状态若有显示则表示电动机保护器已连接上设置软件, 模块选型中会显示已经安装好的模块。设置软件说明见图 14、图 15。

Install all modules and connect communication wire, select serial port configuration in communication setting, choose serial port number, device address, baud rate, and click "ok", then click "connecting device" icon and click "real-time status" icon. Data's show in real-time status means that the motor protector is already connected with setting software, and the module selection displays the already installed modules. Setting software instruction is as shown in figure 14 and figure 15.



图 14 设置软件说明 1



Figure 14 Setting software instruction 1

通过 DI5-DI8 可以对起动、停车、复位、普通 DI 功能等进行开关量输入设置。并可通过 DO5-DO7 对运转、计数器、定时器等进行开关量输出设置。

Users can set switching value input about starting, stopping, resetting and basic DI function by DI5-DI8, as well as set switching value output about running, counter, and timer by DO5-DO7.

温度模块可根据外置的温度传感器类型进行设置，如 PT100、PT1000、Cu50、PTC、NTC。设置模块温度基本保护时，如图 15 所示，对其进行各种修改只需将鼠标移至对应的数值处，双击鼠标即可进行修改，对模块温度保护可进行动作值、返回值、动作时间、返回时间、复位方式、脱扣、报警等设置。

Temperature module can be set according to external temperature sensors such as PT100、PT1000、Cu50、PTC、NTC. As shown in figure 15, when set basic protection, users can move the mouse to corresponding numerical location and then double click for modification. Users can also set action value, return value, action time, return time, reset mode, tripping and alarm during temperature protection.

在图 15 中可进行模拟量高、低保护设置。对其进行修改只需将鼠标移至对应的数值处，双击鼠标即可进行，模拟量保护中可设置报警、脱扣的阈值及时间。

Users can set analog value high or low protection in figure 15, move the mouse to corresponding numerical location and double click to implement the modification. Analog value protection setting includes alarm, tripping threshold and time.

按照通讯连接说明进行通讯连接。在图 15 中可进行模拟量输入输出的基本设置。ARD3T 模拟量输出类型，4mA、20mA 对应关系可编程，编程内容见表 21。

Connect communication according to communication connecting instruction, users implement basic setting about analog value input and output in figure 15. The corresponding relationship between type of ARD3T analog output and 4mA/20mA can program, the programming content is as shown in table 21.

注：4mA/20mA 对应值设置含义如下：以变送类别为 Ia 为例，4mA 对应值设置为“0”表示 Ia 为 0 时输出 4mA，20mA 对应值设置为“100”，乘上单位“0.01”表示 Ia 达到 1 倍额定电流后输出 20mA。

Notes: The meaning of 4mA/20mA corresponding value setting is as follows: take transmitting type “Ia” for example, 4mA corresponding value set to “0” means output is 4mA when Ia equals to 0; 20mA corresponding value set to “100” and multiply the unit “0.01”, which means output is 20mA when Ia reaches 1 time rated current.

液晶显示的开关量显示和设置详见液晶菜单概述。

More details about LCD switching value display and setting are as shown in LCD menu overview.



图 15 设置软件说明 2

Figure 15 Setting software instruction 2

开关量模块

Switching value module

接线方式 Wiring mode

对照接线图及接线端子连接各线路，并参照图 16 进行接线。

Connect each circuit according to wiring diagram and binding post, and then connect refer to figure 16

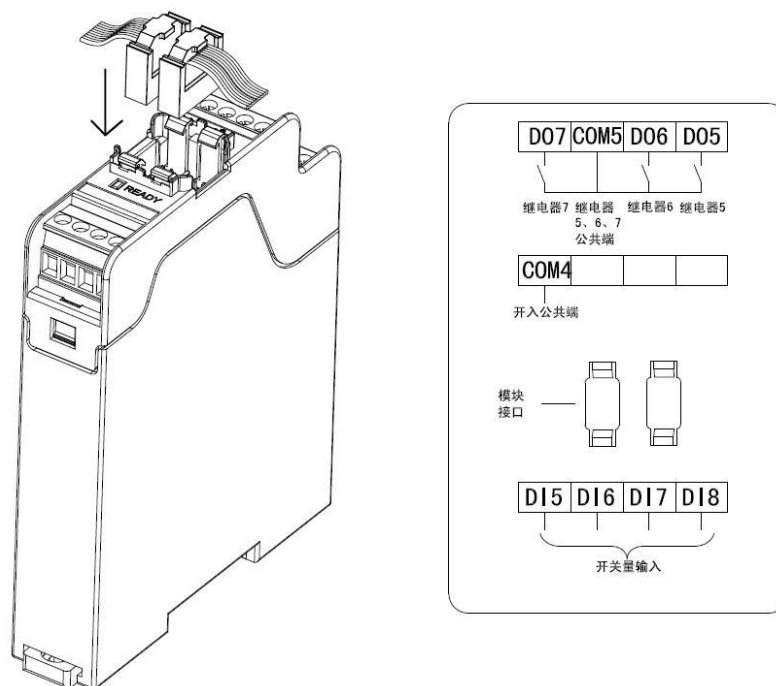


图 16 开关量模块接线示意图

Figure 16 Switching value module wiring diagram

#### 功能介绍 Function introduction

开关量模块是对主体的开关量进行扩展，当主体的开关量点数无法满足使用者需求时，通过外加开关量模块实现产品开关量点数扩展。

Switching value module expands the switching value of master. If switching value points of the master cannot satisfy user's demand, users can implement the expansion about product's switching value points by adding switching value module.

开关量模块正确连接后，如无问题，指示灯会显示绿色闪烁。可通过上位机软件、液晶显示模块进行观察和设置开关量。

After connecting switching value module properly, the indicator light will show green flash. Users can observe and set switching value by upper computer or LCD display module.

#### 温度模块 Temperature module

##### 接线方式 Wiring mode

对照接线图及接线端子连接各线路，并参照图 17 进行接线。

Connect each circuit according to wiring diagram and binding post, and then connect refer to figure 17

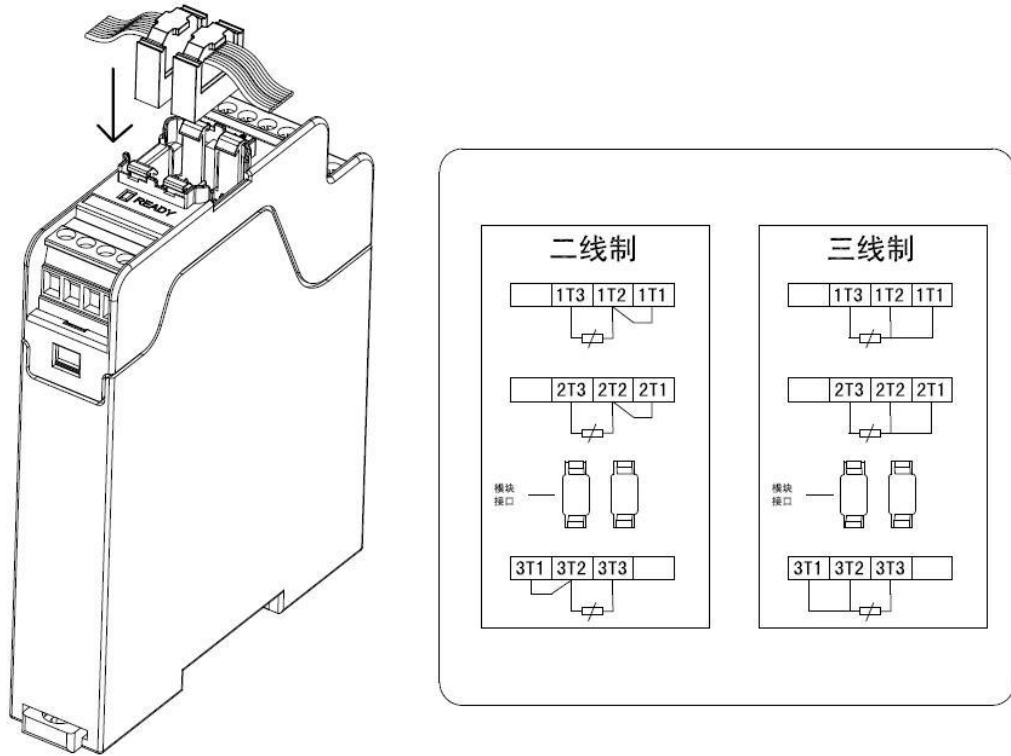


图 17 温度模块接线示意图

Figure 17 Temperature module wiring diagram

#### 功能介绍 Function introduction

温度模块通过外接 PT100、PT1000、Cu50、PTC/NTC 等传感器实现温度测量。

Temperature module implement temperature measurement using external sensors such as PT100、PT1000、Cu50、PTC/NTC, and etc.

温度模块正确连接后，如无问题，指示灯会显示绿色闪烁。可通过上位机软件、液晶显示模块进行观察和设置模拟量。

After connecting temperature module properly, the indicator light will show green flash. Users can observe and set analog value by upper computer or LCD display module.

液晶显示的温度显示和设置详见液晶菜单概述。

The LCD temperature display and setting are as shown in LCD menu overview for details

#### 模拟量模块 Analog value module

##### 接线方式 Wiring mode

对照接线图及接线端子连接各线路，并参照图 18 进行接线。

Connect each circuit according to wiring diagram and binding post, and then connect refer to figure 18

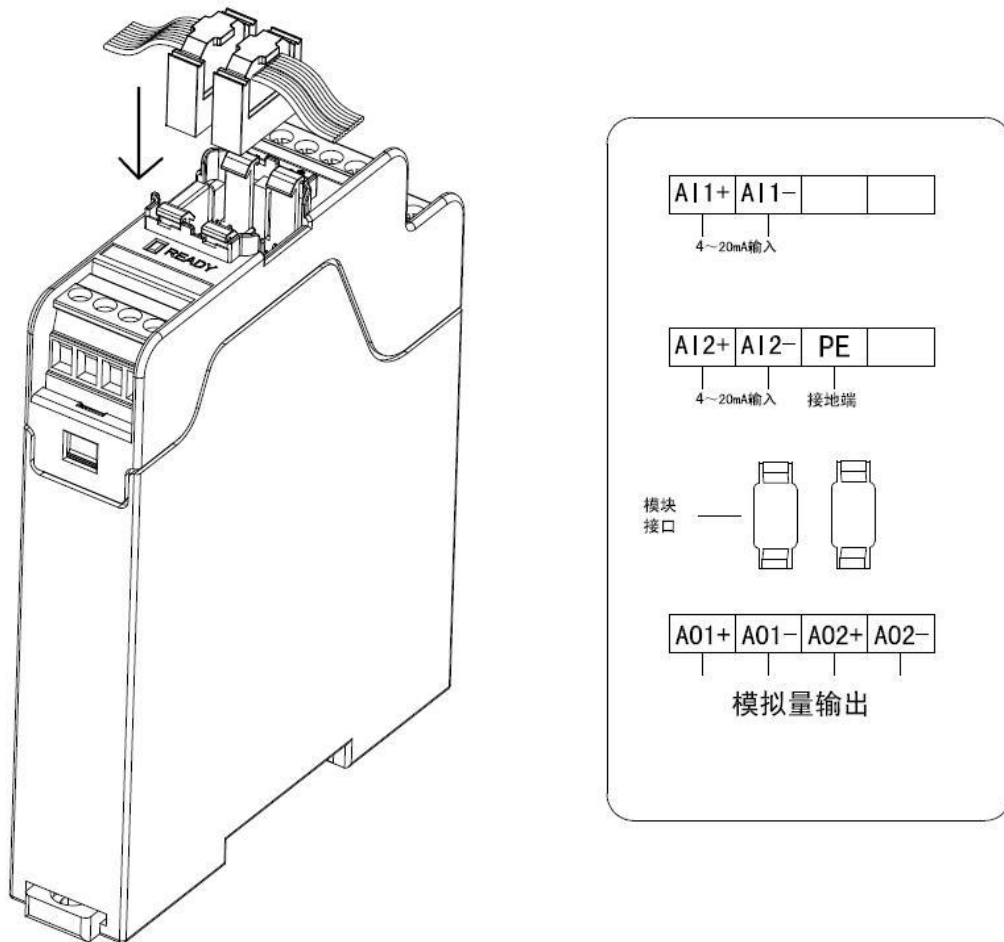


图 18 模拟量模块接线示意图

Figure 18 Analog value module wiring diagram

**功能介绍 Function introduction**

模拟量模块可以实现模拟量输入测量和模拟量变送输出。

**Analog value module implement analog value input measurement and transmitting output**

模拟量模块正确连接后，如无问题，绿色指示灯闪烁。可通过上位机软件、液晶显示模块进行观察和设置模拟量。

After connecting analog value module properly, the indicator light shows green flash. Users can observe and set analog value by upper computer or LCD display module.

**通讯模块 Communication module**

**接线方式 Wiring mode**

对照接线图及接线端子连接各线路，并参照图 19 进行接线。

Connect each circuit according to wiring diagram and binding post, and then connect refer to figure 19

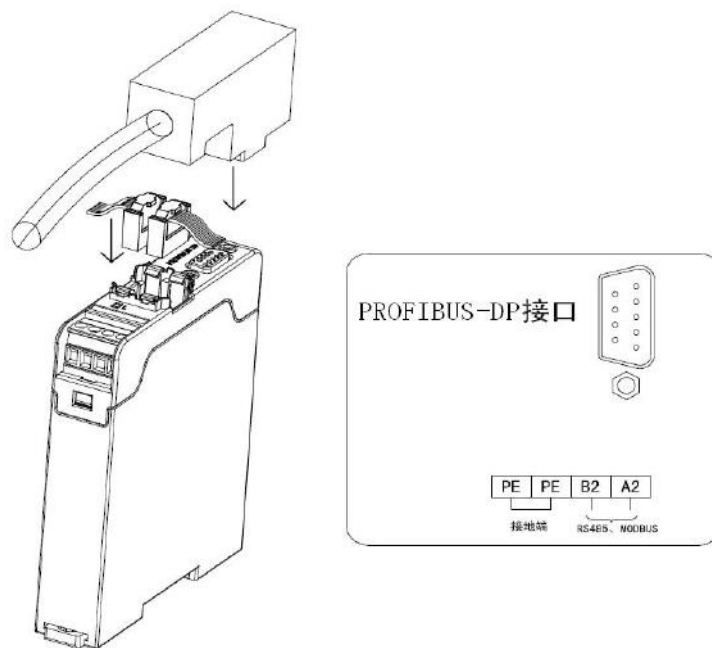


图 19 通讯模块接线示意图

Figure 19 Communication module wiring diagram

### 功能介绍 Function introduction

通讯模块可以实现双 MODBUS、PROFIBUS 通讯功能。可通过上位机软件、液晶显示模块进行观察和设置通讯地址、波特率。

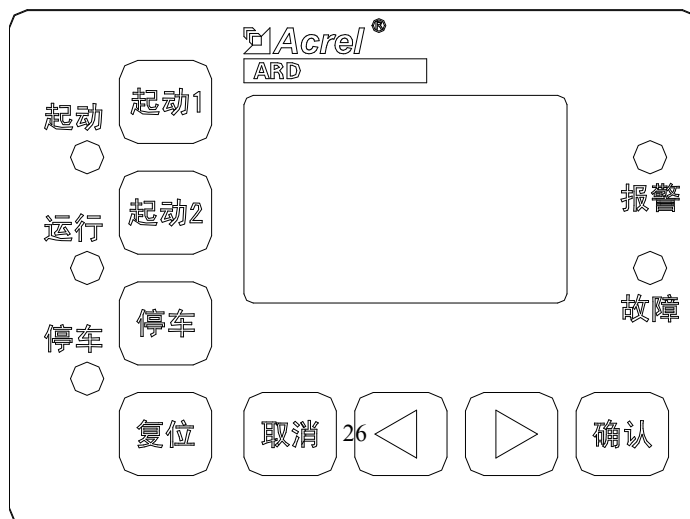
Communication module implement double Modbus and Profibus. Users can observe and set communication address and baud rate by upper computer or LCD display module.

当通讯模块为 PROFIBUS 时，首先将波特率 2 设置为 PROFIBUS，在通讯地址 2 中设置 PROFIBUS 从站地址。Profibus 通讯时，主站与从站处于数据交换时，绿色指示灯闪烁；主站与从站无数据交换时红灯常量。Modbus 通讯时，模块上指示灯常暗，通讯指示灯见主体通讯指示灯，有通讯时绿灯闪烁，无通讯时常暗。

When communication module is Profibus, users can set baud rate 2 as Profibus, then set Profibus slave station address in communication address 2. Green light flash when data exchange between master station and slave station during Profibus communication, otherwise red light is normally on if no data exchange. When communication module is Modbus, indicator light of communication module is normally off, communication indicator light accords with master communication indicator light: green light falsh when communication, otherwise the indicator light is normally off.

## 7 操作指南 Operation guide

### 7.1 60L 显示模块面板 60L Display module panel



60L 显示模块面板如图 20 所示。60L Display module panel is as shown in Figure 20.

## 7.2 显示操作指南 Display operation guide

The description of the display and operation of 60L display module is as shown in Table 15.

Table 15 Description of the indicators and keys

序号 No.	名称 Name	状态 Status	功能说明 Function Description
1	就绪指示灯 Ready indicator	亮/灭 On/Off	亮表示电动机正常，可以起动电动机 On: Motor is normal, and permit to start motor.
			灭表示非停车状态或故障脱扣 Off: No-stopping status or having fault tripping
2	停车指示灯 Stopping indicator	亮/灭 On/Off	亮表示电动机处于停止状态 On: Motor is in stopping status
			灭表示运行状态 Off: Motor is in working status
3	起动指示灯 Starting indicator	亮/灭 On/Off	亮表示电动机处于起动阶段 On: Motor is in the starting stage
			灭表示非起动状态 Off: Motor is in no-starting status
4	运行指示灯 Running indicator	亮/灭 On/Off	亮表示电动机处于运行状态 On: Motor is in working status
			灭表示非运行状态 Off: Motor is in no-working status
5	报警指示灯 Alarm indicator	亮/灭 On/Off	亮表示保护器报警，报警继电器已动作 On: The protector is warning, and alarm relay has operated.
			灭表示没有发生报警 Off: No warning
6	脱扣指示灯 Tripping indicator	亮/灭 On/Off	亮表示电动机发生故障，保护器脱扣继电器已动作 On: Motor is at fault, the protector tripping relay has operated.
			灭表示没有发生脱扣 Off: no tripping.
7	 起动 1 按键 Starting 1 key	单击 Click	非保护模式下操作起动 1 继电器，起动电动机，控制权限为本地 In non-protective mode, starting1 relay is operated, the motor is started. The control is local.
8	 起动 2 按键 Starting 2 key	单击 Click	双向模式时在停车状态下使电动机换向起动运行；双速模式时操作起动 2 继电器，使电动机换速运行，控制权限为本地 Reverse starting motor in two-directional starting mode in stopping status; start relay 2 in two-speed motor control mode to change the speed of motor, the control is local.
9	 停车键 Stopping button	单击 Click	释放起动继电器，使电动机停车，控制权限为本地 Release starting relay to make motor stopped. The control is local.
10	 +  组合	同时按 Press	执行紧急停车，清除热容 Stop motor urgently, and clear the thermal capacity.

	键 Stopping + reset button	simultaneousl y	
11	 复位键 Reset button	单击 Click	电动机发生故障时将保护器复位 Reset protector while motor is at fault.
12	 确定键 Enter button	单击 Click	进入菜单，设定状态下确认修改的参数 Enter the menu, and confirm the revised parameters in setting status
13	 方向键 Direction key	单击 Click	上翻菜单，设定状态下减小设定的数据 Flip over menu backward and decrease the data in setting status.
		长按 Press for a long time	设定状态下修改数据时快速减小数据 Decrease the data when revising in the setting status.
14	 方向键 Direction key	单击 Click	下翻菜单，设定状态下增大设定的数据 Flip over menu forward and increase the data in setting status
		长按 Press for a long time	设定状态下修改数据时快速增大数据 Increase the data when revising in the setting status.
17	 取消按键 Cancel button	单击 Click	退出菜单或取消修改操作 Exit the menu or cancel the revised operation.
18	 组合键 Direction combination key	同时按 Press simultaneously	在显示为主界面时操作，显示对比度将在 50%、15%、85% 之间依次变化（如显示不清，通过取消键，将屏幕恢复到显示主界面，再用此组合键恢复到可视状态，通过菜单中调整对比度至最佳显示） Operate in the main interface, and the display contrast will change among 50%、15% and 85% in sequence.(If the display is obscure, revert to the main interface by cancel key. And revert to the visible status by this combination key, regulate the contrast in the menu to the best show)
19	LCD 显示屏 LCD screen		显示各种测量参数、设置参数 Display all kinds of the measure parameters and setting parameters.

### 7.3 液晶菜单概述 LCD menu overview

ARD3T 液晶显示模块菜单为全中文显示，可同时显示四行汉字的信息，通过按“确定”键进入菜单界面，菜单功能如表 16 所示：

ARD3T LCD module menu show all in Chinese, can show four lines Chinese information simultaneously. Enter the menu interface by click “Enter” button, the menu functions are as shown in Table 16.

表 16 菜单功能

Table 16 Menu function

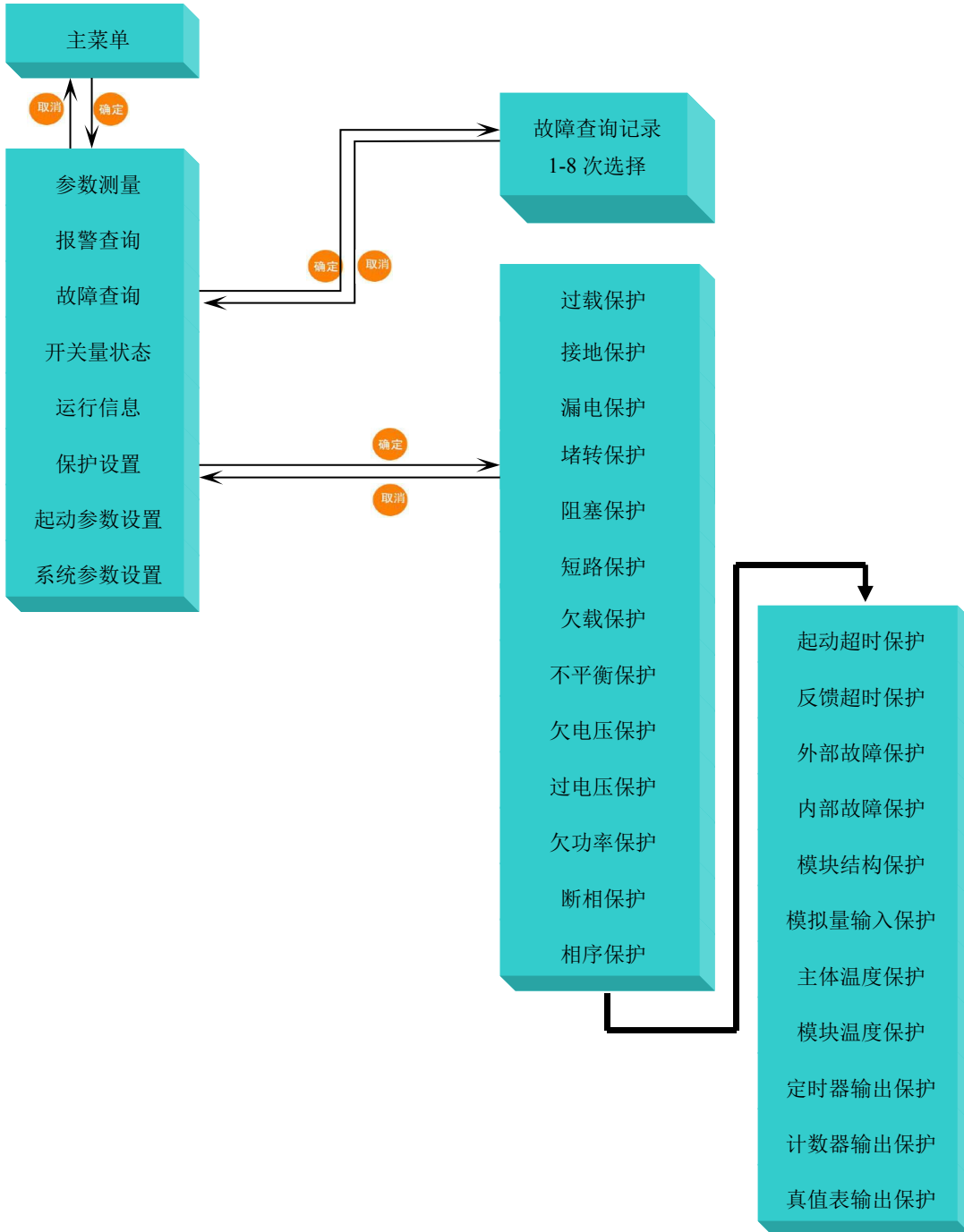
菜单名称 Menu Name	功能 Function	备注 Remarks
参数测量 Measurement	查看电流、电压、频率、温度等测量数值 Check the measure values as current, voltage, frequency, temperature and so on	在此菜单内查看全部测量参数 Check all the measure parameters in this menu.
报警查询 Alarm Query	查看当前报警信息 Check the current alarm information.	
故障查询 Fault Query	查看 1~8 次故障记录 Check 1-8 fault records.	
开关量状态 Device I/Os	查看开关量状态, 对 DI、DO 编程 Check the switching value status, and program to DI, DO.	
运行信息 Running Information	查看运行信息 Check the running information.	可以查看运行时间、停止时间、起动次数等运行信息 Can check the running information including running time, stopping time, starting times and so on.
保护设置 Protect Setting	设定各类保护参数 Set all kinds of protection parameters.	过载、断相、堵转、阻塞、过压、欠压等 Overload, phase failure, stalling, blocking, overvoltage, undervoltage and so on.
起动参数设置 Start Setting	设置起动参数 Set the starting parameters.	可设置: 起动方式、起动时间、转换时间、自起动等与起动有关的内容 Setting allowed: some contents concerned with starting as starting mode, starting time, switching time, self-starting and so on.
系统参数设置 System Setting	设置系统参数 Set the system parameters.	可设置: 电机电流、电机电压、通讯地址、通讯波特率、系统时间、变送输出设置、液晶背光等信息 Setting allowed: information such as motor current, motor voltage, communication

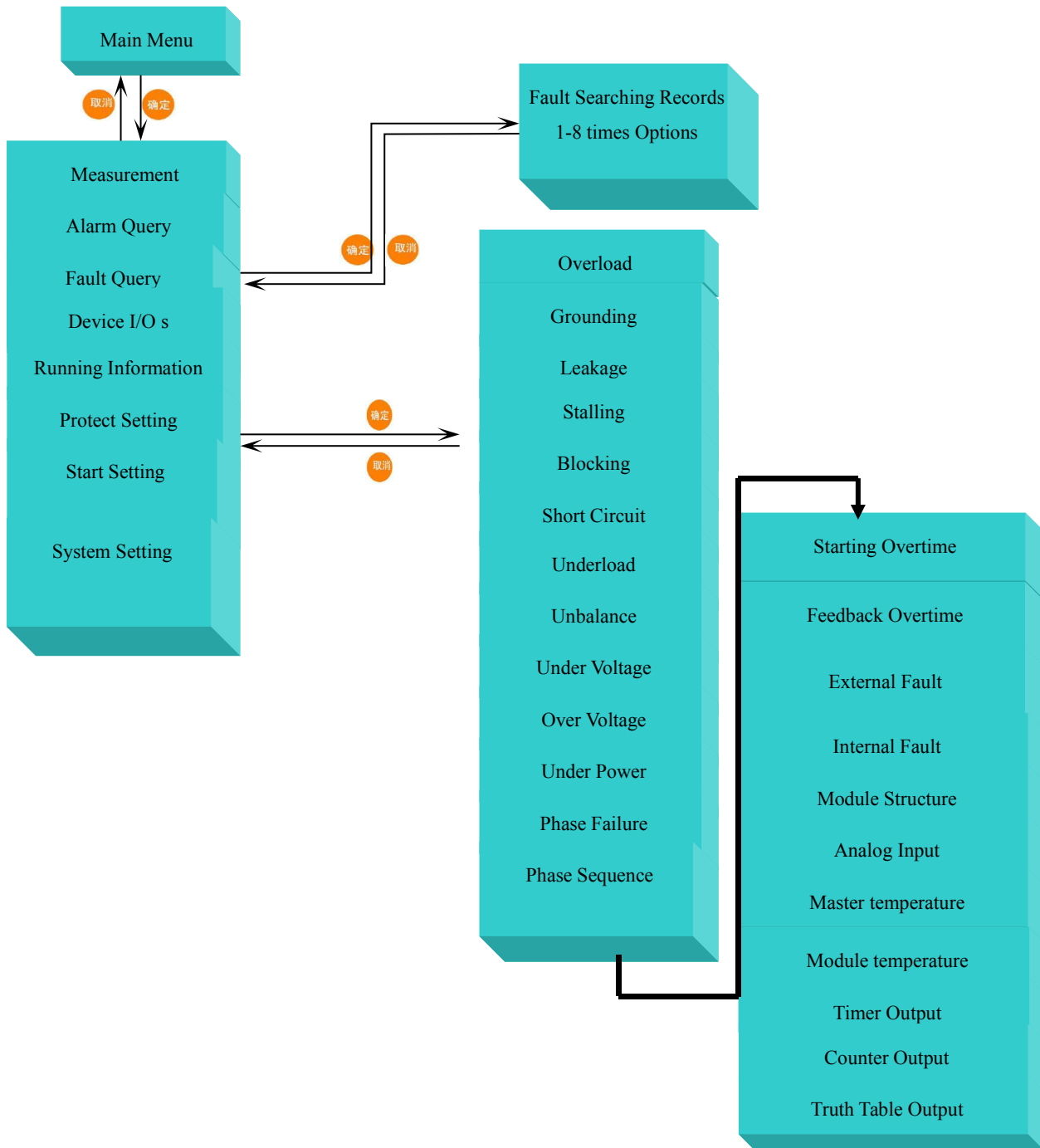


		address, communication baud rate, system time, transmitting output setting, LCD backlights and so on.
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详细菜单结构如下：

Detailed menu structure as follows:





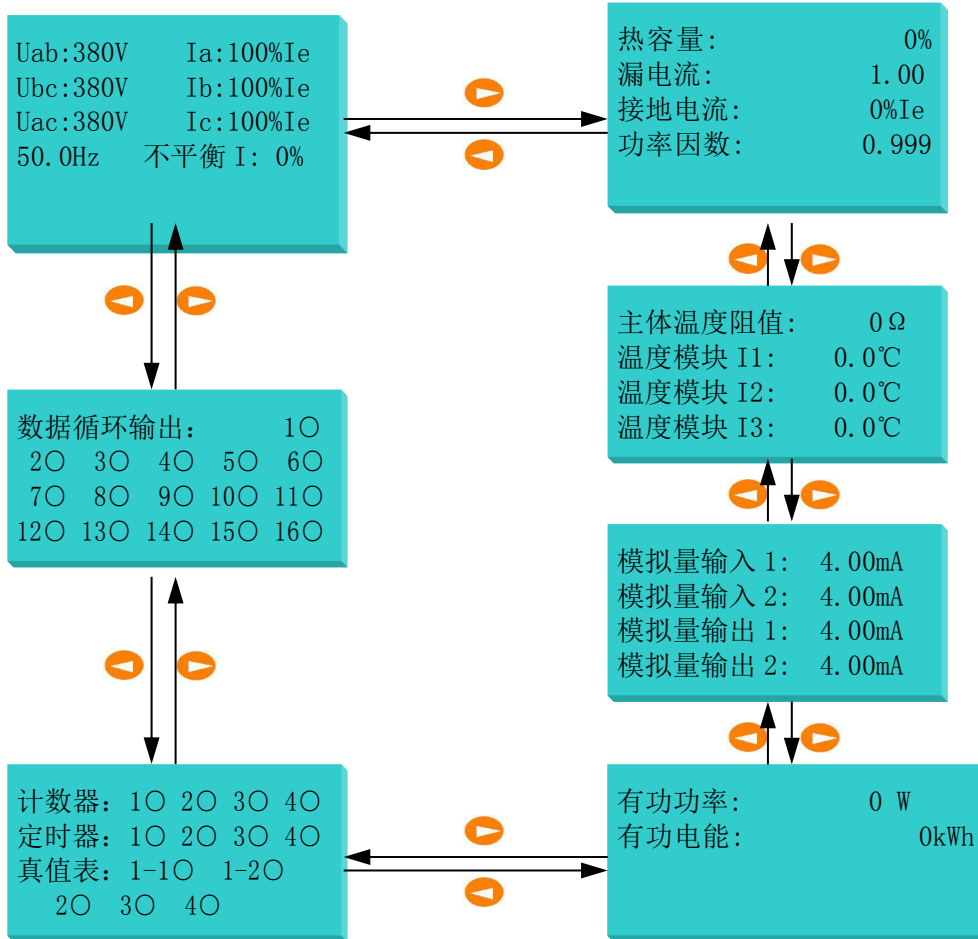
“↑”表示显示的当前页可以操作 ◀ 按键向前翻页，”↑”表示显示的当前页已经是第一页，再向前翻页将跳到最后一页显示。

“↑”shows that the current page can be operated, and ◀ key shows paging forward. ”↑” shows that the current page is already the first one, and will turn to the last page if forward.

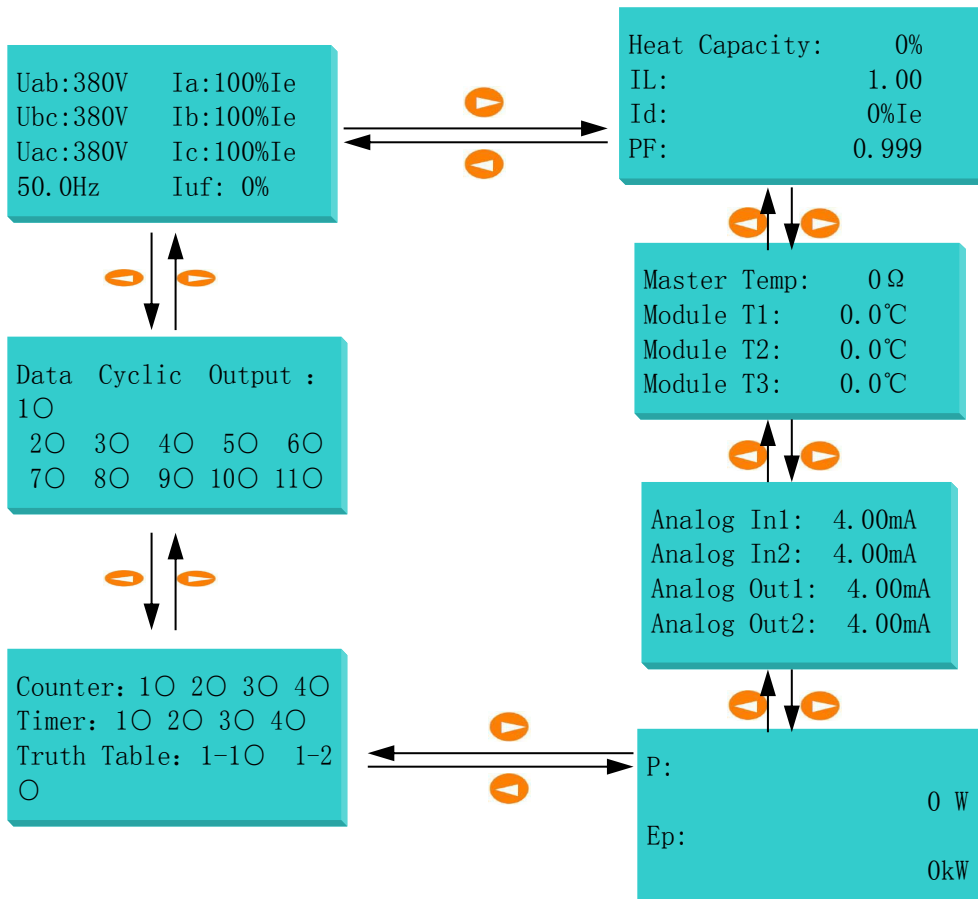
“↓”表示显示的当前页可以操作 ▶ 按键向后翻页，”↓”表示显示的当前页已经是最后一页，再向后翻页将跳到第一页显示。

“↓”shows that the current page can be operated, and ▶ button shows paging backward. ”↓” shows that the current page is already the last one, and will turn to the first page if backward.

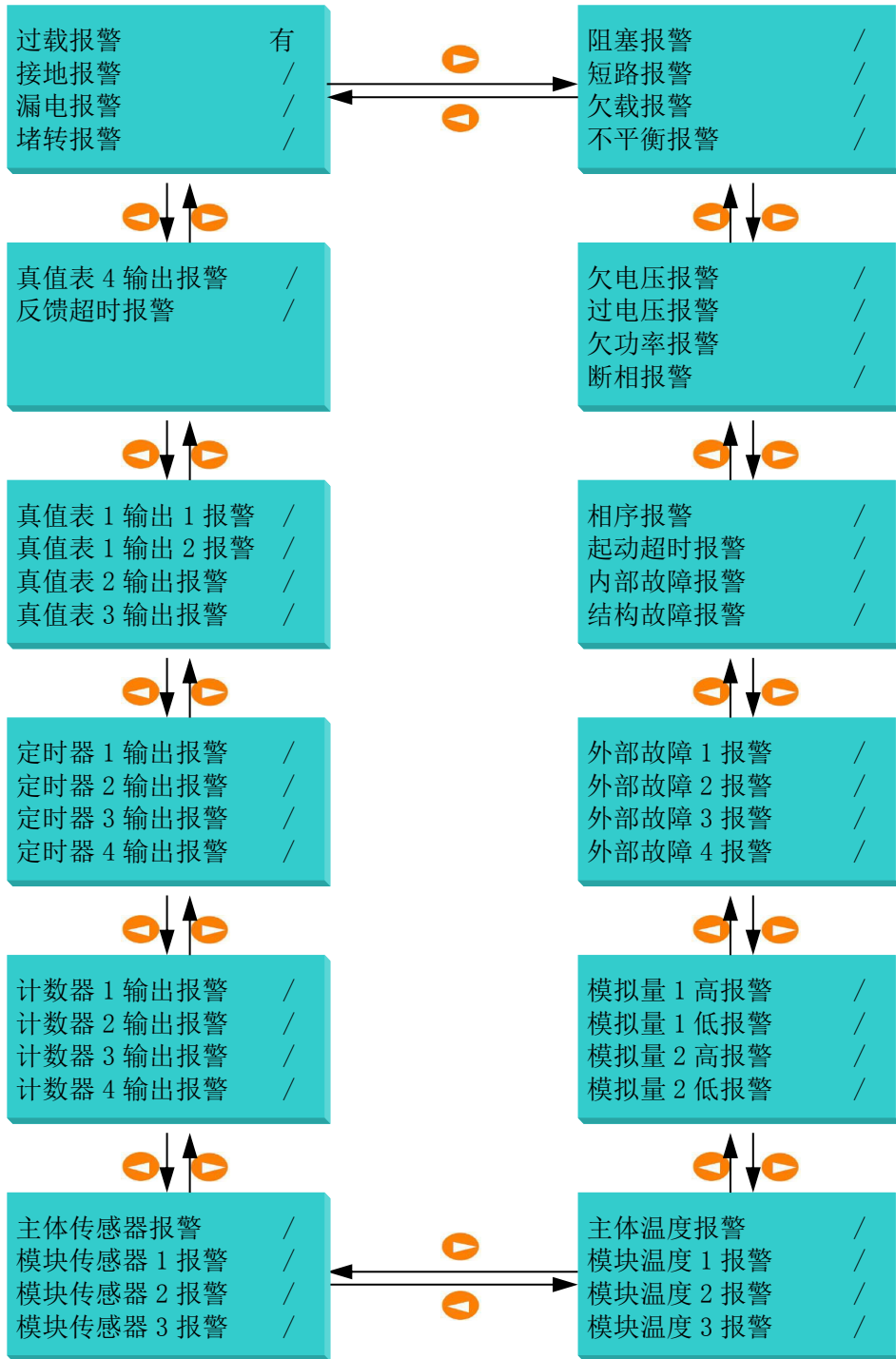
参数测量



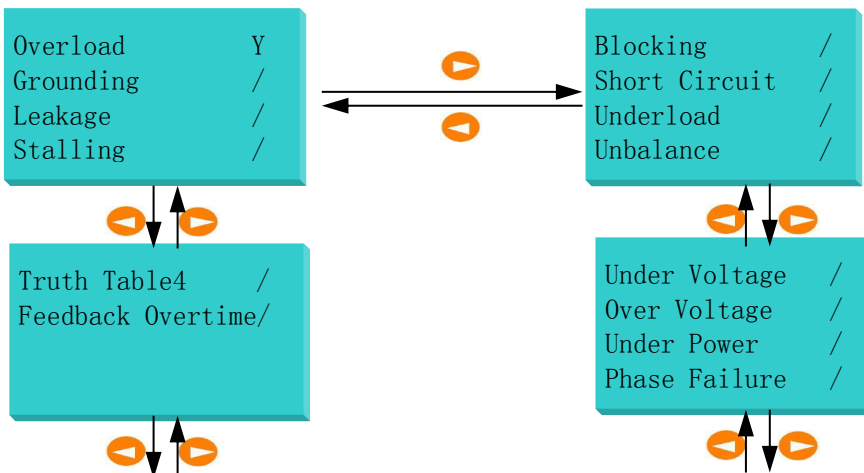
Parameter Measuring:

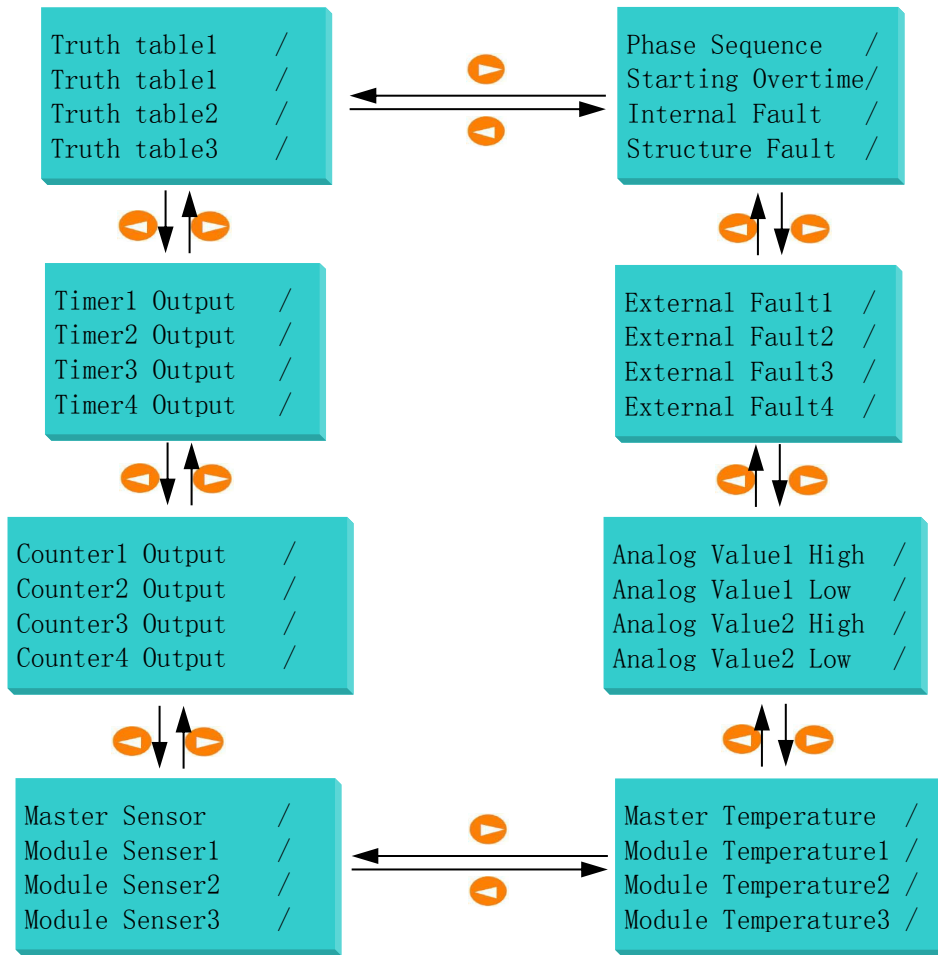


报警查询

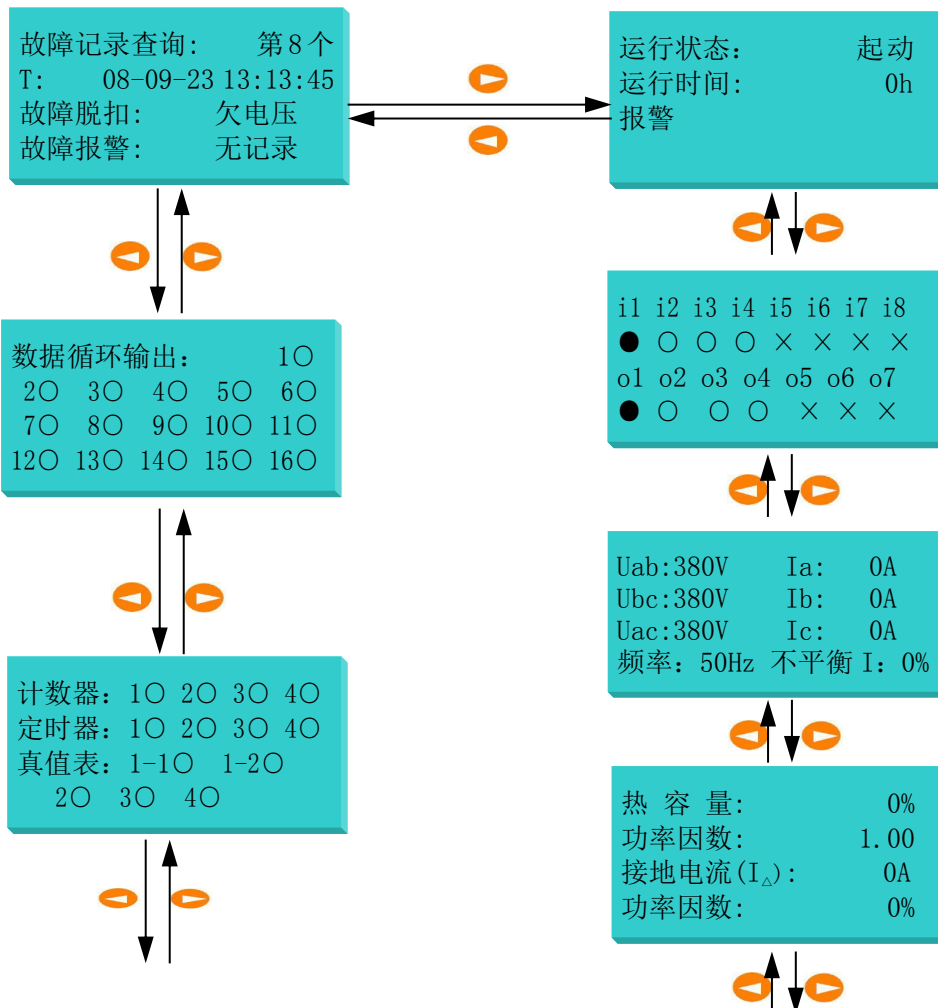


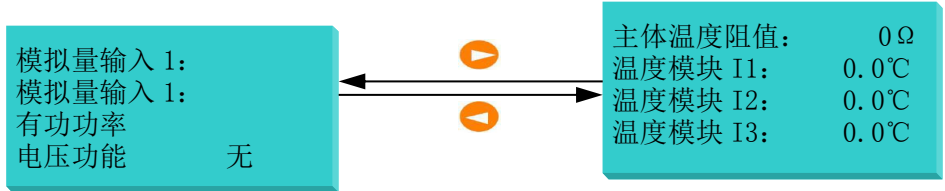
Alarm Search:



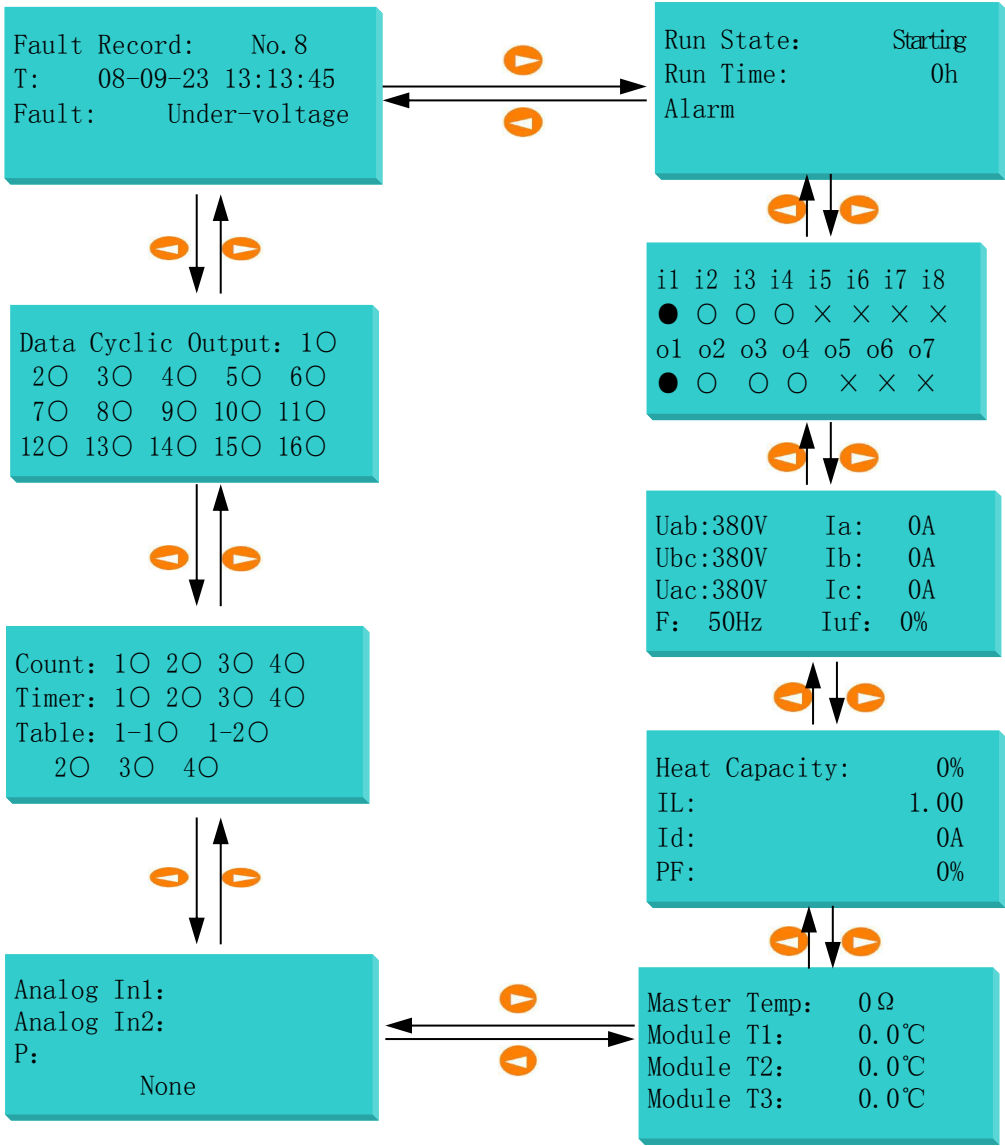


故障查询

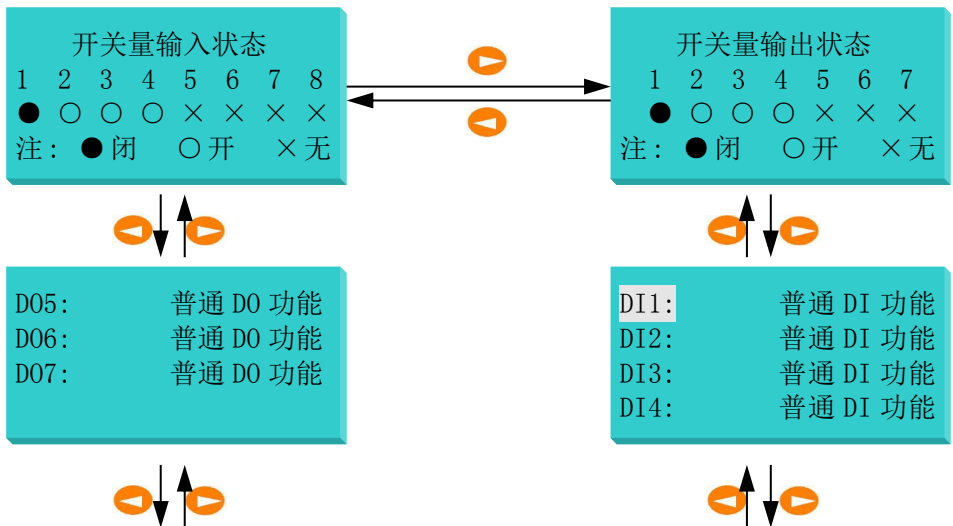


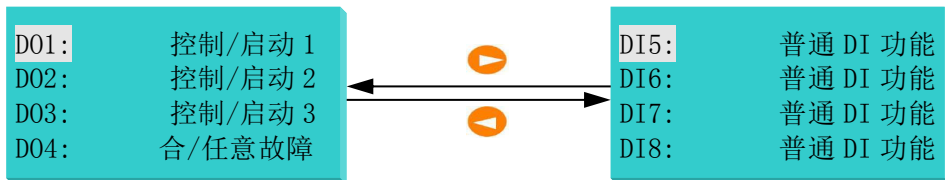


Fault Search:

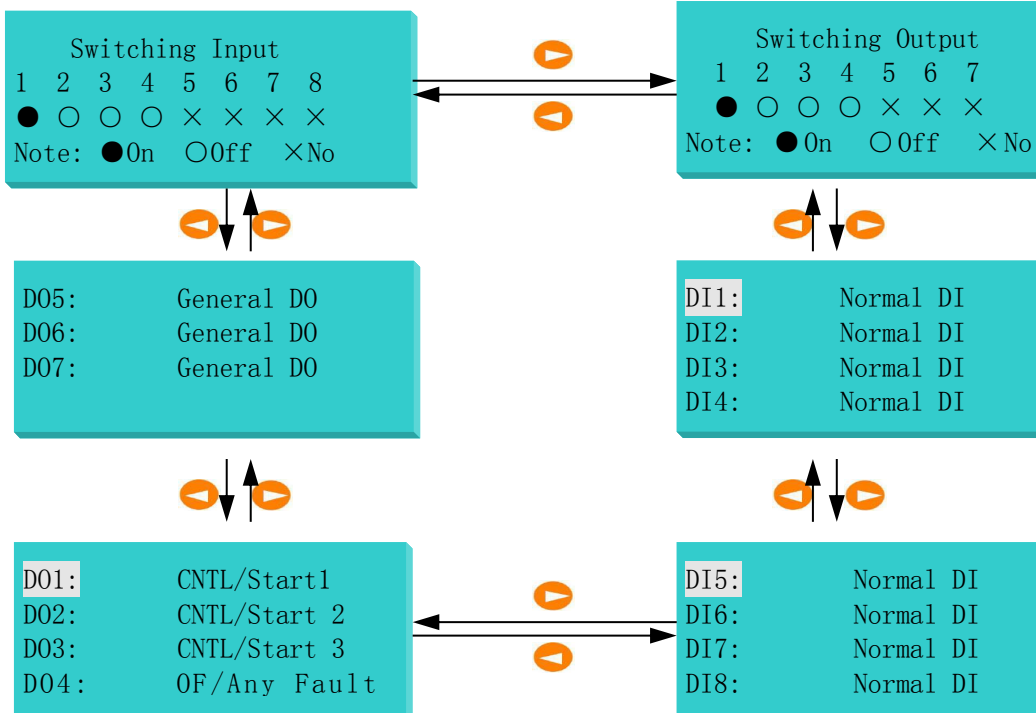


开关量状态



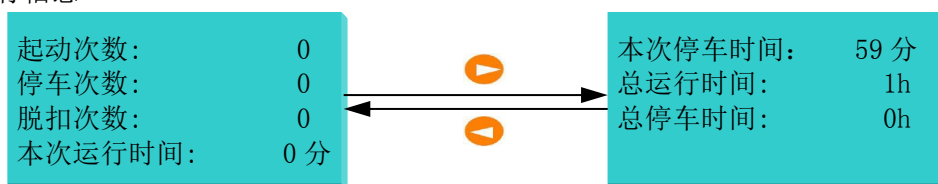


Device I/Os:

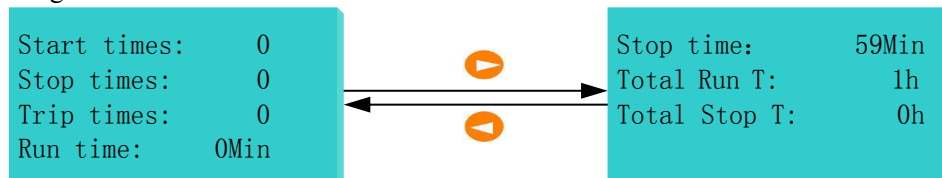


When sub-menu highlight show, adjust ◀、▶ to change different sub-menu. When push the 确定 button, enter the sub-menu to change the parameters, now the responding parameters behind the sub-menu are in reverse show. Adjust ◀、▶ to change the parameters (push ◀、▶ for a long time to adjust the value), then push 确定 to affirm the parameter modification or push 取消 to cancel the parameter modification and exit to the submenu show.

运行信息

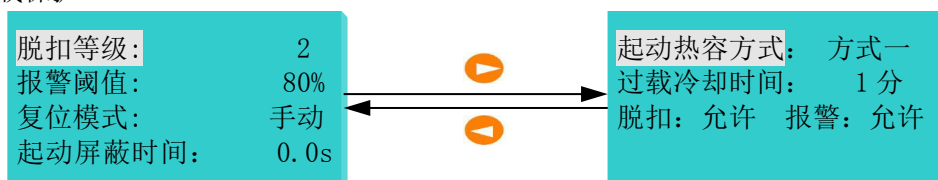


Running Information:



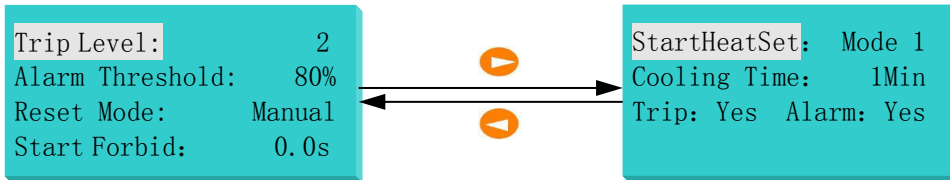
保护设置

过载保护

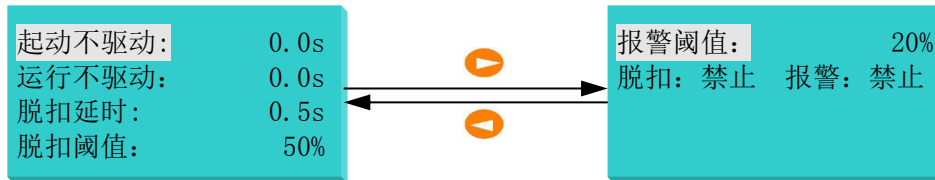


Protection Setting:

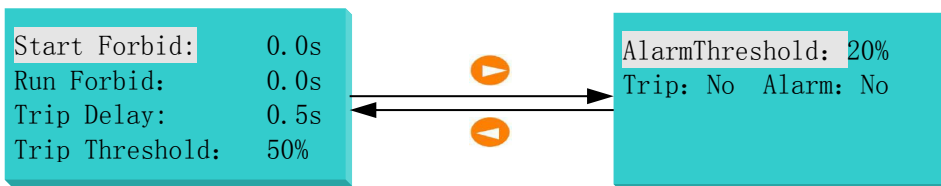
Overload Protection:



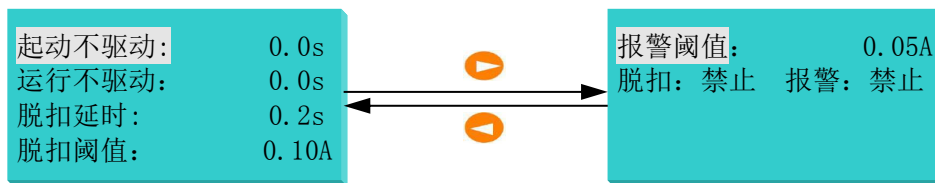
接地保护



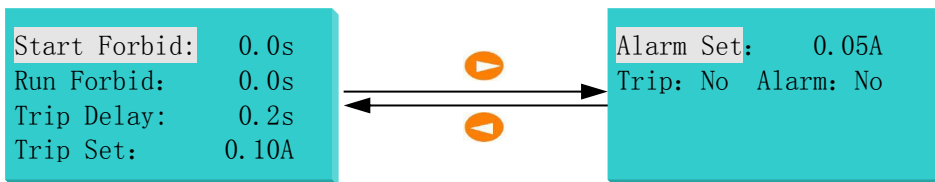
Grounding Protection:



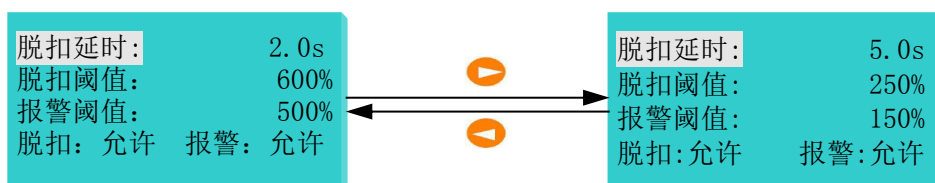
漏电保护



Leakage Protection:



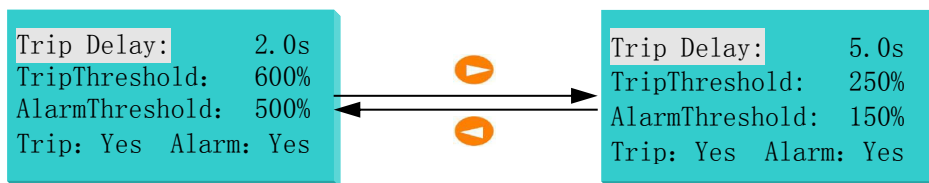
堵转保护



阻塞保护

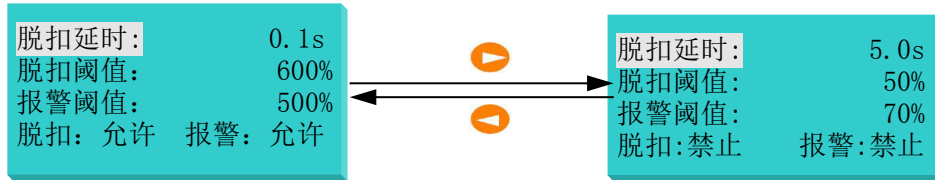
Stalling Protection

Blocking Protection



短路保护

欠载保护





### Short Circuit Protection

Trip Delay: 0.1s  
TripThreshold: 600%  
AlarmThreshold: 500%  
Trip: Yes Alarm: Yes

### 不平衡保护

脱扣延时: 5.0s  
脱扣阈值: 30%  
报警阈值: 20%  
脱扣:允许 报警:允许

### Unbalance Protection

Trip Delay: 5.0s  
TripThreshold: 30%  
AlarmThreshold: 20%  
Trip: Yes Alarm: Yes

### 过电压保护

脱扣延时: 5.0s  
脱扣阈值: 120%  
报警阈值: 110%  
脱扣:允许 报警:允许

### Overvoltage Protection

TripDelay: 5.0s  
TripThreshold: 120%  
AlarmThreshold: 110%  
Trip: Yes Alarm: Yes

### 断相保护

脱扣延时: 1.0s  
脱扣:允许 报警:允许

### Phase Failure Protection

Trip Delay: 1.0s  
Trip: Yes Alarm: Yes

### 起动超时保护

脱扣:允许 报警:允许

### Underload Protection

Trip Delay: 5.0s  
TripThreshold: 50%  
AlarmThreshold: 70%  
Trip: No Alarm: No

### 欠电压保护

脱扣延时: 5.0s  
脱扣阈值: 90%  
报警阈值: 80%  
脱扣:禁止 报警:禁止

### Under-Voltage Protection

Trip Delay: 5.0s  
TripThreshold: 90%  
AlarmThreshold: 80%  
Trip: No Alarm: No

### 欠功率保护

脱扣延时: 50.0s  
脱扣阈值: 50%  
报警阈值: 70%  
脱扣:禁止 报警:禁止

### Underpower Protection

Trip Delay: 50.0s  
TripThreshold: 50%  
AlarmThreshold: 70%  
Trip: No Alarm: No

### 相序保护

脱扣延时: 0.1s  
脱扣:禁止 报警:禁止

### Phase Sequence Protection

Trip Delay: 0.1s  
Trip: No Alarm: No

### 反馈超时保护

脱扣:允许 报警:允许

Starting Overtime Protection

Feedback Overtime Protection

Trip: Yes Alarm: Yes

Trip: Yes Alarm: Yes

外部故障保护

故障 1 延时: 0.1s  
脱扣: 禁止 报警: 禁止  
故障 DI2 延时: 0.1s  
脱扣: 禁止 报警: 禁止

故障 DI3 延时: 0.1s  
脱扣: 禁止 报警: 禁止  
故障 DI4 延时: 0.1s  
脱扣: 禁止 报警: 禁止

External Fault Protection

Fault1 Delay: 0.1s  
Trip: No Alarm: No  
Fault2 Delay: 0.1s  
Trip: No Alarm: No

Fault3 Delay: 0.1s  
Trip: No Alarm: No  
Fault4 Delay: 0.1s  
Trip: No Alarm: No

内部故障保护

脱扣延时: 0.1s  
脱扣: 允许 报警: 允许

Internal Fault Protection

Trip Delay: 0.1s  
Trip: Yes Alarm: Yes

模块结构故障

测量模块: 结构相同  
开关量模块: 结构相同  
模拟量模块: 结构相同  
温度模块: 结构相同

脱扣使能: 允许  
报警使能: 允许

Module Structure Fault

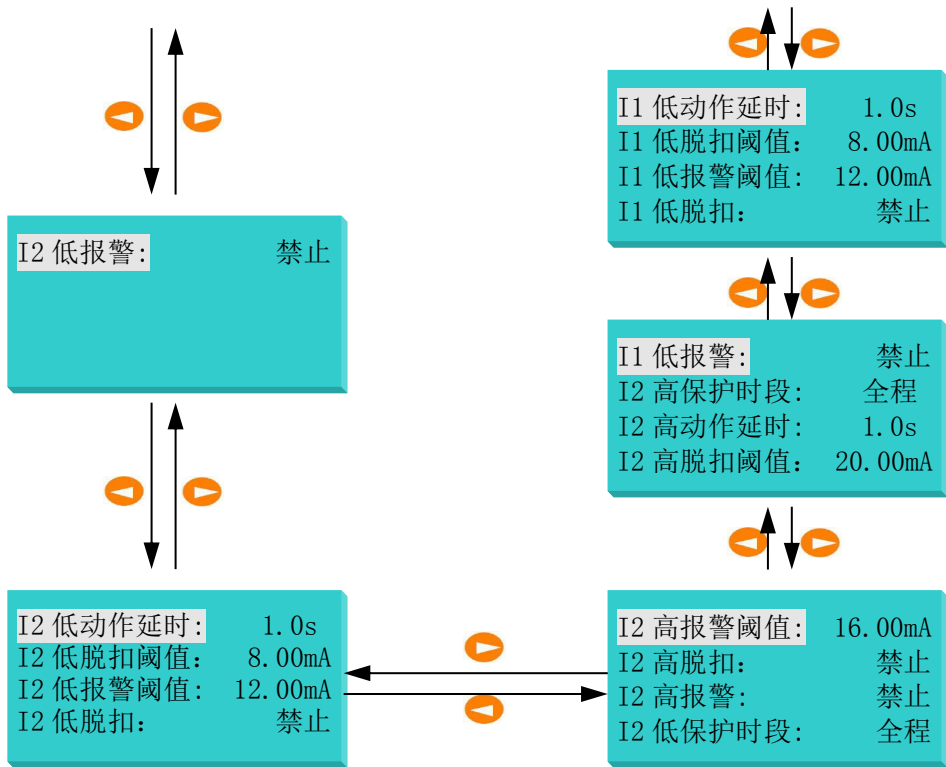
Measurement: Match  
Switch I/O: Match  
Analog: Match  
Temperature: Match

Trip Enabled: Yes  
Alarm Enable: Yes

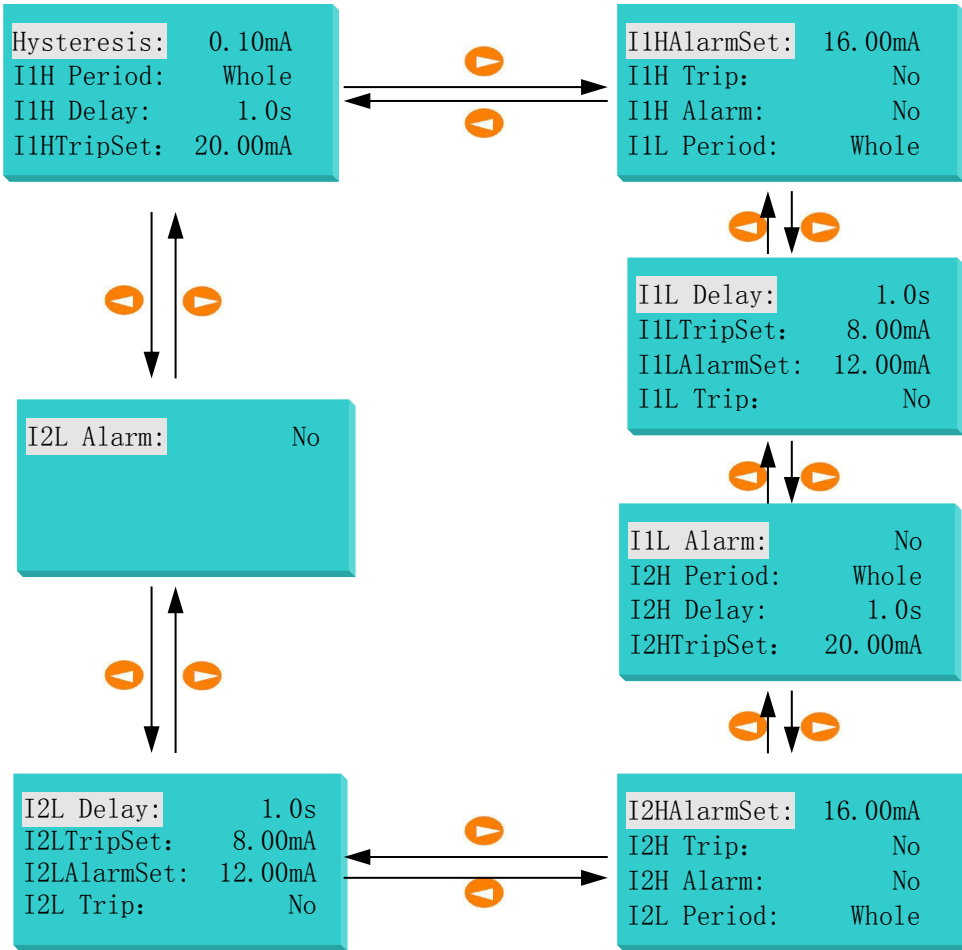
模拟量输入保护

输入回滞量: 0.10mA  
I1 高保护时段: 全程  
I1 高动作延时: 1.0s  
I1 高脱扣阈值: 20.00mA

I1 高报警阈值: 16.00mA  
I1 高脱扣: 禁止  
I1 高报警: 禁止  
I1 低保护时段: 全程



Analog Input Protection



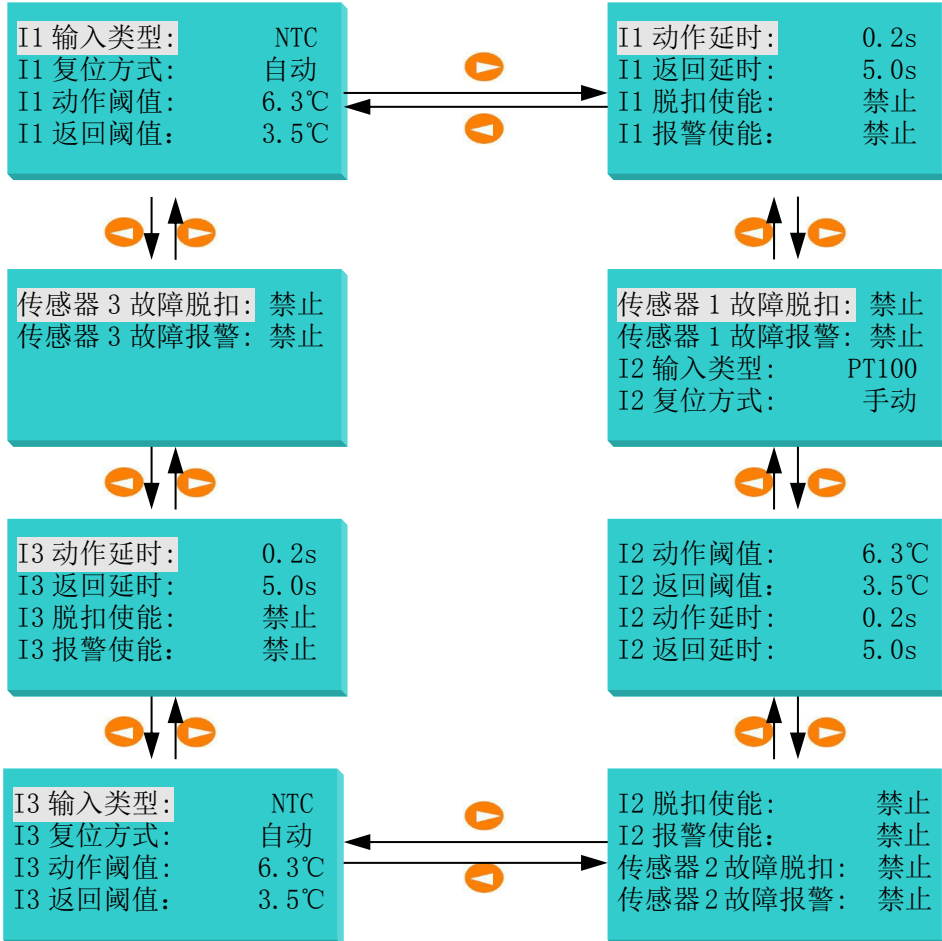
主体温度保护

动作阻值:	1000 Ω
返回阻值:	500 Ω
动作延时:	0.1s
返回延时:	5.0s

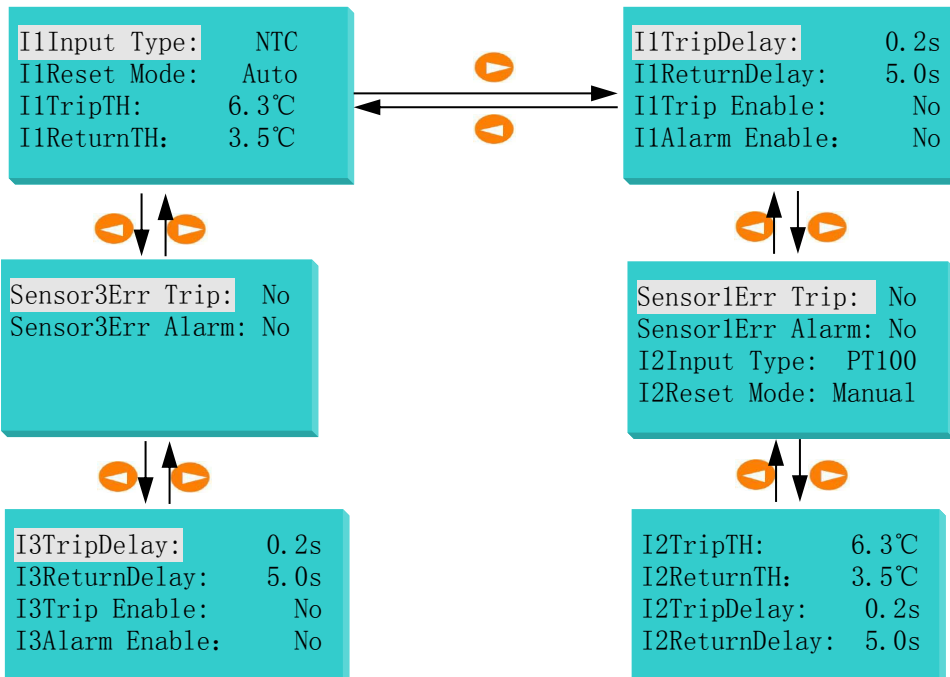
## Master Temperature Protection

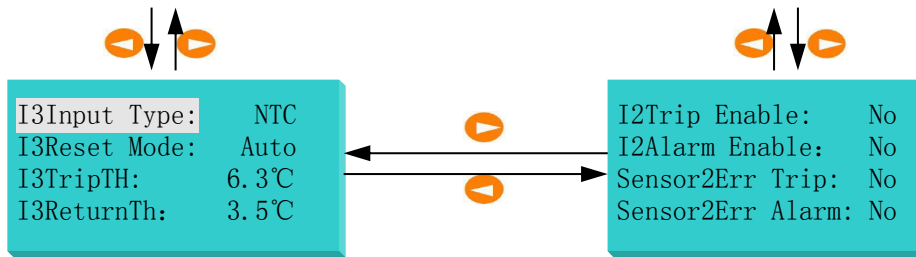
Trip R: 1000 Ω  
 Return Re: 500 Ω  
 Trip Delay: 0.1s  
 Return Delay: 5.0s

### 模块温度保护

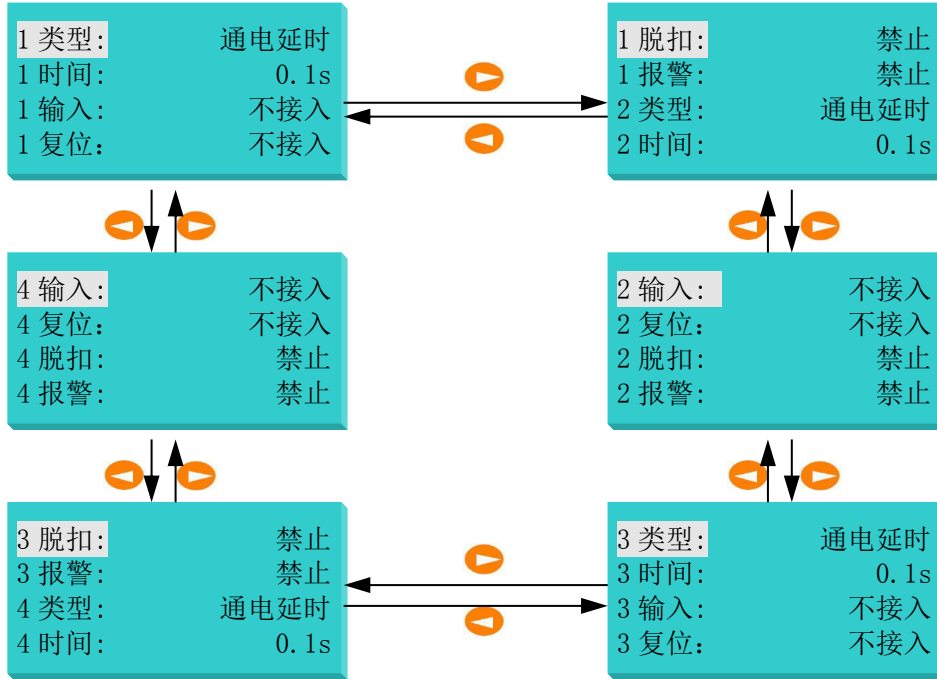


## Module Temperature Protection

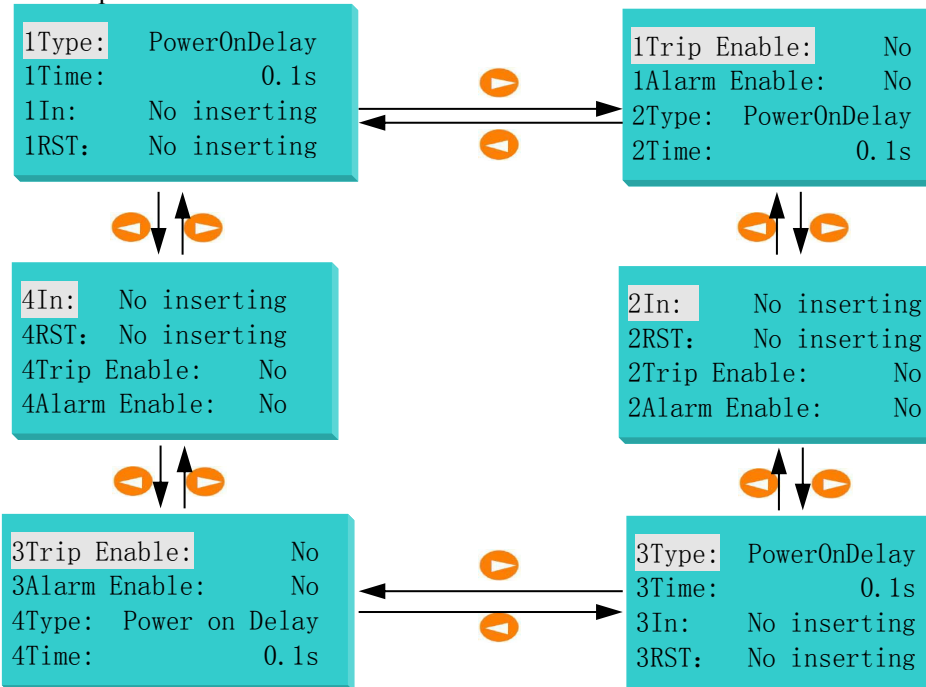




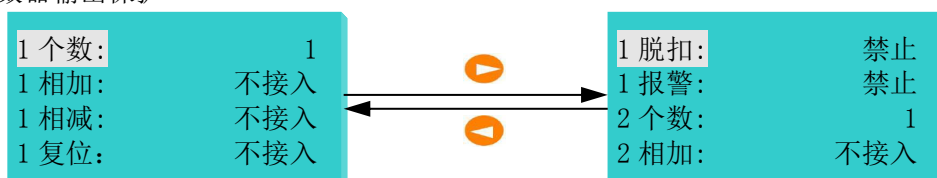
定时器输出保护

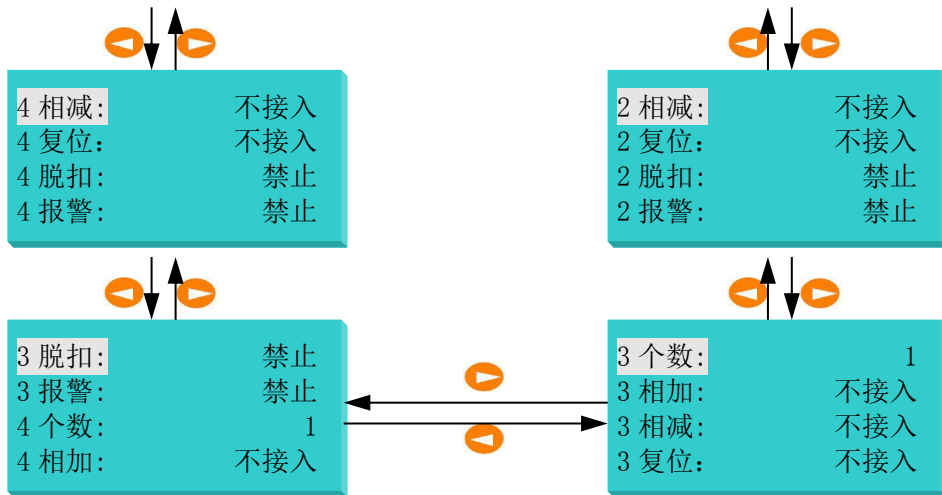


Timer Output Protection

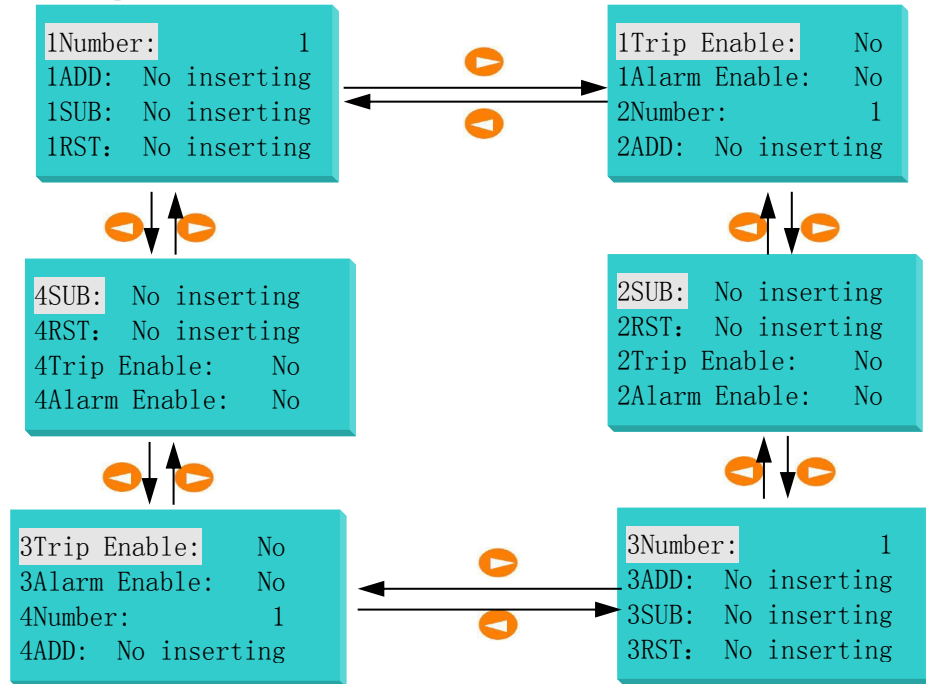


计数器输出保护

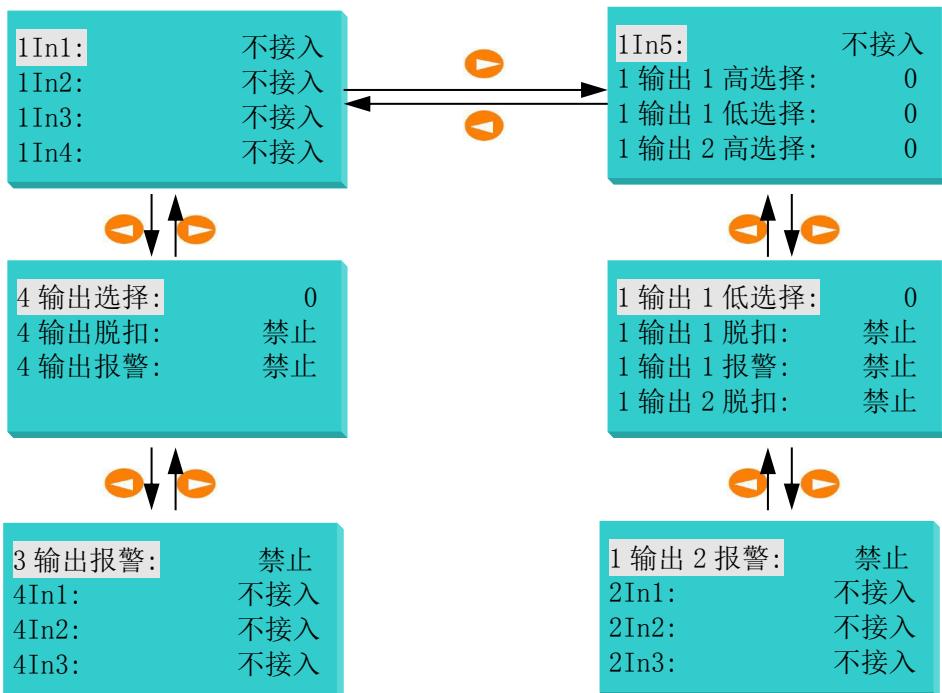


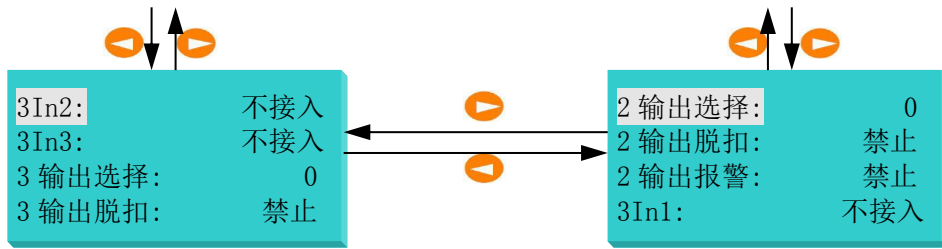


Counter Output Protection

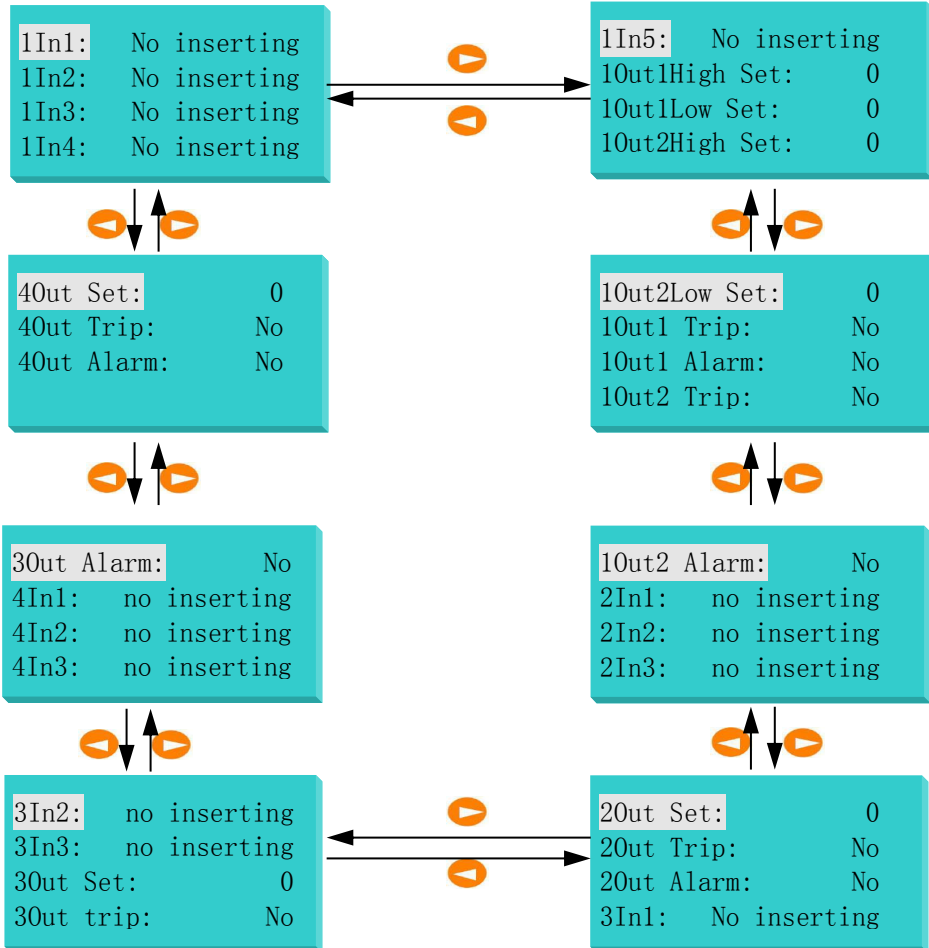


真值表输出保护

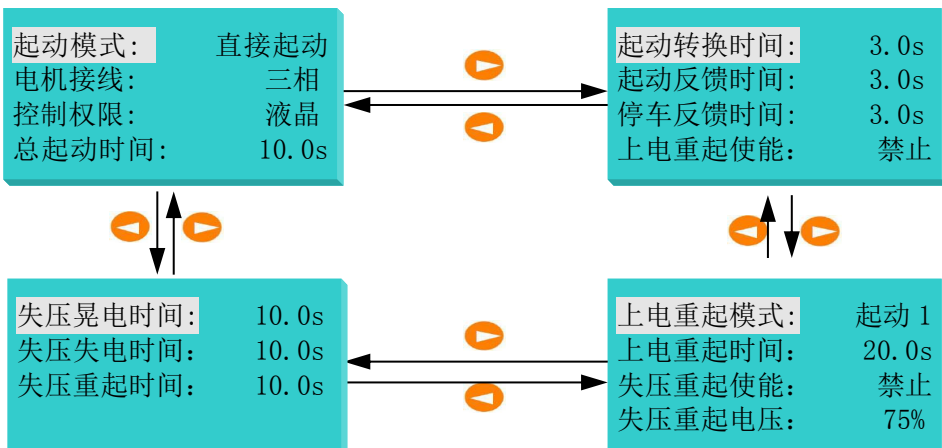




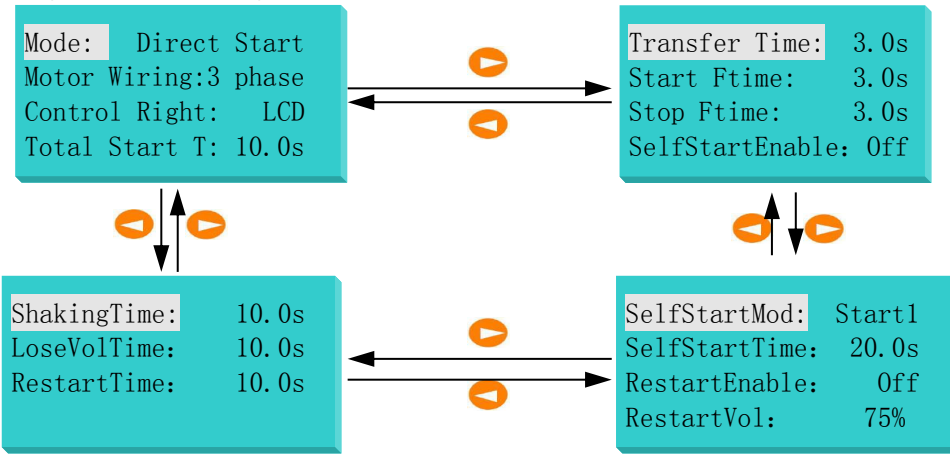
Truth Table Output Protection



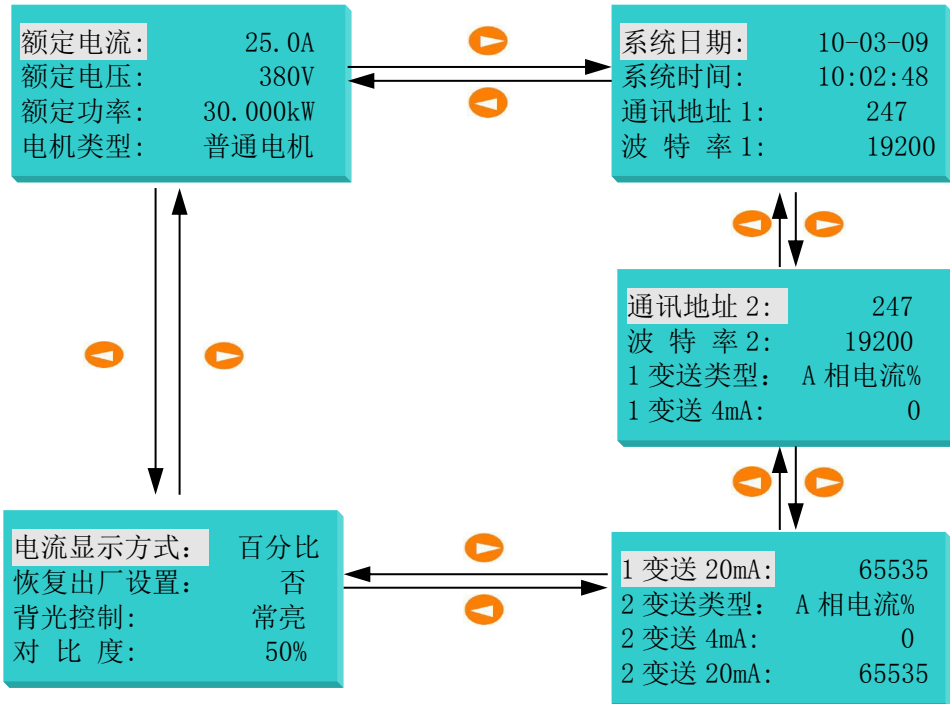
起动参数设置



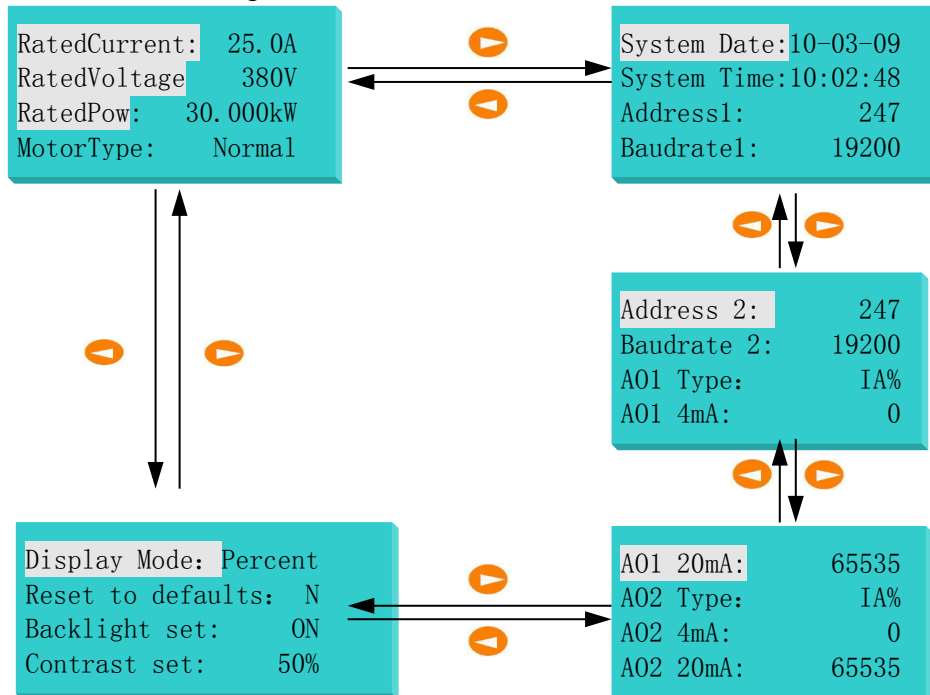
### Starting Parameter Setting



### 系统参数设置



### System Parameter Setting





## 8 功能介绍 Function introduction

### 8.1 保护功能 Protection function

保护参数设定见表 17 所示。Protection parameter setting is as shown in Table 17.

Table 17 Protection parameter setting

功能 Function	项目 Item	内容 Details
电机额定电流 Motor rated current	Ie	1.6(0.40-2.00);6.3 (1.6-6.3);25 (6.3-25); 100 (25-100);250 (63-250);800 (250-800)
电机额定电压 Motor rated voltage	Ue	380V、660V。
过载保护 Overload protection	不动作特性 No-action characteristic	<105%Ie,2h 内不动作 <105%Ie,no action in 2h
	动作特性 action characteristic	120%Ie,1h 内延时动作 120%Ie, action delay in 1h
	脱扣级别 Tripping level	2、3、5,10,15,20,25,30,35,40
	允许起动热容 Allowed starting thermal capacity	方式一、方式二 Mode one, mode two
	冷却时间 Cooling time	0min~120min, 单位(unit): 1min
	起动过载屏蔽时间 Starting overload shield time	0s~起动时间 0s~Starting time
	故障复位方式 Fault reset mode	手动/自动 Manual/automatic
	过载保护方式 Overload protection mode	报警, 跳闸 Alarm, tripping
断相保护 Phase failure protection	动作范围 Action scope	电流不平衡度大于 50% Current unbalance greater than 50%
	动作时间 Action time	0.1S~600.0S
	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
接地保护 Grounding Protection	整定值范围 Setting value scope	(20%~100%)Ie
	起动不驱动时间 Starting no driving time	0.1S~600.0S
	运行不驱动时间 Running no driving time	0.1S~600.0S
	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
漏电保护 Leakage protection	整定值范围 Setting value scope	50mA~1A, 3A~30A
	起动不驱动时间 Starting no driving tim	0.1S~600.0S

	运行不驱动时间 Running no driving time	0.1S~600.0S
	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
堵转保护 Stalling protection	动作值整定范围 Action value setting range	100% Ie~1000%Ie
	延时时间整定范围 Delay time setting scope	0.1S~600.0S
	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
阻塞保护 Blocking protection	动作值整定范围 Action value setting scope	100% Ie~1000%Ie
	延时时间整定范围 Delay time setting scope	0.1S~600.0S
	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
短路保护 Short-circuit protection	动作值整定范围 Action value setting scope	200%Ie~2000%Ie
	延时时间整定范围 Delay time setting scope	0.1S~600.0S
	保护动作方式 Protection action mode	报警, 跳闸, 动作于短路保护继电器 Alarm, tripping, operated by short-circuit protection relay
欠载保护 Underload protection	动作值整定范围 Action value setting scope	(20%~95%) Ie
	延时时间整定范围 Delay time setting scope	0.1S~600.0S
	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
不平衡保护 Unbalance protection	动作条件 Action requirement	三相电流不平衡度为: 10%~100% Three-phase circuit unbalance is: 10%~100%
	动作时间 Action time	0.1S~600.0S
	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
起动超时保护 Starting overtime protection	起动时间范围 Starting time scope	0.1S~60.0S
	动作时间 Action time	瞬动 Action instantaneously
	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
欠电压保护 Undervoltage protection	欠压整定值 Under-voltage setting value	(10%~100%)Ue
	延时动作时间 Delay action time	0.1S~600.0S

	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
过电压保护 Overvoltage protection	过压整定值 Over-voltage setting value	(110%~150%)Ue
	动作时间 Action time	0.1S~600.0S
	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
欠功率保护 Underpower protection	欠功率整定值 Under-power setting value	(10%~100%)P
	动作时间 Action time	0.1S~600.0S
	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
相序保护 Phase sequence protection	动作值设定 Action value setting	使能/禁止 Enable/Forbid
	动作时间 Action time	< 0.5s
	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
外部故障保护 External fault protection	延时时间整定范围 Delay time setting scope	0.1S~600.0S
	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
主体温度保护 Master temperature protection	传感器类型 Sensor type	PTC/NTC
	动作电阻设定值 Action resistance setting value	0.1kΩ~30kΩ
	返回电阻设定值 Return resistance setting value	0.1kΩ~30kΩ
	故障复位方式 Fault reset mode	手动/自动 Manual/Automatic
	动作时间 Action time	0.1S~600.0S
	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
模块温度保护 Module temperature protection	传感器类型 Sensor type	PT100、PT1000、Cu50、PTC、NTC
	复位方式 Reset mode	手动/自动 Manual/Automatic
	动作电阻设定值 Action resistance setting value	温度时(Temperature): -270℃~+850℃; 电阻时(resistance): 0.1kΩ~30kΩ
	返回电阻设定值 Return resistance setting value	温度时(Temperature): -270℃~+850℃; 电阻时(resistance): 0.1kΩ~30kΩ
	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping

定时器输出保护 Timer Output protection	类型 Type	通电延时、记忆通电延时、断电延时、即时翻转 Power on delay, memory power on delay, power failure delay, instant turnover
	动作时间 Action time	0.1S~600.0S
	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
计数器输出保护 Counter output protection	类型 Type	加、减 Adding, subtract
	动作时间 Action time	0.1S~600.0S
	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
真值表输出保护 Truth table output protection	类型 Type	真值表 1~真值表 4 Truth value1~Truth value4
	动作时间 Action time	0.1S~600.0S
	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
模块结构故障 Module structure fault	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
内部故障保护 Internal fault protection	动作时间 Action time	0.1S~600.0S
	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
模拟量输入保护 Analog input protection	输入回滞量 Input hysteresis value	0~2.3mA
	保护时段 Protection period	起动时、运行时、全程 When starting, running, whole course
	动作类型 Action type	高保护、低保护 High protection, low protection
	动作时间 Action time	0.1S~600.0S
	保护动作方式 Protection action mode	报警, 跳闸 Alarm, tripping
上电重起动 Power on restarting	上电重起动 Power on restarting	禁止/使能 Forbid/Enable
	上电重起动模式 Power on restarting mode	恢复、起动 1、起动 2 Recover, start1, start2
	上电重起动时间 Power on restarting time	0.1S~600.0S
欠/失压重起动 (抗晃电功能) Be under/ voltage off restarting (anti-	失压重起动 Voltage off restarting	禁止/允许 Forbid/Enable
	失压重起电压 voltage off restarting voltage	(20%~95%)Ue

interference electricity function)	失压晃电时间 Loss of voltage anti- interference electricity time	0.1S~10.0S
	失压失电时间 Loss of voltage to lose power time	0.5S~600.0S
	失压重起时间 Voltage off restarting time	0.1S~600.0S
tE 保护 tE protection	不动作特性 No-action characteristic	<150%Ie,永不动作 <150%Ie, no action forever
	脱扣级别 Tripping level	2, 3, 4, 5, 6, 8, 10, 12, 15,20
	允许起动热容 Allowed starting thermal capacity	方式一、方式二 Mode one, mode two
	冷却时间 Cooling time	0min~120min, 单位(unit): 1min
	起动屏蔽时间 Starting shield time	0s-起动时间 0s-starting time
	故障复位方式 Fault reset mode	手动/自动 Manual/automatic
	过载保护方式 Over-load protection mode	报警, 跳闸 Alarm, tripping

### 过载保护

当电动机在过负载情况下, 长时间超过其额定电流运行时, 会导致电动机过热, 绝缘降低而烧毁, 保护器根据电动机的发热特性, 计算电动机的热容量, 模拟电动机发热特性对电动机进行保护。

When the motor is running in the situation of overload, the current exceed its rated current for a long time. The motor will overheat and burn down because the insulation decreases. The protector computes the heat capacity according to the heat generation characteristics of the motor, and simulates heat generation characteristics to protect the motor.

允许起动热容为方式一时, 必须等热容降到 15%以下时, 才能允许再起动; 允许起动热容为方式二时, 热容下降到起动热容 (100%热容-上次起动所用的起动热容-2%) 或降到 15%以下热容时,运行起动。

When the allowed starting thermal capacity is mode one, the motor can be allowed to restart only if the thermal capacity drop under 15%. When the allowed starting thermal capacity is mode two, the motor can start while the thermal capacity drop to the starting thermal capacity (100% thermal capacity-the starting thermal capacity last time -2%) or under 15% thermal capacity.

■ 过载保护电流—时间对照表如表 18 所示, 过载特征曲线图 (K 曲线图) 如图 21 所示。

Overload protection current-Time table of comparison is shown as Table 18, the Overload characteristic curve graph (K curve graph) is shown as Figure 21.

表 18 脱扣曲线表

Table 18 Tripping curve table

可选择的脱扣曲线等级 K Selectable tripping curve level K	2	3	5	10	15	20	25	30	35	40
脱扣延时 (S) Tripping delay (s)	三相平衡的负载, 自冷态始 Three-phases balance load, from the cold state									

额定值 Ie Rated value Ie	×1.2	50	75	125	250	375	500	625	750	875	1000
×1.5		32	48	80	160	240	320	400	480	560	640
×2		18	27	45	90	135	180	225	270	315	360
×3		8	12	20	40	60	80	100	120	140	160
×4	4.5 2		6.78	11.3	22.5	33.8	45	56.3	67.5	78.8	90
×5	2.8 8		4.32	7.2	14.4	21.6	28.8	36	43.2	50.4	57.6
×6		2	3	5	10	15	20	25	30	35	40
×7.2		1.4	2.1	3.5	6.9	10.4	13.9	17.4	20.8	24.3	27.8
×8	1.1 2		1.68	2.8	5.6	8.4	11.3	14.1	16.9	19.7	22.5

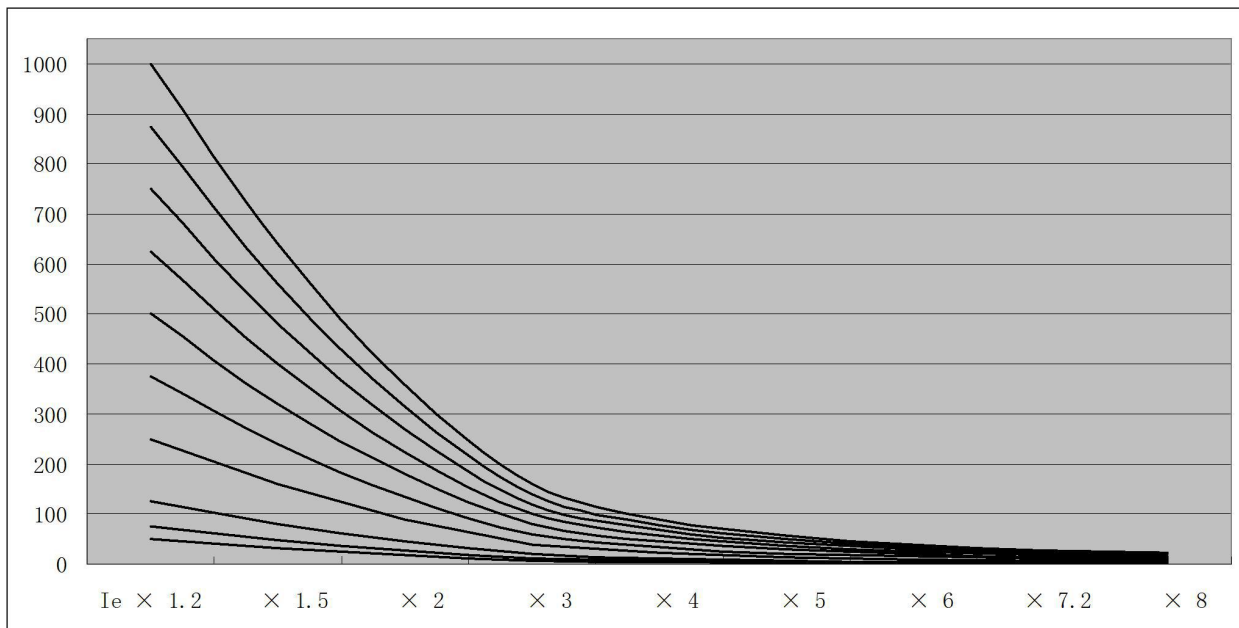


图 21 过载特性曲线图

Figure 21 Overload characteristics graph

### 断相/不平衡保护

#### Phase failure/unbalance protection

断相/不平衡故障运行时对电动机的危害很大，当电动机发生断相或三相电流严重不平衡时，如不平衡率达到保护设定值时，保护器按照设定的要求保护，发出停车或报警，确保电动机的安全运行。

Running in the condition of phase failure/unbalance fault have great harm to motor. When phase failure or serious unbalance of three-phase current occurs, such as the unbalance rate achieves the protection setting value, the protector will operate according to the set demands, stopping or giving an alarm to ensure the secure running of the motor.

三相不平衡率计算公式为： $|I-I_{av}|/I_x$ ， $I_{av}$  为三相电流平均值，当  $I_{av}$  小于  $I_e$  时，分母  $I_x = I_e$ ；当  $I_{av}$  大于  $I_e$  时，分母  $I_x = I_{av}$ 。

The calculating formulas of the three-phase unbalance rate is:  $|I-I_{av}|/I_x$ ， $I_{av}$  is the mean value of the three phases current, When  $I_{av}$  less than  $I_e$ , the denominator  $I_x = I_e$ ; When  $I_{av}$  greater than  $I_e$ , the denominator  $I_x = I_{av}$ .

## 剩余电流保护（接地/漏电）

### Residual current protection (grounding/leakage)

ARD3T 同时具备接地保护和漏电保护功能。接地保护自动计算剩余电流，不需要外接互感器，用于相线对电动机金属外壳的短路保护。漏电保护是通过增加漏电互感器，以检测出故障电流，主要用于非直接接地的保护，以保证人身安全。

ARD3T has the function of grounding and leakage protection. Grounding protection calculates the surplus current automatically, without external joining mutual inductor, to execute the short circuit protection of the motor metal shell by the phase line. Leakage protection detects the fault current by adding the leakage mutual inductance device, and is used for the protection of the non-direct grounding to ensure the personal safety.

### 堵转保护

电动机在起动过程中，由于负荷过大或自身机械原因，造成电动机轴被卡住，而未及时解除故障，将造成电机过热，绝缘降低而烧毁电机，堵转保护适用于电动机起动发生此类故障时进行保护，当电流达到动作设定电流时，保护器及时在动作（延时）设定时间内动作或报警，避免电机烧毁。

### Stalling protection

Because of the too much load or mechanical causes of the motor itself, in the starting process, the motor shaft is locked. If the fault can not be get rid of immediately, the motor will overheat and burn down because of the decreasing insulation. Stalling protection is suitable for such fault protection in the starting process. When the current achieves the operation setting value, the protector will operate timely in the operation (delay) set time or give an alarm to avoid burning motor.

### 阻塞保护

#### Blocking protection

阻塞保护适用于电动机运行过程中发生卡死。当电流达到动作设定电流时，保护器及时在动作（延时）设定时间内动作或报警，避免电机烧毁。

Blocking protection is used for the blocking in the running of the motor. When the current achieve the operation set current, the protector will operate timely in the operation (delay) set time or give an alarm to avoid burning motor.

### 欠载（欠流）保护

#### Underload (undercurrent) protection

当电动机所带负载为泵式负载时，电动机空载或欠载运转会产生危害，保护器提供欠载保护，当三相的平均电流与额定电流的百分比低于欠载设定值时，保护器应在动作（延时）设定时间内动作或报警。

When the load of the motor is the pump, no load or under-load will damage the motor. The protector provides under-load protection. When the percent of the mean current and rated current is less than under-load set value, the protector should operate in the operation (delay) set time or give an alarm.

### 起动超时保护

#### Starting overtime protection

电动机起动时间到后，若保护器检测到电动机回路电流仍未下降到  $110\%I_e$  以下，启动该保护。针对增安电机，起动时间整定不得超过 1.7 倍  $t_E$  时间。

While the starting time is up, the protection will take effect on the condition that the protector detect the loop current is still not under  $110\%I_e$ . To the increased safety, the starting time can not be set to over 1.7 times  $t_E$ .

### 欠压保护

#### Undervoltage protection

电压过低会引起电动机转速降低，甚至停止运行，当主回路电压低于设定的欠电压保护值时，保护器按设定的要求进行保护，在动作设定时间内动作或报警。

Too low voltage will cause to reduce the speed of the motor, even stop running. If the main loop voltage is less than the set under-voltage protection value, the protector will execute the protection according to the set demands to operate in the operation set time or give an alarm.

### 过压保护

## Overvoltage protection

电压过高引起电动机绝缘程度损伤，当主回路电压超过设定的保护电压时，保护器按设定的要求进行保护，在动作设定时间内动作或报警，以保证电动机设备安全。

Over-voltage will cause to damage the insulation of the motor. If the main loop voltage is greater than the set protection voltage, the protector will execute the protection according to the set demands. It will operate in the operation set time or give an alarm to ensure the device safety of the motor.

## 欠功率保护

### Underpower protection

电动机由于传动装置损坏，失去机械输出能力，欠载运行，电动机功率因数较低，但电动机电流很大，大量消耗系统的无功，当负载功率与额定功率的百分比低于设定动作值时，保护器在动作设定时间内动作或报警。

The motor will lose the mechanical output ability and run in under-load state because of the damage of the drive device. The motor power factor is very low, but the motor current is very big to consume a lot of inactive power of the system. If the percent of the load power and the rated power is less than the set operation value, the protector will operate in the operation set time or give an alarm.

## 相序保护

### Phase sequence protection

当保护器检测到电动机的电压相序错误时，闭锁电动机起动，保护电动机安全。

When the protector detects the voltage phase fault of the motor, the locked motor will start to ensure the motor safety.

## 外部故障保护

### External fault protection

检测到外部故障输入信号输入时，保护器按照设定的要求保护，确保电动机设备安全。

When detecting out the external fault input signal, the protector will operate according to the set demands to ensure the motor device safety.

## 温度保护

### Temperature protection

通过检测预埋在电动机绕组上的测温传感器，来实现温度保护。

Execute the temperature protection by detecting the pre-lay temperature-test sensor on the motor coil.

温度保护用于低压（380V）小容量的电动机上，作为长时间过负荷、变负荷和反复短时运行过负荷、断相、三相不平衡、电源频率变化、通风不良、环境温度过高等引起的电机温度过高的保护。

Temperature protection is used for the small capacity motor of low voltage (380V). It execute the protection of the over-high temperature caused by the over-load for a long time, changing load, and running repeatedly and shortly in the case of over-load phase failure, three phases unbalance, power frequency change, bad ventilating, too high environment temperature and so on.

传感器为正温度系数 PTC，实测热电阻 $\geq$ 动作电阻设定值延时动作，故障动作后需待实测热电阻值 $<$ 返回电阻设定值，才可以复位报警或故障输出触点，使电动机再次正常运行。传感器为 NTC 与之相反。

When the sensor is positive temperature coefficient PTC, the protector operate after delay on the condition of the actual measurement thermal resistance $\geq$  operation resistance set value. After the operation, the protector can reset the alarm or fault output contact when the actual measurement thermal resistance $<$  return resistance set value to enable the motor run normally. When the sensor is NTC, the situation is on the contrary.

传感器为 PT100、PT1000、Cu50 时，实测温度值 $\geq$ 动作设定值延时动作，故障动作后需待实测值 $<$ 返回设定值，才可以复位报警或故障输出触点，使电动机再次正常运行。

When the sensor is PT100、PT1000、Cu50, the protector operate after delay on the condition of the actual measurement temperature $\geq$  operation set value. After the operation, the protector can reset the alarm or fault output contact when the actual measurement value $<$  return set value to enable the motor run normally.

## 短路保护

### Short circuit protection



当主回路电流大于接触器最大可分断电流时，不能通过保护继电器分断接触器，如果强行分断会引起接触器触点损坏，此时可以直接通过断路器来分断主回路，也可以通过给断路器励磁线圈发送信号分断断路器。

When the main loop current is greater than the max breaking current of the contactor, the contactor can not be broken by protection relay. The contact of the contactor can be damaged if it is forced to be broken. The main loop can be broken directly by breaker, and it also can be broken by sending signal to the magnetic coil of the breaker.

#### 欠/失电重起（抗晃电）

#### Underpower or loss power restarting (anti-interference electricity)

“晃电”指的是由于雷击、短路或其它原因造成的电网短时电压波动或短时断电现象。当现场电动机因晃电而停机时，如电网电压在允许的时间内恢复正常（回到设定的恢复电压以上），保护器再起动被晃停的电机，如电网电压在允许的时间内没能恢复正常，则保护器将闭锁程序，不再起动电动机。

“Interference electricity” is the voltage shaking shortly of the power grid or power failure for short time because of the thunder, short circuit or any other reasons. When the field motor stops because of anti-interference electricity, the protector can restart the motor if the grid voltage can get right in the allowable time (return to more than the set recovery voltage). The protector will lock the program and will not to restart the motor if the grid voltage can not get right in the allowable time.

为避免多台电机同时失压重起对电网造成较大的冲击，各台电机的失压重起动延时时间要有一定间隔，具体间隔时间根据实际工艺要求设置。

To avoid the great shock to the power grid because of voltage off restarting simultaneously by several motors, the restart delay time of these motors need an interval. The specific interval time can be set according to the actual technological requirements.

欠/失压重起（抗晃电）参数设置范围：

Under/ voltage off restarting (anti-interference electricity) parameters setting scope:

失压重起动 禁止/允许

Voltage off restarting Forbid/enable

失压重起动电压 20%Ue~95%Ue

Voltage off restarting voltage 20%Ue~95%Ue

晃电时间 0.1S~10.0S

Anti- interference electricity time 0.1S~10.0S

失电时间 1.0s~600.0s

Losing power time 1.0s~600.0s

失压重起延时 0.1s~600.0s

Voltage off restarting delay 0.1s~600.0s

#### 上电重起

#### Power on restarting

功能投入后，在保护器上电过程中，保护器将按照系统设置可实现电源恢复后的分时重起动。

When the function is enabled, the protector will execute the time sharing restarting after the power recover according to the system setting in the process of power on.

系统上电重起动功能设置为“允许”，重起动模式设置为“恢复”，ARD3T将根据掉电前的状态，判断系统是否重新起动，若掉电前系统处于运行状态，则上电后按设定的延时时间自动起动运行；

If the power on restarting function of the system is set to “Enabled”, the restarting mode is set to “Recover”, ARD3T will decide to restart or not according to the status before the power down. If the system is running status before the power down, It will start to run automatically according to the set delay time.

系统上电自起动功能设置为“允许”，自起动模式设置为“起动”时，ARD3T在上电时直接按照设定的延时时间自动起动电动机；

If the power on to start automatically function of the system is set to “Enabled”, the start mode is set to “Start”, ARD3T will start automatically according to the set delay time.

若上电重启动功能设置为“禁止”，则功能退出。

If the power on restarting function of the system is set to “Forbid”, the function exit.

tE 时间保护（适用于增安型电动机）

tE time protection (Applied to special safe motor)

对于增安型电动机，交流绕组在最高环境温度下达到额定运行稳定温度后，从开始通过堵转电流时记起，直至上升到极限温度所需的时间即为 tE 时间。增安型电机的 tE 时间通常由电机制造商提供，用户可以在电机铭牌上找到该数据。

For the special safe motor, after AC winding in the maximum environment temperature reached the rated stable running temperature, recording the process time tE from passing stalling current to the limiting temperature. The tE time is usually provided by motor manufacturers, the user may found this data from motor nameplate.

提供堵转时在 tE 时间内断开电动机电源的热过载保护，仅在电动机启动完成后投入，带有独立的延时计时器。tE 保护特征曲线动作延时对照表如表 19 所示，曲线图如图 22 所示。

The heat over-load protection act which break power supply of motor locked motor in tE time act only after finishing motor starting with independent delay timer. The table of comparisons of tE protection characteristic curve operation delay is shown in Table 19, the curve graph is shown Figure 22.

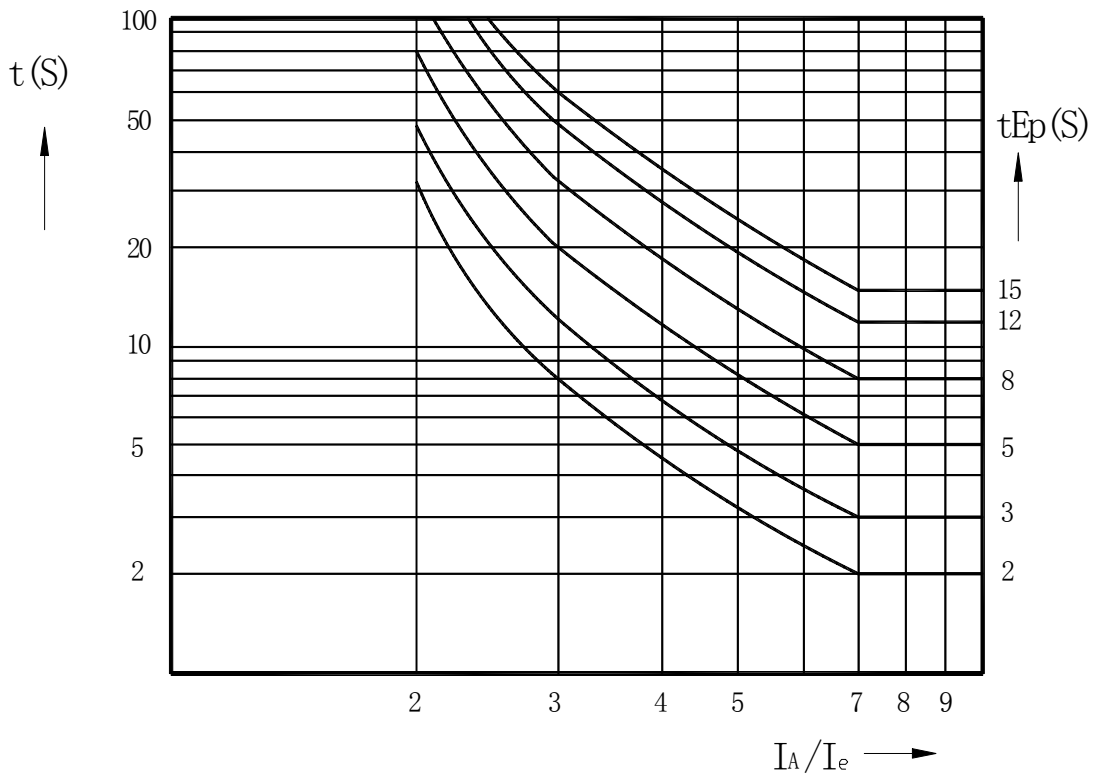


图 22 tE 保护延时与堵转电流比 IA/Ie 的电流—时间特性曲线

Figure22 Time characteristic of IA/Ie ratio of tE protection delay and stalling current

说明： tEp: 7 倍额定电流时允许堵转时间； IA: 堵转电流； Ie: 电动机额定电流。

Notes: tEp: Allowable stalling time at 7 times rated current

IA: Stalling current

Ie: Motor rated current

表 19 TE 曲线脱扣时间对照表

Table19 Table of comparison of TE curve tripping time

tEp 设定 IA/Ie	2 (s)	3 (s)	4 (s)	5 (s)	6 (s)	8 (s)	10 (s)	12 (s)	15 (s)	20(s)
2.0	32	48	64	80	96	128	160	192	240	320
2.2	20.27	30.4	40.54	50.67	60.81	81.08	101.35	121.62	152.02	202.7

2.4	14.75	22.12	29.5	36.87	44.25	59	73.75	88.5	110.63	147.5
2.6	11.54	17.32	23.09	28.87	34.64	46.19	57.74	69.29	86.62	115.4
2.8	9.46	14.19	18.92	23.65	28.39	37.85	43.31	56.78	70.97	94.6
3.00	8	12	16	20	24	32	40	48	60	80
3.20	6.91	10.37	13.83	17.29	20.75	27.67	34.59	41.51	51.88	69.1
3.40	6.08	9.13	12.17	15.22	18.26	24.35	30.44	36.52	45.66	60.8
3.60	5.43	8.14	10.86	13.58	16.29	21.72	27.16	32.59	40.74	54.3
3.80	4.9	7.35	9.8	12.25	14.7	19.6	24.5	29.41	36.76	49
4.00	4.46	6.69	8.93	11.16	13.39	17.86	22.32	26.79	33.48	44.6
4.20	4.09	6.14	8.19	10.24	12.29	16.39	20.49	24.59	30.74	40.9
4.40	3.79	5.68	7.58	9.47	11.37	15.06	18.95	22.74	28.42	37.9
4.60	3.52	5.28	7.05	8.81	10.57	14.1	17.62	21.15	26.43	35.2
4.80	3.29	4.94	6.59	8.24	9.88	13.08	16.48	19.77	24.72	32.9
5.00	3.09	4.64	6.19	7.74	9.29	12.38	15.48	18.58	23.22	30.9
5.20	2.92	4.38	5.84	7.3	8.76	11.68	14.6	17.53	21.91	29.2
5.40	2.76	4.15	5.53	6.91	8.3	11.07	13.83	16.6	20.75	27.6
5.60	2.63	3.94	5.26	6.57	7.89	10.52	13.15	15.78	19.73	26.3
5.80	2.5	3.76	5.01	6.27	7.52	10.03	12.54	15.05	18.81	25
6.00	2.4	3.6	4.8	6	7.2	9.6	12	14.4	18	24
6.20	2.3	3.45	4.6	5.75	6.9	9.2	11.51	13.81	17.26	23
6.40	2.21	3.32	4.42	5.53	6.64	8.85	11.07	13.28	16.6	22.1
6.60	2.13	3.2	4.27	5.33	6.4	8.54	10.67	12.81	16.01	21.3
6.80	2.06	3.09	4.12	5.16	6.19	8.25	10.32	12.38	15.48	20.6
7.00	2	3	4	5	6	8	10	12	15	20
8.00	2	3	4	5	6	8	10	12	15	20
9.00	0.2									

## 8.2 开关量可编程功能 Switching value programmable function

ARD3T 开关量输入输出支持可编程，编程内容见表 20。

ARD3T switching input and output support programmable function. The programmable details are shown in Table20.

表 20 开关量可编程功能

Table20 Switching value programmable function

开关量类型 Switching value type	可编程功能 Programmable function	
DI	普通 DI、起动 1（直接起动、左转、低速）、本地起动 2（右转、高速）、停止、复位、紧急停车、权限输入 1、权限输入 2、外部故障 1、外部故障 2、外部故障 3、外部故障 4、起/停、紧急起动 1、紧急起动 2 General DI, starting 1 (start directly ,left rotation, low speed), field starting 2(right rotation, high speed), stopping, resetting, emergency stopping, permission input1, permission input 2, external fault 1, external fault 2, external fault 3, external fault 4, starting/stopping, emergency starting1, emergency starting 2	
DO	不接入 No inserting	
	运动控制 Motion control	起动 1、起动 2、起动 3、起动准备好、权限指示 1、权限指示 2、运行输出 Starting 1, starting 2, starting 3, starting ready, permission indication 1, permission indication 2, running output
	任意故障脱扣闭合	

Any fault tripping closing	
故障脱扣闭合 Fault tripping closing	过载、断相、接地、堵转、阻塞、欠载、不平衡、外部故障 1、外部故障 2、外部故障 3、外部故障 4、起动超时、反馈超时、过压、欠压、相序、欠功率、模拟量输入、温度保护、定时器、计数器、真值表 Overload, phase failure, grounding, stalling, blocking, underload, external fault 1, external fault 2, external fault 3, external fault 4, start overtime, feedback overtime, overvoltage, undervoltage, phase sequence, underpower, analog input, temperature protection, timer, counter, truth table
任意故障脱扣断开 Any fault tripping breaking	
故障脱扣断开 Fault tripping breaking	过载、断相、接地、堵转、阻塞、欠载、不平衡、外部故障 1、外部故障 2、外部故障 3、外部故障 4、起动超时、反馈超时、过压、欠压、相序、欠功率、模拟量输入、温度保护、定时器、计数器、真值表 Overload, phase failure, grounding, stalling, blocking, underload, unbalance, external fault 1, external fault 2, external fault 3, external fault 4, starting overtime, feedback overtime, overvoltage, undervoltage, phase sequence, underpower, analog input, temperature protection, timer, counter, truth table
任意故障报警 Any fault alarm	
故障报警 Fault alarm	过载、断相、接地、堵转、阻塞、欠载、不平衡、外部故障 1、外部故障 2、外部故障 3、外部故障 4、起动超时、反馈超时、过压、欠压、相序、欠功率、模拟量输入、温度保护、定时器、计数器、真值表 Overload, phase failure, grounding, stalling, blocking, underload, unbalance, external fault 1, external fault 2, external fault 3, external fault 4, starting overtime, feedback overtime, overvoltage, undervoltage, phase sequence, underpower, analog input, temperature protection, timer, counter, truth table
DI 控制 DI controlling	DI1~DI8
循环寄存器 Circulating register	Bit0~Bit15
计数器 Counter	计数器 1~计数器 4 Counter 1~Counter 4
定时器 Timer	定时器 1~定时器 4 Timer 1~Timer 4
真值表 Truth table	真值表 1 输出 1、真值表 1 输出 2, 真值表 2~真值表 4 Truth table 1 input 1, truth table 1 input 2, truth table 2~truth table 4
总线控制 Bus controlling	

### 8.3 模拟量可编程功能 Analog value programmable function

ARD3T 模拟量输出类型, 4mA、20mA 对应关系可编程, 编程内容见表 21。

ARD3T analog value output type, 4mA、20mA corresponding relation programmable. The programmable contents are shown in Table 21.

表 21 模拟量可编程输出

Tbale21 Analog value programmable output

变送类别 Transfer type	4mA对应值 4mA corresponding value	20mA对应值 20mA corresponding value	单位 unit
Ia、 Ib 、 Ic、 I <sub>max</sub> (%)	0~65535	1~65535	0.01
Ia、 Ib 、 Ic、 I <sub>max</sub> 实际值 Ia、 Ib 、 Ic、 I <sub>max</sub> actual value			1.6-0.001; 6.3-0.01; 25-0.01; 100-0.1; 250-0.1; 800-1
U <sub>a</sub> 、 U <sub>b</sub> 、 U <sub>c</sub> (%)			0.01
主体温度电阻值 Master temperature resistance value			1
模块温度值 Module temperature value			显示为温度时: When display is temperature:0.1 显示为电阻时: When display is resistance :1
4~20mA输入测量值 4~20mA input measuring value			0.01
P			0.01
F			0.01
电流不平衡度 Current unbalance			0.01

例 1:

变送类型为 Ia (%) ,%是 Ia 和 I<sub>e</sub> (额定电流)的百分比。要设定关系为:“电流为 0 时输出 4mA, 电流为 100%I<sub>e</sub> 时输出 20mA”。设定如下: 4mA 中设定为“0”, 20mA 中设定为“100”。

Eg1:

Transfer type is Ia(%), % is the percent of Ia and I<sub>e</sub> (rated current). The setting relation is:” When the current is 0, the output is 4mA, when the current is 100%I<sub>e</sub>, the output is 20 mA”. The setting as follows: “0”is set in 4mA,and “100” is set in 20mA.

例 2:

变送类型为 Ia 实际值, 要设定关系为:“电流为 0 时输出 4mA, 电流为额定电流时输出 20mA”。假定电机额定电流为 1.0A, 1.0A 电机对应电机保护器额定电流为 1.6, 根据表 21 可知小数点为 3 位, 设置为下: 4mA 中设定为“0”, 20mA 中设定为“1000”。

Eg2:

Transfer type is Ia actual value. The setting relation is: “When the current is 0, the output is 4mA, when the current is rated current, the output is 20 mA.” Supposed the rated current of the motor is 1.0A, the corresponding motor protector rated current is 1.6. According to Table21, the decimal point is 3, the setting as follows: “0”is set in 4mA,and “1000” is set in 20mA.

#### 8.4 定时器、计数器、真值表功能 Timer, counter, truth table function

ARD3T 可编程计数器上位机设置软件设置界面如图 23 所示, 编程内容如表 22 所示。

The setting interface of ARD3T programmable counter upper computer setting software is shown as Figure 23. The programmable contents are shown in Table22.



图 23 计数器

Figure 23 Counter

表 22 计数器可编程功能

Table 22 Counter programmable function

计数器 Counter	可编程功能 Programmable function	
计数器相加、 计数器相减、 计数器复位 Counter adding, Counter subtracting, Counter resetting	不接入 No inserting	
	运动控制 Motion control	起动 1、起动 2、起动 3、起动准备好、权限指示 1、权限指示 2、运行输出 Starting 1, starting 2, starting 3, starting ready, permission indication 1, permission indication 2, running output
	任意故障脱扣闭合 Any fault tripping closing	
	故障脱扣闭合 Fault tripping closing	过载、断相、接地、堵转、阻塞、欠载、不平衡、外部故障 1、外部故障 2、外部故障 3、外部故障 4、起动超时、反馈超时、过压、欠压、相序、欠功率、模拟量输入、温度保护、定时器、计数器、真值表 Overload, phase failure, grounding, stalling, blocking, underload, unbalance, external fault 1, external fault 2, external fault 3, external fault 4, start overtime, feedback overtime, overvoltage, undervoltage, phase sequence, underpower, analog input, temperature protection, timer, counter, truth table
	任意故障脱扣断开 Any fault tripping breaking	
	故障脱扣断开 Fault tripping breaking	过载、断相、接地、堵转、阻塞、欠载、不平衡、外部故障 1、外部故障 2、外部故障 3、外部故障 4、起动超时、反馈超时、过压、欠压、相序、欠功率、模拟量输入、温度保护、定时器、计数器、真值表 Overload, phase failure, grounding, stalling, blocking, underload, unbalance, external fault 1, external fault 2, external fault 3, external fault 4, starting overtime, feedback overtime, overvoltage, undervoltage, phase sequence, underpower, analog input, temperature protection, timer, counter, truth table
	任意故障报警 Any fault alarm	
故障报警 Fault alarm	过载、断相、接地、堵转、阻塞、欠载、不平衡、外部故障 1、外部故障 2、外部故障 3、外部故障 4、起动超时、反馈超时、过压、欠压、相序、欠功率、模拟量输入、温度保护、定时器、计数器、真值表	

		Overload, phase failure, grounding, stalling, blocking, underload, unbalance, external fault 1, external fault 2, external fault 3, external fault 4, starting overtime, feedback overtime, overvoltage, undervoltage, phase sequence, underpower, analog input, temperature protection, timer, counter, truth table
DI 控制 DI Control	DI1~DI8	
循环寄存器 Circulating register	Bit0~Bit15	
计数器 Counter	计数器 1~计数器 4 Counter 1~Counter 4	
定时器 Timer	定时器 1~定时器 4 Timer 1~Timer 4	
真值表 Truth table	真值表 1 输出 1、真值表 1 输出 2, 真值表 2~真值表 4 Truth table 1 input 1, truth table 1 input 2, truth table 2~truth table 4	
总线控制 Bus controlling		

ARD3T 可编程定时器分为 4 类分别是：通电延时、带记忆通电延时、断电延时、即时翻转。动作特性分别满足下面图 24~图 27，可编程内容见表 23。定时时间最小单位为 0.1s，当将输出脱扣/输出报警设置为使能后，满足设定定时时间后，可完成输出脱扣/输出报警功能。脱扣/报警满足“脱扣报警动作标志”要求。定时器有脱扣动作时，首先要通过复位将脱扣复位，再通过计数复位触发实现计数器复位。

ARD3T programmable timer is divided into 4 types: power on delay, power on delay with memory, power down delay, turning over immediately. The operation characteristic meet the following Figure24~Figure27, the programmable contents are shown in Table23. The min unit of the timing is 0.1s. When the output tripping / output alarm is enabled, it can execute the output tripping / output alarm function if the setting timing is met. Tripping/ alarm meet “tripping alarm operation mark”. When the time is tripped, reset the tripping by resetting firstly, and then reset the counter by counting reset triggering.

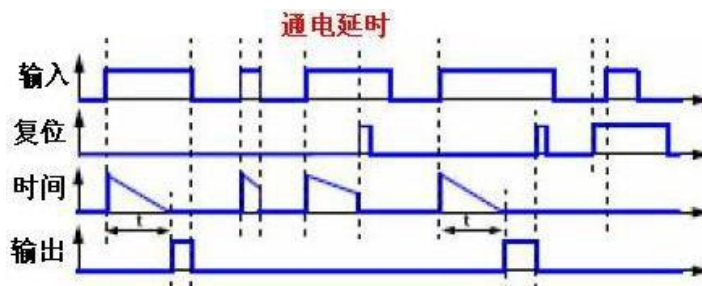


图 24 通电延时定时器动作图

Figure24 Power on delay timer operation diagram

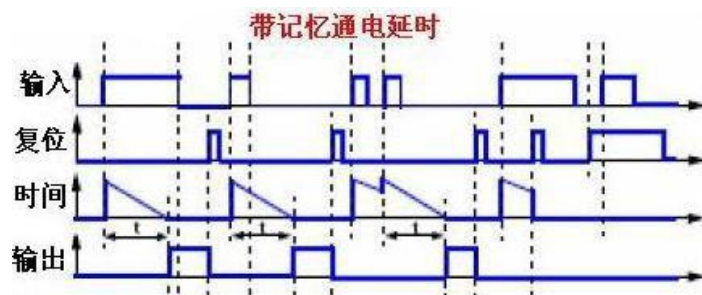


图 25 带记忆通电延时定时器动作图

Figure 25 Power on delay with memory timer operation diagram

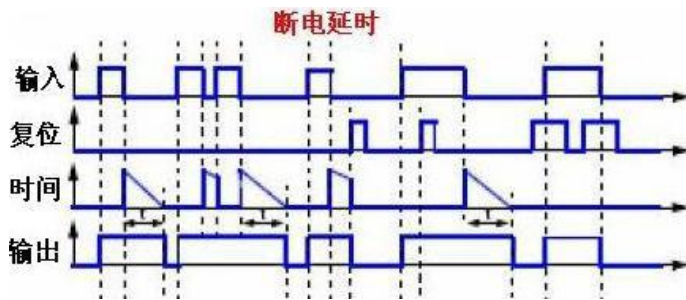


图 26 断通电延时定时器动作图

Figure26 Power down delay timer operation diagram

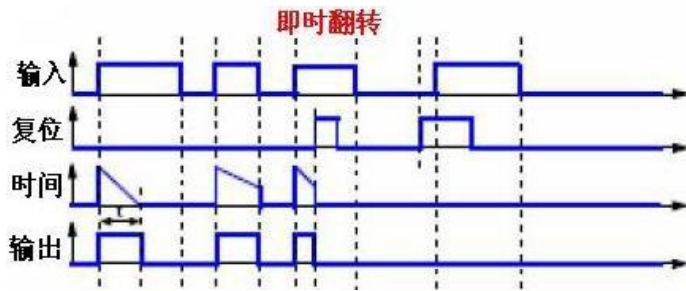


图 27 即时翻转定时器动作图

Figure27 Turning over immediately timer operation diagram

ARD3T 可编程定时器上位机设置软件设置界面如图 23 所示。

The setting interface of ARD3T programmable timer upper computer setting software is shown as Figure23.

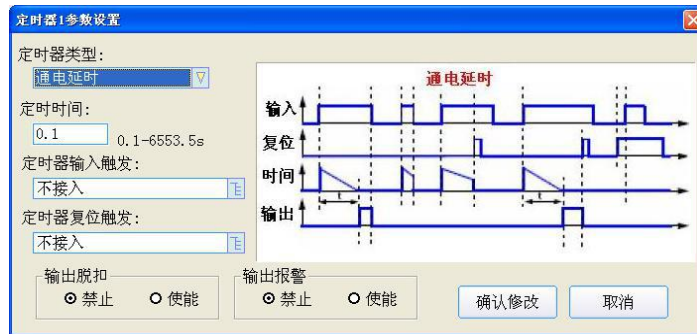


图 28 定时器

Figure 28 Timer

表 23 定时器可编程功能

Table 23 Timer programmable function

定时器 Timer	可编程功能 Programmable function	
定时器输入触发、定时器复位触发 Timer input triggering, timer reset triggering	不接入	No inserting
	运动控制 Motion controlling	起动 1、起动 2、起动 3、起动准备好、权限指示 1、权限指示 2、运行输出 Starting 1, starting 2, starting 3, starting ready, permission indication 1, permission indication 2, running output
	任意故障脱扣闭合 Any fault tripping closing	
	故障脱扣闭合 Fault tripping closing	过载、断相、接地、堵转、阻塞、欠载、不平衡、外部故障 1、外部故障 2、外部故障 3、外部故障 4、起动超时、反馈超时、过压、欠压、相序、欠功率、模拟量输入、温度保护、定时器、计数器、真值表



	Overload, phase failure, grounding, stalling, blocking, underload, unbalance, external fault 1, external fault 2, external fault3, external fault4, starting overtime, feedback overtime, overvoltage, undervoltage, phase sequence, underpower, analog input, temperature protection, timer, counter, truth table
任意故障脱扣断开 Any fault tripping breaking	
故障脱扣断开 Fault tripping breaking	过载、断相、接地、堵转、阻塞、欠载、不平衡、外部故障 1、外部故障 2、外部故障 3、外部故障 4、起动超时、反馈超时、过压、欠压、相序、欠功率、模拟量输入、温度保护、定时器、计数器、真值表 Overload, phase failure, grounding, stalling, blocking, underload, unbalance, external fault 1, external fault 2, external fault 3, external fault 4, starting overtime, feedback overtime, overvoltage, undervoltage, phase sequence, underpower, analog input, temperature protection, timer, counter, truth table
任意故障报警 Any fault alarm	
故障报警 Fault alarm	过载、断相、接地、堵转、阻塞、欠载、不平衡、外部故障 1、外部故障 2、外部故障 3、外部故障 4、起动超时、反馈超时、过压、欠压、相序、欠功率、模拟量输入、温度保护、定时器、计数器、真值表 Overload, phase failure, grounding, stalling, blocking, underload, unbalance, external fault 1, external fault 2, external fault 3, external fault 4, starting overtime, feedback overtime, overvoltage, undervoltage, phase sequence, underpower, analog input, temperature protection, timer, counter, truth table
DI 控制 DI controlling	DI1~DI8
循环寄存器 Circulating register	Bit0~Bit15
计数器 Counter	计数器 1~计数器 4 Counter 1~Counter 4
定时器 Timer	定时器 1~定时器 4 Timer 1~Timer 4
真值表	真值表 1 输出 1、真值表 1 输出 2, 真值表 2~真值表 4 Truth table1 input 1, truth table1 input 2, truth table 2~truth table 4
总线控制 Bus controlling	

ARD3T 真值表: ARD3T 真值表分为: 真值表 1 (5 入、2 出)、真值表 2、3、4 (3 入、1 出), 可编程内容见表 24。上位机设置软件设置界面如图 29、30 所示。

ARD3T truth table: ARD3T truth table is divided into: truth table1 (5 inputs,2 outputs), truth table2、3、4 (3 inputs, 1 output), programmable contents are shown in Table 24. The setting interface of the upper computer setting software is shown as Table29, 30.



图 29 真值表 1

Figure 29 Truth table1



图 30 真值表 2

Figure 30 Truth table2

表 24 真值表可编程功能

Table 24 Truth table programmable function

真值表 Truth table	可编程功能 Programmable function	
	不接入	No inserting
	运动控制 Motion controlling	起动 1、起动 2、起动 3、起动准备好、权限指示 1、权限指示 2、运行输出 Starting 1, starting 2, starting 3, starting ready, permission indication 1, permission indication 2, running output
	任意故障脱扣闭合 Any fault tripping closing	
真值表输入 Truth table input	故障脱扣闭合 Fault tripping closing	过载、断相、接地、堵转、阻塞、欠载、不平衡、外部故障 1、外部故障 2、外部故障 3、外部故障 4、起动超时、反馈超时、过压、欠压、相序、欠功率、模拟量输入、温度保护、定时器、计数器、真值表 Overload, phase failure, grounding, stalling, blocking, underload, unbalance, external fault 1, external fault 2, external fault 3, external fault 4, starting overtime, feedback overtime, overvoltage, undervoltage, phase sequence, underpower, analog input, temperature protection, timer, counter, truth table
	任意故障脱扣断开 Any fault tripping breaking	
	故障脱扣断开 Fault tripping breaking	过载、断相、接地、堵转、阻塞、欠载、不平衡、外部故障 1、外部故障 2、外部故障 3、外部故障 4、起动超时、反馈超时、过压、欠压、相序、欠功率、模拟量输入、温度保护、定时器、计数器、真值表

		Overload, phase failure, grounding, stalling, blocking, underload, unbalance, external fault 1, external fault 2, external fault 3, external fault 4, starting overtime, feedback overtime, overvoltage, undervoltage, phase sequence, underpower, analog input, temperature protection, timer, counter, truth table
	任意故障报警 Any fault alarm	
	故障报警 Fault alarm	过载、断相、接地、堵转、阻塞、欠载、不平衡、外部故障 1、外部故障 2、外部故障 3、外部故障 4、启动超时、反馈超时、过压、欠压、相序、欠功率、模拟量输入、温度保护、定时器、计数器、真值表 Overload, phase failure, grounding, stalling, blocking, underload, unbalance, external fault 1, external fault 2, external fault 3, external fault 4, starting overtime, feedback overtime, overvoltage, undervoltage, phase sequence, underpower, analog input, temperature protection, timer, counter, truth table
	DI 控制 DI controlling	DI1~DI8
	循环寄存器 Circulating register	Bit0~Bit15
	计数器 Counter	计数器 1~计数器 4 Counter 1~counter 4
	定时器 Timer	定时器 1~定时器 4 Timer 1~timer 4
	真值表 Truth table	真值表 1 输出 1、真值表 1 输出 2, 真值表 2~真值表 4 Truth table 1 input 1, truth table 1 input 2, truth table 2~truth table 4
	总线控制 Bus controlling	

## 8.5 Modbus 通讯 Modbus communication

Modbus RTU 通信协议概述

Modbus RTU communication protocol overview

电气接口: RS485 半双工

Electrical interface: RS485 half-duplex

波特率: 1200/2400/4800/9600/19200/38400

Baud rate: 1200/2400/4800/9600/19200/38400

地址: 由一个字节组成 (8 位二进制), 十进制为 0~255, 系统中只使用 1~247, 其它保留

ADDR: composed by a byte (8-bit binary digits), decimalism is 0~255, only use of 1~247 in system, other reserves.

错误检测: CRC

Error detection: CRC

数据格式:

地址码	功能码	数据区	CRC 校验
-----	-----	-----	--------

Data format: address code function code data field CRC checkout

数据长度:

1 个字节	1 个字节	N 字节	2 个字节
-------	-------	------	-------

Data length: one byte one byte n bytes 2 bytes

每字节位: 1 位起始位、8 位数据位 (最小有效位先发送)、无奇偶校验、1 位停止位

Bits of each byte: 1 bit start bit, 8 bits data bit (minimum significance bit sent firstly), no odd-even check bit, 1 bit stop bit

ARD3T 支持的 modbus 功能码

Modbus function code supported by ARD3T

03 (0x03) 功能码: 读保持寄存器

03 (0x03) function code: read holding register

16 (0x10) 功能码: 写多个保持寄存器

16 (0x10) function code: write multiple holding register

注:

To note:

1) 主站写参数, 如参数超出数据范围, 按照异常码 03 (非法数据) 回复。

1) Parameters are written at master station, and if the parameter is beyond the data limits, reply exception code 03 (illegality data)

2) 运行控制位、输出控制位使用 16 功能码写入。

2) Operational control bit or output control bit is written into by 16 function code.

通讯应用

Communion application

本节所举实例尽可能采用下表格式 (数据为 16 进制)

The examples cited by this section should be adopted the style (data are hexademical) as shown in table below as far as possible.

Addr	Fun	Data start		Data		CRC16	
		reg Hi	reg Lo	reg Hi	reg Lo	Lo	Hi
01H	03H	00H	00H	00H	06H	C5H	C8H
地址	功能码	数据起始地址		数据读取个数		循环冗余校验码	

ADDR function code data initial address data read number CRC code

读数据

Read data

例 1: 使用 03 功能读寄存器: 读取 247 号 ARD3T, 从地址 00 开始读 3 个数据

Example 1: Using of 03 function read register: read address 247 ARD3T, start reading 3 data from address 00.

查询数据帧 Inquired data frames	F7 03 00 00 00 03 11 5D
返回数据帧 Returned data frames	F7 03 06 00 00 00 00 00 0E D1

说明:

Explanations:

F7: 从机地址

F7: slave address

03: 功能码

03: function code

06: 十六进制, 十进制为 6, 表示后面有 6 个字节的数据

06: 16 band, 10 band is 6, which means 6 bytes data behind.

0E D1: 循环冗余校验码

0E D1: CRC code

ARD3T 通讯地址见表 25~表 27, 地址 80~286、300~359 为可读写, 其它地址为可读。

ARD3T communication address is as shown in table 25 to 27. Address 80 to 286, and address 300 to 359 are readable and writable, and other addresses are readable.

表 25 通讯地址表

Table 25 Communication address table

地址 Address	名称 Name	范围 Range	数据类型 Data type	备注 Remarks
0	版本号 Version number		Unsigned int	0x0102 表示版本为 V1.2 0x0102 means
1	识别号 Identification number	0x070F	Unsigned int	
2	A 相电流实际值 A phase current actual value		Unsigned int	I=读取电流值/电流倍率 I= reading current value / current multiplying power 例: 读取 A 相电流值为 3000, 电流倍率为 10, 实际 电流为 300.0A; Eg: A phase current readed value is 3000, current multiplying power is 100, then actual current is 300A.
3	B 相电流实际值 B phase current actual value		Unsigned int	
4	C 相电流实际值 C phase current actual value		Unsigned int	
5	三相电流最大值 3-phase current maximum value		Unsigned int	
6	电流倍率 Current multiplying power		Unsigned int	电流倍率为 1 或 10 或 100 或 1000 Current magnification is 1 or 10 or 100 or 1000
7	电流不平衡度 Unbalance degree of current		Unsigned int	单位% Unit %
8	AB 线电压实际值 AB line voltage actual value		Unsigned int	含小数点一位, 例: 0x0BB8 表示 300.0V A bit decimal point owned, eg: 0x0BB8 means 300.0V
9	BC 线电压实际值 BC line voltage actual value		Unsigned int	含小数点一位, 例: 0x0BB8 表示 300.0V A bit decimal point owned, eg: 0x0BB8 means 300.0V
10	CA 线电压实际值 CA line voltage actual value		Unsigned int	含小数点一位, 例: 0x0BB8 表示 300.0V A bit decimal point owned, eg: 0x0BB8 means 300.0V
11	当前频率 Present frequency		Unsigned int	小数点固定为 2 位 (0.01Hz) 2 bits decimal point fixed (0.01Hz)
12	功率因数 Power factor		Signed int	小数点固定为 3 位 3 bits decimal point fixed
13	当前功率实际值高字 High byte of present power actual value		Signed long	小数点 3 位, 单位 kW (0.001kW) 3 bits decimal point, unit Kw (0.001kW)
14	当前功率实际值低字 Low byte of present power actual value			
15	当前电能高字 High byte of present electric energy		Unsigned long	小数点 1 位, 单位 kWh (0.1kWh) 1 bit decimal point, unit kWh (0.1kWh)
16	当前电能低字 Low type of present electric energy			
17	实际接地电流 Actual grounding current		Unsigned int	小数点同地址 6 Decimal point is the same as address 6.
18	漏电流高字 High byte of leakage current		Unsigned long	小数点 3 位, 单位 A (0.001A) 3 bits decimal point, unit A (0.001A)
19	漏电流低字 Low byte of leakage current			

20	当前热容 Present heat capacity		Unsigned int	单位% Unit %
21	预计脱扣时间 Predicting tripping time		Unsigned int	单位秒 Unit second
22	总运行时间 Total operation time		Unsigned int	单位小时 Unit hour
23	总停车时间 Total stopping time		Unsigned int	单位小时 Unit hour
24	本次运行时间 Present operating time		Unsigned int	单位分钟 Unit minute
25	本次停车时间 Present stopping time		Unsigned int	单位分钟 Unit minute
26	起动次数 Starting times		Unsigned int	
27	停车次数 Stopping times		Unsigned int	
28	脱扣次数 Tripping times		Unsigned int	
29	主体温度电阻 Master temperature resistance		Unsigned int	单位Ω Unit Ω
30	温度模块输入 1 Temperature module input 1	传感器类型设置为 PT100,PT1000,Cu50 时单位℃,小数点 1 位,类型为 signed int; 设置为 PTC,NTC 时单位Ω,小数点 0 位,类型为 unsigned int Type of sensor that is PT100 or PT1000 or Cu50, is set as unit °C, and 1 bit decimal point, and signed int type. The type is also set PTC or NTC, and now unit Ω, no decimal point, unsigned int type.		
31	温度模块输入 2 Temperature module input 2			
32	温度模块输入 3 Temperature module input 3			
33	模拟量模块输入 1 Analog module input 1		Unsigned int	单位 mA, 小数点 2 位 (0.01mA) Unit mA, 2 bits decimal point (0.01mA)
34	模拟量模块输入 2 Analog module input 2		Unsigned int	
35	模拟量模块输出 1 Analog module output 1		Unsigned int	
36	模拟量模块输出 2 Analog module output 2		Unsigned int	
37	接地电流百分比 Percentage of grounding current		Unsigned int	
38	当前功率百分比 Percentage of present power		Unsigned int	
39	AB 线电压百分比 Percentage of AB line voltage		Unsigned int	
40	BC 线电压百分比 Percentage of BC line voltage		Unsigned int	
41	CA 线电压百分比 Percentage of CA line voltage		Unsigned int	
42	三相最大电流百分比 Percentage of 3-phase maximum current		Unsigned int	

43	三相平均电流百分比 Percentage of 3-phase average current		Unsigned int	
44	A 相电流百分比 Percentage of A phase current		Unsigned int	
45	B 相电流百分比 Percentage of B phase current		Unsigned int	
46	C 相电流百分比 Percentage of C phase current		Unsigned int	
47	脱扣状态 1 Tripping status 1	<p>Bit0:过载;Bit1:接地电流;Bit2:漏电流;Bit3:堵转;Bit4:阻塞;Bit5:短路分断;Bit6:欠载;Bit7:不平衡;Bit8:欠电压;Bit9:过电压;Bit10:欠功率;Bit11:断相;Bit12:相序;Bit13:外部故障 1;Bit14:外部故障 2;Bit15:外部故障 3;</p> <p>Bit0: overload; Bit1: grounding current; Bit2: leakage current; Bit3: stalling; Bit4: blocking; Bit5: circuit breaker breaking; Bit6: underload; Bit7: unbalance; Bit8: undervoltage; Bit9: overvoltage; Bit10: underpower; Bit11: phase failure; Bit12: phase sequence; Bit13: external fault 1; Bit14: external fault 2; Bit15: external fault 3</p>		
48	脱扣状态 2 Tripping status 2	<p>Bit0:外部故障 4;Bit1:内部故障;Bit2:起动超时;Bit3:模拟量输入 1 高保护;Bit4:模拟量输入 1 低保护;Bit5:模拟量输入 2 高保护;Bit6:模拟量输入 2 低保护;Bit7:主体温度保护;Bit8:模块温度输入 1 保护;Bit9:模块温度输入 2 保护;Bit10:模块温度输入 3 保护;Bit11:主体温度传感器故障;Bit12:模块温度输入 1 传感器故障;Bit13:模块温度输入 2 传感器故障;Bit14:模块温度输入 3 传感器故障;Bit15:模块结构故障</p> <p>Bit0: external fault 4; Bit1: internal fault; Bit2: starting overtime; Bit3: analog input 1 high protection; Bit4: analog input 1 low protection; Bit5: analog input 2 high protection; Bit6: analog input 2 low protection; Bit7: master temperature protection; Bit8: module temperature input 1 protection; Bit9: module temperature input 2 protection; Bit10: module temperature input 3 protection; Bit11: master temperature sensor fault; Bit12: module temperature input 1 sensor protection; Bit13: module temperature input 2 sensor fault; Bit14: module temperature input 3 sensor fault; Bit15: module structure fault</p>		
49	脱扣状态 3 Tripping status 3	<p>Bit0:计数器 1 输出;Bit1:计数器 2 输出;Bit2:计数器 3 输出;Bit3:计数器 4 输出;Bit4:定时器 1 输出;Bit5:定时器 2 输出;Bit6:定时器 3 输出;Bit7:定时器 4 输出;Bit8:真值表 1 输出 1;Bit9:真值表 1 输出 2;Bit10:真值表 2 输出;Bit11:真值表 3 输出;Bit12:真值表 4 输出;Bit13:保留;Bit14:保留;Bit15:反馈时间保护</p> <p>Bit0: output of counter 1; Bit1: output of counter 2; Bit2: output of counter 3; Bit3: output of counter 4; Bit4: output of timer 1; Bit5: output of timer 2; Bit6: output of timer 3; Bit7: output of timer 4; Bit8: output 1 of truth table 1; Bit9: output of truth table 2; Bit11: output of truth table 3; Bit12: output of truth table 4; Bit13: reserved; Bit14: reserved; Bit15: feedback time protection</p>		
50	报警状态 1 Alarm status 1	<p>Bit0:过载;Bit1:接地电流;Bit2:漏电流;Bit3:堵转;Bit4:阻塞;Bit5:短路分断;Bit6:欠载;Bit7:不平衡;Bit8:欠电压;Bit9:过电压;Bit10:欠功率;Bit11:断相;Bit12:相序;Bit13:外部故障 1;Bit14:外部故障 2;Bit15:外部故障 3;</p> <p>Bit0: overload; Bit1: grounding current; Bit2: leakage current; Bit3: stalling; Bit4: blocking; Bit5: short circuit breaking; Bit6: underload; Bit7: unbalance; Bit8: undervoltage; Bit9: overvoltage; Bit10: underpower; Bit11: phase failure; Bit12: phase failure; Bit13: external fault 1; Bit14: external fault 2; Bit15: external fault 3</p>		
51	报警状态 2 Alarm status 2	<p>Bit0:外部故障 4;Bit1:内部故障;Bit2:起动超时;Bit3:模拟量输入 1 高保护;Bit4:模拟量输入 1 低保护;Bit5:模拟量输入 2 高保护;Bit6:模拟量输入 2 低保护;Bit7:主体温度保护;Bit8:模块温度输入 1 保护;Bit9:模块温度输入 2 保护;Bit10:模块温度输入 3 保护;Bit11:主体温</p>		

		度传感器故障;Bit12:模块温度输入 1 传感器故障;Bit13:模块温度输入 2 传感器故障;Bit14:模块温度输入 3 传感器故障;Bit15:模块结构故障 Bit0:external fault 4; Bit1:internal fault; Bit2:starting overtime; Bit3:analog input 1high protection; Bit4:analog input 1low protection; Bit5:analog input 2high protection; Bit6:analog input 2 low protection; Bit7:master temperature protection; Bit8:module temperature input 1protection; Bit9:module temperature input 2 protection; Bit10:module temperature input 3 protection; Bit11:master temperature sensor fault; Bit12:module temperature input 1 sensor fault; Bit13:module temperature input 2 sensor fault;Bit14:module temperature input 3 sensor fault; Bit15:module structure fault		
52	报警状态 3 Alarm status 3	Bit0:计数器 1 输出;Bit1:计数器 2 输出;Bit2:计数器 3 输出;Bit3:计数器 4 输出;Bit4:定时器 1 输出;Bit5:定时器 2 输出;Bit6:定时器 3 输出;Bit7:定时器 4 输出;Bit8:真值表 1 输出 1;Bit9:真值表 1 输出 2;Bit10:真值表 2 输出;Bit11:真值表 3 输出;Bit12:真值表 4 输出; Bit13:保留;Bit14:保留;Bit15:反馈时间保护 Bit0:output of counter 1;Bit1:output of counter 2 ; Bit2:output of counter 3 ; Bit3:output of counter 4; Bit4:output of timer 1; Bit5:output of timer 2; Bit6:output of timer 3; Bit7:output of timer 4; Bit8:output 1 of truth table 1; Bit9:output 2 of truth table 1; Bit10:output of truth table 2; Bit11:output of truth table 3 ; Bit12:output of truth table 4; Bit13: reserve; Bit14:reserve; Bit15:feedback time protection		
53	电机运行状态 Motor operation status		Unsigned int	1 正常停车; 2:故障停车; 3:紧急停车; 4:起动阶段 1;5:起动阶段 2;6:运行 1;7:运行 2; 1: Normal stopping; 2: fault stopping; 3: emergency stopping; 4: starting stage 1; 5: starting stage 2; 6: running 1; 7: running 2
54	当前最新故障记录通信地址 Communication address of present newest fault recording		Unsigned int	同地址 1000 The same as address 1000
55	当前定时器计数器真值表输出状态 Output status of present timer counter truth table	Bit0:计数器 1 输出;Bit1:计数器 2 输出;Bit2:计数器 3 输出;Bit3:计数器 4 输出;Bit4:定时器 1 输出;Bit5:定时器 2 输出;Bit6:定时器 3 输出;Bit7:定时器 4 输出;Bit8:真值表 1 输出 1;Bit9:真值表 1 输出 2;Bit10:真值表 2 输出;Bit11:真值表 3 输出;Bit12:真值表 4 输出; Bit0:output of counter 1; Bit1:output of counter 2; Bit2:output of counter 3;Bit3:output of counter 4; Bit4:output of timer 1; Bit5:output of timer 2; Bit6:output of timer 3; Bit7:output of timer 4; Bit8: output 1 of truth table 1; Bit9:output 2 of truth talbe 1;Bit10:output of truth talbe 2;Bit11: output of truch table 3; Bit12:output of truth talbe 4;		
56	开关量输入状态位 Switching input status bit		Unsigned int	Bit0 第 1 路, 为 1 吸合 (动作), 为 0 断开 Bit0 1st channel, 1 means being on actuation, while 0 means being off.
57	开关量输出状态位 Switching output status bit		Unsigned int	
58	主体传感器状态 Master transformer status		Unsigned int	0 正常, 1 故障 0 normal, 1 fault
59	开关量模块版本 Version of switching module		Unsigned int	0x0102 表示版本为 V1.2 0x0102 means the version is V1.2.
60	开关量模块个数 Number of switching module	高字节 DO 路数, 低字节 DI 路数 Channel number of high byte DO, channel number of low byte DI.		
61	温度模块版本 Version of temperature module		Unsigned int	0x0102 表示版本为 V1.2 0x0102 means the version is V1.2.
62	温度模块类型 Temperature module type	Bit3-Bit0 第 1 路 (0=PT100,1=PT1000,2=Cu50,3=PTC,4=NTC) Bit3-Bit0 1st channel (0=PT100,1=PT1000,2=Cu50,3=PTC,4=NTC) Bit7-Bit4 第 2 路 (0=PT100,1=PT1000,2=Cu50,3=PTC,4=NTC)		



		Bit7-Bit4 2nd channel (0=PT100,1=PT1000,2=Cu50,3=PTC,4=NTC) Bit11-Bit8 第3路 (0=PT100,1=PT1000,2=Cu50,3=PTC,4=NTC) Bit11-Bit8 3rd channel (0=PT100,1=PT1000,2=Cu50,3=PTC,4=NTC)		
63	温度模块状态 Temperature module status	Bit3-Bit0 第1路 (0=关闭,1=正常,其他故障) Bit3-Bit0 1st channel (0 means being off,1 means being normal, other fault) Bit7-Bit4 第2路 (0=关闭,1=正常,其他故障) Bit3-Bit0 2nd channel (0 means being off,1 means being normal, other fault) Bit11-Bit8 第3路 (0=关闭,1=正常,其他故障) Bit3-Bit0 3rd channel (0 means being off,1 means being normal, other fault)		
64	模拟量模块版本 Version of analog module		Unsigned int	0x0102 表示版本为 V1.2 0x0102 means the version is V1.2
65	模拟量模块个数 Number of analog module	高字节模拟量输出路数, 低字节模拟量输入路数 Output channel number of high byte analog, input channel number of low byte analog		
66	测量模块版本 Version of testing module		Unsigned int	0x0102 表示版本为 V1.2 0x0102 means the version is V1.2
67	测量模块类型 Testing module type	Bit7-Bit0 为 (0=0.4-2A;1=1.6-6.3;2=6.3-25A;3=25-100A; 4=63-250A;5=250-800A); Bit11-Bit8 为 (1=380V, 2=660V, 其他无电压模块); Bit13-Bit12 为 (1=1A 漏电流模块, 2=30A 漏电流模块); Bit15 为 1 断相指示 Bit7-Bit0 means (0=0.4-2A;1=1.6-6.3;2=6.3-25A;3=25-100A; 4=63-250A;5=250-800A); Bit11-Bit8 means (1=380V, 2=660V, other no voltage module); Bit13-Bit12 为 (1=1A leakage current module, 2=30A leakage current module); Bit15 为 1 phase failure indication		
68	控制状态指示 Control status indication	Bit0:起动 1 继电器;Bit1:起动 2 继电器;Bit2:起动 3 继电器; Bit3:就绪;Bit4:权限 1;Bit5:权限 2;Bit6:运行指示; Bit0:starting 1 relay; Bit1:starting 2 relay; Bit2: starting 3 relay; Bit3: be ready;Bit4: permission 1; Bit5:permission 2;Bit6:running indication;		
69 - 79	<b>保留</b> Reserved			
80	权限设置 Permission set			bit2=0DI 的权限输入起作用 (液晶上设置为"DI 控制权输入"); permission input of bit2=0DI is working (setting "DI control permission input" on LCD) bit2=1 液晶设置的权限起作用 bit2=1 permission set on LCD takes effect. bit1 bit0: 0 0 液晶 LCD 0 1 DI 1 1 全控 whole control
81	数据循环 Data circulation		Unsigned int	
82	电机控制 Motor control	1-7	Unsigned int	1:停车;2:起动 1;3:起动 2;4:复位(操作完成自动清 零)5:紧急停车;6:紧急起动 1;7:紧急起动 2; 1:stopping; 2:starting 1; 3:starting 2; 4:resetting (auto resetting to clear after operation)5:emergency stopping 1; 6:emergency starting 1;7:emergency starting 2;
83	开关量输出 Switching output	0-0x007f	Unsigned int	

84	时间:分秒 Time : minuter and second	BCD 码格式	Unsigned int	高字节为分 High byte is minute.
85	时间:日時 Time : date and hour	BCD 码格式	Unsigned int	高字节为日 High byte is date.
86	时间:年月 Time : year and month	BCD 码格式	Unsigned int	高字节为年 High byte is year.
87	通信地址 1 Communication address 1	1-247	Unsigned int	
88	通信波特率 1 Communication baud rate 1	1200、2400、 4800、9600、 19200、38400	Unsigned int	
89	通信地址 2 Communication address 2	MODBUS: 1-247 PROFIBUS: 0-126	Unsigned int	
90	通信波特率 2 Communication baud rate 2	1200、2400、 4800、9600、 19200、38400、 PROFIBUS	Unsigned int	
91	模拟量输出 1 类型 Analog output type 1	0-22	Unsigned int	0-22 依次为 A 相电流(%）、B 相电流(%）、C 相电流(%）、三相 最大电流(%）、A 相实际电流、B 相实际电流、C 相实际电流、最大实际电流、A 相电压(%）、B 相 电压(%）、C 相电压(%）、有功功率(%）、频率、A 相电流不平衡度、B 相电流不平衡度、C 相电流不 平衡度、电流最大不平衡度、主体温度电阻值、模 块温度输入 1、模块温度输入 2、模块温度输入 3、 模拟量输入 1、模拟量输入 2、 0-22 are A phase current (%), B phase current (%), C phase current (%), maximum current of three phase (%), A phase actual current, B phase actual current, in turn,C phase actual current, maximum actual current, A phase voltage (%), B phase voltage (%), C phase voltage (%), active powe (%), frequency, unbalance degree of A phase current, unbalance degree of B phase current, unbalance degree of C phase current, current maximum unbalance degree, master temperature resistance value, module temperature input 1, module temperature input 2, module temperature input 3, analog input 1, analog input 2
92	模拟量输出 1 (0%) Analog output 1 (0%)		Unsigned int	对应为不含小数点的值。 例: 变送对应 4-20mA 输入, 4-20mA 输入的显示 小数点为 2 位即 4.00mA 的值为 400, 因此 0%的值为 400, 100%的值填 2000。
93	模拟量输出 1 (100%) Analog output 1 (100%)		Unsigned int	The corresponding is the value of no decimal point. Eg: the transducing corresponds to the input for 4-20mA, which inputting decimal point displayed is 2

				bits, that is to say the value of 4.00mA is 400, so the value of 0% is 400, and the value of 100% is 2000.
94	模拟量输出 2 类型 Analog output type 2	0-19	Unsigned int	同上 The same as above
95	模拟量输出 2 (0%) Analog output 2 (0%)		Unsigned int	
96	模拟量输出 2 (100%) Analog output 2 (100%)		Unsigned int	
97	电机额定电流 Rated current of motor	4-8000	Unsigned int	0.4-2.0A 范围为 4-20 The range of 0.4-2.0A is 4-20 1.6-6.3 A 范围为 16-63 The range of 1.6-6.3 A is 16-63 6.3-25 A 范围为 63-250 The range of 6.3-25 A is 63-250 25-100 A 范围为 250-1000 The range of 25-100 A is 250-1000 63-250 A 范围为 630-2500 The range of 63-250 A is 630-2500 250-800 A 范围为 2500-8000 The range of 250-800 A is 2500-8000
98	电机额定电压 Rated voltage of motor	110-1100	Unsigned int	单位 V Unit V
99	电机额定功率 MSB Rated power of motor MSB		Unsigned long	单位 W Unit W
100	电机额定功率 LSB Rated power of motor LSB			
101	电机类型 Motor type	0/1	Unsigned int	0=普通电机, 1=增安电机 0 means normal motor, and 1 means increased safety motor.
102	电机接线 Motor wiring	0/1	Unsigned int	0=三相电机, 1=单相电机 0 means three phase motor, and 1 means single phase motor.
103	起动总时间 Total starting time	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
104	起动转换时间 Starting transfer time	1-3000	Unsigned int	单位 0.1 秒 Unit 0.1s
105	起动反馈时间 Starting feedback time	1-3000	Unsigned int	单位 0.1 秒 Unit 0.1s
106	停车反馈时间 Stopping feedback time	1-3000	Unsigned int	单位 0.1 秒 Unit 0.1s
107	起动方式 Starting mode	0-6	Unsigned int	0=保护模式, 1=直接起动, 2=正反转起动, 3=星三角起动(2 继), 4=单绕组双速电机起动, 5=双绕组双速电机起动, 6=自耦降压起动(2 继) 0 means protection mode, and 1 means directly starting, and 2 means converse starting, and 3 means Y-△ starting (2 relays), and 4 means single winding two speed motor starting, and 5 means duplex winding double speed motor starting, and 6 means the

				comments step-down starting (2 relays)
108	失压重起动允许 Zero-voltage restarting permitted	0/2	Unsigned int	0=禁止, 1=重起动后执行起动 1, 2=重起动后执行 起动 2 0 means forbiddance, and 1 means operating starting 1 after restarting, and 2 means operating starting 2 after restarting.
109	失压重起动电压整定值 Zero-voltage restarting voltage setting value	30-90	Unsigned int	单位%Ue Unit % Ue
110	失压重起动延时时间 Zero-voltage restarting relay time	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
111	失压重起动最大失电时间 Zero-voltage restarting maximum losing power time	5-3000	Unsigned int	单位 0.1 秒 Unit 0.1s
112	失压重起动晃电时间 Zero-voltage restarting shaking time	1-200	Unsigned int	单位 0.1 秒 Unit 0.1s
113	上电自起动允许 Power on self-starting permitted	0/1	Unsigned int	0=禁止, 1=允许 0 means forbiddance, and 1 means permission.
114	上电自起动模式 Power on self-starting mode	0/2	Unsigned int	1=执行起动 1, 2=执行起动 2,3=执行恢复 1 means operating starting 1, and 2 means operating starting 2, and 3 means operating recover.
115	自起动时间 Self-starting time	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
116	脱扣使能 1 Tripping enable 1	Bit0:过载;Bit1:接地电流;Bit2:漏电流;Bit3:堵转;Bit4:阻塞;Bit5:短路分断;Bit6:欠载;Bit7: 不平衡;Bit8:欠电压;Bit9:过电压;Bit10:欠功率;Bit11:断相;Bit12:相序;Bit13:外部故障 1;Bit14:外部故障 2;Bit15:外部故障 3; Bit0:overload;Bit1:grounding current ;Bit2:leakage current;Bit3:stalling;Bit4:blocking;Bit5:short circuit breaking;Bit6:underload;Bit7:unbalance;Bit8:undervoltage;Bit9:overvoltage;Bit10:underpow er;Bit11:phase failure;Bit12:phase sequence;Bit13:external fault 1;Bit14:external fault 2;Bit15:external fault 3;		
117	脱扣使能 2 Tripping enable 2	Bit0:外部故障 4;Bit1:内部故障;Bit2:起动超时;Bit3:模拟量输入 1 高保护;Bit4:模拟量输入 1 低保护;Bit5:模拟量输入 2 高保护;Bit6:模拟量输入 2 低保护;Bit7:主体温度保护;Bit8: 模块温度输入 1 保护;Bit9:模块温度输入 2 保护;Bit10:模块温度输入 3 保护;Bit11:主体温 度传感器故障;Bit12:模块温度输入 1 传感器故障;Bit13:模块温度输入 2 传感器故 障;Bit14:模块温度输入 3 传感器故障;Bit15:模块结构故障 Bit0:external fault 4;Bit1:internal fault ;Bit2:starting overtime;Bit3:hith protection of analog input 1;Bit4:low protection of analog input ;Bit5:high protection of analog input 2;Bit6: low protection of analog input 2;Bit7:master temperature protection;Bit8:protection of module temperature input 1;Bit9:protection of module temperature input 2;Bit10:protection of module temperature input 3;Bit11:master temperature sensor fault;Bit12:sensor fault of module temperature input 1;Bit13:sensor fault of module temperature input 2;Bit14:sensor fault of module temperature input 3;Bit15:module structure fault		
118	脱扣使能 3 Tripping enable 3	Bit0:计数器 1 输出;Bit1:计数器 2 输出;Bit2:计数器 3 输出;Bit3:计数器 4 输出;Bit4:定时 器 1 输出;Bit5:定时器 2 输出;Bit6:定时器 3 输出;Bit7:定时器 4 输出;Bit8:真值表 1 输出 1;Bit9:真值表 1 输出 2;Bit10:真值表 2 输出;Bit11:真值表 3 输出;Bit12:真值表 4 输出; Bit13:保留;Bit14:保留;Bit15:反馈时间保护 Bit0:output of counter 1;Bit1:output of counter 2 ; Bit2:output of counter 3 ; Bit3:output of		

		counter 4; Bit4:output of timer 1; Bit5:output of timer 2; Bit6:output of timer 3; Bit7:output of timer 4; Bit8:output 1 of truth table 1; Bit9:output 2 of truth table 1; Bit10:output of truth table 2; Bit11:output of truth table 3 ; Bit12:output of truth table 4; Bit13: reserve; Bit14:reserve; Bit15:feedback time protection		
119	报警使能 1 Alarm enable 1	Bit0:过载;Bit1:接地电流;Bit2:漏电流;Bit3:堵转;Bit4:阻塞;Bit5:短路分断;Bit6:欠载;Bit7:不平衡;Bit8:欠电压;Bit9:过电压;Bit10:欠功率;Bit11:断相;Bit12:相序;Bit13:外部故障 1;Bit14:外部故障 2;Bit15:外部故障 3; Bit0:overload; Bit1:grounding current; Bit2:leakage current; Bit3:stalling; Bit4:blocking; Bit5:short circuit breaking; Bit6:underload; Bit7:unbalance; Bit8:undervoltage; Bit9:overvoltage; Bit10:underpower; Bit11:phase failure; Bit12:phase sequence; Bit13:external fault 1; Bit14:external fault 2; Bit15:external fault 3;		
120	报警使能 2 Alarm enable 2	Bit0:外部故障 4;Bit1:内部故障;Bit2:起动超时;Bit3:模拟量输入 1 高保护;Bit4:模拟量输入 1 低保护;Bit5:模拟量输入 2 高保护;Bit6:模拟量输入 2 低保护;Bit7:主体温度保护;Bit8:模块温度输入 1 保护;Bit9:模块温度输入 2 保护;Bit10:模块温度输入 3 保护;Bit11:主体温度传感器故障;Bit12:模块温度输入 1 传感器故障;Bit13:模块温度输入 2 传感器故障;Bit14:模块温度输入 3 传感器故障;Bit15:模块结构故障 Bit0: external fault 4; Bit1: internal fault; Bit2: starting overtime; Bit3: analog input 1 high protection; Bit4: analog input 1 low protection; Bit5: analog input 2 high protection; Bit6: analog input 2 low protection; Bit7: master temperature protection; Bit8: module temperature input 1 protection; Bit9: module temperature input 2 protection; Bit10: module temperature input 3 protection; Bit11: master temperature sensor fault; Bit12: module temperature input 1 sensor protection; Bit13: module temperature input 2 sensor fault; Bit14: module temperature input 3 sensor fault; Bit15: module structure fault		
121	报警使能 3 Alarm enable 3	Bit0:计数器 1 输出;Bit1:计数器 2 输出;Bit2:计数器 3 输出;Bit3:计数器 4 输出;Bit4:定时器 1 输出;Bit5:定时器 2 输出;Bit6:定时器 3 输出;Bit7:定时器 4 输出;Bit8:真值表 1 输出 1;Bit9:真值表 1 输出 2;Bit10:真值表 2 输出;Bit11:真值表 3 输出;Bit12:真值表 4 输出; Bit13:保留;Bit14:保留;Bit15:反馈时间保护 Bit0:output of counter 1;Bit1:output of counter 2 ; Bit2:output of counter 3 ; Bit3:output of counter 4; Bit4:output of timer 1; Bit5:output of timer 2; Bit6:output of timer 3; Bit7:output of timer 4; Bit8:output 1 of truth table 1; Bit9:output 2 of truth table 1; Bit10:output of truth table 2; Bit11:output of truth table 3 ; Bit12:output of truth table 4; Bit13: reserve; Bit14:reserve; Bit15:feedback time protection		
122	允许起动热容方式 Heat capacity mode of permitted starting	0/1	Unsigned int	方式一、方式二 Mode 1, mode 2
123	冷却时间 Cooling time	1-120	Unsigned int	单位分钟 Unit minute
124	过载保护起动屏蔽时间 Starting shielding time of overload protection	1-3000	Unsigned int	单位 0.1 秒 Unit 0.1s
125	过载脱扣级别 Overload tripping grade	0-8	Unsigned int	普通电机 0-8 依次表示等级 2,3,5,10,15,20,25,30,35,40; 增安电机 0-8 依次表示等级 2,3,4, 5, 6, 8,10,12,15,20。 Normal motor 0-8 means the class 2,3,5,10,15,20,25,30,35,40 in turn. Increased safety motor 0-8 means the class 2,3,4, 5, 6, 8,10,12,15,20 in turn.

126	过载复位方式 Overload resetting mode	0/1	Unsigned int	0=手动, 1=自动 0 means manually operation, 1 means automation.
127	过载故障报警阈值 Warning threshold of overload fault	10-100	Unsigned int	单位%Ie Unit % Ie
128	接地保护脱扣值 Tripping value of grounding protection	20-100	Unsigned int	单位%Ie Unit % Ie
129	接地保护报警值 Warning value of grounding protection	20-100	Unsigned int	单位%Ie Unit % Ie
130	接地保护动作时间 Operation time of grounding protection	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
131	接地保护起动不驱动时间 Starting no-driving time of grounding protection	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
132	接地保护运行不驱动时间 Operation no-driving time of grounding protection	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
133	漏电流保护脱扣值 Tripping value of leakage current protection	5-3000	Unsigned int	范围 0.05~30.00A, 单位 0.01A Range : 0.05~30.00A, unit 0.01A
134	漏电流保护报警值 Warning value of leakage current protection	5-3000	Unsigned int	范围 0.05~30.00A, 单位 0.01A Range : 0.05~30.00A, unit 0.01A
135	漏电流保护动作时间 Operation time of leakage current protection	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
136	漏电流起动不驱动时间 Starting no-driving time of leakage current	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
137	漏电流运行不驱动时间 Operation no-driving time of leakage current	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
138	堵转保护脱扣值 Tripping value of stalling protection	100-700	Unsigned int	单位%Ie Unit % Ie
139	堵转保护报警值 Warning value of stalling protection	100-700	Unsigned int	单位%Ie Unit % Ie
140	堵转保护动作时间 Operation time of stalling protection	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
141	阻塞保护脱扣值 Tripping value of blocking protection	100-600	Unsigned int	单位%Ie Unit % Ie
142	阻塞保护报警值 Warning value of blocking protection	100-600	Unsigned int	单位%Ie Unit % Ie
143	阻塞保护动作时间 Operation time of blocking	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s

	protection			
144	短路分断保护脱扣值 Tripping value of short circuit breaking protection	200-2000	Unsigned int	单位%Ie Unit % Ie
145	短路分断保护报警值 Warning value of short circuit breaking protection	200-2000	Unsigned int	单位%Ie Unit % Ie
146	短路分断保护动作时间 Operation time of short circuit breaking protection	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
147	欠载保护脱扣值 Tripping value of underload protection	20-95	Unsigned int	单位%Ie Unit % Ie
148	欠载保护报警值 Warning value of underload protection	20-95	Unsigned int	单位%Ie Unit % Ie
149	欠载保护动作时间 Operation time of underload protection	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
150	不平衡保护脱扣值 Tripping value of unbalance protection	10-100	Unsigned int	单位% Unt %
151	不平衡保护报警值 Warning value of unbalance protection	10-100	Unsigned int	单位% Unt %
152	不平衡保护动作时间 Operation time of unbalance protection	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
153	欠电压保护脱扣值 Tripping value of undervoltage protection	45-90	Unsigned int	单位%Ue Unit % Ue
154	欠电压保护报警值 Warning value of undervoltage protection	45-90	Unsigned int	单位%Ue Unit % Ue
155	欠电压保护动作时间 Operation time of undervoltage protection	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
156	过电压保护脱扣值 Tripping value of overvoltage protection	110-150	Unsigned int	单位%Ue Unit % Ue
157	过电压保护报警值 Warning value of overvoltage protection	110-150	Unsigned int	单位%Ue Unit % Ue
158	过电压保护动作时间 Operation time of overvoltage protection	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
159	欠功率保护脱扣值	10-100	Unsigned int	单位%Pe

	Tripping value of underpower protection			Unit % Pe
160	欠功率保护报警值 Warning value of underpower protection	10-100	Unsigned int	单位%Pe Unit % Pe
161	欠功率保护动作时间 Opetation time of underpower protection	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
162	断相保护动作时间 Operation time of phase failure protection	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
163	相序保护动作时间 Operation time of phase sequence protection	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
164	外部故障 1 动作时间 Operation time of external fault 1	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
165	外部故障 2 动作时间 Operation time of external fault 2	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
166	外部故障 3 动作时间 Operation time of external fault 3	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
167	外部故障 4 动作时间 Operation time of external fault 4	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
168	内部故障动作时间 Operation time of internal fault	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
169	模拟量 1-2 监视时段 Monitoring time interval of analog 1-2	0、1、2	Unsigned int	低字节为模拟量 1: 0=全程, 1=启动时, 2=运行时; Low byte is analog 1, and 0 means overall process, and 1 means at the time of starting, and 2 means at the time of running. 高字节为模拟量 2: 0=全程, 1=启动时, 2=运行时; High byte is analog 2, and 0 means overall process, and 1 means at the time of starting, and 2 means at the time of running.
170	模拟量 1、2 输入保护回滞量 Input protection return volume of analog 1、2	0-230	Unsigned int	单位 0.01mA Unit 0.01mA
171	模拟量输入 1 高保护脱扣值 High protection tripping value of analog input 1	400-2000	Unsigned int	单位 0.01Ma Unit 0.01mA
172	模拟量输入 1 高保护报警值 High protection warning value of analog input 1	400-2000	Unsigned int	单位 0.01mA Unit 0.01mA
173	模拟量输入 1 高保护动作时间 High protection operating time of analog input 1	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
174	模拟量输入 1 低保护脱扣值 Low protection tripping value of analog input 1	400-2000	Unsigned int	单位 0.01mA Unit 0.01mA



175	模拟量输入 1 低保护报警值 Low protection warning value of analog input 1	400-2000	Unsigned int	单位 0.01mA Unit 0.01mA
176	模拟量输入 1 低保护动作时间 Low protection operating time of analog input 1	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
177	模拟量输入 2 高保护脱扣值 High protection tripping value of analog input 2	400-2000	Unsigned int	单位 0.01mA Unit 0.01mA
178	模拟量输入 2 高保护报警值 High protection warning value of analog input 2	400-2000	Unsigned int	单位 0.01mA Unit 0.01mA
179	模拟量输入 2 高保护动作时间 High protection operating time of analog input 2	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
180	模拟量输入 2 低保护脱扣值 Low protection tripping value of analog input 2	400-2000	Unsigned int	单位 0.01mA Unit 0.01mA
181	模拟量输入 2 低保护报警值 Low protection warning value of analog input 2	400-2000	Unsigned int	单位 0.01mA Unit 0.01mA
182	模拟量输入 2 低保护动作时间 Low protection operating time of analog input 2	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
183	温度脱扣复位方式 Temperature tripping resetting mode		Unsigned int	bit0:主体, bit1:模块 1, bit2:模块 2, bit3:模块 3 对应位 0=手动复位, 1=自动复位 bit0:master, bit1:module 1, bit2:module 2, bit3:module 3 corresponding bit 0 means manually resetting, and 1 means automation resetting
184	主体温度类型 Master temperature type	0-1	Unsigned int	0=PTC, 1=NTC 0 means PTC, and 1 means NTC.
185	主体温度动作电阻值 Master temperature operating resistance value	100-30000	Unsigned int	单位Ω Unit Ω
186	主体温度返回电阻值 Master temperature return resistance value	100-30000	Unsigned int	单位Ω Unit Ω
187	主体温度动作时间 Master temperature operating time	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
188	主体温度返回时间 Master temperature return time	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
189	温度模块传感器类型 Transformer type of temperature module	每路 0-4	Unsigned int	每路 0-4, bit0-bit3 第 1 路, bit4-bit7 第 2 路, bit8-bit11 第 3 路。0=PT100,1=PT1000,2=CU50,3=PTC,4=NTC Each channel 0-4, bit0-bit3 1st channel, bit4-bit7 2nd channel, bit8-bit11 3rd channel, 0=PT100,1=PT1000,2=CU50,3=PTC,4=NTC
190	温度模块输入 1 动作整定值	类型设置为 0=PT100,1=PT1000,2=CU50 单位℃, 类型为 Signed int, 小数点 1 位; 类型		

	Operating setting value of temperature module input 1	设置为 3=PTC,4=NTC 单位 $\Omega$ , 类型为 Unsigned int, 小数点 0 位。 Type is set 0=PT100,1=PT1000,2=CU50, and unit is $^{\circ}\text{C}$ , and type is Signed int, and 1 bit decimal point. And type is set 3=PTC,4=NTC, and unit is $\Omega$ , and type is Unsigned int, and no decimal point.		
191	温度模块输入 1 返回整定值 Return setting value of temperature module input 1			
192	温度模块输入 1 动作时间 Operating time of temperature module input 1	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
193	温度模块输入 1 返回时间 Return time of temperature module input 1	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
194	温度模块输入 2 动作整定值 Operating setting value of temperature module input 2	类型设置为 0=PT100,1=PT1000,2=CU50 单位 $^{\circ}\text{C}$ , 类型为 Signed int, 小数点 1 位; 类型设置为 3=PTC,4=NTC 单位 $\Omega$ , 类型为 Unsigned int, 小数点 0 位。 Type is set 0=PT100,1=PT1000,2=CU50, and unit is $^{\circ}\text{C}$ , and type is Signed int, and 1 bit decimal point. And type is set 3=PTC, 4=NTC, and unit is $\Omega$ , and type is Unsigned int, and no decimal point.		
195	温度模块输入 2 返回整定值 Return setting value of temperature module input 2			
196	温度模块输入 2 动作时间 Operating time of temperature module input 2	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
197	温度模块输入 2 返回时间 Return time of temperature module input 2	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
198	温度模块输入 3 动作整定值 Operating setting value of temperature module input 3	类型设置为 0=PT100,1=PT1000,2=CU50 单位 $^{\circ}\text{C}$ , 类型为 Signed int, 小数点 1 位; 类型设置为 3=PTC,4=NTC 单位 $\Omega$ , 类型为 Unsigned int, 小数点 0 位。 Type is set 0=PT100,1=PT1000,2=CU50, and unit is $^{\circ}\text{C}$ , and type is Signed int, and 1 bit decimal point. And type is set 3=PTC, 4=NTC, and unit is $\Omega$ , and type is Unsigned int, and no decimal point.		
199	温度模块输入 3 返回整定值 Return setting value of temperature module input 3			
200	温度模块输入 3 动作时间 Operating time of temperature module input 3	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
201	温度模块输入 3 返回时间 Return time of temperature module input 3	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
202	计数器 1 计数个数 Counting number of counter 1		Unsigned int	
203	计数器 1 触发输入相加 Addition of trigger input for counter 1	0-145	Unsigned int	见备注 1 See the remark 1
204	计数器 1 触发输入相减 Subtraction of trigger input for counter 1	0-145	Unsigned int	
205	计数器 1 复位条件 Reset condition of counter 1	0-145	Unsigned int	
206	计数器 2 计数个数 Counting number of counter 2		Unsigned int	

207	计数器 2 触发输入相加 Addition of trigger input for counter 1	0-145	Unsigned int	见备注 1 See the remark 1
208	计数器 2 触发输入相减 Subtraction of trigger input for counter 2	0-145	Unsigned int	
209	计数器 2 复位条件 Reset condition of counter 2	0-145	Unsigned int	
210	计数器 3 计数个数 Counting number of counter 3		Unsigned int	
211	计数器 3 触发输入相加 Addition of trigger input for counter 3	0-145	Unsigned int	见备注 1 See the remark 1
212	计数器 3 触发输入相减 Subtraction of trigger input for counter 3	0-145	Unsigned int	
213	计数器 3 复位条件 Reset condition of counter 3	0-145	Unsigned int	
214	计数器 4 计数个数 Counting number of counter 4		Unsigned int	
215	计数器 4 触发输入相加 Addition of trigger input for counter 4	0-145	Unsigned int	见备注 1 See the remark 1
216	计数器 4 触发输入相减 Subtraction of trigger input for counter 4	0-145	Unsigned int	
217	计数器 4 复位条件 Reset condition of counter 4	0-145	Unsigned int	
218	定时器 1 输入类型 Input type of timer 1	0-3	Unsigned int	0=通电延时, 1=带记忆通电延时, 2=断电延时, 3=即时翻转 0 means power on delay, and 1 means power on delay with memory, and 2 means power off delay, and 3 means timely overturn.
219	定时器 1 定时时间 Timing time of timer 1	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
220	定时器 1 输入触发 input trigger of timer 1	0-145	Unsigned int	见备注 1 See the remark 1
221	定时器 1 复位触发 Reset trigger of timer 1	0-145	Unsigned int	
222	定时器 2 输入类型 Input type of timer 2	0-3	Unsigned int	同地址 218 The same as address 218
223	定时器 2 定时时间 Timing time of timer 2	1-6000	Unsigned int	单位 0.1 秒 Unit 0.1s
224	定时器 2 输入触发 Input trigger of timer 2	0-145	Unsigned int	见备注 1 See the remark 1
225	定时器 2 复位触发 Reset trigger of timer 2	0-145	Unsigned int	

226	定时器 3 输入类型 Input type of timer 3	0-3	Unsigned int	同地址 218 The same as address 218
227	定时器 3 定时时间 Timing time of timer 3	1-6000	Unsigned int	单位 0.1 秒 Uint 0.1s
228	定时器 3 输入触发 Input trigger of timer 3	0-145	Unsigned int	见备注 1 See the remark 1
229	定时器 3 复位触发 Reset trigger of timer 3	0-145	Unsigned int	
230	定时器 4 输入类型 Input type of timer 4	0-3	Unsigned int	同地址 218 The same as address 218
231	定时器 4 定时时间 Timing time of timer 4	1-6000	Unsigned int	单位 0.1 秒 Uint 0.1s
232	定时器 4 输入触发 Input trigger of timer 4	0-145	Unsigned int	见备注 1 See the remark 1
233	定时器 4 复位触发 Reset trigger of timer 4	0-145	Unsigned int	
234	真值表 1(I5_O2)输入 1 选择 Input 1 selection of truth table 1 (I5_O2)	0-145	Unsigned int	
235	真值表 1(I5_O2)输入 2 选择 Input 2 selection of truth table 1 (I5_O2)	0-145	Unsigned int	
236	真值表 1(I5_O2)输入 3 选择 Input 3 selection of truth table 1 (I5_O2)	0-145	Unsigned int	
237	真值表 1(I5_O2)输入 4 选择 Input 4 selection of truth table 1 (I5_O2)	0-145	Unsigned int	
238	真值表 1(I5_O2)输入 5 选择 Input 5 selection of truth table 1 (I5_O2)	0-145	Unsigned int	
239	真值表 1(I5_O2)输出 1 选择高字 Output 1 selection high byte of truth table (I5_O2)		Unsigned int	
240	真值表 1(I5_O2)输出 1 选择低字 Output 1 selection low byte of truth table 1 (I5_O2)		Unsigned int	真值表的值（地址 234-238 符合条件组成的 0-31 的值 $2^5$ ）不同状态对应此时输出 1、输出 2 分别 bit0-31 位应该输出的值。 The value of truth table (address 234-238 matching the value $2^5$ of condition component 0-31 ) output 1 and output 2 are separately correspondence to the should output value of bit0-31 in different status.
241	真值表 1(I5_O2)输出 2 选择高字 Output 2 selection high byte of truth table 1 (I5_O2)		Unsigned int	
242	真值表 1(I5_O2)输出 2 选择低字 Output 2 selection low byte of truth table 1 (I5_O2)		Unsigned int	
243	真值表 2(I3_O1)输入 1 选择 Input 1 selection of truth table 2 (I3_O1)	0-145	Unsigned int	
244	真值表 2(I3_O1)输入 2 选择	0-145	Unsigned int	见备注 1 See the remark 1

	Input 2 selection of truth table 2 (I3_O1)			
245	真值表 2(I3_O1)输入 3 选择 Input 3 selection of truth table 2 (I3_O1)	0-145	Unsigned int	
246	真值表 2(I3_O1)输出选择 Output selection of truth table 2 (I3_O1)		Unsigned int	真值表的值（地址 243-245 符合条件组成的 0-7 的值 $2^3$ ）不同状态对应此时 bit0-7 位应该输出的值。 The value of truth table (address 243-245 matching the value $2^3$ of condition component 0-7 ) the expected values of bit0-7 are separately corresponded to the different status.
247	真值表 3(I3_O1)输入 1 选择 Input 1 selection of truth table 3 (I3_O1)	0-145	Unsigned int	见备注 1 See the remark 1
248	真值表 3(I3_O1)输入 2 选择 Input 2 selection of truth table 3 (I3_O1)	0-145	Unsigned int	
249	真值表 3(I3_O1)输入 3 选择 Input 3 selection of truth table 3 (I3_O1)	0-145	Unsigned int	
250	真值表 3(I3_O1)输出选择 Output selection of truth table 3 (I3_O1)		Unsigned int	真值表的值（地址 247-249 符合条件组成的 0-7 的值 $2^3$ ）不同状态对应此时 bit0-7 位应该输出的值。 The value of truth table (the value of address 247-249 matching condition component 0-7 is $2^3$ ) the should output value of bit0-7 are separately corresponded to the different status.
251	真值表 4(I3_O1)输入 1 选择 Input 1 selection of truth table 4 (I3_O1)	0-145	Unsigned int	见备注 1 See the remark 1
252	真值表 4(I3_O1)输入 2 选择 Input 2 selection of truth table 4 (I3_O1)	0-145	Unsigned int	
253	真值表 4(I3_O1)输入 3 选择 Input 3 selection of truth table 4 (I3_O1)	0-145	Unsigned int	
254	真值表 4(I3_O1)输出选择 Output selection of truth table 4 (I3_O1)		Unsigned int	真值表的值（地址 251-253 符合条件组成的 0-7 的值 $2^3$ ）不同状态对应此时 bit0-7 位应该输出的值。 The value of truth table (the value of address 251-253 matching condition component 0-7 is $2^3$ ) the should output value of bit0-7 are separately corresponded to the different status.
255	DI1 功能选择 DI1 function selection	0-14	Unsigned int	0-14 依次表示如下： 普通 DI 功能 起动 1(直起/左转/低速) 起动 2(右转/高速) 停车 复位 紧急停车
256	DI2 功能选择 DI2 function selection	0-14	Unsigned int	
257	DI3 功能选择 DI3 function selection	0-14	Unsigned int	
258	DI4 功能选择	0-14	Unsigned int	

	DI4 功能选择 DI4 function selection			权限输入 1
259	DI5 功能选择 DI5 function selection	0-14	Unsigned int	权限输入 2
260	DI6 功能选择 DI6 function selection	0-14	Unsigned int	外部故障 1
261	DI7 功能选择 DI7 function selection	0-14	Unsigned int	外部故障 2
262	DI8 功能选择 DI8 function selection	0-14	Unsigned int	外部故障 3
263	DI9 功能选择 DI9 function selection	0-14	保留	外部故障 4
264	DI10 功能选择 DI10 function selection	0-14	保留	起/停(合停止,开启动 1)
265	DI11 功能选择 DI11 function selection	0-14	保留	紧急启动 1
266	DI12 功能选择 DI12 function selection	0-14	保留	紧急启动 2
267	DI13 功能选择 DI13 function selection	0-14	保留	
268	DI14 功能选择 DI14 function selection	0-14	保留	0-14 means as shown separately:
269	DI15 功能选择 DI15 function selection	0-14	保留	Normal DI function
270	DI16 功能选择 DI16 function selection	0-14	保留	Starting 1 (direct / turn left / low speed)
271	DO1 功能选择 DO1 function selection	0-186	Unsigned int	Starting 2 (turn right / high speed)
272	DO2 功能选择 DO2 function selection	0-186	Unsigned int	停车
273	DO3 功能选择 DO3 function selection	0-186	Unsigned int	reset
274	DO4 功能选择 DO4 function selection	0-186	Unsigned int	Emergency stopping
275	DO5 功能选择 DO5 function selection	0-186	Unsigned int	Permission input 1
276	DO6 功能选择 DO6 function selection	0-186	Unsigned int	Permission input 2
277	DO7 功能选择 DO7 function selection	0-186	Unsigned int	External fault 1
278	DO8 功能选择 DO8 function selection	0-186	保留	External fault 2
279	DO9 功能选择 DO9 function selection	0-186	保留	External fault 3
280	DO10 功能选择 DO10 function selection	0-186	保留	External fault 4
281	DO11 功能选择 DO11 function selection	0-186	保留	Starting / stopping (close stopping, open starting 1)
				Emergency starting 1
				Emergency starting 2
				见备注 2
				See the remark 2

282	DO12 功能选择 DO12 function selection	0-186	保留	
283	DO13 功能选择 DO13 function selection	0-186	保留	
284	DO14 功能选择 DO14 function selection	0-186	保留	
285	DO15 功能选择 DO15 function selection	0-186	保留	
286	DO16 功能选择 DO16 function selection	0-186	保留	
<b>287</b> - <b>300</b>	<b>保留</b> Reserved			
300	上次设定的测量模块 Measuring module of set last time	用于读取配置 的项目状态	Unsigned int	同上 The same as above
301	上次设定的开关量模块是否安装 Switching set last time whether installation	用于读取配置 的项目状态	Unsigned int	
302	上次设定的模拟量模块路数 Channel numbers of analog module set last time	用于读取配置 的项目状态	Unsigned int	
303	上次设定的温度模块路数 Channel numbers of temperature module set last time	用于读取配置 的项目状态	Unsigned int	
304	(高速)额定电流 High speed rated current		Unsigned int	同地址 80-286 中内容 The same as the contents in address 80-286
305	(高速)过载脱扣级别 High speed overload tripping grade		Unsigned int	
306	(高速)过载复位方式 High speed overload resetting mode		Unsigned int	
307	(高速)接地保护脱扣值 High speed grounding protection tripping value		Unsigned int	
308	(高速)接地保护报警值 High speed grounding protection warning value		Unsigned int	
309	(高速)接地保护动作时间 High speed grounding protection operating time		Unsigned int	
310	(高速)漏电流保护脱扣值 High speed leakage current protection tripping value		Unsigned int	
311	(高速)漏电流保护报警值 Hith speed leakage current protection warning value		Unsigned int	
312	(高速)漏电流保护动作时间 High leakage current protection		Unsigned int	

	operating time		
313	(高速)堵转保护脱扣值 High speed stalling protection tripping value		Unsigned int
314	(高速)堵转保护报警值 High stalling protection warning value		Unsigned int
315	(高速)堵转保护动作时间 High speed stalling protection operating time		Unsigned int
316	(高速)阻塞保护脱扣值 High speed blocking protection tripping value		Unsigned int
317	(高速)阻塞保护报警值 High speed blocking protection warning value		Unsigned int
318	(高速)阻塞保护动作时间 High speed blocking protection operating time		Unsigned int
319	(高速)短路分断保护脱扣值 High speed short circuit breaking protection tripping value		Unsigned int
320	(高速)短路分断保护报警值 High speed short circuit breaking protection warning value		Unsigned int
321	(高速)短路分断保护动作时间 High speed short circuit breaking protection operating time		Unsigned int
322	(高速)欠载保护脱扣值 High speed underload protection tripping value		Unsigned int
323	(高速)欠载保护报警值 High speed underload protection warning value		Unsigned int
324	(高速)欠载保护动作时间 High speed underload protection operating time		Unsigned int
325	(高速)不平衡保护脱扣值 High speed unbalance protection tripping value		Unsigned int
326	(高速)不平衡保护报警值 High speed unbalance protection warning value		Unsigned int
327	(高速)不平衡保护动作时间 High speed unbalance protection operating time		Unsigned int
328	(高速)欠电压保护脱扣值		Unsigned int



	High speed undervoltage protection tripping value		
329	(高速)欠电压保护报警值 High speed undervoltage protection warning value		Unsigned int
330	(高速)欠电压保护动作时间 High speed undervoltage protection operating time		Unsigned int
331	(高速)过电压保护脱扣值 High speed overvoltage protection tripping value		Unsigned int
332	(高速)过电压保护报警值 High speed overvoltage protection warning value		Unsigned int
333	(高速)过电压保护动作时间 High speed overvoltage protection operating time		Unsigned int
334	(高速)欠功率保护脱扣值 High speed unerpover tripping value		Unsigned int
335	(高速)欠功率保护报警值 High speed underpower protection warning value		Unsigned int
336	(高速)欠功率保护动作时间 High speed underpower protection operating time		Unsigned int
337	(高速)断相保护动作时间 High speed phase failure protection operating time		Unsigned int
338	(高速)相序保护动作时间 High speed phase sequence protection operating time		Unsigned int
339	温度脱扣复位方式 Resetting mode of temperature tripping		Unsigned int
340	(高速)主体温度动作电阻值 High speed master temperature operating resistance value		Unsigned int
341	(高速)主体温度返回电阻值 High speed master temperature returning resistance value		Unsigned int
342	(高速)主体温度动作时间 High speed master temperature operating time		Unsigned int
343	(高速)主体温度返回时间 High speed master temperature returning time		Unsigned int
344	(高速)温度模块输入 1 动作整定值		Unsigned int

	Operation setting value of high speed temperature module input 1			
345	(高速)温度模块输入 1 返回整定值 Return setting value of high speed temperature module input 1			Unsigned int
346	(高速)温度模块输入 1 动作时间 Operation time of high speed temperature module input 1			Unsigned int
347	(高速)温度模块输入 1 返回时间 Return time of high speed temperature module input 1			Unsigned int
348	(高速)温度模块输入 2 动作整定值 Operation setting value of high speed temperature module input 2			Unsigned int
349	(高速)温度模块输入 2 返回整定值 Return setting value of high speed temperature module input 2			Unsigned int
350	(高速)温度模块输入 2 动作时间 Operation time of high speed temperature module input 2			Unsigned int
351	(高速)温度模块输入 2 返回时间 Return time of high speed temperature module input 2			Unsigned int
352	(高速)温度模块输入 3 动作整定值 Operation setting value of high speed temperature module input 3			Unsigned int
353	(高速)温度模块输入 3 返回整定值 Return setting value of high speed temperature module input 3			Unsigned int
354	(高速)温度模块输入 3 动作时间 Operation time of high speed temperature module input 3			Unsigned int
355	(高速)温度模块输入 3 返回时间 Return time of high speed temperature module input 3			Unsigned int
356	脱扣状态 1 Tripping condition 1	Bit0:过载;Bit1:接地电流;Bit2:漏电流;Bit3:堵转;Bit4:阻塞;Bit5:短路分断;Bit6:欠载;Bit7:不平衡;Bit8:欠电压;Bit9:过电压;Bit10:欠功率;Bit11:断相;Bit12:相序;Bit13:外部故障 1;Bit14:外部故障 2;Bit15:外部故障 3; Bit0: overload; Bit1: grounding current; Bit2: leakage current; Bit3: stalling; Bit4: blocking; Bit5: circuit breaker breaking; Bit6: underload; Bit7: unbalance; Bit8: undervoltage; Bit9: overvoltage; Bit10: underpower; Bit11: phase failure; Bit12: phase sequence; Bit13: external fault 1; Bit14: external fault 2; Bit15: external fault 3		
357	脱扣状态 2 Tripping condition 2	Bit0:外部故障 4;Bit1:内部故障;Bit2:起动超时;Bit3:模拟量输入 1 高保护;Bit4:模拟量输入 1 低保护;Bit5:模拟量输入 2 高保护;Bit6:模拟量输入 2 低保护;Bit7:主体温度保护;Bit8:模块温度输入 1 保护;Bit9:模块温度输入 2 保护;Bit10:模块温度输入 3 保护;Bit11:主体温度传感器故障;Bit12:模块温度输入 1 传感器故障;Bit13:模块温度输入 2 传感器故障;Bit14:模块温度输入 3 传感器故障;Bit15:模块结构故障 Bit0: external fault 4; Bit1: internal fault; Bit2: starting overtime; Bit3: analog input 1 high		

		protection; Bit4: analog input 1 low protection; Bit5: analog input 2 high protection; Bit6: analog input 2 low protection; Bit7: master temperature protection; Bit8: module temperature input 1 protection; Bit9: module temperature input 2 protection; Bit10: module temperature input 3 protection; Bit11: master temperature sensor fault; Bit12: module temperature input 1 sensor protection; Bit13: module temperature input 2 sensor fault; Bit14: module temperature input 3 sensor fault; Bit15: module structure fault		
358	报警状态 1 Warning condition 1	<p>Bit0:过载;Bit1:接地电流;Bit2:漏电流;Bit3:堵转;Bit4:阻塞;Bit5:短路分断;Bit6:欠载;Bit7:不平衡;Bit8:欠电压;Bit9:过电压;Bit10:欠功率;Bit11:断相;Bit12:相序;Bit13:外部故障 1;Bit14:外部故障 2;Bit15:外部故障 3;</p> <p>Bit0: overload; Bit1: grounding current; Bit2: leakage current; Bit3: stalling; Bit4: blocking; Bit5: circuit breaker breaking; Bit6: underload; Bit7: unbalance; Bit8: undervoltage; Bit9: overvoltage; Bit10: underpower; Bit11: phase failure; Bit12: phase sequence; Bit13: external fault 1; Bit14: external fault 2; Bit15: external fault 3</p>		
359	报警状态 2 Warning condition 2	<p>Bit0:外部故障4;Bit1:内部故障;Bit2:起动超时;Bit3:模拟量输入 1 高保护;Bit4:模拟量输入 1 低保护;Bit5:模拟量输入 2 高保护;Bit6:模拟量输入 2 低保护;Bit7:主体温度保护;Bit8:模块温度输入 1 保护;Bit9:模块温度输入 2 保护;Bit10:模块温度输入 3 保护;Bit11:主体温度传感器故障;Bit12:模块温度输入 1 传感器故障;Bit13:模块温度输入 2 传感器故障;Bit14:模块温度输入 3 传感器故障;Bit15:模块结构故障</p> <p>Bit0: external fault 4; Bit1: internal fault; Bit2: starting overtime; Bit3: analog input 1 high protection; Bit4: analog input 1 low protection; Bit5: analog input 2 high protection; Bit6: analog input 2 low protection; Bit7: master temperature protection; Bit8: module temperature input 1 protection; Bit9: module temperature input 2 protection; Bit10: module temperature input 3 protection; Bit11: master temperature sensor fault; Bit12: module temperature input 1 sensor protection; Bit13: module temperature input 2 sensor fault; Bit14: module temperature input 3 sensor fault; Bit15: module structure fault</p>		
360 - 999	保留 Reserved			
1000	当前最新故障记录通信地址 Communication address of present newest fault records	1001 1051 1101 1151 1201 1251 1301 1351	Unsigned int	
1001	故障发生时间分秒 Fault occurrence time: minute second	<p>一共八路，每路 50 个 WORD 参数含义同上</p> <p>All is 8 channels, and each channel has 50 words. The parameters meaning is the same as above.</p>		
1002	故障发生时间日时 Fault occurrence time: date hour			
1003	故障发生时间年月 Fault occurrence time: year month			
1004	脱扣状态 1 Tripping condition 1			
1005	脱扣状态 2 Tripping condition 2			
1006	脱扣状态 3 Tripping condition 3			
1007	报警状态 1 Warning condition 1			
1008	报警状态 2 Warning condition 2			

1009	报警状态 3 Warning condition 3
1010	电机运行状态 Motor running status
1011	DI 状态 DI condition
1012	DO 状态 DO condition
1013	A 相电流实际值 A phase current actual value
1014	B 相电流实际值 B phase current actual value
1015	C 相电流实际值 C phase current actual value
1016	电流小数点 Current decimal point
1017	电流不平衡度 Current unbalance degree
1018	AB 线电压实际值 AB line voltage actual value
1019	BC 线电压实际值 BC line voltage actual value
1020	CA 线电压实际值 CA line voltage actual value
1021	当前频率 Present frequency
1022	功率因素 Power factor
1023	当前功率实际值 Present power actual value
1024	当前功率实际值 Present power actual value
1025	接地电流 Grounding current
1026	漏电流 Leakage current
1027	漏电流 Leakage current
1028	当前热容 Present heat capacity
1029	主体温度保护电阻值 Master temperature protection resistance value
1030	模块温度类型 Module temperature type
1031	模块温度 1 数据 Data of module temperature 1

1032	模块温度 2 数据 Data of module temperature 2			
1033	模块温度 3 数据 Data of module temperature 3			
1034	模拟量输入 1 Analog input 1			
1035	模拟量输入 2 Analog input 2			
1036	当前定时器计数器真值表输出状态 Output status of present timer counter truth table			
1037	本次电机运行时间 Operation time of the present motor			
1038	当前数据循环寄存器状态 Condition of present data circulating register			
1039	测量模块 保留 Mearsuring module: reserved			
1040	开关量模块 保留 Switching module: reserved			
1041	温度模块 保留 Temperature module : reserved			
1042	模拟量模块 保留 Analog module : reserved			
1043-1050	保留 Reserved			
1051-1100	故障记录数据 2 Failure logging data 2			同 1001-1050 The same as 1001-1050
1101-1150	故障记录数据 3 Failure logging data 3			同 1001-1050 The same as 1001-1050
1151-1200	故障记录数据 4 Failure logging data 4			同 1001-1050 The same as 1001-1050
1201-1250	故障记录数据 5 Failure logging data 5			同 1001-1050 The same as 1001-1050
1251-1300	故障记录数据 6 Failure logging data 6			同 1001-1050 The same as 1001-1050
1301-1350	故障记录数据 7 Failure logging data 7			同 1001-1050 The same as 1001-1050
1351-1400	故障记录数据 8 Failure logging data 8			同 1001-1050 The same as 1001-1050
保留 Reserved				
1500	三相电流最大值 Maximum value of three-phase current		Unsigned int	I=读取电流值/10^电流小数点 例: 0x0BB8,电流小数点为 0x0001 表示 300.0A I= current value readed / 10^ current decimal point
1501	A 相电流实际值 A phase current actual value		Unsigned int	

1502	B 相电流实际值 B phase current actual value		Unsigned int	
1503	C 相电流实际值 C phase current actual value		Unsigned int	
1504	开关量输出、输入状态位 Switching output, input status bit		Unsigned int	bit0~bit7 第 1 路~第 8 路开关量输入状态, bit8~bit15 第 1 路~第 8 路开关量输出状态 1 吸合 (动作), 为 0 断开 bit0~bit7 1st channel to 8th channel switching input status, bit8~bit15 1st to 8th channel switching output status. 1 means actuation, and 0 means break off.
1505	电流小数点指数位、电机运行状态 Current decimal point index number bit, motor running status		Unsigned int	Bit0-bit7:1 正常停车; 2:故障停车; 3:紧急停车; 4:起动阶段 1;5:起动阶段 2;6:运行 1;7:运行 2; Bit8-bit15:0-3 Bit0-bit7:1 normal stopping; 2: fault stopping; 3: emergency stopping; 4: starting stage 1; 5: starting stage 2; 6: running 1; 7: running 2; Bit8-bit15: 0-3
1506	脱扣状态 1 Tripping condition 1			Bit0:过载;Bit1:接地电流;Bit2:漏电流;Bit3:堵转;Bit4:阻塞;Bit5:短路分断;Bit6:欠载;Bit7:不平衡;Bit8:欠电压;Bit9:过电压;Bit10:欠功率;Bit11:断相;Bit12:相序;Bit13:外部故障 1;Bit14:外部故障 2;Bit15:外部故障 3; Bit0: overload; Bit1: grounding current; Bit2: leakage current; Bit3: stalling; Bit4: blocking; Bit5: circuit breaker breaking; Bit6: underload; Bit7: unbalance; Bit8: undervoltage; Bit9: overvoltage; Bit10: underpower; Bit11: phase failure; Bit12: phase sequence; Bit13: external fault 1; Bit14: external fault 2; Bit15: external fault 3
1507	脱扣状态 2 Tripping condition 2			Bit0:外部故障 4;Bit1:内部故障;Bit2:起动超时;Bit3:模拟量输入 1 高保护;Bit4:模拟量输入 1 低保护;Bit5:模拟量输入 2 高保护;Bit6:模拟量输入 2 低保护;Bit7:主体温度保护;Bit8:模块温度输入 1 保护;Bit9:模块温度输入 2 保护;Bit10:模块温度输入 3 保护;Bit11:主体温度传感器故障;Bit12:模块温度输入 1 传感器故障;Bit13:模块温度输入 2 传感器故障;Bit14:模块温度输入 3 传感器故障;Bit15:模块结构故障 Bit0: external fault 4; Bit1: internal fault; Bit2: starting overtime; Bit3: analog input 1 high protection; Bit4: analog input 1 low protection; Bit5: analog input 2 high protection; Bit6: analog input 2 low protection; Bit7: master temperature protection; Bit8: module temperature input 1 protection; Bit9: module temperature input 2 protection; Bit10: module temperature input 3 protection; Bit11: master temperature sensor fault; Bit12: module temperature input 1 sensor protection; Bit13: module temperature input 2 sensor fault; Bit14: module temperature input 3 sensor fault; Bit15: module structure fault
1508	脱扣状态 3 Tripping condition 3			Bit0:计数器 1 输出;Bit1:计数器 2 输出;Bit2:计数器 3 输出;Bit3:计数器 4 输出;Bit4:定时器 1 输出;Bit5:定时器 2 输出;Bit6:定时器 3 输出;Bit7:定时器 4 输出;Bit8:真值表 1 输出 1;Bit9:真值表 1 输出 2;Bit10:真值表 2 输出;Bit11:真值表 3 输出;Bit12:真值表 4 输出;Bit13:保留;Bit14:保留;Bit15:反馈时间保护 Bit0: output of counter 1; Bit1: output of counter 2; Bit2: output of counter 3; Bit3: output of counter 4; Bit4: output of timer 1; Bit5: output of timer 2; Bit6: output of timer 3; Bit7: output of timer 4; Bit8: output 1 of truth table 1; Bit9: output of truth table 2; Bit11: output of truth table 3; Bit12: output of truth table 4; Bit13: reserved; Bit14: reserved; Bit15: feedback time protection
1509	报警状态 1 Warning condition 1			Bit0:过载;Bit1:接地电流;Bit2:漏电流;Bit3:堵转;Bit4:阻塞;Bit5:短路分断;Bit6:欠载;Bit7:不平衡;Bit8:欠电压;Bit9:过电压;Bit10:欠功率;Bit11:断相;Bit12:相序;Bit13:外部故障 1;Bit14:外部故障 2;Bit15:外部故障 3;

		Bit0: overload; Bit1: grounding current; Bit2: leakage current; Bit3: stalling; Bit4: blocking; Bit5: circuit breaker breaking; Bit6: underload; Bit7: unbalance; Bit8: undervoltage; Bit9: overvoltage; Bit10: underpower; Bit11: phase failure; Bit12: phase sequence; Bit13: external fault 1; Bit14: external fault 2; Bit15: external fault 3		
1510	报警状态 2 Warning condition 2	Bit0:外部故障 4;Bit1:内部故障;Bit2:起动超时;Bit3:模拟量输入 1 高保护;Bit4:模拟量输入 1 低保护;Bit5:模拟量输入 2 高保护;Bit6:模拟量输入 2 低保护;Bit7:主体温度保护;Bit8:模块温度输入 1 保护;Bit9:模块温度输入 2 保护;Bit10:模块温度输入 3 保护;Bit11:主体温度传感器故障;Bit12:模块温度输入 1 传感器故障;Bit13:模块温度输入 2 传感器故障;Bit14:模块温度输入 3 传感器故障;Bit15:模块结构故障 Bit0: external fault 4; Bit1: internal fault; Bit2: starting overtime; Bit3: analog input 1 high protection; Bit4: analog input 1 low protection; Bit5: analog input 2 high protection; Bit6: analog input 2 low protection; Bit7: master temperature protection; Bit8: module temperature input 1 protection; Bit9: module temperature input 2 protection; Bit10: module temperature input 3 protection; Bit11: master temperature sensor fault; Bit12: module temperature input 1 sensor protection; Bit13: module temperature input 2 sensor fault; Bit14: module temperature input 3 sensor fault; Bit15: module structure fault		
1511	报警状态 3 Warning condition 3	Bit0:计数器 1 输出;Bit1:计数器 2 输出;Bit2:计数器 3 输出;Bit3:计数器 4 输出;Bit4:定时器 1 输出;Bit5:定时器 2 输出;Bit6:定时器 3 输出;Bit7:定时器 4 输出;Bit8:真值表 1 输出 1;Bit9:真值表 1 输出 2;Bit10:真值表 2 输出;Bit11:真值表 3 输出;Bit12:真值表 4 输出; Bit13:保留;Bit14:保留;Bit15:反馈时间保护 Bit0:output of counter 1;Bit1:output of counter 2 ; Bit2:output of counter 3 ; Bit3:output of counter 4; Bit4:output of timer 1; Bit5:output of timer 2; Bit6:output of timer 3; Bit7:output of timer 4; Bit8:output 1 of truth table 1; Bit9:output 2 of truth table 1; Bit10:output of truth table 2; Bit11:output of truth table 3 ; Bit12:output of truth table 4; Bit13: reserve; Bit14:reserve; Bit15:feedback time protection		
1512	模拟量模块输入 1 Analog module input 1		Unsigned int	单位 mA, 小数点 2 位 (0.01mA) Uint mA, 2 bits decimal point (0.01mA)
1513	模拟量模块输入 2 Analog module input 2		Unsigned int	
1514	模拟量模块输出 1 Analog module output 1		Unsigned int	
1515	模拟量模块输出 2 Analog module output 2		Unsigned int	
1516	主体温度电阻 Master temperature resistance		Unsigned int	单位Ω Unit Ω
1517	温度模块输入 1 Temperature module input 1	传感器类型设置为 PT100,PT1000,Cu50 时单位℃,小数点 1 位,类型为 signed int; 设置为 PTC,NTC 时单位Ω,小数点 0 位,类型为 unsigned int Type of transformer is set PT100 or PT1000 or Cu50, and now unit °C, and 1 bit decimal point, and signed int type. The type is also set PTC or NTC, and now unit Ω, no decimal point, unsigned int type.		
1518	温度模块输入 2 Temperature module input 2			
1519	温度模块输入 3 Temperature module input 3			
保留 Reserved				
1603	三相电流最大值 Maximum value of three-phase current		Unsigned int	I=读取电流值/10^电流小数点 例: 0x0BB8,电流小数点为 0x0001 表示 300.0A I= current readed / 10^ current decimal point Eg: 0x0BB8, current decimal point 0x0001 means 300.0A

1604	开关量输出、输入状态位 Switching output, input status bit		Unsigned int	同地址 1504 The same as address 1504
1605	电流小数点指数位、电机运行状态 Current decimal point index number bit, motor running status		Unsigned int	同地址 1505 The same as address 1505
1606	脱扣状态 1 Tripping condition 1			同地址 1506 The same as address 1506
1607	脱扣状态 2 Tripping condition 2			同地址 1507 The same as address 1507
1608	脱扣状态 3 Tripping condition 3			同地址 1508 The same as address 1508
1609	报警状态 1 Warning condition 1			同地址 1509 The same as address 1509
1610	报警状态 2 Warning condition 2			同地址 1510 The same as address 1510
1611	报警状态 3 Warning condition 3			同地址 1511 The same as address 1511
1612	模拟量模块输入 1 Analog module input 1		Unsigned int	单位 mA, 小数点 2 位 (0.01mA) Unit mA, 2 bits decimal point (0.01mA)
1613	模拟量模块输入 2 Analog module input 2		Unsigned int	
1614	模拟量模块输出 1 Analog module output 1		Unsigned int	
1615	模拟量模块输出 2 Analog module output 2		Unsigned int	
1616	主体温度电阻 Master temperature resistance		Unsigned int	单位Ω Unit Ω
1617	温度模块输入 1 Temperature module input 1	传感器类型设置为 PT100,PT1000,Cu50 时单位℃,小数点 1 位,类型为 signed int; 设置为 PTC,NTC 时单位Ω,小数点 0 位,类型为 unsigned int Type of transformer is set PT100 or PT1000 or Cu50, and now unit °C, and 1 bit decimal point, and signed int type. The type is also set PTC or NTC, and now unit Ω, no decimal point, unsigned int type.		
1618	温度模块输入 2 Temperature module input 2			
1619	温度模块输入 3 Temperature module input 3			
保留 Reserved				
1700	三相最大电流百分比 Percentage of the three-phase maximum current		Unsigned int	
1701	A 相电流百分比 Percentage of A phase current		Unsigned int	
1702	B 相电流百分比 Percentage of B phase current		Unsigned int	
1703	C 相电流百分比 Percentage of C phase current		Unsigned int	
1704	开关量输出、输入状态位 Switching output, input status bit		Unsigned int	同地址 1504 The same as 1504



1705	电机运行状态 Motor running status		Unsigned int	1 正常停车; 2:故障停车; 3:紧急停车; 4:起动阶段 1;5:起动阶段 2;6:运行 1;7:运行 2; 1: Normal stopping; 2: fault stopping; 3: emergency stopping; 4: starting stage1; 5: starting stage 2; 6: running 1; 7: running 2
1706	脱扣状态 1 Tripping condition 1			同地址 1506 The same as 1506
1707	脱扣状态 2 Tripping condition 2			同地址 1507 The same as 1507
1708	脱扣状态 3 Tripping condition 3			同地址 1508 The same as 1508
1709	报警状态 1 Warning condition 1			同地址 1509 The same as 1509
1710	报警状态 2 Warning condition 2			同地址 1510 The same as 1510
1711	报警状态 3 Warning condition 3			同地址 1511 The same as 1511
1712	模拟量模块输入 1 Analog module input 1		Unsigned int	
1713	模拟量模块输入 2 Analog module input 2		Unsigned int	单位 mA, 小数点 2 位 (0.01mA)
1714	模拟量模块输出 1 Analog module output 1		Unsigned int	Unit mA, 2 bits decimal point (0.01mA)
1715	模拟量模块输出 2 Analog module output 2		Unsigned int	
1716	主体温度电阻 Master temperature resistance		Unsigned int	单位Ω Unit Ω
1717	温度模块输入 1 Temperature module input 1	传感器类型设置为 PT100,PT1000,Cu50 时单位℃,小数点 1 位,类型为 signed int; 设置为 PTC,NTC 时单位Ω,小数点 0 位,类型为 unsigned int Type of transformer is set PT100 or PT1000 or Cu50, and now unit °C, and 1 bit decimal point, and signed int type. The type is also set PTC or NTC, and now unit Ω, no decimal point, unsigned int type.		
1718	温度模块输入 2 Temperature module input 2			
1719	温度模块输入 3 Temperature module input 3			
保留 Reserved				
1803	三相最大电流百分比 Percentage of three-phase maximum current		Unsigned int	
1804	开关量输出、输入状态位 Switching output, input status bit		Unsigned int	同地址 1504 The same as 1504
1805	电机运行状态 Motor running status		Unsigned int	1 正常停车; 2:故障停车; 3:紧急停车; 4:起动阶段 1;5:起动阶段 2;6:运行 1;7:运行 2; 1: Normal stopping; 2: fault stopping; 3: emergency stopping; 4: starting stage1; 5: starting stage 2; 6: running 1; 7: running 2
1806	脱扣状态 1 Tripping condition 1			同地址 1506 The same as 1506

1807	脱扣状态 2 Tripping condition 2	同地址 1507 The same as 1507	
1808	脱扣状态 3 Tripping condition 3	同地址 1508 The same as 1508	
1809	报警状态 1 Warning condition 1	同地址 1509 The same as 1509	
1810	报警状态 2 Warning condition 2	同地址 1510 The same as 1510	
1811	报警状态 3 Warning condition 3	同地址 1511 The same as 1511	
1812	模拟量模块输入 1 Analog module input 1	Unsigned int	单位 mA, 小数点 2 位 (0.01mA) Unit mA, 2 bits decimal point (0.01mA)
1813	模拟量模块输入 2 Analog module input 2	Unsigned int	
1814	模拟量模块输出 1 Analog module output 1	Unsigned int	
1815	模拟量模块输出 2 Analog module output 2	Unsigned int	
1816	主体温度电阻 Master temperature resistance	Unsigned int	单位Ω Unit Ω
1817	温度模块输入 1 Temperature module input 1	传感器类型设置为 PT100,PT1000,Cu50 时单位℃,小数点 1 位,类型为 signed int; 设置为 PTC,NTC 时单位Ω,小数点 0 位,类型为 unsigned int Type of transformer is set PT100 or PT1000 or Cu50, and now unit °C, and 1 bit decimal point, and signed int type. The type is also set PTC or NTC, and now unit Ω, no decimal point, unsigned int type.	
1818	温度模块输入 2 Temperature module input 2		
1819	温度模块输入 3 Temperature module input 3		

备注 1: 0-145 对应如下 (对应菜单设置的各输入设置, 如定时器, 计数器, 真值表的触发输入、复位设置等)  
Remark 1: 0-145 is corresponded as follows (each input setting corresponded menu setting, such as timer, counter, triggering input of truth table, resetting, and etc.)

表 26 输入设置  
Table 26 input setting

0	不接入, no inserting	73	故障报警\内部故障 fault warning \ internal fault
1	运转控制\启动 1(直接启动、左转、低速、星三角星形启动, 保护模式) Motion control \ starting 1 (direct starting, turn left, low speed, Y-△ Y starting, protection mode)	74	故障报警\启动超时 Fault warning \ starting overtime
2	运转控制\启动 2(右转、高速星三角星形启动) Motion control \ starting 2 (turn right, high speed Y-△ Y starting)	75	故障报警\反馈超时 Fault warning \ feedback overtime
3	运转控制\启动 3(单绕组高速) Motion control \ starting 3 (single winding high speed)	76	故障报警\模拟量输入\In1 高保护 Fault warning \ analog input \ In1 high protection
4	运转控制\启动准备好输出 Motion control \ starting ready to output	77	故障报警\模拟量输入\In1 低保护 Fault warning \ analog input \ In1 low protection
5	运转控制\权限指示 1 Motion control \ permission indication 1	78	故障报警\模拟量输入\In2 高保护 Fault warning \ analog input \ In2 high protection
6	运转控制\权限指示 2	79	故障报警\模拟量输入\In2 低保护

	Motion control \\ permission indication 2		Fault warning \\ analog input \\ In2 low protection
7	运转控制\\运行输出 Motion control \\ motion output	80	故障报警\\温度保护\\主体温度保护 Fault warning \\ temperature protection \\ master temperature protection
8	任意故障脱扣 Any fault tripping	81	故障报警\\温度保护\\模块输入 1 Fault warning \\ temperature protection \\ module input 1
9	故障脱扣\\过载, Fault tripping \\ overload	82	故障报警\\温度保护\\模块输入 2 Fault warning \\ temperature protection \\ module input 2
10	故障脱扣\\接地电流 Fault tripping \\ grounding current	83	故障报警\\温度保护\\模块输入 3 Fault warning \\ temperature protection \\ module input 3
11	故障脱扣\\漏电流 Fault tripping \\ leakage current	84	故障报警\\温度保护\\主体温度传感器故障 Fault warning \\ temperature protection \\ master temperature sensor fault
12	故障脱扣\\堵转 Fault tripping \\ stalling	85	故障报警\\温度保护\\模块输入 1 传感器故障 Fault warning \\ temperature protection \\ sensor fault of module input 1
13	故障脱扣\\阻塞 Fault tripping \\ blocking	86	故障报警\\温度保护\\模块输入 2 传感器故障 Fault warning \\ temperature protection \\ sensor fault of module input 2
14	故障脱扣\\短路分断 Fault tripping \\ short circuit breaking	87	故障报警\\温度保护\\模块输入 3 传感器故障 Fault warning \\ temperature protection \\ sensor fault of module input 3
15	故障脱扣\\欠载 Fault tripping \\ underload	88	故障报警\\模块结构故障 Fault warning \\ module structure fault
16	故障脱扣\\不平衡 Fault tripping \\ unbalance	89	故障报警\\计数器\\计数器 1 输出 Fault warning \\ counter \\ output of counter 1
17	故障脱扣\\欠电压 Fault tripping \\ undervoltage	90	故障报警\\计数器\\计数器 2 输出 Fault warning \\ counter \\ output of counter 2
18	故障脱扣\\过电压 Fault tripping \\ overvoltage	91	故障报警\\计数器\\计数器 3 输出 Fault warning \\ counter \\ output of counter 3
19	故障脱扣\\欠功率 Fault tripping \\ underpower	92	故障报警\\计数器\\计数器 4 输出 Fault warning \\ counter \\ output of counter 4
20	故障脱扣\\断相 Fault tripping \\ phase failure	93	故障报警\\定时器\\定时器 1 输出 Fault warnng \\ timer \\ output of timer 1
21	故障脱扣\\相序 Fault tripping \\ phase sequence	94	故障报警\\定时器\\定时器 2 输出 Fault warnng \\ timer \\ output of timer 2
22	故障脱扣\\外部故障 1 Fault tripping \\ external fault 1	95	故障报警\\定时器\\定时器 3 输出 Fault warnng \\ timer \\ output of timer 3
23	故障脱扣\\外部故障 2 Fault tripping \\ external fault 2	96	故障报警\\定时器\\定时器 4 输出 Fault warnng \\ timer \\ output of timer 4
24	故障脱扣\\外部故障 3 Fault tripping \\ external fault 3	97	故障报警\\真值表\\真值表 1 输出 1 Fault warning \\ truth table \\ output 1 of truth table 1
25	故障脱扣\\外部故障 4 Fault tripping \\ external fault 4	98	故障报警\\真值表\\真值表 1 输出 2 Fault warning \\ truth table \\ output 2 of truth table 1
26	故障脱扣\\内部故障 Fault tripping \\ internal fault	99	故障报警\\真值表\\真值表 2 输出 Fault warning \\ truth table \\ output of truth table 2
27	故障脱扣\\起动超时	100	故障报警\\真值表\\真值表 3 输出

	Fault tripping \ starting overtime		Fault warning \ truth table \ output of truth table 3
28	故障脱扣\反馈超时 Fault tripping \ feedback overtime	101	故障报警\真值表\真值表 4 输出 Fault warning \ truth table \ output of truth table 4
29	故障脱扣\模拟量输入\In1 高保护 Fault tripping \ analog input \ In1 high protection	102	DI 状态\DI1 DI status \ DI1
30	故障脱扣\模拟量输入\In1 低保护 Fault tripping \ analog input \ In1 low protection	103	DI 状态\DI2 DI status \ DI2
31	故障脱扣\模拟量输入\In2 高保护 Fault tripping \ analog input \ In2 high protection	104	DI 状态\DI3 DI status \ DI3
32	故障脱扣\模拟量输入\In2 低保护 Fault tripping \ analog input \ In2 low protection	105	DI 状态\DI4 DI status \ DI4
33	故障脱扣\温度保护\主体温度保护 Fault tripping \ temperature protection \ master temperature protection	106	DI 状态\DI5 DI status \ DI5
34	故障脱扣\温度保护\模块输入 1 Fault tripping \ temperature protection \ module input 1	107	DI 状态\DI6 DI status \ DI6
35	故障脱扣\温度保护\模块输入 2 Fault tripping \ temperature protection \ module input 2	108	DI 状态\DI7 DI status \ DI7
36	故障脱扣\温度保护\模块输入 3 Fault tripping \ temperature protection \ module input 3	109	DI 状态\DI8 DI status \ DI8
37	故障脱扣\温度保护\主体温度传感器故障 Fault tripping \ temperature protection \ master temperature sensor fault	110	DO 状态\DO1 DO status \ DO1
38	故障脱扣\温度保护\模块输入 1 传感器故障 Fault tripping \ temperature protection \ sensor fault of module input 1	111	DO 状态\DO2 DO status \ DO2
39	故障脱扣\温度保护\模块输入 2 传感器故障 Fault tripping \ temperature protection \ sensor fault of module input 2	112	DO 状态\DO3 DO status \ DO3
40	故障脱扣\温度保护\模块输入 3 传感器故障 Fault tripping \ temperature protection \ sensor fault of module input 3	113	DO 状态\DO4 DO status \ DO4
41	故障脱扣\模块结构故障 Fault tripping \ module structure fault	114	DO 状态\DO5 DO status \ DO5
42	故障脱扣\计数器\计数器 1 输出 Fault tripping \ counter \ output of counter 1	115	DO 状态\DO6 DO status \ DO6
43	故障脱扣\计数器\计数器 2 输出 Fault tripping \ counter \ output of counter 2	116	DO 状态\DO7 DO status \ DO7
44	故障脱扣\计数器\计数器 3 输出 Fault tripping \ counter \ output of counter 3	117	循环寄存器\Bit0 Circulating register \ Bit0
45	故障脱扣\计数器\计数器 4 输出 Fault tripping \ counter \ output of counter 4	118	循环寄存器\Bit1 Circulating register \ Bit1
46	故障脱扣\定时器\定时器 1 输出 Fault tripping \ timer \ output 1 of timer 1	119	循环寄存器\Bit2 Circulating register \ Bit2
47	故障脱扣\定时器\定时器 2 输出 Fault tripping \ timer \ output 1 of timer 2	120	循环寄存器\Bit3 Circulating register \ Bit3
48	故障脱扣\定时器\定时器 3 输出	121	循环寄存器\Bit4

	Fault tripping \ timer \ output 1 of timer 3		Circulating register \ Bit4
49	故障脱扣\定时器\定时器 4 输出 Fault tripping \ timer \ output 1 of timer 4	122	循环寄存器\Bit5 Circulating register \ Bit5
50	故障脱扣\真值表\真值表 1 输出 1 Fault tripping \ truth table \ output 1 of truth table 1	123	循环寄存器\Bit6 Circulating register \ Bit6
51	故障脱扣\真值表\真值表 1 输出 2 Fault tripping \ truth table \ output 1 of truth table 2	124	循环寄存器\Bit7 Circulating register \ Bit7
52	故障脱扣\真值表\真值表 2 输出 Fault tripping \ truth table \ output of truth table 2	125	循环寄存器\Bit8 Circulating register \ Bit8
53	故障脱扣\真值表\真值表 3 输出 Fault tripping \ truth table \ output of truth table 3	126	循环寄存器\Bit9 Circulating register \ Bit9
54	故障脱扣\真值表\真值表 4 输出 Fault tripping \ truth table \ output of truth table 4	127	循环寄存器\Bit10 Circulating register \ Bit10
55	任意故障报警 Any fault warning	128	循环寄存器\Bit11 Circulating register \ Bit11
56	故障报警\过载 Fault warning \ overload	129	循环寄存器\Bit12 Circulating register \ Bit12
57	故障报警\接地电流 Fault warning \ grounding current	130	循环寄存器\Bit13 Circulating register \ Bit13
58	故障报警\漏电流 Fault warning \ leakage current	131	循环寄存器\Bit14 Circulating register \ Bit14
59	故障报警\堵转 Fault warning \ stalling	132	循环寄存器\Bit15 Circulating register \ Bit15
60	故障报警\阻塞 Fault warning \ blocking	133	计数器\计数器 1 输出 Counter \ output of counter 1
61	故障报警\短路分断 Fault warning \ short circuit breaking	134	计数器\计数器 2 输出 Counter \ output of counter 2
62	故障报警\欠载 Fault warning \ underload	135	计数器\计数器 3 输出 Counter \ output of counter 3
63	故障报警\不平衡 Fault warning \ unbalance	136	计数器\计数器 4 输出 Counter \ output of counter 4
64	故障报警\欠电压 Fault warning \ undervoltage	137	定时器\定时器 1 输出 Timer \ output of timer 1
65	故障报警\过电压 Fault warning \ overvoltage	138	定时器\定时器 2 输出 Timer \ output of timer 2
66	故障报警\欠功率 Fault warning \ underpower	139	定时器\定时器 3 输出 Timer \ output of timer 3
67	故障报警\断相 Fault warning \ phase failure	140	定时器\定时器 4 输出 Timer \ output of timer 4
68	故障报警\相序 Fault warning \ phase sequence	141	真值表\真值表 1 输出 1 Truth table \ output 1 of truth table 1
69	故障报警\外部故障 1 Fault warning \ external fault 1	142	真值表\真值表 1 输出 2 Truth table \ output 2 of truth table 1
70	故障报警\外部故障 2 Fault warning \ external fault 2	143	真值表\真值表 2 输出 Truth table \ output of truth table 2
71	故障报警\外部故障 3 Fault warning \ external fault 3	144	真值表\真值表 3 输出 Truth table \ output of truth table 3

72	故障报警\\外部故障 4 Fault warning \\ external fault 4	145	真值表\\真值表 4 输出 Truth table \\ output of truth table 4
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备注 2: 0-186 对应如下 (对应菜单中 DO 输出设置)

Remark 2: 0-186 is corresponded as follows (DO output setting in corresponded menu)

表 27 DO 输出设置

Talbe 27 DO output setting

0	“不接入” no inserting	94	“故障脱扣断开\\定时器\\定时器 2 输出” Fault tripping breaking off \\ timer \\ output of timer 2
1	“运转控制\\起动 1(直接起动、左转、低速、星三角星形、保护模式)” Motion control \\ starting 1 (direct starting , turn left, low speed, Y-△ Y starting, protection mode)	95	“故障脱扣断开\\定时器\\定时器 3 输出” Fault tripping breaking off \\ timer \\ output of timer 3
2	“运转控制\\起动 2(右转、高速、星三角三角形)” Motion control \\ starting 2 (turn right, high speed, Y-△ △ starting)	96	“故障脱扣断开\\定时器\\定时器 4 输出” Fault tripping breaking \\ timer \\ output of timer 4
3	“运转控制\\起动 3(单绕组高速)” Motion control \\ starting 3 (single winding high speed)	97	“故障脱扣断开\\真值表\\真值表 1 输出 1” Fault tripping breaking \\ truth table \\ output 1 of truth table 1
4	“运转控制\\起动准备好输出” Motion control \\ starting ready to output	98	“故障脱扣断开\\真值表\\真值表 1 输出 2” Fault tripping breaking \\ truth table \\ output 2 of truth table 1
5	“运转控制\\权限指示 1” Motion control \\ permission indication 1	99	“故障脱扣断开\\真值表\\真值表 2 输出” Fault tripping breaking \\ truth table \\ output of truth table 2
6	“运转控制\\权限指示 2” Motion control \\ permission indication 2	100	“故障脱扣断开\\真值表\\真值表 3 输出” Fault tripping breaking \\ truth table \\ output of truth table 3
7	“运转控制\\运行输出” Motion contril \\ running output	101	“故障脱扣断开\\真值表\\真值表 4 输出” Fault tripping breaking \\ truth table \\ output of truth table 4
8	“任意故障脱扣闭合” Any fault tripping closing	102	“任意故障报警” Any fault warning
9	“故障脱扣闭合\\过载” Fault tripping closing \\ overload	103	“故障报警\\过载” Fault warning \\ overload
10	“故障脱扣闭合\\接地电流” Fault tripping closing \\ grounding current	104	“故障报警\\接地电流” Fault warning \\ grounding current
11	“故障脱扣闭合\\漏电流” Fault tripping closing \\ leakage current	105	“故障报警\\漏电流” Fault warning \\ leakage current
12	“故障脱扣闭合\\堵转” Fault tripping closing \\ stalling	106	“故障报警\\堵转” Fault warning \\ stalling
13	“故障脱扣闭合\\阻塞” Fault tripping closing \\ blocking	107	“故障报警\\阻塞” Fault warning \\ blocking
14	“故障脱扣闭合\\短路分断” Fault tripping closing \\ short circuit breaking	108	“故障报警\\短路分断” Fault warning \\ short circuit breaking
15	“故障脱扣闭合\\欠载” Fault tripping closing \\ underload	109	“故障报警\\欠载” Fault warning \\ underload
16	“故障脱扣闭合\\不平衡” Fault tripping closing \\ unbalance	110	“故障报警\\不平衡” Fault warning \\ unbalance
17	“故障脱扣闭合\\欠电压” Fault tripping closing \\ undervoltage	111	“故障报警\\欠电压” Fault warning \\ undervoltage
18	“故障脱扣闭合\\过电压” Fault tripping closing \\ overvoltage	112	“故障报警\\过电压” Fault warning \\ overvoltage
19	“故障脱扣闭合\\欠功率” Fault tripping closing \\ underpower	113	“故障报警\\欠功率” Fault warning \\ underpower
20	“故障脱扣闭合\\断相” Fault tripping closing \\ phase failure	114	“故障报警\\断相” Fault warning \\ phase failure
21	“故障脱扣闭合\\相序” Fault tripping closing \\ phase sequence	115	“故障报警\\相序” Fault warning \\ phase sequence
22	“故障脱扣闭合\\外部故障 1” Fault tripping closing \\ external fault 1	116	“故障报警\\外部故障 1” Fault warning \\ external fault 1

23	“故障脱扣闭合\外部故障 2” Fault tripping closing \ external fault 2	117	“故障报警\外部故障 2” Fault warning \ external fault 2
24	“故障脱扣闭合\外部故障 3” Fault tripping closing \ external fault 3	118	“故障报警\外部故障 3” Fault warning \ external fault 3
25	“故障脱扣闭合\外部故障 4” Fault tripping closing \ external fault 4	119	“故障报警\外部故障 4” Fault warning \ external fault 4
26	“故障脱扣闭合\内部故障” Fault tripping closing \ internal fault	120	“故障报警\内部故障” Fault warning \ internal fault
27	“故障脱扣闭合\起动超时” Fault tripping closing \ starting overtime	121	“故障报警\起动超时” Fault warning \ starting overtime
28	“故障脱扣闭合\反馈超时” Fault tripping closing \ feedback overtime	122	“故障报警\反馈超时” Fault warning \ feedback overtime
29	“故障脱扣闭合\模拟量输入\In1 高保护” Fault tripping closing \ analog input \ In1 high protection	123	“故障报警\模拟量输入\In1 高保护” Fault warning \ analog input \ In1 high protection
30	“故障脱扣闭合\模拟量输入\In1 低保护” Fault tripping closing \ analog input \ In1 low protection	124	“故障报警\模拟量输入\In1 低保护” Fault warning \ analog input \ In1 low protection
31	“故障脱扣闭合\模拟量输入\In2 高保护” Fault tripping closing \ analog input \ In2 high protection	125	“故障报警\模拟量输入\In2 高保护” Fault warning \ analog input \ In2 high protection
32	“故障脱扣闭合\模拟量输入\In2 低保护” Fault tripping closing \ analog input \ In2 low protection	126	“故障报警\模拟量输入\In2 低保护” Fault warning \ analog input \ In2 low protection
33	“故障脱扣闭合\温度保护\主体温度保护” Fault tripping closing \ temperature protection \ master temperature protection	127	“故障报警\温度保护\主体温度保护” Fault warning \ temperature protection \ master temperature protection
34	“故障脱扣闭合\温度保护\模块输入 1” Fault tripping closing \ temperature protection \ module input 1	128	“故障报警\温度保护\模块输入 1” Fault warning \ temperature protection \ module input 1
35	“故障脱扣闭合\温度保护\模块输入 2” Fault tripping closing \ temperature protection \ module input 2	129	“故障报警\温度保护\模块输入 2” Fault warning \ temperature protection \ module input 2
36	“故障脱扣闭合\温度保护\模块输入 3” Fault tripping closing \ temperature protection \ module input 3	130	“故障报警\温度保护\模块输入 3” Fault warning \ temperature protection \ module input 3
37	“故障脱扣闭合\温度保护\主体温度传感器故障” Fault tripping closing \ temperature protection \ master temperature sensor fault	131	“故障报警\温度保护\主体温度传感器故障” Fault warning \ temperature protection \ master temperature sensor fault
38	“故障脱扣闭合\温度保护\模块输入 1 传感器故障” Fault tripping closing \ temperature protection \ sensor fault of module input 1	132	“故障报警\温度保护\模块输入 1 传感器故障” Fault warning \ temperature protection \ sensor fault of module input 1
39	“故障脱扣闭合\温度保护\模块输入 2 传感器故障” Fault tripping closing \ temperature protection \ sensor fault of module input 2	133	“故障报警\温度保护\模块输入 2 传感器故障” Fault warning \ temperature protection \ sensor fault of module input 2
40	“故障脱扣闭合\温度保护\模块输入 3 传感器故障” Fault tripping closing \ temperature protection \ sensor fault of module input 3	134	“故障报警\温度保护\模块输入 3 传感器故障” Fault warning \ temperature protection \ sensor fault of module input 3
41	“故障脱扣闭合\模块结构故障” Fault tripping closing \ module structure fault	135	“故障报警\模块结构故障” Fault warning \ module structure fault
42	“故障脱扣闭合\计数器\计数器 1 输出” Fault tripping closing \ counter \ output of counter 1	136	“故障报警\计数器\计数器 1 输出” Fault warning \ counter \ output of counter 1
43	“故障脱扣闭合\计数器\计数器 2 输出” Fault tripping closing \ counter \ output of counter 2	137	“故障报警\计数器\计数器 2 输出” Fault warning \ counter \ output of counter 2
44	“故障脱扣闭合\计数器\计数器 3 输出” Fault tripping closing \ counter \ output of counter 3	138	“故障报警\计数器\计数器 3 输出” Fault warning \ counter \ output of counter 3
45	“故障脱扣闭合\计数器\计数器 4 输出” Fault tripping closing \ counter \ output of counter 4	139	“故障报警\计数器\计数器 4 输出” Fault warning \ counter \ output of counter 4
46	“故障脱扣闭合\定时器\定时器 1 输出” Fault tripping closing \ timer \ output of timer 1	140	“故障报警\定时器\定时器 1 输出” Fault warning \ timer \ output of timer 1
47	“故障脱扣闭合\定时器\定时器 2 输出” Fault tripping closing \ timer \ output of timer 2	141	“故障报警\定时器\定时器 2 输出” Fault warning \ timer \ output of timer 2
48	“故障脱扣闭合\定时器\定时器 3 输出” Fault tripping closing \ timer \ output of timer 3	142	“故障报警\定时器\定时器 3 输出” Fault warning \ timer \ output of timer 3
49	“故障脱扣闭合\定时器\定时器 4 输出” Fault tripping closing \ timer \ output of timer 4	143	“故障报警\定时器\定时器 4 输出” Fault warning \ timer \ output of timer 4
50	“故障脱扣闭合\真值表\真值表 1 输出 1” Fault tripping closing \ truth table \ output 1 of truth table 1	144	“故障报警\真值表\真值表 1 输出 1” Fault warning \ truth table \ output 1 of truth table 1

51	“故障脱扣闭合\真值表\真值表 1 输出 2” Fault tripping closing \ truth table \ output 2 of truth table 1	145	“故障报警\真值表\真值表 1 输出 2” Fault warning \ truth table \ output 2 of truth table 1
52	“故障脱扣闭合\真值表\真值表 2 输出” Fault tripping closing \ truth table \ output of truth table 2	146	“故障报警\真值表\真值表 2 输出” Fault warning \ truth table \ output of truth table 2
53	“故障脱扣闭合\真值表\真值表 3 输出” Fault tripping closing \ truth table \ output of truth table 3	147	“故障报警\真值表\真值表 3 输出” Fault warning \ truth table \ output of truth table 3
54	“故障脱扣闭合\真值表\真值表 4 输出” Fault tripping closing \ truth table \ output of truth table 4	148	“故障报警\真值表\真值表 4 输出” Fault warning \ truth table \ output of truth table 4
55	“任意故障脱扣断开” Any fault tripping breaking	149	“DI 控制\DI1” DI control \ DI1
56	“故障脱扣断开\过载” Fault tripping breaking \ overload	150	“DI 控制\DI2” DI control \ DI2
57	“故障脱扣断开\接地电流” Fault tripping breaking \ grounding current	151	“DI 控制\DI3” DI control \ DI3
58	“故障脱扣断开\漏电流” Fault tripping breaking \ leakage current	152	“DI 控制\DI4” DI control \ DI4
59	“故障脱扣断开\堵转” Fault tripping breaking \ stalling	153	“DI 控制\DI5” DI control \ DI5
60	“故障脱扣断开\阻塞” Fault tripping breaking \ blocking	154	“DI 控制\DI6” DI control \ DI6
61	“故障脱扣断开\短路分断” Fault tripping breaking \ short circuit breaking	155	“DI 控制\DI7” DI control \ DI7
62	“故障脱扣断开\欠载” Fault tripping breaking \ underload	156	“DI 控制\DI8” DI control \ DI8
63	“故障脱扣断开\不平衡” Fault tripping breaking \ unbalance	157	“循环寄存器\Bit0” Circulating register \ Bit0
64	“故障脱扣断开\欠电压” Fault tripping breaking \ undervoltage	158	“循环寄存器\Bit1” Circulating register \ Bit1
65	“故障脱扣断开\过电压” Fault tripping breaking \ overvoltage	159	“循环寄存器\Bit2” Circulating register \ Bit2
66	“故障脱扣断开\欠功率” Fault tripping breaking \ underpower	160	“循环寄存器\Bit3” Circulating register \ Bit3
67	“故障脱扣断开\断相” Fault tripping breaking \ phase failure	161	“循环寄存器\Bit4” Circulating register \ Bit4
68	“故障脱扣断开\相序” Fault tripping breaking \ phase sequence	162	“循环寄存器\Bit5” Circulating register \ Bit5
69	“故障脱扣断开\外部故障 1” Fault tripping breaking \ external fault 1	163	“循环寄存器\Bit6” Circulating register \ Bit6
70	“故障脱扣断开\外部故障 2” Fault tripping breaking \ external fault 2	164	“循环寄存器\Bit7” Circulating register \ Bit7
71	“故障脱扣断开\外部故障 3” Fault tripping breaking \ external fault 3	165	“循环寄存器\Bit8” Circulating register \ Bit8
72	“故障脱扣断开\外部故障 4” Fault tripping breaking \ external fault 4	166	“循环寄存器\Bit9” Circulating register \ Bit9
73	“故障脱扣断开\内部故障” Fault tripping breaking \ internal fault	167	“循环寄存器\Bit10” Circulating register \ Bit10
74	“故障脱扣断开\起动超时” Fault tripping breaking \ starting overtime	168	“循环寄存器\Bit11” Circulating register \ Bit11
75	“故障脱扣断开\反馈超时” Fault tripping breaking \ feedback overtime	169	“循环寄存器\Bit12” Circulating register \ Bit12
76	“故障脱扣断开\模拟量输入\In1 高保护” Fault tripping breaking \ analog input \ In1 high protection	170	“循环寄存器\Bit13” Circulating register \ Bit13
77	“故障脱扣断开\模拟量输入\In1 低保护” Fault tripping breaking \ analog input \ In1 low protection	171	“循环寄存器\Bit14” Circulating register \ Bit14
78	“故障脱扣断开\模拟量输入\In2 高保护” Fault tripping breaking \ analog input \ In2 high protection	172	“循环寄存器\Bit15” Circulating register \ Bit15
79	“故障脱扣断开\模拟量输入\In2 低保护” Fault tripping breaking \ analog input \ In2 low protection	173	“计数器\计数器 1 输出” Counter \ output of counter 1
80	“故障脱扣断开\温度保护\主体温度保护” Fault tripping breaking \ temperature protection \ master temperature protection	174	“计数器\计数器 2 输出” Counter \ output of counter 2



81	“故障脱扣断开\\温度保护\\模块输入 1” Fault tripping breaking \\ temperature protection \\ module input 1	175	“计数器\\计数器 3 输出” Counter \\ output of counter 3
82	“故障脱扣断开\\温度保护\\模块输入 2” Fault tripping breaking \\ temperature protection \\ module input 2	176	“计数器\\计数器 4 输出” Counter \\ output of counter 4
83	“故障脱扣断开\\温度保护\\模块输入 3” Fault tripping breaking \\ temperature protection \\ module input 3	177	“定时器\\定时器 1 输出” Timer \\ output of timer 1
84	“故障脱扣断开\\温度保护\\主体温度传感器故障” Fault tripping breaking \\ temperature protection \\ master temperature sensor fault	178	“定时器\\定时器 2 输出” Timer \\ output of timer 2
85	“故障脱扣断开\\温度保护\\模块输入 1 传感器故障” Fault tripping breaking \\ temperature protection \\ sensor fault of module input 1	179	“定时器\\定时器 3 输出” Timer \\ output of timer 3
86	“故障脱扣断开\\温度保护\\模块输入 2 传感器故障” Fault tripping breaking \\ temperature protection \\ sensor fault of module input 2	180	“定时器\\定时器 4 输出” Timer \\ output of timer 4
87	“故障脱扣断开\\温度保护\\模块输入 3 传感器故障” Fault tripping breaking \\ temperature protection \\ sensor fault of module input 3	181	“真值表\\真值表 1 输出 1” Truth table \\ output 1 of truth table 1
88	“故障脱扣断开\\模块结构故障” Fault tripping breaking \\ module structure fault	182	“真值表\\真值表 1 输出 2” Truth table \\ output 2 of truth table 1
89	“故障脱扣断开\\计数器\\计数器 1 输出”， Fault tripping breaking \\ counter \\ output of counter 1	183	“真值表\\真值表 2 输出”， Truth table \\ output of truth table 2
90	“故障脱扣断开\\计数器\\计数器 2 输出”， Fault tripping breaking \\ counter \\ output of counter 2	184	“真值表\\真值表 3 输出”， Truth table \\ output of truth table 3
91	“故障脱扣断开\\计数器\\计数器 3 输出”， Fault tripping breaking \\ counter \\ output of counter 3	185	“真值表\\真值表 4 输出”， Truth table \\ output of truth table 4
92	“故障脱扣断开\\计数器\\计数器 4 输出”， Fault tripping breaking \\ counter \\ output of counter 4	186	“总线控制输出”。 Bus control output
93	“故障脱扣断开\\定时器\\定时器 1 输出”， Fault tripping breaking \\ timer \\ output of timer 1		

备注 3:

地址 80-286，地址 300-359 为可读写，写入数据必须在设置范围内，否则返回异常码报错；其他地址为只读状态。

Remark 3:

Address 80-286 and 300-359 are rewritable, and the data written must be in the range of setting, otherwise beep on error by returning exception code. And other addresses are in the status of reading only.

## 8.6 PROFIBUS 通讯 PROFIBUS communication

### 8.6.1 Profibus-DP 物理层 Profibus-DP physical layer

传输介质 Transmission media

PROFIBUS-DP 传输技术采用的是 RS485 传输，其传输介质可以选择型式 A 和型式 B 两种导线，A 为屏蔽双绞线，B 为普通双绞线。在 EN50 170 标准中规定为型式 A 导线，型式 A 比型式 B 说明见表 28，本说明书推荐采用 Line A。

PROFIBUS-DP transmission technology adopts RS485 for transmission, and transmission media can be chosen from 2 kinds of wires: Line A and Line B. Line A is shielded twisted pair, and line B is normal twisted pair. Line A is ruled in standard EN50 170, and the introductions of comparing A with B are as shown in table 28, and the specification recommend to adopt Line A.

表 28 Line A Line B 说明

Table 28 Introductions of Line A and Line B

电缆参数 Calbe parameters	A 型 Line A	B 型 Line B
特征阻抗 (Ω)	135~165Ω	100~130Ω

Characteristic impedance ( $\Omega$ )	(f=3MHz~20MHz)	(f>100kHz)
单位长度的电容 (PF/m) Capacity of unit length (PF/m)	<30pF/m	<60pF/m
回路电阻 ( $\Omega$ /km) Loop resistance ( $\Omega$ /km)	$\leq 110\Omega$ /km	-
线芯截面积 (mm <sup>2</sup> ) Wire core cross-sectional area (mm <sup>2</sup> )	$\geq 0.34\text{mm}^2$ (22 AWG)	$\geq 0.22\text{mm}^2$ (22 AWG)

也可以选用光纤作为 PROFIBUS-DP 传输介质。光纤可分为塑料光纤和玻璃光纤，塑料光纤传输距离小于 50m；玻璃光纤传输距离可达几公里。

Optical fiber can also be chosen as the transmission media of PROFIBUS-DP. Optical fiber (POF) includes polymer optical fiber and glass optical fiber (GOF). The transmission distance of POF is less than 50m, and that of GOF is many kilometers away.

#### 传输距离 Transmission distance

标准 Profibus-DP 支持以下传输速率：（单位：kbps）9.6、19.2、31.25、45.45、93.75、187.5、500、1500、3000、6000、12000。每个 DP 从站的输入数据和输出数据最大为 244B，使用屏蔽双绞电缆时最长通讯距离为 9.6km（需要增加中继），使用光缆时最长为 90km。

Standard Profibus-DP stands by the transmission rate as follows: (unit: kbps) 9.6, 19.2, 31.25, 45.45, 93.75, 187.5, 500, 1500, 3000, 6000, 12000. The maximum data of input or output in each DP slave station is 244B. The maximum communication distance of using shielded twisted pair is 9.6 km (need to add relay), and that of using optical fiber is 90 km.

Profibus-DP 每段的电缆最大长度与传输速率有关，不同的介质，不同的波特率，信号可传输的距离也不同，如表 29 所示。

The maximum length of each Profibus-DP cable is concerned with transmission rate. In different medium, or at different baud rate, the distance of signal transmitted is also different, which is as shown in table 29.

表 29 传输速率与距离关系表

Table 29 Ration of transmission rate and distance

波特率 kbps/s Baud rate kbps/s	9.6	19.2	93.75	187.5	500	1500	3000	6000	12000
(Line A) 电缆长度 m Cable length (m)	1200	1200	1200	1000	400	200	200	100	100
(Line B) 电缆长度 m Cable length (m)	1200	1200	1200	600	200	不推荐 Not recommend	不推荐 Not recommend	不推荐 Not recommend	不推荐 Not recommend

注意：该传输距离指不加重复器（中继器）的距离。此外，该传输距离是理论值，实际传输距离也会受到现场环境的影响。

To note: The transmission distance means the one of not adding repeaters. Besides, the transmission distance is theoretical value, and the actual transmission distance is effected by the field environment.

#### PROFIBUS-DP 总线网络结构 PROFIBUS-DP bus network structure

PROFIBUS 支持总线型、星型和树型拓扑结构。总线型拓扑结构，如图 31、图 32 所示。标准 Profibus-DP 系统最多可连接 127 个站（站号从 0~126，不包含中继器）。PROFIBUS 支持中继器连接，若采用中继器，可增加电缆长度和所连的站数。

PROFIBUS supports topological structure of bus, star and tree topology, as shown in figure 31 and figure 32. Standard Profibus-DP system can connect 127 station maximumly (station no. are 0~126, no relay). PROFIBUS supports relay conection, and if adopting relay, the number of station connected and the length of cable are added.

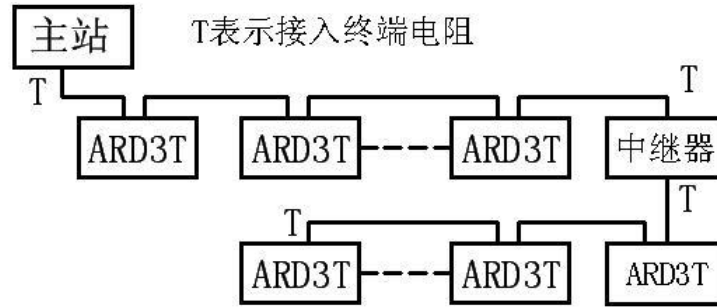


图 31 DP 总线型拓扑 1

Figure 31 DP bus topology 1

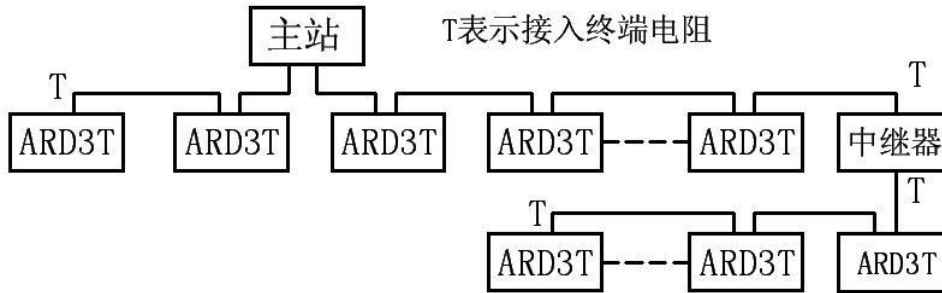


图 32 DP 总线型拓扑 2

Figure 32 DP bus topology 2

根据 EIA RS485 标准，为了最小化电缆反射并确保在数据线上所定义的噪声等级，在数据传输电缆的两端，必须使用终端电阻器来终止一个网段。在每个 PROFIBUS-DP 网段的两端必须有终端电阻，在其它地方绝对不能设置终端电阻。有些终端设备（比如中继器或从站等）上面有终端电阻，这种情况下要避免同时把设备上的终端电阻和连接器上的终端电阻都接入。

According to standard EIA RS485, in order to minimize cable reflection and to insure noise grade defined in data line, the terminating resistor must be used to terminate a network segment in both ends of data transmitting cable. The terminating resistor has to be used in both ends of each PROFIBUS-DP network segment, while has not to be set in other position. Some terminal devices, such as relays or slave stations, have terminating resistor, and in this case, avoid to insert the terminating resistor of devices and the one of connector at the same time.

以上资料仅供参考，由于 Profibus-DP 内容较多，详细资料请查阅 PROFIBUS 安装相关规范。

The information above is just for reference, and due to many contents in Profibus-DP, for more details, please refer to installation related standard in PROFIBUS.

## 8.6.2 ARD3T Profibus-DP 通讯功能配置 ARD3T Profibus-DP communication function configuration

### 8.6.2.1 ARD3T-Profibus 通讯接口接线 ARD3T-Profibus communication interface wiring

图33是ARD保护器的Profibus通讯接口,与PROFIBUS通讯网络相连。

Figure 33 is Profibus communication interface of ARD protector, and the interface is connected with PROFIBUS communication network.

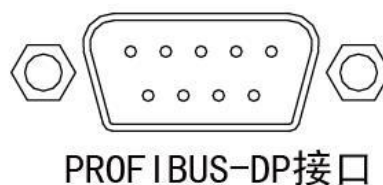


图 33 ARD3T-Profibus 通讯接口

Figure 33 Communication interface of ARD3T-Profibus

### 8.6.2.2 ARD3T 从站设置 ARD3T slave station setting

1) 进入主菜单，选择系统参数设置界面，如图 34 所示。

1) Enter into the main menu, select the system parameter setting interface, as shown in table 34.

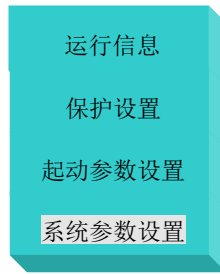


图 34 选择系统参数设置

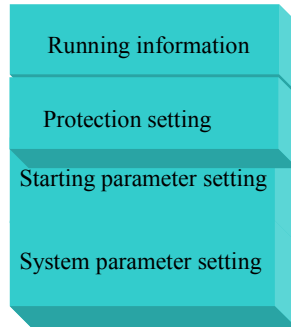


Figure 34 selection of system parameter setting

在默认参数显示界面时，通过按 进入系统主菜单，再通过 切换到“系统参数设置”菜单。如果显示界面处于主菜单中，首先通过按 退出菜单，再通过 切换到“系统参数设置”菜单。

Press key in the default parameter displaying interface, and go into the system main menu, and swich to the memu of system parameter setting by the key or . If the main menu is on the displaying interface, firstly quit the menu by pressing the key , and then swich into the menu of system parameter setting by or .

2) 按 进入系统菜单设置中，通过 切换到“通讯地址 2”界面，首先将“波特率 2”设置为“Profibus”，然后在“通讯地址 2”设定 Profibus 从站地址。如图 35 所示。

Press key into the system memu setting, and switch into the interface of communication address 2 by or . Firstly set the value of baud rate 2 as “Profibus”, and then set the slave station address of Profibus. These are as shown in figure 35.

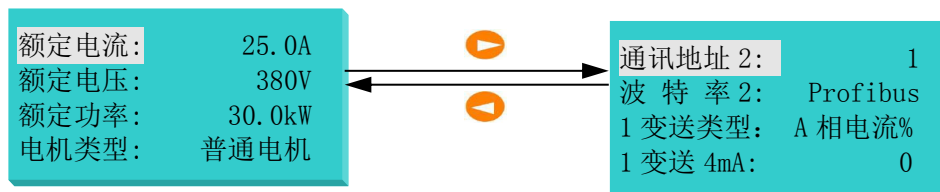


图 35 profibus 从站设定

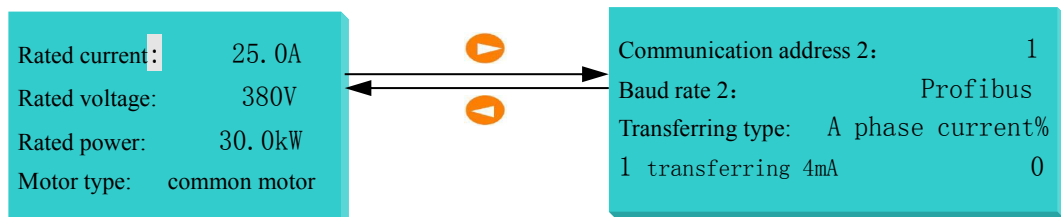


Figure 35 Save station setting of profibus

注意事项：

To note:

(1) ARD3T 上电后,若改变了 ARD3T 从站地址 (地址设定值范围 1~126), 需要对 ARD3T 重新上电, 更改的从站地址才能有效 (此功能遵循 PROFIBUS-DP 规约)。

If the slave station address of ARD3T (address setting range is 1~126) changes after powered on, ARD3T needs to be powered on again, and the slave address changed can be effective (the function follows the protocol of PROFIBUS-DP).

(2) 采用 Profibus 通讯后,通讯接口的波特率为自适应 9.6 kbit/s~12000 kbit/s。

After adopting Profibus communication, the baud rate of communication interface is self-adaption 9.6 kbit/s~12000 kbit/s.

### 8.6.2.3 Profibus 通讯变量表 Profibus communication variable table

ARD3T Profibus 通讯协议是依据 DPV0 开发。DPV0 为是周期性数据交换, 即在每个 DP 循环中,交换的数据是周期性数据。

The communication protocol of ARD3T Profibus is developed according to DPV0. DPV0 adopts periodic data exchange, that is to say the data exchanged is periodic data in each DP circulation.

输入数据为: ARD3T 反馈给 DP 主站的响应数据 (ARD3T→DP 主站)。

Input data: the feedback from ARDET to the response data of DP master station (ARD3T→DP master station)

输出数据为: DP 主站发送至 ARD3T 的控制命令 (DP 主站→ARD3T)。

Output data: the control command transferred from DP master station to ARD3T (DP main station→ARD3T)

在 PLC 中通过对输入数据和输出数据编程来完成循环数据的处理。输入、输出交换数据的长度取决于硬件组态 GSD 文件类型。输入输出数据具体见表 30、表 31 所示。

Deal with the circulating data by programming the input and output data in PLC. The length of input or output exchanging data depends on the file type of hardware configuration GSD. Input and output data in specific are as shown in table 30 and 31.

表 30 输入数据为 17 个字 (ARD3T→DP 主站)

Table 30 input data is 17 byte (ARD3T→DP master station)

输入 input	参数名称 Parameter name	数据类型 Data type	备注 Remarks
[0][1]	三相电流最大值 Maximum of three-phase current	word	1.6-小数点 3 位; 6.3-小数点 2 位; 25-小数点 2 位; 100-小数点 1 位; 250-小数点 1 位; 800-没有小数点 1.6-3 bits decimal point; 6.3-2 bits decimal point; 25-2 bits decimal point; 100-1 bit decimal point; 250-1 bit decimal point; 800-no decimal point
[2][3]	开关量输出、输入状态位 Switching output, input status bit	word	bit0~bit7 第 1 路~第 8 路开关量输入状态, bit8~bit15 第 1 路~第 8 路开关量输出状态 1 吸合 (动作), 为 0 断开 bit0~bit7 1st channel to 8th channel switching input status, bit8~bit15 1st to 8th channel swiching output status. 1 means actuation, and 0 means break off.
[4][5]	电流小数点指数位、电机运行状态 Current decimal point index bit, motor running status	word	Bit0-bit7:1 正常停车; 2:故障停车; 3:紧急停车; 4:起动阶段 1; 5:起动阶段 2;6:运行 1;7:运行 2;Bit8-bit15:0-3 Bit0-bit7:1 normal stopping; 2:fault stopping; 3:emergency stopping; 4:starting stage 1;5:starting stage 2;6:running 1;7:running 2; Bit8-bit15:0-3
[6][7]	脱扣状态 1 Tripping status 1	word	Bit0:过载;Bit1:接地电流;Bit2:漏电流;Bit3:堵转;Bit4:阻塞;Bit5:短路分断;Bit6:欠载;Bit7:不平衡;Bit8:欠电压;Bit9:过电压;Bit10:欠功率;Bit11:断相;Bit12:相序;Bit13:外部故障 1;Bit14:外部故障 2;Bit15:外部故障 3; Bit0: overload; Bit1: grounding current; Bit2: leakage current; Bit3: stalling; Bit4: blocking; Bit5: circuit breaker breaking; Bit6: underload; Bit7: unbalance; Bit8: undervoltage; Bit9: overvoltage; Bit10: underpower; Bit11: phase failure; Bit12: phase sequence; Bit13: external fault 1; Bit14: external fault 2; Bit15: external fault 3

[8][9]	脱扣状态 2 Tripping status 2	word	<p>Bit0:外部故障 4;Bit1:内部故障;Bit2:起动超时;Bit3:模拟量输入 1 高保护;Bit4:模拟量输入 1 低保护;Bit5:模拟量输入 2 高保护;Bit6:模拟量输入 2 低保护;Bit7:主体温度保护;Bit8:模块温度输入 1 保护;Bit9:模块温度输入 2 保护;Bit10:模块温度输入 3 保护;Bit11:主体温度传感器故障;Bit12:模块温度输入 1 传感器故障;Bit13:模块温度输入 2 传感器故障;Bit14:模块温度输入 3 传感器故障;Bit15:模块结构故障</p> <p>Bit0: external fault 4; Bit1: internal fault; Bit2: starting overtime; Bit3: analog input 1 high protection; Bit4: analog input 1 low protection; Bit5: analog input 2 high protection; Bit6: analog input 2 low protection; Bit7: master temperature protection; Bit8: module temperature input 1 protection; Bit9: module temperature input 2 protection; Bit10: module temperature input 3 protection; Bit11: master temperature sensor fault; Bit12: module temperature input 1 sensor protection; Bit13: module temperature input 2 sensor fault; Bit14: module temperature input 3 sensor fault; Bit15: module structure fault</p>
[10][11]	脱扣状态 3 Tripping status 3	word	<p>Bit0:计数器 1 输出;Bit1:计数器 2 输出;Bit2:计数器 3 输出;Bit3:计数器 4 输出;Bit4:定时器 1 输出;Bit5:定时器 2 输出;Bit6:定时器 3 输出;Bit7:定时器 4 输出;Bit8:真值表 1 输出 1;Bit9:真值表 1 输出 2;Bit10:真值表 2 输出;Bit11:真值表 3 输出;Bit12:真值表 4 输出;Bit13:保留;Bit14:保留;Bit15:反馈时间保护</p> <p>Bit0: output of counter 1; Bit1: output of counter 2; Bit2: output of counter 3; Bit3: output of counter 4; Bit4: output of timer 1; Bit5: output of timer 2; Bit6: output of timer 3; Bit7: output of timer 4; Bit8: output 1 of truth table 1; Bit9: output of truth table 2; Bit11: output of truth table 3; Bit12: output of truth table 4; Bit13: reserved; Bit14: reserved; Bit15: feedback time protection</p>
[12][13]	报警状态 1 Warning status 1	word	<p>Bit0:过载;Bit1:接地电流;Bit2:漏电流;Bit3:堵转;Bit4:阻塞;Bit5:短路分断;Bit6:欠载;Bit7:不平衡;Bit8:欠电压;Bit9:过电压;Bit10:欠功率;Bit11:断相;Bit12:相序;Bit13:外部故障 1;Bit14:外部故障 2;Bit15:外部故障 3;</p> <p>Bit0: overload; Bit1: grounding current; Bit2: leakage current; Bit3: stalling; Bit4: blocking; Bit5: circuit breaker breaking; Bit6: underload; Bit7: unbalance; Bit8: undervoltage; Bit9: overvoltage; Bit10: underpower; Bit11: phase failure; Bit12: phase sequence; Bit13: external fault 1; Bit14: external fault 2; Bit15: external fault 3</p>
[14][15]	报警状态 2 Warning status 2	word	<p>Bit0:外部故障 4;Bit1:内部故障;Bit2:起动超时;Bit3:模拟量输入 1 高保护;Bit4:模拟量输入 1 低保护;Bit5:模拟量输入 2 高保护;Bit6:模拟量输入 2 低保护;Bit7:主体温度保护;Bit8:模块温度输入 1 保护;Bit9:模块温度输入 2 保护;Bit10:模块温度输入 3 保护;Bit11:主体温度传感器故障;Bit12:模块温度输入 1 传感器故障;Bit13:模块温度输入 2 传感器故障;Bit14:模块温度输入 3 传感器故障;Bit15:模块结构故障</p> <p>Bit0: external fault 4; Bit1: internal fault; Bit2: starting overtime; Bit3: analog input 1 high protection; Bit4: analog input 1 low protection; Bit5: analog input 2 high protection; Bit6: analog input 2 low protection; Bit7: master temperature protection; Bit8: module temperature input 1 protection; Bit9: module temperature input 2 protection; Bit10: module temperature input 3 protection; Bit11: master temperature sensor fault; Bit12: module temperature input 1 sensor protection; Bit13: module temperature input 2 sensor fault; Bit14: module temperature input 3 sensor fault; Bit15: module structure fault</p>
[16][17]	报警状态 3 Warning status 3	word	<p>Bit0:计数器 1 输出;Bit1:计数器 2 输出;Bit2:计数器 3 输出;Bit3:计数器 4 输出;Bit4:定时器 1 输出;Bit5:定时器 2 输出;Bit6:定时器 3 输出;Bit7:定时器 4 输出;Bit8:真值表 1 输出 1;Bit9:真值表 1 输出 2;Bit10:真值表 2 输出;Bit11:真值表 3 输出;Bit12:真值表 4 输出; Bit13:保留;Bit14:保留;Bit15:反馈时间保护</p>

			Bit0:output of counter 1;Bit1:output of counter 2 ; Bit2:output of counter 3 ; Bit3:output of counter 4; Bit4:output of timer 1; Bit5:output of timer 2; Bit6:output of timer 3; Bit7:output of timer 4; Bit8:output 1 of truth table 1; Bit9:output 2 of truth table 1; Bit10:output of truth table 2; Bit11:output of truth table 3 ; Bit12:output of truth table 4; Bit13: reserve; Bit14:reserve; Bit15:feedback time protection
[18][19]	模拟量模块输入 1 Analog module input 1	word	单位 mA, 小数点 2 位 (0.01mA) Unit mA, 2 bits decimal point (0.01mA)
[20][21]	模拟量模块输入 2 Analog module input 2	word	
[22][23]	模拟量模块输出 1 Analog module output 1	word	
[24][25]	模拟量模块输出 2 Analog module output 2	word	
[26][27]	主体温度电阻 Master temperature resistance	word	单位Ω Unit Ω
[28][29]	温度模块输入 1 Temperature module input 1	word	设置为 PT100,PT1000,Cu50 时单位℃,小数点 1 位,类型为 signed int; 设置为 PTC,NTC 时单位Ω,小数点 0 位,类型为 unsigned int Type of transformer is set PT100 or PT1000 or Cu50, and now unit °C, and 1 bit decimal point, and signed int type. The type is also set PTC or NTC, and now unit Ω, no decimal point, unsigned int type.
[30][31]	温度模块输入 2 Temperature module input 2	word	
[32][33]	温度模块输入 3 Temperature module input 3	word	

注意：高字节在前，低字节在后，如[0][1]，[0]是高 8 位，[1]是低 8 位，其它类推。

To note: high byte is ahead, and low byte is behind, eg [0][1] , [0] is high 8 bits, [1] is low 8 bits, and other analogy.

表 31 输出数据为 1 个字（DP 主站→ARD3T）

Table 31 output data is 1 byte (DP master station→ARD3T)

输出 output	参数名称 Parameter name	数值范围 Data value range	备注 remarks
[00][01]	控制字 (word) Control byte	1:停车;2:起动 1;3:起动 2;4:复位(操作完成自动清零)5:紧急停车;6:紧急起动 1; 7:紧急起动 2; 1:stopping; 2:starting 1; 3:starting 2; 4:resetting (auto resetting to clear after operation)5:emergency stopping 1; 6:emergency starting 1;7:emergency starting 2;	
		Bit15: 输出数据有效使能位 Bit15: effective enable bit of output data	此位为 1 时,对 bit0-bit4 的操作是有效的。为 0 时,操作无效。 When the bit is 1, operation of bit0-bit4 is in effective. While 0, operateion is ineffectiveness.

Profibus输出数据（控制数据），举例：若远程起动，起动方式选择“起动1”，输出数据:0x8002（十六进制数）即可。

The output data (control data) of Profibus, such as starting mode is selected “starting 1” in remote starting, output data is 0x8002 (hexadecimal number).

注意：PROFIBUS-DP V0为循环数据交换，对于控制信息要慎用，避免重复设置、循环设置给设备带来的损害。

To note : PROFIBUS-DP V0 is circulating data exchange, and should adopt prudently the control information to avoid the damages caused by repeating setting or circulating setting.

#### 8.6.2.4 关于GSD文件说明 About GSD file specification

GSD 文件获取途径：

GSD file acquiring way:

仪表的 GSD 文件可从公司网站 [www.acrel.cn](http://www.acrel.cn) 下载

The GSD file of instrument can be downloaded from company website [www.acrel.cn](http://www.acrel.cn).

GSD 文件名为“ARD3T.GSD”在进行 PROFIBUS 主站组态时，装载 GSD 文件后，GSD 文件内容如图所示。ARD3T 包含 16 个模块，“2 words principal values”~“17 words principal values”表示输入数据长度为 “2 words” ~“17 words”，GSD 添加文件如图 36 所示。

The name of GSD file is “ARD3T.GSD”. When configurating PROFIBUS master station, install GSD file, and GSD file contents are as shown in figure. ARD3T includes 16 modules. “2 words principal values”~“17 words principal values”means the length of input data is “2 words” ~“17 words”. Addition file of GSD is as shown in figure 36.

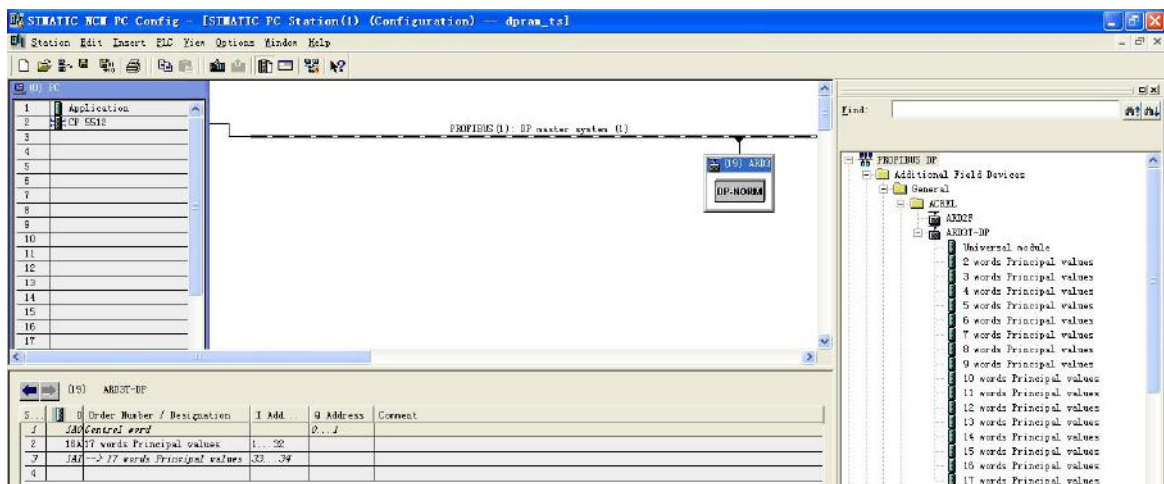


图 36 GSD 文件添加

Figure 36 Addition file of GSD

读 17 words 输入数据的用户参数如图 37 所示

The user parameters of reading 17 words input data are shown in figure 37.

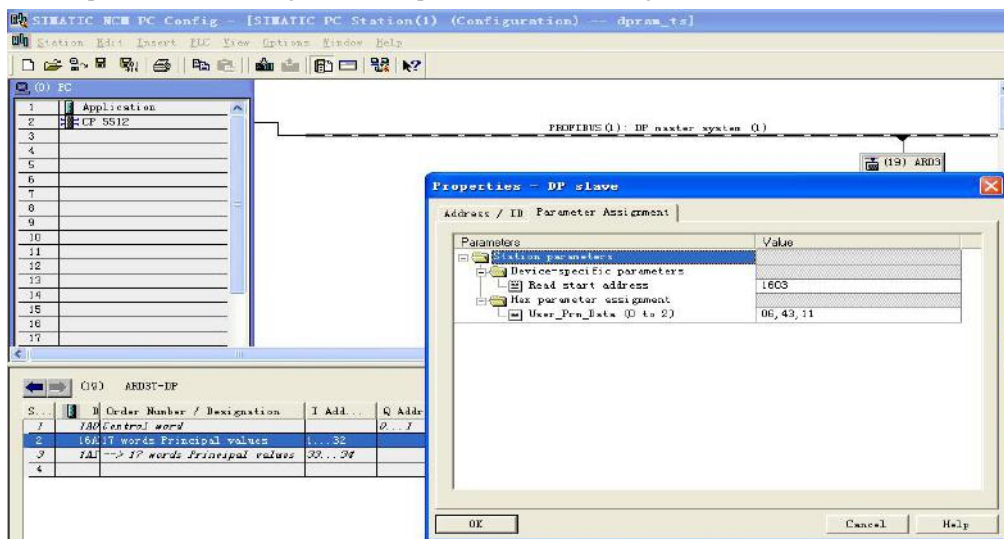


图 37 17words 输入数据用户参数

Figure User parameters of 17 words input data



写输出数据的用户参数如图38所示。

The user parameters of writing output data are as shown in figure 38.

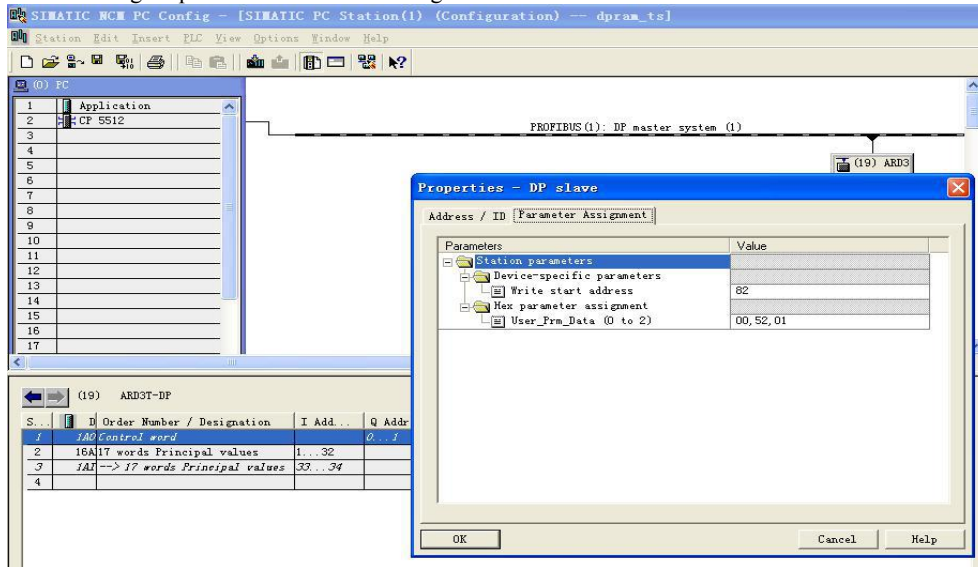
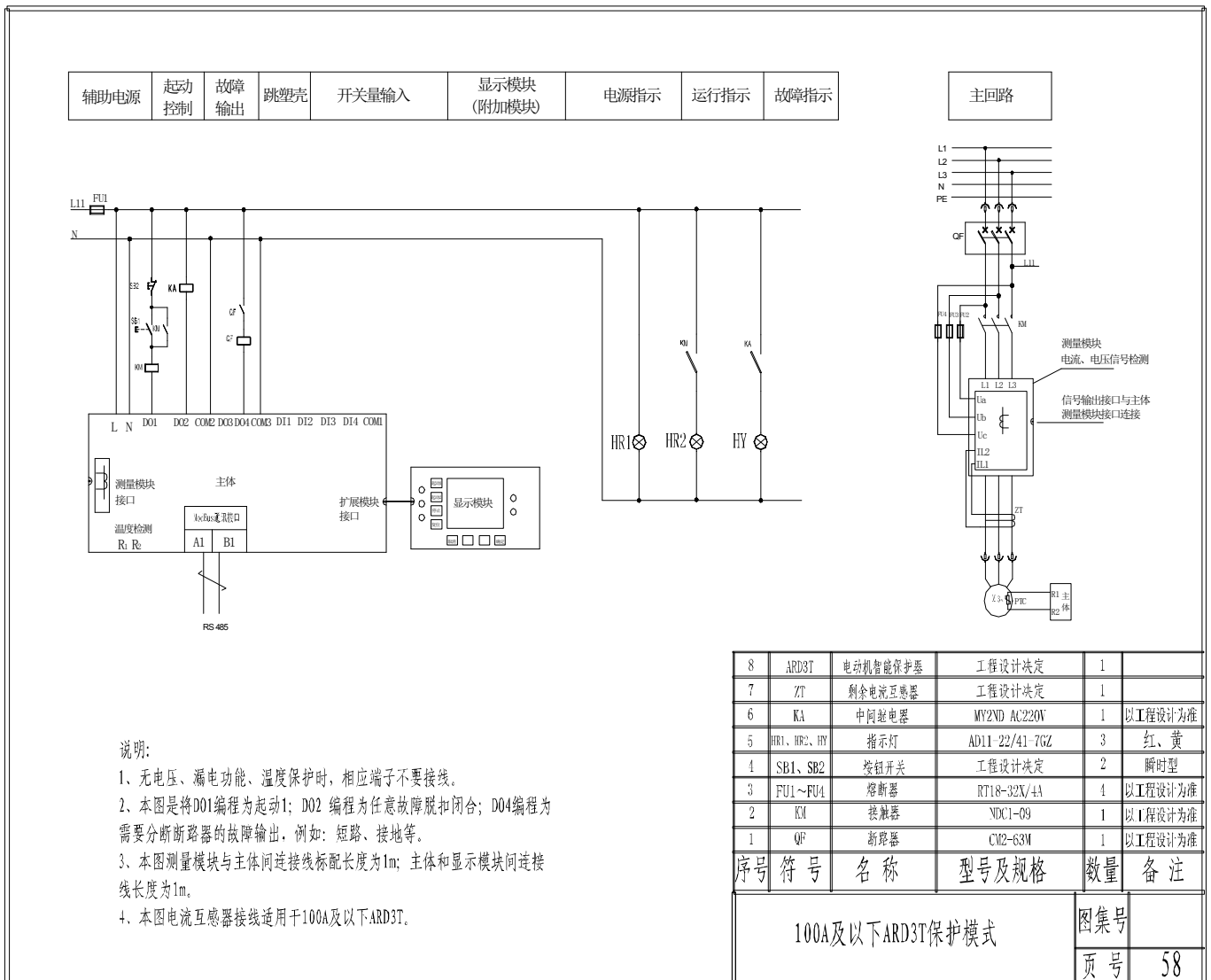


图38 输出数据用户参数

Figure 38 User parameters of output data

## 9 典型应用原理图 Typical application schematic diagram

### 9.1 100A 及以下 ARD3T 保护模式 ARD3T of 100A and below protection mode



说明: Notes:

1.无电压, 漏电功能, 温度保护时, 对应端子不要接线

Without voltage, leakage, temperature protection function, the corresponding terminals should not be wired.

2.本图是将 D01 编程为起动 1; D02 编程为任意故障脱扣闭合; D04 编程为需要分断断路器的故障输出, 例如: 短路, 接地等

This figure defines D01 as starting1, D02 as any fault tripping close, and D04 as fault output of circuit breaker which need disjunction, for example: short circuit or grounding.

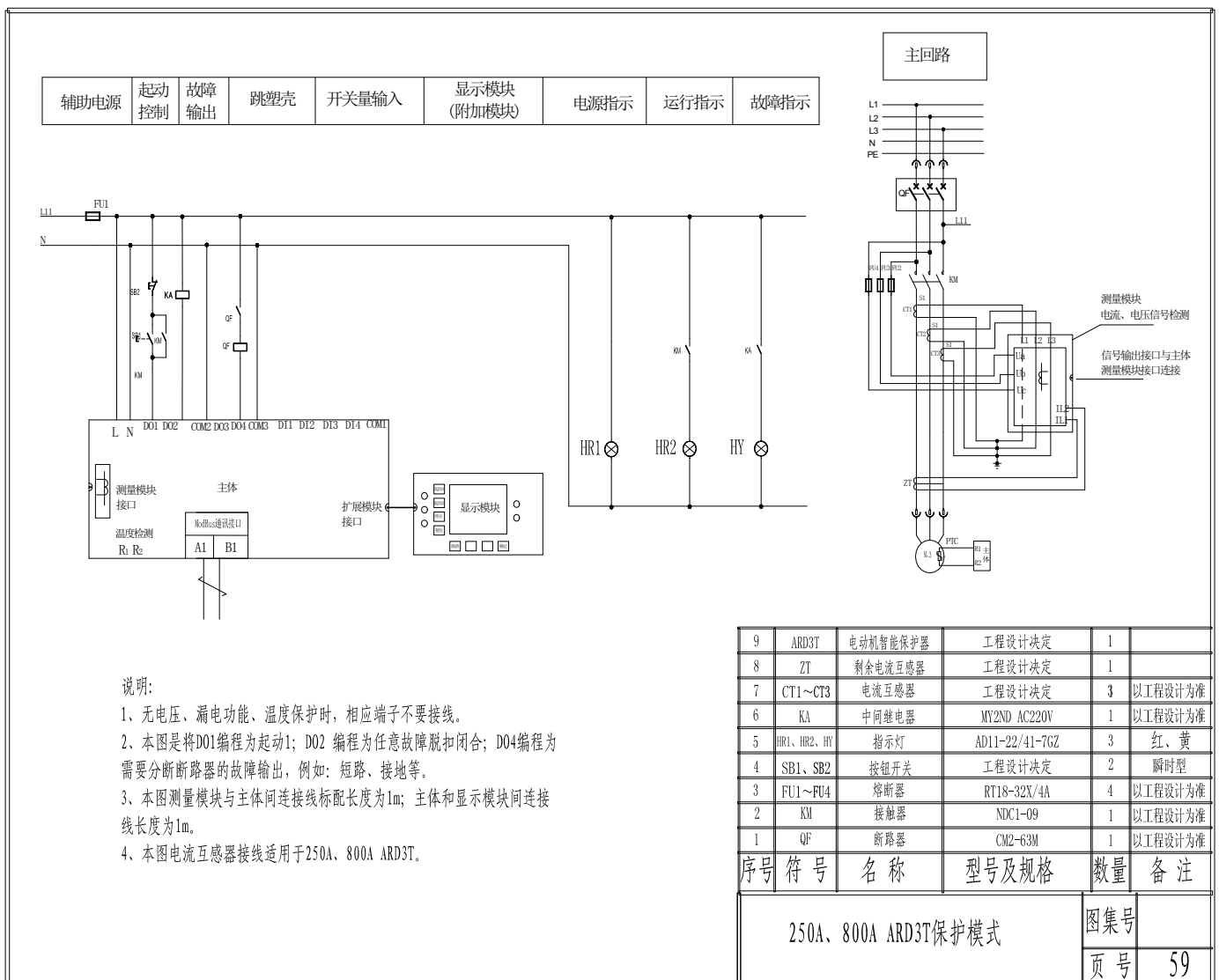
3.本图测量模块与主体间连接标配长度 1m, 主体和显示模块间连接线长度为 1m

The standard configuration connecting line between master and measurement module is 1m, and the connecting line between master and display module is also 1m.

4.本图电流互感器接线适用于 200A 及以下 ARD3T

The wiring of current transformer in this figure is used for ARD3T of 200A and below.

### 9.2 250A、800A ARD3T 保护模式 ARD3T of 250A, 800A protection mode



说明: Notes:

1.无电压, 漏电功能, 温度保护时, 对应端子不要接线

Without voltage, leakage, temperature protection function, the corresponding terminals should not be wired.

2.本图是将 D01 编程为起动 1; D02 编程为任意故障脱扣闭合; D04 编程为需要分断断路器的故障输出, 例如: 短路, 接地等

This figure defines D01 as starting1, D02 as any fault tripping close, and D04 as fault output of circuit breaker which need disjunction, for example: short circuit or grounding.

disjunction, for example: short circuit or grounding.

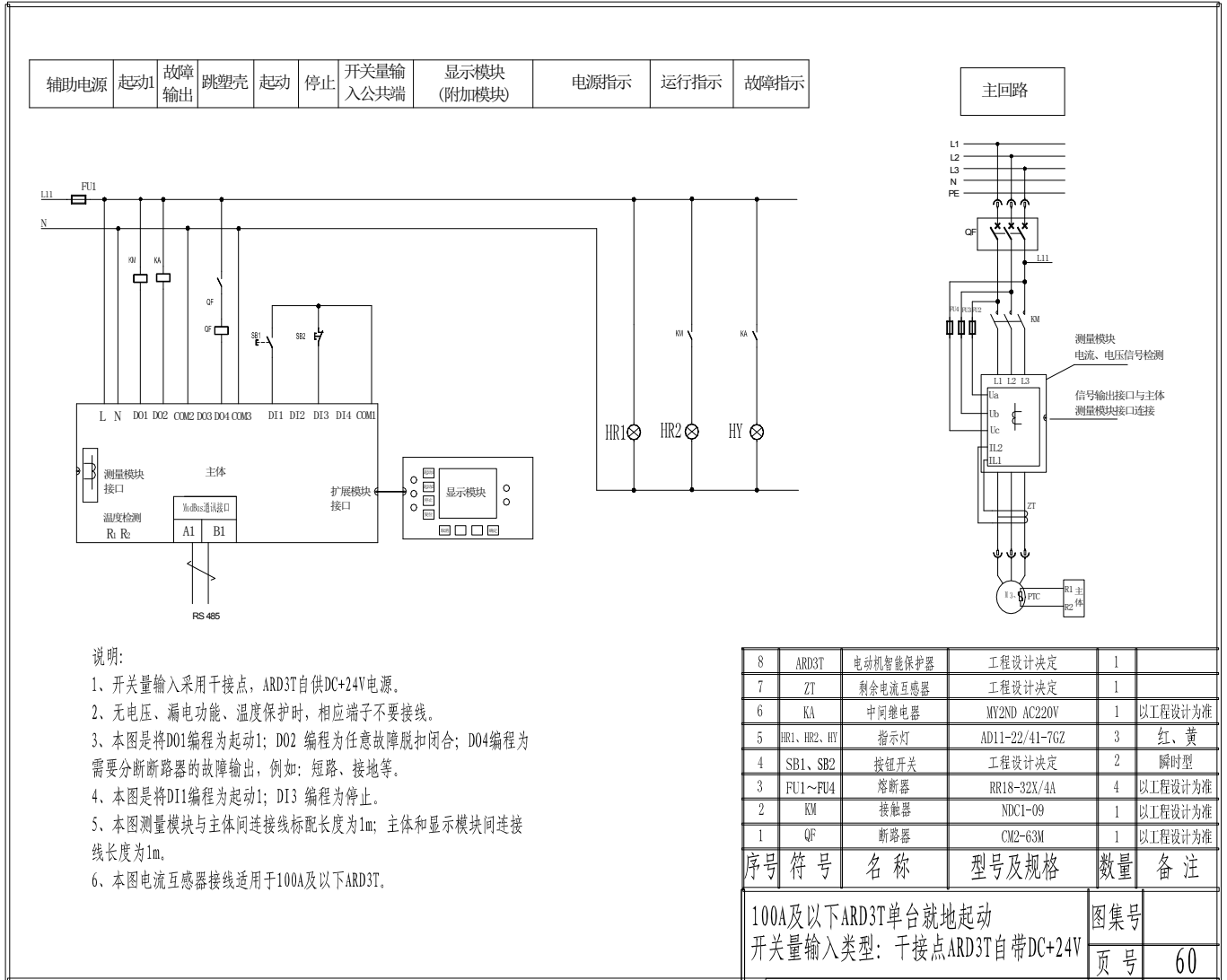
3. 本图测量模块与主体间连接标配长度 1m，主体和显示模块间连接线长度为 1m

The standard configuration connecting line between master and measurement module is 1m, and the connecting line between master and display module is also 1m.

4. 本图电流互感器接线适用于 250A, 800A ARD3T

The wiring of current transformer in this figure is used for ARD3T of 250A, 800A.

### 9.3 100A 及以下 ARD3T 单台就地直接起动 ARD3T of 100A and below single field direct starting



说明：Notes:

1. 开关量输入采用干接点，ARD3T 自供 DC+24V 电源。

Switching input adopts dry contact, ARD3T provides DC+24V power supply itself.

2. 无电压，漏电功能，温度保护时，对应端子不要接线

Without voltage, leakage, temperature protection function, the corresponding terminals should not be wired.

3. 本图是将 D01 编程为起动 1；D02 编程为任意故障脱扣闭合；D04 编程为需要分断断路器的故障输出，例如：短路，接地等

This figure defines D01 as starting1, D02 as any fault tripping close, and D04 as fault output of circuit breaker which need disjunction, for example: short circuit or grounding.

4. 本图是将 DI1 编程为起动 1；DI3 为停止。

This figure defines DI1 as starting1, DI2 as starting 2, and DI3 as stopping.

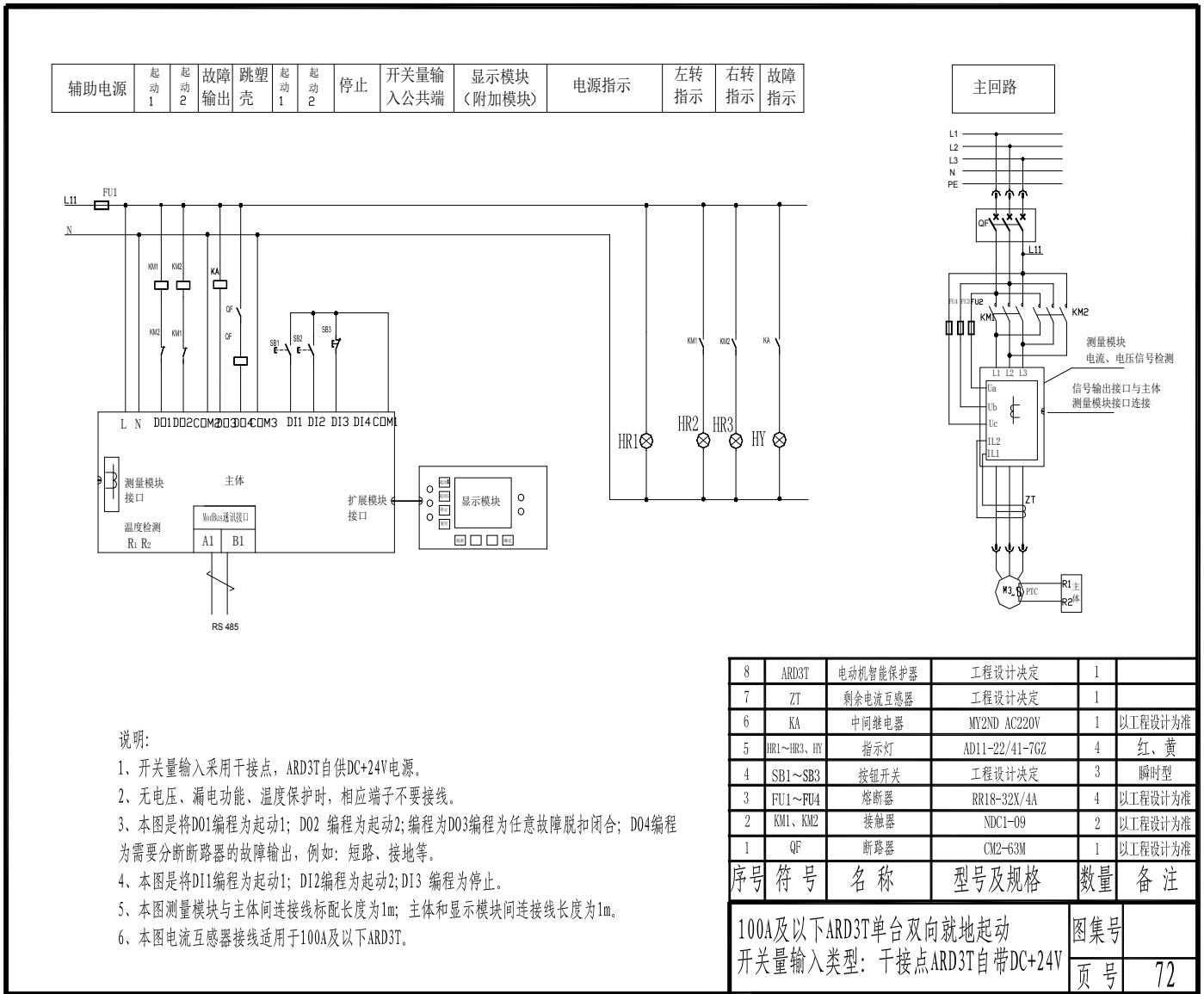
5. 本图测量模块与主体间连接标配长度 1m，主体和显示模块间连接线长度为 1m

The standard configuration connecting line between master and measurement module is 1m, and the connecting line between master and display module is also 1m.

6.本图电流互感器接线适用于 100A 及以下。

The wiring of current transformer in this figure is used for ARD3T of 100A and below.

**9.4 100A 及以下 ARD3T 单台双向就地起动的 ARD3T of 100A and below single two-directional field starting**



说明：Notes:

1.开关量输入采用干接点，ARD3T 自供 DC+24V 电源。

Switching input adopts dry contact, ARD3T provides DC+24V power supply itself.

2.无电压，漏电功能，温度保护时，对应端子不要接线

Without voltage, leakage, temperature protection function, the corresponding terminals should not be wired.

3.本图是将 D01 编程为启动 1；D02 编程为任意故障脱扣闭合；D04 编程为需要分断断路器的故障输出，例如：短路，接地等

This figure defines D01 as starting1, D02 as any fault tripping close, and D04 as fault output of circuit breaker which need disjunction, for example :short circuit or grounding.

4.本图是将 DI1 编程为启动 1；DI2 编程为启动 2；DI3 为停止。

This figure defines DI1 as starting1, DI2 as starting 2, and DI3 as stopping.

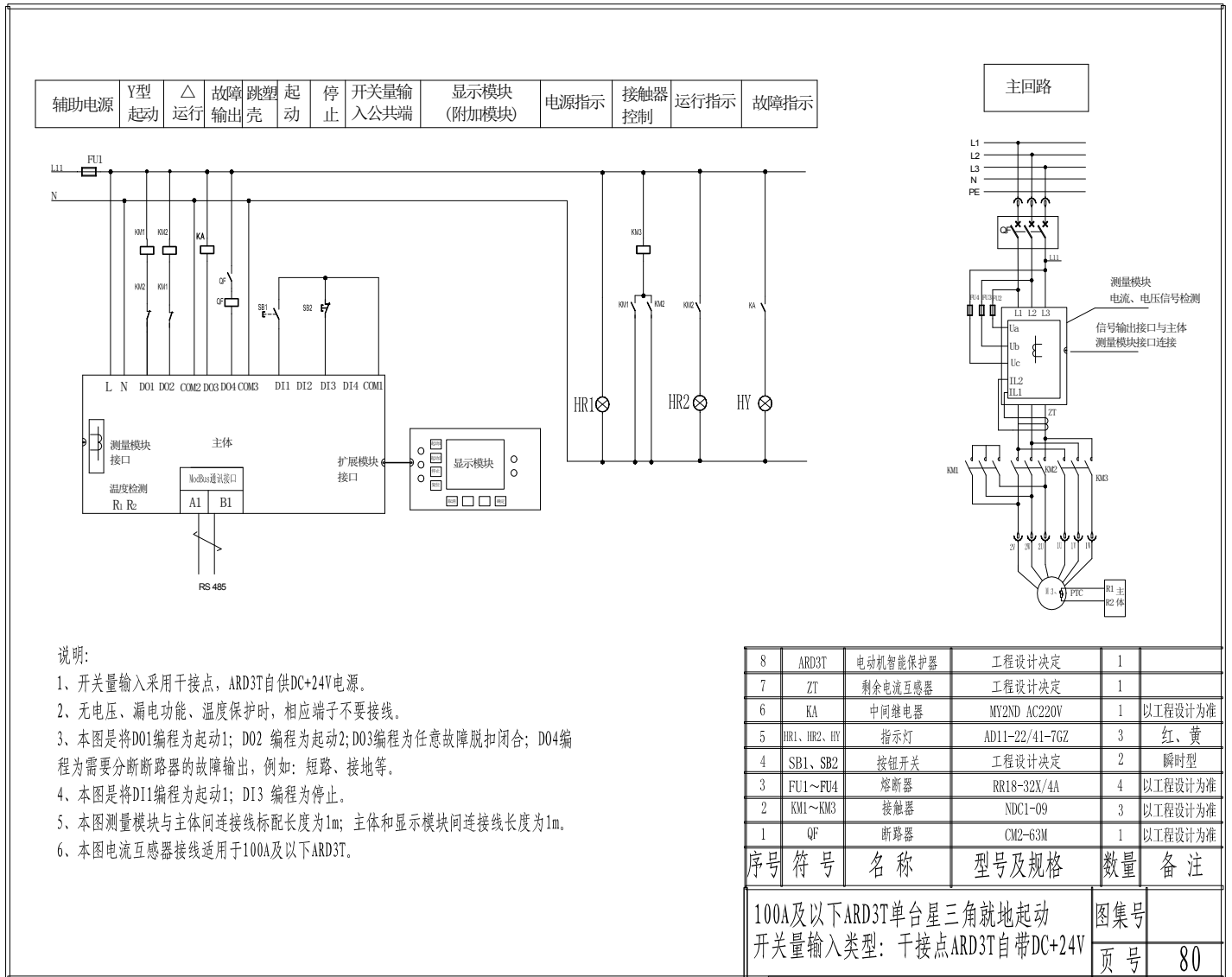
5.本图测量模块与主体间连接标配长度 1m，主体和显示模块间连接长度为 1m

The standard configuration connecting line between master and measurement module is 1m, and the connecting line between master and display module is also 1m.

6. 本图电流互感器接线适用于 100A 及以下。

The wiring of current transformer in this figure is used for ARD3T of 100A and below.

**9.5 100A 及以下 ARD3T 单台星三角就地起动 ARD3T of 100A and below single Y-Δ field starting**



说明:

1. 开关量输入采用干接点, ARD3T自供DC+24V电源。
2. 无电压、漏电功能、温度保护时, 相应端子不要接线。
3. 本图是将D01编程为起动1; D02编程为任意故障脱扣闭合; D04编程为需要分断断路器的故障输出, 例如: 短路、接地等。
4. 本图是将DI1编程为起动1; DI3编程为停止。
5. 本图测量模块与主体间连接标配长度为1m; 主体和显示模块间连接长度为1m。
6. 本图电流互感器接线适用于100A及以下ARD3T。

说明: Notes:

1. 开关量输入采用干接点, ARD3T 自供 DC+24V 电源。

Switching input adopts dry contact, ARD3T provides DC+24V power supply itself.

2. 无电压, 漏电功能, 温度保护时, 对应端子不要接线

Without voltage, leakage, temperature protection function, the corresponding terminals should not be wired.

3. 本图是将 D01 编程为起动 1; D02 编程为任意故障脱扣闭合; D04 编程为需要分断断路器的故障输出, 例如: 短路, 接地等

This figure defines D01 as starting1, D02 as any fault tripping closing, and D04 as fault output of circuit breaker which need disjunction, for example: short circuit or grounding.

4. 本图是将 DI1 编程为起动 1; DI3 为停止。

This figure defines DI1 as starting1, and DI3 as stopping.

5. 本图测量模块与主体间连接标配长度 1m, 主体和显示模块间连接长度为 1m

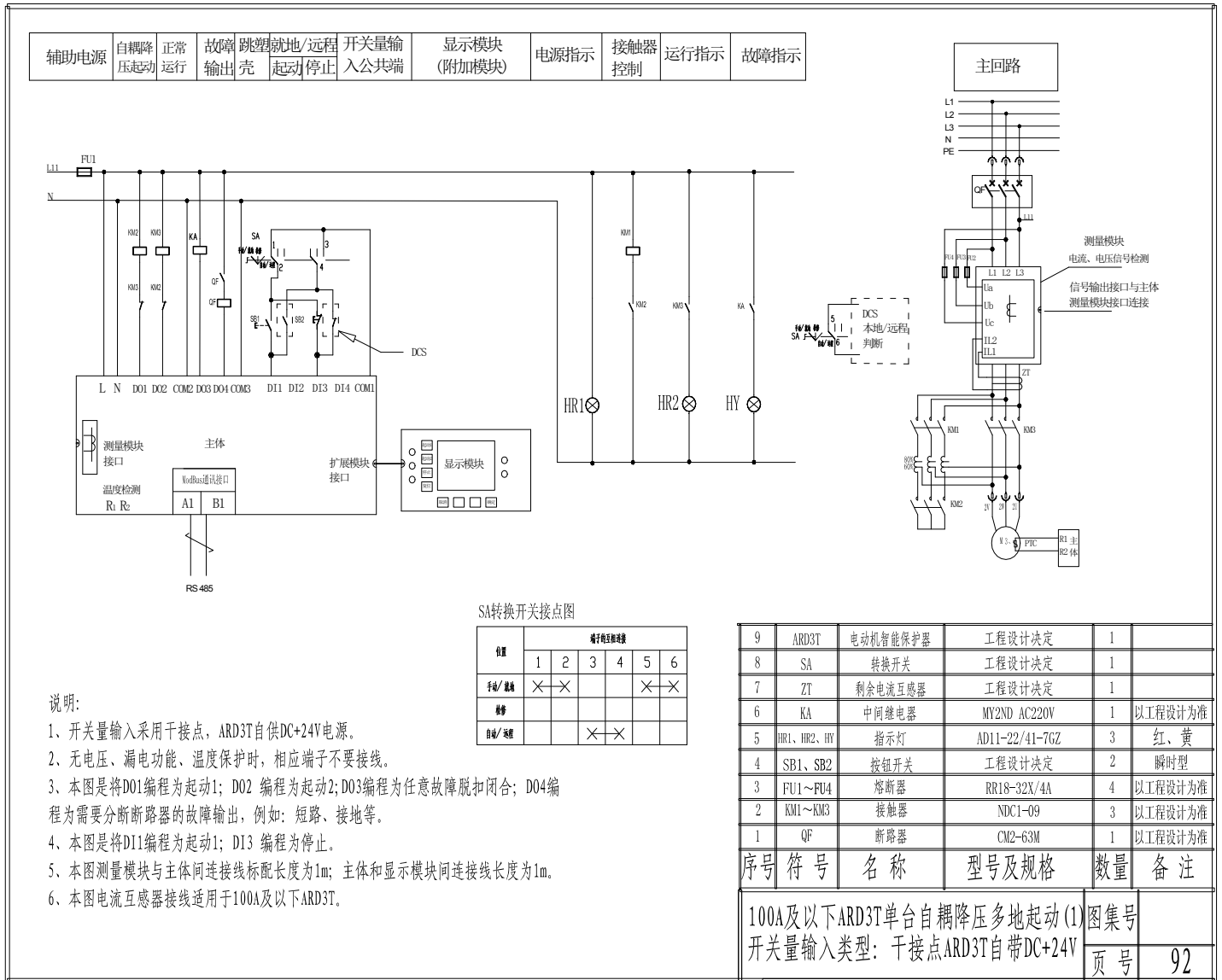
The standard configuration connecting line between master and measurement module is 1m, and the connecting line between

master and display module is also 1m.

6.本图电流互感器接线适用于 100A 及以下。

The wiring of current transformer in this figure is used for ARD3T of 100A and below.

### 9.6 100A 及以下 ARD3T 单台自耦降压就地起动 ARD3T of 100A and below single autotransformer step-down field starting



说明: Notes:

1.开关量输入采用干接点，ARD3T 自供 DC+24V 电源。

Switching input adopts dry contact, ARD3T provides DC+24V power supply itself.

2.无电压，漏电功能，温度保护时，对应端子不要接线

Without voltage, leakage, temperature protection function, the corresponding terminals should not be wired.

3.本图是将 D01 编程为起动 1；D02 编程为任意故障脱扣闭合；D04 编程为需要分断断路器的故障输出，例如：短路，接地等

This figure define D01 as starting1, D02 as any fault tripping closing, and D04 as fault output of circuit breaker which need disjunction,for example:short circuit or grounding.

4.本图是将 DI1 编程为起动 1；DI3 为停止。

This figure defines DI1 as starting1, and DI3 as stopping.

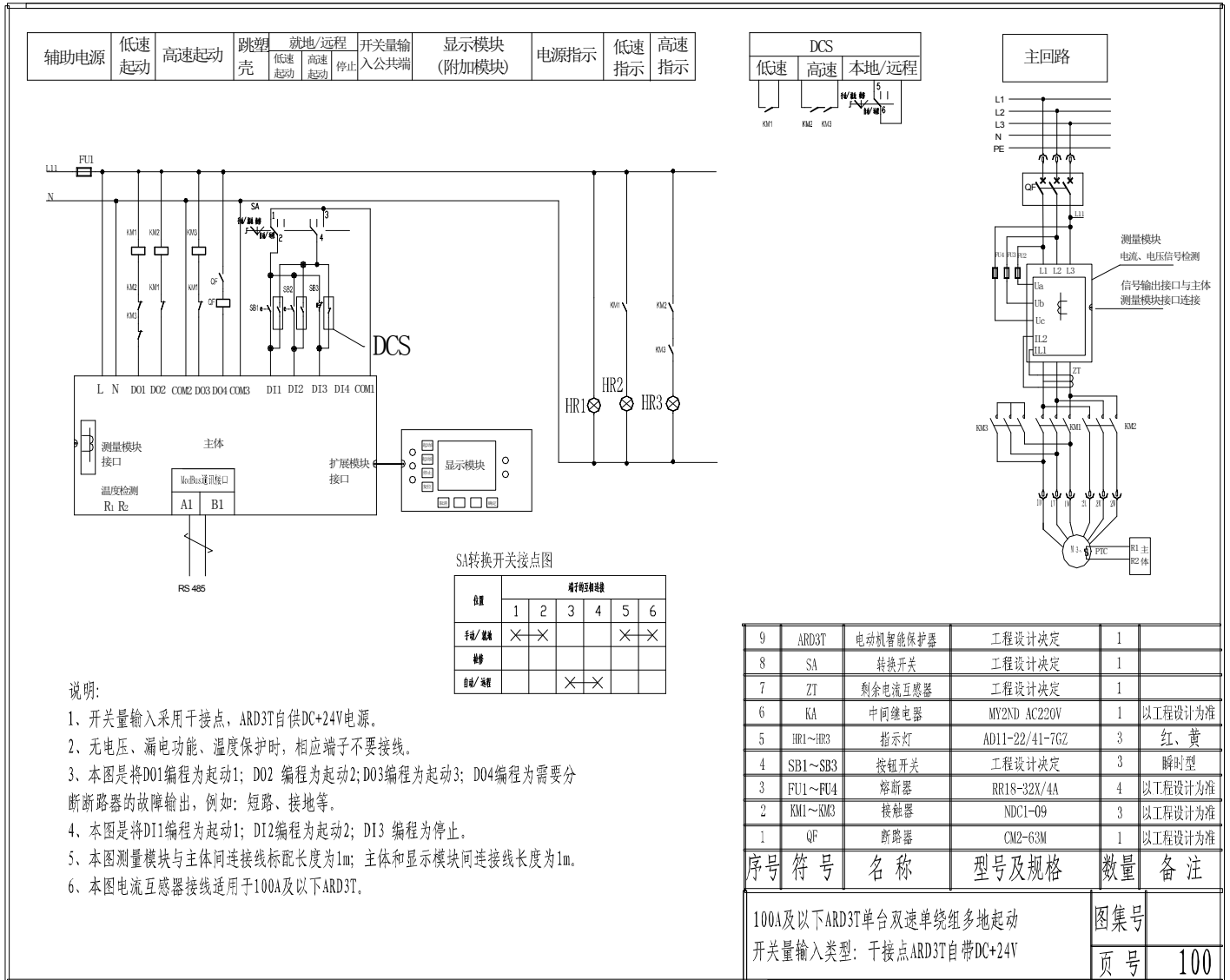
5. 本图测量模块与主体间连接标配长度 1m，主体和显示模块间连接线长度为 1m

The standard configuration connecting line between master and measurement module is 1m, and the connecting line between master and display module is also 1m.

6. 本图电流互感器接线适用于 100A 及以下。

The wiring of current transformer in this figure is used for ARD3T of 100A and below.

### 9.7 100A 及以下 ARD3T 单台双速单绕组就地起动 ARD3T of 100A and below single two-speed single winding field starting



说明:

1. 开关量输入采用干接点，ARD3T自供DC+24V电源。
2. 无电压、漏电功能、温度保护时，相应端子不要接线。
3. 本图是将D01编程为起动1；D02编程为起动2；D03编程为起动3；D04编程为需要分断断路器的故障输出，例如：短路、接地等。
4. 本图是将DI1编程为起动1；DI2编程为起动2；DI3编程为停止。
5. 本图测量模块与主体间连接标配长度为1m；主体和显示模块间连接线长度为1m。
6. 本图电流互感器接线适用于100A及以下ARD3T。

说明：Note:

1. 开关量输入采用干接点，ARD3T 自供 DC+24V 电源。

Switching input adopts dry contact, ARD3T provides DC+24V power supply itself.

2. 无电压，漏电功能，温度保护时，对应端子不要接线

Without voltage, leakage, temperature protection function, the corresponding terminals should not be wired.

3. 本图是将 D01 编程为起动 1；D02 编程为任意故障脱扣闭合；D04 编程为需要分断断路器的故障输出，例如：短路，接地等

This figure defines D01 as starting1, D02 as any fault tripping closing, and D04 as fault output of circuit breaker which need disjunction, for example: short circuit or grounding.

4. 本图是将 DI1 编程为起动 1；DI2 起动 2；为 DI3 为停止。

This figure define DI1 as starting1, DI1 as starting2, and DI3 as stopping.

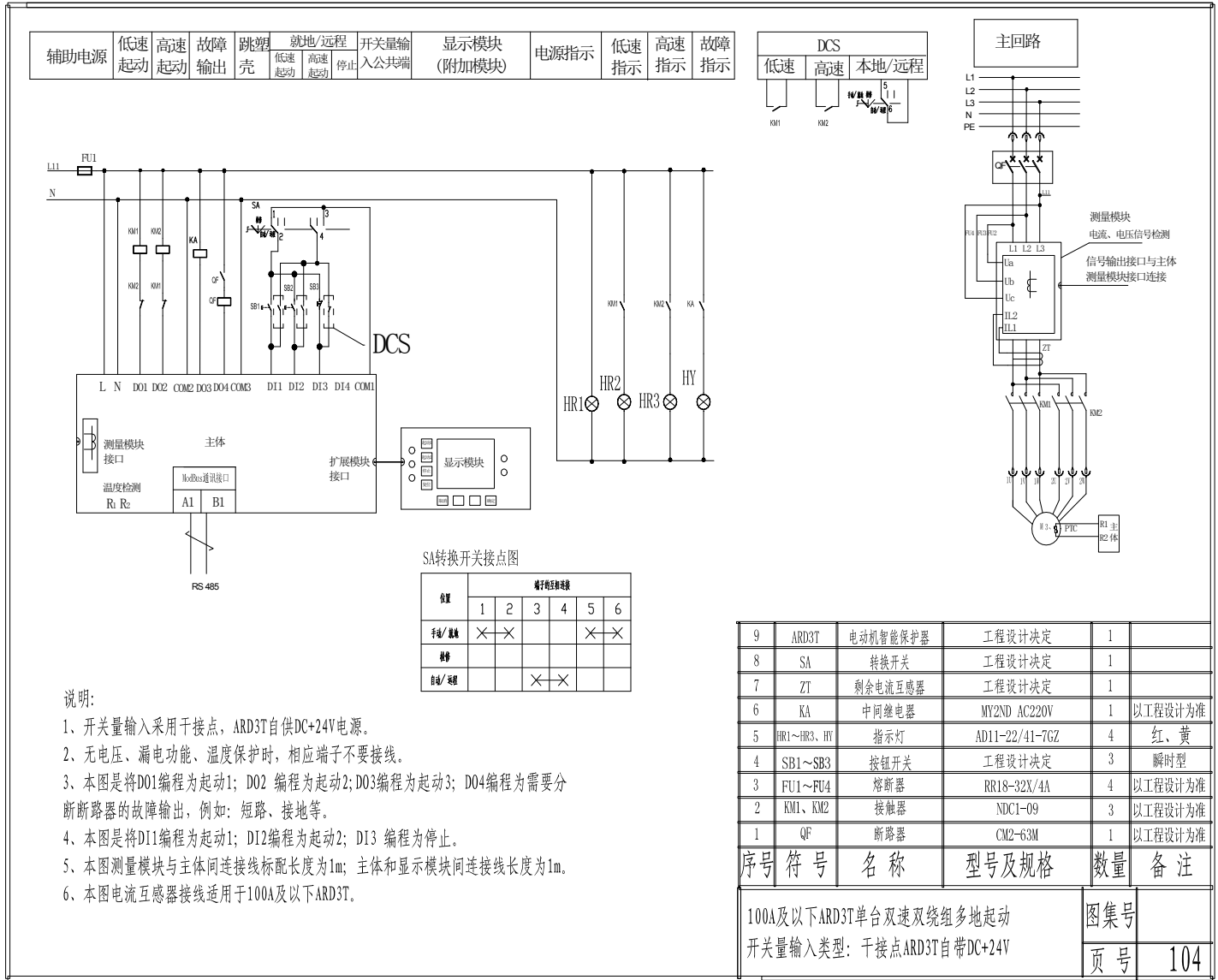
5.本图测量模块与主体间连接标配长度 1m，主体和显示模块间连接线长度为 1m

The standard configuration connecting line between master and measurement module is 1m, and the connecting line between master and display module is also 1m.

6.本图电流互感器接线适用于 100A 及以下。

The wiring of current transformer in this figure is used for ARD3T of 100A and below.

### 9.8 100A 及以下 ARD3T 单台双速双绕组就地启动 ARD3T of 100A and below single two-speed duplex winding field starting



说明: Notes:

1.开关量输入采用干接点，ARD3T 自供 DC+24V 电源。

Switching input adopts dry contact, ARD3T provides DC+24V power supply itself.

2.无电压，漏电功能，温度保护时，对应端子不要接线

Without voltage, leakage, temperature protection function, the corresponding terminals should not be wired.

3.本图是将 D01 编程为启动 1；D02 编程为任意故障脱扣闭合；D04 编程为需要分断断路器的故障输出，例如：短路，接地等

This figure defines D01 as starting1, D02 as any fault tripping closing, and D04 as fault output of circuit breaker which need disjunction,for example:short circuit or grounding.

4.本图是将 DI1 编程为启动 1；DI2 启动 2；为 DI3 为停止。

This figure define DI1 as starting1, DI1 as starting2, and DI3 as stopping.



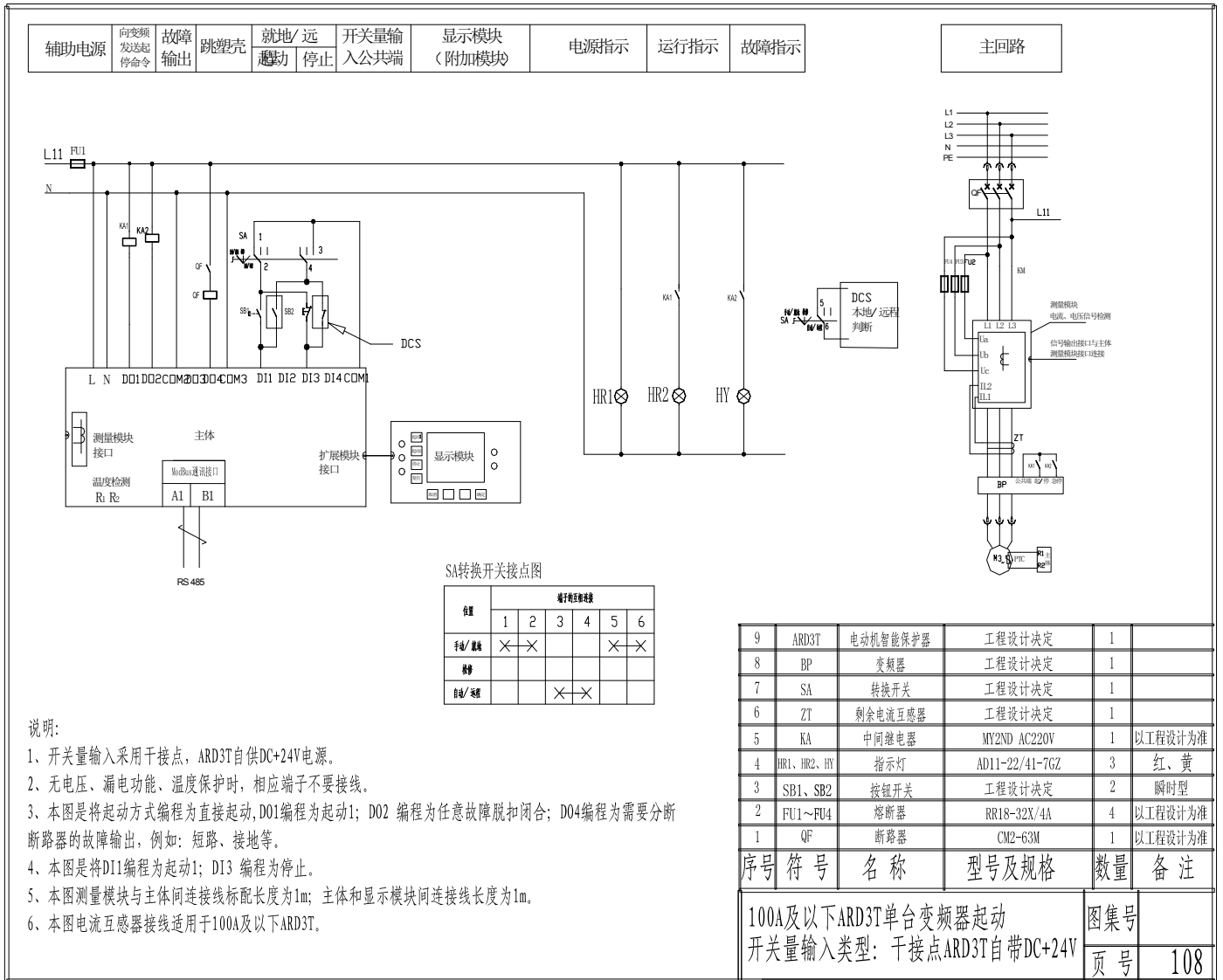
5.本图测量模块与主体间连接标配长度 1m，主体和显示模块间连接线长度为 1m

The standard configuration connecting line between master and measurement module is 1m, and the connecting line between master and display module is also 1m.

6.本图电流互感器接线适用于 100A 及以下。

The wiring of current transformer in this figure is used for ARD3T of 100A and below.

### 9.9 ARD3T 单台变频起动 ARD3T single frequency conversion starting



说明:

1. 开关量输入采用干接点，ARD3T自供DC+24V电源。
2. 无电压、漏电功能、温度保护时，相应端子不要接线。
3. 本图是将起停方式编程为直接起停，D01编程为起停1；D02编程为任意故障脱扣闭合；D04编程为需要分断断路器的故障输出，例如：短路、接地等。
4. 本图是将DI1编程为起停1；DI3编程为起停。
5. 本图测量模块与主体间连接标配长度为1m；主体和显示模块间连接长度为1m。
6. 本图电流互感器接线适用于100A及以下ARD3T。

说明：Notes:

1.开关量输入采用干接点，ARD3T 自供 DC+24V 电源。

Switching input adopts dry contact, ARD3T provides DC+24V power supply itself.

2.无电压，漏电功能，温度保护时，对应端子不要接线

Without voltage, leakage, temperature protection function, the corresponding terminals should not be wired.

3.本图是将 D01 编程为起停1；D02 编程为任意故障脱扣闭合；D04 编程为需要分断断路器的故障输出，例如：短路，接地等

This figure defines D01 as starting1, D02 as any fault tripping closing, and D04 as fault output of circuit breaker which need disjunction,for example:short circuit or grounding.

4.本图是将 DI1 编程为起停1；为 DI3 为起停。

This figure defines DI1 as starting1, and DI3 as stopping.

5.本图测量模块与主体间连接标配长度 1m，主体和显示模块间连接长度为 1m

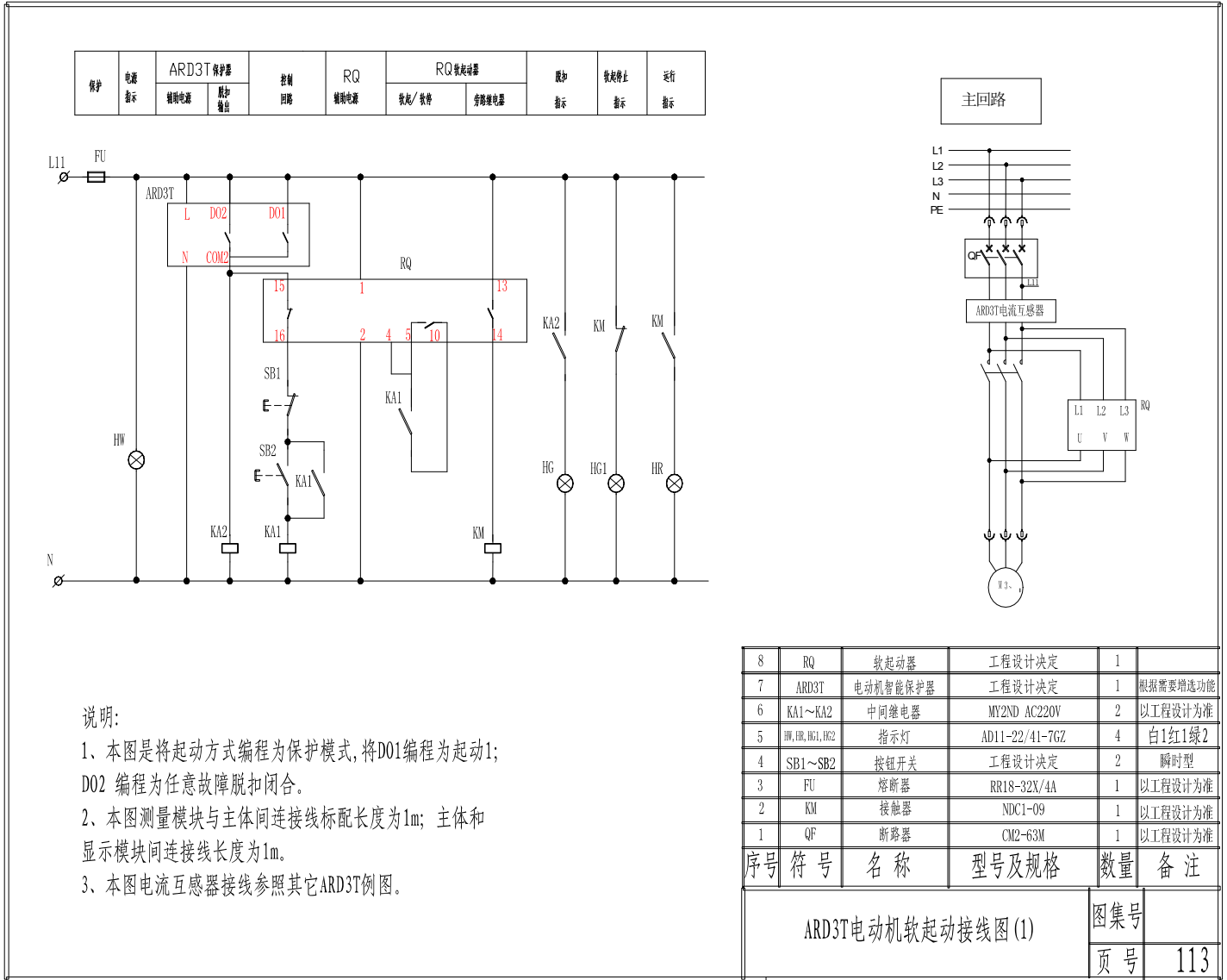
The standard configuration connecting line between master and measurement module is 1m, and the connecting line between

master and display module is also 1m.

6. 本图电流互感器接线适用于 100A 及以下。

The wiring of current transformer in this figure is used for ARD3T of 100A and below.

9.10 ARD3T 软起动接线图 (1) ARD3T soft starting wiring diagram(1)



说明: Notes:

1. 本图是将起动方式编程为保护模式, 将 D01 编程为起动 1; D02 编程为任意故障脱扣闭合

This figure defines starting mode as protection mode, D01 as starting 1, D02 as any fault tripping closing

2. 本图测量模块与主体间连接标配长度 1m, 主体和显示模块间连接线长度为 1m

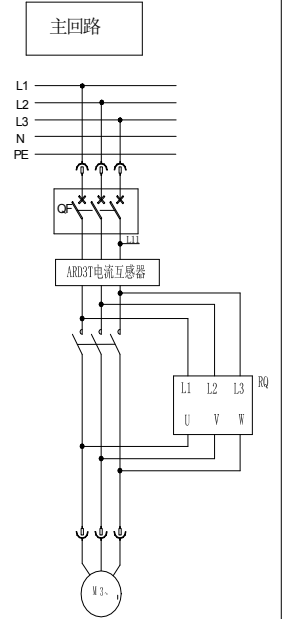
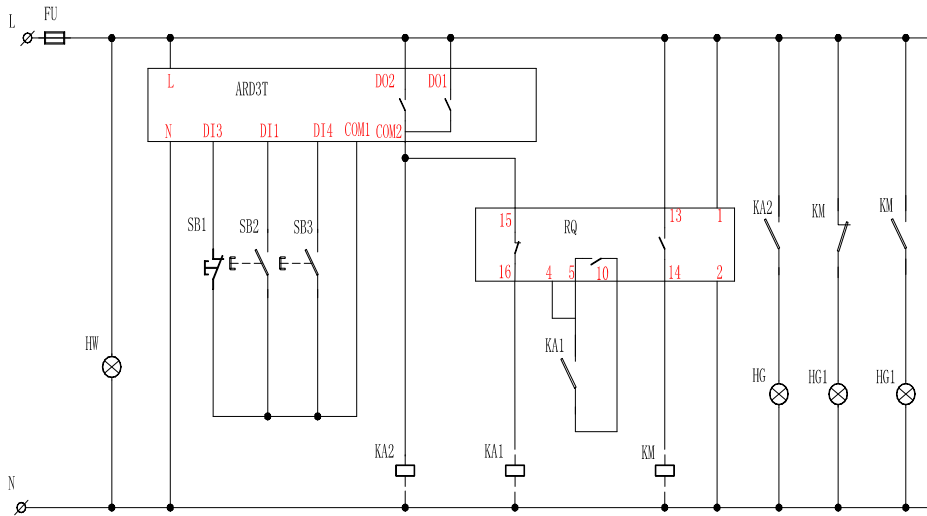
The standard configuration connecting line between master and measurement module is 1m, and the connecting line between master and display module is also 1m.

3. 本图电流互感器接线参照其它 ARD3T 例图

Current transformer's wiring refers to other ARD3T illustration.

9.11 ARD3T 软起动接线图 (2) ARD3T soft starting wiring diagram(2)

保护	电源指示	ARD3T 保护器						脱扣保护	RQ 软启动器			脱扣指示	软起停止指示	运行指示
		辅助电源	停止	启动	复位	公共端	脱扣输出		软起/软停	旁路继电器	辅助电源			



说明:

- 1、本图是将起方式编程为直接模式,将DO1编程为起1; DO2 编程为任意故障脱扣闭合。
- 2、本图DI1编程为起, DI3编程为停, DI4编程为复。
- 3、本图测量模块与主体间连接标配长度为1m; 主体和显示模块间连接线长度为1m。
- 4、本图电流互感器接线参照其它ARD3T例图。

8	RQ	软启动器	工程设计决定	1		
7	ARD3T	电动机智能保护器	工程设计决定	1	根据需要增选功能	
6	KA1~KA2	中间继电器	MY2ND AC220V	2	以工程设计为准	
5	HR, HW	指示灯	AD11-22/41-7GZ	2	红、白	
4	SB1~SB2	按钮开关	工程设计决定	2	瞬时型	
3	FU	熔断器	RR18-32X/4A	1	以工程设计为准	
2	KM	接触器	NDC1-09	1	以工程设计为准	
1	QF	断路器	CM2-63M	1	以工程设计为准	
序号	符号	名称	型号及规格	数量	备注	
ARD3T电动机软起接线图(2)					图集号	
					页号	114

说明: Notes:

1. 本图是将起方式编程为直接模式,将 DO1 编程为起 1; 为 DO2 为任意故障脱扣闭合。  
This figure define starting mode as direct mode, D01 as starting1, D02 as any fault tripping closing
2. 本图 DI1 编程为起, DI3 编程为停, DI4 编程为复。  
This figure defines DI1 as starting, DI3 as stopping, and DI4 as resetting.
3. 本图测量模块与主体间连接标配长度 1m, 主体和显示模块间连接线长度为 1m  
The standard configuration connecting line between master and measurement module is 1m, and the connecting line between master and display module is also 1m.
4. 本图电流互感器接线参照其它 ARD3T 例图  
Current transformer's wiring refers to other ARD3T illustration.